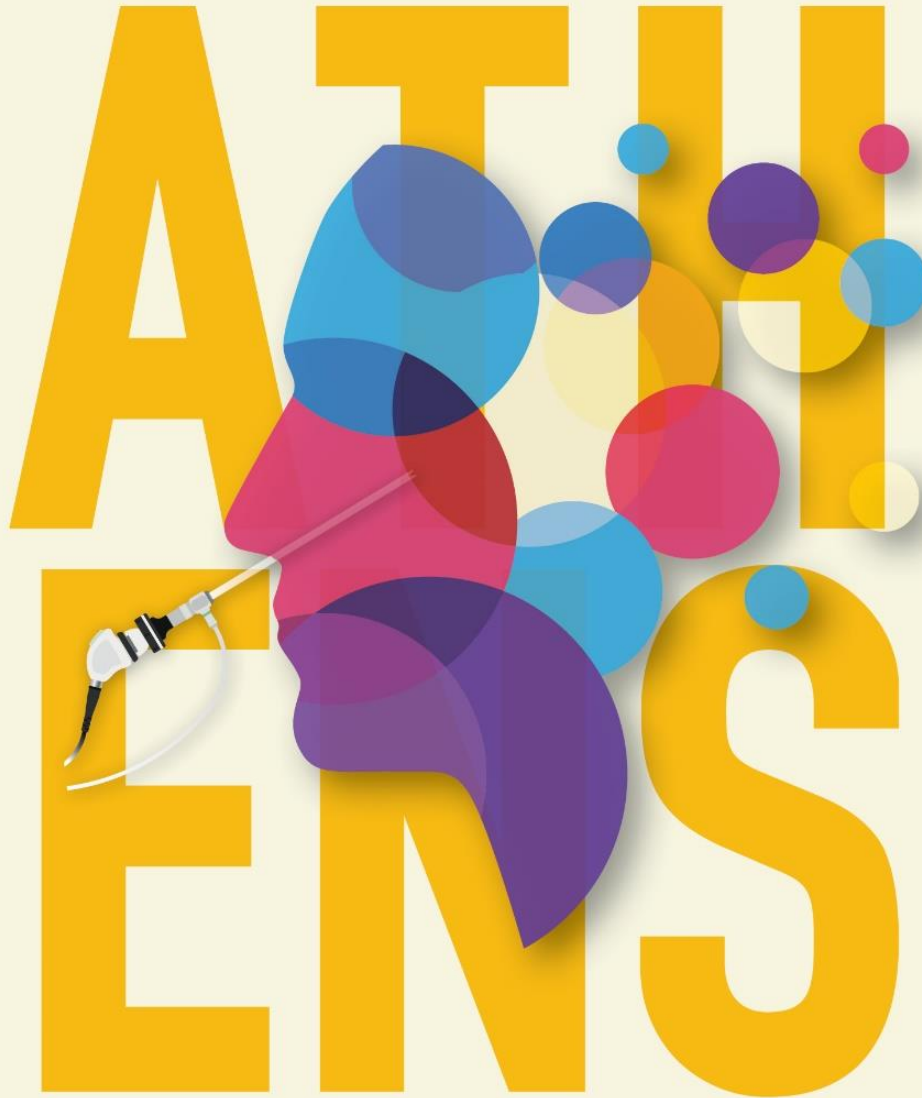


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Oral Abstracts

5772

ENDOSCOPIC ENDONASAL TRANSNASOPHARYNGEAL APPROACH FOR VENTRAL CRANIOVERTEBRAL JUNCTION LESIONS

Takeshi Hongo¹, Yusuke Morinaga¹, Shunsuke Shibao¹, Ryu Kurokawa¹, Yasuhiro Tsunemi², Takashi Kashiwagi², Tsuguhisa Nakayama², Hiroyoshi Akutsu¹

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Objective: Lesions of the ventral craniovertebral junction pose significant challenges due to their deep location and proximity to critical neurovascular and pharyngeal structures. This study describes the surgical technique and outcomes of the endoscopic endonasal transnasopharyngeal approach for these lesions, emphasizing key considerations in approach selection, airway management, and occipitocervical stabilization.

Methods: We retrospectively analyzed seven patients who underwent this approach for ventral craniovertebral junction lesions. Data included preoperative planning, surgical technique, postoperative care, airway and nutrition strategies, and occipitocervical fixation requirements. A representative case demonstrates essential technical steps.

Results: Among the seven patients, six had tumors and one had basilar invagination. Despite a mean lesion size of 39.4 mm, subtotal or greater resection was achieved in five tumor cases. Occipitocervical fixation was required in two patients. Two underwent prophylactic tracheostomy. Of five orally intubated cases, three were extubated immediately and two by day two. Oral feeding resumed by day ten in six patients. No infections or CSF leaks occurred.

Conclusion: The endoscopic endonasal transnasopharyngeal approach offers a safe, effective option for ventral craniovertebral junction lesions with careful patient selection and individualized airway and stability management.



5778

ENDOSCOPIC ENDONASAL APPROACH IN ESTHESIONEUROBLASTOMA: EFFICACY AND PROGNOSIS

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Introduction: Esthesioneuroblastoma (ENB) is a rare malignant tumor of the anterior skull base. The expanded endoscopic endonasal approach (EEEA) has emerged as a less invasive alternative to craniofacial resection. This study aimed to evaluate outcomes, recurrence, and prognostic factors in patients treated with EEEA.

Methods: We retrospectively reviewed 10 patients with ENB treated between 2014–2024 at a tertiary oncology center. All underwent EEEA followed by external beam radiotherapy. Clinical data, Kadish and Hyams classifications, previous surgeries, adjuvant therapies, and survival were analyzed.

Results: Patients ranged from 38–70 years (mean 52.2), with 60% male. Eight cases (80%) were high-grade Kadish (7 C, 1 D), while two (20%) were early stage (A/B). Six patients (60%) had prior surgery, and four (40%) received adjuvant chemotherapy. Median overall survival was 3.5 years. Five-year overall survival was 70%, while three patients (30%) developed recurrence. Only Hyams grade showed a significant correlation with prognosis ($p=0.035$); lower grades correlated with better survival. Kadish stage and chemotherapy were not statistically significant.

Conclusions: EEEA combined with radiotherapy is effective for ENB, achieving good control with low morbidity. Hyams grade remains the key prognostic factor, while chemotherapy may have a role in select high-grade cases. Long-term follow-up is essential.

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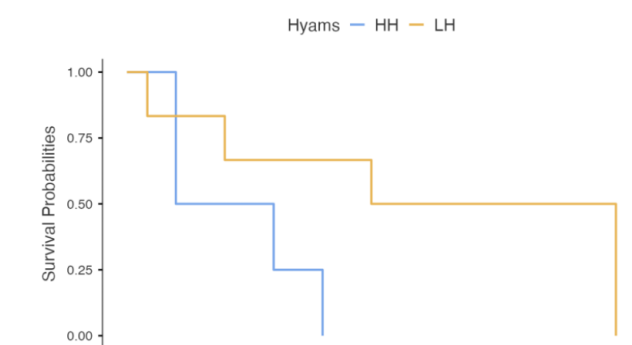
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Survival Curve



Survival Curve

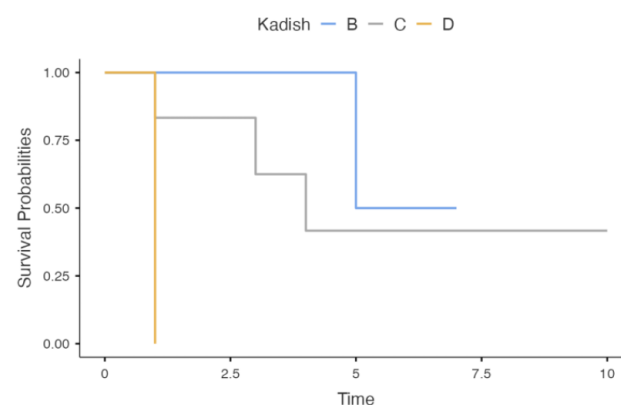


Figure 1: Kaplan-Meier survival curves: prognostic impact of Hyams and Kadish classifications

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SUTURE-BASED SKULL BASE RECONSTRUCTION IN ENDOSCOPIC ENDONASAL SKULL BASE SURGERY

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Introductions: Endoscopic endonasal surgery has become widely adopted for skull base lesions, supported by advances in visualization and surgical techniques. Although tumor resection can now be performed safely and effectively, skull base reconstruction remains a critical challenge, particularly in preventing postoperative CSF leakage.

Materials and Methods: We employed a suture-based closure technique using fascia lata to achieve reliable dural repair. Between 2010 and 2024, 250 patients with definite intraoperative CSF leakage underwent reconstruction with this method. A fascia lata graft, larger than the dural defect, was placed intradurally and patch-sutured to the native dura until CSF flow completely ceased. A second graft was then placed epidurally and reinforced with bone fragments, followed by application of a vascularized nasoseptal or local mucosal flap. Reconstruction required 20–40 minutes, with no lumbar drainage, and postoperative bed rest was limited to the day of surgery.

Results: No postoperative CSF leakage or infections occurred in this series. The watertight closure achieved by suturing proved essential for preventing early postoperative leakage, while mucosal flaps promoted healing and provided vascularized coverage.

Conclusions: These results demonstrate that suture-based reconstruction is a highly effective and reliable technique for skull base closure in endoscopic endonasal surgery, offering durable protection against CSF leakage.

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5800

INITIAL EXPERIENCE FOR TRANSORBITAL NEURO ENDOSCOPIC SURGERY

¹Kafr Elsheikh , ²Kasr Eleiny

This is a feasibility study done in Kasr Eleiny university hospital on 10 fresh frozen cadavers and 10 dry skulls. Doing all trans orbital endoscopic approaches. 4 corridors were studied (superior lid crease approach - medial precaruncular approach - lateral retrocanthal approach - inferior preseptal approach). Good anatomical orientation of the orbit were studied endoscopically. Endoscopic Trans orbital different approaches we can use to do direct access to anterior and middle cranial fossa without crossing major vessels or important nerves.

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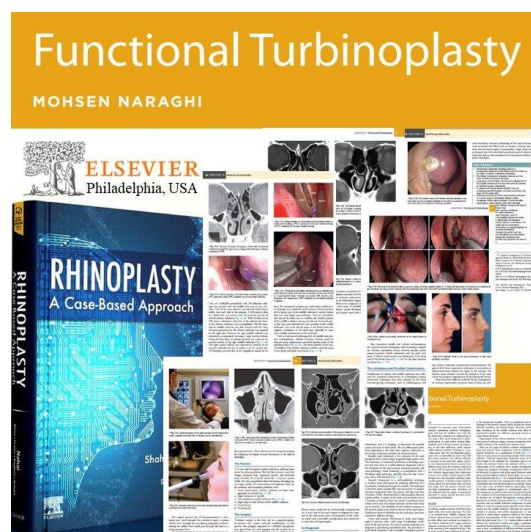
5804

FUNCTIONAL TURBINOPLASTY

Mohsen Naraghi¹

¹Chairman, Rhinology Research Society, ²Rhinology Research Society

Correction of functional problems in the nasal airway is a vital step in successful sinonasal surgery. Turbinates play an essential role in regulating airflow through the nose. Clinical and modern simulation studies revealed the critical role of turbinates in nasal physiology. Anatomic variations and inflammatory conditions could affect the normal physiology of the nose. Therefore correction of the pathologic conditions of the inferior and middle turbinates is crucial in restoring nasal function in nasal airway problems. A better understanding of the delicate physiology of the turbinates and advances in minimally invasive surgery have persuaded us to be much more conservative in manipulating these vital structures. Less traumatic approaches provide maximal preservation of the turbinate mucosa while modifying the airway resistance.





5807

EXTENDED ENDOSCOPIC SINUS SURGERY VERSUS NASALIZATION AS A CHOICE FOR RECALCITRANT NASAL POLYPOSIS: CLARIFICATIONS AND MODIFICATIONS

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Nasal polyposis (NP) is considered as one of the most common disease processes in rhinology. The importance of this disease process came from its treatment difficulties among a certain categories of it. Although, there are variable patterns for the classification of this condition, however, based on my long- term experience, I think one of the most significant forms of the categorization of this disease that, which concerns with the response to the treatment. In accordance, the NP is not always obey the commands, sometimes; it will be very recalcitrant that needs the aggressive interventions. For this reason, it become very necessary to research for more extended eradicated surgical procedures rather than the functional one. Hence, there are recognized forms of the NP associated with high incidence of recurrence, which might be operated functionally for frequent sessions; in addition, the recurrence was proved due to specific circumstances. Therefore, the extended endoscopic procedure became more indicated as compared to the functional technique. On the other hand, the extended procedures should be optimized to preserve the sinonasal function as much as possible. Thus, I tried via this presentation to highlight on the importance of the extended techniques as the treatment of choice, for the certain patterns of NP. In the same context, I tried to emphasize about the restricted indications for this non-functioning procedure. Moreover, I presented our own experience regarding the modification of well –established as well as published methods toward the extended procedure.





5827

ENDOSCOPIC ENDONASAL SKULL BASE SURGERY FOR RESECTION OF TRIGEMINAL SCHWANNOMAS

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Objective: With advances in endoscopic endonasal skull base surgery, resection of ventral skull base tumors has become feasible. We report our experience with this approach for trigeminal schwannomas.

Materials and Methods: Eleven patients who underwent endoscopic endonasal surgery between November 2015 and January 2025 were reviewed. The cohort included five men and six women, aged 28–77 years (median, 48). Tumor resection rate, complications, recurrence, and postoperative therapy were evaluated.

Results: Tumor volume ranged from 2.9 to 42.3 cm³ (median, 6.8 cm³). Total removal was achieved in five cases (45%), subtotal (>90%) in four (37%), and partial in two (18%). Two were recurrences after prior radiation. No cerebrospinal fluid (CSF) leakage occurred, and one had transient mild ocular movement disorder. No recurrence or regrowth was seen during follow-up without additional therapy.

Discussion: Endoscopic endonasal surgery for trigeminal schwannomas requires drilling lateral to the internal carotid artery, making it more demanding than for midline lesions. Though not yet standardized, safety has improved with magnetic navigation and ICG endoscopy, enabling visualization of the carotid artery. Preoperative MRI helps predict cranial nerve positions. Multilayer reconstruction with a nasoseptal flap ensures reliable CSF closure. With careful selection, lesions once treated by craniotomy can now be safely managed endonasally.



5842

ENDOSCOPIC ORBITAL DECOMPRESSION: A 15 YEARS INSTITUTIONAL OUTCOMES AND TEMPORAL TRENDS (2010–2025)

Florence Rogister¹, Anne-Sophie Bronfort¹, Olivier Bouchain¹, Laurent Demanez¹, Gaël Khaufaire², Antoine Moreau², Anne-Lise Poirrier¹, Gilles Reuter³, Nicolas Peigneux¹

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Introduction Endoscopic orbital decompression (EOD) is a key procedure for orbital complications of sinonasal disease. This study reviews indications, outcomes, and temporal trends in a tertiary center. **Methods** Retrospective analysis of 54 EODs performed between 2010–2025. Data included indication, urgency, imaging, intravenous (IV) therapy, delay to treatment, length of stay (LOS), and postoperative sequelae.

Results: Median age was 57 years [42–71]. Indications: inflammatory 31.5%, benign tumor 24.1%, infectious 16.7%, malignant 5.6%, traumatic 3.7%. Emergency admission 45.5%, IV therapy 35.1%, CT 91.1%, MRI 24.4%. Median delay 21 days [1–60.5], LOS 3 days [2–4]. Ophthalmological sequelae occurred in 51.2%, mainly in inflammatory cases (88.2%) versus infectious (11.1%) and benign tumor (25%). Naso-sinusal sequelae 17.1% overall. Between ≤ 2018 and $>$, inflammatory indications decreased (50%→13%) while infectious increased (17%→27%).

Conclusion: EOD remains safe and effective for both inflammatory and infectious orbital disease. Ophthalmological sequelae predominate in inflammatory cases. Shifting indications over time reflect evolving surgical practice and referral patterns.





5845

DEVELOPMENT OF A TREATMENT ALGORITHM FOR ENDOSCOPIC MANAGEMENT OF PEDIATRIC HYDROCEPHALUS: A RETROSPECTIVE ANALYSIS OF 400 CASES AT A TERTIARY CARE CENTER

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Introduction : Based on an analysis of 400 hydrocephalus cases, this study developed a definitive treatment algorithm to guide the choice between endoscopic procedures and shunt surgery. The key finding is that successful endoscopic management depends on a dual-classification system.

Methodology: firstly; hydrocephalus was categorized by cerebrospinal fluid (CSF) dynamics as either Obstructive or Communicating. Second, it was classified by ventricular anatomy as either Uni-compartmental (simple) or Multi-compartmental (complex). Endoscopic procedures performed included endoscopic third ventriculostomy (ETV), septostomy, foraminoplasty, cyst fenestration, and aqueductoplasty and endoscopic lavage

Results: showed that Endoscopic Third Ventriculostomy (ETV) was most successful for Obstructive, Uni-compartmental hydrocephalus. Multi-compartmental cases often required complex, multi-step endoscopic procedures. Communicating hydrocephalus had a lower overall success rate with endoscopy, though some patients with favorable factors (like in case CSF protein can decline to normal) still benefited.

Conclusion: We propose a definitive treatment algorithm that directs surgeons toward the most effective endoscopic procedure—or away from it in favor of shunt surgery—based on this dual-classification system.



5865

ALLEVIATING EOSINOPHILIC INFLAMMATION IN CRSWNP BY REDUCING EPITHELIAL CST1 EXPRESSION THROUGH EPITHELIAL LINEAGE SWITCHING

Mingming Wang¹

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Background & Aim: Chronic rhinosinusitis with nasal polyps (CRSwNP) is characterized by pathological alterations including goblet cell hyperplasia and ciliated cell reduction. We hypothesize that secretory phenotypic shift in epithelial remodeling amplifies Th2 inflammation through enhanced inflammatory mediator secretion, while lineage switching between goblet and ciliated cells may restore epithelial homeostasis and alleviate inflammation.

Methods: Nasal mucosa from healthy controls and nasal polyp tissues from CRSwNP patients were analyzed using bulk RNA-seq, scRNA-seq, and histological experiments.

Results: In CRSwNP tissues, a positive correlation was observed between goblet cell and eosinophil counts. CST1 was identified as a key factor specifically highly expressed in ECRSwNP goblet cells, with its expression levels positively correlated with both goblet cell and eosinophil counts. Recombinant CST1 protein directly promoted eosinophil migration and activation. While IL-13 induced goblet cell hyperplasia and CST1 expression/secretion, inhibition of the Notch signaling pathway not only effectively blocked IL-13-induced effects but also promoted goblet-to-ciliated cell transdifferentiation, accelerating the clearance of pre-synthesized intracellular CST1.

Conclusions: This study reveals a novel therapeutic strategy: Notch inhibition promotes epithelial lineage switching to downregulate CST1 and alleviate eosinophilic Th2 inflammation in ECRSwNP.



6031

ENDOSCOPIC ENDONASAL RESECTION VERSUS CRANIOFACIAL SURGERY FOR OLFACTORY NEUROBLASTOMA: A SYSTEMATIC REVIEW AND META-ANALYSIS OF ONCOLOGICAL OUTCOMES, MORBIDITY, AND OLFACTORY PRESERVATION

José-Carlos Redondo-Benavente, Dolores Rodríguez-Rodríguez, Jesús-Carlos Verge-González, Óscar-Emilio Cazorla-Ramos

Olfactory neuroblastoma has traditionally been treated with craniofacial resection, but endoscopic endonasal surgery has emerged as a less invasive alternative. We conducted a systematic review and meta-analysis of 22 studies (~850 patients) comparing both approaches. Two-year local control was ~91% for endoscopic and ~90% for craniofacial surgery; five-year local control was ~82% vs ~80%, with no significant differences. R0 resection rates were similar (~94% vs ~96%). Major complications (Clavien–Dindo $\geq$ II) were significantly lower after endoscopic surgery (13–28% vs 39–53%; OR $\approx$ 0.45, 95% CI 0.30–0.68), and 30-day mortality occurred only in the craniofacial group (~2–3%). Olfactory preservation was achieved in ~60–70% of selected unilateral endoscopic cases, compared to <5% following craniofacial resection. Subgroup analyses showed no differences in local control by Hyams grade or Kadish stage, and the reduced complication rate with endoscopy persisted even in high-grade disease. Sensitivity analyses requiring $\geq$ 24 months follow-up and exclusion of high-risk-of-bias studies confirmed the robustness of the results.

Conclusion: Endoscopic endonasal surgery provides oncological control equivalent to craniofacial resection, with lower morbidity and meaningful potential for olfactory preservation. It should be considered the preferred first-line surgical approach when technically feasible.



6193

A NOVEL TECHNIQUE FOR VASCULARIZED SELLA RECONSTRUCTION : KIRUBA FLAP

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Introduction: The pedicled nasoseptal flap (NSF) has revolutionized skull base reconstruction, dramatically reducing post-operative cerebrospinal fluid (CSF) leak rates. However, its use can be associated with complications such as mucocoele formation due to the burial of non-mucosalized flap surfaces and the potential for incomplete healing. We present a novel modification of the standard NSF technique—the tailored naso-septal flap harvest and mucosa double-breasting the naso-septal flap, utilising autologous sphenoid sinus mucosa. While the construct utilizes this design, it is intended to mitigate these risks by ensuring a complete mucosal lining of the sphenoid sinus and promoting rapid re-epithelialization without the use of foreign materials.

Methods: A prospective randomised control trial was conducted on 40 consecutive patients who underwent endoscopic endonasal transsphenoidal surgery for pituitary adenomas with intraoperative CSF leak, necessitating vascularised reconstruction. Preoperative imaging was used to measure the exact width and length required for sellar reconstruction from the sphenopalatine foramen. The length and breadth were extrapolated to the nasal septum, and a tailored nasoseptal flap was harvested for each patient. Care was taken to avoid the olfactory mucosa and the septal swell body in all cases. The patient was randomised into two groups by box randomisation. The surgical technique involved harvesting the naso-septal flap in both groups. In Group A, the unique step involved the preservation and meticulous dissection of the contralateral sphenoid sinus mucosa. This autologous mucosa was then used to line the surface of the flipped NSF, creating a "double-breasted" construct where both the sinus wall and the covering flap were fully mucosalized. No fibrin glue or other synthetic materials were used for stabilization. In group B, a standard naso-septal flap was used for sellar reconstruction. Appropriate statistical tests were done to analyse the results.

Results: In group A, 20 patients (100%) underwent successful reconstruction with the Kiruba flap technique. The post-operative CSF

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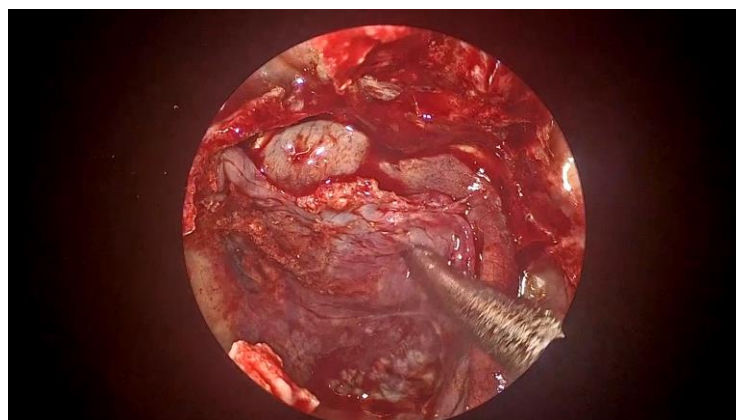
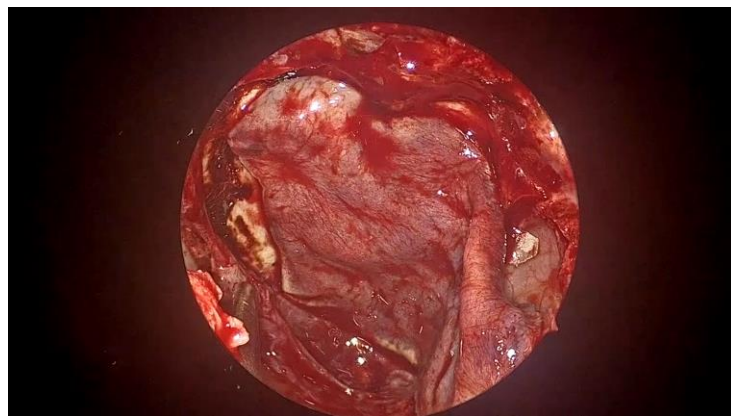
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leak rate was 0%. Follow-up endoscopic examinations at 2, 4, and 12 weeks demonstrated remarkably rapid and complete mucosalization of the sphenoid sinus in all cases, with healing often complete by the 4-week mark. No patient developed a sphenoid sinus mucocoele during a mean follow-up period of 14 months. There were no flap failures, and no post-operative infections were attributed to the reconstruction. In group B, a Standard naso-septal flap was used for reconstruction. There were no CSF leaks in both groups. Mucosalisation was complete in group B patients by 12-16 weeks.

Conclusion: The Kiruba flap technique (utilizing autologous contralateral sphenoid sinus mucosa overlaying the tailored naso-septal flap) is a highly effective and safe method for sellar reconstruction. It leverages entirely autologous tissues to create a sealed, physiologically superior barrier that eliminates the risk of mucocoele formation by preventing exposed bone and fostering immediate mucosal continuity. This technique obviates the need for fibrin glue or other stabilizing agents, reducing costs and the potential for a foreign body reaction.



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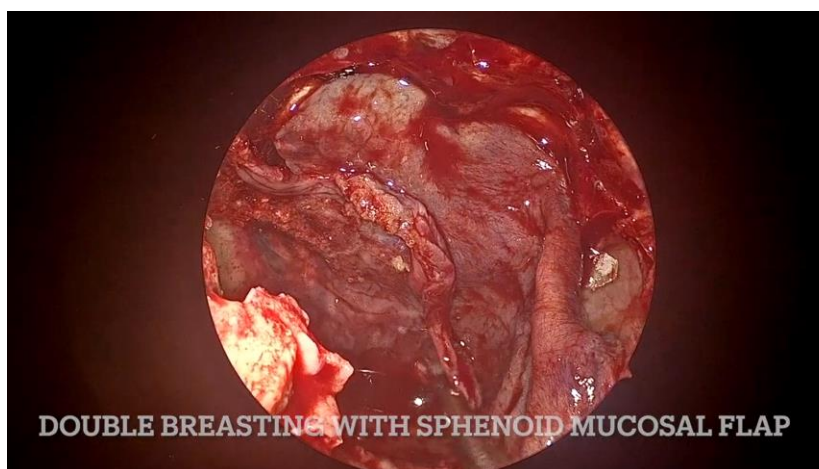
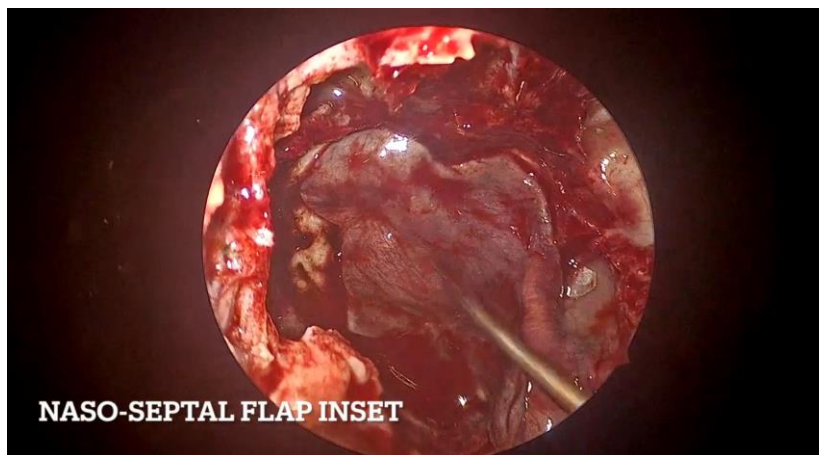
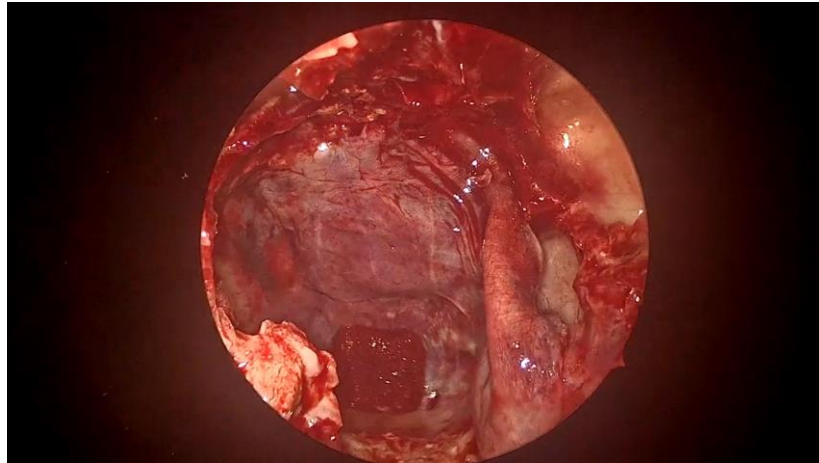
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6328

THE ENDOSCOPIC VERSUS OPEN APPROACH FOR ANTERIOR SKULL BASE TUMORS: A SYSTEMATIC REVIEW OF COMPARATIVE OUTCOMES AND A FRAMEWORK FOR SURGICAL SELECTION.

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Introduction: Anterior skull base tumors (ASBTs) pose significant surgical challenges due to their proximity to critical neurovascular structures. Surgical management has evolved with the adoption of both endoscopic and open approaches. This systematic review synthesizes evidence comparing these approaches in terms of complications, outcomes, and indications.

Materials and Methods: We conducted a systematic review following PRISMA guidelines, analyzing studies published between 1981 and 2022. A total of 1200 articles were initially identified from databases including PubMed, MEDLINE, JSTOR, and Science Direct, with 60 relevant references ultimately included. Data extraction focused on surgical approaches, tumor types, prevalence, and complications.

Results: Anterior skull base tumors exhibit varying prevalence and associated complications depending on their type. Meningiomas account for nearly one-third of all cases, with an annual incidence of 2 per 100,000 individuals and recurrence rates ranging from 5% for grade I to 50-80% for grade III. Common complications include anosmia (10-20%), cerebrospinal fluid (CSF) leakage (10%), visual abnormalities, and bleeding (5-10%). Pituitary adenomas are predominantly secretory, with microadenomas comprising 97% and macroadenomas 70%. They frequently cause damage to the internal carotid artery, optic nerve, and result in CSF leakage. Craniopharyngiomas are reported at 0.1 cases per 100,000 annually, with over 80% situated in the suprasellar region. Cavernous sinus tumors represent less than 3% of all meningiomas, while glomus tumors, more prevalent in females (6:1 ratio), present 1-3 instances per million individuals and can lead to facial paralysis, auditory impairment, and cranial nerve palsies. Chordomas and chondrosarcomas, occurring at 0.08 cases per 100,000, are more common in Caucasian men. Esthesioneuroblastomas constitute 2-3% of intranasal neoplasms, often resulting in CSF leakage and infection. Craniofacial malignancies predominantly originate from the maxillary

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(60-70%) and ethmoid sinuses (10-15%), while skull base metastasis appears in approximately 4% of cancer patients, typically from breast, lung, renal, and prostate cancers. Surgical approaches also come with distinct complications. The endoscopic endonasal approach (EEA) has a bacterial meningitis rate of 0-0.69%, with venous thromboembolism (VTE) being rare but more likely in older patients or those with coagulation issues. Cerebral infarction may occur due to vasospasm, subarachnoid hemorrhage, vascular damage, or electrolyte imbalances, while the risk of pneumocephalus is minimized through careful lumbar drain management and sinus precautions. Open surgical approaches commonly result in CSF leaks, meningitis, vascular injury, and visual disturbances. Conclusion: This systematic review synthesizes evidence from 60 studies to propose a decision-making framework. We conclude that the endoscopic endonasal approach is associated with superior quality of life and reduced morbidity for midline tumors (e.g., tuberculum sellae meningiomas, pituitary adenomas), offering comparable gross total resection rates. In contrast, open approaches remain paramount for tumors with significant lateral extension, massive size, or complex vascular involvement, where maximal exposure facilitates radical resection despite higher associated morbidity. This analysis provides a nuanced evidence base to guide individualized surgical strategy.



6374

CORRELATION OF RADIOLOGICAL AND INTRA OPERATIVE LANDMARKS OF FRONTAL SINUS TO PREDICT THE DIAMETER OF FRONTAL NEO-OSTIUM AFTER DRAF 3 PROCEDURE

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Introduction: The Draf 3 procedure is an effective surgical approach for treating recurrent frontal sinus disease. Identifying the radiologic landmarks of the frontal recess and correlating them with endoscopic landmarks is crucial for maximizing the size of the frontal ostium and preventing restenosis. In this study, we define the radiologic landmarks and analyzed their correlation with intraoperative landmarks to predict the maximum possible Draf 3 size preoperatively.

Method: In this retrospective study, 42 patients who were candidates for Draf III frontal sinus surgery were evaluated. Radiologic "Frontal M" defined as the intersection point of lateral lamella with cribriform plate, septum and crista galli in axial plane. Anteroposterior radiologic frontal neo-ostium dimension defines as the distance between the radiologic ethmoidal slit & nasion. Horizontal radiologic frontal neo-ostium dimension defines as the distance between the orbit in frontal M plane. Radiologic dimensions measured preoperatively on PNS CT scan using OsiriX imaging software. Intraoperative dimensions were assessed using PARS Neuronavigation system at the end of the procedure. Preoperative and intraoperative measurements were then compared.

Results: A total of 42 patients (22 males and 20 females) were included in the study. The most common pathology was CRSwNP, observed in 35 patients. Revision surgery was performed in 34 cases. The mean intraoperative AP frontal neo-ostium dimension was 13.90 ± 1.54 which correlate & was 2.30 ± 1.54 lower than anteroposterior radiologic frontal neo-ostium dimension (16.20 ± 2.79 , P value<0.05). The mean intraoperative horizontal frontal neo-ostium dimension was 23.06 ± 2.82 which correlate & was 3.43 ± 2.25 lower than anteroposterior radiologic frontal neo-ostium dimension (26.49 ± 2.98 , P value<0.05).

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Conclusion: Radiologic frontal landmarks demonstrate a correlation with intraoperative anatomical references, and their utilization may aid in predicting the postoperative diameter of the frontal neo-ostium after a Draf III procedure.



6381

IN-OFFICE LOCAL ANAESTHETIC RHINOLOGY: OUTCOMES AND COST SAVINGS FROM A UK SINUS CENTRE EXPERIENCE

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¹James Paget University Hospital/Norfolk Norwich University Hospital

Background Rhinology procedures have traditionally been performed under general anaesthetic (GA). Recent ENT UK guidelines highlight the expanding role of local anaesthetic (LA) rhinology. We evaluated outcomes and cost impact of in-office LA rhinology procedures in a tertiary UK sinus centre.

Methods A retrospective review was performed of 39 consecutive LA rhinology procedures (Sept 2024–July 2025), including sinus debulking or balloon dilatation with/without Propel stents, septal button insertion, cryotherapy, biopsies and minor excisions. Change in SNOT-22 from baseline to 3 months, safety, tolerability and procedural completion rates were recorded. Costs were benchmarked against 2024/25 NHS tariffs for LA versus GA theatre procedures.

Results Balloon procedures (18.4% of total) and nasal polypectomies (10.5%) represented the largest groups of CRS-targeted interventions. Seven patients undergoing sinus-debulking procedures had paired SNOT-22 data. Mean improvement was 8.0 points (95% CI 3.1–19.1), with clinically meaningful change (MCID ≥ 9) achieved in 28.6% of cases. No complications or unplanned returns to theatre occurred, although one procedure was abandoned because of pain. Estimated per-case cost of in-office sinus debulking was ~£710 compared with ~£2,118 for GA theatre-based surgery, representing a saving of £1,408 per case (~£8,500 across the cohort). The remaining 32 cases (septal button, cryotherapy, biopsies, excisions) were safely completed under LA, avoiding GA theatre use and enabling timely treatment.

Conclusion In-office LA rhinology procedures are safe, well tolerated and provide clinically relevant benefit for selected patients. Ongoing data collection is underway to expand the database and capture longer-term outcomes as the service grows.



6382

LONG TERM EVOLUTION OF CRANIAL DEFECTS AFTER MUCOCELES TREATMENT

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Introduction All mucoceles can be treated endoscopically with low recurrence rates and low morbidity. The endoscopic treatment of mucocoele and preservation of the mucoperiosteum promotes osteogenesis and spontaneous bone reconstruction. The largest mucoceles can induce extensive cranial bone resorption. To date, long-term bone evolution of mucocoele-induced frontal defect and skull base defects is unknown. Therefore, the management of the most extensive mucoceles remains controversial especially the role of cranioplasty.

Material & Methods The database of a tertiary university hospital was explored for all mucoceles treated between 2000 and 2024. Long term (> 1 year) bony healing was assessed with CT scan in each case. We distinguished 3 stages of bone reconstruction with none, partial and full reconstruction and compared in each category the size of bony defects and the volume of mucocoele to evaluate any correlation.

Results 109 mucoceles were treated in 115 patients. 81 mucoceles were associated with bone osteolysis. Among 40 patients with long term follow-up, 85% had spontaneous bone regeneration: 21 with full (52,5%) and 13 with partial (32,5%) bone defect regeneration. The rate of natural reconstruction did not differ between small and large defects ($p < 0.05$). One patient who was treated with open approach necessitated a cranioplasty. The most important risk factor for absent bone regeneration was previous open surgery.

Conclusions Consequently, cranioplasty or skull base reconstruction after endoscopic surgery for osteolytic mucoceles does not seem to be necessary as spontaneous healing can be expected in the vast majority of cases, even with the largest defects (> 5cm²).

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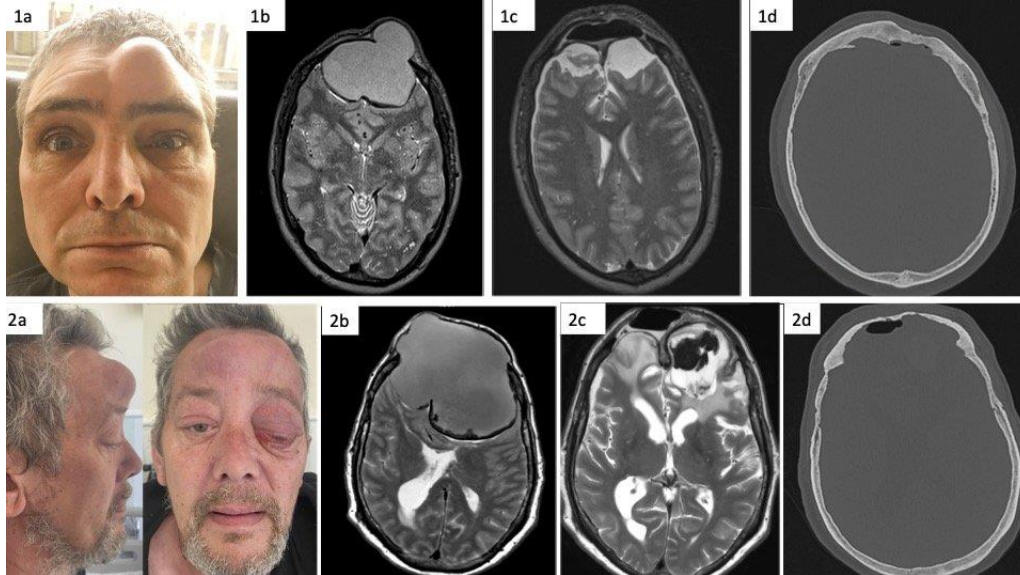
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6383

COBLATION-ASSISTED ENDOSCOPIC RESECTION OF JUVENILE NASOPHARYNGEAL ANGIOFIBROMA: A FOCUSED REVIEW OF SURGICAL EFFICIENCY AND OUTCOMES

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Introduction: Juvenile nasopharyngeal angiofibroma (JNA) remains a surgical challenge due to its vascularity and potential extension into critical anatomical regions. Coblation technology, using low-temperature plasma for controlled ablation, has been increasingly adopted to improve intraoperative safety and visualization.

Material and Methods: Evaluating coblation-assisted endoscopic JNA surgery with emphasis on intraoperative blood loss, operative time, complications, and recurrence on our recent 10 cases.

Results: Coblation consistently reduced intraoperative bleeding through simultaneous ablation and vessel coagulation, resulting in improved visualization and facilitating complete resection. Early-stage tumors demonstrated shorter operative times. Postoperative recovery was favorable, with hospital discharge typically within 1–5 days and minimal thermal injury to surrounding tissues. Complications were primarily related to tumor anatomy—hemorrhage, CSF leak, or injury to adjacent structures—rather than coblation itself.

Conclusion: Coblation-assisted endoscopic surgery enhances surgical efficiency and intraoperative safety in JNA management. Its advantages in hemostasis, visualization, and recovery support its expanding role; however, larger long-term studies are required to validate its impact across all tumor stages.





6389

EARLY POSTOPERATIVE DECLINE IN INSULIN-LIKE GROWTH FACTOR 1 (IGF-1) PREDICTS SURGICAL REMISSION OF ACROMEGALY

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Purpose: To determine the utility of perioperative decline in insulin-like growth factor 1 (IGF-1) in predicting 3-month remission in patients undergoing surgery for growth hormone (GH)-secreting pituitary adenomas.

Methods: Retrospective single-centre cohort study of patients with surgically managed GH-secreting pituitary adenomas over January 1, 1999 to January 1, 2025. We compared the utility of early postoperative adjusted IGF-1 (adjusted to upper limit of normal), and early postoperative adjusted IGF-1 reduction compared to preoperative levels, to predict hormonal remission (normal IGF-1) at 3 months postoperatively. Other clinical/radiological factors associated with 3-month remission were also examined.

Results: We identified 49 patients with mean age 47.6 ± 12.5 (SD 12.5), 29 were females (59%). Mean values were 2.50-fold upper limit normal (SD 0.88) for preoperative adjusted IGF-1 and 1.43 ± 0.6 ULN for early postoperative adjusted IGF-1 ($p < 0.001$) measured at a mean of 4 days postoperatively. Early postoperative adjusted IGF-1 was lower in those who achieved 3-month remission vs. those who did not (1.13 ± 0.44 vs 1.89 ± 0.53 , $P < 0.01$), and perioperative IGF-1 reduction was considerably greater (49.7 ± 21.8 vs 22.2 ± 30.6 , $P < 0.01$). Receiver operating curve (ROC) of early postoperative adjusted IGF-1 in predicting 3-month remission demonstrated an AUC of 0.841. ROC curve of perioperative IGF-1 reduction demonstrated an AUC of 0.783.

Conclusion: The degree of IGF-1 decline within days of pituitary surgery predicts 3-month acromegaly remission. Our findings argue for IGF-1 measurement before discharge to inform patient counselling during the surgical admission and guide intensity of early follow-up.



6473

DIFFERENCES IN THE CELLULAR MEMBRANE PROTEOME BETWEEN PITUITARY GLAND AND NON-FUNCTIONAL PITUITARY ADENOMAS

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Purpose: To investigate differences in the proteome of the normal pituitary gland and non functioning pituitary adenomas, with a specific focus on the cellular membrane protein fraction with the goal of identifying potential targets for surgical fluorophores.

Methods: The cellular membrane protein fraction of ten pituitary glands and twenty non-functional pituitary adenoma samples were extracted and analysed using Ultra-High-Performance Liquid Chromatography and mass spectrometry. Differential protein expression analysis was performed, followed by over representation (ORA) and gene set enrichment analyses (GSEA). Filtering Differentially Expressed Proteins (DEPs) using a tumour:control ratio> or control:tumour ratio>, mean expression of> with a p value of <0.01 and then filtering based on proteins found in the cell membrane or extracellular membrane was performed to focus on proteins that would be accessible to surgical fluorophores. These were considered candidate proteins. **Results:** 1812 DEPs were identified, with 876 upregulated in tumour samples and 936 upregulated in control samples. Principal component analysis showed good separation of tumour and gland samples. Four candidate proteins were found for tumour samples (ADAMTSL-1, SEZ6L, LRRC4B and SLC4A10), whereas 23 proteins were found for pituitary gland samples.

Conclusion: Our study demonstrates the proteome of non functioning pituitary adenomas is extremely different to the proteome of pituitary adenomas. We report multiple differentially expressed proteins located in the cell membrane or extracellular matrix that could serve as potential targets for surgical fluorophores.



6487

HISTOPATHOLOGY AND RESPONSE TO AZITHROMYCIN OF CRS PATIENTS WITH RECALCITRANT PURULENT RHINOSINUSITIS

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Introduction: Recalcitrant Purulent Rhinosinusitis (RPR) represents a population of patients with purulence and edema persisting for at least 3 months after complete functional endoscopic sinus surgery (FESS) despite 3 rounds of post-surgical antibiotics, oral steroids, and steroid rinses. By identifying structured histopathology (SHP) trends in RPR patients and RPR patients who respond to long term azithromycin therapy, we aim to understand how changes in tissue architecture influence disease pathophysiology and potential management.

Methods: Retrospective chart review was conducted on patients who underwent FESS. Data was collected on SHP, demographics, and comorbidities[RW1]. Cohort was divided into RPR and non RPR controls. RPR patients were trialed on long-term azithromycin therapy. Perioperative and pre-azithromycin treatment culture was collected on RPR patients.

Results: 25 patients with RPR and 496 non RPR control patients were included. RPR was associated with increased moderate-severe degree of inflammation (80.0% vs 16.5% $p < 0.011$), subepithelial edema (88.0% vs 64.4% $p < 0.015$), and decreased eosinophil aggregation (4.0% vs 22.5% $p < 0.028$). Of 21 RPR patients with perioperative culture, 6 (28.6%) grew *P. Aeruginosa*, 8 (38.1%) grew *S. Aureus*, and 9 (42.9%) grew coagulase negative *Staphylococcus* (CNS) species. 13 RPR patients were trialed on long-term azithromycin therapy. 11 demonstrated disease clearance endoscopically, 3 grew *P. Aeruginosa* and 4 grew *S. Aureus* on pretreatment culture. 2 nonresponders grew *S. Aureus*.

Conclusion: RPR is associated with significant changes in several SHP variables that may influence the disease pathogenesis. Long term azithromycin therapy may be effective in this population.



6496

ENDOSCOPIC ENDONASAL SURGERY FOR PEDIATRIC CRANIOPHARYNGIOMAS: HYPOTHALAMUS SPARING?

Hirtoshi Nishioka, Masahiko Tosaka, Noriaki Fukuhara, Hirokazu Fukuhara

Introduction: Surgical outcomes for craniopharyngiomas have markedly improved in recent years. However, in pediatric patients, functional prognosis often remains unsatisfactory. To prevent hypothalamic obesity—a serious long-term complication—hypothalamic-sparing surgery has been strongly advocated.

Patients and Results: We retrospectively analyzed 39 consecutive pediatric patients aged 3–18 years; 19 boys and 20 girls. Twenty-nine underwent primary surgery, and 11 underwent reoperation. Total resection was achieved in 29 cases. Stalk preservation was obtained in 20 cases; however, all of them exhibited some degree of pituitary dysfunction. Apart from two reoperated cases of visual deterioration, no other permanent complications were observed. Two patients experienced a postoperative BMI increase exceeding +2SD, but both were transient, and no cases of permanent severe obesity were noted. During a mean follow-up period of 61 months, tumor recurrence occurred in eight cases.

Conclusion: Total resection with stalk preservation has become increasingly achievable, particularly in primary surgeries. However, postoperative pituitary function generally remained poor. Notably, even in cases involving total resection of tumor with hypothalamic involvement, no patients developed severe obesity. These findings suggest that meticulous, directly visualized dissection from the hypothalamus may be effective in preventing postoperative obesity.



6540

THE ROLE OF ENDOSCOPIC SPINAL SURGERY IN ONCOLOGY: A LITERATURE REVIEW

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Introduction: Endoscopic spinal surgery (ESS) has emerged as a minimally invasive alternative to traditional open procedures, offering reduced tissue trauma, shorter hospital stays, and faster recovery. In oncology, where spinal tumors demand decompression and stabilization and quality of life, ESS presents an evolving frontier. However, its role in malignant and metastatic spinal disease remains under investigation. This review aims to evaluate current literature on the applications, outcomes, and limitations of ESS in spinal oncology.

Material & Methods: A systematic literature review was performed using PubMed, Scopus, and Google Scholar for studies published between 2000 and 2025. Inclusion criteria comprised primary studies reporting ESS in the management of spinal tumors. **Results:** Twenty-six relevant studies were identified. ESS was associated with reduced intraoperative blood loss and shorter hospitalization compared to open surgery. Neurological improvement and pain relief were achieved in most patients. Complication rates ranged from 5–15%, primarily dural tears and transient neurological deficits. However, limitations included restricted tumor access, incomplete oncologic margins, and a steep learning curve. Evidence for long-term oncologic control remains limited, with few prospective comparative studies.

Conclusion: ESS represents a promising adjunct in spinal oncology, offering significant benefits in symptom palliation, reduced morbidity, and rapid postoperative recovery. While it is not yet a replacement for open oncologic resection, ESS may serve as a valuable tool for biopsy, decompression, and palliative management in selected patients. Further high-quality, multicenter studies are warranted to define its oncologic efficacy, refine techniques, and establish standardized indications in malignant spinal disease.



6549

ENDOSCOPIC PTERYGOID PROCESS RESECTION WITHOUT MAXILLARY SINUS INVASION IN TOTAL MAXILLECTOMY – A TECHNICAL NOTE

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Background: Maxillary cancer is an uncommon malignancy frequently diagnosed at an advanced stage, often requiring an en bloc total maxillectomy. One of the most critical steps of this procedure is the detachment of the maxillary bone from the neurocranium at the pterygomaxillary junction (PMJ), which in open approaches is performed blindly, increasing the risk of hemorrhage and positive posterior margins. Endoscopic transnasal techniques allow a controlled and well-visualized pterygoid osteotomy, potentially improving oncologic safety and reducing intraoperative complications. O

bjective: To describe two mutually exclusive endoscopic techniques for PMJ detachment—performed without violating the maxillary sinus—in the context of a total maxillectomy (Liverpool type IIIa): the “lower cut,” executed at the level of the nasal floor, and the “upper cut,” performed just inferior to the vidian foramen.

Methods: A 67-year-old woman with a pT4aN0M0 carcinoma of the left superior alveolar process underwent a combined open and endoscopic total maxillectomy. Preoperative imaging demonstrated extensive maxillary sinus destruction with extension to the infratemporal fossa, palate, zygomatic region, alveolar arch, and possible perineural spread along V2. The endoscopic approach was used to perform the PMJ osteotomy either at the lower or upper level, preserving the integrity of the maxillary sinus.

Results: The lower cut technique involved a stepwise drilling of the palatine bone, isolation and transection of the palatine pedicle, and progressive removal of the pterygoid plates until the muscular plane was reached. The upper cut relied on an expanded ethmoidal-sphenoidal corridor, identification of the sphenopalatine foramen and vidian canal,

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controlled removal of the PPF contents, and drilling just inferior to the vidian canal to safely separate the maxilla from the skull base. In both techniques, PMJ detachment was achieved under direct vision with preservation of the sinus cavity. Frozen sections confirmed negative posterior margins, and no intraoperative complications occurred.

Conclusions: Endoscopic PMJ detachment without maxillary sinus violation is a feasible, precise, and oncologically sound adjunct to total maxillectomy. Compared with the blind open osteotomy, the endoscopic approach offers improved visualization of the pterygopalatine and infratemporal fossae, better hemostatic control, and reduced risk of tumor seeding. These techniques may enhance surgical safety and margin control in advanced maxillary malignancies.



6602

THE MACRO TRIAL: A RANDOMISED CONTROLLED TRIAL OF CLARITHROMYCIN AND ENDOSCOPIC SINUS SURGERY FOR ADULTS WITH CHRONIC RHINOSINUSITIS WITH AND WITHOUT NASAL POLYPS

Claire Hopkins¹, Carl Philpott, Jonathan Cook, Elnaz Saeedi, Caroline Clarke, David Beard, Mike Thomas, Paul Little, Jane Vennik, Anne Schilder, Stephen Durham, Valerie Lund

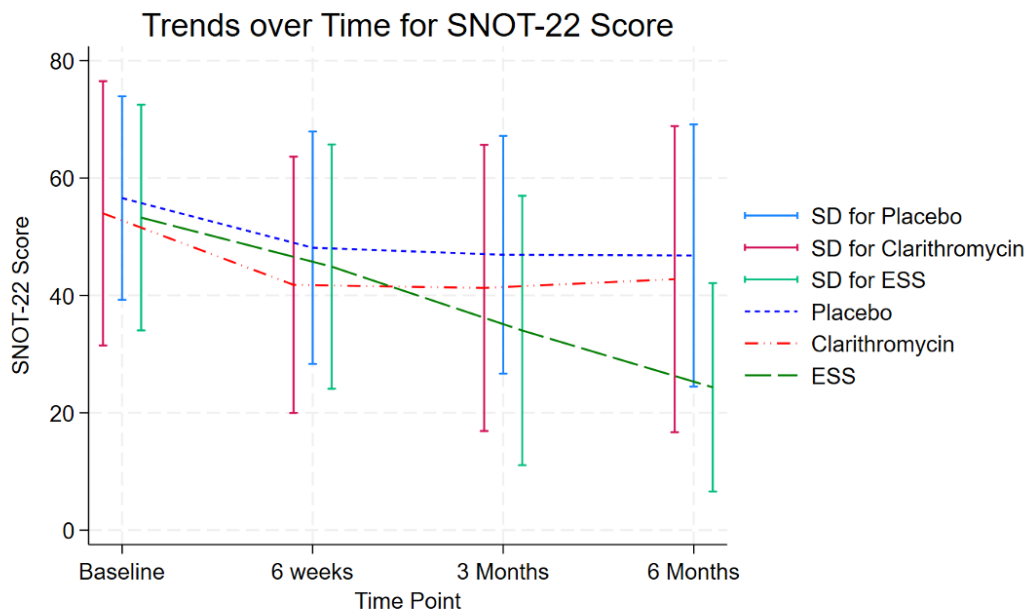
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Background: Evidence regarding use of antibiotics and endoscopic sinus surgery (ESS) in managing chronic rhinosinusitis (CRS) is lacking. The trial objective was to compare clinical-effectiveness of adding ESS or prolonged clarithromycin to intranasal medication (IM) in adults with CRS with (CRSwNP) or without nasal polyps (CRSsNP). Methods: A 3-arm randomised controlled trial recruited at 20 UK sites. CRS patients remaining symptomatic after receiving IM comprising corticosteroids and saline irrigations were randomised 1:1:1 to receive ongoing IM plus either 1) ESS, 2) clarithromycin (250mg bd for 2 weeks then od for 10 weeks) or 3) matched placebo. Participants and medical staff were blinded to medical interventions but not surgery. Primary outcome measure was the SNOT-22 disease-specific quality-of-life (QOL) questionnaire at 6 months. Secondary outcomes included generic QOL and cost-effectiveness. Planned sample size was 510. An intention-to-treat analysis was undertaken. ISRCTN: 36962030. Findings: 181/514 (35.2%) female and 333/514 (64.8%) male participants, with CRSwNP (n=410) or CRSsNP (n=104), were recruited between 2018-2023 and randomised to ESS (n=171), clarithromycin (n=172), or placebo (n=171). Statistically significant mean differences in SNOT-22 favoured ESS over the other groups (-18.13, (98.33%,CI -24.26, -11.99) and -20.44, (98.33%,CI -26.42, -14.46), respectively), secondary outcomes showed significantly greater improvements with surgery versus clarithromycin or placebo. No significant benefit of clarithromycin over placebo was found. When comparing those patients with nasal polyps to those without, ESS improved quality of life in both groups compared to clarithromycin and placebo. Furthermore, when comparing disease endotypes, ESS was seen to be effective in both main endotypes, with the effect being



stronger in type 2 inflammatory disease (defined as IgE>100 IU/L and/or eosinophil count>.15 x10⁹. Clarithromycin did not show a significant effect on change in SNOT-22 in either subgroup, but there was a trend towards significance in non-type 2 CRS participants. The secondary outcomes also showed significant differences in favour of the endoscopic sinus surgery at 6 months except for PEFR and PNIF, which did not show evidence of differences between the groups. With regards to improvements in participants' sense of smell, the trial observed a significantly greater improvement in TDI scores 6 months after randomisation in surgical group comparing to placebo, however only 40% of those in the surgical arm achieved the minimum clinically important difference of 5.5 points on the TDI score. Interpretation: ESS improves disease-specific QOL at 6 months in CRS patients. There is no evidence supporting the routine use of low-dose clarithromycin in CRSwNP while benefit in CRSsNP remains uncertain. Further analysis of the impact or extent of surgery will be presented, and long-term follow up is ongoing.





6605

MICROVASCULAR FREE-FLAP RECONSTRUCTION VIA CALDWELL-LUC AND INFRATEMPORAL CORRIDORS FOR THE VENTRAL SKULL BASE

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Background: The transmaxillary (Caldwell-Luc) and infratemporal corridors represent two complementary routes for microvascular free-flap pedicle transposition in ventral skull base reconstruction. Their selection depends on the defect location, pedicle length, and availability of recipient vessels.

Methods: A systematic review of the literature was performed to summarize current clinical practice in skull base reconstruction using these approaches. Complementary cadaveric dissections were conducted to measure the minimal pedicle lengths required for each corridor, providing quantitative anatomical data for surgical planning.

Results: The Caldwell-Luc corridor is a reproducible and minimally invasive route, ideal for anterior skull base reconstruction but requiring a relatively long pedicle—favoring flaps such as the radial forearm or anterolateral thigh. The infratemporal corridor, following more physiological planes, can be advantageous in previously treated or vessel-depleted cases.

Conclusions: The integration of anatomical and clinical data enables refined preoperative planning and flap selection. The presentation will include photographic material from cadaveric dissections, illustrating anatomical landmarks and transposition pathways.



6606

CHALLENGING BONY AND OSSIFYING LESIONS OF THE PARANASAL SINUSES: A TREATMENT ALGORITHM

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Introduction: Bony and ossifying lesions of the sinonasal region are a relatively frequent pathology encounter in the clinical practice. Given the peculiar anatomy of the site, these lesions often involve critical and noble structures such as skull base and orbit. In this series we described our treatment algorithm including different endoscopic and combined approaches to appropriately manage the challenging sinonasal locations.

Material and Methods: The case series included the clinical data of all challenging benign bony and ossifying lesions surgically treated with curative intent at two different Referral Centers, between 2014 and 2024. The information was extrapolated to report epidemiologic and clinical data, surgical approach and follow up.

Results: The patients were 38 in total, 16 females and 22 males. The histological types were consistent with: 27 (71%) osteomas, 6 (16%) ossifying fibromas, 4 (11%) giant cell tumors, 1 (2%) osteblastoma. We classified the patients according to the location of the lesion in: 16 lesions invaded the lateral recess of the frontal sinus, 10 lesions invaded the anterior or middle skull base, 7 lesions invaded the orbit, and 5 lesions invaded the hard palate. The patients were treated with a specific surgical strategy (endoscopic or combined) based on the subsite. Mean follow-up was 47 months.

Conclusions: Challenging bony and ossifying lesions of the sinonasal region can imply severe symptoms and complications for the patients and their surgical management is complex. Given the benign nature of these tumors could be necessary to make a balance between complete resection and sequelae. Our treatment algorithm based on the location of the tumor resulted helpful in the surgical planning and management of these peculiar cases.



6607

MICROVASCULAR FREE-FLAP FOR VENTRAL SKULL BASE RECONSTRUCTION USING SUPERFICIAL AND DEEP PARATEMPORAL CORRIDORS VIA THE SUPERFICIAL TEMPORAL VESSELS

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Introduction (Background & Aims): The superficial and deep paratemporal corridors provide lateral access to the ventral skull base and represent key routes for microvascular free-flap reconstruction, particularly when using the superficial temporal vessels as recipient site. **Material and methods:** A systematic literature review summarized current clinical applications of paratemporal corridors in ventral skull base reconstruction, while cadaveric dissections were conducted to measure minimal pedicle lengths and verify the feasibility of each route. **Results:** Both corridors allow a short, direct transposition of the flap pedicle without a cervical phase. They are suitable for multiple flaps—including the radial forearm, anterolateral thigh, vertical rectus abdominis, and latissimus dorsi. The superficial temporal artery offers consistent anatomy, although the small caliber and variability of its companion veins may limit use in selected cases.

Conclusions: The combination of clinical evidence and anatomical measurements supports the reliability and versatility of the paratemporal corridors in advanced ventral skull base reconstructive surgery. The presentation will be supported by photographic material from cadaveric dissections, illustrating key anatomical and surgical details.



6609

ENDONASAL SURGERY OF SELLAR AND SUPRASellar TUMORS IN CHILDREN: EXPERIENCE OF 67 CASES

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Introduction. Transnasal endoscopic approaches have become increasingly important in the surgical management of pediatric sellar and suprasellar tumors. Aim of this study – to evaluate the safety, feasibility and evolution of this surgery based on the one multidisciplinary team experience.

Materials and Methods. A total of 67 children (<8 years) with tumors of the chiasmal–sellar region underwent endoscopic transnasal surgery. Tumor distribution was as follows: craniopharyngiomas (41 cases; 61%), Rathke's cleft cysts (9; 13%), pituitary adenomas (11; 16%), chiasmal gliomas (4; 6%), and rare tumors (2; 3%), including one embryonal carcinoma. The cohort included 25 boys (37%) and 42 girls (63%), aged 3.5–17.8 years. Results: Standard sellar approach was performed in 17 cases (25.4%), 50 children (74.6%)—extended endonasal approaches. Technique optimization involved neuronavigation, usage of 2.7 (and 3.0 ENT) mm endoscopes, pediatric-tailored nasal approaches. Total or subtotal tumor removal was achieved in 43 children (64.2%), and partial removal or cyst drainage in 24 (35.8%). Older children (13–17 years) demonstrated adult-like anatomy, whereas younger children—especially those under six—posed challenges due to limited sphenoid pneumatization and narrow nasal corridors. No postoperative mortality occurred. Complications included: vascular injury, A2 segment (1), worsening hypopituitarism (28, 41.8%), new diabetes insipidus (10, 14.9%), visual deterioration (6, 9%), CSF leak (10, 14.9%), and meningitis (3). Endocrine disturbances were managed collaboratively within the multidisciplinary team.

Conclusions: Endoscopic transnasal surgery is a safe and effective option for most pediatric sellar and suprasellar tumors when anatomical nuances and age-specific features are considered. Children demonstrate faster nasal adaptation compared to adults, though CSF leak rates remain higher. Multidisciplinary management is essential to optimize outcomes and postop recovery.



6610

REAL-TIME DEEP LEARNING-BASED SEGMENTATION TO ASSIST TRANSSPHENOIDAL SURGERY: A CLINICAL FEASIBILITY STUDY

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³Skill Systems Inc.

Background: Transsphenoidal surgery (TSS) is a standard approach for pituitary tumors. Key challenges include endocrine non-remission due to residual tumor in functioning adenomas, postoperative hemorrhage in non-functioning tumors, and hypopituitarism from manipulation of the normal gland. Minimizing these complications while maximizing tumor resection remains essential. However, distinguishing tumor from normal pituitary tissue and performing delicate maneuvers under suboptimal visualization require high surgical expertise. Improving intraoperative visualization and ensuring rapid, accurate tissue identification may enhance resection rates and reduce postoperative complications.

Methods: We collaboratively developed a real-time intraoperative deep-learning-based segmentation system with Skill Systems Inc., using operative videos from transsphenoidal procedures performed at Nagoya University Hospital between 2017 and 2021. The system was applied during live TSS, and segmentation accuracy for distinguishing tumor and normal pituitary gland was evaluated using mean Intersection over Union (mIoU). Accuracy before and after visualization-improving maneuvers—such as blood removal or advancing the endoscope—was compared.

Results: After visualization-improving maneuvers, the mIoU for tumor and gland segmentation increased compared with pre-maneuver values. This indicates that intraoperative visual conditions strongly influence AI performance and that optimized visualization and AI assistance may function synergistically during TSS.

Conclusion: This study provides one of the first clinical evaluations of an AI-based real-time segmentation system during TSS. Incorporating noise-robust algorithms and advanced segmentation techniques may further improve accuracy, supporting more precise tumor resection and

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preservation of normal pituitary tissue. These findings demonstrate the feasibility of real-time AI assistance in endoscopic pituitary surgery and underscore its potential to augment future surgical workflows.



6611

FEASIBILITY OF ENDOSCOPIC ENDONASAL TRANSSPHEOIDAL APPROACH FOR CRANIOPHARYNGIOMA REMOVAL IN VERY YOUNG CHILDREN A CASE SERIES OF 5 PATIENTS

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Introduction. The endoscopic endo-nasal trans-sphenoidal approach (EETS) has become increasingly used for craniopharyngioma surgery in the pediatric population, but questions still arise regarding its utility in younger children. The narrow surgical corridor, the incomplete pneumatization of the cranium in little children, and the fear of hypothalamic injury have traditionally relegated this approach to older children. The authors present a series of 5 consecutive pediatric patients, with age under 6 years old, that underwent surgery for craniopharyngioma removal with an endoscopic endonasal transsphenoidal approach.

Material And Methods. The databank of "Anna Meyer" Children's Hospital in Florence was used to collect the data. In a period included between January 2011 to January 2022, 123 consecutive pediatric patients (age ≤ 18 years), with skull base lesions, underwent surgery via an EETS. In 29 patients the lesion resulted being a craniopharyngioma, among these, 5 patients presented an age less than 6 years old, at the moment of surgery. Our study focuses on the latter group of patients. The clinical, radiological and intraoperative data of all patients were available. Patients were then evaluated through regular follow-up appointments in a dedicated outpatient clinic, check with the fibroscope was performed in all cases.

Results. The mean age of the patients was 3.9 years old. The mean follow-up is 6 years. In all 5 patients the craniopharyngioma presented both a solid and a cystic component and had a conchal sphenoid aeration. Gross-total resection was achieved in 100% of these patients. All patients needed a complete hormone replacement therapy after surgery. 2 patients (40%) had a significative increase in body mass index. Visual function was stable or improved in 80%. We had no cases of

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cerebrospinal fluid leak. 1 patient underwent proton therapy as an adjuvant treatment.

Conclusions. The endoscopic endonasal transsphenoidal approach is feasible and suitable for removing pediatric craniopharyngiomas even in young children with suprasellar tumors, with solid components and conchal sphenoid sinus.



6612

CRANIOPHARYNGIOMA IN CHILDREN YOUNGER THAN 6 YEARS OLD – WHAT IS THE BEST MANAGEMENT? A CLINICAL AND SURGICAL ANALYSIS

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Objective: Craniopharyngiomas represent one of the most common tumors of the hypothalamo-pituitary region in childhood. Despite their benign histology, the proximity to noble structures makes their management an ongoing challenge due to the possible neuro-endocrinological symptoms, visual impairment and eventual obstructive hydrocephalus that influence importantly the quality of life of the patient. This is particularly true in little children. Eventhough there are different surgical techniques to treat this type of tumor, the timing and approach of choice in children younger than 6 years old is still debated. The aim of this work is to analyze the best management from a clinical and surgical point of view.

Methods: For this retrospective study, the databank of Meyer Children's Hospital IRCCS the was used. 129 consecutive pediatric patients (0-18 years old) with a craniopharyngioma were referred to our centre between January 1994 and January 2024. Of these 22 patients were younger than 6 years old upon diagnosis. All patients underwent endocrinological, ophtalmogical and radiological examination upon admission. Standard follow-up appointments at the outpatient clinic were given to the patients.

Results: The mean follow-up was of 10 years $\pm$ 1.4 years. All of the tumors had sellar and suprasellar components. The most common presenting symptoms were headaches (67.8%), visual impairment (30% - not reliable due to the very young age of the children who are thus less compliant during the ophthalmologic evaluation), and nausea/vomiting (39%). Most patients (74%) had resolution of their presenting symptoms by their first postoperative visit. Postoperatively, incidence of panhypopituitarism or diabetes insipidus developed in 84% and 91% of patients, respectively. 5 patients underwent only an Ommaya reservoir positioning, in 1 of these patients an endoscopic fenestration of the tumoral cyst was performed

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before putting in the Ommaya reservoir. 4 patients underwent first an endoscopic fenestration and not long after a subfrontal approach for craniopharyngioma removal. 5 patients were operated via a transsphenoidal endonasal approach for removal of the tumor while 12 patients were operated on through a subfrontal approach. We noticed no significant differences in terms of extensive resection and outcome between the patients operated via a subfrontal approach and those operated by an endoscopic approach. Recurrence rate and need for adjuvant radiation is quite similar in both groups.

Conclusions. Considering the very young age of these group of patients, it is important to bear in mind that the choice of the treatment should aim to preserve the hypothalamic function of the child. Thus, the least invasive approach is often the best approach. Given the similarity in terms of outcome between the craniotomic and endoscopic approach we believe that the latter should be the treatment of choice. However this depends on the expertise of the surgeon.



6614

SELECTION OF AN ENDOSCOPIC ENDONASAL OR TRANSORAL APPROACH TO THE INFRATEMPORAL FOSSA

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Background: Both endonasal and transoral approaches can provide minimally invasive access to the infratemporal fossa (ITF), however, the appropriate indications for each corridor have not been sufficiently defined. This study aimed to explore the indication for selection of an endonasal or a transoral approach to the ITF.

Methods: Cadaveric dissection was performed on 6 specimens, one side for an endonasal approach, and the contralateral side for a transoral approach. A complementary subdivision of the ITF into four quadrants (A-D) based on the crossing line at the lower border of the lateral pterygoid plate was established. Thirty-one patients who underwent endoscopic endonasal (Group 1) or transoral approach (Group 2) to remove tumors in the ITF, were retrospectively reviewed. Related indices for each surgical approach were compared.

Results: On cadaveric dissection, both the endonasal and the transoral approaches can provide access to the ITF. In Group 1, twenty-six patients underwent an endonasal approach, and the main tumor body was located at quadrant A. While patients in Group 2 performed a transoral resection, the tumor was mainly located in quadrant D. No significant difference for indices (eg. operation length, morbidity) between groups (all $p > 0.05$), and no recurrence were detected.

Conclusion: The endonasal and transoral corridors are suitable for management of lesions at the medial, and lateral or inferolateral aspects of the ITF, respectively. The relative tumor location to the lateral pterygoid plate may constitute an anatomic division tool to determine surgical approach selection.



6615

FREE FLAP RECONSTRUCTION FOLLOWING ENDOSCOPIC-ASSISTED TRANSORAL PARTIAL MAXILLECTOMY

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Background: Maxillectomy was routinely performed via open rhinotomy to address locally advanced sinonasal malignancies, leading to anticipated cosmetic concerns due to the facial incision and oronasal deficit. This study aimed to describe the endoscopic-assisted maxillectomy conducted via transoral corridor without facial incision and reconstructed with free flap.

Methods: Cadaveric dissection was performed in 2 specimens to evaluate the feasibility of performing an endoscopic-assisted transoral maxillectomy without facial incision. Seven patients with locally advanced sinonasal lesions who underwent an endoscopic-assisted transoral maxillectomy and reconstructed with free flap were included. Peri-operative morbidities were assessed.

Results: An endoscopic-assisted transoral maxillectomy was successfully performed on four cadaveric sides. For seven patients with locally advanced sinonasal lesions with inferior maxilla infiltration, transoral maxillectomy was successfully completed and negative margins were achieved. Reconstruction with the anterolateral thigh flap and forearm flap were completed in four and three patients, respectively. Both the organ function and facial cosmetics were adequately maintained. No recurrence was detected in this cohort.

Conclusion: An endoscopic-assisted transoral maxillectomy reconstructed with the free flap serves as a valuable alternative for selected locally advanced sinonasal lesions at the lower maxilla. With guarantee of the oncological outcomes, both the organ function and facial cosmetics are adequately maintained.



6616

ENDOSCOPIC ENDONASAL APPROACH TO THE TEMPOROMANDIBULAR JOINT REGION

Li Lifeng

Background: The temporomandibular joint (TMJ) region is the most superolateral aspect of exposure via the endonasal corridor, while literatures regarding the endonasal approach to this specific region are lack. This study aimed to provide a detailed step by step operative technique to reveal the TMJ region on cadaveric dissection, and to retrospectively review endonasal removal of tumors at the TMJ region.

Methods: Cadaveric dissection was performed on 4 specimens to illustrate the surgical technique of endonasal access to the TMJ region. Five patients harbored malignancies at the TMJ region who underwent an endonasal tumor removal were included. The feasibility, peri-operative morbidities and clinical outcomes were assessed.

Results: The TMJ region could be adequately exposed via the endonasal approach on all 8 cadaveric sides. For five patients included, three were osteosarcoma, and two were rhabdomyosarcoma following chemotherapy. The endonasal approach provided the rationale corridor for tumor removal at the TMJ region, and gross total resection was achieved. Variable extent of post-operative difficult mouth opening was encountered for these patients, while it gradually relieved and impacted little on quality of life. With an average follow up of 24.4 months, no recurrence was detected.

Conclusion: It is feasible to perform an endonasal approach to the TMJ region. For select lesion like osteosarcoma or chemotherapeutic rhabdomyosarcoma at the TMJ region, the endonasal approach can serve as a valuable alternative for tumor removal with seemingly less complications.



6617

CAN THE REGROWTH OF RESIDUAL NON-FUNCTIONAL PITNET AFTER ENDOSCOPIC ENDONASAL SURGERY BE PREDICTED?

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Introduction: The risk of postoperative tumor regrowth after endoscopic endonasal surgery (EES) for non-functional pituitary neuroendocrine tumors (NFPitNETs) remains insufficiently clarified. Predicting the postoperative behavior of residual tumors may support earlier consideration of adjuvant therapy. This study aimed to evaluate the prognosis of residual NFPitNETs and identify factors associated with tumor regrowth.

Methods: Among 254 patients who underwent EES for NFPitNETs between 2015 and 2024, 99 patients with postoperative residual tumors were retrospectively reviewed. Patients were divided into a regrowth group (n = 24) and a non-regrowth group (n = 75). Clinical and radiological variables, including age, sex, tumor size, residual tumor location, extent of resection, and the T2-weighted tumor-to-frontal lobe signal intensity ratio (TFSIR), were examined as potential predictors. TFSIR was calculated by measuring tumor and frontal lobe signal intensities using ROI-based analysis.

Results: The mean age was 60.6 ± 13.1 years, and 48 patients (48.5%) were male. Cavernous sinus involvement was the most common residual tumor site (61.6%), and subtotal resection was achieved in 89.9%. Tumor regrowth occurred in 24.2% of patients, 70.8% of whom required additional treatment during a mean follow-up of 35.5 ± 27.9 months. The regrowth group was significantly younger ($p < 0.01$) and showed a higher TFSIR ($p = 0.03$). Multivariate analysis identified younger age ($p < 0.01$) and elevated TFSIR ($p = 0.03$) as independent predictors of regrowth. **Conclusion:** Residual NFPitNETs regrew in about one-quarter of cases.

6621

NASAL POLYPS RECURRENCE

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Introduction: Nasal polyps are noncancerous growths like gray grapes inside the nose and sinuses. They affect 4.3% of population and occur usually in men than women, often after 40 years old. Chronic inflammation of mucous membrane seems to be the cause of nasal polyps. Risk factors are: allergies, cystic fibrosis, NSAIDs, aspirin sensitivity, asthma, chronic rhinosinusitis, heredity, chronic stress. Symptoms are: difficulty in breathing, runny nose, nasal speech, loss of smell, taste, headache, snoring. Complications are: osteomyelitis, abscesses of brain and eye, meningitis. Diagnosis include nasal endoscopy, allergy tests, MRI, CT scans and biopsy. The drugs used for the treatment are steroids, antihistamine, antibiotics for bacterial sinusitis, biologics (dupilumab, mepolizumab). Surgery include polypectomy, balloon sinuplasty, functional endoscopic sinus surgery. Nasal polyps frequently relapse but not always.

Case study: A 51-year-old male presented to us with nasal obstruction due to nasal polyps, which were extended to all sinuses. He underwent simple polypectomy in 2006 and took steroids and antihistamines. The recurrence of polyps had as a result to be operated again in 2023 and postoperative took mepolizumab 100mg, an antibody IgG1 against IL-5. It was a relief for him and had better quality of life. In 2025 he came back with nasal polyps recurrence. So he underwent FESS and postoperative medication with mepolizumab.

Results - Conclusion : Nasal polyps recurrence is a phenomenon that is not prevented always. The patient has to avoid nasal bacterial infections, allergy factors and have a good life.



6623

INTEGRATION OF THE HYBRID OPERATING ROOM IN ENDOSCOPIC ENDONASAL SKULL BASE SURGERY: A NEW STEP IN MULTIDISCIPLINARY CHORDOMA MANAGEMENT

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Introduction (Background & Aim): Endoscopic endonasal approaches have become the gold standard for the management of skull base chordomas, typically followed by postoperative proton therapy. However, these procedures are technically demanding due to the close relationship between the tumor and critical vascular structures, particularly the internal carotid artery (ICA). The hybrid operating room (HOR), integrating high-quality imaging and endovascular capabilities into the surgical environment, offers a new dimension of safety and precision in skull base surgery. The aim of this paper is to present our initial experience with the use of a HOR for endoscopic skull base chordoma surgery, emphasizing both its technical benefits and the enhanced collaboration between otolaryngologists, neurosurgeons and interventional radiologist

Materials and Methods: A dedicated multidisciplinary protocol was developed to perform extended endoscopic endonasal resections within a HOR equipped with a fully integrated angiography system. The setup allows for immediate intraoperative angiographic control and, if necessary, endovascular management without patient transfer. The procedure was jointly performed by ENT and neurosurgical teams, under continuous radiological guidance, ensuring real-time vascular assessment throughout tumor dissection.

Results: The hybrid environment facilitated confident tumor dissection near the ICA, offering the surgical team continuous visualization of vascular anatomy and the ability to perform on-the-spot angiographic checks. The immediate availability of endovascular expertise provided an additional safety layer, allowing for controlled and progressive resection while minimizing procedural stress. Beyond technical advantages, this setting strengthened interdisciplinary communication

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and decision-making, promoting a seamless integration between surgical and radiological workflows.

Conclusion: The hybrid operating room represents a major evolution in endoscopic skull base surgery, enhancing both safety and collaboration. By combining endoscopic and endovascular technologies in a single operative space, it opens new perspectives for complex skull base tumor management. This preliminary experience highlights the feasibility and potential of such an integrated approach within European skull base centers.



6624

CLINICAL VALIDATION OF ENHANCED SURGICAL OUTCOMES AND SAFETY THROUGH THE IMPLEMENTATION OF A NOVEL AUGMENTED REALITY NAVIGATION SYSTEM IN ENDOSCOPIC ENDONASAL SKULL BASE SURGERY

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Background: Endoscopic endonasal skull base surgery (EES) demands precise spatial recognition of complex anatomy to achieve safe and radical tumor removal. To address this challenge, we developed a novel augmented reality navigation system (ARnavS) that projects patient-specific 3D reconstructions of tumors, vessels, and nerves directly onto the surgical monitor (Goto Y et al. Cancers. 2023; 15:2148). In this system, a simplified alignment method was implemented to ensure accurate registration and enhance intraoperative anatomical recognition.

Methods: We retrospectively analyzed 195 EES procedures performed between June 2021 and July 2025. Registration accuracy of key structures (internal carotid artery, pituitary gland, optic nerve, tumor) was validated using the simplified alignment method. Surgical outcomes were compared across four phases: pre-ARnavS (June 2021–July 2022), early post-ARnavS (Aug 2022–July 2023), mid (Aug 2023–July 2024), and late (Aug 2024–July 2025). Gross total or near-total resection (GTR/NTR) rates and perioperative complications were assessed.

Results: ARnavS achieved high accuracy in anatomical visualization. Tumor resection rates improved significantly after ARnavS integration: 58% in the pre-AR period, 58% in the early post-AR period, 72% in the mid period, and 87% in the late period (ANOVA p

Conclusion: Stepwise integration and refinement of ARnavS markedly improved tumor resection rates while maintaining surgical safety. ARnavS enhances surgical precision, spatial orientation, and education by providing intuitive anatomical understanding and reducing cognitive load. Ongoing developments include applications in open cranial surgery, automated registration, and head-mounted display platforms.

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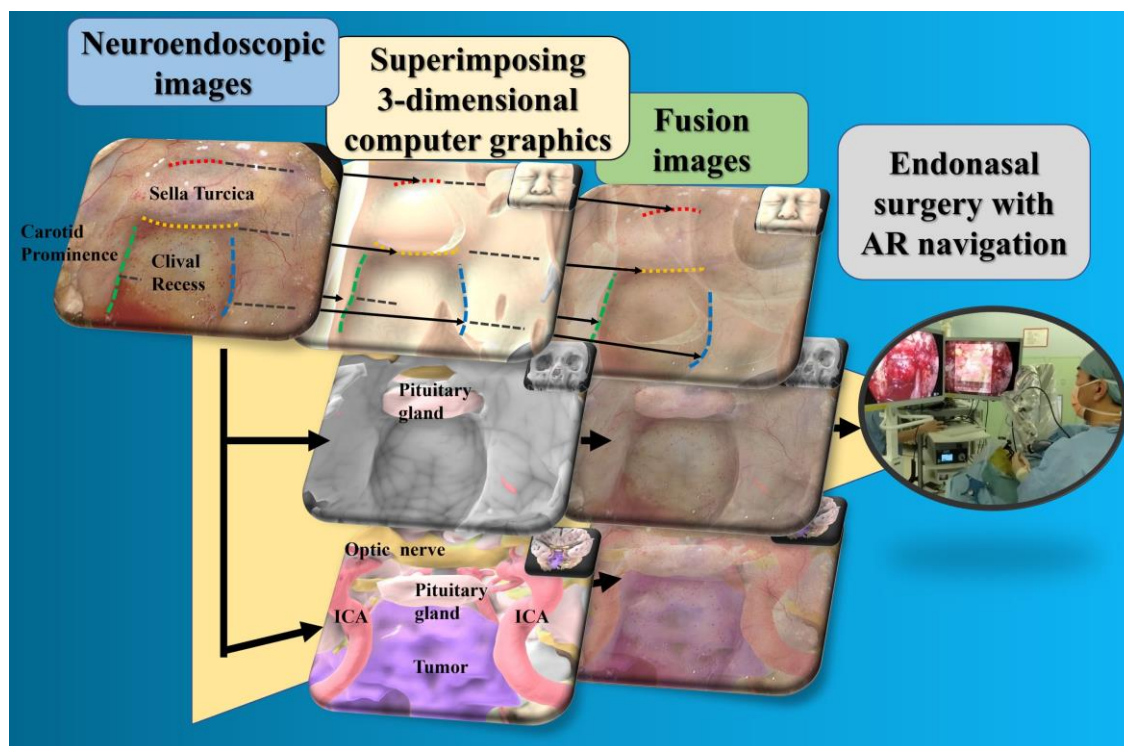
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MULTILAYERED DURAL RECONSTRUCTION WITH DURAL SUTURES IS USEFUL FOR PREVENTING INTRAOPERATIVE CEREBROSPINAL FLUID LEAKAGE DURING ENDOSCOPIC ENDONASAL SKULL BASE SURGERY

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Background: Cerebrospinal fluid (CSF) leakage remains a major complication in endoscopic endonasal skull base surgery. While multilayered reconstruction is widely used, dural suturing is technically demanding and not routinely adopted.

Methods: At our institution, an original training kit was developed using silicone sheets, enabling repeated practice of dural suturing. Five surgeons (one expert, two clinical fellows, and two residents) underwent structured training. Their suturing performance was evaluated in 40 consecutive cases between June 2024 and May 2025. Clinical outcomes were compared between multilayered reconstruction alone and multilayered reconstruction combined with dural suturing.

Results: Prior to training, three surgeons were unable to complete dural suturing. After practice, all five surgeons achieved successful closure, with significant reductions in intraoperative suturing time. Multilayered reconstruction alone maintained a low CSF leak rate (2.3%, 1/44 cases). However, when dural suturing was added, postoperative CSF leakage was eliminated (0%, 0/174 cases), including in high-flow leaks and large dural defects. This approach also minimized the need for nasoseptal flap or lumbar drainage, thereby reducing morbidity and improving postoperative quality of life.

Conclusions: Our findings demonstrate two key points: (1) dedicated practice using a simple training kit enables surgeons to reliably perform dural suturing with improved efficiency, and (2) combining dural suturing with multilayered reconstruction ensures robust prevention of postoperative CSF leakage. Training and reconstruction strategy refinement are therefore essential for overcoming this critical issue in endoscopic skull base surgery.

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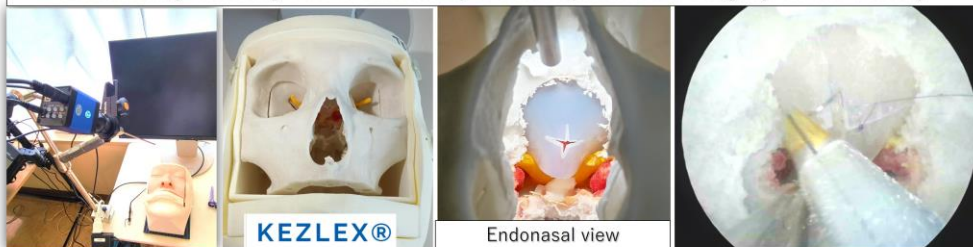
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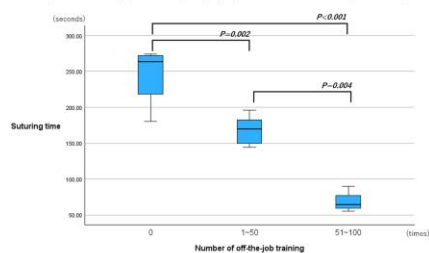
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Laboratory training kit for endoscopic transsphenoidal surgery in our facility

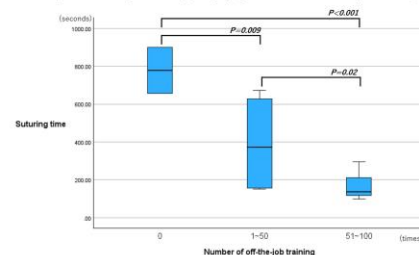


Correlation between practice volume and dural suturing time

The box plot of suturing time during surgery by the number of off-the-job training in Physician 1



The box plot of suturing time during surgery by the number of off-the-job training in Physician 2





6627

TRANSFORAMINAL ENDOSCOPIC DISCECTOMY: EARLY OUTCOMES OF A 56-PATIENT IRANIAN SERIES WITH SIX-MONTH FOLLOW-UP

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Introduction : Transforaminal endoscopic discectomy is an increasingly adopted minimally invasive treatment for lumbar disc herniation; however, evidence from Middle Eastern and resource-limited settings is scarce. We report the outcomes of an initial single-surgeon series in Iran, focusing on feasibility, safety, and short-term effectiveness.

Material and Methods: We prospectively evaluated 56 consecutive patients who underwent transforaminal endoscopic discectomy with a six-month follow-up. The variables included demographics, LDH morphology (central, shoulder/ventral, and axillary), migration zone, disc size, operative parameters, complications, recurrence, and pain measured using the Visual Analog Scale (VAS). The procedures used a standard C-arm without advanced navigation. **Results:** The mean age was 39.6 ± 7.4 years; 53.6% were male and 33.9% were obese. Half of the patients had at least one comorbidity. The LDH types were central (42.9 %), shoulder/ventral (32.1 %), and axillary 25.0%. The mean operative time was 57.3 ± 18.8 min, mean blood loss was 57.9 ± 17.1 mL, and mean length of stay was 1.4 ± 0.6 days. No intraoperative complications occurred, and one superficial wound infection (1.8 %) developed. The symptomatic recurrence at six months was 1.8%. No neurological deficits or reoperation were observed. The Mean VAS decreased from 7.20 ± 1.04 preoperatively to 3.00 ± 0.87 at 1 d postoperatively ($p < 0.001$) and to 2.00 ± 0.73 at 6 months ($p < 0.001$), showing sustained pain reduction. **Conclusion:** In a resource-restricted setting without navigation technology, transforaminal endoscopic discectomy achieved excellent outcomes with low morbidity, sustained pain reduction, minimal blood loss, and short hospitalization across diverse LDH morphologies. Longer follow-up and comparative studies are needed to confirm the durability and effectiveness of this technique.

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OPTIMIZING RETROGRADE ENDOSCOPIC DCR: ADVANTAGES OF PIEZOSURGERY

Matteo Alicandri Ciufelli

Endoscopic dacryocystorhinostomy (DCR) is a well-established treatment for nasolacrimal duct obstruction. The retrograde variant (rDCR) provides rapid access to the lacrimal sac by identifying the thin bony "crack point" at the anterior insertion of the inferior turbinate, improving orientation even in challenging anatomies. In this setting, piezosurgery may further enhance surgical control. Our aim is to describe the integration of piezosurgery into rDCR and assess its impact on osteotomy precision, intraoperative visibility and postoperative healing. We present the preoperative assessment, the intraoperative technique and the postoperative care that we routinely apply in our center. The surgical technique presented here involves the use of piezosurgery to progressively remove the bone overlying the nasolacrimal duct, following it retrogradely to the lacrimal sac. In our experience, piezosurgical bone removal facilitates controlled and selective exposure of the duct and sac, with reduced bleeding and improved visualization compared with traditional diamond burrs. Soft-tissue preservation is particularly advantageous in narrow nasal cavities, reducing the risk of flap damage. Osteotomies are smooth and well-defined, supporting optimal apposition of lacrimal sac flaps and orderly mucosal healing. In conclusion, incorporating piezosurgery into rDCR appears to increase surgical precision, safety and mucosal preservation while maintaining the intrinsic advantages of the retrograde approach.



6629

PIEZOSURGERY IN OSTEOPLASTIC FLAP PROCEDURES: A SAFE AND PRECISE APPROACH TO FRONTAL SINUS ACCESS

Matteo Alicandri Ciufelli

The osteoplastic flap (OPF) is an essential approach for managing complex frontal sinus disease, particularly when endoscopic access is limited by lateral extension, in cases of neo-osteogenesis of the frontal recess, or recurrent pathology after multiple surgeries. However, conventional bone-cutting techniques may increase the risk of thermal injury, irregular osteotomies and postoperative morbidity. Piezosurgery offers enhanced precision and selective bone cutting while sparing soft tissues. Our aim is to highlight the potential advantages of integrating piezosurgery into OPF procedures. A descriptive evaluation was performed based on clinical experience with OPF in challenging frontal sinus cases. Particular attention was given to the technical feasibility, handling characteristics and perioperative outcomes when piezoelectric instrumentation was used for flap harvesting and refinement of the bony margins. In our experience, piezosurgery allows accurate delineation of the frontal sinus borders, producing smooth osteotomies with excellent preservation of periosteal and soft-tissue structures; it also offers optimal integrity of the flap and stability after repositioning. Reduced bleeding and enhanced visibility contribute to safer elevation of the flap. Early postoperative recovery is generally favourable, with low pain levels, preserved forehead contour, and no sensory deficits. In conclusion, the use of piezosurgery in OPF procedures appears to improve surgical precision and intraoperative control, potentially reducing morbidity associated with traditional techniques.



6630

PIEZOSURGERY-ASSISTED ENDOSCOPIC REPAIR OF CHOANAL ATRESIA: TECHNICAL ADVANTAGES AND CLINICAL RATIONALE

Matteo Alicandri Ciufelli

Choanal atresia is a congenital obstruction of the posterior nasal airway whose surgical management aims to achieve long-term patency while minimizing trauma to mucosa and adjacent neurovascular structures. Restenosis remains the most frequent postoperative challenge, often related to mucosal injury, granulation and scarring. Piezosurgery—an ultrasonic, bone-selective cutting technology—offers precise osteotomy with soft-tissue preservation, therefore improving surgical outcomes. Our aim is to describe the application of piezosurgery in the endoscopic repair of choanal atresia and to evaluate its potential benefits in reducing mucosal trauma, surgical complications and restenosis, compared with traditional mechanical or powered instrumentation. Patients undergoing endoscopic correction with piezoelectric instrumentation were reviewed, focusing on surgical handling, postoperative healing and choanal patency over follow-up. Our results show that piezosurgery enables precise removal of the bony obstruction with minimal bleeding and good mucosal preservation. Healing is favorable, with reduced crusting and rapid re-epithelialization. In conclusion, endoscopic transnasal CA repair with piezosurgery is a safe, effective technique that improves soft-tissue preservation and may contribute to reduced granulation and restenosis, supporting long-term choanal patency and reducing the restenosis risk.



6633

POSTOPERATIVE SUPRASellar CEREBROSPINAL FLUID LEAK IN NON-PITUITARY PATHOLOGY: A SINGLE INSTITUTION CASE SERIES

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²,

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Introduction: Endoscopic endonasal surgery is being increasingly utilized over transcranial approaches for suprasellar lesions including meningiomas, Rathke cleft cysts, and craniopharyngiomas. Accessing these suprasellar tumors presents challenges over other locations in the sagittal plane as their superior extension thins the diaphragma or may erode into the third ventricle making intraoperative high flow leaks much more common and oftentimes unavoidable. **Materials & Methods:** This is a single-institution retrospective case series reviewing post-operative CSF leaks associated with suprasellar defects for non-pituitary pathology from 2015-2025. Patients with other extended approaches in the sagittal plane, including transcribriform and transclival, were not included in this analysis. Patient demographics, operative and reconstructive techniques, and strategy for post-operative leak management were among the variables collected.

Results: A total of 20 patients met inclusion criteria. Pathology consisted of tuberculum meningioma (n=6, 30%), craniopharyngioma (n=6, 30%), suprasellar Rathke cleft cyst (n=3, 15%), planum meningioma (n=2, 10%) and other (n=3, 15%). 3 cases were for recurrent lesions, all of which were craniopharyngiomas. All patients had intra-operative leaks, with 3 (15%) having low flow and 17 (85%) having high flow leaks. The most common means of reconstruction was a dural substitute inlay (all patients), with or without fascia lata onlay (5 patients had fascia onlays, 15 patients did not), followed by a nasoseptal flap (17 out of 20 patients had nasoseptal flaps, 2 had free mucosal grafts, and 1 had a pericranial flap). At the time of initial surgery, 5 patients received lumbar or extraventricular drains and 15 (75%) did not. 8 patients presented with post-operative leak during their same admission, whereas 12 patients were readmitted for leak management. Of those with post-operative leaks all were

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managed by return to the operating room for exam under anesthesia; displacement of the reconstruction was noted in 9 patients, with 14 patients noted to have flap dehiscence, and 2 patients with flap necrosis or death. Both instances of flap necrosis were noted to be only partial necrosis, and only one of them required additional vascularized reconstruction via a lateral nasal wall flap. Otherwise, on return to the operating room, all patients were able to reuse their initial reconstruction after repositioning and bolstering. Lumbar drain or EVD were placed in 18/20 patients.

Conclusions: CSF leak remains an inherent risk following suprasellar endonasal approaches due to their propensity for intra-operative high flow leaks. A majority of these leaks result from displacement or dehiscence of the reconstruction, and as such can be salvaged with return to the operating room for leak identification and reconstruction repositioning and securing. Future efforts to reduce the incidence of suprasellar CSF leaks could focus on optimizing technique to avoid flap dehiscence and novel techniques to better secure the reconstruction.



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PROTON BEAM RADIOTHERAPY VERSUS INTENSITY-MODULATED RADIOTHERAPY IN OLFACTORY NEUROBLASTOMA: A MULTI-INSTITUTIONAL PROPENSITY MATCHED STUDY

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Introduction Olfactory Neuroblastoma (ONB) is a rare sinonasal malignancy that can present with locally advanced disease. Previous studies have demonstrated that post-resection radiotherapy can provide a survival and recurrence advantage in patients with ONB, particularly in the setting of higher stage and histologic grade. Two of the main methods of radiotherapy delivery include proton beam radiotherapy (PBRT) and intensity-modulated radiotherapy (IMRT). The differences in the effectiveness of these two methods have been studied in other fields including head and neck cancer, however, no studies comparing the two methods have been studied for patients with ONB. Therefore, the purpose of this study is to compare the differences in survival and recurrence for ONB patients being treated with PBRT and

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IMRT using propensity-matched cohorts from a multi-institutional database.

Materials & Methods This modern-era multi-center data originated from the retrospective review of electronic health records (EHRs) of all patients who presented with ONB between 2005 and 2021 at nine academic, tertiary care centers within North America. Only patients treated with either IMRT or PBRT were included in the study. Clinicopathologic features including treatment modalities, pathologic and MRI imaging status, modified Kadish staging systems, Hyams grading, margin-status, and follow-up time. Outcomes collected for analysis included local recurrence-free survival (Local-RFS), regional recurrence-free survival (Regional-RFS), total recurrence-free survival (RFS), and overall survival (OS). Propensity matching of age, gender, Hyams grade, modified Kadish staging, resection margin-status, and chemotherapy use between treatment modalities was confirmed with chi-square and fisher exact tests. Statistical analysis was done using Kaplan-Meier curves and log-rank tests.

Results Of the 205 ONB patients treated with surgical resection and adjuvant radiation therapy for curative intent, 18 patients were identified to receive PBRT. This cohort was then matched to the current standard of IMRT at a 1:1 ratio for a total of 36 patients in this multi-institutional study. The average follow-up time for IMRT was 71.7 (SD, 52.9) months and for PBRT was 53.2 (SD, 39.5) months ($P=0.24$). For IMRT, the 5-year local-RFS, Regional-RFS, RFS and 5-year OS were 69.2%, 92.9%, 64.8%, and 80.8%, respectively. For PBRT, the 5-year local-RFS, Regional-RFS, RFS and 5-year OS were 90.9%, 79.7%, 56.7%, and 85.7%, respectively. Similarly, there were no differences in local RFS ($P=0.34$, Figure 1), regional RFS ($P=0.29$, Figure 2), total recurrence-free survival ($P=0.4$, Figure 3), and overall survival ($P=0.52$, Figure 4) between patients treated with PBRT and IMRT.

Conclusions This study is the first to compare the effectiveness of IMRT and PBRT in patients with advanced olfactory neuroblastoma. These findings support that IMRT and PBRT are comparable in overall survival and recurrence-free survival as treatment methods for advanced stage/grade olfactory neuroblastoma. Future investigations comparing quality-of-life outcomes between these radiotherapy modalities are needed to better delineate patient-centered treatments for ONB.



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Advances in Treatment and follow up of Allergic Fungal Sinusitis: What Clinicians Need to Know

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Introduction: Allergic fungal rhinosinusitis (AFRS) is a subtype of chronic rhinosinusitis with nasal polyposis; it is characterized by type 2 inflammation, IgE-mediated hypersensitivity to fungal antigens, and usually affects adolescents and young adults presenting with progressive nasal obstruction or orbital symptoms. Imaging often shows heterogeneous sinus opacification with expansion and remodeling. This study evaluates current therapeutic strategies and evolving approaches to recurrence in our center.

Materials and Methods: A synthesis of the current literature with our institutional experience in the assessment of surgical techniques, postoperative regimens, and emerging therapies was performed. Key areas discussed included FESS, corticosteroids, antifungal agents, and biologics targeting type 2 pathways.

Results: AFRS is characterized by eosinophilic mucin, extensive polyposis, and bony sinus expansion. Functional endoscopic sinus surgery (FESS) remains the cornerstone of management, enabling mucin clearance and restoration of sinus ventilation. Despite this, recurrence rates remain high. Strong evidence supports the use of postoperative corticosteroids to control inflammation. In addition, our study highlights the significant role of systemic antifungals. Early data on biologics particularly anti-IgE agents demonstrate promise in reducing polyp burden and recurrence in refractory cases, though optimal patient selection and treatment duration require further clarification.

Conclusions: AFRS remains difficult to manage due to high recurrence rates. Optimal care relies on thorough surgical clearance supported by individualized medical therapy. Emerging biologics offer a promising option for refractory cases and may improve long-term disease control as evidence grows.

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THE POTENTIAL OF ENDOSCOIC ENDONASAL, TRANSORAL, AND TRANSORBITAL APPROACHES TO THE INFRATEMPORAL FOSSA OBVIATING TRADITIONAL OPEN SURGERIES

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Background: Anterior endoscopic approaches to middle cranial base pathologies, including infratemporal fossa lesions, have become standard of care. Endoscopic endonasal, transoral sublabial, and endoscopic transorbital techniques have all been described, with the endonasal route most commonly preferred; transorbital and transoral sublabial approaches are emerging as viable, evolving alternatives. This clinical case series summarizes our institution's experience using these complementary anterior routes, highlighting indications, technical considerations, and outcomes.

Material and Method: We included all patients who underwent pure endoscopic endonasal, transoral sublabial, and transorbital approaches. Data were collected prospectively and analyzed to compare indications, intraoperative findings, and short-term outcomes across approaches.

Results: We performed an anterior endoscopic transoral sublabial transmaxillary approach to access the infratemporal fossa, upper parapharyngeal space, and middle cranial fossa in 14 patients. Additionally, the endoscopic transorbital approach (ETOA) was utilized in 26 cases, and an endoscopic endonasal approach in 35 patients (28 benign and 7 malignant pathologies). Gross total resection was achieved in the majority of cases without any major complication.

Conclusion: The infratemporal fossa can now be approached safely and effectively using a range of endoscopic corridors — notably endonasal transpterygoid, and transmaxillary routes (accessed via the endonasal, transoral, or both), as well as transorbital approaches. Tailored selection of endonasal, transoral, or transorbital strategies allows focused access

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to the ITF and adjacent spaces while minimizing morbidity, frequently avoiding the need for traditional open exposures. Careful preoperative planning and corridor-specific expertise remain essential to optimize outcomes.



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COMPREHENSIVE OUTCOME ANALYSIS OF ENDOSCOPIC ENDONASAL SURGERY IN NON-FUNCTIONAL PITUITARY ADENOMAS: VISUAL, RADIOLOGIC, HORMONAL, AND SURGICAL OUTCOMES AND COMPLICATIONS

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Background: Endoscopic endonasal transsphenoidal surgery (EETS) has recently gained favor for resection of non-functional pituitary adenomas due to its superior visualization and minimally invasive profile. In this retrospective study, we assessed surgical outcomes, rates of visual and hormonal recovery, and postoperative complications in patients undergoing EETS for NFPA.

Material and Methods: We reviewed 243 patients with nonfunctioning pituitary adenomas who underwent endoscopic endonasal transsphenoidal surgery. Preoperative and postoperative assessments at 3, 6, and 12 months included visual acuity and visual field testing, comprehensive endocrine profiles, volumetric MRI measurements, and documentation of complications. **Results:** EETS resulted in significant improvements in both visual acuity and visual fields. Poorer visual recovery was associated with lobulated tumors, and optic disc atrophy and prior EETS. Postoperatively, hormonal deficiencies improved significantly overall, although larger tumor volume independently predicted new hypogonadism, and larger tumors, solid consistency, prior surgery, and older age predicted new postoperative thyroid and adrenal dysfunction. At 3-month MRI, gross total resection was achieved in 212 patients (87.2%), near-total in 24 (9.9%), subtotal in 5 (2.1%), and partial in 2 (0.8%)

Conclusion: EETS is a safe and effective approach for removing nonfunctioning pituitary adenomas, achieving high rates of resection and favorable functional recovery. However, lobulated tumor morphology, larger tumor volume, extensive cavernous sinus invasion, and a history of prior surgery are associated with worse visual, endocrine, and surgical outcomes. Recognizing these risk factors preoperatively is

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essential for tailoring surgical approaches and reconstruction strategies to each patient, thereby optimizing long-term results.



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FREE-FLAP PEDICLE TRANSPOSITION THROUGH PARAPHARYNGEAL AND RETROPHARYNGEAL CORRIDORS IN CLIVAL AND VENTRAL SKULL BASE DEFECTS

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Background: The parapharyngeal and retropharyngeal corridors offer inferior access routes to the ventral skull base, particularly suited for microvascular free-flap reconstruction of clival and nasopharyngeal defects. Their use is indicated in oncologic, post-radiation, or infectious settings.

Methods: A systematic review of the literature was conducted to identify current reconstructive practices and outcomes related to these approaches. In parallel, cadaveric dissections were performed to quantify the minimal pedicle lengths required for safe and effective flap transposition.

Results: Both corridors enable routing of pedicles from cervical recipient vessels—typically the facial, superior thyroid, or external carotid artery—to the central skull base. The anterolateral thigh and radial forearm flaps are the most frequently used. Major limitations include extended transcervical dissection time and potential morbidity such as dysphagia or cranial nerve injury.

Conclusions: Quantitative anatomical data and clinical evidence support a more reliable, patient-tailored reconstructive approach. The presentation will be enriched with original photographic documentation from cadaveric dissections, highlighting spatial relationships and technical details of each corridor.



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COMPARISON OF MEDIAL ENDOSCOPIC MAXILLECTOMY WITH PRELACRIMAL APPROACH AND CONVENTIONAL ENDOSCOPIC MAXILLECTOMIES: A MULTICENTRE RETROSPECTIVE STUDY

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Background Over the past decades, the endoscopic prelacrimal recess approach (PRLA) has been increasingly employed in the management of benign tumours, inflammatory diseases, and selected malignant lesion of the maxillary sinus. This success is given its non-invasiveness procedure – preserving the inferior turbinate and nasolacrimal duct- while giving a wide access to the maxillary sinus. The aim of this retrospective multicentric study is to evaluate the clinical outcomes of the conventional and non-conventional endoscopic approaches to the maxillary sinus for benign tumours and inflammatory lesions.

Objectives The primary endpoint was to assess and compare recurrence rates of benign and inflammatory lesions according to the different surgical approaches. The secondary endpoint was to evaluate and compare postoperative complications occurring at any time after surgery, with a minimum follow-up period of six months.

Methods An international multicentre retrospective analysis was conducted to compare surgical outcomes achieved by conventional endoscopic procedures (i.e., middle meatal antrostomy and endoscopic medial maxillectomy) with those obtained using the PRLA.

Results A total of 632 patients with a minimum follow-up of six months were analysed. Surgical approaches were distributed as follows: 182 patients underwent Type I-A/II-B, 285 Type III/C, 44 Type IV/D, and 121 PRLA procedures. Overall, 43 recurrences (6.8%) were observed, with the lowest rate in the PRLA cohort (4.1%), although not reaching statistical significance. No significant differences were found among approaches regarding intraoperative or perioperative complications. Postoperatively, PRLA demonstrated significantly lower rates of epiphora, nasal obstruction, crusting, and dental pain compared to conventional techniques, whereas middle meatal antrostomy was associated with the lowest rate of gingival numbness ($p < 0.0001$). Periorbital swelling occurred in 3.8% of patients overall (13% in the Type

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III/C group; $p = 0.3656$), and only three cases of alar collapse were reported (one each in the Type III/C, Type IV/D, and PRLA cohorts).

Conclusions The PRLA proved to be a safe and effective procedure, offering low recurrence rates and fewer postoperative complications compared with conventional endoscopic approaches. To date, this represents the largest multicentre retrospective study comparing PRLA with traditional approaches for benign maxillary sinus lesions in the scientific literature.



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COMPREHENSIVE -APPROACHES TO UNDERSTANDING ISOLATED SPHENOID LESIONS (TWENTY YEARS OF INSIGHT)

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Introduction: The sphenoid sinus, often termed the "forgotten sinus" due to its deep location and difficult access, makes isolated sphenoid sinus disease (ISSD) rare and challenging to diagnose early. Symptoms are typically vague most commonly headache leading patients to consult neurologists or primary care physicians rather than otolaryngologists.

Materials and Methods: We performed a 20-year retrospective analysis of 87 ISSD cases to gain deeper insights into their pathology, symptomatology, and treatment outcomes.

Results: A total of 87 patients with isolated sphenoid sinus pathology were reviewed, including 47 males and 40 females, with an age range of 10 to 82 years (mean age: 42 years). In 63% of cases, the left sphenoid sinus was involved, and in 37% the right. Headache was the most common presenting symptom, followed by retro-orbital pain and postnasal discharge. The etiologies of ISSD included inflammatory disease in 60 cases (68.97%); benign neoplasia in 20 cases (23%), comprising extension of pituitary adenoma in 15 cases, sphenochoidal polyp in 3 cases, and fibro-osseous lesions in 2 cases; miscellaneous causes in 5 cases (5.74%), including CSF leak in 3 cases, a foreign body (bullet) in 1 case, and an internal carotid artery pseudoaneurysm in 1 case; and malignancy in 2 cases (2.29%), consisting of adenoid cystic carcinoma and metastatic Ewing sarcoma.

Conclusion: Isolated sphenoid sinus disease often presents with nonspecific symptoms, leading to delayed diagnosis and treatment. Timely management requires coordinated efforts among general practitioners, neurologists, ophthalmologists, and otolaryngologists to prevent potentially serious complications.

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ADDITION OF INFERIOR MEATAL ANTROSTOMY TO PRELACRIMAL APPROACH AS A MODIFICATION TO IMPROVE POSTOPERATIVE MAXILLARY SINUS ACCESS: TECHNIQUE NOTE

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Introduction: The prelacrimal approach to the maxillary sinus has been described as an effective technique that provides wide exposure and optimal visualization of the maxillary walls for the management of inflammatory and tumorous diseases of the maxillary sinus. However, one of its main drawbacks is the restricted endoscopic access to the maxillary sinus during postoperative office evaluations. The addition of the functional medial maxillectomy technique is described in this article as a complementary modification to improve postoperative accessibility and visualization of the maxillary sinus.

Methods: We classified the prelacrimal approach into three subtypes: Prelacrimal approach without middle meatal antrostomy, Prelacrimal approach with middle meatal antrostomy & Prelacrimal approach with middle meatal and inferior meatal antrostomy. Prelacrimal approach with MMA & IMA recommended in tumorous or inflammatory cases which post operative maxillary access is necessary.

Conclusion: The addition of functional medial maxillectomy to the prelacrimal approach provides improved post operative access to maxillary sinus in office endoscopic evaluations.



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ENDOSCOPIC ENDONASAL SURGERY BASED ON FUNDAMENTAL PRINCIPLES OF TUMOR REMOVAL: UTILITY OF STEERABLE INSTRUMENTS WITH ROBOTIC-LIKE MANEUVERABILITY

Masaaki Taniguchi¹

¹Other

Introduction

In surgical strategies for tumors around the pituitary gland, we consider two fundamental principles of tumor removal to be critical: (1) initiating resection by directly approaching the site of origin, and (2) retracting the tumor from its peripheral extension back toward the origin for safe removal. Endoscopic endonasal surgery (EES) offers a substantial advantage for midline skull base tumors in fulfilling principle (1). However, with respect to principle (2), it often remains challenging to pursue superiorly or laterally extended components of the tumor while circumventing critical neurovascular structures. In such situations, additional skull base exposure or combined transcranial approaches may be required. To overcome these limitations, we have adopted steerable instruments that enable secure management of the point of origin and allow precise navigation around adjacent vital structures, facilitating controlled tumor retraction back toward the origin. In this study, we report the practical application and usefulness of this surgical concept.

Methods We retrospectively analyzed 356 consecutive cases of EES in which steerable instruments were utilized, either individually or in combination: steerable forceps with grasping capability and rotational/bending mobility, and an extensible curved suction device (pituitary adenoma, n=211; craniopharyngioma, n=37; chordoma, n=29; meningioma, n=16; chondrosarcoma, n=7; others, n=56). **Results** The steerable forceps enabled effective tumor traction in any desired direction and provided improved access to deep lateral and superior surgical fields. The extensible suction allowed secure aspiration in deep peripheral areas. Furthermore, the combined use of steerable instruments enabled the application of counter-traction during tumor dissection, allowing the tumor to be grasped while performing dissection along its interface using the edge of the suction device. This enabled reliable tumor removal, including relatively fibrous lesions, even in areas

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that are difficult to access with conventional instruments. As a result, in a substantial number of cases, the intended concept of tumor removal could be achieved without requiring further skull base bone removal. Conclusion Steerable instruments provide enhanced maneuverability in deep and narrow corridors, achieving movements similar to those of robotic systems. This may represent a next-generation advancement in endoscopic endonasal surgery.





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QUANTITATIVE ASSESSMENT OF SURGICAL FEASIBILITY IN THE ENDOSCOPIC ENDONASAL TRANS-LACERUM APPROACH FOR LESIONS EXTENDING TO THE INFERIOR PETROUS APEX

Masaaki Taniguchi¹

¹Other

Introduction

The inferior petrous apex is one of the most challenging regions to access using either transcranial or endoscopic endonasal approaches. We previously reported the endoscopic endonasal trans-lacerum approach (TLA), which provides access to this area by opening the anterior aspect of the foramen lacerum (J Neurosurg, 2016). However, surgical maneuverability and the risk of internal carotid artery (ICA) injury can vary considerably depending on the paraclival ICA configuration. The purpose of this study was to quantitatively evaluate the surrounding anatomical parameters and identify simple preoperative indicators that may predict surgical feasibility and safety.

Methods Among the 24 patients who underwent the TLA since 2009, 15 patients in whom gross-total resection (GTR) was intended were included in this study. The area of the supraeustachian triangle (SET) was measured on preoperative imaging, and the correlation between the SET area and resection rate of the tumor components extending lateral to the paraclival internal carotid artery (ICA) was analyzed. In addition, the inclination angle of the petrous ICA was evaluated as a simple preoperative indicator of SET size.

Results A total of 20 sides were treated in 15 patients, including 5 patients with bilateral tumor extension. In 16 sides (80%), >% resection of the lateral extension was achieved. Although the SET area did not correlate with the resection rate in the overall cohort, when the analysis was limited to cases in which the tumor extended beyond the midpoint of the horizontal ICA segment, the SET area was significantly larger in cases achieving >% resection ($P = 0.019$). Moreover, the inclination angle of the petrous ICA showed a significant correlation with the SET area, indicating its usefulness as a simple preoperative predictive indicator of surgical feasibility.

Conclusion In the endoscopic endonasal trans-lacerum approach, anatomical characteristics significantly influence resectability,

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particularly in tumors with substantial lateral extension. The inclination angle of the petrous ICA serves as a practical preoperative indicator for estimating surgical maneuverability and may also help infer the potential risk of ICA injury.





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CLINICAL OUTCOMES OF ENDOSCOPIC ENDONASAL SURGERY FOR CRANIOPHARYNGIOMAS

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Objective: Endoscopic endonasal surgery (EES) has become an important surgical option for craniopharyngiomas, offering favorable tumor control with reduced surgical morbidity compared with traditional transcranial approaches. Nevertheless, recurrence and postoperative endocrine dysfunction remain major clinical challenges. This study aimed to comprehensively evaluate the outcomes of initial EES for craniopharyngiomas by classifying tumors into three clinically relevant subtypes—adamantinomatous infradiaphragmatic (AI), adamantinomatous supradiaphragmatic (AS), and papillary (Pa)—and to clarify prognostic differences among these groups.

Methods: We retrospectively analyzed 80 consecutive patients who underwent initial EES for craniopharyngioma between 2011 and 2024 at Tsukuba University and Dokkyo Medical University. Clinical data, radiological findings, surgical outcomes, endocrine function, complications, recurrence patterns, and progression-free survival (PFS) were evaluated. Postoperative endocrine function was assessed using both basal hormone levels and loading tests. The median follow-up duration was 51 months (range, 3–148 months). Subtype-specific outcomes were compared to identify prognostic factors.

Results: Gross total resection was achieved in 67.5% of cases, and no postoperative visual deterioration occurred. New-onset diabetes insipidus and panhypopituitarism developed in 52% and 29% of patients, respectively. Among 78 evaluable cases, 30 (38%) experienced tumor recurrence, most of which were effectively managed with repeat EES; only a minority required radiotherapy or transcranial surgery. Median PFS differed substantially among subtypes, measuring 9 months in the AI group, 65 months in the AS group, and 21 months in the Pa group. AI tumors demonstrated a significantly higher recurrence risk compared with both AS and Pa tumors. In contrast, AS tumors showed the most favorable long-term tumor control.

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Conclusion: EES is a safe and effective treatment strategy for craniopharyngiomas, achieving high resection rates and acceptable complication profiles while allowing effective repeat endoscopic surgery for recurrent disease. Tumor subtype strongly influences prognosis: AI tumors carry the highest recurrence risk, whereas AS tumors exhibit the most durable tumor control. Despite favorable surgical outcomes, postoperative endocrine dysfunction remains frequent, underscoring the need for continued multidisciplinary management.



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OUTCOMES OF ENDOSCOPIC ENDONASAL SURGERY FOR PEDIATRIC CRANIOPHARYNGIOMA WITH A FOCUS ON ENDOCRINE FUNCTIONS

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Introduction: With the advancement of endoscopic endonasal surgery (EES), treatment outcomes for craniopharyngioma—particularly tumor resection rates and visual function—have improved. However, preservation of endocrine function remains challenging. In pediatric patients, postoperative maintenance of pituitary function is even more critical than in adults, given its impact on growth and future fertility; thus, endocrine preservation should be prioritized. At our institution, we aim to preserve endocrine function by achieving maximal safe tumor resection while maintaining the morphological integrity of the pituitary stalk whenever possible. In this study, we analyzed the outcomes of this treatment strategy.

Material & methods: We retrospectively reviewed 22 pediatric patients who underwent 35 EES procedures for craniopharyngioma between 2011 and 2022 (17 boys; median follow-up, 72.5 months). Tumors were classified by location into infra-diaphragmatic (ID) and supra-diaphragmatic (SD) types. A pediatric endocrinologist participated in the management of all patients, and any hormone axis requiring postoperative replacement therapy was defined as dysfunctional. Treatment outcomes (extent of resection, visual function assessed using the VIS score, return to school, postoperative obesity, and complications) were evaluated. We additionally assessed the feasibility of pituitary stalk preservation and its impact on postoperative endocrine function.

Results: Gross total resection was achieved in 30 of 35 surgeries (85.7%). Among 13 patients with preoperative visual impairment, improvement was observed in 11. New-onset postoperative obesity occurred in 6 patients (17.1%). Endocrine function was preserved preoperatively in 25 surgeries (ID = 13, SD = 12), and these were analyzed for endocrine outcomes. Pituitary stalk preservation was feasible in 18 surgeries (72%; ID = 13, SD = 5). Endocrine function was maintained postoperatively in 14 of these cases (ID = 12, SD = 2). Endocrine preservation was significantly more likely in ID tumors ($p < 0.001$). Tumor recurrence

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occurred in 11 of 22 patients, requiring repeat surgery. On log-rank analysis, pituitary stalk preservation was associated with an increased risk of recurrence ($p = 0.044$).

Conclusion: In ID tumors, preservation of the pituitary stalk can facilitate postoperative maintenance of pituitary endocrine function, whereas this remains difficult in SD tumors. However, surgeons must recognize that stalk preservation increases the risk of recurrence. Treatment goals should therefore be individualized according to tumor characteristics and clinical priorities.



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ENDONASAL ENDOSCOPIC SURGERY OF CRANIOPHARYNGIOMAS: OUTCOMES AND SURGICAL CONSIDERATIONS

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Background. Quality of life and tumor control remain key goals in craniopharyngioma (CP) management. Endonasal approaches offer effective and safe tumor removal for most CP types, although preservation of pituitary function is rather achievable. **Goal:** to evaluate outcomes of endonasal endoscopic removal of CPs with attention to tumor type, extent of resection, technique and complications.

Materials and Methods. A total of 154 consecutive adult patients underwent endonasal endoscopic surgery for CPs at the Romodanov Institute of Neurosurgery in 2016 -2025. Tumor distribution was: 32 infradiaphragmatic (20.8%), 23 infra-supradiaphragmatic (14.9%), - 99 supradiaphragmatic tumors (64.3%). Planning of resection included assessment of diencephalic involvement and multidisciplinary team discussion. Surgical techniques included: 20 posterior clinoidectomies, 4 full pituitary transpositions, 14 partial (hemi-) transpositions. In all transposition cases, the pituitary stalk was preserved. Among supradiaphragmatic tumors, the stalk was preserved in 63 patients and sacrificed in 37. Multilayer closure technique in all cases. **Results.** Extent of resection: 113 total/near total (73.4%), 35 partial (22.7%), 6 biopsies/cyst aspirations (3.9%). All 55 infra- and infra-supradiaphragmatic patients experienced postoperative pituitary dysfunction. DI or worsening occurred in 41 cases (74,5%). Anatomical stalk preservation achieved in 63.6 % of supradiaphragmatic cases but 28.6% of them had anterior pituitary deterioration and 19.0% developed DI. After hemiposition, 8/14 patients (57.1%) demonstrated satisfactory anterior pituitary function without new DI.

Complications: CSF leak in 10 cases (6.5%), meningitis in 6 cases (3.9%), mortality 4 patients (2.6%). Diencephalic obesity observed in 15 patients (9.7%).

Conclusions: The endonasal approach is the method of choice for most CPs in adults (except Kassam IV). Pituitary function preservation remains challenging in radical resections. In selected supradiaphragmatic cases,

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satisfactory endocrine outcomes are achievable with stalk preservation and hemi-transposition techniques.



6652

CLOSURE OF SPONTANEOUS CSF LEAK: REVIEW OF 53 ENDOSCOPIC CASES

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Background. Spontaneous cerebrospinal fluid (CSF) rhinorrhea is often not promptly recognized by patients, which increases the risk of meningitis. Over the last decade, the endoscopic endonasal approach (EEA) has been used more widely and may be safer and more effective than traditional open surgery in managing spontaneous CSF leaks.

Methods. Fifty-three consecutive patients with spontaneous CSF leakage underwent EEA at the Department of Endonasal Skull Base Surgery, Romodanov Neurosurgery Institute, between February 2014 and February 2025 (F/M = 50/3). Patient age ranged from 17 to 67 years. Preoperative evaluation included nasal discharge glucose testing, BMI assessment, MRI, and high-resolution CT. CT cisternography and MRI cisternography were performed in all 53 patients; additionally, 20 patients underwent MR venography. Various autologous tissues (muscle, fat, fascia lata, tailored nasoseptal flaps) and artificial materials (fibrin-collagen patches) were used for closure. Lumbar drainage was applied in all cases.

Results. MRI indicators of intracranial hypertension were identified in 39/53 (73.6%) patients. BMI > kg/m² was observed in 41/53 (77.4%). Venous sinus obstruction was found in 18 patients (90% of those evaluated). The most common leak sites were the cribriform/ethmoidal region (31/53, 58.5%), sphenoid sinus lateral recess (14/53, 26.5%), clivus (4/53, 7.5%), and sella turcica (4/53, 7.5%). Encephalocele was discovered intraoperatively in 23 cases (43.4%). Complications included one case of meningitis. Postoperative follow-up (6–123 months) revealed no CSF leak recurrence.

Conclusion. EEA is an effective and reliable technique for the management of spontaneous CSF leakage. We advocate a maximal "aggressive" defect opening and multilayer reconstruction strategy, adapted from extended endoscopic skull base surgery with routine nasoseptal flap.



6653

HOW WE MADE IT EASY: DESIGNING MUCOSAL FLAP FOR OUTSIDE IN DRAF3 FRONTAL SINUSOTOMY

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Objectives: One of the popular approaches for opening the frontal drainage pathway is the outside-in technique. It is preferred to cover the drilled area with flaps, that is usually challenging and time consuming. The aim of the present study was to propose an easy to learn and perform technique of designing the flap.

Methods: In this prospective pilot study during 2023, candidates for Draf3 frontal sinusotomy with normal or mildly polypoid mucosa in nasal vault area, were assessed for landmarks to design and harvest the inferiorly based lateral nasal wall mucosal flap. The minimum flap diameters were measured. Preservation of the pedicle of the flap was checked in the end of the procedure. The condition of the flap was evaluated in the first and third month follow up visits.

Results: Thirty consecutive patients entered the study. Appropriate access was achieved to the frontal sinuses via outside in procedure. The flap insertion was easily performed in all patients and the width of the pedicles were favorable. In addition, taking flaps from both sides, give complete coverage of the whole bare area after drilling. Correction of septal deviation was needed in 83.3% of patients. The most challenging step was to secure the suction, so as to save the pedicle till the end the operation. The edema of the flap is resolved by the 3rd month.

Conclusion: The length of the inferiorly based lateral nasal wall mucosal flap is desirable to cover the drilled frontal beak periosteum. Designing of the flap is easily educable.



6654

RADIOLOGICAL CLASSIFICATION AND MANAGEMENT ALGORITHM OF PETROUS APEX CHOLESTEROL GRANULOMAS

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Introduction: Petrous apex cholesterol granulomas (PACGs) are benign inflammatory cystic lesions of the temporal bone which are usually asymptomatic but whose expansion may lead to the encroachment on neurovascular structures and thus the appearance of a wide variety of symptoms. Their management remains controversial, with treatment strategies ranging from observation to complex skull base procedures. This study aims at evaluating the surgical outcomes of PACGs and at proposing a CT-based radiological classification and a management algorithm useful for guiding endoscopic and microscopic approaches to the petrous apex.

Materials and Methods: A retrospective review was conducted on patients undergoing surgery for PACG between 2014 and 2024 at a tertiary skull base center. Demographic data, symptoms, radiological features, surgical approaches, and complications were analyzed. CT scans were reviewed to classify PACGs into three radiological types: Type A (preserved apex cellularity), Type B (cellularity erosion without involvement of bone boundaries to neurovascular structures), and Type C (erosion of the bony boundaries of critical structures). Each type was further subdivided according to anatomical continuity with infracochlear, perilabyrinthine, or sphenoidal cell tracts into Connected (C) or Disconnected (D) categories. Treatment selection was guided by this classification. **Results:** Nineteen surgically treated patients with symptoms like diplopia, headache and hearing loss were included (mean follow-up 22 months). CT classification identified 1 Type A, 4 Type B, and 14 Type C lesions. Nine lesions were anatomically connected to drainage pathways, while ten were disconnected. The surgical management included seven total resections, five subtotal/near-total resections, and seven surgical drainages. Symptom improvement and subsequent stability were observed in 17/19 patients, with only two postoperative complications (one ICA fissuration and one subdural hematoma), both resolved without sequelae.

Conclusion: The proposed CT-based classification provides a practical framework for guiding PACGs' management. Type A lesions are

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generally managed through observation; Type B lesions require surgery only when symptomatic; Type C lesions warrant surgery regardless of symptoms due to their invasive potential. The Connected/Disconnected subclassification predicts feasibility of endoscopic drainage, which should always be preferred when possible, otherwise, a surgical resection is chosen and its completeness depends on the patient's features and hearing status.



6660

LONG-TERM OUTCOME OF MANAGEMENT OF BILATERAL CONGENITAL CHOANAL ATRESIA AND ITS EFFECT ON MIDFACIAL GROWTH: A SYSTEMATIC REVIEW AND A RETROSPECTIVE REVIEW IN A TERTIARY INSTITUTION.

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Introduction The aim of the current study was to review the existing literature on long-term outcome of choanoplasty and its effect on midfacial growth and investigate our own experience on such topic.

Methods: a. Systematic review: The review yielded 31 papers meeting the inclusion criteria for having long-term follow up period (>6 months). b. Retrospective cohort Records of 164 patients of BCCA who underwent endonasal choanoplasty between 1998 and 2024 at Mansoura University Hospitals were included.

Results: The following complications were detected during the follow up period (average 12.7 years): severe restenosis (n=49), alar necrosis (n=3), columellar necrosis (n=2), mild epistaxis (n=7), palatal fistula (n=3), and one infant died of severe bleeding postoperatively due to neonatal coagulopathy. Patients aged 17 years and older (n=47) were recalled but only 36 patients could attend where CT showed a large posterior septal defect (> 2 cm) in 7 of them. Anthropometric measurements showed a variety of abnormalities: nasal tip protrusion (16.6%) was the most affected parameter, reduction of nasal height (13.8%), nasal dorsum length (11.1%), columella length (8.3%), and nasal width (2.7%). Likewise, angular measurements (including nasolabial angle (11.1%), nasofrontal angle (8.3%), and nasofacial angle (8.3%)) were minimally altered.

Conclusion: The current systematic review demonstrated a shortage in the literature investigating affection of midfacial growth as a result of this procedure. In our cohort, although choanoplasty proved to be a safe and reliable technique with acceptable long-term complication, it nonetheless exhibited an influence on facial and nasal growth in a small subset of patients.



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EVALUATION OF HYPERTONIC SEAWATER NASAL DROPS IN INFANTS WITH ENT DISORDERS: A REAL WORLD USER SURVEY STUDY

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Introduction Infants and young children frequently experience a range of common infectious illnesses, including the common cold, acute rhinosinusitis, and bronchiolitis, which can lead to symptoms such as nasal congestion, rhinorrhea, sneezing, cough, and general discomfort. These symptoms often interfere with feeding and sleep, contributing to significant distress for both children and caregivers. Saline nasal drops are widely used as supportive therapy to help alleviate nasal congestion and improve comfort; however, real-world evidence on the efficacy, safety, and usability of hypertonic seawater nasal drops (HSND) in this population remains limited. To address this gap, a user-survey study of HSND was conducted in 100 infants (1–24 months) recruited across hospital centers.

Methods The study assessed a series of quantitative and qualitative parameters, namely changes of several sinonasal and Quality-of-Life (QoL) symptom scores. Caregivers assessed nasal and QoL-related symptoms before and after HSND use. The use of prescribed medication, product usability and satisfaction, consumer use and recommendation intentions as well as product safety and performance, were also evaluated.

Results Product use was consistent, with caregivers typically administering the drops 2–3 times daily. The mean duration of use was 9.38 days (median: 10 days, SD: 1.50, range: 6–14 days). Nasal symptoms demonstrated a mean percentage improvement of 97.2% (average score change: 3.27 points, p value <0.001), while QoL-related symptoms improved by 92.6% (average score change: 4.12 points, p value <0.001), confirming a robust and clinically significant response across all assessed symptoms. Caregiver-reported satisfaction was consistently high, with over 95% rating both usability and overall efficacy of the HSND as very good or excellent. No adverse events or product-related safety concerns were identified during the observation period.

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Conclusion The hypertonic nasal drops solution demonstrated strong real-world efficacy and excellent tolerability, supporting its usefulness in managing sinonasal and QoL symptoms in infants with ENT infections.



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ENDOSCOPIC RESECTION OF GLOMUS TYMPANICUM TUMORS – A CASE SERIES

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Introduction: Endoscopic middle ear surgery is increasingly important for minimally invasive resection of glomus tympanicum tumors.

Methods: We present a case series of patients who underwent endoscopic resection of glomus tympanicum tumors at our clinic over the past 10 years.

Results: Between 2014 and 2023, we performed complete endoscopic resection of glomus tympanicum tumors (Glasscock-Jackson I) in 3 patients. After endoscopic elevation of a tympanomeatal flap, the tumor and its supplying vessel were visualized. Adrenaline-soaked sponges and electrocoagulation were used for the endoscopic resection of the tumors in toto. In one case, there was an intraoperative bleeding, which was successfully controlled using an absorbable hemostat. Postoperatively, a good hearing outcome and improvement of preoperative tinnitus were observed.

Discussion: The endoscopic approach is highly suitable for the resection of small glomus tympanicum tumors limited to the middle ear. This technique reduces intraoperative soft tissue trauma and shortens the postoperative healing duration.



6664

LATERALITY AS A PRIMARY MACHINE-LEARNING TASK IN CLINICAL NASAL ENDOSCOPY

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Introduction: Laterality is essential information for diagnosing side-specific nasal diseases such as unilateral polyps, focal septal deviation and side-dominant sinusitis. Correct side labeling also improves documentation, referral quality and longitudinal tracking of clinical outcomes. A robust laterality classification model can augment the precision of segmentation models for clinical applications of real-time AI-assisted nasal endoscopy. A highly precise laterality prediction capability minimizes error propagation through segmentation tasks. To our knowledge, existing AI studies on nasal endoscopy either ignore nostril laterality, treat it as one of several coarse anatomical labels, or use it only for subgroup analysis, rather than as a primary prediction target. In this paper, we sought to address the problem of nostril laterality visual classification by developing a pretrained deep learning model.

Material & Methods: A dataset of 3448 images from 978 patients was used to train the YOLO11n-cls classification model with a patient-level data split of 80% training, 10% validation and 10% prediction testing. Four individual physicians under the guidance of a fellowship-trained otolaryngologist annotated manually these clinically captured images into two classes: Right-Nostril and Left-Nostril. The complete dataset is composed of 1988 left nostril images and 1460 right nostril ones. We trained and fine-tuned the model with 5-fold cross validations to classify laterality of nostril images. Subsequent to the final model training with our best hyperparameters, the model was tested on its prediction capability using the remaining 358 images in the held-out test set.

Results: Our classification model achieved 94.1% F1 score on test for detecting laterality for the left nostril and 92.3% F1 score for the right. The model's precision also reached 94.5% for the left nostril and 91.7% for the right with an overall accuracy of 93.3%. Sensitivity was 93.6% for the left

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and 92.9% for the right while specificity was 92.9% for the left and 93.6% for the right nostril. The accompanied figure also depicts other metrics and graphs.

Conclusions: A ML model for nostril laterality classification showed favorable performance with minimal performance asymmetry between nasal cavity sides. This work demonstrates that laterality can be reliably inferred from routine clinical endoscopic images, establishing it as a learnable primary task rather than a secondary label. The model's high precision and balanced side-specific performance suggest strong potential for integration as an upstream module in real-time AI-assisted nasal endoscopy pipelines. Future work will evaluate generalizability across institutions and explore coupling laterality prediction with downstream anatomical segmentation and diagnostic models.



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FUNCTIONAL ROLE OF PAPP-A1 IN CHRONIC RHINOSINUSITIS WITH NASAL POLYP

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Introduction: Chronic rhinosinusitis with nasal polyp (CRSwNP) is characterized by nasal mucosa remodeling and polyp growth. We previously demonstrated that PAPP-A1/IGFBP-4/5/IGF-1 axis is upregulated in CRSwNP. Given the role of PAPP-A1 in regulating IGF-1-mediated cellular functions, it may contribute to tissue remodeling. Accordingly, the aim of this study was to investigate the functional role of PAPP-A1 in CRSwNP pathogenesis by evaluating the impact of its modulation on proliferation and migration of primary cells derived from CRSwNP.

Methods: Primary epithelial and fibroblast cells derived from CRSwNP (n=4) and from control (n=4) were used for: 1) downregulation of PAPP-A1 by siRNA-mediated knockdown; 2) exogenous addition of recombinant active human PAPP-A1 (rhPAPP-A) in order to mimic its extracellular activity; 3) Cell treatment with different active substances and biologics. The live/dead assay for cell proliferation measurement and the wound healing assay for fibroblast cell migration measurement were assessed at different time points. **Results:** PAPP-A1 knockdown led to a significant gradual decrease in cell proliferation of epithelial cells ($p < 0.0001$) and of fibroblast cells ($p < 0.05$). Whereas a significant decrease in fibroblast migration ($p < 0.001$) was observed. Similarly, cell treatment with Verapamil, Mometasone and Linsitinib showed a significant decrease of epithelial cell proliferation ($p < 0.001$) and of fibroblast cells ($p < 0.05$). Furthermore, inhibition of PAPP-A proteolytic activity by an inhibitory antibody reproduced the knockdown effect. Conversely, rhPAPPA cell treatment induced a significant increase in cell proliferation ($p < 0.05$).

Discussion: PAPP-A1 regulates cell proliferation and migration in CRSwNP, suggesting its involvement in polyp growth and potential as a therapeutic target.



6670

CORRELATION BETWEEN INTRAOPERATIVE FROZEN AND FINAL DURAL MARGINS IN SINONASAL AND ANTERIOR SKULL BASE MALIGNANCIES

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Introduction Sinonasal and anterior skull base malignancies can abut or invade adjacent dura. Dural involvement and positive dural margins portend negative oncologic outcomes. Even malignancies that encroach the skull base without radiographic involvement, occult dural invasion remains high. The extent of dural resection in gross or suspected dural involvement must be balanced against the increased risk to critical neurovascular structures, reconstructive complexity, and cerebrospinal fluid leaks. Intraoperative frozen margins are used to guide intraoperative decision making. Discordances between frozen and final pathology occur and have been demonstrated in other settings. To date, no data characterizes the diagnostic characteristics of intraoperative frozen assessment for dural margins in sinonasal and anterior skull base malignancies.

Material & Methods This was a single institution retrospective chart review. All sinonasal and anterior skull base malignancies treated surgically at a single center from 2010-2025 were reviewed. Eligibility criteria included adult patients (≥ 18 yo), pathologic diagnosis of sinonasal or anterior skull base malignancies, treated via endoscopic endonasal approach (EEA) or combined (open/endoscopic) approach involving dural resection, and complete frozen and final pathology data. Patient, tumor, treatment, and pathology data were extracted. Individual dural frozen and final specimens (per specimen analysis) as well as tumor dural frozen and final margin statuses (per tumor analysis) were compared to determine diagnostic test characteristics.

Results Out of 316 sinonasal and anterior skull base malignancies, 69 patients met the study eligibility criteria with a total of 404 frozen dural margins. Histopathologies included 32 olfactory neuroblastoma (ONB), 11 squamous cell carcinomas (SCC), 7 adenocarcinomas, 6 sinonasal

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undifferentiated carcinomas, 5 sinonasal neuroendocrine carcinomas (SNEC), and 8 other malignancies. 59 patients were treated via EEA and 10 patients via combined approach. There were 2 false positives, 10 false negatives, 34 indeterminate results, and 5 frozens without final pathology due to tissue exhaustion during processing. Per specimen analysis showed sensitivity, specificity, positive predictive value, and negative predictive value of 0.78, 0.99, 0.95, 0.97, respectively. Per tumor analysis showed a sensitivity, specificity, positive predictive value, and negative predictive value of 0.29, 0.93, 0.57, 0.81, respectively. Per specimen sensitivity analysis interpreting indeterminate results as positive, showed sensitivity, specificity, positive predictive value, and negative predictive value of 0.79, 0.93, 0.64, 0.96, respectively. Highest rates of frozen-final discordance and indeterminate specimens were observed in SCC and neuroectodermal tumors (ONB and SNEC). False positive frozens were only observed in ONB.

Conclusions Frozen dural margins have high specificity in the setting of individual specimens and overall tumor margins. Negative and indeterminate frozen margins are less accurate and should be interpreted as a supplement to other preoperative and intraoperative factors during surgical decision making. Surgeons and pathologists should be cognizant of the limitations of dural frozens due to inaccuracy, indeterminate results, and issues with tissue processing.



6671

ENDOSCOPIC ACCESS TO BRAIN ABSCESS DUE TO SINONASAL INFECTION

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Introduction: Brain abscesses caused by sinonasal infections have become more common during the coronavirus pandemic, particularly due to the increase in sinonasal mucormycosis. This study aimed to evaluate the efficacy and safety of endoscopic endonasal brain abscess drainage as a therapeutic technique for these cases.

Material & Methods: Clinical outcomes and retrospective evaluations were performed in patients who underwent endoscopic endonasal brain abscess drainage between May 2019 and August 2022. A total of 7 patients diagnosed with 9 brain abscesses caused by sinonasal infections were included in the study. The main outcome of this study was to evaluate the success and safety of this technique. **Results:** The average age of the patients was 40.71 ± 14.17 years. The most common symptom observed in these patients was nasal discharge, and the frontal lobe was the most common site of abscess. Notably, the majority of cases were associated with COVID-19.

Conclusions: Based on the results of this study, endoscopic endonasal brain abscess drainage is considered a viable treatment option for skull base brain abscesses caused by sinonasal infections. Further research in this field can help establish this technique as a mainstay approach for managing brain abscesses at the skull base.



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TRANSNASAL ADENOMECTOMY WITH MEDIAL CAVERNOUS SINUS WALL RESECTION FOR HORMONE-SECRETING PITUITARY ADENOMAS: SAFETY AND SHORT-TERM OUTCOME

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Background: Even experienced pituitary adenoma surgeons may prefer not to remove tumor tissue in the medial cavernous sinus wall (MCSW) or within the sinus itself, because of the risk of neurovascular injury and the unclear benefit in terms of the remission rate. There is increasing evidence that this conservative attitude may be unjustified. Hormone-secreting pituitary adenomas (HsPA) frequently involve the MCSW, even when this is not expected on the basis of the MR findings and/or intraoperative visual inspection. We analyzed the safety and short-term outcome of adenomectomy with systematic MCSW resection (MCSWR) in a consecutive cohort of patients with HsPA in contact with the MCSW (Knosp grades 0-3).

Methods: We changed our surgical standard in February 2024 and performed from then onward, in addition to the classic endoscopic adenomectomy, a systematic MCSWR in all patients harboring an HsPA in contact with the MCSW as seen on the preoperative MRI. We followed the surgical steps according to published standards. The preoperative data included the demographic information, clinical presentation, imaging, Knosp grade, and endocrine profile of each patient. Perioperative complications and short-term endocrinological outcomes were assessed prospectively.

Results: All 23 patients who underwent adenomectomy with MWCSR in the year from 1 February 2024 to 31 November 2025 were included in the analysis. Thirteen patients with acromegaly (57%), 7 prolactinoma (30%), 2 Cushing (7%), and 1 posthoc inactive adenoma (4%) were included in the analysis, 10 of which (46%) were microadenomas. Knosp grades 0 (Hardy Grade 1) was found in 7/23 patients (30%), I in 8/23 (35%), II in 6/23 (26%), and III in 2/23 (9%). Gross-total resection was achieved in all cases.

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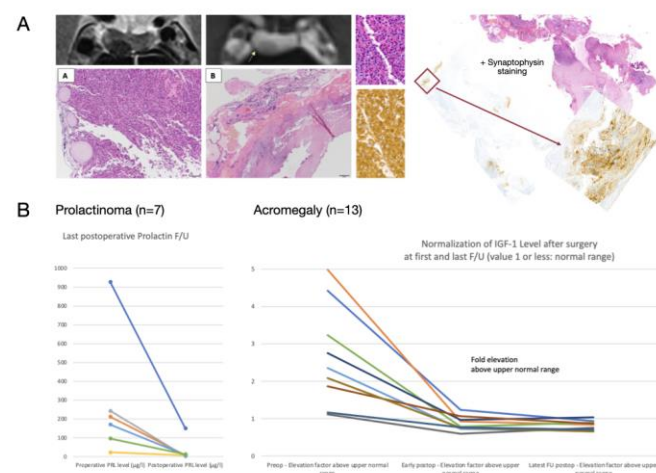
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There were no permanent or major surgical complications or new permanent postoperative pituitary insufficiencies recorded, with a mortality rate of 0/23 (0%). Transient minor events included unilateral abducens (VI) nerve palsy in 3/23 (13%), with spontaneous recovery within day in 2/23 (9%), and within 3 months in 1/23 (4%), and unilateral trigeminal (V) nerve symptoms in 1/23 (4%). Other minor events included syndrome of inappropriate antidiuresis (SIAD) in 2/23 (9%), temporary lumbar drainage due to post-surgical cerebrospinal fluid leakage in 2/23 (9%) and aspiration of nasal package without sequelae in 1/23 (4%) patients. Cavernous sinus involvement was identified by intraoperative visual inspection in 11/23 patients (48%). MCSW involvement was confirmed by histology (synaptophysin staining as marker for neuroendocrine tumors) in 15 out of 20 available cases (75%), 4 of which had a Knosp Grade 0 (Figure 1A). Short-term endocrinological follow-up was available for the 22/23 patients (acromegaly: mean of 10.6 months [range 2.5-18]; prolactinoma: mean of 6.4 months [range 0.5-12]). All 22 patients were in full remission (Figure 1B).

Conclusions: In our series, endoscopic adenomectomy with systematic MCSWR according to published standards² was safe. The histological confirmation of CS invasion, even in four tumors with Knosp grades 0, and the excellent short-term endocrinological outcomes that we observed suggest that MRI underestimates CS involvement and that overall long-term remission rates can be improved by systematic MCSWR.





6677

REAL-TIME ICP DYNAMICS AFTER PREOPERATIVE ETV: IDENTIFYING THE OPTIMAL TIMING FOR POSTERIOR FOSSA TUMOR RESECTION

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Introduction: Hydrocephalus is a frequent and clinically significant complication in patients with posterior fossa tumors (PFTs). Although endoscopic third ventriculostomy (ETV) is widely utilized as a CSF diversion technique, real-time intracranial pressure (ICP) behavior after ETV—and its implications for optimal tumor-resection timing—remain insufficiently characterized. Given this gap in knowledge, the primary objectives of the present study were twofold: (1) to quantitatively assess the changes in intracranial pressure (ICP) following preoperative endoscopic third ventriculostomy (ETV), and (2) to determine the optimal time window in which ICP stabilizes sufficiently to allow for safe posterior fossa tumor resection.

Materials and Methods: Eighteen fully conscious patients with obstructive hydrocephalus due to PFTs underwent preoperative ETV. An external ventricular catheter was placed solely for continuous ICP monitoring, without CSF drainage (video demonstrations of the surgical procedure will be available on presentation). ICP values were recorded at 4-hour intervals up to 200 hours post-ETV, and again after tumor resection. Tumor resection occurred within 1–7 days, based on clinical stability and ICP trends. **Results:** ETV produced a rapid ICP decline within the first 24–36 hours. Mean ICP decreased from 18.4 mmHg (4 hours post-ETV) to 14.1 mmHg at 36 hours. Beyond this point, ICP displayed mild fluctuations but no secondary elevation (Figure 1). After tumor resection, ICP stabilized between 10–12 mmHg after 36 to 48 hours, with only transient early increases (Figure 2). No patient required CSF diversion, re-intervention, or experienced ETV failure, upward herniation, or CSF leakage.

Conclusion: Preoperative ETV effectively reduces ICP in PFT-associated obstructive hydrocephalus, with the most consistent stabilization occurring within the first 36–48 hours. Continuous ICP monitoring supports this period as an optimal window for safe tumor resection. These findings

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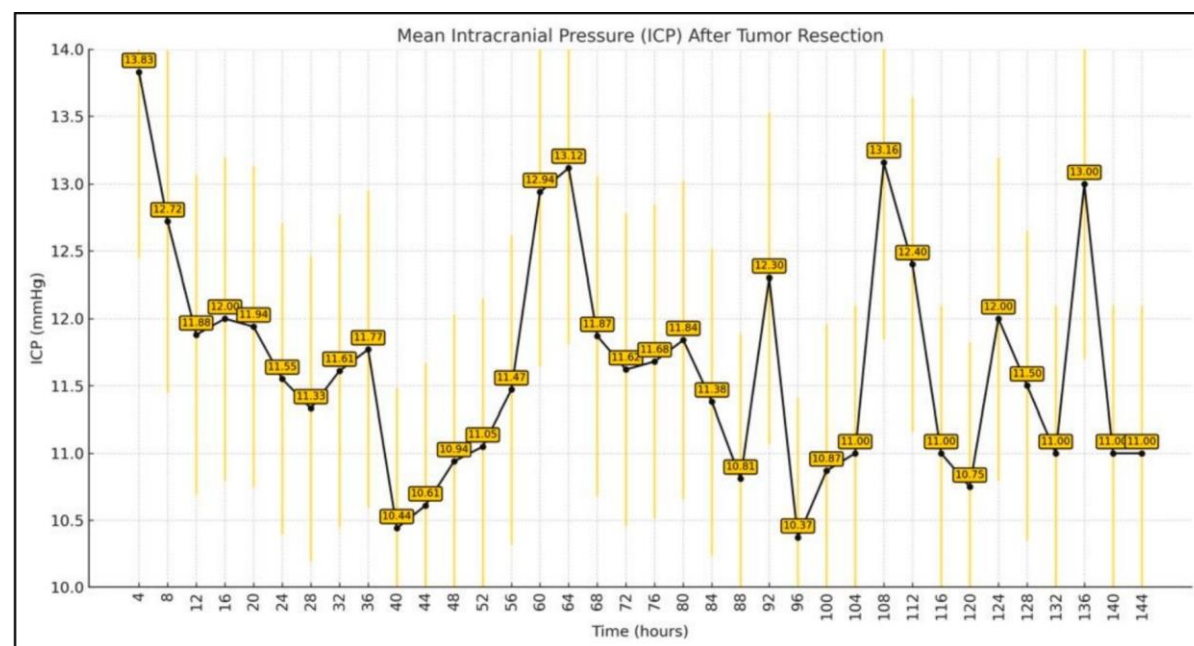
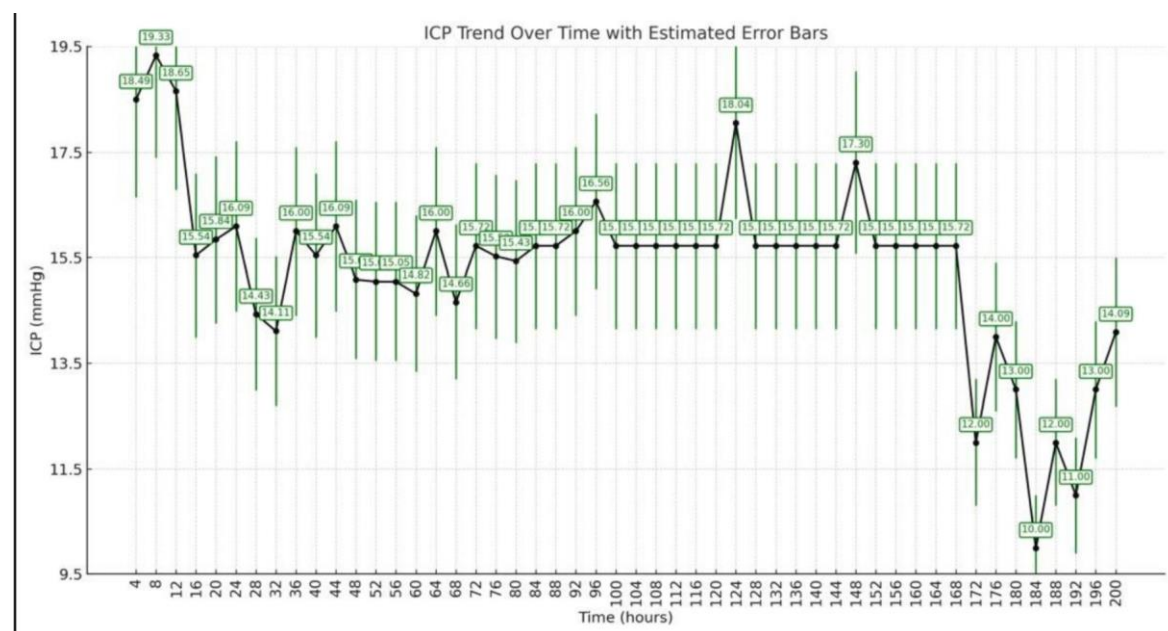


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reinforce the value of ETV as a physiologically guided strategy in PFT management.





6679

POSTOPERATIVE MANAGEMENT OF SPONTANEOUS SKULL BASE CSF LEAKS: AN ICP-GUIDED CLINICAL ALGORITHM IN LIGHT OF RECENT EVIDENCE

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Introduction: Spontaneous skull base cerebrospinal fluid (CSF) leaks are now firmly linked to chronically elevated intracranial pressure (ICP) and the spectrum of idiopathic intracranial hypertension (IIH). Recent series and reviews confirm that, although endoscopic repair achieves high initial closure rates, untreated or recurrent ICP elevation remains a major cause of leak recurrence and visual morbidity. However, and acceptable guideline for postoperative ICP assessment and stepwise management is still lacking. We aimed to synthesize contemporary evidence (2017–2025) and present an updated, ICP-guided postoperative management algorithm for patients undergoing endoscopic repair of spontaneous skull base CSF leaks.

Materials and Methods: A narrative review was performed focusing on: (1) the association between spontaneous CSF leaks and IIH; (2) postoperative ICP evaluation via lumbar drain or lumbar puncture; (3) the impact of non-surgical ICP-lowering therapy (e.g., acetazolamide, weight-loss strategies, and emerging agents); and (4) indications and timing for permanent CSF diversion. Recent outcome studies and proposed algorithms were integrated together. **Results:** Contemporary cohorts confirm high endoscopic repair success rates (>90%) when elevated ICP is considered and treated. Long-term series and multicenter data show that patients with unrecognized or undertreated ICP have significantly higher recurrence rates, whereas early postoperative ICP monitoring (within 48–72 hours), use of acetazolamide, scheduled delayed ICP reassessment at 2–6 months, and timely shunting improve durability of repair. Newer work has also highlighted venous sinus pathology and obesity-targeted therapies (including GLP-1 agonists) as potentially modifiable contributors within this algorithm.

Conclusion: Successful treatment of spontaneous skull base CSF leaks extends well beyond defect closure. An ICP-guided postoperative management (early and delayed pressure assessment, evidence-based

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medical therapy, and clearly defined thresholds for permanent CSF diversion) offers a reliable and reproducible plan that aligns with the most recent literature and can help standardize postoperative care and reduce recurrence rate.



6682

ENDOSCOPIC ENDONASAL APPROACH WITH PITUITARY TRANSPOSITION AND BILATERAL POSTERIOR CLINOIDECTOMY FOR RESECTION OF MIDBRAIN CAVERNOMAS IS A SAFE AND EFFECTIVE ALTERNATIVE TO OPEN APPROACHES: A CASE SERIES AND ANATOMICAL CONSIDERATIONS

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Introduction: Midbrain cavernous malformations are challenging to treat given their anatomical location within eloquent brainstem tissue surrounded by critical white matter tracts and perforating vessels. Traditional open approaches require significant brain retraction and indirect working angles. This study reports a case series of 3 midbrain cavernous malformations arising to the surface of the cerebral peduncles at the interpeduncular cistern undergoing an endoscopic endonasal approach for resection (EEA) as well as defines anatomical considerations with high-definition fiber tractography (HDFT) and anatomical cadaveric specimens.

Materials & Methods: 3 patients with midbrain cavernomas with lesions rising to the surface of the cerebral peduncles with (HDFT) revealing corticospinal tracts lateral to the lesion underwent EEA and pituitary transposition for resection of lesion. Midbrain exposure areas, upper clivus drilling percentages, and oculomotor nerve lengths were measured using stereotactic navigation. Ten silicone-injected cadaveric specimens underwent stepwise endoscopic endonasal dissection including transsphenoidal transcavernous approach, unilateral and bilateral posterior clinoidectomy, and division of the diaphragma sellae. Midbrain exposure areas, upper clivus drilling percentages, and oculomotor nerve lengths were measured using stereotactic navigation. Relevant vascular anatomy of the P1 segment posterior cerebral artery was characterized. HAAFT was performed on 32 normal subjects from the Human Connectome Project to analyze corticospinal tract and oculomotor nerve anatomy.

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Results: In the clinical series, 3 patients with mesencephalic cavernous malformations underwent endoscopic endonasal transcavernous resection with interdural pituitary transposition. Case 1: A 25-year-old woman with recurrent hemorrhage achieved gross total resection with transient worsening of pre-existing internuclear ophthalmoplegia and hemiparesis that returned to baseline at one month. Case 2: A 34-year-old man with complete oculomotor palsy underwent successful resection with slight improvement in third nerve function at two weeks and temporary diabetes insipidus requiring DDAVP. Case 3: A 52-year-old female with 2 years of progressive diplopia found to have a partial left third nerve palsy. Complete resection was achieved with some transient worsening of her third nerve palsy. No CSF leaks occurred in any patient, and all achieved gross total resection as confirmed on postoperative imaging. Anatomic study showed that each surgical step of bilateral posterior clinoidectomy, pituitary transposition, and diaphragma division improved exposure significantly.

Conclusions: The endoscopic endonasal transcavernous approach with bilateral posterior clinoidectomy provides excellent visualization of the ventral midbrain and interpeduncular cistern and is safe in providing gross total resection in a case series of 3 patients. This minimally invasive approach offers an alternative to traditional transcranial routes for carefully selected mesencephalic cavernous malformations, particularly those with midline or ventral locations, while minimizing brain retraction and optimizing working angles for safe resection.



6683

INSTITUTIONAL EXPERIENCE USING THE ENDOSCOPIC ENDONASAL APPROACH FOR THE TREATMENT OF 40 INTRACRANIAL ANEURYSMS: INDICATIONS, OUTCOMES, AND TECHNICAL CONSIDERATIONS

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Introduction: The endoscopic endonasal approach (EEA) provides a ventral surgical corridor, which can be advantageous in the management of carefully selected cerebral aneurysms. The literature lacks large series to better delineate the indications and limitations of this technique. The aim of this study was to elucidate the technique's safety, indications, advantages, and limitations, as well as its evolution over time.

Materials & Methods: The clinical records of all patients with intracranial aneurysms treated via EEA at the authors' institution, from the unveiling of the technique in March 2005 to February 2025, were retrospectively reviewed. Patient-specific treatment indications, surgical results, and technical parameters were examined.

Results: The study cohort consisted of 40 aneurysms in 34 patients. Six patients had 2 aneurysms clipped during the same endonasal procedure, while 3 others had a sellar tumor excised concurrently. Seven patients initially presented with subarachnoid hemorrhage, and 4 had pseudoaneurysms. Anatomically, 29 aneurysms were situated in the paraclinoid or cavernous sinus region, 10 were in the posterior circulation, and 1 giant aneurysm involved the petrous and cavernous internal carotid artery. Surgical treatment was only considered if endovascular therapy was not thought to be appropriate by experienced endovascular specialists. EEA was chosen if it was perceived to be safer than an open approach in terms of obtaining proximal and distal control, reducing manipulation of cranial nerves or the brain, or for the treatment of concomitant sellar pathology. Four patients underwent EEA for mass effect, 2 after postcoiling recanalization, and 3 because of antiplatelet contraindication/intolerance. Postoperative complications included 8

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patients experiencing CSF leaks, 3 meningitis, 2 clip exposure, 3 lacunar infarcts (2 causing mild disability), and 4 new cranial nerve palsies that either improved or resolved. There were no parenchymal contusions, venous infarcts, postoperative seizures, optic neuropathies, lower cranial nerve palsies, or procedure-related mortalities. In the latter series of 14 cases since 2019, complications were mainly CSF leaks, with no long-term effects. During an average follow-up of 62.6 months, 1 patient required retreatment with a flow diverter.

Conclusions: The ventral surgical corridor afforded by EEA is a valuable option for the surgical treatment of carefully selected paraclinoid internal carotid artery and posterior circulation aneurysms arising medial to the cranial nerves, particularly when endovascular options are restricted. EEA may result in decreased morbidity related to cranial nerve deficits and parenchymal injury compared with lateral approaches. However, CSF leaks remain the main limitation, especially after subarachnoid hemorrhage.



6684

THE MANDIBULAR STRUT AND INFERIOR PETROUS CAROTID TRIANGLE AS KEY LANDMARKS FOR ENDOSCOPIC ENDONASAL LOCALIZATION OF THE PARAPHARYNGEAL INTERNAL CAROTID ARTERY

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Introduction: We aimed to define anatomical landmarks for the parapharyngeal segment of the internal carotid artery (ICA) relevant to the endoscopic endonasal approach (EEA).

Methods: Four cadaveric heads (8 carotids) were dissected endonasally employing "the transpterygoid-transmandibular strut-transmedial jugular tubercle-inferior transpetrosal EEA". Extensive endoscopic laboratory investigation of the ICA course led to the development of a technique, which was subsequently demonstrated in a nasopharyngectomy and presented as a step-by-step guide (Figure 1). **Results:** Using a transpterygoid approach, the foramen lacerum was reached, the parasellar and paraclival ICA segments were exposed, and the lingual process was removed. Drilling proceeded through the mandibular strut and adjacent petrous base along the inferolateral surface of the horizontal petrous ICA (hplICA) up to the vertical petrous ICA (vpICA). The medial jugular tubercle was drilled, and the eustachian tube disconnected and excised. Dissection was performed from superior to inferior using the vpICA to locate the carotid foramen and parapharyngeal ICA (pplICA). The "inferior petrous carotid (IPC) triangle" was identified and delineated by the ventral hplICA, vpICA and the line connecting the carotid foramen to the lacerum cartilage. Its importance lies in providing access for an anteroinferior petrosectomy, which is obstructed by the hplICA in an open approach, while its inferior apex marks the depth of the pplICA, enabling safer parapharyngeal space dissection.

Conclusions: The mandibular strut and IPC triangle serve as valuable landmarks for tracing the petrous ICA, facilitating reliable craniocaudal localization of the pplICA during EEA.



6685

PILOT VALIDATION OF A 3-DIMENSIONAL PRINTED PITUITARY ADENOMA, VASCULAR INJURY, AND CEREBROSPINAL FLUID LEAK SURGICAL SIMULATOR

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Background Endoscopic pituitary surgery is a subspecialty field which benefits significantly from high fidelity surgical simulators. Giving trainees the opportunity to reduce their learning curve by practicing a variety of procedures and managing difficult complications such as large vessel injury on surgical simulators will inevitably improve patient outcomes.

Methods A pituitary surgery course in Australia will run for the second iteration at the end of 2024. During the first iteration neurosurgeons and ENT surgeons of varying experience agreed to participate in assessing the validity of a 3D printed pituitary surgery model, figure 1. This model allowed participants to perform a transsphenoidal exposure and resection of a pituitary adenoma, repair a CSF leak, control a carotid injury and repair a skull base defect, figure 2. The content, face and construct validity of the 3D printed model was examined.

Results During the first iteration of the course the heart rate of the participants significantly increased from baseline when starting the carotid injury simulation (mean 90vs121, $p=0.029$) and significantly decreased once the injury was controlled (mean 121vs110, $p=0.033$). The participants reported a significant improvement in anxiety in facing a major vascular injury, an increase in their confidence in management of major vascular injury, resecting a pituitary adenoma and repair of a CSF leak using a 5-point Likert scale (mean 4.42vs3.58 $p=0.05$, 2vs3.25 $p<0.001$, 2.36vs4.27 $p<0.001$ and 2.45vs4.0 $p=0.001$ respectively), figure 3. The data from the second iteration of the course in late 2024 will be used to update these results.

Conclusion Using the preliminary data from the first iteration of this course it has been demonstrated a 3D printed surgical simulator for endoscopic pituitary surgery that allows surgeons to practice all aspects of a transsphenoidal approach and resection of a pituitary adenoma. The additional data of the second iteration of the course is expected to reinforce these findings.



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IMPACT OF 3D PRINTED TECHNOLOGY ON ENDOSCOPIC TRANSORBITAL SURGERY. AN EARLY EXPERIENCE

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Introduction Endoscopic Transorbital access is a relatively new skull base approach to anterior skull base pathologies. The main concerns regarding potential complications are around orbital damage and post operative CSF leak. Custom 3D printed implants for skull defect reconstruction play a vital role in reducing post operative CSF leak. Similarly, use of a custom 3D printed orbital retractor helps minimize retraction injuries to the globe

Material and Methods Custom 3D printed titanium implants were manufactured for skull base reconstruction after transorbital surgery and used in 5 patients. Custom 3d printed titanium orbital retractors were manufactured and used in 2 patients for retraction of the globe. Post operative CSF leak data, intra operative pupil reaction and size, post operative visual assessments were analysed.

Results No post operative complications were seen with the use of custom 3D printed implants or retractors. No post operative CSF leak were seen in all patients where 3D printed implants were used for reconstruction. No pupillary dilatation or visual complications were seen in patients where custom retractors were used vs transient pupillary dilatation seen in 3 out of 6 patients where traditional retractors were used.

Conclusion Custom 3D printed implants help reconstruct skull base defects better after transorbital endoscopic surgery, minimizing post operative complications. Long term data with a larger patient series is required to understand the full impact of this new technology.



6688

ENDOSCOPIC TRANSORBITAL APPROACH FOR SKULL BASE LESIONS: A SYSTEMATIC REVIEW

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³Other

Introduction Endoscopic transorbital approaches (ETOA), also known as transorbital neuroendoscopic surgery (TONES), have gained traction as surgical corridors for managing certain orbital, sinus, and skull base (SB) pathologies. Given growing global adoption, this study systematically reviews the literature to evaluate number of publications/year, indications, outcomes, and trends in the clinical application of this approach.

Material and methods: A systematic review was performed in accordance with PRISMA guidelines. PubMed, Scopus, and grey literature were searched through May 2025. Inclusion criteria were English-language studies reporting transorbital endoscopic surgery with clinical outcomes. A total of 96 studies involving 837 patients were included. Data were extracted on surgical indications, approaches, and outcomes.

Results Meningiomas (n=314) and schwannomas (n=116) were the most common neoplastic indications, while trauma (n=105), CSF leaks (n=62), and inflammatory lesions (n=70) represented the main non-neoplastic indications. Intracranial involvement was noted in 81.2% of publications. A superior lid crease incision was most frequently used (76.8%). ETOA was used as a standalone approach in 38.4% of cases and as a combined approach in the remainder. Conversion to open craniotomy was rare (6.3%). Recently, the number of clinical publications has doubled approximately every 2–3 years, with over 40% published since 2024, reflecting a rise in global adoption.

Conclusions Transorbital endoscopic surgery is a safe, versatile technique in appropriately selected patients with broadening indications and growing global utilization. While early outcomes are favorable, additional series evaluating outcomes, nuances and new applications will help guide ideal surgical management strategies so

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that ETOA can take its appropriate place in the armamentarium of skull base approaches.



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ENDOSCOPE ASSISTED ANTERIOR SKULL BASE MENINGIOMA SURGERY. 7 YEAR EXPERIENCE USING QEVO

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Introduction Anterior skull base meningiomas at planum sphenoidale can grow along medial aspects of optic canal. This portion of tumours is usually not readily visible via traditional skull base approaches. Using an angled endoscope can help visualise any hidden tumours along medial optic canal, thus enabling complete excision and recurrence avoidance.

Material and Methods All 36 patients undergoing surgery for planum and tuberculum sphenoidale meningiomas via supraorbital craniotomy between August 2018 to January 2025 were included in the study. All patients had surgery with assistance of Zeiss QEVO inspection tool to assess any tumour at medial optic canal at end of resection. Any tumour found in optic canal was removed with endoscope assistance.

Results Medial optic canal invasion from meningioma was seen in 23 out of 36 patients. In all of 23 patients, tumour was removed from medial optic canal with QEVO guidance. None of these patients showed any residual or recurrent disease so far with followup period ranging from 1-7 years.

Conclusions Angled QEVO inspection tool enabled recognition and removal of medial optic canal invasion by meningioma in 23 out of 36 patients. These tumours would otherwise be hidden from standard craniotomy approaches and would have resulted in residual disease with potential optic nerve compression.



6690

THORACOSCOPIC RESECTION OF NEUROGENIC DUMBBELL TUMORS: A SINGLE-CENTRE EXPERIENCE

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Introduction Thoracic neurogenic tumors are rare lesions arising from neural elements and include nerve sheath tumors (schwannomas and neurofibromas), autonomic ganglion tumors (ganglioneuromas and neuroblastomas), and paraganglionic tumors (pheochromocytomas and paragangliomas). Their extension through the neuroforamen produces a characteristic dumbbell configuration. Traditionally, these tumors are managed through posterior or combined posterior–thoracic approaches involving laminectomy and facetectomy, often necessitating spinal stabilization. While effective, such strategies may compromise spinal stability. Thoracoscopic techniques offer direct visualization of the extraforaminal and foraminal components and may reduce the need for destabilizing posterior surgery. Many published series still routinely combine thoracoscopic and posterior approaches, often in staged procedures. In this study, we report our experience with a primarily thoracoscopic strategy, reserving a minimally invasive posterior decompression as a selective adjunct during the same procedure when the intracanalicular component cannot be safely addressed thoracoscopically.

Materials and Methods We performed a retrospective review of all thoracoscopic resections of medium-sized paraspinal tumors at our institution between 2003 and 2025. All procedures were performed jointly by a neurosurgeon and a thoracic surgeon. Tumor size and pathology, estimated blood loss, complications, length of stay, extent of resection, and recurrence were analyzed. Posterior decompression using a minimally invasive tubular system (MetrX®, Medtronic) was added only in cases with significant intracanalicular extension not safely resectable via a thoracoscopic approach alone. In these patients, thoracoscopy and posterior decompression were performed in a single operative session in prone position.

Results Twelve patients were included. An adjunctive minimally invasive posterior decompression was required in 3 cases (25%). Histopathology

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revealed schwannomas in 75% of patients. Mean tumor diameter was 51 mm (range 23–118 mm). Median estimated blood loss was 100 mL. Gross total resection, confirmed by postoperative imaging, was achieved in 8 of 12 patients, with an overall recurrence rate of 17%. For all thoracoscopic resections, all intercostal drains were removed on postoperative day one, resulting in a median length of stay of 2 days including the day of surgery. One case required conversion to thoracotomy with wedge lobectomy due to dense pleural adhesions, necessitating prolonged drainage. Postoperative sensory disturbance with allodynia occurred in 4 of 11 patients. One patient developed Horner syndrome and transient lower brachial plexus weakness. Mean follow-up was 6 years. No perioperative mortality occurred, and no cases of progressive spinal instability were observed during long-term follow-up.

Conclusions Our single-center experience demonstrates that a thoracic-dominant, primarily thoracoscopic approach is an effective and safe strategy for medium-sized thoracic paraspinal tumors. By reserving posterior decompression for selected cases and performing it in a minimally invasive manner, most patients avoided destabilizing spinal surgery altogether. This approach was associated with favorable oncological outcomes, early mobilization, short hospital stay, low complication rates, and no evidence of late spinal instability.



6691

THE "INSIDE-OUT" TECHNIQUE IN CRANIOPHARYNGIOMA SURGERY: INSTITUTIONAL OUTCOMES

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Introduction: Microvascular injury to the optic nerves and hypothalamus is a common source of morbidity during craniopharyngioma surgery. To mitigate this, we describe the "inside-out" concept in craniopharyngioma resection and evaluate the associated outcomes. **Methods:** The surgical technique involves accessing the tumor at a superficial point, and establishing a subpial, as opposed to a subarachnoid dissection plane with the surrounding tissues. The aim is to protect the microvasculature by preserving a thin tissue layer, centrifugally displaced by the tumor and interfacing with the subarachnoid space. An institutional review was conducted to validate the technique's applicability.

Results: From January 2019 to December 2024, 46 patients harboring craniopharyngiomas underwent endonasal surgery using the "inside-out" technique. Gross/ near total resection was accomplished in 83%, and subtotal in 17% of patients. Postoperatively, cerebrospinal fluid leak was the most frequent complication (15%). Complete preservation of pituitary function was achieved in 13% of cases, while 40% of those with partial dysfunction retained some degree of pituitary function postoperatively. No infarcts or hypothalamic injuries were noted. Within a mean 34.5-month follow-up, recurrence occurred in 8, and 7 received retreatment. Significant correlations were observed between tumor volume and subtotal resection, subtotal resection and retreatment, subtotal resection and shorter time to retreatment, pituitary function loss and intraventricular tumor extension, and pituitary function loss and greater stalk disruption.

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Conclusions: The "inside-out" dissection in craniopharyngioma surgery can reduce the rate of microvascular injury to the hypothalamus and optic apparatus, while potentially facilitating more complete resection.



6692

WHEN CANCER IS LEFT UNTREATED: NASAL MYIASIS IN CUTANEOUS SQUAMOUS CELL CARCINOMA

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Introduction Cutaneous squamous cell carcinoma (cSCC) of the nose is an uncommon but potentially curable malignancy when diagnosed and treated at an early stage. In the absence of treatment, tumour necrosis and secondary infections may develop. Myiasis, an infestation caused by dipteran larvae, is a rare complication that typically occurs in necrotic or ulcerated wounds. This report presents a rare case of nasal myiasis in a patient with untreated cSCC and provides a brief review of the relevant literature.

Material & Methods We report the case of a 96-year-old woman diagnosed with early-stage cSCC of the right nasal ala, who declined surgical treatment due to fear of disfigurement. The disease progressed, leading to extensive necrosis and subsequent nasal myiasis. A review of the clinical records and relevant literature was conducted to better understand this complication and to explore available therapeutic approaches.

Results The patient presented to the emergency department with recurrent epistaxis. Examination revealed an ulcerated necrotic lesion of the right nasal ala and adjacent nasal subunits, with cutaneous fistulisation extending to the lower dorsum and nasolabial fold. Numerous larvae were observed within the necrotic tissue. Stabilisation included mechanical removal of larvae, irrigation, systemic antibiotics, and occlusive dressing. A literature review identified only 12 comparable cases, mostly in socioeconomically disadvantaged male patients. Combined treatment with ivermectin has shown efficacy in selected reports. This case is remarkable given the patient's advanced age, preserved autonomy, and access to healthcare, underscoring the potential psychological factors contributing to treatment refusal.

Conclusions Management of craniofacial myiasis requires surgical debridement and systemic therapy, often including ivermectin. This case contributes to the understanding of rare oncological complications and highlights the importance of addressing patient fears and psychological barriers to improve treatment adherence.

6693

ORBITAL APEX SYNDROME AS INITIAL PRESENTATION OF RHINO-ORBITO-CEREBRAL MUCORMYCOSIS IN A DIABETIC PATIENT

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Introduction Rhino-orbito-cerebral mucormycosis (ROCM) is a rare, rapidly progressive, angioinvasive fungal infection caused by Mucorales species, predominantly affecting immunocompromised or poorly controlled diabetic individuals. Despite therapeutic advances, ROCM remains associated with high morbidity and mortality, particularly when orbital or cerebral structures are involved. We report a rare case of ROCM presenting as orbital apex syndrome (OAS) in an elderly diabetic patient, highlighting the diagnostic challenges and the importance of early multidisciplinary intervention.

Material & Methods A 71-year-old man with poorly controlled type 2 diabetes mellitus and prior treatment for right lower limb malignant peripheral nerve sheath tumour presented with acute left orbital pain, complete ophthalmoplegia, facial hypoesthesia, and vision loss. Initial computed tomography and magnetic resonance imaging revealed ethmoid and maxillary sinusitis with posterior orbital involvement, without abscess or intracranial extension. Nasal endoscopy showed necrotic tissue, and biopsies confirmed mucormycosis. Empirical high-dose liposomal amphotericin B and broad-spectrum antibiotics were initiated, followed by radical surgical debridement through a Weber–Ferguson approach and orbital exenteration.

Results Histopathology demonstrated broad, non-septate hyphae consistent with Mucorales. The patient achieved local disease control, with no evidence of intracranial spread on follow-up imaging. Although visual function could not be restored, systemic condition stabilised under antifungal therapy and metabolic optimisation.

Conclusions This case emphasises that ROCM with OAS, though rare in non-endemic regions, requires a high index of suspicion. Prompt antifungal treatment, aggressive surgical management, and correction of underlying risk factors are key to improving survival and limiting disease extension.

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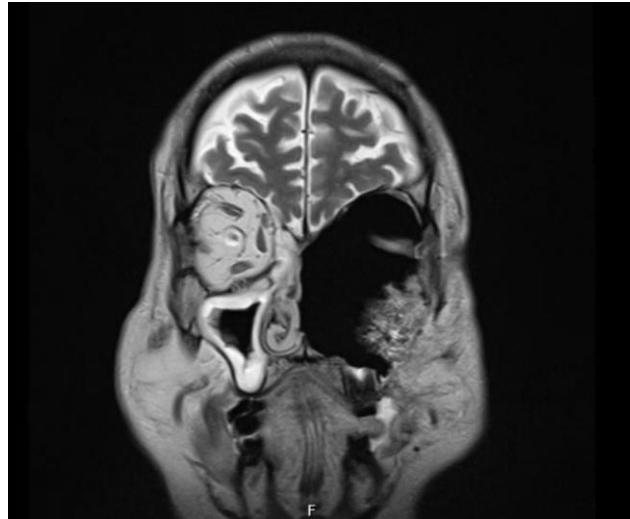
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STEPWISE TECHNIQUE FOR SAFE EXPOSURE OF THE PARACLINOID, PARASELLAR AND PARACLIVAL ICA FOR ENDOSCOPIC ENDONASAL APPROACH: TECHNICAL NUANCES

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Introduction: Over the past decade, endoscopic endonasal surgery (EES) has become a cornerstone in the treatment of skull base pathologies. Expanded lateral corridors in EES often require exposure of the internal carotid artery (ICA), increasing the risk of a rare but potentially devastating complication. We describe a stepwise strategy to optimize safe ICA exposure and review our institutional experience with injuries during bone removal.

Materials & Methods: Anatomical dissections were performed on silicone-injected cadaveric heads to define safe techniques for exposing the paraclinoid (PClin), parasellar (PS), and paraclival (PCLiv) ICA segments. In addition, a retrospective review of all patients who underwent EEA at our institution between June 1998 and January 2025 was conducted to identify cases of intraoperative ICA injury specifically occurring during the exposure phase. Surgical videos are included to illustrate the proposed stepwise technique. **Results:** Our approach emphasizes stepwise "eggshell" drilling, controlled fracture, and circumferential removal of bony protuberances to ensure safe ICA exposure. For the PClin /PS segments, key steps included: (1) opening the sella to the medial opticocarotid recess (MOCR), (2) sellar floor drilling, (3) unroofing the anterior cavernous sinus wall, (4) inferior-to-superior ICA skeletonization to the distal dural ring, (5) en bloc removal of the middle clinoid process, (6) tuberculum margin drilling, (7) optic canal unroofing, and (8) MOCR removal. For the PCLiv segment: (1) anterior ICA skeletonization, (2) drilling of the middle/lower clivus, and (3) en bloc resection of the medial wall and posterior bone behind the

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ICA. Among 4,924 EES procedures with ICA exposure, ICA injury during bone removal occurred in 5 cases (0.1%): 3 at the PS segment and 2 at the PCliv segment.

Conclusions: Safe ICA exposure during EES requires a combination of comprehensive anatomical knowledge, careful preoperative imaging assessment, and adherence to a stepwise, meticulous surgical technique. This structured approach is critical to minimize the risk of ICA injury during bone removal and to improve patient safety in complex skull base procedures.



6697

A SEVEN-YEAR EXPERIENCE WITH MULTILAYER SKULL BASE RECONSTRUCTION IN ENDOSCOPIC ENDONASAL SURGERY: INCORPORATING DIRECT ARACHNOID SUTURE

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Background: Postoperative cerebrospinal fluid (CSF) leakage remains a major concern in endoscopic endonasal surgery. Although multiple reconstruction techniques have been established, optimal management of intraoperative arachnoid defects is not standardized.

Aim: To evaluate outcomes of a stepwise institutional skull base reconstruction strategy applied to various sellar and parasellar lesions, and to highlight the feasibility of direct arachnoid suturing.

Methods: We retrospectively reviewed 44 consecutive patients who underwent endoscopic endonasal surgery for sellar and parasellar lesions between January 2018 and November 2025. The cohort included 38 pituitary adenomas (5 recurrent cases), 3 Rathke's cleft cysts, and 2 craniopharyngiomas. A standardized skull base reconstruction protocol was applied in all cases. This included dural suturing as needed, rigid reconstruction using sellar floor bone, nasal septal cartilage, or the perpendicular plate of the ethmoid bone, and mucosal coverage with sphenoid sinus mucosa or a nasoseptal flap. When intraoperative CSF leakage was observed, autologous fat packing was selectively added. DuraGen was used in recurrent tumors or when leakage persisted after dural closure. Two patients with arachnoid tearing underwent direct arachnoid suturing. Clinical outcomes including postoperative CSF leakage, reoperation, and meningitis were evaluated.

Results: None of the 44 patients developed postoperative CSF leakage (0%). In the two cases with arachnoid tearing, direct arachnoid suturing contributed to achieving watertight closure as part of the standard multilayer reconstruction protocol, without the need for any unplanned

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additional procedures. Although dural suturing techniques have been reported in the literature, reports specifically describing direct arachnoid suturing as part of a structured skull base reconstruction strategy are limited. No reoperation or postoperative meningitis occurred.

Conclusion: Our stepwise reconstruction protocol demonstrated excellent reliability across multiple sellar and parasellar pathologies, achieving zero postoperative CSF leakage over seven years. Direct arachnoid suture is a feasible and effective adjunct for managing intraoperative arachnoid defects and may strengthen the robustness of skull base reconstruction in endoscopic endonasal surgery.



6698

ONE BURR HOLE ENDOSCOPIC RESECTION OF GLIOBLASTOMA: A MINIMALLY INVASIVE SURGICAL OPTION

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Background: Glioblastoma is a highly malignant brain tumor, and standard treatment consists of maximal safe resection followed by chemoradiotherapy. Bevacizumab is also used as an additional therapeutic option; however, impaired wound healing is a known adverse effect, making less invasive surgical strategies desirable. Burr hole-based endoscopic surgery may offer a minimally invasive alternative, particularly for deep-seated lesions.

Methods: Between 2017 and 2025, six patients with glioblastoma underwent one burr hole endoscopic tumor resection. Using neuronavigation, a single burr hole was created and a 10-mm transparent sheath was advanced directly to the tumor. Tumor resection was performed endoscopically using suction and forceps. Surgical assistance included neuronavigation and photodynamic diagnosis (PDD). Preoperative planning focused on identifying limited anatomical landmarks to prevent disorientation in the narrow operative field. **Results:** Gross total resection of the targeted lesion was achieved in all six cases. One patient developed postoperative hematoma accumulation in the resection cavity; however, no reoperation was required. The approach allowed effective access to deep-seated tumors with minimal surgical exposure. Hemostasis was challenging due to the hypervascular nature of glioblastoma but was managed using monopolar suction coagulation in combination with hemostatic agents such as cellulose- and collagen-based materials.

Discussion: The primary advantages of this technique include minimal invasiveness and improved access to deep lesions through a single burr hole. Conversely, intraoperative disorientation and bleeding control represent major challenges. These issues can be mitigated through the combined use of neuronavigation, PDD, meticulous preoperative planning, and appropriate hemostatic strategies.

Conclusion: One burr hole endoscopic resection is a safe and minimally invasive surgical option for selected glioblastoma cases. Careful patient

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selection and thorough surgical planning are essential to maximize the benefits of this approach. @font-face {font-family:"Cambria Math"; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:roman; mso-font-pitch:variable; mso-font-signature:-536870145 1107305727 0 0 415 0;}@font-face {font-family:游明朝; panose-1:2 2 4 0 0 0 0 0 0 0; mso-font-charset:128; mso-generic-font-family:roman; mso-font-pitch:variable; mso-font-signature:-2147482905 717749503 18 0 131231 0;}@font-face {font-family:"\@游明朝"; mso-font-charset:128; mso-generic-font-family:roman; mso-font-pitch:variable; mso-font-signature:-2147482905 717749503 18 0 131231 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0mm; text-align:justify; text-justify:inter-ideograph; mso-pagination:none; font-size:10.5pt; mso-bidi-font-size:12.0pt; font-family:"游明朝",serif; mso-ascii-font-family:游明朝; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:游明朝; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:游明朝; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-font-kerning:1.0pt;}.MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-family:"游明朝",serif; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}div.WordSection1 {page:WordSection1;



6700

THREE-DIMENSIONAL ANATOMY OF THE JUNCTION BETWEEN THE POSTERIOR ETHMOIDAL REGION AND THE SPHENOID SINUS

Márton Eördögh, Robert Reisch, Henry W.S. Schroeder¹, Hans Rudolf Briner, Werner Hosemann

¹Other

Introduction: The anatomy of the sphenoethmoidal recess is clinically important; however, existing literature mainly focuses on the superior turbinate and the sphenoid ostium. We analyzed the entire junction between the posterior ethmoidal region and the sphenoid sinus (SEJ) to identify consistent patterns.

Material & Methods: The SEJ was evaluated on 100 paranasal sinus CTs using 3D Slicer software.

Results: The SEJ consisted of two components: medially, the sphenoethmoidal recess, and laterally, the wall separating these aerated regions. In 92.0%, this wall was formed by the basal lamella of the superior turbinate (4BL) which was present in all cases, with the most common phenotype being a frontally oriented pentagonal non-dehiscent wall (44.0%). A bony wall lacked between the third basal lamella (3BL) and the anterior wall of the sphenoid sinus in 49.0% of cases, while one bony wall was observed in 42.0%. Three factors complicated the anatomy of the 4BL. First, anterior displacement occurred when a supreme turbinate was present (43.0%). Second, pneumatization of the 4BL and superior turbinate (25.0%) was associated with an incomplete or dehiscent anterior 4BL wall. Third, the presence of sphenoethmoidal cells (36.0%) resulted in bony contact between the optic canal and the 4BL in 33.0%.

Conclusions: This study demonstrated that the 4BL is a key landmark for skull base surgery, with consistent morphology and a characteristic phenotype. Surgeons should be aware that after dissection of the 3BL, the next encountered wall is most often the 4BL, which typically merges with the anterior sphenoid wall.

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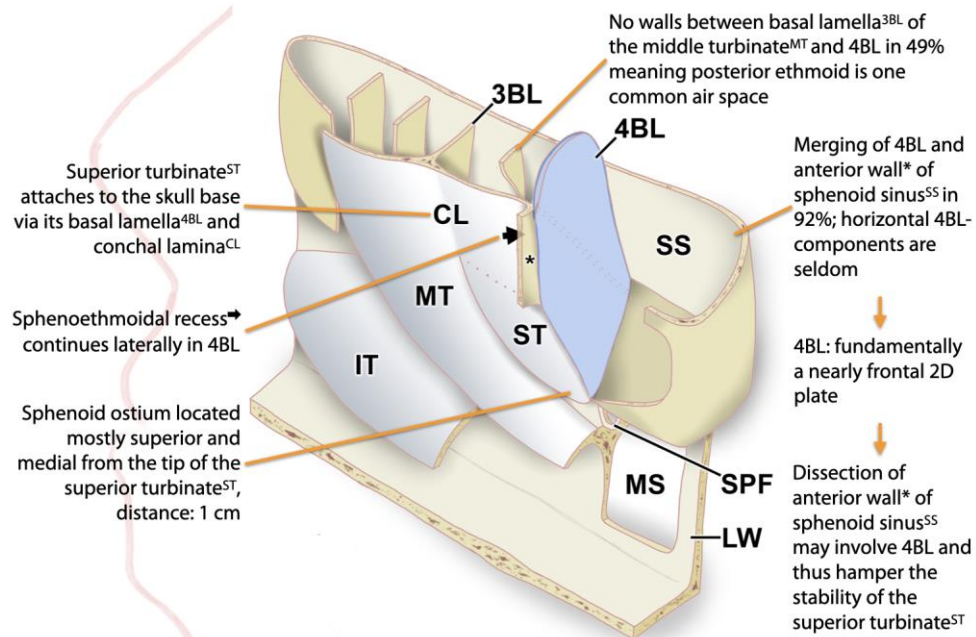
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Source: *Rhinology* 2025 Oct 13. doi: 10.4193/Rhin24.565. Online ahead of print. IT: inferior turbinate, LW: lateral wall of nasal cavity, MS: maxillary sinus, SPF: sphenopalatine foramen



6701

TEAMWORK IN NEUROSURGERY: GLOBAL GAPS, PREDICTIVE FACTORS, AND LATENT CLASSES IN A MULTINATIONAL COHORT

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Introduction Teamwork is essential for delivering safe and effective patient care, particularly in complex, high-stakes, and long-duration skull base surgical procedures. Effective collaboration enhances a surgical team's ability to perform intricate operations, reduces medical errors, and improves patient satisfaction. Despite its importance, the current landscape of teamwork in neurosurgery is not well understood. This study aims to identify existing gaps in neurosurgical teamwork and highlight opportunities for improvement.

Methods An international survey of 404 neurosurgeons.

Results A total of 305 respondents completed the teamwork-related questions. Only 64% agreed that their colleagues and they worked effectively as a team and that their colleagues supported them in building surgical skills. Fewer than half reported that their supervisors positively contributed to their work environment (47%) or that they had a skilled surgical assistant during complex operations (46.5%). There were no significant differences in teamwork quality or related factors between skull base and non-skull base neurosurgeons. Multivariate analysis identified several positive predictors of effective teamwork included: having a skilled surgical assistant during complex procedures (OR 4.28, $p = 0.002$), supervisors who contribute positively to the work environment (OR 4.19, $p = 0.001$), colleagues who support development of surgical skills (OR 3.94, $p = 0.002$), and practicing in non-European countries (OR 3.49, $p = 0.035$). Latent class analysis identified two groups: Class 1 had <0% probability of endorsing teamwork components, while Class 2 had >%. Factors associated with membership in Class 2 included: practicing in an academic center ($p = 0.002$), practicing in Asia ($p = 0.01$) or non-European countries ($p < 0.001$), having outstanding surgical skills ($p = 0.04$), strong reasoning ability ($p = 0.03$), confidence in surgical abilities ($p = 0.005$), strong interpersonal skills ($p = 0.02$) and a supportive or positive work environment ($p < 0.001$).

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Conclusion Our findings reveal that teamwork in neurosurgery is far from optimal, and many surgeons lack support from colleagues, supervisors, and surgical assistants during complex procedures. Strengthening institutional culture, investing in surgical staff training, and fostering supportive leadership are essential steps toward improving surgical teamwork. Enhancing these areas could significantly improve surgeon well-being, operative efficiency, and patient safety.



6702

ENDOSCOPIC THIRD VENTRICULOSTOMY VS. VENTRICULOPERITONEAL SHUNT FOR OBSTRUCTIVE HYDROCEPHALUS

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Introduction: Ventriculoperitoneal shunt (VPS) and endoscopic third ventriculostomy (ETV) are primary treatments for obstructive hydrocephalus.

Objectives: To synthesize findings from meta-analyses comparing the safety and efficacy of ETV versus VPS.

Methods: We searched PubMed (2019–2025) for 'Endoscopic Third Ventriculostomy', 'Ventriculoperitoneal Shunt', and 'Obstructive Hydrocephalus', including only studies comparing fully endoscopic versus traditional techniques. Primary outcomes included postoperative complications, mortality, and surgical success rates.

Results: The review encompassed data from RCTs involving up to 398 patients. ETV significantly minimized postoperative infection rates across studies: one analysis reported 0.8% (1/128) for ETV versus 21.3% (26/122) for VPS (RR: 0.09; 95% CI: 0.02–0.32), while another confirmed this trend with 5 versus 32 events (RR: 0.19). ETV also demonstrated superior outcomes regarding postoperative hematoma (1.6% vs. 8.2%; RR: 0.26) and blockage rates (6 vs. 22 events; RR: 0.28). Conversely, ETV was associated with a significantly higher risk of CSF leakage in one study (10 vs. 1 event; RR: 5.10), though another found no statistical difference (RR: 2.00). Mortality (RR 0.19–0.64) and surgical success rates (approx. 65%–73%) were statistically comparable between procedures.

Conclusion: While mortality and success rates are similar, ETV offers a distinct safety advantage by significantly reducing infections and mechanical failures, despite a potential increase in CSF leakage risk.



6703

HYPOTHALAMIC AND ENDOCRINOLOGICAL OUTCOMES AFTER CRANIOPHARYNGIOMA RESECTION: A COMPARISON BETWEEN TRANSCRANIAL AND ENDOSCOPIC ENDONASAL APPROACH

Antonio Delacy Martini Vial¹, Daniel Marchi Kieling², Bruno Zilli Peroni, Rudolfh Batista Arendt, Letícia Marchi Kieling, Guilherme Gago, Paulo Mesquita Filho, Bernard Soccol Beraldin

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Introduction: Craniopharyngioma surgical management remains debated. The choice between Transcranial (TCA) and Endoscopic Endonasal (EEA) approaches requires balancing resection with hypothalamic-pituitary function preservation.

Objectives: To synthesize systematic reviews on TCA vs. EEA outcomes in craniopharyngioma.

Methods: A PubMed search (2024–2025) used the terms 'Craniopharyngioma,' 'Endoscopic Endonasal Approach,' 'Transcranial Approach,' and 'Meta-analysis.' Inclusion was limited to meta-analyses comparing fully endoscopic versus transcranial techniques, excluding all other methods. Data extracted and synthesized for efficacy and safety included tumor resection, endocrine function, hypothalamic morbidity, and complications.

Results: Data from over 12,000 patients were analyzed. EEA demonstrated a superior Gross Total Resection (GTR) rate of 87.3% compared to 79.1% in TCA. Regarding endocrine outcomes, large-scale analysis indicated EEA was associated with significantly lower postoperative hypopituitarism rates (14.3% vs. 37.2% for TCA), although other reviews reported comparable incidences. Postoperative diabetes insipidus rates were statistically similar between groups, despite varying incidences (EEA 21.2–58.2% vs. TCA 20–60.3%). Hypothalamic morbidity occurred in 42.7% of EEA and 29.5% of TCA patients. Notably, EEA showed significantly lower visual deterioration (4.6% vs. 13.6%) but was associated with a higher rate of CSF leakage (3.0% vs. 1.1%).

Conclusion: EEA appears superior in resection and visual preservation and may minimize hypopituitarism. However, hypothalamic morbidity remains high in both approaches, requiring critical patient selection due to the higher CSF leak risk associated with EEA.



6704

VISUAL OUTCOMES IN SUPRASELLAR MENINGIOMAS: COMPARING TRANSCRANIAL AND ENDOSCOPIC APPROACHES

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⁴Hospital São Vicente - Passo Fundo

Introduction: The choice between Transcranial (TCA) and Endoscopic Endonasal Approaches (EEA) for suprasellar meningiomas remains controversial regarding efficacy and complications.

Objectives: To synthesize data comparing TCA and EEA regarding vision, GTR, and complications.

Methods: We searched PubMed (2022-2025) using terms like Meningioma OR Anterior Skull Base Meningioma AND Endoscopic Endonasal Approach AND Transcranial Approach AND Visual Outcome. We synthesized data to compare visual outcomes, gross total resection (GTR) rates, and perioperative complications.

Results: Synthesized data revealed that EEA is superior for visual recovery. Onemeta-analysis demonstrated significantly higher odds of visual improvement for EEA (OR = 3.24, $p = 0.0053$) compared to TCA. In absolute figures, visual improvement rates reached 88.5% in EEA cohorts versus 76.2% in TCA groups. However, safety profiles favored craniotomy. EEA was associated with a nearly 4-fold increase in CSF leaks (OR = 3.71, $p = 0.0098$), with incidence rates ranging from 16% to 21% for endoscopy versus only 2.3% to 4.8% for transcranial surgery. Regarding tumor control, GTR rates were statistically comparable ($p = 0.30$), averaging 83.2% for TCA and 80.4% for EEA, showing no significant superiority for either technique in removing the mass.

Conclusion: EEA provides superior visual outcomes but higher CSF leak rates, necessitating a careful risk-benefit analysis.



6705

A PROSPECTIVE RANDOMIZED LONG-TERM COMPARISON ANALYSIS OF TRANSSPHENOIDAL ENDOSCOPIC VERSUS ENDOSCOPE-ASSISTED MICROSCOPIC PITUITARY ADENOMA RESECTION

Márton Eördögh, Laszlo Barany, Christian Rosenstengel, Victoria Bogaczyk, Jörg Baldauf, Silke Vogelgesang, Michael Kirsch, Werner Hosemann, Antje Steveling, Henry W.S. Schroeder¹

¹University Medicine Greifswald

Introduction: The benefits of endoscopic and microscopic approaches in transsphenoidal pituitary adenoma surgery remain incompletely defined. We compared pure endoscopic and endoscope-assisted microscopic techniques, focusing on long-term surgical, radiological, endocrinological, ophthalmological, and rhinological outcomes, as well as quality of life.

Material & Methods: 33 individuals with elective transsphenoidal pituitary adenoma surgery were randomized (pure endoscopic approach versus endoscope-assisted microscopic approach) and prospectively underwent investigations, focusing on patient-related subjective outcome measurements.

Results: The mean follow-up period was 6.3 years (max. 14 years). In the microsurgical group, endoscopic inspection revealed residual tumor in 46.7% not seen by the microscope. Endoscopic resection provided long-term tumor-free state in all of them. Compared to pure microsurgical treatment, endoscopy was associated with a lower probability of tumor recurrence (OR = 0.24) and appeared advantageous in the long-term achievement of any surgical goal (OR = 3.80) as well as in anterior pituitary lobe function improvement (OR = 1.60). Where gross total tumor resection was the stated preoperative goal, there was no long-term tumor recurrence in 81.8% (endoscopy group) and 83.3% (endoscope-assisted microsurgical group). Most aspects showed no significant difference between the techniques, such as length of hospital stay, complication rate (endoscopy: 16.7%, endoscope-assisted microsurgery: 20.0%), long-term maintenance of any preoperatively stated extent of resection, pituitary and olfactory function, rates of DI and SIADH, ophthalmological improvement, and SNOT scores.

Conclusions: Both approaches yield favorable long-term outcomes across multiple clinical domains. The use of endoscope enhances long-

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term achievement of the initial surgical goal and improves anterior pituitary function.



6707

INVESTIGATING THE IMPACT OF VITAMIN D ON THE RECURRENCE OF CHRONIC NASAL SINUSITIS WITH POLYPOSIS FOLLOWING FUNCTIONAL ENDOSCOPIC SINUS SURGERY (FESS): A RANDOMIZED, TRIPLE-BLIND, PLACEBO-CONTROLLED CLINICAL STUDY

Shirin Irani¹, Nouri Leila¹, Salehinia Farahnaz², Mohammadreza Firouzifar¹, Heidari Kazem³

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Introduction Vitamin D3 possesses several anti-inflammatory properties similar to those of corticosteroids. The study aims to evaluate the effect of vitamin D supplementation on the recurrence of chronic nasal sinusitis with polyposis following endoscopic sinus surgery.

Methods & Materials: This is a randomized, triple-blind, placebo-controlled clinical trial conducted at Amir Alam Hospital. Participants were randomized and then stratification resulted in three subgroups according to baseline vitamin D levels, deficient (<20 ng/ml), insufficient (20-29 ng/ml) and sufficient (≥30 ng/ml). Patients in group 1 and 2 were administered vitamin D pearl 50,000 IU weekly for 8 weeks, then monthly and patients in group 3 were administered 50,000 IU monthly. Patients in Control group received placebo pearl identical in appearance and schedule. Baseline laboratory tests were calcium, phosphorus, vitamin D3, intact parathyroid hormone (iPTH), albumin. Follow-up serum vitamin D and calcium levels at 1, 3, and 6 months were checked. Endoscopic evaluations at 1, 3, and 6 months, measuring disease recurrence via endoscopic scoring. Subjective assessment using the SNOT-22 questionnaire at similar intervals.

Results: These differences between the SNOT-22 of two groups are not statistically significant. The examination of the patients' endoscopy scores shows that at the one-month, three-month, and six-month follow-ups, the scores are very close to each other and are not statistically significant.

Conclusions: Given the data obtained, no significant correlation has been observed between Vitamin D consumption and the endoscopy

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scores or symptoms of patients with chronic rhinosinusitis with polyposis, but for sure it needs more precise and rigorous follow-up.



6710

EVALUATION OF AN INSTITUTIONAL POLICY OF DAY 1 POST-OPERATIVE DISCHARGE FOLLOWING ELECTIVE PITUITARY ADENOMA RESECTION – A 6 YEAR EXPERIENCE AND COMPARISON TO UK NATIONAL DATA OF 3,607 CASES.

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Introduction The length of stay (LOS) and 30 day re-admission rates are important surgical metrics following endonasal transsphenoidal surgery (ETS) for pituitary adenoma. In November 2017 we introduced a post-operative day 1 (POD1) discharge policy for elective pituitary adenoma patients undergoing ETS. We reviewed our institutional experience of the new policy over a 6 year period and compared local results to the UK national data.

Materials and Methods Data on all endoscopic procedures at our institution is stored on a prospectively maintained database. All elective pituitary adenomas undergoing ETS were reviewed for the time period from January 2018 to June 2024. Retrospective case note analysis was undertaken for additional information for any LOS greater than 1 day. National data was obtained from the National Consultant information Portal (NCIP) from NHS England. **Results** A total of 215 elective pituitary ETS cases were performed in our institution over the study period. The POD1 discharge rate was 49.8% (n=107). Stratifying by LOS, the mean age of patients discharged on POD1 was 54.8, with 43.9% (n=47) being female. The intra-operative CSF leak rate was 20.6% (n=22) with a 30 day re-admission rate of 10.3% (n=11). The post-operative CSF leak rate needing readmission and return to theatre (RTT) was 0.93% (n=1). For patients discharged on POD>1, the mean age was 56.7, with 54.6% (n=59) being female. The intra-operative CSF leak rate was 34.9% (n=38) with a 30 day re-admission rate of 13% (n=14). The post-operative CSF leak rate needing RTT was 2.78% (n=3). The commonest reason for re-admission across both groups was sodium abnormalities (n=9). The commonest reasons for increased LOS were sodium abnormalities and/or post-operative polyuria at 38% (n=41). Multiple logistic regression analysis showed a significant association between increased LOS and

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intra-operative CSF leak (Odds ratio 2.3, $p < 0.05$). There was no significant association with age, gender or histology (i.e. functioning vs non-functioning adenoma). Over the same time period, 3607 pituitary procedures were performed nationally. In the national data only LOS > 3 data is collected and this is 56.81% ($n = 2049$) of admissions compared to 14.88% ($n = 32$) in our data. The overall reported national CSF leak rate was 14.03% and the 30 day readmission rate was 11.26%. Of the total national procedures, 91.35% were elective procedures and 93.48% were endoscopic. Assuming a daily hospital bed cost of approximately £400, we estimate a minimum cost saving of £42,800 with a conservative estimate of 1 day in hospital saved for the 107 patients discharged on POD1 at our hospital.

Conclusions Our single institution experience of discharging patients on POD1 appears to be safe, feasible and cost-effective. The 30 day re-admission rate is comparable to the national data and we have experienced no morbidity or mortality to date, suggesting no significant detrimental effect since initiation of the policy. This system is dependent on a safety network including patient/carer education and streamlined ward access if there are any concerns. We advocate consideration of adopting a similar early discharge strategy internationally to streamline patient experiences and improve cost saving measures.



6711

A NOVEL COMPREHENSIVE, GENERALIZABLE AND MULTI-MODAL PROTOCOL TO REDUCE OPIOID UTILIZATION FOLLOWING ENDOSCOPIC ENDONASAL INTRACRANIAL SURGERY – A SINGLE INSTITUTION PILOT STUDY

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Introduction: Pain control after surgery remains challenging for skull base surgeons. Despite its untoward effects, opioid analgesia is a mainstay of post-operative treatment. Additionally, no single intervention has resulted in a significant decrease in post-endonasal intracranial surgery narcotic requirement. While enhanced recovery after surgery (ERAS) and multimodal pain protocols have been studied in other neurosurgical populations, no comprehensive ERAS-style protocol has been evaluated specifically in patients undergoing endoscopic endonasal surgery. We present the results of the first study, to the author's knowledge, utilizing a comprehensive, generalizable and multi-modal protocol focused on non-narcotic analgesia to reduce opioid utilization following endoscopic endonasal surgery.

Methods: We conducted a prospective multi-cohort pilot study evaluating post-operative opioid utilization throughout hospitalization in patients undergoing endoscopic endonasal surgery in both urgent and elective cases. Patients in the historic cohort (January 2019 - December 2021) received the traditional pain control algorithm. A comprehensive, multi-modal protocol spanning the patient's surgical continuum (including pre-operative counseling, total-Intravenous-anesthesia (TIVA), multimodal opioid-sparing analgesia, early mobilization and closely monitored post-operative convalescence) was implemented in January 2022 and administered to all patients undergoing endoscopic endonasal surgery through December 2024. **Results:** There were 112 patients included for review. Average morphine milligram equivalents (MME) administered to patients in the historic cohort was 33.93 versus 2.62 for patients in the implementation cohort ($p=0.023$). Total MME administered for patients in the historic cohort was 712.6 versus 238.6 in the implementation cohort. 91% of patients in the implementation cohort did not require a single opioid following craniotomy, versus 52%

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in the historic cohort. No post-surgical intracranial hemorrhage related to peri-operative NSAIDs was noted. No patients returned to the emergency department within 30 days of surgery for pain crisis in the historic or implementation cohort. Average length of stay for patients in the historic cohort was 3.62 days versus 2.88 days in the implementation cohort ($p=0.167$).

Conclusions: Utilization of a comprehensive, generalizable and multi-modal pain protocol was feasible and resulted in significant reductions in postoperative opioid consumption amongst patients undergoing endoscopic endonasal surgery. There was no increase in NSAID-related intracranial hemorrhage. Additionally, there was a trend towards improvement in length of stay in these patient cohorts. These findings support the efficacy of ERAS protocols in this population and warrant further investigation in larger studies.





6712

THE DIRECT FRONTAL APPROACH: A CONCEPT-DRIVEN TECHNIQUE FOR ADVANCED FRONTAL SINUSOTOMY

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Introduction (Background & Aim) Limited access to the frontal outflow tract remains a major challenge in advanced and revision frontal sinus surgery. The Direct Frontal Approach (DFA) is a technical modification designed to overcome anatomical constraints in Draf IIb, extended Draf III, and complex revision cases. This abstract highlights the core components and surgical rationale of DFA.

Materials & Methods The DFA is based on three key surgical components: (1) Direct frontal bone removal from periorbital to periorbital to expose the frontal outflow tract, (2) Frontal aperture reconstruction by removing obstructing bony partitions from frontal maxillary process down to ascending process of maxilla till reach to smooth periosteum, and (3) Orbital transposition achieved through medial orbital decompression to widen the surgical corridor. Targeted resection includes the nasal side of the lacrimal bone, ascending process of the maxilla, maxillary process of the frontal bone, parts of the superior orbital rim, and, when required, the lateral nasal bone.

Results DFA creates a wide frontal aperture with direct access to the frontal sinus floor and lateral recesses. Smooth periosteal exposure promotes predictable secondary mucosalization without mucosal flaps or grafts. Removal of irregular bony edges reduces granulation tissue formation and lowers the risk of postoperative restenosis. Orbital transposition improves visualization and access to laterally placed frontal recesses.

Conclusions The Direct Frontal Approach is an effective and concept-driven technique for advanced frontal sinus surgery. By integrating direct bone removal, periosteal-based aperture reconstruction, and orbital transposition, DFA provides a wide, stable, and durable frontal sinus drainage pathway and represents a valuable strategy for Draf IIb, extended Draf III, and complex revision cases.



6713

FEASIBILITY OF ROBOT-ASSISTED TRANSORAL SKULL BASE SURGERY AND MICROVASCULAR ANASTOMOSIS USING THE DA VINCI XI SYSTEM: CHALLENGES AND ADVANTAGES

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Introduction Endoscopic surgery via both the nasal and oral approaches for lesions in the nasopharynx and posterior cranial fossa has been expanding in its indications, but it remains a highly challenging procedure. In this study, we used the Da Vinci Xi system to perform transoral approach for skull base lesions and microvascular anastomosis. We examined both the advantages and challenges of robot-assisted surgery in suturing.

Methods Using twenty cadavers, we performed robot-assisted transoral skull base surgery and open vascular anastomosis using the Da Vinci Xi system. Observation was also conducted through nasal endoscopy, too. The surgical arms used included the Black Diamond, and Potts scissors were employed for dissection.

Results A retractor was used to incise the soft palate and create a corridor. A 1 cm square dural defect was created in both the anterior cranial fossa and the clivus. The defect was closed using the fascia lata and deep suturing with 7-0 Prolene. A circumferential suturing of 8-10 stitches was performed to close the dural defect. Suturing in the restricted space required specific techniques for each direction, but suturing was successfully achieved. The disadvantage of lacking tactile sensation was partially overcome with experience. Additionally, after opening the skull and separating the Sylvian fissure, we performed anastomosis of the radial artery with the internal carotid artery and the radial artery with the middle cerebral artery using 7-0 Prolene. End-to-side anastomosis was performed with four to five stitches per side.

Conclusion Using existing tools and the Da Vinci Xi system, we confirmed the feasibility of performing deep dural suturing and superficial vascular anastomosis. The disadvantage of lacking tactile sensation can be mitigated with practice.



6715

INTRAOPERATIVE REAL-TIME NEAR-INFRARED IMAGE-GUIDED ENDOSCOPIC ENDONASAL SURGERY FOR BRAIN TUMORS BY DELAYED WINDOW INDOCYANINE GREEN TECHNIQUE

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Background: We developed the Delayed window ICG technique, which uses ICG to fluoresce brain tumors during surgery, enabling real-time localization and removal. We applied this technique to endoscopic surgeries such as pituitary tumors.

Objective: To assess whether the delayed-window indocyanine green (ICG) (DWIG) technique can visualize and distinguish normal pituitary gland from tumors under the endoscope in real-time during surgery.

Methods: 67 patients with pituitary adenoma received 12.5 mg intravenous ICG during surgery. Near-infrared (NIR) visualization was performed from 0 to 180 minutes following ICG administration. The patients underwent dynamic contrast-enhanced (DCE) perfusion magnetic resonance imaging (MRI) due to insurance system limitations. Therefore we analyzed Gd dynamics of these patients in detail.

Results: The normal pituitary gland and pituitary adenoma were visualized by NIR fluorescence in all 67 patients. The relative ratio of the fluorescence emission of the normal gland to that of the tumor (signal-to-background ratio [SBR] normal gland/tumor) increased after 15 minutes, peaking at 5.8 at 90 minutes. It suggested the pituitary gland was more clearly visualized during that period. The tumor/blood (SBR tumor) and normal gland/ blood (SBR gland) NIR fluorescence was significantly positively correlated with each Ktrans on dynamic contrast-enhanced MRI, indicating vascular permeability.

Conclusions: This study showed the utility of DWIG for identifying a normal pituitary gland from a tumor in endoscopic endonasal surgery 15 mins after ICG administration. Permeability can contribute to gadolinium enhancement on MRI and to ICG retention and NIR fluorescence in a normal pituitary gland and tumor.



6716

RHINO-ORBITO-CEREBRAL MUCORMYCOSIS OUTCOME DURING COVID-19 PANDEMY: A SINGLE-CENTER STUDY

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Introduction (Background & Aim): Rhino-Orbito-Cerebral Mucormycosis (ROCM) cases increased dramatically during COVID-19 pandemic, particularly Delta variant surge in Iran. In this study, we describe the demographic and clinical features of COVID-19 associated ROCM patients, stage of ROCM, sites of involvement and the outcome of patients.

Materials & Methods: We included ROCM patients, with previous or concurrent COVID-19 infection, who were admitted in Amir-Alam hospital, in Tehran, Iran between July 2021 and March 2022. The patients were monthly visited after discharge for at least 6 months. Serial MRI and nasal endoscopy were done when needed during follow-ups.

Results: Of 72 patients of pathology proven ROCM, mean age of 53.74, 40 patients were men. All patients had a history of concurrent or previous COVID-19, 75% of them had got severe COVID-19 and hospitalized and 77.6% of patients received corticosteroid. Fifty patients were diabetic and 15 patients had post-COVID related hyperglycemia. Of 24 patients with Orbital involvement, orbital exenteration were performed for only 2

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patients. Both of them survived of ROCM. For all 72 patients 1-7 endoscopic debridement surgery with a mean of 2.31 were done. 8 patients (11.1%) had Internal Carotid Artery thrombosis in MRI, 17 patients (23.5%) had Cavernous Sinus thrombosis. 18 patients (25%) had intracranial involvement, in 7 patients brain abscess were seen and had been drained endoscopically in 6 and with craniotomy in one patient by neurosurgeon colleagues. Mortality rate of patients was 11% and all deceased cases had got high stage ROCM. Outcome of patients was correlated with stage of ROCM (p -value=0.011).

Conclusions: Early diagnosis, prompt start of Amphotericin B, and serial surgical debridement reduced the mortality rate of COVID associated ROCM in our center.



6717

CLINICAL SIGNIFICANCE OF OPTIC CANAL SUPERIOR WALL DECOMPRESSION IN ENDOSCOPIC ENDONASAL APPROACH FOR TUBERCULUM SELLAE MENINGIOMAS

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Objective: To describe technical nuances of optic canal superior wall (OCSW) decompression during the endoscopic endonasal approach (EEA) for tuberculum sellae meningiomas (TSMs), quantify decompression, and evaluate associations with tumor features and outcomes.

Methods: Data of 17 patients who underwent EEA for TSMs were retrospectively reviewed. Postoperative computed tomography (CT) was performed to measure the width and anteroposterior length of the OCSW decompression, and an OCSW decompression rate was calculated relative to the inter-anterior clinoid process distance. Tumor characteristics were scored using the University of California–San Francisco (UCSF) system, and surgical outcomes were assessed based on the extent of resection, postoperative complications, cerebrospinal fluid (CSF) leakage, Visual Impairment Score (VIS)–based visual change, and intraoperative blood loss. Correlations and a two-predictor logistic regression (tumor size, OCSW decompression) modeled visual improvement.

Results: The cohort comprised 11 females and 6 males (mean age, 64.6 years). The mean UCSF total score was 4.65 (median, 5; range, 1–6), with mean subscores of 1.71 (size), 1.35 (canal), and 1.59 (arterial encasement). Gross total resection was achieved in 12/17 (70.6%), and VIS improved in 13/17 (76.5%); no visual deterioration occurred. The mean OCSW opening ratio was 93.3% (range, 71.4–107.8%). OCSW decompression correlated with tumor size score (Spearman $\rho=0.55$, $p=.022$) and total UCSF score ($\rho=0.56$, $p=.019$), but not with extent of resection, CSF leakage, VIS improvement on univariate testing, or blood loss. In the logistic model, tumor size (OR 2.42, $p=.0038$) and OCSW

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decompression (OR 2.04, $p=.0092$) independently predicted visual improvement (pseudo- $R^2=0.49$; goodness-of-fit $p=.798$).

Conclusions: Wider OCSW decompression scaled with tumor complexity and, after adjustment for tumor size, independently increased the odds of visual improvement. These data support planned, adequately wide OCSW decompression to secure lateral working space and facilitate safe dissection in EEA for TSMs.



6719

OLFACTORY PRESERVATION IN ENDOSCOPIC ENDONASAL TRANSPHENOIDAL SURGERY WITH PARTIAL RESECTION OF THE SUPERIOR TURBinate FOR PITUITARY NEUROENDOCRINE TUMORS

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Introduction In endoscopic endonasal surgery (EES) for pituitary adenomas (PitNETs), opening of the sphenoid sinus alone may provide insufficient working space for tumor resection, particularly in cases with an Onodi cell or marked lateral tumor extension. Although posterior ethmoidectomy can expand the surgical corridor, it raises concerns regarding postoperative olfactory dysfunction due to disruption of nasal structures. This study retrospectively evaluated the impact on olfactory function of a transsphenoidal approach combined with posterior ethmoid sinus opening via partial resection of the superior turbinate (PRST).

Methods Among 102 patients with PitNET who underwent EES between August 2021 and February 2025, 44 patients who underwent pre- and postoperative olfactory assessment using T&T olfactometry and had documented PRST in the operative records were included. Olfactory dysfunction was classified as mild (threshold 1.1–2.5), moderate (2.6–4.0), severe (4.1–5.5), or anosmia (≥ 5.6). Olfactory deterioration was defined as an increase in olfactory threshold of ≥ 1.0 accompanied by moderate or greater dysfunction. PRST was performed by an otorhinolaryngologist, involving resection of the inferior one-third of the superior turbinate. **Results** The study cohort consisted of 44 patients (15 males and 29 females) with a mean age of 59.0 years. Knosp grades were as follows: grade 0 in 3 patients, grade 1 in 3, grade 2 in 1, grade 3a in 22, grade 3b in 2, and grade 4 in 13, indicating a high proportion of laterally extended tumors. Consequently, additional middle meatal ethmoidectomy was performed in 14 patients. Onodi cells were identified in 22 patients (50%) and were opened in all cases. Postoperative olfactory evaluation was

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conducted at a mean of 4.2 months (range, 2.3–13.0 months). Olfactory deterioration occurred in 4 patients (9%), including 1 case of moderate impairment, 1 case of severe impairment, and 2 cases of anosmia. In patients with anosmia, intraoperative cribriform plate injury, use of an extended sphenoid sinus approach, or repeat surgery was observed.

Conclusion The transsphenoidal approach combined with posterior ethmoid sinus opening using PRST provides an adequate surgical corridor for EES in PitNETs while preserving olfactory function in most patients. This technique appears to be a safe and effective option, and preservation of the olfactory cleft mucosa is considered crucial for maintaining postoperative olfactory function.



6721

ENDOSCOPIC TRANSFORAMINAL TREATMENT OF SCIATIC SCOLIOSIS — A FIVE-CASE CLINICAL EXPERIENCE

Faramarz Roohollahi, Abolfazl Paeenmahali, Sanaz Adeli

Introduction: Functional scoliosis secondary to radicular pain, commonly known as sciatica scoliosis, is an under-recognized condition in which spinal misalignment results from antalgic muscle contraction rather than structural deformity. Traditional decompression techniques may alleviate pain but rarely demonstrate measurable postural correction. To evaluate pain improvement and scoliotic alignment correction following transforaminal endoscopic discectomy in patients presenting with sciatica scoliosis.

Material and Methods: Five consecutive patients (ages 22–32) with single-level L4–L5 lumbar disc herniation underwent transforaminal endoscopic discectomy. Herniation type was central in one case and paracentral in four. All interventions were performed under local anesthesia with an average operative time of 65 minutes and a 24-hour hospital stay. No complications occurred. Pain intensity (VAS) and Cobb angle were recorded preoperatively and at 6-month follow-up.

Results: Mean VAS scores improved from 8.0 ± 0.8 to 2.2 ± 0.7 , reflecting rapid and sustained relief of radicular pain. Average Cobb angle decreased from 17° to 4° , indicating correction of functional postural deviation once the root compression was resolved. All patients returned to normal gait and upright posture within two weeks post-procedure.

Conclusion: Endoscopic transforaminal discectomy proved effective not only in relieving radicular pain but also in restoring spinal alignment in cases of sciatica-induced functional scoliosis. The results highlight how targeted root decompression can reestablish both comfort and symmetry through a minimally disruptive approach.



6723

ENDOSCOPIC TRANSSPHENOIDAL REMOVAL OF GROWTH-HORMONE SECRETING PITUITARY ADENOMAS: OUR SINGLE-CENTER EXPERIENCE

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Introduction: Acromegaly is a rare endocrine disorder most commonly caused by growth hormone-secreting pituitary adenomas. Surgical resection remains the primary treatment, with long-term disease control depending on tumor characteristics and multidisciplinary management. This study presents the long-term outcomes of acromegaly treatment at a single tertiary referral center.

Materials and Methods: We retrospectively analyzed 31 consecutive patients with acromegaly who underwent treatment at our institution. Clinical presentation, radiological findings, histopathology, surgical details, endocrinological, ophthalmological, and radiological outcomes, as well as complications, were assessed. Mean follow-up was 3 years (range: 1–12 years).

Results: The cohort comprised 21 women (67%) and 10 men (33%), with a mean age of 52 years (range: 15–87) and a mean body mass index of 28 kg/m². All patients underwent transsphenoidal pituitary surgery as first-line therapy. The majority were macroadenomas (61%). Long-term endocrinological evaluation was available in 30 cases and demonstrated sustained disease control in the majority of patients (cured acromegaly in 80%, improvement in 13%, persistence in 7%). Postoperative radiological assessment showed no tumor recurrence in 86%. Residual disease was managed by revision surgery (14%), adjuvant medical therapy (7%) and/or radiotherapy (3%). Visual function remained stable or improved in all patients. The overall complication rate was low with minor and temporary sequelae (23%), consistent with reported series.

Conclusions: Our single-center experience demonstrates that transsphenoidal surgery provides effective long-term disease control in patients with acromegaly, with acceptable morbidity. Close interdisciplinary collaboration enables favorable endocrinological, radiological, and ophthalmological outcomes and supports individualized postoperative management.



6725

PEDIATRIC TEENAGE RHINOSEPTOPLASTY

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Aim: to recognise and create a mature decision for eventual nose changes which will be made with the operative intervention or they are not mature enough and the decisions were made by their parents.

Material and Methods: Our retrospective study was made at University Clinic for Ear, Nose and Throat, Faculty of Medicine, Ss Cyril and Methodius University of Skopje in the period of 10 years (2015-2025). Seventy-three patients were admitted with recent or previous nasal trauma or nasal deformity. The first group of 32 were children and adolescents from 6-14 years old who were admitted to our hospital because of recent nasal trauma. The second group of 41 children and adolescents from 6-14 years old were admitted to our hospital because of previous nasal trauma, which was not treated on time, or it was not treated properly. The second group of patients fills the brief psychological questioner prepared by Clinical psychiatrist from University Clinic of Psychiatry

Results: Sixteen of children and adolescents who had a nasal fracture with subluxation of nasal septum were operated with closed reduction. The second group of 41 children and adolescents from 6-14 years old consisted with the previous nasal trauma which was not treated on time or it was improperly treated. In 24 (58.54%) of these patients septoplasty was performed and in 17 (41.46%) was performed rhino septoplasty.

Conclusion: Clinical reports have not produced solid evidence for the statement that septal surgery has no negative effect on nasal growth or can serve for correcting abnormal growth. The functional and esthetic problems of the patient, however, mean a continuous stimulus for further clinical and experimental investigations.



6727

OLFACTORY OUTCOMES FOLLOWING ENDOSCOPIC WIDENING OF THE OLFACTORY CLEFT IN PATIENTS WITH OLFACTORY CLEFT STENOSIS

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Introduction: Anatomical narrowing of the olfactory cleft (OC) can impair airflow to the olfactory epithelium and contribute to olfactory dysfunction. Endoscopic widening of the OC may increase airflow and improve olfactory performance, although clinical outcomes remain uncertain.

Methods: Patients with OC stenosis who underwent OC widening between November 2013 and February 2025 were included. Olfactory function was assessed using Threshold-Discrimination-Identification (TDI) scores. Clinically meaningful improvement was defined as a ≥ 6 -point post-operative increase. Secondary analyses explored patient-reported outcomes and potential predictors of response, including baseline severity, duration of dysfunction, and gender.

Results: Twenty-seven patients (mean age 45.7 ± 16.3 years) underwent endoscopic OC widening. Mean change in TDI was $+2.93 \pm 8.09$, which was not statistically significant (Wilcoxon $p = 0.10$). Eight patients (30%) achieved a clinically meaningful improvement ($\Delta\text{TDI} \geq 6$). Thirteen patients (48%) reported subjective symptomatic improvement, but of these, only six met the ≥ 6 -point TDI threshold. Shorter symptom duration correlated with greater post-operative improvement. Response rate was higher in hyposmic patients compared to anosmic patients (44% vs 22%, $p = 0.38$) and males compared to females ($+5.26$ vs -0.55 , $p = 0.21$), though neither was statistically significant.

Conclusion :Endoscopic OC dilatation can improve olfaction in a subset of patients, particularly those with hyposmia and shorter symptom duration. Earlier surgical intervention may yield greater benefit. Patients perceive meaningful improvement at TDI changes below the ≥ 6 -point threshold. These preliminary findings, limited by small sample size, highlight the need for larger, multi-centre studies to clarify efficacy and predictors of response.



6728

ENDOSCOPIC AND EXOSCOPIC MINIMALLY INVASIVE SURGERY FOR MENINGIOMAS IN ELDERLY PATIENTS

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Introduction In our hospital, all craniotomies for tumor resection are performed with Eco and Endoscopic Surgeries. By utilizing exoscopes with a free visual axis and endoscopes suited for deep tissue visualization, we strive to perform minimally invasive surgery with smaller craniotomies and smaller skin incisions. In this presentation, we present for techniques of skin incision and craniotomy in meningioma cases treated in our hospital, focusing particularly on approaches that reduce the burden on elderly patients.

Cases From March 2022 to December 2025, we performed surgery on 116 meningioma cases. Among these, patients aged 75 years or older were classified as elderly. The breakdown by location was as follows: 7 elderly patients among 21 convexity meningiomas, 5 among 18 parasagittal/falx meningiomas, 4 among 26 frontal base meningiomas, 6 among 16 middle cranial fossa meningiomas, and 3 among 35 posterior fossa meningiomas. Approximately 20% of all surgeries involved elderly patients. **Surgical Technique** For convexity meningiomas, the conventional approach involves a craniotomy extending to the dural tail for resection. In our hospital, however, the craniotomy size is tailored to the tumor itself, and the dural tail is removed using a 30-45 degrees endoscope for curettage. This enables minimal craniotomy and skin incision. For falx meningiomas, we position the patient with the tumor side down, using gravity to create a gap between the falx and the brain. An endoscope is inserted through this gap, allowing resection along the falx through an extremely small 2.5×1.5 cm craniotomy. Recent approaches include performing craniotomies using the mini-pterion technique and endoscopic resection for olfactory groove meningiomas. The benefits include not only being minimally invasive but also enabling management of the attachment region. For sphenoid ridge meningiomas, an transorbital approach is used, with surgery performed endoscopically through an eyelid incision.

Conclusion In all cases, large skin incisions and extensive craniotomies were no longer necessary, yet resection outcomes remained as

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favorable as with conventional methods. The smaller, simpler incision resulted in shorter craniotomy times. Tumor resection, aided by both endoscopic and exoscopic view, was performed safely and reliably, further reducing operative time. Minimal postoperative pain and swelling at the incision site allowed for earlier ambulation, contributing to the prevention of disuse syndrome in elderly patients.

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6731

ENDOSCOPIC REPAIR OF CSF LEAKS FROM ANTERIOR SKULL BASE DEFECTS

Narayan Jayashankar

This lecture gives an insight into endoscopic management of spontaneous CSF leaks as also cerebrospinal fluid leaks following anterior skull base defects and long term results of the same.



6732

ENDOSCOPIC ENDONASAL MANAGEMENT OF PITUITARY APOPLEXY: EXPERIENCE FROM A TERTIARY CENTER

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Introduction: Pituitary apoplexy is a rare but potentially life-threatening emergency caused by acute hemorrhage/infarction of the pituitary gland, usually within a macroadenoma. It typically presents with sudden-onset headache, visual impairment, ophthalmoplegia or hypopituitarism. Optimal management remains debated, particularly regarding surgical-timing and indications. Endoscopic endonasal transsphenoidal surgery (EETS) has become the preferred approach in reference-centers, providing direct sellar access with lower morbidity. We present a case series of patients with pituitary apoplexy treated at a tertiary hospital.

Material & Methods: A retrospective review of patients admitted for pituitary apoplexy who underwent EETS between 2019-2025. Diagnosis was established through clinical and MRI findings.

Results: Ten patients (4 male; mean age 61,1 years) were included. The most common symptom was vision loss (100%), followed by headache (90%) and hypopituitarism (70%). Half presented with nausea or altered mental status; ophthalmoplegia occurred in two cases. MRI confirmed macroadenomas in all cases (mean size 3,3cm), with apoplexy being its first manifestation in 7. Mean time from symptom-onset to EETS was 5,9 days and from patient-admission to surgery was 3,4 days. Postoperative MRI demonstrated complete optic nerve decompression in all cases and gross total resection in 50%. Headache and vision improved in 100% and 80% of patients, respectively. Ophthalmoplegia resolved in both cases. Endocrine function did not recover postoperatively. One patient required reoperation for a surgical hematoma and one died from ischemic-stroke, two months post-op. No recurrences were observed (mean follow-up 33 months).

Conclusions: EETS was a safe and effective approach for pituitary apoplexy, achieving rapid decompression and improving headache and visual symptoms.



6733

EVALUATION OF HEADACHE/FACIAL PAIN BEFORE AND AFTER ENDOSCOPIC SINUS SURGERY IN PATIENTS WITH SINONASAL POLYPOSIS

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¹Tehran University of Medical Sciences

Introduction: The aim of this study was to show the effect of endoscopic sinus surgery on headache/facial pain in patients with sinonasal polyposis.

Materials and methods: Patients with sinonasal polyposis who had not responded to medical therapy and were planned for endoscopic sinus surgery entered this study. Their symptoms, endoscopic examination and CT-scan characteristics were documented by sinonasal outcome test (SNOT-22), Lund-Kennedy and Lund-Mackay scoring systems, respectively. If they suffered from headache/facial pain, the HIT-6 questionnaire was filled, too and they were referred for neurological consult. The same data were gathered 6 and 12 months postoperatively except for the CT-scan.

Results: Fifty-six patients with sinonasal polyposis underwent endoscopic sinus surgery. Forty-three were men and 13 women with a mean age of 38.29(range: 18-67 years). 21.4% had headache (58.3% sinus headache, 25% migraine and 16.7% other types). The score of SNOT-22 preoperatively was significantly different between headache-positive and headache-negative patients. In addition, the headache-positive patients' symptoms changed over 6 and 12 months postoperatively much more significantly than those without headache (p-value<0.046).

Conclusion: Headache was present in 21.4% of our patients undergoing endoscopic sinus surgery of whom 58% had sinus headache. They benefited from surgery much more than the ones without headache.



6734

OSTEOPLASTIC LATERAL WALL ORBITOTOMY IN TRANSORBITAL SURGERY: A SINGLE-CENTRE CLINICAL CASE SERIES

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Introduction Transorbital neuro-endoscopic surgery (TONES) has gained increasing acceptance in recent years, with growing reports describing novel techniques and early clinical outcomes. A major limitation of the superior eyelid transorbital approach (SETOA) is the narrow operative corridor, which restricts instrument maneuverability and angulation and may increase need for periorbital/globe retraction with resultant associated risks. As a solution, lateral orbital wall osteotomy has been used to expand the working corridor. Early cadaveric studies support evidence of reduction in intraorbital pressure after orbitotomy. However, complete removal of the lateral orbital wall disrupts its vascularization and may result in structural disruption and resorption. As an alternative, we have been using an osteoplastic orbitotomy which has been also been described and studied in cadaveric models, allowing controlled lateral wall mobilization while preserving periosteal integrity and temporalis muscle attachment to the bony fragment. This technique aims to enhance exposure and angles of attack while maintaining vascular supply and minimizing cosmetic sequelae.

Materials and Methods We report preliminary results from our first consecutive case series (2024–2025) using a SETOA with osteoplastic lateral wall orbitotomy for middle cranial fossa lesions. In all cases, lateral orbital wall mobilization was considered necessary to allow safe instrument manipulation and achieve gross total resection. Patient demographics, indication, perioperative complications, clinical outcomes and follow-up were analyzed.

Results Seven patients were included. All underwent SETOA for middle cranial fossa pathology, including sphenoid meningioma (n = 4), trigeminal schwannoma (n = 2), and metastatic melanoma involving Meckel's cave (n = 1). Titanium mini-plates were used for osteotomy closure in all patients. No new postoperative visual deficits were observed. All patients with Meckel's cave involvement had

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preoperative trigeminal nerve symptoms and experienced transient or persistent postoperative V1–V2 hypesthesia. One patient demonstrated worsening of a pre-existing abducens nerve palsy. Gross total resection, as intended, was achieved in all cases. At 3 and 6 months follow-up no cosmetic complications including enophthalmos, temporal muscle atrophy or lateral orbital wall asymmetry, were identified

Conclusions Osteoplastic orbitotomy represents a safe and effective alternative to lateral orbital wall removal in transorbital neuro-endoscopic surgery. By increasing the operative working space while preserving vascularized soft-tissue attachments, this technique facilitates safe tumor resection and reduces the risk of cosmetic and functional complications.



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NEUROENDOSCOPE-ASSISTED MINIMALLY INVASIVE SUPRAORBITAL APPROACH FOR ANTERIOR CRANIAL FOSSA DURAL ARTERIOVENOUS FISTULAS: RETHINKING THE CONCEPT OF MINIMALLY INVASIVE SURGERY

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Background Anterior cranial fossa dural arteriovenous fistulas (ACF dAVFs) account for approximately 4–5% of all dAVFs and are associated with a high annual hemorrhage risk of 7–20% due to their anatomical characteristics. With the widespread use of advanced imaging modalities, asymptomatic and incidentally detected ACF dAVFs have been increasingly identified, leading to a growing demand for prophylactic treatments that combine minimal invasiveness with high curability. Treatment options include open surgical disconnection and endovascular therapy. Although recent advances in endovascular devices have increased reports of endovascular treatment, open surgery remains the first-line treatment in terms of curability and safety. However, its major drawback is invasiveness. To address this limitation, we developed a neuroendoscope-assisted minimally invasive supraorbital approach. In this study, we present two representative cases to evaluate the advantages and limitations of this approach, as well as the key technical points required for its safe application.

Cases Both cases involved asymptomatic ACF dAVFs that were incidentally detected. Case 1 demonstrated venous ectasia, a large draining varix, and cortical venous reflux, whereas Case 2 exhibited venous ectasia alone. Both lesions were classified as Cognard type IV and Borden type III, for which surgical intervention was indicated. Surgical disconnection was performed using the present approach. The draining vein was interrupted as close as possible to the shunt point near the cribriform plate, and complete obliteration of the abnormal vasculature was confirmed by intraoperative angiography. No postoperative complications were observed in either case. Compared with conventional craniotomy, postoperative recovery was favorable, and patient satisfaction was high.

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Conclusion This approach may represent a truly minimally invasive surgical option in terms of reducing postoperative patient burden. However, its safe and effective application requires a thorough understanding of vascular anatomy in addition to procedure-specific technical considerations.



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ENDOSCOPIC SEPTAL PERFORATION REPAIR BY INFERIOR NASAL FLAPS

Mohsen Naraghi¹

¹Chairman, Rhinology Research Society

Nasal septal perforation is a frequent problem which may be caused may by primary or secondary etiologies. However, in both etiologies, bilateral disruptions of septal mucoperichondrium and destruction or resection of quadrangular cartilage have been occurred. While patients with posterior perforations are usually asymptomatic, most patients may have different symptoms which depend on the location and size the perforation. With large perforations, laminar airflow will be displaced by turbulence with resultant sensation of nasal obstruction, decreased nasal temperature and humidity and finally dryness and mucosal injury. Secondary rhinorrhea, crusting, epistaxis and infection are consequences of septal perforations. In extensive perforations, loss of dorsal support may cause saddle nose deformity. Septoplasty with or without rhinoplasty is the most common cause of septal perforation. Repairing the large septal perforations has been a challenge for most ENT surgeons. Various methods have been explained for repair of a septal perforation. The author's preferred method includes an incision in the lateral nasal wall mucosa, just below the inferior turbinate. Then the incision was extended to posterior direction, where it was turned up to get more mobility before transposition. A high-quality video will be shown to demonstrate pearls of the technique. The most important key for success is to provide very large, vascularized floor of nose flaps to make a relaxed closure without any tension.

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EFFICIENT ENDOSCOPIC DCR: BALANCING SIMPLICITY, SAFETY, AND SUPERIOR RESULTS

Mohsen Naraghi¹

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Improvements in endonasal endoscopic dacryocystorhinostomy techniques have led to better results, fewer complications, and higher success rates. This lecture presents a safe and simple technique that ensures a non-traumatic procedure, avoiding mucosal damage and bone exposure at the end of the surgery, and ensuring long-term patency. This technique also reduces instrumentation expenses and surgical time. Preserving normal tissues and creating a wide, patent rhinostomy with minimal surgical trauma and less subsequent scarring play crucial roles in achieving successful outcomes.



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ENDOSCOPIC ENDONASAL VERSUS TRANSCRANIAL APPROACHES FOR TREATMENT OF TUBERCULUM SELLAE MENINGIOMAS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF COMPARISON STUDIES

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Background: Tuberculum sellae meningiomas (TSMs) account for 5–10% of intracranial meningiomas and frequently cause visual deficits due to optic apparatus compression. Surgical management is primarily achieved through transcranial approaches (TCA) or endoscopic endonasal approaches (EEA). The relative safety and efficacy of these techniques remain debated.

Methods: PubMed, Web of Science, Cochrane, and Embase were searched from inception to October 2024 for comparative studies reporting outcomes of TCA and EEA for TSMs. Primary endpoints were gross total resection (GTR), visual improvement, and visual worsening. Secondary endpoints included complications, recurrence, and reoperation. Risk ratios (RR) with 95% confidence intervals (CI) were calculated using random-effects models, and heterogeneity was assessed with I^2 statistics.

Results: Nineteen studies encompassing 1,857 patients were included. GTR rates were comparable between approaches (RR = 1.03, 95% CI: 0.97–1.09). EEA was associated with higher visual improvement (RR = 1.37, 95% CI: 1.19–1.59) and lower visual worsening (RR = 0.50, 95% CI: 0.36–0.70). Overall complication rates were similar (RR = 1.00, 95% CI: 0.74–1.36); however, EEA carried higher risks of cerebrospinal fluid leak (RR = 4.75, 95% CI: 2.44–9.25) and meningitis (RR = 3.36, 95% CI: 1.31–8.60), but lower risks of cerebrovascular accident (RR = 0.34, 95% CI: 0.13–0.95) and seizures (RR = 0.20, 95% CI: 0.05–0.77). Recurrence favored EEA (RR

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= 0.72, 95% CI: 0.52–0.99), though reoperations were more frequent (RR = 2.82, 95% CI: 1.10–7.19).

Conclusion: EEA and TCA achieve similar rates of tumor resection for TSMs. EEA offers superior visual outcomes and lower risks of certain neurological complications but is associated with higher rates of cerebrospinal fluid leakage, meningitis, and reoperation. Surgical approach selection should be individualized, integrating tumor anatomy, patient factors, and surgeon expertise to optimize outcomes while minimizing morbidity.

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and performance of intraoperative additional resections. Analyses were conducted on the overall cohort and stratified by histology. Covariates included surgical era, institution, surgeon, and years of skull base surgery expertise of the first surgeon. Statistical analyses were exploratory and included descriptive and comparative analyses, as well as time-to-event analyses for oncologic outcomes. Multivariable models are currently under development.

Results. Analyses were performed on 1416 patients from five institutions. Frozen section analysis was used in 1,008 cases (71%). Frozen section positivity was reported in 683 cases (68%), leading to intraoperative additional resections in 609 procedures. Final margin status was R0 in 74% of cases, R1 in 19%, and R2 in 6%. Preliminary analyses indicate variability over time in margin management strategies. Histology appears to influence both the rate of positive margins and the prognostic impact of margin status. Certain anatomical subsites, including dura, infratemporal fossa, and periorbital region, were more frequently associated with margins classified as R0 yet prone to local recurrence. Discrepancies between frozen section and final histopathological assessment were observed in 135 of 683 cases (19.8%). Preliminary data also suggest that margins rendered negative after intraoperative re-resection may differ in oncologic significance from margins negative at initial assessment.

Conclusions. This study addresses unresolved issues in margin definition and management in endoscopic sinonasal cancer surgery. Ongoing analyses may support future standardization of margin assessment and clinical decision-making, integrating histology-specific behavior, surgical complexity, and the role of frozen section analysis.



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ENDOSCOPIC DACRYOCYSTORHINOSTOMY: KEY STEPS TO OPTIMIZE OUTCOMES

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Introduction Endoscopic dacryocystorhinostomy (EDCR) has success rates comparable to the external approach, with less morbidity and the possibility of treating concomitant nasal disease. However, failures still occur due to inadequate osteotomy, incomplete sac exposure and suboptimal postoperative care. We describe a standardized, stepwise EDCR protocol designed to optimize outcomes.

Material and methods We present a technical video description of our standardized EDCR protocol, illustrated with ten primary nasolacrimal duct obstruction cases. Using a 0° endoscope, local lidocaine–adrenaline infiltration and cotton pledgets provide decongestion. A large mucosal flap is fashioned with a superior horizontal and two vertical incisions, then elevated to expose the frontal process of the maxilla. Bone is removed with Kerrison punches and a 4-mm burr until the entire lacrimal sac is visible as a nasal bulge. The sac is widely marsupialized with a vertical incision and two relaxing cuts, trimming mucosa to maintain a broad ostium. Silicone intubation is used selectively. We routinely apply 1.0% hyaluronic acid to the surgical bed and schedule standardized postoperative endoscopic debridement at 1 week, 2 weeks, 1 month, and then monthly thereafter for the first three months.

Results Ten nasal fossae from ten patients (7 females; mean age 63,3 years, range 51–73) were included. All procedures were performed for primary acquired nasolacrimal duct obstruction; no patient had previous lacrimal surgery. Silicone intubation was used in 4/10 cases (40%). Endoscopic septoplasty was applied in 4/10 cases (40%). Mean operative time was 40 minutes. At a mean follow-up of 4 months, anatomical patency was achieved in 9/10 fossae (90%), with a visible, freely irrigable ostium. Functional success (complete or marked improvement of epiphora) was observed in 8/10 cases (80%). Endoscopic controls at 1 and 2 weeks, 1 month and monthly thereafter showed progressive epithelialization of the rhinostomy; one patient developed granulomatous restenosis requiring revision EDCR. Minor

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complications included transient intraoperative bleeding in 1 case and mild postoperative synechiae in 3 cases, all managed conservatively (Tab.1).

Conclusion A simple, reproducible stepwise EDCR technique focused on generous bone removal, complete sac marsupialization, and standardized postoperative care may help maximize anatomical patency and functional success.

Patient No.	Age (years)	Sex	DCR	Silicone stent	Follow-up	Complications
1	51	F	Unilateral	No	Routine clinical and endoscopic follow-up up to 3 months	None
2	55	M	Unilateral	Yes, Endoscopic septoplasty	Silicone stent; endoscopic debridement at 1 and 2 weeks, 1 month, then monthly (total follow-up 5 months)	Transient intraoperative bleeding, resolved with local measures
3	71	F	Bilateral	Yes, Endoscopic septoplasty	Silicone stent; endoscopic debridement at 1 and 2 weeks, 1 month, then monthly (total follow-up 4 months)	Mild postoperative synechiae, managed endoscopically
4	68	F	Unilateral	No	Routine clinical and endoscopic follow-up up to 4 months	Mild postoperative synechiae, managed endoscopically
5	73	F	Bilateral	Yes, Endoscopic septoplasty	Silicone stent; endoscopic debridement at 1 and 2 weeks, 1 month, then monthly (total follow-up 5 months)	None
6	58	F	Unilateral	No	Routine clinical and endoscopic follow-up up to 3 months	Mild postoperative synechiae, managed conservatively
7	62	F	Unilateral	Yes, Endoscopic septoplasty	Silicone stent; endoscopic debridement at 1 and 2 weeks, 1 month, then monthly (total follow-up 4 months)	None
8	69	F	Unilateral	No	Routine clinical and endoscopic follow-up up to 4 months	Granulomatous restenosis requiring revision EDCR

Table 1. Demographic data, follow-up and complications of the 8 patients (10 nasal fossae) undergoing endoscopic dacryocystorhinostomy.



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HIGH-STAKES ANGIOFIBROMA SURGERY BEYOND THE DURA: MASTERING INTRADURAL EXTENSION WITH CONFIDENCE

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While angiofibromas often reach the skull base, true intradural invasion is exceptional. Although it reaches less than five percent of all stage IVb cases, it converts a hyper-vascular tumor into a life-threatening skull-base lesion that encases the petrous ICA, invades Meckel's cave and may compress the optic chiasm. Radical, safe removal is the only curative option; radiation is ineffective and carries long-term morbidity. These rare intradural tumors demand a carefully orchestrated, single-stage extra- and intradural strategy to prevent the dual catastrophes of carotid rupture and cerebral injury. Our cases were university-hospital managed through a standardized single-stage, multidisciplinary protocol by neurosurgical phase first, residual tumor is gently pushed inferiorly toward the skull-base defect. Then rhinosurgical phase by image-guided endoscopic delivery of the extracranial bulk and the intermediate waist through the same corridor; a vascularized nasoseptal flap is used to support the fascia-lata dural grafts for water-tight closure. Results included all macroscopic total resection, ; no carotid rupture, stroke or new cranial-nerve deficit, One CSF leak repaired endoscopically and one late infratemporal recurrence. In conclusion a reversed-sequence, combined extra-/intradural strategy converts the high-stakes intradural JNA from an uncontrollable hemorrhagic emergency into a predictable, single-session rhino-neurosurgical resection. The keys are: neurosurgical de-bulking from above to revascularize and mobilize the intradural component, endoscopic clean-up from below to extirpate the extracranial reservoir, and vascularized flap reinforcement to prevent CSF fistula. Adoption of this protocol obviates adjuvant therapy and yields durable cure even in recurrent, adult-onset cases.



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UNPREDICTABLE PROGRESSION IN SEVERE PAEDIATRIC SINUSITIS: A CASE SERIES HIGHLIGHTING THE ROLE OF EARLY FESS

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Background The timing of surgical intervention for severe paediatric sinusitis is debated. While early functional endoscopic sinus surgery (FESS) may prevent progression to orbital and intracranial complications, conservative medical management remains common. This case series examines management thresholds and outcomes in the context of current evidence.

Methods We present three paediatric cases of severe pansinusitis from a district general hospital. For each, we detail presentation, imaging, antimicrobial therapy, multidisciplinary involvement, timing of FESS, surgical technique and outcomes.

Results Case A presented with frontal headache and swelling. CT revealed pansinusitis with frontal involvement. It was managed conservatively with IV antibiotics. A post-treatment MRI due to residual drowsiness revealed superior sagittal sinus thrombosis, necessitating anticoagulation and long term monitoring. Cases B and C presented with forehead and periorbital swelling. Contrast CT confirmed drainable subgaleal collections, leading to urgent FESS with drainage. Case B later required further IV antibiotics for a small re-collection, while Case C recovered uneventfully.

Conclusion This series illustrates the unpredictable course of severe paediatric sinusitis, where intracranial complications can develop despite clinical improvement on antibiotics. The occurrence of venous thrombosis in a conservatively managed case indicates that serious progression can be clinically silent. These cases emphasise the need for clearer guidelines on risk stratification to inform the decision for early surgical intervention, potentially preventing severe sequelae.

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STERNBERG'S CANAL / LATERAL SPHENOID CSF LEAK, A CASE REPORT

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Sternberg's Canal / Lateral Sphenoid CSF Leak, a case report Lateral sphenoid CSF leaks are rare, and numerous techniques and approaches are available. In this presentation, we are trying to demonstrate "Endoscopic Endonasal Transpterygoid Approach (EETPA) for Sternberg's Canal/Lateral Sphenoid CSF Leak." How to implement this approach at the Iran University of Medical Sciences and identify and reconstruct a strategy as the gold Standard.



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EVALUATION OF ACCESS TO MAXILLARY SINUS WALLS AND SPACE IN FUNCTIONAL MEGA-ANTROSTOMY APPROACH

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Introduction: Various endoscopic approaches provide access to the maxillary sinus. However, broader access increases the risk of intraoperative complications, post-operative morbidity, and impairment of natural sinus function. In this study we present Functional Mega Antrostomy (FMA) that is a variation of Mega Antrostomy technique that we preserve the inferior cornea. We collected the operative and post operative data on the patients that undergone Functional Endoscopic Sinus Surgery with FMA technique.

Materials and Methods: In this retrospective study we analyzed intraoperative videos of 31 patients (21 men and 10 women) diagnosed with nasal polyposis who underwent surgery. In the functional mega-antrostomy technique, the maxillary sinus is accessed from the posterior wall to the lacrimal duct anteriorly. The superior boundary extends from the orbital floor to the inferior limit at the nasal cavity floor. Also, a part of the upper section of the inferior turbinate and a minor anterior edge of the middle cornea are trimmed. The entire length of the inferior turbinate is preserved to maintain function. The access to the Maxillary walls and peri-lacrimal space was assessed by using a zero-degree lens. The complication such as dryness, epiphora and post operative bleeding was also evaluated.

Results: A total of 54 maxillary sinuses were evaluated, with an age range from 13 to 75 years (average 43.9) and a follow-up period of 6 to 19 months (average 12.5). The access to the posterior wall was 98%, the floor was 82%, the anterior-lateral wall was 79%, and the pre-lacrimal recess was 46%. Post-operative complications included dryness in 7% of cases, bleeding requiring surgical intervention in 7%, temporary epiphora in 18%, and permanent epiphora in 7%.

Conclusions: In the functional mega antrostomy method (FMA), we achieve maximum access to the maxillary sinus space and walls with minimal functional damage to the sinus. despite the increased access to the walls and space of the maxillary sinus, the natural function of the

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inferior turbinate and the maxillary sinus is preserved, unlike other advanced antrostomy methods.



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CAVERNOUS SINUS THROMBOSIS SECONDARY TO ACUTE SPHENOIDITIS. CONSERVATIVE VS SURGICAL MANAGEMENT PHILOSOPHY.

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Background: Cavernous sinus thrombosis (CST) is a critical complication of acute sinusitis where treatment delays can lead to permanent visual or neurological deficit. The debate between initial conservative medical management and early surgical source control is often influenced by the treating surgeon's subspecialty perspective.

Methods: This case report details the management of a patient with CST secondary to sphenoid sinusitis, contrasting the approaches of two clinical pathways: initial treatment by a generalist ENT surgeon favouring a conservative strategy, and subsequent referral to a rhinologist. The clinical reasoning, timing of intervention, and outcome are analysed in the context of relevant literature.

Results: The generalist opted for a trial of intensive intravenous antibiotics and anticoagulation alone, reserving surgery for clear clinical deterioration. When the patient's visual deficits and sepsis failed to resolve after 48 hours, referral was made. The consulting rhinologist, citing evidence that medical management fails in a significant subset of CST cases, proceeded urgently to endoscopic sinus surgery (ESS) for drainage and decompression. The patient's clinical improvement accelerated post-operatively.

Conclusion: This case underscores a critical divergence in management philosophy. The generalist's conservative approach, while valid in select cases, risks a dangerous delay in definitive care. In contrast, the rhinologist's propensity for early surgical intervention, based on specialised familiarity with sinonasal anatomy and literature supporting aggressive source control, likely mitigated the risk of permanent morbidity. The outcome argues strongly for the early involvement of a rhinologist in such complex, time-sensitive complications to expedite the most effective treatment pathway.



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THE USE OF BIODEGRADABLE STEROID-ELUTING STENTS FOLLOWING ENDOSCOPIC REPAIR OF CHOANAL ATRESIA IN CHILDREN: CASE SERIES AND PRELIMINARY RESULTS

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Introduction Choanal atresia is a rare congenital anomaly that poses a high risk of respiratory compromise in neonates, who are considered obligate nasal breathers. Re-stenosis after repair remains a major challenge. Initially designed for frontal sinus surgery in cases of chronic rhinosinusitis, biodegradable steroid-eluting stents are increasingly being used off-label for airway procedures in both adults and children. We report our preliminary experience from two tertiary pediatric centers in Athens using these devices following endoscopic choanal atresia repair.

Materials and Methods Retrospective review of all children who underwent endoscopic choanal atresia repair with placement of biodegradable mometasone-eluting stents (Propel®), either during primary or revision surgery. The primary outcome was the need for reoperation due to restenosis. Secondary outcomes included intraoperative and postoperative complications, length of hospitalization, and the need for postoperative interventions or increased surveillance.

Results Four children met the inclusion criteria, with a mean age of 28 months. Two patients (50%) were diagnosed with CHARGE syndrome. Three patients (75%) had bilateral choanal atresia; one (25%) had unilateral atresia. Three cases (75%) represented revision procedures. Postoperative hospitalization was short, and during follow-up, no cases of restenosis were observed. No stent-related complications or device-related systemic steroid effects were observed. Representative cases and endoscopic images are presented.

Conclusion In line with emerging international data, our experience shows that these stents appear to be a safe and promising adjunct that may reduce postoperative inflammation and lower rates of restenosis and reoperation. Controlled studies are needed to compare outcomes with conventional management.



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MULTIDISCIPLINARY MANAGEMENT OF BILATERAL CHOANAL ATRESIA IN NEONATES: DELAYED SURGICAL TIMING AND ADVANTAGES OF THE TRANSNASAL ENDOSCOPIC APPROACH

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Introduction Bilateral choanal atresia is a potentially life-threatening congenital malformation that requires prompt management to ensure airway patency. Surgical correction, typically performed via an endoscopic endonasal approach, is usually undertaken early in life. However, in clinically stable neonates, a conservative management strategy may be adopted, allowing surgery to be postponed beyond the first month of life, with potential benefits in terms of outcomes and morbidity.

Materials and Methods From May 2020 to May 2025, five neonates with bilateral choanal atresia were treated at Sant'Anna Hospital in Como using a multidisciplinary approach involving the Neonatology, Otorhinolaryngology, and Maxillofacial Surgery Units. In all cases, a McGovern nipple combined with an orogastric tube was used to ensure adequate respiration and nutrition until completion of the first month of life. Surgical correction was performed via an endoscopic endonasal approach, with the creation of mucosal flaps to line the atretic plate opening and prevent bone exposure. No choanal stents were placed. A second-look procedure under general anesthesia was subsequently scheduled for nasal cavity toiletting and dressing, in order to maintain choanal patency.

Results All patients spent the first month of life in the Neonatology Unit, maintaining good oxygen saturation levels and adequate weight gain. Surgical procedures were completed successfully, with no perioperative complications, either anesthetic or surgical. Stable choanal patency

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was achieved in all five cases, with no episodes of restenosis and good integration of the mucosal flaps.

Conclusions Conservative management in clinically stable neonates allowed surgery to be postponed beyond the first month of life, reducing anesthetic and respiratory risks. Greater development of the nasal cavities facilitated the endoscopic procedure and promoted healing, with no cases of restenosis observed. The presented case series suggests that, in selected neonates, this approach may represent a valid alternative to early surgery, improving outcomes and reducing overall morbidity.



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HIDDEN COMPLICATIONS OF ANTERIOR SKULL BASE SURGERY: A CASE OF OCCULT CSF LEAK

Aleena Faizan, Eva Sherin Saravana Kumar¹, Meriem Amarouche, Sarah Little

¹

Esthesioneuroblastoma, also known as olfactory neuroblastoma, is a rare malignant neoplasm arising from the olfactory neuroepithelium, typically presenting with nonspecific sinonasal symptoms and diagnosed at an advanced local stage. Over ~1,000 cases have been described in the world literature since the tumour was first reported in 1924. [1] Optimal management requires a multidisciplinary skull-base approach combining surgery and radiotherapy.[2] We report the case of a 58-year-old woman, previously fit and well, who presented with several months of nasal obstruction, increased mucous production, reduced olfaction and persistent difficulty in throat clearing. MRI and CT imaging revealed a left-sided Sinonasal Cavity and the anterior Cranial Fossa lesion expanding into the olfactory recess (cT3N0M0). Endoscopic biopsy confirmed Hyams grade 2 esthesioneuroblastoma (Kadish stage C). The patient underwent a combined endoscopic endonasal and transcranial resection via a bicoronal frontal craniotomy with intraoperative lumbar drain insertion. The procedure was uncomplicated. However, her postoperative course was notable for symptomatic pneumocephalus and fluctuating levels of consciousness, which were attributed to low-pressure headaches. Due to the absence of an external CSF leak, CSF rhinorrhea and the lumbar drain being clamped, the underlying cause of the low pressure symptoms could not be identified. She was managed with high-flow oxygen therapy and an epidural blood patch, which resulted in clinical improvement, retrospectively indicating the presence of an occult CSF leak. No further CSF leakage occurred. The patient progressed to ward-based care and was discharged on postoperative day 16. She subsequently completed adjuvant proton beam radiotherapy without complication. At early follow-up, she demonstrated good postoperative recovery with no residual neurological deficits. It is important to recognise and treat occult CSF leaks, which are uncommon but clinically significant in anterior skull base surgery. Unlike overt CSF leaks that present with clear

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clinical signs such as rhinorrhea or wound drainage, occult CSF leaks may manifest only through indirect features, including low-pressure headaches, altered consciousness, or postoperative pneumocephalus. Therefore, heightened clinical vigilance and a low threshold for treatment are essential in the postoperative care of anterior skull base surgery patients, even in the absence of overt CSF leakage. References:1. Arnold PM, Habib A, Newell K, Anderson KK. Esthesioneuroblastoma metastatic to the thoracic intradural and extradural space. Spine J. 2009 May;9(5):e1-5. [PubMed] 2. G X Papacharalampous I, P V Vlastarakos, A Chrysovergis, P K Saravakos, G P Kotsis, D I Davilis. Olfactory neuroblastoma (esthesioneuroblastoma): towards minimally invasive surgery and multi-modality treatment strategies - an updated critical review of the current literature



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POST-IRRADIATION EXTERNAL AUDITORY CANAL-TEMPOROMANDIBULAR JOINT FISTULA SUCCESSFULLY TREATED WITH LONG-TERM INTRAVENOUS ANTIBIOTICS: A CASE REPORT AND LITERATURE REVIEW

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Background and Aim Osteoradionecrosis (ORN) of the temporal bone is a rare but debilitating late complication of radiotherapy for head and neck malignancies, particularly nasopharyngeal carcinoma (NPC). Involvement of the temporomandibular joint (TMJ) and fistulisation into the external auditory canal (EAC) are exceedingly uncommon. Most reported cases require surgical intervention, with conservative management rarely achieving resolution. This case highlights an instance of TMJ osteoradionecrosis (TMJ-ORN) complicated by a TMJ-EAC fistula that healed spontaneously with medical therapy alone. Case study A 79-year-old man, 37 years post-radiotherapy for NPC, presented with progressive otalgia and otorrhoea. Otoscopic examination revealed exposed bone in the left EAC, and dynamic assessment demonstrated a TMJ-EAC fistula visible only on jaw opening. Imaging confirmed a bony defect communicating with the TMJ. Cultures grew methicillin-resistant *Staphylococcus aureus* and fungal organisms. Considering the risks associated with surgery in irradiated tissues, a conservative approach was adopted.

Results Our patient demonstrated several unique aspects - response to antibiotics and presence of otorrhea and pain as his presenting complaint. The patient received two months of intravenous, culture-directed antibiotics followed by oral therapy, coupled with regular aural care. Serial endoscopic examinations showed progressive improvement, with complete closure of the fistula and full symptom resolution by three months. No recurrence was observed during follow-up.

Conclusions Dynamic otoscopy is vital for detecting TMJ-EAC fistulas that may not be visible at rest. In select irradiated patients, prolonged conservative management can achieve spontaneous fistula closure and symptom resolution, avoiding high-risk surgery. This case broadens the therapeutic spectrum for TMJ-ORN management.

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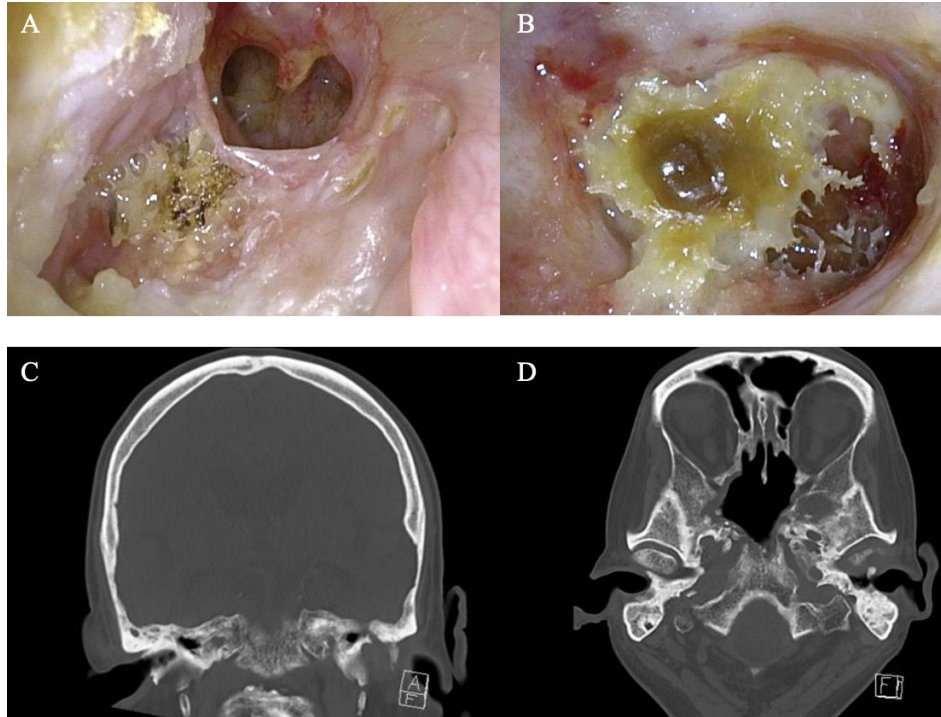
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ERGONOMICS AND SURGICAL FREEDOM IN THE LATERAL TRANSORBITAL NEUROENDOSCOPIC SURGERY: A TAILORED POSITIONING STRATEGY

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Background and Objective: The endoscopic transorbital neuroendoscopic approach has expanded the armamentarium of skull base surgery. However, particularly in the lateral transorbital approach, variability in surgeon positioning and instrument configuration may lead to meaningful differences in ergonomics and surgical freedom. The objective of this study was to summarize how surgeon/patient positioning, surgeon handedness, and lesion laterality influence ergonomics and surgical freedom in transorbital surgery.

Methods: We compared multiple operative setups incorporating surgeon position (lateral side of the patient vs at the head/end of the patient), surgeon handedness (right vs left), lesion side, target depth, patient head orientation (vertex up vs vertex down), and instrument configuration. For each setup, surgical freedom was quantified using motion tracking of the instrument tip to calculate the collision-free area of exposure. In addition, the range of angle of attack achievable without instrument collision was measured using a transparent protractor overlay.

Results: In the conventional lateral-side position, surgeons commonly leaned forward and laterally toward the patient, which may contribute to discomfort during prolonged procedures. In contrast, the end-of-head position allowed a more upright trunk posture and freer movement to either side of the head, providing improved comfort and maneuverability, particularly for deeper skull base targets. Comparable surgical exposure could be maintained in the end-of-head position relative to the lateral-side position. Although no single "optimal" setup applied to all transorbital cases, for posterior fossa targets the end-of-head position tended to provide greater surgical freedom and improved ergonomics. In selected setups, a gravity-assisted brain fall-away effect was also observed as an additional benefit.

Conclusions: In transorbital neuroendoscopic surgery, surgeon position and patient head orientation should not be fixed but rather tailored to lesion location and depth as well as surgeon-specific factors, including

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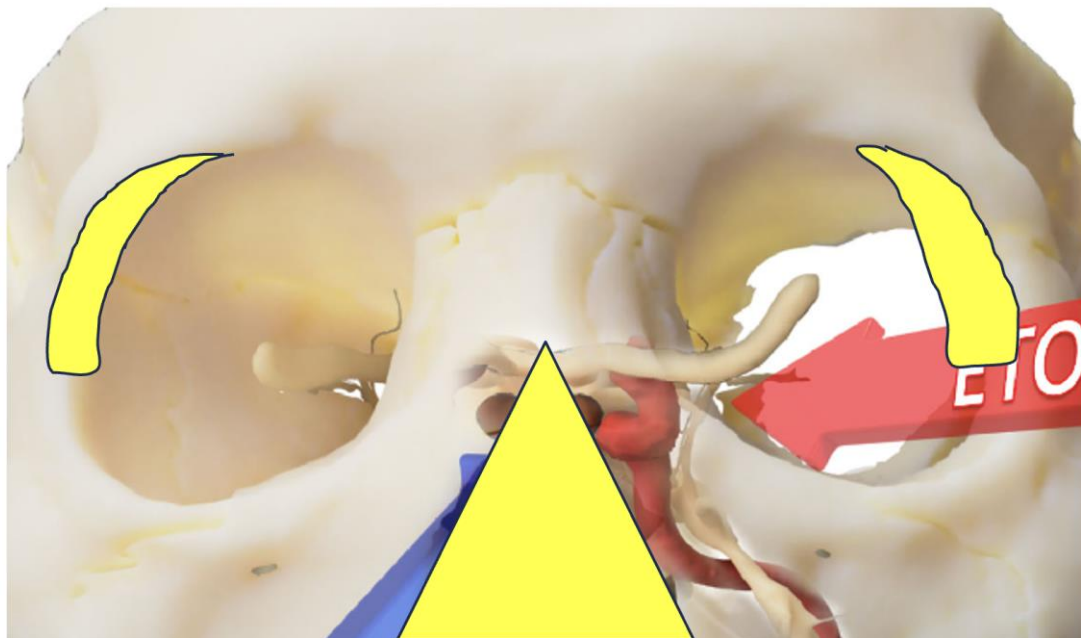
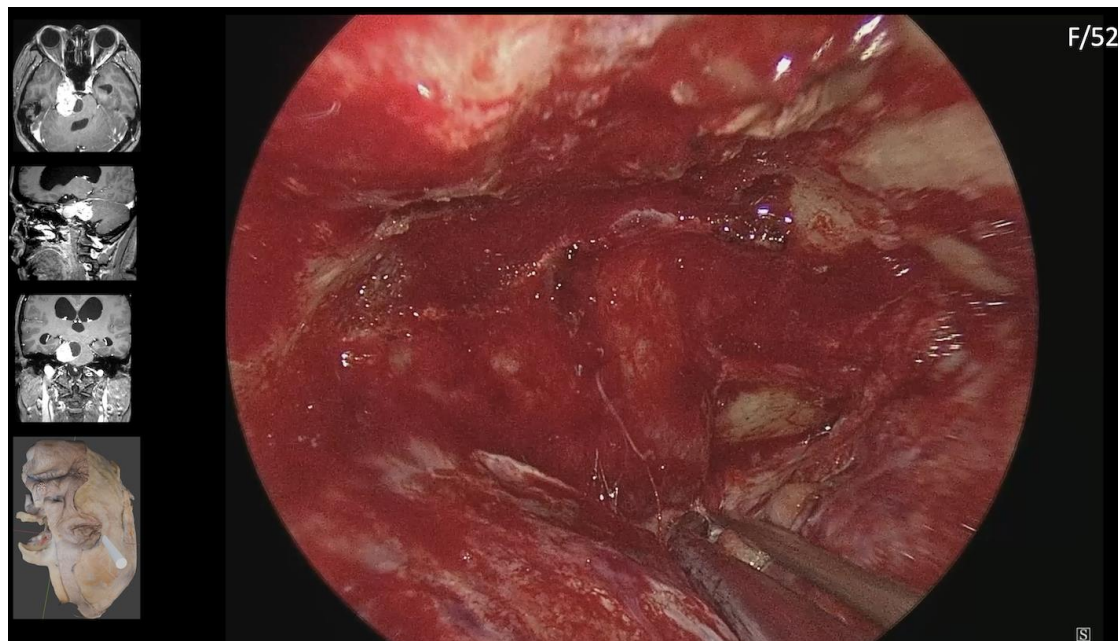


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handedness. For posterior fossa targets, an end-of-head setup may offer ergonomic advantages and enhanced surgical freedom.





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MUCOCILIARY CLEARANCE AND ITS ROLE IN OLFACTORY FUNCTION AFTER ENDOSCOPIC SINUS SURGERY

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Introduction Olfactory dysfunction has a serious effect in CRSwNP patients and their quality of life and this can be through various mechanisms. Airway obstruction and epithelial changes are the most suggested mechanisms. Mucociliary function is one of the measures of this epithelial change. In this study we wanted to assess the relation between olfactory function and mucociliary clearance and their effect on the quality of life and subjective nasal symptoms.

Materials and Methods This cohort study was performed on 20 CRSwNP patients with Lund Mackay Scores of 20 to 24 who underwent endoscopic endonasal surgery from May to December 2021. All patients underwent bilateral complete FESS and DRAF 2A or 2B surgery of frontal sinuses. We measured Smell Identification Threshold (SIT) and saccharin test before and after surgery we also recorded SNOT-22 and QODN-NS questionnaires responses before and after surgery.

Results There were 16 male and 4 female patients in this study, the age range was 23 to 59 years. The mean score of the SIT test in the 7-month follow-up period was significantly improved (10.5 versus 14.8 $p = 0.011$) also mucociliary clearance by saccharin test improved but marginally significant (10:09 versus 11:30 $p = 0.058$). There was a significant relationship between the improvement in mucociliary clearance and the improvement in smell function (p -value: 0.043). Significant improvement was also seen in SNOT 22 (P



6763

EXPANDING UTILIZATION OF ENDOSCOPIC ENDONASAL SURGERY FOR VARIOUS SKULL BASE TUMORS

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Purpose: Recent advances of endoscopic endonasal surgery (EES) in the area of neurosurgery have been significant. EES is a good surgical indication not only for pituitary tumors but also for other midline or para-midline skull base tumors, and its indications have still expanded. We discuss surgical strategy and case selection for these skull base tumors to achieve maximum safe resection.

Methods: Excluding patients with pituitary adenomas (PitNETs) and malignant nasal and sinonasal carcinomas, we treated 92 patients with following other skull base pathologies by EES since 2014: suprasellar, parasellar, and clival meningiomas in 31 cases, suprasellar craniopharyngiomas in 28 cases, chordoma/ chondrosarcomas in 13 cases, intraorbital tumors in 8 cases, other pathologies in 12 cases.

Results: Long-term follow-up revealed five patients died of tumor-related causes, all due to malignant pathologies (3 malignant meningiomas, 1 chordoma, 1 malignant transformed craniopharyngioma). Surgical complications included one case of internal carotid artery injury and two cases of cerebrospinal fluid leakage, all of which resolved successfully with additional treatment. Depending on the tumor extension, a surgical strategy was adopted to achieve safe and maximum resection by performing combined surgery with concomitant craniotomy.

Conclusion: By dissecting the nasal cavity and paranasal sinuses for wide expansion and placing the lesion within the wide field of view of the endoscope, it is possible to handle a wide variety of skull base tumors. While outcomes for malignant invasive tumors remain a challenge, generally favorable results were achieved for all benign pathologies.



6764

CAROLYN'S WINDOW APPROACH FOR DRAF 2A FRONTAL SINUSOTOMY IN ASIAN PATIENTS

Minh Phuoc Hoang¹

¹

Introduction (Background & Aim): The recently introduced "Carolyn's Window Approach" (CWA) provides direct access to the frontal sinus without the need for an angled endoscope. This technique might present challenges for Asian noses due to lower radix and dorsal heights. To address this concern, our study assessed the success rates and frontal sinus patency outcomes of the CWA in a cohort of Asian patients.

Material & Methods: A total of 41 patients were included with 51 procedures were performed. All frontal sinus surgeries were successfully performed via CWA using a 0° endoscope. The anthropometric data for nasal appearance in the studied population were determined. The outcomes were the success rate and the patency of the frontal sinus, as determined by the ability to endoscopically visualize the frontal sinus at 3 and 6 months postoperatively. **Results:** All frontal sinus surgeries were successfully performed via CWA using a 0° endoscope. At 3 months postoperatively, 94.1% of sinuses were patent, decreasing slightly to 86.3% at 6 months.

Conclusions: The CWA is a feasible and effective technique for frontal sinus surgery in Asian patients, despite anatomical differences.



6765

PATIENT-SPECIFIC 3D SURGICAL SIMULATION EFFECTIVELY GUIDES SELECTION OF EXTENDED ENDONASAL APPROACHES FOR GIANT PITNETS WITH SKULL BASE INVASION

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Background: Pituitary neuroendocrine tumors (PitNETs) sometimes become giant (>4cm), and extend to skull base lesion in which conventional transsphenoidal approaches are often insufficient. To address this issue, we have adopted a patient-specific three-dimensional computer graphics (3DCG) system (GRID) that reconstructs detailed anatomical models from preoperative CT/MRI, including microvascular structures and cranial nerves. This enables precise surgical simulation and tailored planning for these complex skull base lesions.

Methods: We retrospectively reviewed 123 PitNET cases treated with endonasal transsphenoidal surgery (ETS) between June 2021 and October 2025. Among them, 13 patients with giant PitNETs (≥ 4 cm) with skull base invasion were analyzed. Surgical strategies were determined using GRID-based 3D simulation, and extended endoscopic endonasal approaches, including transthyroid, transpterygoid, transmaxillary, and modified medial maxillectomy were selectively combined according to the direction and degree of tumor extension.

Results: Gross total or sub-total resection was achieved in all 13 cases. Visual impairment improved promptly in patients with preoperative deficits. Blood loss was minimized by careful dissection guided by simulation, and complications were limited, with transient sensory disturbance in one patient. Overall surgical outcomes were favorable.

Conclusion: Giant PitNETs with skull base invasion can be safely and effectively managed through endoscopic endonasal surgery when guided by patient-specific 3D simulation. The GRID system provided critical visualization of fine neurovascular structures, facilitated selection of appropriate extended approaches, and contributed to excellent surgical results. Preoperative 3D simulation thus represents a valuable tool for achieving tailored, minimally invasive treatment in these challenging cases.

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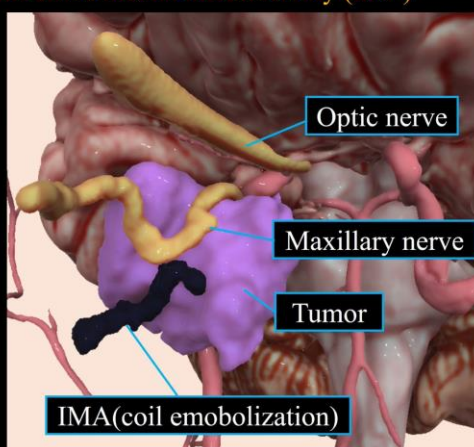
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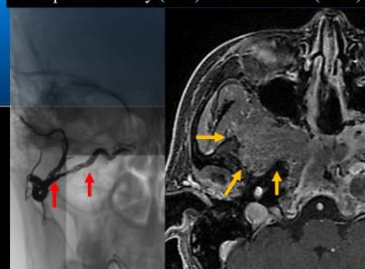
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Illustrative case 2: 42 y.o. Female.
PitNET extending into pterygopalatine fossa (PPF)
Approach: Preoperative **IMA** embolization and EM³

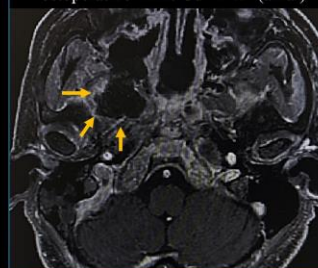
Endoscopic modified medial maxillectomy (EM³)



Preoperative Xray (A-P) and Gd-T1WI (axial)



Postoperative MRI: Gd-T1WI (axial)



3DCG
Navigation
system
ICG



6770

TRANSORAL ENDOSCOPIC APPROACH FOR SKULL BASE LESIONS: 10 – YEAR EXPERIENCE OF A SINGLE TERTIARY CENTER

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Background: Management of skull base lesions pose considerable challenges due to the complex anatomy, as well as the diversity and rarity of the pathologies. Various anterior approaches versus endoscopic techniques provide access to different regions of the skull base. **Objective:** The aim of this study was to explore transoral endoscopic route in terms of mucosal incisions and anatomical corridors, target areas, specific pathologies, surgical procedures, and outcomes.

Materials & Method: Data on demographic features, imaging characteristics, pathology, approaches, extent of resection, outcome, serious complications and follow up information were retrospectively gathered and analyzed on skull base lesions that underwent anterior transoral endoscopic approach during 10 years period in Imam Khomeini Hospital, Iran.

Results: During 2013-2023, 71 patients were included in this study. Thirty-eight (53.5%) were female and mean age was 36.84 ± 19.13 years. Among patients who were treated with an endoscopic trans-oral approach solely, or as a part of combined endonasal trans-oral approach, the most common anatomical origin and the most frequently encountered pathology were CVJ and chordoma, respectively. In meningiomas of middle and posterior skull base, due to extensive dural involvement, subtotal resection was performed. For middle cranial base lesions trans-maxillary approach with a sublabial incision was most commonly selected. Endoscopic transoral access to the lower parapharyngeal space, greater wing of the sphenoid, and pterygoid region was performed in nine cases using palatal, trigonal, and pilar incisions. One-third of the cases required a multi-portal approach combining endonasal and transoral routes. Total removal was achieved in cases with benign lesions. Recurrence occurred in 14 of 38 cases of

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malignant tumors and in 4 of 33 cases with benign lesions. The mean follow-up period was 33.06 ± 20.72 months.

Conclusion: The endoscopic transoral approach can be used to access selected skull base lesions in CVJ, infratemporal fossa and lower parapharyngeal space, The procedure can be performed with minimal morbidity, magnified direct exposure and favorable outcomes.



6772

ENDOSCOPIC PRELACRIMAL APPROACH FOR EXCISION OF A RARE ADENOMATOID ODONTOGENIC TUMOR OF THE MAXILLA IN A PEDIATRIC PATIENT

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²Jaslok Hospital and Research Centre Mumbai, India

Introduction (Background And Aim): Adenomatoid odontogenic tumor (AOT) is an infrequent, benign odontogenic lesion, most often reported in adolescent females and commonly involving the anterior maxilla. Surgical removal is definitive treatment, with an excellent prognosis. In children, conventional external or intraoral approaches may be associated with aesthetic concerns, growth-related issues, and increased surgical morbidity. Endoscopic techniques have expanded the scope of minimally invasive management for maxillary pathology. This report aims to describe the use of an endoscopic prelacrimal recess approach for complete excision of a rare maxillary AOT in a pediatric patient and to emphasize its surgical advantages.

Case Study: A 10-year-old boy presented with unilateral left sided maxillary swelling associated with nasal obstruction. Imaging demonstrated a well-circumscribed maxillary lesion consistent with an odontogenic tumor. Surgical excision was undertaken using an endoscopic prelacrimal recess approach under general anesthesia. The approach allowed direct access to the lesion while maintaining integrity of the inferior turbinate and nasolacrimal duct. The excised specimen was subjected to histopathological analysis. Postoperative follow-up was carried out clinically and radiologically.

Result: The lesion was completely removed endoscopically without complications or external incision. Postoperatively, nasal function and lacrimal drainage were preserved, and cosmetic outcome was satisfactory. Histopathology confirmed the diagnosis of adenomatoid odontogenic tumor. No recurrence or functional impairment was noted during 6 months of follow-up.

Conclusion: The endoscopic prelacrimal recess approach offers a minimally invasive, anatomy-sparing option for the management of selected pediatric maxillary tumors. It provides excellent surgical access with minimal morbidity and favorable functional and cosmetic

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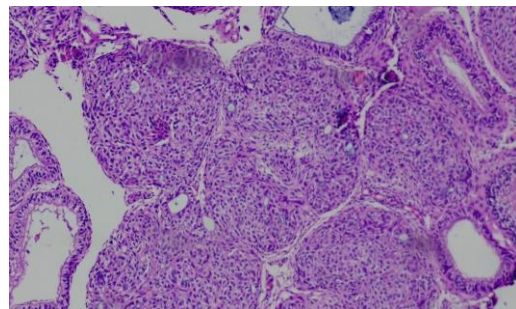
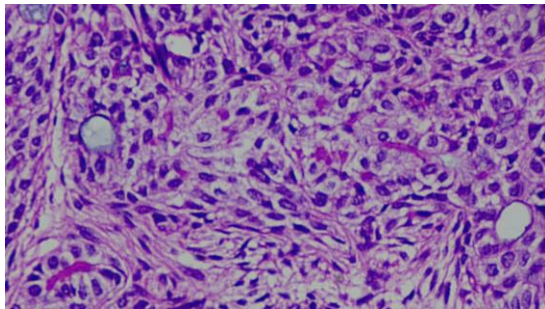
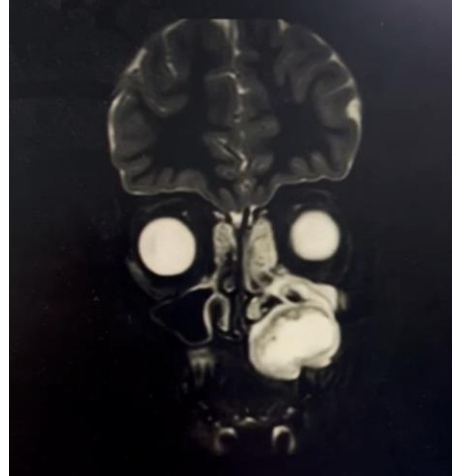


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outcomes, making it a valuable alternative to conventional open techniques.





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ENDONASAL ENDOSCOPIC SURGERY FOR TUBERCULUM SELLAE MENINGIOMAS: ANALYSIS OF 42 CASES

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Introduction. Tuberculum sellae meningiomas (TSMs) may require different transcranial or endoscopic approaches depending on tumor features and the involvement of optic canals. The endoscopic endonasal approach (EEA) provides direct midline access, early tumor devascularization, hyperostosis management and superior visualization of the optic apparatus. Large series support EEA as a good option for selected TSMs. This study evaluates outcomes and safety profile in a 42-patient selective cohort.

Materials and Methods A total of 42 patients underwent EEA for TSMs between 2014 and 2025 in Romodanov Institute of Neurosurgery. Mean tumor diameter was 18 mm (10-26mm) . Multilayer skull base closure was performed in all cases and included: -Autologous fat graft -TachoSil™ layer to fix and seal the fat graft-Outlay fascia layer (optional for large defects) -Nasoseptal flap (NSF) — used in all cases -Lumbar drainage — applied in all cases **Results** Visual outcomes: • Improved visual acuity and/or visual fields: 35 patients (83.3%) • Stable vision: 4 patients (9.5%) • Worsening in 3 patients (7.1%), including one case due to graft overpacking **Complications:** • New hypopituitarism — 1 patients (4,2%) • Anosmia — 8 patients (19%) • Meningitis -2 patients (4,8%) No major hemorrhage, or mortality occurred. The absence of CSF leak is attributable to the systematic multilayer closure with NSF and lumbar drainage.

Conclusions In this 42-patient series, EEA demonstrated high visual improvement rates, strong safety profile for appropriately selected TSMs. Extremely low CSF leak rate is associated with implementation of protocol designed to minimize postoperative CSF leak. TachoSil™, NSF, and lumbar drainage appears to be a key factor ensuring durable and reliable closure.



6781

TECHNICAL NOTE: SPHENOIDAL MUCOSAL FLAP FOR SELLAR RECONSTRUCTION IN ENDOSCOPIC ENDONASAL TRANSSPHENOIDAL SURGERY

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Background Endoscopic endonasal transsphenoidal surgery (EETS) requires reliable skull base reconstruction to prevent cerebrospinal fluid (CSF) leak. The vascularised nasoseptal flap is widely accepted as the standard technique but carries donor-site morbidity including septal perforation, olfactory disturbance, and prolonged crusting.[1,2] The sphenoidal mucosal flap is a less-reported alternative that avoids septal harvest-related sequelae.[3]

Methods The sphenoidal mucosal flap technique for skull base reconstruction in EETS is outlined. A retrospective review was performed of consecutive patients undergoing EETS with sphenoidal mucosal flap reconstruction at a tertiary neurosurgical centre between July 2023 and July 2025. Variables included demographics, pathology, intra-operative CSF leak grade, postoperative complications, sinonasal morbidity, and length of stay (LOS). A representative operative video will be presented to demonstrate key technical steps.

Results Twenty-one patients underwent sphenoidal mucosal flap reconstruction. Median age was 49 years (IQR 41–60), and most procedures were primary (18/21, 85.7%). Intra-operative CSF leak was encountered in 7/21 (33.3%) with grades 1,2 and 3 in 4, 1 and 2 patients, respectively. No postoperative CSF leaks occurred. No endocrine complications occurred, and no infectious complications were observed. Median LOS was 3 days (range 1–8).

Conclusion The sphenoidal mucosal flap provided effective reconstruction after EETS, with no postoperative complications and low sinonasal morbidity. The flap is harvested within the operative field, is technically reproducible, and represents a practical alternative to the nasoseptal flap for sellar closure. **References**1. Hadad G, Bassagasteguy L, Carrau RL, et al. Vascular pedicle nasoseptal flap for endonasal skull base reconstruction. *Laryngoscope*. 2006;116(10):1882-

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6783

ENDOSCOPIC ENDONASAL APPROACH FOR ACTH-PITNET CAUSING CUSHING'S DISEASE: MULTI-CENTER RETROSPECTIVE STUDY ON 162 PATIENTS WITH EARLY POSTOPERATIVE CORTISOL ASSESSMENT

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Introduction Cushing's disease (CD) is a severe endocrinological disease, whose diagnosis and treatment can be troublesome. The primary treatment for confirmed CD is pituitary tumor resection. Nonetheless postop hypersecretion might not be obtained, albeit GTR. So that, remission can be uncertain. There is no unique consensus on which biochemical thresholds and should be referred to determine remission.

Materials and Methods A multicentric observational retrospective cohort study of 162 consecutive patients with CD who underwent endoscopic endonasal resection, from January 2007 to September 2021, was conducted. Institutions from the USA and Europe participated with three centers involved including the University of Southern California, Los Angeles, California; University of Naples "Federico II", Naples, Italy; and Medical University of Vienna, Vienna, Austria. Clinical information, including age, sex, preoperative serum and urinary free cortisol levels, imaging findings, histopathological examination and immunohistochemistry exam, postoperative endocrinological results, and early and late follow-up were reported.

Results Medical records and radiographs for 162 consecutive ACTH-PitNET patients operated on via endoscopic endonasal approach, were reviewed. Median follow-up time was 29.8 ± 28.75 months. After surgery, cortisol levels <5 mcg/dL were statistically associated with absence of

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parasellar extension on preoperative MRI (7.2% [7/97]; $p=0.01$), absence of intraoperative impression of cavernous sinus invasion (7.8% [8/103]; $p=0.003$), and a submaximal extent of resection (3.9% [4/103]; $p=0.0001$). The recurrence rate was not different in case of morning cortisol serum level was $<2 \mu\text{g/dl}$ (OR 0.08, 95% C. I. 0.004-0.38, $p=0.01$) or $<5 \mu\text{g/dl}$ (OR 0.25 95% C.I. 0.09- 0.61, $p=0.003$) during the first three postoperative days ($<2\text{mcg/dL}$: OR 0.24 95%C.I. 0.08-0.62, $p = 0.006$; $<5\text{mcg/dL}$: OR 0.22 95% C.I. 0.09 - 0.51, $p <0.001$).

Conclusion The endoscopic endonasal approach for the removal of pituitary adenoma represented the primary treatment in the multidisciplinary management of Cushing's disease. Cavernous sinus invasion, prior surgery, and Crooke's cell lineage were factors significantly increasing the risk of persistent or recurrent CD. The best predictor of long-term remission has been the finding of plasmatic cortisol levels $< 5\text{ng/ml}$ at the early postoperative period.



6784

ORBITAL COMPLICATIONS OF RHINOSINUSITIS IN ADULTS: A RETROSPECTIVE STUDY

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Introduction: Rhinosinusitis can be complicated by infectious extension to the orbit, threatening ocular function. This occurs through ethmoid bone erosion or hematogenous, through the ophthalmic venous system which has no valves. This study aims to analyse patients with orbital complications in order to identify the main outcomes and prognosis.

Materials and Methods: We performed a retrospective analysis of the charts of patients with orbital involvement secondary to rhinosinusitis, presented to our clinic from January 2015 to December 2025. The etiology, demographic data, clinical manifestations and treatment are discussed.

Results: The study reviewed a total of 23 patients. There were 15 males and 8 females. The average age was 40 years. In 19 cases it was odontogenic sinusitis, and in 4 cases it was CRSwNP. In most situations all sinuses on the affected side were involved. Two-thirds of patients presented with left eye involvement (17), and 6 with right eye involvement. Orbital cellulitis was identified in 11 cases, 12 patients had orbital abscess (one complicated with fistula and one with hematoma). Associated symptoms were: decreased visual acuity, decreased eyeball mobility, chemosis, proptosis, exophthalmos. In 22 of the cases, surgical management was chosen (15 endoscopic approach, 7 mixed approach). In one case medical treatment was effective. 2 patients suffered neurological complications and were transferred to neurology clinics.

Conclusions: The eye involvement in rhinosinusitis may range from cellulitis to subperiosteal abscesses. Surgical management, along with aggressive medical treatment remains the standard to restore visual function and to achieve a favorable prognosis.



6785

ANALYSIS OF VISUAL IMPAIRMENT SCORE IN A SERIES OF 48 TUBERCULUM SELLAE MENINGIOMAS OPERATED ON VIA THE ENDOSCOPIC ENDONASAL APPROACH

Ilaria Bove¹, Domenico Solari², Felice Esposito³, Jacopo Berardinelli¹, Paolo Cappabianca¹, Luigi Maria Cavallo¹

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Introduction: Tuberculum sellae meningioma (TSM) represents a complex skull base tumor. The primary goals of surgical treatment are represented by maximal safe resection and visual recovery; therefore, appropriate patient selection is critical to optimize results. In the last 2 decades, the endoscopic endonasal approach (EEA) has appeared as a successful and viable strategy for the management of these tumors. The authors identified preoperative factors associated with extent of resection and visual outcome after EEA for TSM.

Methods: In this retrospective cohort study, the authors analyzed patients who underwent extended endoscopic endonasal surgery for TSM between January 2005 and April 2022 at the Division of Neurosurgery, Università degli Studi di Napoli Federico II, Naples, Italy. Tumor size, vessel encasement, and optic canal involvement were classified according to University of California, San Francisco, score. Visual acuity and visual fields were analyzed according to the visual impairment score (VIS), defined as a four-level classification: grade 1 (VIS 0-25), grade 2 (VIS 26-50), grade 3 (VIS 51-75), and grade 4 (VIS 76-100). Ophthalmological functions were tested preoperatively and during the early postoperative period (within 6 months after surgery) and late postoperative period.

Results: A total of 48 patients were enrolled. Forty-one (85.4%) patients experienced blurred vision or visual field defect as a presenting sign. Gross-total resection was achieved in 40 (83.3%), near-total resection in 2 (4.2%), and subtotal resection in 6 (12.5%). Visual defect improved in 82.9% (34/41) of cases, 12.2% (5/41) had no significant changes, and 2.4% (1/41) had worsened visual defect. The mean change in VIS was 42% (95% CI 58.77-31.23). Visual outcome was poorer when preoperative

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VIS (VIS-pre) was greater than 25 ($p = 0.02$). Six postoperative CSF leaks occurred (12.5%), and 1 patient (2.1%) required revision surgery.

Conclusions: The EEA is a safe and effective approach for TSM removal, with the advantage of preserving optic apparatus vascularization, and can promote gross-total resection and visual improvement. The authors have defined four categories based on VIS that relate to postoperative outcome: the lower the VIS-pre, the higher the rate of postoperative VIS improvement. This finding may be useful for predicting a patient's visual outcome at the preoperative stage.



6786

MANAGEMENT AND TREATMENT OF HIGH-FLOW CEREBROSPINAL FLUID FISTULAS IN PEDIATRIC PATIENTS

Flavia Maesa, Federica Ferri, Martina Zonca, Ettore Lupi, Filippo Giovannetti, Paolo Priore, Valentino Valentini

Introduction (Background & Aim) Paediatric middle skull base reconstruction after endoscopic endonasal surgery represents a significant surgical challenge, particularly in the presence of high-flow cerebrospinal fluid (CSF) leaks and age-related anatomical constraints. The primary aim of this study was to analyse reconstructive techniques, surgical outcomes, and complication rates in a paediatric population undergoing endoscopic middle skull base reconstruction for grade 2–3 CSF leaks.

Materials & Methods A retrospective review was conducted of paediatric patients (<8 years) who underwent endoscopic endonasal middle skull base reconstruction at Anna Meyer Children's Hospital between January 2013 and December 2021. Inclusion criteria comprised grade 2 or 3 CSF leaks, complete clinical and radiological documentation, and a minimum follow-up of 12 months. Collected data included demographics, aetiology, surgical approach, CSF leak grade, reconstruction technique, lumbar drain (LD) use, postoperative complications, and sequelae. CSF leaks were graded according to the Esposito and Conger classification systems. Reconstruction techniques included the multilayer technique (MT), Gasket Seal technique (GST), single nasoseptal flap (NSF), and heterologous reconstruction using bovine pericardium. Statistical analysis was performed using SPSS version 27.0.

Results Forty-nine patients met the inclusion criteria (mean age 11.5 years; range 9 months–18 years). Craniopharyngioma was the most common diagnosis (73.5%), followed by clival chordoma (8.2%). Eleven patients (22.4%) presented with grade 2 CSF leaks and 38 (77.6%) with grade 3 leaks. MT was performed in 36.7% of cases, GST in 24.5%, and single NSF in 38.8%. LD was used in 5.2% of patients. Major postoperative complications occurred in 7.6% of cases, including CSF leak (2.5%), brain abscess (1.2%), and diabetes insipidus (3.5%). Minor complications were rare. Independent t-test analysis revealed no statistically significant differences in complication rates among reconstruction techniques ($p >$

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0.05). No donor-site morbidity was observed. The overall success rate of reconstruction ranged from 96.5% to 100%, with a mean hospital stay of 6.5 days.

Conclusions Endoscopic endonasal middle skull base reconstruction in paediatric patients is safe and effective, even in the presence of high-flow CSF leaks. Autologous multilayer techniques are recommended for extensive defects, whereas simpler reconstructions are sufficient for limited resections. These procedures should be performed in specialised tertiary referral centres with multidisciplinary expertise.



6788

ARTIFICIAL INTELLIGENCE-ASSISTED SVM MODELS FOR PREDICTING SHORT-TERM POSTOPERATIVE OUTCOMES IN ALLERGIC FUNGAL RHINOSINUSITIS.

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Objectives: In spite of maximal medical treatment, disease control in Allergic Fungal Rhinosinusitis (AFRS) may be very challenging, although surgery is an undoubted treatment step. AI advances have led to tools that enhance predictive capabilities. The aim of the study was to evaluate support vector machine (SVM) models' prediction of 3-month postoperative outcomes in AFRS patients using standard preoperative data.

Methods: In this prospective observational study, we analyzed 53 patients with AFRS and aged under 75 years who underwent Functional endoscopic sinus surgery (FESS) in 2025. Preoperative demographic and clinical data, including age, sex, Lund-Mackay score, baseline SNOT-22 score, eosinophil count, and serum IgE levels were used to predict SNOT-22 and Lund-Kennedy scores after 3 months. Five SVM and multilayer perceptron (MLP) regression models were developed using a standardized machine-learning pipeline with z-score normalization, and a random 80/20 train-test dataset split. Given the limited sample size, model performance was evaluated using stratified five-fold cross-validation and held-out testing to reduce optimistic bias. We reported predictive performance as MSE, MAE, and R² on both training and test datasets.

Results: Classical regression models showed limited generalizability for both Lund-Kennedy and SNOT-22 scores, with test R² values at or below zero. Incorporation of deep representation learning substantially enhanced prediction of Lund-Kennedy scores, with autoencoder-derived features achieving a test R² of 0.66 and a mean absolute error of approximately 0.5. In contrast, predictive accuracy for SNOT-22 remained consistently low across all models, suggesting that this patient-reported outcome is predominantly influenced by factors beyond the measured clinical and laboratory variables.

Conclusion: Our results show both the potential and the limits of SVM and MLP-driven tools in predicting AFRS surgery outcomes. They also

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emphasize the need for larger datasets, further model enhancements,
and richer data types such as endoscopic and radiologic data.



6789

ENDOSCOPIC ENDONASAL TRANSLIVAL APPROACH FOR THE RESECTION OF A VENTRAL PONTINE CAVERNOUS MALFORMATION: ILLUSTRATIVE CASE

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Background: Brainstem cavernous malformations (BSCMs) are rare vascular lesions, most frequently located in the pons. Their surgical management is particularly demanding due to the dense concentration within the brainstem of eloquent neural pathways and nuclei. Among various surgical routes, the endoscopic endonasal translival approach (EETA) has been established as a valuable option for treating selected ventrally located lesions.

Case Study: The authors report the case of a 54-year-old woman with a ventral pontine cavernous malformation (CM) presenting with recurrent hemorrhagic episodes, all resolving without neurological sequelae. Based on the anterior midline location of the lesion within the pons and the posterolateral displacement of the corticospinal tracts (CSTs) on preoperative tractography, an EETA was deemed the most suitable approach. Gross-total removal was achieved without neurological worsening or postoperative CSF leakage.

Conclusions: This case supports the use of EETA as a safe and effective surgical route for ventral pontine CMs with anterior surface presentation. Accurate preoperative planning, including assessment of CST displacement via diffusion tensor imaging, and direct intraoperative cortical stimulation are essential for identifying a safe entry point. Although technically demanding and not universally applicable, EETA offers a direct surgical corridor that minimizes neurovascular manipulation and facilitates favorable outcomes in selected cases.

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6791

ENDOSCOPIC CONTROLLED RESSECTION OF PINEAL TUMOUR

Kwan Ho Chow¹

¹

Pineal region had been deep seated region with critical structures multiple critical structures. This had been a surgical challenge for neurosurgeons. With advance in application of neuroendoscopy in intracranial use, the enhanced visualization had allowed improved surgical approach for pathologies at the pineal region. This presentation would describe the surgical approach to pineal region lesion. A 23 year old gentlemen present with a pineal region mass with evidence of enlargement. With negative tumour marker, patient was indicated for open surgery. A supracerebellar infratentorial surgical approach under endoscope control. The surgical nuance will be described and discussed in detail. Gross total excision was performed and the patient had no new neurological deficits. The pathological study revealed the lesion was a mature teratoma. Application of endoscope had allowed improved outcome for surgery in the pineal region.



6792

RECONSTRUCTION TECHNIQUES FOR NASAL SEPTAL PERFORATIONS USING PEDICLED FLAPS BASED ON THE ANTERIOR ETHMOIDAL ARTERY, SPHENOPALATINE ARTERY, AND COMBINED FLAPS: EXTENDED CLINICAL EXPERIENCE

Martina Zonca, Flavia Maesa

Introduction (Background & Aim) Nasal septal perforations (NSPs) are defects of the nasal septum caused by loss of mucoperichondrium or mucoperiosteum with subsequent cartilage or bone resorption. Symptomatic NSPs may result in crusting, epistaxis, nasal obstruction, whistling, and aesthetic deformities, significantly affecting quality of life. While conservative treatments may alleviate symptoms, surgical repair remains the definitive management. The advent of endoscopic techniques and vascularized pedicled flaps has improved closure rates and reduced morbidity. The aim of this study is to present our extended clinical experience with endoscopic reconstruction of NSPs using pedicled flaps based on the anterior ethmoidal artery (AEA), sphenopalatine artery (SPA), and combined AEA+SPA flaps, and to discuss flap selection based on defect characteristics.

Materials & Methods A retrospective review was conducted on 12 consecutive patients (8 females, 4 males; age range 35–60 years) with symptomatic NSPs refractory to conservative treatment, treated between January 2022 and December 2024 at a tertiary referral center. All patients underwent endoscopic repair under general anesthesia. Flap selection was tailored according to perforation size and location: AEA flap for anterior perforations ($n = 7$), SPA flap for posterior perforations ($n = 2$), and combined AEA+SPA flap for small anterior perforations ($n = 3$). Bilateral silicone nasal splints were maintained for 3–4 weeks postoperatively. Patients were followed at 1, 3, 6, and 12 months to assess closure, healing, and symptom resolution.

Results Complete closure of the septal perforation was achieved in 9 patients (75%). Three patients had small residual defects (<0.5 cm) but experienced significant symptomatic improvement, including resolution of crusting, epistaxis, and whistling. No major complications, such as flap necrosis, infection, or hematoma, were observed. Outcomes remained stable throughout a mean follow-up of 12 months.

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Conclusions Endoscopic reconstruction of NSPs using pedicled flaps based on the AEA, SPA, or their combination is a safe, reliable, and versatile surgical strategy. Careful, individualized flap selection according to perforation size and location is essential to achieve tension-free closure and durable results. These techniques provide high rates of functional improvement with minimal morbidity, supporting their role as a preferred approach in the management of complex nasal septal perforations.



6797

OPTIMIZED SELLAR RECONSTRUCTION STRATEGY FOR ENDOSCOPIC ENDONASAL APPROACHES: EXPERIENCE OF A TERTIARY CENTER IN GREECE

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Introduction: The endoscopic endonasal approach is used for sellar tumor resection, but cerebrospinal fluid (CSF) leak remains a challenge. **Methods:** A retrospective review was conducted using data from our institutional database of endoscopic endonasal transsphenoidal procedures from July 2019 to December 2025. A total of 296 procedures were performed for sellar pathologies, including pituitary adenomas, Rathke's cysts, craniopharyngiomas and others. Intraoperative CSF leaks were classified by severity: Grade 0 (no leak), Grade 1 (small leak without obvious diaphragmatic defect, "weeping diaphragm"), Grade 2 (moderate leak) and Grade 3 (large diaphragmatic defect). For Grade 0 human fibrinogen-thrombin patch (Tachosil®) is routinely used. For Grade 1, fat and fascia lata (abdominal and allogenic or autologous), and fibrin glue were added. For Grade 2, a vascularized nasoseptal flap or free mucosal flap (via middle turbinectomy) was added. In Grade 3, lumbar drainage (LD) was employed as an additional part of reconstruction.

Results: Twenty-three patients needed sellar reconstruction for CSF leak prevention. These consisted of 3 cases with anticipated CSF leak due to intradural pathology (2 Craniopharyngiomas, 1 Epidermoid cyst), 2 cases of CSF leaks in prolactinomas after dopamine agonist treatment and 18 intrasellar pathologies (16 macroadenomas, 1 Rathke's cyst and 1 giant adenoma). No postoperative repair failures or pneumocephalus were noted. Four out of seven patients, who had Grade 3 leaks and had LD inserted, developed bacterial meningitis postoperatively.

Conclusions: Our algorithm for sellar reconstruction has yielded positive results, however, insertion of LD should be reconsidered due to its potential role in meningitis.



6798

SINONASAL MALIGNANT MELANOMAS - SURGICAL OUTCOMES AND ONGOING CHALLENGES

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Sinonasal malignant melanomas are rare tumors that may affect the nose and sinuses. The most common occurrence of malignant melanomas is on the skin, due to frequent exposure to the sun and UV radiations. The first case of melanoma situated in the nasal mucosa was reported by Lucke in 1869, with the etiology being unclear (possible occupational exposure to formaldehyde). Diagnosis is often delayed because of the insidious symptoms and the advanced disease in the moment of presentation at the hospital.

Material and Methods This paper aims to discuss a series of cases of sinonasal malignant melanomas, where a surgical approach was used, custom-tailored to each case. In all cases the tumor was completely removed, but the type of intervention was adapted to the particularities of each case, taking into account the extension of the lesion and the local anatomy, especially in patients that were undergoing revision surgery. The result and the subsequent follow-up plan are presented and underlined.

Results Sinonasal melanomas are characterized by the tendency toward early local recurrences and local extension and the risk of frequent metastasis to lymph nodes and viscera. Another question that we must answer in managing these patients is if we are dealing with a primary or metastatic lesion. An open approach combined with endoscopic control was considered optimal, allowing the thorough control of the resection area. The complete evaluation of the patient by ENT complete examination, imagistic investigations (CT and MRI), a biopsy and an oncologic evaluation are mandatory before deciding the chosen therapy.

Conclusions The reported series consist of a small number of cases, so no real therapeutical protocol based on large cohorts is available. Surgery remains the first therapeutical option, with radiotherapy and chemotherapy reserved as adjuvant methods or for very advanced stages as palliation. An aggressive follow-up is crucial in diagnosing and treating promptly any possible recurrence.



6799

SINONASAL CHOLESTEATOMA: DIAGNOSTIC CHALLENGES AND CONTEMPORARY ENDOSCOPIC MANAGEMENT

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Introduction: Cholesteatoma is defined as the proliferation of keratinizing squamous epithelium in ectopic locations. Although it most commonly involves the middle ear, localization within the nasal cavity and paranasal sinuses is extremely rare. In these atypical sites, the lesion may demonstrate locally aggressive behavior, leading to progressive bone erosion and, in advanced cases, orbital or intracranial extension. Early clinical manifestations are usually nonspecific and frequently mimic common sinonasal conditions, resulting in delayed diagnosis and increased management complexity. Owing to its rarity, available data on sinonasal cholesteatoma remain limited, and standardized diagnostic and therapeutic strategies are still evolving. This study aims to summarize current knowledge regarding sinonasal cholesteatoma, focusing on epidemiology, pathogenesis, diagnostic evaluation, and contemporary surgical management.

Materials and Methods: A comprehensive review of the English-language literature was performed to identify all reported cases of cholesteatoma involving the nasal cavity and paranasal sinuses. Extracted data included patient demographics, presenting symptoms, radiologic findings, surgical approaches, histopathological confirmation, and postoperative outcomes. Particular emphasis was placed on the diagnostic contribution of high-resolution computed tomography and diffusion-weighted magnetic resonance imaging, which are essential for differentiating cholesteatoma from other destructive sinonasal lesions.

Results: By mid-December 2025, 51 cases of sinonasal cholesteatoma had been documented. The frontal sinus was the most frequently affected site, followed by the maxillary, ethmoid, and sphenoid sinuses. Patients typically presented with nasal obstruction, recurrent infections, or localized facial pressure, often leading to diagnostic delay. Computed tomography reliably demonstrated bony erosion and sinus expansion, while diffusion-weighted MRI provided superior soft-tissue characterization. Surgical excision remains the definitive treatment, with

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endoscopic approaches offering improved visualization and reduced morbidity. Recurrence may occur, particularly when epithelial remnants persist, and rare cases of associated squamous cell carcinoma have been reported.

Conclusion: Sinonasal cholesteatoma, although rare, requires early recognition and meticulous surgical management to prevent serious complications. Advances in imaging and endoscopic surgery have improved outcomes, while continued case reporting remains essential to refine management strategies and reduce recurrence.



6800

REVISION ENDONASAL FRONTAL SINUS SURGERY AFTER EXTERNAL (OPEN) ACCESS TREATMENT

Elizaveta Bolozneva¹, Sergey Karpishchenko¹

¹Other

Frontotomy is a challenging surgical task associated with the risk of recurrence inflammatory process in the frontal sinus after primary intervention in acute and chronic frontal sinusitis. Traditional external approach, along with the advantage of wide drainage of inflammatory exudate, has a significant disadvantage: the impossibility of adequate restoration of patency of the frontonasal communication without causing extensive surgical trauma to both the mucosa of the frontal sinus and the mucosa of the frontal-ethmoidal complex. These disadvantages of the external approach are successfully eliminated with an endoscopic approach to the frontal sinus. The possibilities of electromagnetic image guidance in conditions of altered anatomical landmarks after external access to the frontal sinus allow confidently carrying out endoscopic access to the frontal sinus to recreate frontal recess drainage function. An important aspect of success after endoscopic frontotomy, which makes it possible to reduce the risk of restenosis of the frontal recess in the long-term period, may be the technique of endoscopically assisted frontal recess care. In our series of clinical observations, there are 14 patients who underwent surgical treatment of the frontal sinus with external approach: 1 patient after failure frontal osteoma reduction, 1 patient with chronic frontitis recurrent after obliteration of the frontal sinus, 1 patient with Pott's tumor, 3 patients with frontal mucocele and 8 patients with chronic frontitis. All 14 patients underwent endoscopic treatment. Two patients required repeated endoscopic surgery, but they were all healthy at the last visit.



6803

POST-OPERATIVE SINONASAL FUNCTIONAL OUTCOMES IN TRANSNASAL ENDOSCOPIC SURGERY FOR SKULL BASE PATHOLOGY IN A TERTIARY REFERRAL CENTER.

Alessia Giorli¹

¹

Introduction: Over the last 20 years, transnasal endoscopic approach (TEA) has increasingly replaced traditional transcranial and craniofacial techniques for anterior skull base and pituitary pathologies, through collaboration between otolaryngologists and neurosurgeons. This approach provides a direct access, reducing postoperative morbidity and mortality. However, concerns remain regarding its impact on post-operative sinonasal function. Our main aim is to assess sinonasal outcomes of transnasal endoscopic surgery. Secondary objectives include evaluating relationships between functional outcomes, pathology type, and skull base reconstruction.

Material And Methods: This prospective study included 110 adults undergoing transnasal endoscopic surgery for skull base disease. Only 10% of patients had sinonasal inflammatory burden before surgery. Patients were evaluated preoperatively (T0) and at 1-2 months (T1) and 6-9 months (T2). Nasal function was measured using Lund-Kennedy score, VAS (nasal obstruction, rhinorrhea, facial pain, sleep, olfaction), SNOT-22, Sniffin' Sticks, and PNIF.

Results: At T1, nasal obstruction improved significantly ($p < 0.005$), with no change in olfaction, reduced facial pain, and slight improvement in sleep. At T2 significant improvements were observed in nasal patency (VAS and PNIF, $p < 0.001$) and olfactory function (Sniffin' Sticks, $p = 0.004$) at T2. Facial pain also improved significantly ($p = 0.003$), while positive changes in sleep quality, rhinorrhea, and other symptoms were not consistently significant. SNOT-22 globally improved at T2. No worsening of nasal functionality was observed. No long-term impairment of sinonasal function was reported even in extended approaches and/or major reconstructions (e.g. transturbeculum-transplanum approaches; nasoseptal flap).

Conclusions: Transnasal endoscopic surgery for skull base pathologies not only offers excellent results in terms of healing and disease control, but also allows a positive or neutral impact on sinonasal patency and

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quality of life, depending on the preoperative sinonasal conditions, confirming the importance of ENT-neurosurgeons cooperation in transnasal endoscopic skull base surgery.



6804

IMPROVED AND SUSTAINED EFFICACY: LONG-TERM COMPARATIVE OUTCOMES OF CORTICOSTEROID-ELUTING IMPLANTS VERSUS NO IMPLANTS FOLLOWING FUNCTIONAL ENDOSCOPIC SINUS SURGERY

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Introduction: This 2-part study aims to demonstrate Corticosteroid-Eluting Implants (CEI) placed following Functional Endoscopic Sinus Surgery (FESS) are associated with improved long-term post-operative outcomes compared to FESS-alone in chronic rhinosinusitis (CRS) patients.

Methods: In part 1, a European prospective registry (N=184) tracked SNOT-22, endoscopic gradings, and post-operative interventions through 12-months when CEIs were placed in the ethmoid sinus and/or frontal sinus ostium after FESS. The primary outcome (6-month SNOT-22 change) was compared to a performance goal (PG) derived from historical FESS-only studies. In part 2, this registry CEI-cohort outcomes will be compared to a FESS-alone control cohort, retrospectively identified from a multi-source database and well-balanced to the CEI-cohort in critical baseline covariates such as asthma/allergic rhinitis/prior FESS via Propensity Score (PS)-matching.

Results: The CEI-cohort achieved 6-month SNOT-22 change of -28.6 ± 19.6 , surpassing the FESS-alone PG of -17.4 ($p < 0.0001$). SNOT-22 improvements were sustained at 12-months (-29.0 ± 21.2). Endoscopic gradings also improved through 12-months, with low rates of post-operative interventions ($< 7\%$). PS-matching successfully established a FESS-alone control cohort well-balanced with CEI-cohort across all critical baseline covariates (Standard Mean Difference ≤ 0.2 for all, see attachment). This will allow for a well-controlled comparison of key outcomes, including SNOT-22 and post-FESS interventions (oral steroids, revision surgery or CRS biologics) through 12-months. The full cohort outcomes comparisons are ongoing, and results will be presented at the conference.

Conclusion: CEI placement after FESS provides significant and sustained improvement of SNOT-22 over PG historical control, along with excellent

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endoscopic outcomes and a low need for post-FESS interventions over 12-months.



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ENDOSCOPIC VERSUS MICROSCOPIC TRANSSPHEOIDAL PITUITARY ADENOMA SURGERY

Daniel Marchi Kieling¹

¹Λοιπά

Endoscopic versus microscopic transsphenoidal pituitary adenoma surgery Daniel Marchi Kieling¹, Bruno Zilli Peroni¹, Rudolph Batista Arendt¹, Letícia Marchi Kieling, Paulo Mesquita Filho², Antônio Delacy³; Guilherme Gago⁴, Bernard Beraldin⁵ Federal University of Fronteira Sul - Passo Fundo Rio Grande do Sul² Department of Neurosurgery - Clinical Hospital of Passo Fundo³ Department of Neurosurgery - Hospital São José⁴ Department of Neurosurgery Université Laval - Quebec, Canada.⁴ Department of Otorhinolaryngology - Santa Casa POA

Introduction: Though transsphenoidal surgery is standard for pituitary adenomas, the superiority of ETSS versus MTSS regarding efficacy and safety remains debated.

Methods: A PubMed search (2014-2025) used the terms Pituitary Neoplasms, Endoscopic Transsphenoidal, Microscopic Transsphenoidal, and Meta-analysis. We included only meta-analyses comparing the pure endoscopic versus microsurgical techniques for pituitary adenomas, excluding endoscopic-assisted studies. We extracted and analyzed data on GTR, hormonal remission, visual outcomes, and complications to identify consensus.

Results: ETSS was frequently associated with higher resection rates. Almutairi et al. reported a pooled GTR of 74.0% for ETSS versus 66.4% for MTSS, while Gao et al. found 71.8% versus 58.0%, respectively. Regarding visual recovery, Yu et al. demonstrated higher improvement rates with ETSS (77%) compared to MTSS (50%). Safety profiles varied by complication type. Ammirati et al. identified a significantly higher vascular complication rate in ETSS (1.58%) compared to MTSS (0.50%). Conversely, Goudakos et al. found postoperative diabetes insipidus was lower in ETSS (15%) than MTSS (28%). Furthermore, Gao et al. reported reduced septal perforation rates for ETSS (2.1% vs 8.5%) and a shorter mean hospital stay (3.8 vs 6.3 days). Endoscopy was indicated for larger, voluminous, and invasive tumors, highlighting significant baseline heterogeneity compared to microsurgery.

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Conclusion: ETSS shows benefits in GTR, visual recovery, and hospital stay, but risks are higher. Selection depends on surgeon experience and tumor features.



6806

SINONASAL MALIGNANCY PRESENTING AS CHRONIC RHINOSINUSITIS WITH BILATERAL NASAL POLYPS, A CASE REPORT.

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Sinonasal malignancies typically present as a unilateral nasal mass, causing unilateral nasal obstruction .Rarely, a sinonasal tumour can mimic common inflammation and present as bilateral benign nasal polyps . Aim of this case report is to present a patient with bilateral inflammatory nasal polyps ,with an underlying malignancy of the maxillary antrum.

Case report A 53 year old man presented with a 8 month onset of bilateral nasal obstruction, and nasal secretions .Endoscopy of the nose revealed bilateral nasal polyps ,and computed tomography scan showed total opacification of the maxillary ,the ethmoid sinuses, the nasal cavities bilaterally and of the right frontal sinus. The patient was initially treated with antibiotics and nasal steroids , which resulted in minimal improvement of nasal obstruction .Therefore ,as symptoms persisted, a decision was made for endoscopic sinus surgery. Intraoperatively and after an uneventful operation of the right side ,antroscopy of the left side revealed a lesion in the right maxillary sinus, that was not a simple polyp, but a highly vascular tumor. Histology revealed squamous cell carcinoma of the left maxillary sinus.

Conclusions : Bilateral presentation of benign nasal polyps does not preclude the presence of a sinonasal malignancy . Obstruction due to malignant nasal tumor, can initiate inflammation , which can explain the presence of bilateral inflammatory nasal polyps. It is also possible that chronic rhinosinusitis with nasal polyps and sinonasal malignancy can coexist. Intraoperative features of the tumor are important in order to raise the suspicion for the presence of malignancy. Surgical management and histology is essential for the correct diagnosis and treatment of persistent bilateral nasal polyps.



6808

OCCULT LYMPH NODE METASTASES IN SINONASAL CARCINOMAS: IMPACT ON OUTCOME AND THE ROLE OF ELECTIVE NECK DISSECTION

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Introduction: Management of the clinically node-negative (cN0) neck remains controversial in head and neck oncology. While elective neck dissection (END) is commonly performed in many head and neck malignancies, evidence-based recommendations are lacking for rare sinonasal carcinomas. The present multicenter study aimed to determine the prevalence of occult cervical lymph node metastases in sinonasal carcinomas and to assess the impact of END on recurrence and survival outcomes.

Materials and Methods: A retrospective multicenter cohort study was conducted including patients with histologically confirmed sinonasal carcinomas treated between 2012 and 2022. Demographic, clinical, pathological, and therapeutic parameters were systematically collected. All treatment decisions, including the indication for END, were based on recommendations from interdisciplinary head and neck tumor boards. Occult lymph node metastasis was defined as histopathological nodal involvement in patients staged cN0 by pretherapeutic imaging.

Results: In total, 490 patients with a mean age of 61 years were included. Occult lymph node metastases were detected in 6.2% of patients with radiologically cN0 necks. END was performed in 22% of cases. Among all evaluated pretherapeutic factors, only squamous cell carcinoma histology was significantly associated with the presence of occult nodal disease (odds ratio 6.644; $p = 0.002$). Patients with occult lymph node metastases showed a significantly reduced five-year disease-free survival compared to patients without nodal involvement ($p < 0.001$).

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Conclusions: Occult cervical lymph node metastases occur in a relatively small proportion of patients with sinonasal carcinomas; however, their presence is associated with significantly impaired disease-free survival. These findings do not support routine elective neck dissection in all cN0 sinonasal carcinoma patients. Risk-adapted strategies, including consideration of sentinel lymph node biopsy, may be particularly relevant in patients with squamous cell carcinoma histology



6809

COMPARISON OF SUBJECTIVE AND OBJECTIVE OLFACTORY ASSESSMENT TOOLS AFTER ENDOSCOPIC SKULL BASE SURGERY

Vinicius Ferreira¹, Dino Perez¹, Letícia Sayuri Yada, Ricardo Landini Dolci¹

¹Other

Introduction: Olfactory dysfunction (OD) is a potential condition following endoscopic skull base surgery (ESBS) and it is associated with impaired quality of life. The objectives of this study was 1) to determine the correlation between the self-assessment tool, the Visual Analog Scale (VAS) for olfaction, and the psychophysical Connecticut Chemosensory Clinical Research Center (CCCRC) test and 2) to analyze the chronological evolution of olfaction in patients undergoing ESBS;

Methods: This study evaluated patients underwent ESBS at a tertiary center between January 2021 - July 2025. Olfactory function was assessed preoperatively and at postoperative time points of 1, 3, and 6 months. Assessment instruments included the Visual Analog Scale (VAS) for olfaction, the Sinonasal Outcome Test-22 (SNOT-22), and the CCCRC test.

Results: A total of 72 patients (mean age 50.2 ± 1.5 y) were included. The most prevalent condition and surgical access were, respectively, pituitary macroadenoma ($n = 39$, 54%) and the transsphenoidal approach ($n = 52$, 72%). A strong inverse correlation was observed between the VAS and CCCRC scores ($r = -0.702$, Spearman, $p < 0.01$) across all assessment periods, and a moderate correlation was found between the CCCRC and Item 21 of the SNOT-22 ($r = -0.499$, Spearman, $p < 0.01$). In the chronological analysis, there was a significant impairment in the mean CCCRC test value at one month post-ESBS (5.18 vs 3.17, $p < 0.001$), followed by recovery at six months (5.18 vs 5.12, $p = 0.650$), with values returning to preoperative baseline status.

Conclusion: The olfactory VAS demonstrated a strong correlation with the CCCRC test and a moderate correlation with Item 21 of the SNOT-22 questionnaire. ESBS was associated with an transient olfactory deterioration in the immediate postoperative period, followed by recovery to baseline levels at six months.

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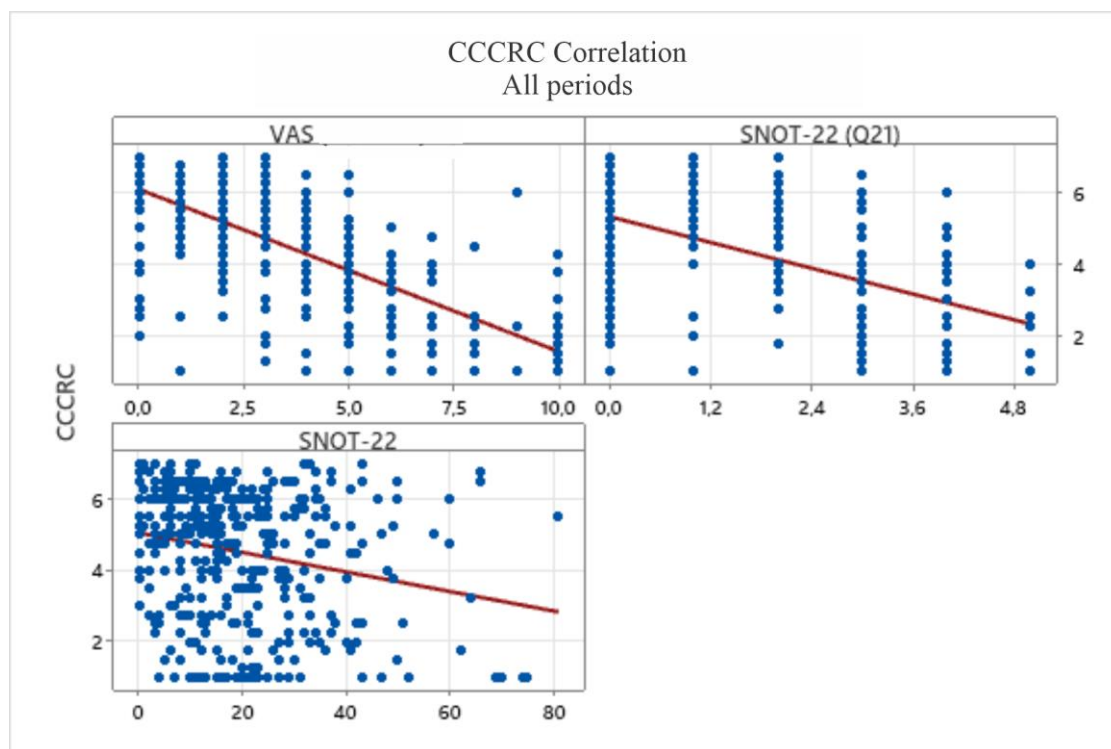
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6810

ENDOSCOPIC REPAIR OF POSTOPERATIVE ANTERIOR SKULL ENCEPHALOCELE WITH PERSISTENT PNEUMOCEPHALUS IN A VENTRICULOPERITONEAL-SHUNTED PATIENT

Duffy¹

¹

Introduction: Our aim is to describe the diagnostic challenge and successful surgical management of a 61-year-old female patient who presented severe spontaneous intraventricular pneumocephalus after three months of ventriculoperitoneal shunt placement for hydrocephalus associated with neurologic progressive deterioration. **Materials and methods:** A 61-year-old female with a history of anterior right side skull base meningioma excision developed hydrocephalus three months postoperatively and treated with VP shunt placement. Initially, improvement was noted, but three months later, the patient was admitted to the neurosurgery department of our hospital due to altered mental status and headache while CT scan confirmed persistent pneumocephalus. Next, we were contacted to evaluate the patient. Clinical examination did not reveal active CSF leak and fine cut brain and sinus CT-scan was not indicative of any skull base defect, but demonstrated a notable feature of opacified ethmoid cells with air bubbles on the right side. Given the persistent and worsening symptoms, surgical intervention was planned. Preoperative intrathecal fluorescein administration did not reveal active leakage but endoscopic sinus surgery revealed a small bony defect and herniated brain tissue, suggestive of an encephalocele at the suspected region of the cribriform plate. The defect was repaired using a multilayer closure with pedicle mucosal graft, and fibrin sealant. **Results:** The patient had an uneventful postoperative recovery with resolution of symptoms gradually. Follow-up imaging at 2 months postoperative demonstrated resolution of pneumocephalus and absence of any related symptoms. **Conclusion:** Persistent pneumocephalus following VP shunting in patients with previous anterior skull base surgery should prompt evaluation for an "occult" skull base defect, even in the absence of active CSF leakage on clinical or intraoperative fluorescein assessment, as over-drainage of CSF through the shunt could create negative intracranial pressure,

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predisposing to entrance of air through the skull base defect, a phenomenon described as "siphon effect" in the literature. Endoscopic transnasal repair offers a minimally invasive and effective approach for definitive closure of skull base defects.



6811

COMBINED RAMAN-FLUORESCENCE SPECTROSCOPY FOR INTRAOPERATIVE IDENTIFICATION OF PITUITARY ADENOMA

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Introduction (Background & Aim): Differentiating pituitary adenomas from healthy glandular tissue and nearby anatomical structures remains a significant surgical challenge. Reliable intraoperative tissue identification is essential for maximizing tumor removal, achieving hormonal remission, and safeguarding pituitary function. Following our earlier preclinical work validating a bayonet-style endonasal Raman probe, this study assessed a combined Raman spectroscopy and tissue fluorescence system for ex-vivo differentiation of pituitary adenoma, normal gland, and adjacent sellar tissues.

Materials & Methods: We conducted a prospective study involving 32 patients undergoing transsphenoidal adenoma resection. Raman spectroscopy and near-infrared fluorescence data were collected ex vivo from resected tissue specimens during surgery. A limited number of spectra were obtained from normal gland. Histopathological analysis served as the gold-standard. Fluorescence intensity values were normalized for integration time and compared statistically between tissue types. Spectral angular mapping (SAM) was applied to standard-normal-variate (SNV)-normalized Raman spectra for tissue classification. **Results:** 502 spectra were analyzed. Both pituitary gland and adenoma showed higher fluorescence than surrounding tissues. Fluorescence alone achieved an AUC of 0.90, with 86% accuracy, 88% sensitivity, and 86% specificity for adenoma detection. Raman spectroscopy analyzed using the SAM metric provided complementary biochemical contrast (87% accuracy, 76% sensitivity, 96% specificity). A two-stage approach,

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combining fluorescence preselection with Raman classification, improved discrimination between normal gland and adenoma: 94.5% sensitivity, 85.7% specificity.

Conclusions: Combined Raman spectroscopy and tissue fluorescence allow label-free differentiation of pituitary adenoma from normal gland and surrounding structures in ex-vivo human tissue. These results demonstrate the potential of optical guidance for pituitary surgery, with further validation underway through ongoing in vivo clinical trials.



6814

COMPUTED TOMOGRAPHY-BASED MORPHOMETRIC ANALYSIS OF THE OCCIPITAL CONDYLE FOR ENDOSCOPIC ENDONASAL CVJ APPROACHES

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Background Endoscopic endonasal approaches to the craniovertebral junction (CVJ) require precise anatomical knowledge of the occipital condyles, which define the inferior and lateral limits of the surgical corridor. However, population-specific morphometric data and the influence of age-related variation on these structures remain insufficiently characterized.

Objective: To provide radiological morphometric reference data of the occipital condyles relevant to endoscopic endonasal CVJ approaches and to evaluate side-to-side asymmetry and age-related anatomical variation.

Methods: Fine-cut computed tomography angiography scans of 100 neurologically normal adults were retrospectively analyzed using bone window settings. Measurements included anterior and posterior intercondylar distances, condylar length, width, height, and basion-anterior condylar tip distances bilaterally. Statistical analysis assessed right-left asymmetry and correlations between morphometric parameters and age.

Results: The mean anterior intercondylar distance was 15.29 ± 2.99 mm, with a significant side-to-side difference ($p < 0.001$). Condylar length and height demonstrated significant asymmetry, whereas condylar width and basion-anterior condylar tip distances were bilaterally symmetric. Increasing age was associated with a reduction in intercondylar distances and basion-condylar tip measurements, while condylar width and height showed a positive correlation with age ($p < 0.01$) (Table 1).

Conclusion: This study provides normative morphometric data of the occipital condyles that are directly relevant to endoscopic endonasal CVJ approaches. The observed anatomical variability and age-related changes suggest that surgical corridors at the craniovertebral junction are not uniform and should be individually assessed during preoperative planning to optimize surgical exposure and safety.



6815

OUTCOMES OF SURGICAL MANAGEMENT IN TRAUMATIC FACIAL NERVE PARALYSIS PRESENTATION OF TWO COMPLEX TEMPORAL BONE FRACTURE CASES

Duffy¹

¹

Introduction: Facial nerve paralysis secondary to temporal bone fractures represents a severe and potentially debilitating consequence of high-energy trauma. Early identification and appropriate surgical management can influence long-term outcomes, although recovery remains highly variable. We present two complex cases of polytrauma patients with temporal bone fractures who developed complete facial nerve paralysis, illustrating different injury patterns, surgical findings, and postoperative courses. Material and

Methods: Case 1: A 44-year-old woman involved in a motorcycle accident sustained multiple injuries including a temporal bone fracture. One week after admission and following extubation, she was found to have complete right-sided facial nerve paralysis (House-Brackmann VI). High-resolution CT showed a longitudinal comminuted petrous bone fracture without definitive imaging signs of facial nerve disruption. Pure tone audiometry revealed complete hearing loss on the affected side, while electroneurography demonstrated >90% degeneration. Two weeks post-injury, transmastoid exploration identified a bony fragment causing complete transection of the greater superficial petrosal nerve and compression along the tympanic and mastoid facial nerve segments. Decompression was performed. Case 2: A 47-year-old who fell from a first floor building was rushed to the emergency department with right-sided temporal bone trauma, multiple rib fractures, and fractures of the hand and leg presented with complete facial nerve paralysis (House Brackmann VI) and ipsilateral right vocal cord paralysis. Main radiologic findings after temporal bone computed tomography included mixed temporal bone fractures and ossicular chain disruption on the right side. Audiometry demonstrated moderate mixed hearing loss, and electroneurography of the facial nerve showed >90% degeneration. Furthermore, his course was complicated by meningitis and pneumonia, delaying surgery. One month after injury, transmastoid exploration revealed near total axonotmesis (Sunderland grade IV) of the facial

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nerve at the second genu region. Repair of the transected nerve was performed by mobilizing the facial nerve parts, following fibrin adhesive coaptation technique.

Results: Case 1: Recovery was progressive, with initial signs of movement appearing within months. At 10 months, facial function improved to House–Brackmann III. Case 2: At 6 months postoperatively, no facial nerve recovery had been observed despite an uncomplicated postoperative course.

Conclusion: These two cases highlight the variability in facial nerve recovery following temporal bone trauma, even when electrodiagnostic findings and surgical intervention are carefully considered. Early surgical exploration may contribute to meaningful recovery in selected patients, as demonstrated in Case 1. However, extensive nerve damage and delays caused by systemic complications may limit functional restoration, as observed in Case 2. Ongoing long-term follow-up is essential for assessing recovery potential. Investigation is still required in order to develop algorithms who will facilitate the optimal time for surgical intervention.



6816

COMPARATIVE SURGICAL ANATOMY OF THE SPHENOID SINUS IN GROWTH HORMONE-SECRETING PITUITARY NEUROENDOCRINE TUMORS

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Background Growing literature showed that growth hormone secreting pituitary neuroendocrine tumors (GH-PitNETs) are associated with bone remodeling and may influence sphenoid sinus pneumatization. To date, the morphometric relevant to endoscopic skull base surgery remain insufficiently defined. We aimed to compare sphenoid sinus pneumatization patterns and adjacent neurovascular relationships in cadaveric specimens and patients with GH-PitNETs.

Methods Seventeen GH adenoma patients and 17 adult cadavers were evaluated using fine-cut coronal maxillofacial CT. Pneumatization type (I-III) and related morphometric parameters including foramen rotundum (FR) and vidian canal (VC) diameters, FR-midline distance, VC-midline distance, and FR-VC interval were measured bilaterally. Sella depth and anteroposterior length were also assessed. Statistical analysis was performed using SPSS 26; significance was set at $p < 0.05$.

Results Pneumatization types were evenly distributed (Type I-III) on both sides in cadavers and similarly balanced among patients. FR and VC diameters did not differ across pneumatization types or between groups. In Type III sinuses, both FR-midline distance and the direct FR-VC interval were significantly longer than in Types I and II ($p < 0.05$), a pattern observed consistently in both patients and cadavers. VC-midline distance remained stable across all groups. Sella depth and anteroposterior length were significantly greater in patients than in cadavers ($p < 0.05$), independent of pneumatization type, and correlated positively with lesion size suggesting tumor-related remodeling. IGF-1 levels and disease duration were not associated with any morphometric parameter. Notably, all three patients with CSF leakage had Type III pneumatization.

Conclusion Type III sphenoid pneumatization is associated with lateralization of the FR and widening of the FR-VC interval, irrespective of clinical or cadaveric status. While pneumatization does not alter VC

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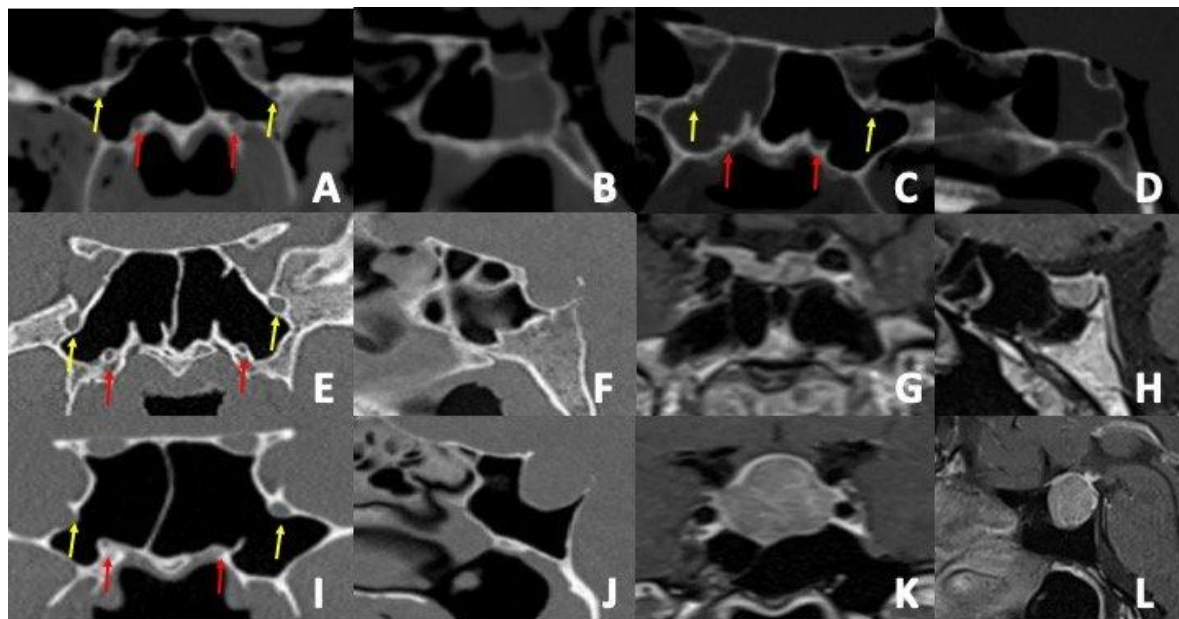


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position, it defines a more complex surgical corridor. GH adenomas appear to remodel sella morphology but not sinus-related morphometry. Type III anatomy may predispose to CSF leakage, as all observed leaks occurred in this group.





6817

THE ENDOSCOPIC UNILATERAL TRANSETHMOID-PARASEPTAL APPROACH TO THE CENTRAL SKULL BASE

Eördögh Marlon¹, Hans Rudolf Briner¹

¹

Objectives: Endoscopic transnasal skull base surgery provides excellent visualization and unrestricted instrument maneuverability; however, approach-related sinonasal injury may negatively affect patients' quality of life (QOL). To reduce rhinological morbidity without compromising surgical access or extent of tumor resection, we implemented a unilateral transethmoid-paraseptal approach.

Material and methods: 42 consecutive patients underwent endoscopic skull base surgery using the unilateral transethmoid-paraseptal approach. Perioperative evaluation included neurological, radiological, endocrinological, ophthalmological, and rhinological assessments. Sinonasal QOL was assessed preoperatively, and at 1 month and 1 year postoperatively using the Sino-Nasal Outcome Test (SNOT-22).

Results: A unilateral transethmoid-paraseptal approach was successfully performed in all patients. Resection of the turbinates, posterior septal resection, or conversion to a biportal approach was not required in any case. No intraoperative neurovascular complications occurred. All patients demonstrated marked improvement in disease-related symptoms, supported by objective clinical findings. Gross total resection was intended in 39 cases and achieved in 31. SNOT-22 scores showed a transient deterioration at 1 month postoperatively, followed by a non-significant improvement at 1 year compared with baseline. A subgroup of seven patients with preoperative sinonasal disease exhibited a sustained and statistically significant improvement in SNOT-22 scores over time ($p < .05$). Olfactory screening revealed no significant differences across the evaluated time points.

Conclusion: The unilateral transethmoid-paraseptal approach enables safe and effective access to the central skull base while preserving sinonasal structures and minimizing long-term rhinological morbidity, without limiting surgical exposure or tumor resection.



6818

OLFACTORY OUTCOMES AND QUALITY OF LIFE FOLLOWING ENDOSCOPIC REPAIR OF OLFACTORY FISSURE CSF LEAKS: NASOSEPTAL FLAP VERSUS FREE GRAFT

Gulpembe Bozkurt¹

¹

Background: Repairing cerebrospinal fluid (CSF) leaks in the olfactory fissure presents a challenge in balancing successful closure with the preservation of olfactory function. While both vascularized nasoseptal flaps and synthetic grafts are utilized, their comparative impact on long-term olfactory outcomes remains debated. This study aimed to compare the efficacy and olfactory morbidity of flap versus graft repair techniques.

Methods: We retrospectively analyzed 36 patients undergoing endoscopic repair for olfactory fissure CSF leaks between 2020 and 2024. Patients were stratified into two groups: those repaired with a nasoseptal flap (n=25) and those with graft (n=11). Outcomes were assessed using the "Sniffin' Sticks" test for olfactory Identification, Discrimination, and Threshold, as well as the SNOT-22 quality-of-life survey. Data were collected preoperatively and at 1, 6, and 12 months postoperatively and analyzed in R.

Results: Baseline demographics were comparable, though traumatic etiology was significantly more frequent in the graft group ($p=0.042$). Both techniques successfully resolved leaks with minimal complications (Flap 8.0% vs. Graft 0%; $p>0.9$). Regarding olfactory function, the flap group demonstrated superior preservation of olfactory sensitivity. Specifically, the change in Threshold scores from preoperative baseline to 12 months was significantly better in the flap group (mean change -0.2 ± 2.3) compared to the graft group, which experienced a notable decline (-1.9 ± 1.9 ; $p=0.032$). Changes in Identification and Discrimination scores were not statistically different between groups. Both cohorts achieved significant improvements in SNOT-22 scores (-12.9 vs. -17.0), with no significant difference in quality-of-life gains ($p=0.50$).

Conclusion: Both nasoseptal flaps and synthetic grafts are effective for repairing olfactory fissure leaks and improving patient quality of life. However, the nasoseptal flap appears to offer superior preservation of olfactory threshold function at one year compared to graft repair. These

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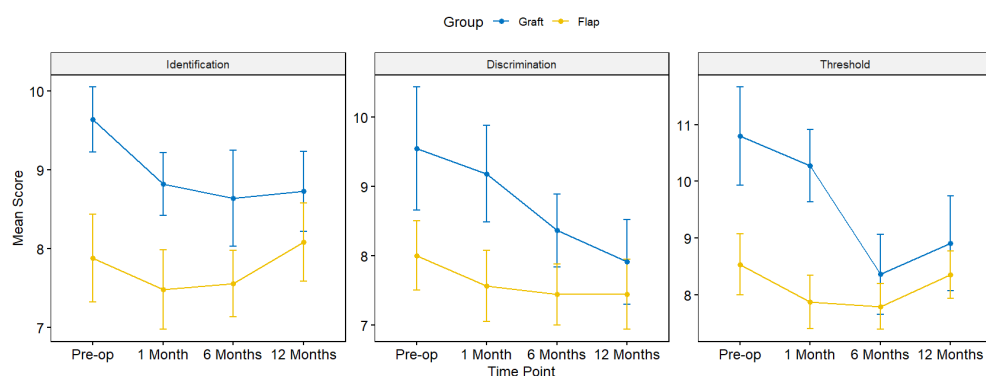


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findings suggest that the use of a vascularized flap does not compromise olfactory outcomes and may be preferable for preserving sensory threshold.



Recovery of Olfactory Functions Over Time





6820

NONFUNCTIONAL CORTICOTROPH-LINEAGE PITNETS: INCIDENCE AND SURGICAL CHARACTERISTICS IN GIANT AND EXTREMELY GIANT PITUITARY ADENOMAS

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Background Under the WHO 2022 classification, pituitary adenomas are designated as pituitary neuroendocrine tumors (PitNETs) and categorized according to cell lineage using pituitary transcription factors. Corticotroph-lineage PitNETs, including clinically non-functioning silent corticotroph tumors and so-called "whispering" corticotroph tumors (subclinical Cushing disease), are increasingly recognized as biologically aggressive, often presenting with large size and invasive growth.

Methods A retrospective analysis was conducted of all 311 PitNET endoscopic surgical cases in 2024-2025 at Endonasal Skull base Dept., Romodanov Institute of Neurosurgery with focus on giant (>40 mm) and extremely giant (>60 mm) cohorts. Histopathological evaluation followed WHO 2022 criteria, with routine immunohistochemistry for pituitary hormones and transcription factors (T-PIT, PIT-1, SF-1) in all cases. Corticotroph-lineage PitNETs included both silent corticotroph tumors and whispering (subclinical Cushing disease) tumors. Tumor invasiveness, surgical peculiarities anatomy, and early postoperative outcomes were analyzed.

Results A total of 66 tumors (21,2%) met criteria for giant PitNETs, including 14 extremely giant tumors. 28 tumors (9 %) were classified as corticotroph-lineage PitNETs based on T-PIT expression. Corticotroph-lineage tumors demonstrated a strong association with large size: 21 of 28 cases (75%) occurred within the giant PitNET cohort. They accounted for 21 of 66 giant PitNETs (31,8%) and 5 of 14 extremely giant PitNETs (38 %). Characteristic surgical features included local skull base bone destruction in 70% of cases, cystic and apoplectic changes in 30%, extracapsular invasive growth in 55%, and direct intraventricular extension in 15%, frequently limiting the possibility of gross total resection.

Conclusions Non-active corticotroph-lineage PitNETs represent a disproportionately large fraction of giant and extremely giant PitNETs

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and exhibit invasive surgical anatomy. These tumors should be regarded as a high-risk subgroup, requiring multidisciplinary treatment and close postoperative surveillance.



6821

COST-EFFECTIVENESS OF CHITOGEL IN SEVERE BILATERAL CRS EARLY POSTOPERATIVE MANAGEMENT AFTER BILATERAL FULL-HOUSE FESS

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Background Early postoperative care following functional endoscopic sinus surgery (FESS) for chronic rhinosinusitis (CRS) is essential for optimising outcomes and reducing early morbidity. In the United Kingdom, various sinonasal dressings are used postoperatively, with SinuFoam being the most used at Aintree University Hospital, in Liverpool. Chitogel, a chitosan-based hydrogel, has recently emerged as a potential alternative, with proposed benefits in enhancing mucosal healing. This study aim is to evaluate Chitogel cost-effectiveness in improving early postoperative recovery, compared to Sinufoam, in patients with extensive bilateral CRS undergoing bilateral full-house FESS in a tertiary rhinology centre.

Materials And Methods A prospective clinical audit was conducted involving 40 consecutive patients with severe bilateral CRS (Lund-Mackay score >) undergoing bilateral full-house FESS. All patients received standard postoperative care with saline nasal irrigation and topical corticosteroids. Participants were randomly allocated to Chitogel or Sinufoam dressing cohorts. Patient-reported outcomes (SNOT-22) and clinician-reported outcomes (Lund-Kennedy and Perioperative Sinus Endoscopy scores) were collected at baseline (V0), three weeks (V1), and three months (V2) postoperatively. **RESULTS:** Preliminary data demonstrated improved early mucosal healing in the Chitogel cohort, reflected by reduced postoperative antibiotic and oral corticosteroid use, and fewer escalation in topical corticosteroid. No statistically significant differences were observed between groups in both patient- and clinician- reported outcome measures at V1 or V2. **Conclusion** Chitogel appeared to enhance early mucosal healing by reducing early postoperative complication rate. Its use may provide a more predictable mucosal recovery process and reduce unscheduled or additional follow-up, suggesting potential clinical and cost-effectiveness advantages.



6822

ENDOSCOPIC-ASSISTED TRANSORAL RESECTION OF PRESTYLOID PLEOMORPHIC ADENOMA: A CASE SERIES

Fatma Gülüm Bayraktar

Background: Pleomorphic adenomas arising in the prestyloid parapharyngeal space are uncommon and traditionally managed through external approaches such as transcervical or transparotid routes. While these approaches provide adequate exposure, they may be associated with cosmetic concerns and potential morbidity. Advances in endoscopic techniques have expanded the role of minimally invasive transoral approaches in selected cases. This study presents our experience with endoscopic-assisted transoral resection of prestyloid pleomorphic adenomas.

Methods: A retrospective review was performed of three patients diagnosed with prestyloid parapharyngeal space pleomorphic adenomas who underwent endoscopic-assisted transoral resection between [2020-2025]. All patients were evaluated preoperatively with magnetic resonance imaging to confirm tumor location and prestyloid compartment involvement. Surgical resection was performed via a transoral route under endoscopic visualization, allowing enhanced illumination and magnification. Demographic data, tumor characteristics, surgical outcomes, complications, and follow-up findings were analyzed.

Results: All three tumors were successfully resected using an endoscopic-assisted transoral approach without conversion to an external incision. Complete macroscopic excision was achieved in all cases. No intraoperative major vascular or neural complications were encountered. Postoperatively, no patients developed cranial nerve deficits, significant bleeding, or airway compromise. Oral intake was resumed early, and hospital stay was short in all cases. Histopathological examination confirmed pleomorphic adenoma in all patients. During a mean follow-up of [47] months, no evidence of tumor recurrence was observed.

Conclusion: Endoscopic-assisted transoral resection appears to be a feasible and safe minimally invasive option for selected prestyloid pleomorphic adenomas. This approach offers excellent visualization of the surgical field while avoiding external incisions and their associated

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morbidity. Careful patient selection and thorough preoperative imaging are essential. Larger studies with longer follow-up are required to further validate oncologic outcomes and define the role of this technique.



6825

LACRIMAL SULCUS AS ANATOMICAL LANDMARK FOR FRONTAL SINUSOTOMY

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Background Performing a safe endoscopic frontal sinusotomy can be very challenging in the presence of distorted anatomy (extensive nasal polyposis, neoplasms, or revision sinus surgery). Establishing a reliable, consistent endoscopic anatomical landmark would be helpful in those cases. The lacrimal sulcus (LS) is easy to define during ESS, located between the lacrimal and ethmoid bones. This study evaluates the reliability of the LS as a safe, consistent landmark, to direct the surgeon in the correct trajectory to the frontal infundibulum and away from the anterior skull base (ASB).

Methods Descriptive study of the LS as a novel landmark for frontal sinusotomy, with analysis of sagittal CT scans of 14 patients (28 sides). A radiologist and otolaryngologist identified a line representing the coronal plane of the LS, its intersection with the frontal infundibulum and its distance from ASB were determined. Interrater variability was assessed using intraclass correlation coefficient (ICC), and variability across sides and subjects were analyzed.

Results The LS, located posterior to the posterior lacrimal crest and the nasolacrimal duct, extends superiorly as an oblique line crossing the anterior aspects of the frontal sinus infundibulum. The average distance from the LS coronal plane to ASB at the frontal infundibulum was 11.1 mm (SD 1.97) on the right and 11.4 mm (SD 2.77) on the left, with no significant difference ($P = 0.236$). Subjects variability was significant on the left ($P = 0.008$). Interrater agreement was excellent (ICC 0.89-0.95; $P < 0.001$).

Conclusion The LS a reliable anatomical landmark. Its superior trajectory can be clearly visualized endoscopically and consistently directs the surgeon through the anterior half of the frontal infundibulum and away from the ASB during ESS.



6827

A RARE CASE OF SCC CONVERSION TO NEUROENDOCRINE UNDIFFERENTIATED CARCINOMA AFTER INDUCTION CHEMOTHERAPY AND CONCURRENT CRT

Despoina Giasirani, Dimitra Riga, Efthymios Koniaris

Introduction: Squamous cell carcinoma of the head and neck typically demonstrates predictable histopathological behaviour and transformation into a neuroendocrine undifferentiated carcinoma is exceedingly rare. Such transformation markedly alters prognosis, biological evolution and treatment strategy. We present a rare case of a T4aN0M0 that underwent neuroendocrine conversion after induction chemotherapy and concurrent CRT.

Case Study: The patient was initially examined due to unilateral nasal obstruction and bulging of the right nasal sidewall and radix region. Radiological investigation with CT and MRI revealed a mass in the right nasal cavity which occupied the right anterior and posterior ethmoid cells and eroded the medial wall of the maxillary sinus, the anterior wall of the right sphenoid sinus, the right nasal bone as well as the right frontal recess with partial extension into the right frontal sinus. A biopsy showed an HPV-related nonkeratinizing squamous cell carcinoma of the nasal cavity and with appropriate radiological investigation it was staged as a cT4aN0M0 SCC. The patient then received induction chemotherapy with partial response, followed by concurrent CRT. 3 months after the completion of CRT, imaging studies showed partial opacification of the right ethmoid cells and middle meatus and he was referred to our institution. Subsequently, ESS was performed with DRAF III and removal of the posterior 2/3 of the septum. The histologic report was negative for malignancy. 2 weeks after the operation the patient presented with a painful bulging of the right forehead region. New imaging studies showed partial opacification of the right frontal sinus with radiological signs mimicking a Pott's puffy tumor. The patient was again led to the OR for combined open and endoscopic approach. Histology revealed a high grade undifferentiated neuroendocrine carcinoma.

Conclusion: This case highlights the need for vigilance in patients with persistent or atypically evolving disease, even when interim histology appears negative. Early re-biopsy in the setting of clinical changes is

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essential, as histologic conversion -although rare- can significantly influence treatment strategy and prognosis



6828

INTRANEURAL THERMAL DYNAMICS DURING ENDOSCOPIC ENDONASAL OPTIC CANAL DECOMPRESSION: CADAVERIC MICROPROBE MONITORING AND TRANSLATIONAL HEAT-TRANSFER MODELING

Gago da Silva Guilherme¹

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Introduction Thermal injury is a recognized concern during drilling near cranial nerves. In endoscopic endonasal optic canal decompression, the magnitude and temporal profile of intraneural optic nerve heating remain poorly defined. Although irrigation is routinely employed, its quantitative protective effect and the translational relevance of cadaveric thermal measurements are not fully understood.

Methods Six cadaveric heads underwent standardized endoscopic endonasal optic canal drilling using a 3-mm diamond burr (75,000 rpm). Ultra-fine micro thermometer probes recorded intraneural temperature at pre foraminal, foraminal, and post foraminal optic nerve segments. Drilling was performed without irrigation (n = 3) or with continuous room-temperature saline irrigation (20 mL/min; n = 3). Outcomes included heating slope, peak temperature, cumulative exposure, and time to reach 43 °C. A simplified translational heat-transfer model incorporating optic canal geometry, perineural environment, and the absence of cerebrospinal fluid circulation and vascular perfusion in cadaveric conditions was used to estimate how conductive coupling, heating slopes, and time to reach injury-relevant temperatures may differ under in vivo physiological conditions.

Results Without irrigation, intraneural heating was segment-dependent, with the foraminal and post foraminal segments exhibiting the steepest slopes and reaching the 43 °C injury threshold within 6–48 s, whereas pre foraminal segments heated more slowly and inconsistently crossed this threshold. Corrected mean intraneural temperatures reached 35–40 °C, with peak values up to 86 °C during continuous drilling. Continuous irrigation maintained mean temperatures near baseline (~25 °C), prevented threshold crossing in all segments, and reduced heating slopes by approximately 60% (p < 0.001). Translational modeling predicted substantially stronger bone-to-nerve conductive coupling under in vivo conditions, suggesting that the time required to reach

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injury-relevant temperatures without irrigation may be several-fold shorter than observed in cadaveric settings.

Conclusion Intraneural microprobe monitoring demonstrates that high-speed optic canal drilling without irrigation can rapidly elevate optic nerve temperature, particularly in the foraminal and postforaminal segments, whereas continuous irrigation effectively suppresses intraneural heating. Translational heat-transfer modeling indicates that cadaveric conditions may underestimate early in vivo heating rates due to partial thermal insulation and absent physiological heat exchange. Together, these findings highlight a narrow temporal safety window during optic canal drilling and reinforce continuous irrigation as a critical protective measure.



6829

EFFECT OF BUPIVACAINE WITH EPINEPHRINE/TOPICAL VASOCONSTRICTOR INJECTION ON INTRAOPERATIVE BLEEDING DURING ENDOSCOPIC SINUS SURGERY: A DOUBLE-BLIND, RANDOMIZED CONTROLLED TRIAL

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Introduction: Endoscopic sinus surgery (ESS) is an increasingly utilized technique for managing a variety of sinonasal pathologies and for accessing skull base lesions. Among these, chronic rhinosinusitis (CRS) remains the most common indication. ESS is frequently performed alongside procedures such as nasal septoplasty. Despite advances in technique, intraoperative bleeding continues to pose a significant challenge, compromising surgical visibility and increasing the risk of complications and prolonged operative time. This study evaluates the effectiveness of submucosal injection of 0.25% bupivacaine with epinephrine in reducing intraoperative bleeding, total blood loss, and surgical duration, as compared to a sham injection during ESS.

Methods: This interim analysis includes the first 21 patients enrolled out of a planned total of 80 participants. Patients were randomized to receive either a submucosal injection of 0.25% bupivacaine with epinephrine or a sham injection during endoscopic sinus surgery (ESS). The primary outcome was intraoperative bleeding, assessed using the Boezaart bleeding score, evaluated separately for two surgical components: endoscopic septoplasty and ESS. Secondary outcomes included intraoperative mean arterial pressure, total blood loss, operative time, and postoperative pain. Due to the small sample size and the associated risk of type I errors, no formal hypothesis testing was performed. Continuous and ordinal data are reported descriptively as mean $\pm$ standard deviation (SD) or median [interquartile range, IQR], stratified by treatment group.

Results: Of 21 patients analyzed (10 Injection, 11 Sham), median Boezaart scores were lower in the Injection group for the nasal septum region (median 1.0 [IQR 0]) compared to Sham (2.3 [IQR 1.1]). Scores in the sinus region were also numerically lower in the Injection group (1.46 [IQR 1.06]) versus Sham (2.21 [IQR 0.46]). Mean arterial pressure during surgery was similar between groups. The Injection group had lower mean

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blood loss (128 ± 51 mL) compared to Sham (366 ± 144 mL), while surgical time was comparable (Injection: 95.7 ± 18.3 minutes; Sham: 108.1 ± 21.6 minutes). Postoperative pain scores across all measured time points (1 to 4 hours post-op) showed similar trends between groups, with mean scores ranging from 2.6 to 2.9 in the Injection group and 2.1 to 2.8 in the Sham group. Final analyses will include the full sample and apply conventional hypothesis testing thresholds ($p < 0.05$).

Conclusion: Submucosal injection of 0.25% bupivacaine with epinephrine during endoscopic sinus surgery appears to reduce intraoperative bleeding without significantly affecting operative time, mean arterial pressure, or postoperative pain. Statistical significance may be impacted by sample size. These preliminary results suggest that this technique may improve surgical field visibility and operative efficiency.



6830

OPTIMIZING SURGICAL EXTENT IN SINONASAL MUCORMYCOSIS: BALANCING AGGRESSIVENESS AND FUNCTION

Elisabeta David, Adriana Lozba, Sabina-Cristiana Farin, Geanina Indries

Introduction Sinonasal mucormycosis is one of the most problematic invasive, opportunistic fungal infections, posing a significant challenge for surgeons in Otolaryngology (ENT) and related specialties. The evolution of this pathology is directly influenced by the patient's general condition and the promptness with which the diagnosis is established. Given that the profile of the patient susceptible to this ubiquitous infection often includes multiple comorbidities and a compromised immune system, the prognosis is usually guarded. The treatment of choice is surgical, but it must be supplemented by specific antifungal medication and therapy to support vital functions.

Materials and Methods A cohort of patients with confirmed sinonasal mucormycosis was evaluated at our tertiary referral institution, the Institute of Phonoaudiology and Functional ENT Surgery "Prof. Dr. Dorin Hociotă," Bucharest. The general condition of the patients upon admission ranged from a patient in a comatose state to those in good condition, able to tolerate the fungal infection. The therapeutic approach consisted, for all patients, of radical surgical interventions, including wide excision of necrotic tissues, along with specific antifungal treatment and rigorous management of underlying conditions. **Results** A survival rate considered reasonable in the context of the severity of the condition was recorded, with only one death occurring at 1 month postoperatively. The surviving patients showed favorable recovery and good functional outcomes despite extensive surgical resections.

Conclusions The multidisciplinary management of patients with sinonasal mucormycosis is crucial. In this context, surgery plays an essential role, requires extensive experience, and is indispensable when supported by adequate antifungal therapy and strict control of associated comorbidities. Although the patient's general condition directly influences the prognosis, it is imperative to emphasize that, without prompt and appropriate surgical intervention, the outcome is most likely fatal.



6833

SURGICAL MANAGEMENT OF SKULL BASE OSTEOMYELITIS: INDICATIONS AND PRINCIPLES

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¹University Hospital Of Modena

Objective: To analyze the indications, principles, and outcomes of surgical management in skull base osteomyelitis (SBO), emphasizing its diagnostic and therapeutic relevance within a multidisciplinary framework.

Methods: A retrospective case series of patients treated for SBO at the University Hospital of Modena between 2020 and 2025 was reviewed. Clinical presentation, imaging, microbiological findings, and surgical techniques were analyzed in correlation with postoperative outcomes.

Results: Fourteen patients (mean age 71 years) were included. The most common pathogens were *Pseudomonas aeruginosa* and *Aspergillus* spp. All patients underwent surgery under general anesthesia. Six patients (42.9%) underwent surgery for diagnostic deep biopsy to establish a definitive diagnosis and guide targeted antimicrobial therapy, whereas another six (42.9%) underwent debridement to eradicate the disease. Early surgical debridement (n = 2, 14.3%) was associated with faster clinical and radiologic recovery, while delayed procedures (n = 5, 35.7%) resulted in partial improvement. Four patients (28.6%) died from progressive infection and systemic deterioration despite combined therapy.

Conclusion: Although medical therapy remains the cornerstone of treatment, surgery plays a crucial role in diagnostic confirmation, debridement of necrotic tissue, and control of refractory infection. The outcomes of this series highlight the importance of early multidisciplinary management, integrating surgical and medical strategies to improve disease control and survival. Larger prospective studies are warranted to clarify the prognostic impact of surgical intervention in SBO.



6834

IMPACT OF S-POINT CAUTERIZATION ON THE MANAGEMENT OF IDIOPATHIC EPISTAXIS: A RETROSPECTIVE COHORT STUDY

Inês Constant, Tomás Carvalho

Introduction: Endoscopic ligation or cauterization of the sphenopalatine artery (SPA) and angioembolization have long been considered standard treatments for refractory epistaxis. Identification of the S-point as a frequent bleeding source introduced one more targeted endoscopic approach. This study compared the frequency and temporal trend of SPA-directed interventions before and after the publication of S-point cauterization technique described by Kosugi et al. **Methods:** A retrospective cohort study included all patients undergoing surgical or endovascular treatment for epistaxis between 2014 and 2025 (n = 83). Exclusion criteria were traumatic, iatrogenic and tumor-related epistaxis. Patients were divided into pre-S-point (2014–2018) and post-S-point (2019–2025) periods. Surgical procedures, length of hospital stay and recurrence were analysed. Fisher's exact test and Mann-Whitney U test were used for comparisons. Multivariable logistic regression identified independent predictors of SPA-directed intervention.

Results: Seventy-two patients were analysed (pre-S-point n = 40; post-S-point n = 32). The proportion of patients requiring SPA approaches decreased from 92.5% to 46.9% after S-point implementation ($p < 0.001$). The post-S-point period remained independently associated with a lower likelihood of SPA approach after adjustment for age > years, anticoagulation/antiplatelet therapy and epistaxis-related risk factors (adjusted OR 0.07; 95% CI 0.01–0.26). No significant differences were observed in length of hospital stay or recurrence.

Conclusions: The observed reduction in SPA-directed interventions should be interpreted in light of the exclusion of S-point epistaxis cases successfully managed with outpatient cauterization. Consequently, the true impact of S-point identification is likely underestimated.

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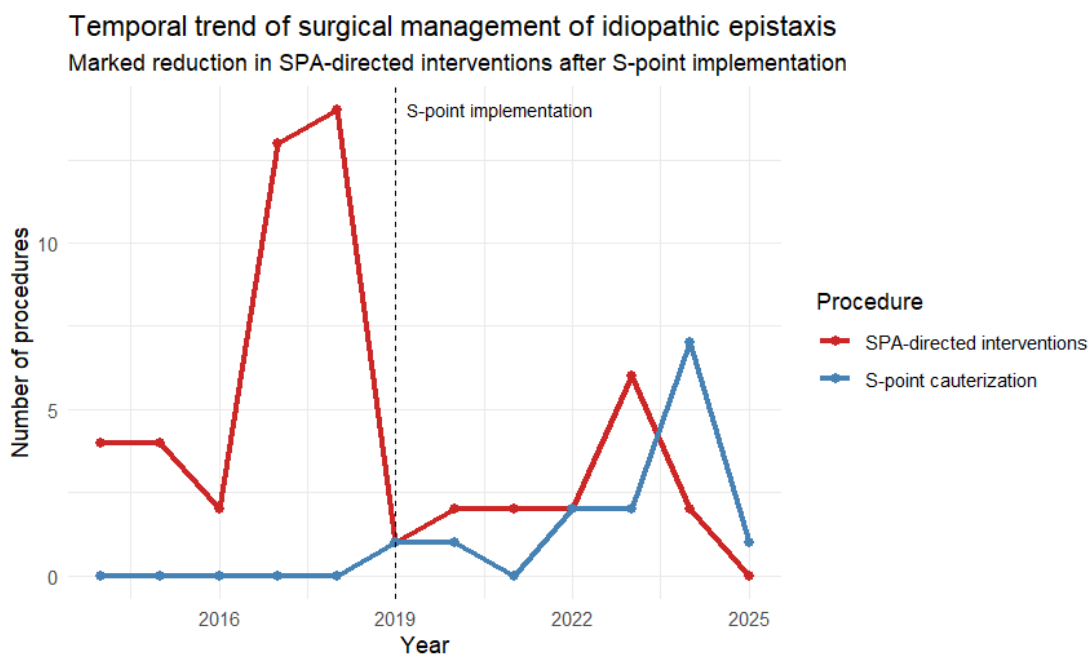
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DEVELOPMENT OF A 3D SLICER EXTENSION FOR MAPPING BIOPSIES IN SKULL BASE TUMORS.

Paul Brugerolles, Myriam Edjlali-goujon, Charlotte Robert, Natacha Hugot, Bresson Damien, Kevin Comair

Introduction : Although neuronavigation has become standard practice in skull base tumors surgery, data generated during navigation are rarely used beyond the operating room. This limits interdisciplinary collaboration and hinders the development of precision medicine approaches. This study aims to develop and evaluate a 3D Slicer extension that maps intraoperative biopsy coordinates onto preoperative imaging.

Materials & Methods : We developed a Python extension for 3D Slicer that imports intraoperative biopsy coordinates from the Medtronic StealthStation® system and projects them onto preoperative imaging. Once integrated, the data can be exported as Digital Imaging and Communications in Medicine (DICOM) annotations or objects. Accuracy was assessed by comparing StealthStation® navigation screenshots with corresponding 3D Slicer reconstructions, using landmark matching and robust homography estimation (RANSAC) to compute biopsy projection error (BPE) in millimeters. Local anatomical consistency was further evaluated using the Pearson correlation. **Results :** Seven patients (62 biopsies) were included. The extension successfully mapped all 62 biopsies onto preoperative images. The overall mean biopsy projection error was 0.319 ± 0.215 mm across all anatomical planes. Local anatomical consistency was high, with a mean Pearson correlation coefficient of 0.977 ± 0.024 .

Discussion : High accuracy was achieved, with biopsy projection errors remaining below 0.4 mm in all anatomical planes. This precision was supported by strong local intensity correlations between aligned volumes ($r = 0.977 \pm 0.024$). The ability to export biopsy locations together with histopathological results as DICOM objects or annotations represents a major advantage. Biopsy sites can be visualized in any PACS or radiotherapy planning system, facilitating communication between neurosurgeons, radiologists, pathologists, and radiation oncologists. In addition, voxel-level signal values corresponding to each biopsy can be extracted and directly compared with histopathological

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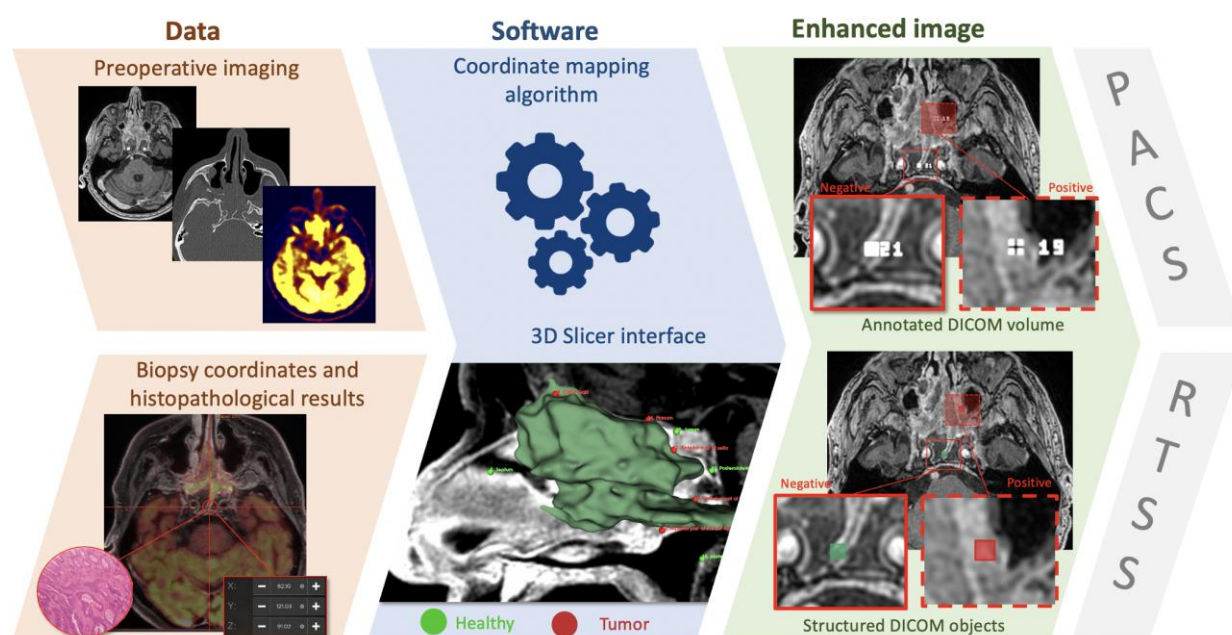
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findings. Clinically, this extension may improve the evaluation of tumor invasion in sinonasal skull base tumors by linking histopathology and imaging, enabling quantitative analysis.

Conclusion: This work demonstrates the feasibility, accuracy, and clinical value of a tool that integrates intraoperative navigation data into preoperative imaging.





6836

ENDOSCOPIC ANATOMY OF THE PTERYGOID CANAL

Hussam Elbosraty¹

¹Other

Abstract Introduction: The pterygoid canal (also known as vidian canal) is a passage in the medial plate of the pterygoid of the sphenoid bone leading from just anterior to the foramen lacerum in the middle cranial fossa to the pterygopalatine fossa. It transmits the nerve of pterygoid canal (Vidian nerve), and the artery & vein of the pterygoid canal. It is 17.79 ± 1.09 mm in length its mean diameter is 0.86 ± 0.11 mm. The canal lies inferomedial to the foramen rotundum and their intervening distance depends on the degree of sphenoid sinus pneumatization. The Vidian canal is a reliable neurosurgical landmark in identifying the anterior genu and lacerum segment of the petrous ICA, mainly during lateral extended endoscopic endonasal approaches to the skull base. It also serves as passage for tumor spread whether direct along its lumen as in benign nasopharyngeal angiofibroma or as perineural spread as in adenoid cystic carcinoma.

Material and methods: we demonstrate the endoscopic anatomy of the pterygoid canal in 38 cases of various pathologies in this region like JNA, neurofibroma and Skull base osteomyelitis showing the importance of the canal as a landmark and how we deal with lesions extending to or through it.

Conclusion: endoscopic demonstration of the vidian (pterygoid) canal in the transpterygoid approaches seems to be a very important landmark as safe corridor to follow and eradicate pathologies in this region



6840

ENDOSCOPIC-ASSISTED SURGERY FOR ORBITAL VENOUS MALFORMATIONS: SURGICAL OUTCOMES AND FIRST QUANTITATIVE VALIDATION OF THE CHEER CLASSIFICATION IN A MONOCENTRIC SERIES

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Introduction. Orbital venous malformations (OVMs) are the most common benign vascular lesions of the adult orbit and may cause visual and functional impairment requiring surgical treatment. Endoscopic-assisted approaches have emerged as effective minimally invasive alternatives to traditional orbitotomies. The CHEER classification was recently proposed to anatomically stratify OVMs according to surgical complexity, but has not yet been quantitatively validated against surgical outcomes. This study aims to analyze clinical, surgical, and radiological outcomes of endoscopic-assisted OVM resection and to provide the first quantitative validation of the CHEER classification.

Materials & Methods. Thirty consecutive adult patients with OVMs underwent endoscopic-assisted surgery between 2011 and 2024 using endonasal, transorbital, or combined approaches. Clinical presentation, complications, functional outcomes, and extent of resection were assessed. Pre- and postoperative CT and MRI were systematically reviewed to evaluate lesion characteristics and residual disease. All lesions were retrospectively staged according to the CHEER classification. Associations between CHEER stage, lesion volume, and outcomes were analyzed using univariate and multivariable models.

Results. The cohort included 30 patients (77% female; mean age 45.7 ± 12.6 years), with 90% symptomatic at presentation. Gross total resection was achieved in 26 cases (87%), while residual disease occurred in 4 (13%). Postoperative symptom improvement was observed in 89% of symptomatic patients, and functional recovery in 86% of those with preoperative deficits. Intraoperative complications occurred in 7%, transient postoperative complications in 50%, and permanent morbidity in 7%, with no permanent visual loss. Lesion volume was associated with increased complication risk ($p = 0.023$). Residual disease showed a strong correlation with CHEER stage ($p = 0.001$): no residuals occurred in

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CHEER I-II lesions, whereas all CHEER IVB lesions resulted in subtotal resection.

Conclusions. Endoscopic-assisted surgery is a safe and effective treatment for selected OVMs, providing high rates of functional recovery with acceptable morbidity. This study represents the first quantitative validation of the CHEER classification, demonstrating its ability to predict resectability and surgical outcomes. These findings support CHEER as a clinically meaningful tool for surgical planning and prognostic stratification, warranting multicenter validation in larger cohorts.



6844

CLINICAL OUTCOMES AND MORBIDITY OF THE ENDOSCOPIC PRELACRIMAL RECESS APPROACH IN ANTROCHOANAL POLYPS: A REAL-WORLD EXPERIENCE

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Introduction Antrochoanal polyps (ACP) are benign unilateral lesions originating from the maxillary sinus, most commonly affecting children and young adults. Complete surgical excision is the treatment of choice; however, polyps arising from the anterior or inferior maxillary sinus walls are difficult to access using standard endoscopic techniques. Traditional external approaches, such as the canine fossa or Caldwell–Luc procedures, are associated with significant morbidity. The endoscopic prelacrimal recess approach (PLA) provides improved access to challenging maxillary regions while preserving the inferior turbinate and nasolacrimal duct. This study evaluates postoperative morbidity, recurrence rates, and anatomical risk factors in patients with ACP treated using PLA.

Methods This retrospective case series included 42 patients with primary ACP who underwent endoscopic PLA. Patients younger than 10 years, those with recurrent ACP, uncontrolled systemic disease, or other maxillary sinus pathology were excluded. Demographic data, polyp origin, and postoperative outcomes were collected from medical records. Preoperative paranasal sinus CT scans were reviewed to measure the width of the prelacrimal recess (WPR), classified according to Simmen's classification, and the anterior–posterior nasal dimension (APN). Postoperative endoscopic follow-up was performed at one month and continued for at least six months. Morbidity included cheek numbness and epiphora, classified as temporary or permanent. Statistical analysis was performed using SPSS version 27, with a significance threshold of $P < 0.05$.

Results The cohort included 23 males and 19 females, with a mean age of 15.2 years. Polyps were right-sided in 73.8% of patients. Among cases with documented origin, 69.2% arose from the anterolateral maxillary

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wall. The mean WPR was 5.9 mm; 52% of patients were classified as type 2, 32% as type 3, and 16% as type 1. Temporary cheek numbness occurred in 28.5% of patients and resolved within three months, while permanent numbness was observed in 9.5%. One patient developed transient epiphora due to nasolacrimal duct injury. Recurrence occurred in one patient (2.4%). No significant association was found between postoperative numbness and WPR type ($P > .05$) or mean APN ($P = 0.85$). Conclusion The endoscopic prelacrima recess approach is a safe and effective technique for complete resection of antrochoanal polyps, including those arising from anatomically challenging maxillary sinus regions. Despite concerns regarding anatomical limitations, PLA demonstrated low recurrence rates and acceptable, predominantly transient morbidity, with no clear CT-based predictors of complications.

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ENDONASAL ENDOSCOPIC OPTIC NERVE DECOMPRESSION

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Endoscopic Optic Decompression Introduction: Endoscopic optic nerve decompression (EOND) is currently the treatment of choice for traumatic optic neuropathy (TON). Familiarity with anatomical landmarks and optic nerve decompression are important determinants of safe and effective surgeries. Having a firm understanding of the anatomical structures of the optic nerve region and obtaining an anatomical image of the patient prior to the surgery could critically facilitate optic nerve decompression and reduce surgical risk. Other indications include skull base tumors e.g., meningiomas growing into the optic canal, or fibro-osseous lesions of the skull base. Endoscopic optic nerve decompression is most suited to pathology located medial to the optic nerve.

Material & Methods: In this study we demonstrate our experience about Endoscopic optic nerve decompression in cases with variable etiologies and showing the value of the powered instrumentation to achieve the best outcome.

Conclusion: Endonasal endoscopic optic nerve decompression is a technique that is mandatory to be learnt by rhinologist since that it is valuable and has a great positive impact on the function of the optic nerve in case of compressed nerve.



6847

ENDOSCOPIC MANAGEMENT OF JNA: TIPS AND TRICKS

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¹ Kasr El-Aini Hospital, Cairo University

Juvenile nasopharyngeal angiofibroma (JNA) is a combined vascular and fibrous neoplasm which arises from the posterior-lateral wall of the nose. The tumor exhibits a strong tendency to bleed and, despite being microscopically benign, frequently exhibits destructive and aggressive behavior. Various treatment modalities are currently available for JNA, but surgical resection remains the best option. Recently, and after the advent of preoperative embolization many endoscopic trials were used to treat small JNA with great success. Still, however, the large Tumors remain a challenge. We describe our experience in 153 cases of endoscopic resection of advanced JNA including cases with intracranial intradural extension.

Materials and methods: We describe our experience in 153 cases of endoscopic resection of advanced JNA including cases with intracranial extension. All the patients were adolescent males, the age ranges from 6 to 48 years. Tumor staging was 71 cases were stage III, 39 cases were stage IV and 43 cases were stage I and II. all cases were embolized 2 days pre-op.

Results: complete tumor removal is achieved in 143 cases. incomplete removal in 10 cases. one case has been irradiated, the other 9 cases a 2nd session of endoscopic resection was done. 3 of these cases required a 3rd. session with no recurrence on the next 5 years. morbidity in the form of permanent loss of Eustachian tube dysfunction in 2 cases. infra-orbital hyposthesia in one case. in our series 3 cases of mortality from uncontrolled blood loss.

Conclusion: Recently, and after the advent of preoperative embolization, endoscopic resection of JNA is considered the state of art management, still, however, the large Tumors remain a challenge. E-mail: bosraty@yahoo.com Dural Invasion in JNA: Does it exists? Juvenile nasopharyngeal angiofibroma (JNA) is a combined vascular and fibrous neoplasm which arises from the posterior-lateral wall of the nose. Despite being microscopically benign, the tumor frequently exhibits destructive and aggressive behavior. Various staging

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classification had been suggested, but there is no universal agreement worldwide about the most accepted. Each author takes into consideration different perspective. The dural invasion is one of the most challenging and determinant factor in the management of this tumor. In the literature, there is a great debate regarding this point. We managed 109 cases of JNA, 27 of them were having intracranial extension. Only four of them were with true dural invasion. We describe our experience in dealing with advanced JNA including cases with intracranial intradural extension.



6849

DEMOGRAPHIC AND RADIOGRAPHIC CHARACTERISTICS OF PATIENTS WITH SPONTANEOUS CEREBROSPINAL FLUID LEAKS OF THE SKULL BASE: A SINGLE-CENTER EXPERIENCE

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Introduction Spontaneous cerebrospinal fluid (CSF) leaks of the skull base are increasingly recognized and are frequently associated with elevated intracranial pressure and characteristic radiographic findings. This study aimed to describe the demographic, clinical, and radiographic characteristics of patients with spontaneous skull base CSF leaks treated at a tertiary referral center.

Methods This retrospective study included 31 patients diagnosed with spontaneous skull base CSF leaks between 2011 and 2023. Demographic data, comorbidities, presenting symptoms, imaging findings (CT, MRI, and cisternography), surgical techniques, postoperative outcomes, and intracranial pressure (ICP) measurements were analyzed. Radiographic parameters included optic nerve sheath diameter (ONSD), optic nerve changes, empty sella, Meckel's cave width, temporal squama sign (TSS), skull base defects, and lesion characteristics. Associations between imaging findings, demographic variables, clinical symptoms, and postoperative ICP were evaluated using chi-square, Fisher's exact test, and logistic regression.

Results The cohort consisted predominantly of women (96.8%), with a mean age of 43.7 ± 10.2 years. The mean body mass index was 29.8 ± 7.3 kg/m², indicating a high prevalence of overweight and obesity. Common comorbidities included hypertension (29.0%), dyslipidemia (16.1%), and diabetes (12.9%). The most frequent presenting symptom was CSF rhinorrhea (96.8%), followed by headache (38.7%). Ethmoid sinus involvement was most common (67.7%), followed by sphenoid (32.2%) and frontal sinuses (12.9%). Radiographic findings included

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empty sella in 71.0%, enlarged Meckel's cave in 96.8%, optic nerve changes in 45.2%, enlarged ONSD in 41.9%, and scalloped inner table of the calvarium in all patients. Meningoceles were observed in 74.2% and meningoencephaloceles in 25.8%. Multilayer skull base reconstruction was the most common surgical technique (48.4%). During a mean follow-up of 33.6 months, postoperative ICP elevation occurred in 6.5% of patients, with no recurrence of CSF leak. Logistic regression identified age as a significant predictor of optic nerve sheath enlargement and empty sella, while height was associated with optic nerve tortuosity. Conclusion Spontaneous skull base CSF leaks predominantly affect overweight middle-aged women and demonstrate characteristic radiographic markers of altered intracranial dynamics. These findings highlight the importance of comprehensive imaging evaluation in diagnosis and management.



6851

OPTIMIZED SELLAR RECONSTRUCTION STRATEGY FOR ENDOSCOPIC ENDONASAL APPROACHES: EXPERIENCE OF TERTIARY CENTER IN GREECE

Thanasis Katsikas¹, Ioannis Gkalonakis¹, Georgios Georgountzos¹, Maria-Eleni Sakellaridou¹, Ioannis Charalampous-Georgoulakos¹, Christina Balakera², Theofilos Paleologos¹, Konstantinos Barkas¹

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Background: The endoscopic endonasal approach is widely used for sellar tumor resection, but cerebrospinal fluid (CSF) leak remains a significant challenge. The aim of this study is to propose a comprehensive strategy for sellar reconstruction in the context of the endoscopic transsphenoidal approach.

Methods: A retrospective review was conducted using data from our institutional database of endoscopic endonasal transsphenoidal procedures from 2019 to the present. A total of 290 procedures were performed for various sellar pathologies, including pituitary adenomas, Rathke's cysts, craniopharyngiomas and others. Intraoperative CSF leaks were classified by severity: Grade 0 (no leak), Grade 1 (small leak without obvious diaphragmatic defect, "weeping diaphragm"), Grade 2 (moderate leak) and Grade 3 (large diaphragmatic defect). For Grade 0 human fibrinogen-thrombin patch (Tachosil®) is routinely used. For Grade 1, fat and fascia lata (abdominal and allogenic or autologous), and fibrin glue were added. For Grade 2, a vascularized nasoseptal flap or free mucosal flap (via middle turbinectomy) was added. In Grade 3, lumbar drainage was employed as an additional part of the reconstruction strategy.

Results: Twenty three patients needed sellar reconstruction for CSF leak prevention. These consisted of 3 cases with anticipated CSF leak due to intradural pathology (2 Craniopharyngiomas, 1 Epidermoid cyst), 2 cases of CSF leaks in prolactinomas after dopamine agonist treatment and 18 intrasellar pathologies (16 macroadenomas, 1 Rathke's cyst and 1 giant adenoma). No postoperative repair failures or pneumocephalus were noted. Four patients, who had Grade 3 leaks and had LD inserted, developed bacterial meningitis postoperatively. Risk factors for

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intraoperative CSF leak included recurrence, adenoma size, and the extended approach.

Conclusions: Based on our experience, the algorithm for sellar reconstruction has yielded positive results. However, LD should be reconsidered due to its potential role in meningitis.



6852

INTRINSIC DIAGNOSTIC PERFORMANCE OF PET-MRI AND PET-CT IN SINONASAL MALIGNANT TUMORS INVADING THE SKULL BASE

Vincent Lebon

Objective: To compare the intrinsic diagnostic performance of positron emission tomography combined with magnetic resonance imaging (PET-MRI) and positron emission tomography combined with computed tomography (PET-CT) for detecting tumor invasion in sinonasal malignant tumors involving the skull base, using maximal standardized uptake values (SUVmax).

Methods: This paired prospective diagnostic study included eight patients (143 biopsies) who underwent both PET-MRI and PET-CT acquired from the same injection of fluorine-18 fluorodeoxyglucose. During surgery, biopsy coordinates were recorded using the Medtronic StealthStation® S8 neuronavigation system, allowing precise three-dimensional spatial localization of each tissue sample; these coordinates were subsequently processed and mapped onto preoperative imaging using a dedicated 3D Slicer extension. Histopathological analysis of each biopsy served as the gold standard for determining tumor invasion. Intrinsic diagnostic performance was assessed through sensitivity, specificity, and Receiver Operating Characteristic (ROC) curve analysis. Inter-modality correlation and agreement were evaluated using Pearson correlation coefficients and Bland–Altman plots.

Results: PET-MRI showed a sensitivity of 0.74 (95% CI: 0.54–0.87) compared with 0.70 (95% CI: 0.49–0.84) for PET-CT ($p = 0.02$), and a specificity of 0.73 (95% CI: 0.65–0.80) compared with 0.67 (95% CI: 0.58–0.74) for PET-CT ($p = 0.02$). The area under the curve (AUC) for PET-MRI was 0.69 (95% CI: 0.58–0.80) versus 0.66 (95% CI: 0.54–0.78) for PET-CT ($p = 0.64$). The correlation coefficient between the two modalities was 0.90.

Discussion : SUVmax values from PET-MRI and PET-CT showed excellent agreement ($r = 0.90$), with Bland–Altman analysis revealing only a minimal positive bias toward PET-CT. PET-MRI demonstrated slightly better diagnostic performance, although AUC differences were not statistically significant—likely due to the limited sample size and low number of positive biopsies. These results suggest that PET-MRI offers

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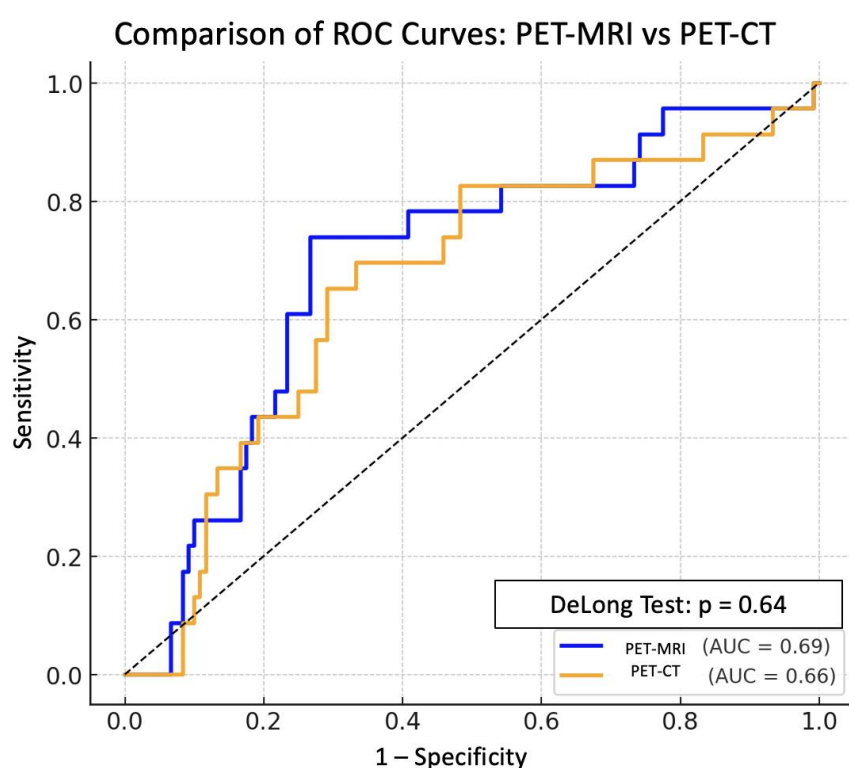
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diagnostic accuracy at least equivalent to PET-CT, with a potential advantage for detecting subtle tumor invasion.

Conclusion: PET-MRI appears to be a reliable modality for the preoperative assessment of sinonasal malignant tumors invading the skull base. It demonstrates diagnostic performance at least equivalent—and potentially slightly superior—to that of PET-CT.





6853

LEUKOCYTE- AND PLATELET-RICH FIBRIN VERSUS COMMERCIAL FIBRIN SEALANTS FOR SKULL BASE RECONSTRUCTION AFTER ENDOSCOPIC ENDONASAL TRANSSPHEOIDAL SURGERY: PRELIMINARY RESULTS OF A MULTICENTER RANDOMIZED NON-INFERIORITY TRIAL.

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Introduction Postoperative cerebrospinal fluid (CSF) leakage remains a major complication following endoscopic endonasal transsphenoidal approaches (EETA), increasing morbidity and healthcare costs. Commercial fibrin sealants are widely used for skull base reconstruction, but concerns persist regarding cost and biological efficacy. Autologous leukocyte- and platelet-rich fibrin (L-PRF) may offer a cost-effective, biologically active alternative. This study aimed to evaluate the non-inferiority of L-PRF compared to commercially available fibrin sealants for prevention of postoperative CSF leakage after EETA.

Material & Methods A prospective, single-blinded, multicenter randomized controlled non-inferiority trial was conducted in two Belgian centers (University Hospitals Leuven and AZ Sint-Jan Bruges). Adult patients undergoing EETA between November 2018 and August 2025 were randomized 1:1 to receive either autologous L-PRF membranes or commercially available fibrin sealants. In cases without intraoperative CSF leak, the material was used as dural or sellar reinforcement; in cases with intraoperative CSF leak or large defects, it was applied as an additional sealing layer following standard multilayer reconstruction. The primary endpoint was clinically relevant postoperative CSF leakage. Secondary endpoints included risk factors for reconstruction failure, rhinologic outcomes, interference with postoperative imaging, and cost-effectiveness. Follow-up was 12 months.

Results Preliminary analysis shows comparable postoperative CSF leak rates between the L-PRF and fibrin sealant groups, supporting non-inferiority. No significant differences were observed in rhinologic symptoms or imaging interpretation. Early cost analysis suggests a significant reduction in reconstruction-related expenses with L-PRF use.

Conclusion Preliminary results indicate that L-PRF membranes are a safe, effective, and cost-efficient alternative to commercial fibrin sealants for

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skull base reconstruction in EETA. Final analysis with complete follow-up will further clarify long-term outcomes and risk factors for reconstruction failure.



6856

MODIFIED DRAF IIC VS DRAF III: A RETROSPECTIVE COHORT STUDY COMPARING OUTCOME IN CRS PATIENTS

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Introduction Chronic rhinosinusitis (CRS) is a common inflammatory condition affecting approximately 11% of the global population, with substantial impacts on quality of life. Endoscopic frontal sinus surgery is often indicated for patients with recalcitrant CRS. While the Draf III procedure is a well-established approach for managing severe or bilateral disease, it carries a high complication and revision burden due to its extensive nature. In response, a less invasive technique, the modified Draf IIc, has been proposed. This approach consists of bilateral Draf IIb procedures with anterior superior nasal septum resection and preservation of the interfrontal sinus septum and frontal beak.

Methods This retrospective cohort study included adult patients (≥18 years) with CRS who underwent revision frontal sinus surgery at a tertiary sinus center. Patients underwent either a modified Draf IIc or Draf III procedure, all performed by a single senior surgeon to ensure procedural consistency. Demographic, clinical and radiologic data were collected. To evaluate surgical outcomes at one year postoperatively, SNOT-22 scores, Sinonasal New Endoscopic Staging (SiNES) and the need for a revision surgery (minor in the office or major in the operating room) were assessed. Only patients with a minimum postoperative follow-up of three months were included in the analysis.

Results The initial analysis demonstrated that in the 36 patients that were analyzed (18 per group), both groups had similar sex distribution (10 M, 8 F), and comparable rates of biologics use (39%). The modified Draf IIc group was younger (mean age 58.4 vs. 63.9 years) and had higher rates of asthma (78% vs. 50%) with lower rates of chronic rhinosinusitis with nasal polyps (CRSwNP) (72% vs. 78%). At 1-year follow-up, the modified Draf IIc group had a lower revision rate compared to the Draf III group (5.6% vs 11.1%). Additionally, the mean SNOT-22 score was lower in the modified Draf IIc group (33.55 vs. 39.93).

Conclusions These findings suggest that modified Draf IIc provides comparable or better outcomes than Draf III, despite being less invasive.



6859

NASAL PREPARATION WITH DILUTED ADRENALINE AND LIDOCAINE VS ADRENALINE-ONLY IN ENDOSCOPIC TRANSSPHEOIDAL SURGERY: A CASE-CONTROL STUDY

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Background: During transsphenoidal surgery, preparation of the nasal cavity with vasopressors is a mainstay for a clear field of work. Various solutions of adrenaline have been used over the years with no solid evidence on a specific regimen. The aim of this study is to assess the effect of a solution with adrenaline and lidocaine on the visualization of the surgical field and the bleeding during the operation.

Materials-Methods: A case-control study was conducted in a total of 40 patients that underwent ETSS for pituitary neuroendocrine tumors and in 20 of them their nasal cavity was prepared with a solution of lidocaine and adrenaline while the other 20 were prepared with adrenaline only. A single surgeon evaluated the bleeding at the commencement of surgery and at regular 10- according to a validated scale.

Results: There was improvement in the surgical field scores in the lidocaine group compared to adrenaline only with no difference in arterial pressure or heart rate monitoring.

Conclusion: Preparation of the nasal cavity with a solution of adrenaline and lidocaine prior to ETSS according to our experience offers a clearer field of view during the nasal approach.



6863

COMBINED ENDOSCOPIC ENDONASAL AND TRANSORAL RESECTION OF MAXILLARY AMELOBLASTOMA: SAFETY AND OUTCOMES IN A CASE SERIES OF THREE PATIENTS

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Introduction Maxillary ameloblastoma is a rare, benign but locally aggressive odontogenic tumor that presents unique surgical challenges due to its proximity to critical anatomical structures and its high risk of recurrence. Traditional management often involves open maxillectomy with facial incisions, which may result in significant cosmetic and functional morbidity. Minimally invasive endoscopic approaches have recently emerged as potential alternatives in selected cases. This study presents a case series of three patients with multicystic maxillary ameloblastoma managed using an endoscopic endonasal approach, with or without a transoral extension.

Case Series Three patients (two males and one female; age range 63–68 years) with primary or recurrent multicystic maxillary ameloblastoma were treated at a tertiary referral center. Tumors originated from the maxillary sinus floor with extension to adjacent structures, including the pterygoid plate and infratemporal region. Surgical management consisted of image-guided endoscopic endonasal medial maxillectomy, combined with an endoscopic-assisted transoral approach when required to achieve adequate margins and allow dental extraction. In cases with oroantral defects, reconstruction was performed using buccal fat pad grafts and local palatal flaps. Intraoperative frozen sections were used to confirm negative margins in all cases.

Results Complete tumor resection with negative margins was achieved in all three patients. One patient experienced a localized recurrence at six months, which was successfully managed with revision endoscopic resection. No additional recurrences were observed during follow-up periods ranging from 6 to 15 months. All patients demonstrated satisfactory wound healing without persistent oroantral fistula,

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dysphagia, or cosmetic deformity. Functional outcomes, including swallowing and speech, were preserved.

Conclusion Endoscopic endonasal resection, with selective transoral extension, represents a safe and effective surgical option for carefully selected cases of maxillary ameloblastoma. This approach allows complete tumor excision with acceptable oncologic control while minimizing morbidity associated with traditional open procedures. Larger studies with long-term follow-up are needed to further define its role in the management of maxillary ameloblastoma.



6864

NEOADJUVANT CHEMO-IMMUNOTHERAPY COMBINED WITH PROTONS IN SINONASAL UNDIFFERENTIATED CANCER: A PROSPECTIVE CLINICAL TRIAL (NEOPESINO, NCT05925491)

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Introduction: This phase II study has been designed to assess the activity to neoadjuvant chemo-immunotherapy combined with protons in sinonasal undifferentiated cancer patients (including SNUC and undifferentiated epithelial malignancies with the loss of one SWI/SNF complex subunit either SMARCB1 or SMARCA4). Secondary aims are: i) to investigate the toxicity profile of chemo-immunotherapy (e.g. rate of toxicities higher than G3 according to CTC.AE v 5.0); ii) to record quality of life (QoL) (EORTC C30, H&N and EQ5D questionnaires) and iii) to assess feasibility of adjuvant pembrolizumab.

Materials and Methods: In this multi-centric, Italian clinical trial patients with treatment-naïve, stage III-IV sinonasal undifferentiated carcinoma will receive cisplatin, docetaxel and pembrolizumab for up to 3 cycles, in the absence of disease progression or unacceptable toxicity. Proton therapy in combination with high-dose cisplatin will be administered in patients with an objective response rate (ORR)>% according to RECIST 1.1. In non-responders, surgery will be performed, followed by proton therapy based on pathological risk factors. Adjuvant pembrolizumab will be given for up to 1 year, provided there is no disease progression or unacceptable toxicity. The primary hypothesis is to test the non-inferiority of the investigational regimens compared to benchmark trials (NCT02099175; NCT02099188). A sample size of 28 patients provides 80% power to detect a non-inferiority proportion (P_0) of 0.50 using a one-sided binomial test for non-inferiority. At least 18 responses are expected for the success of the study. Progression-free survival (PFS) and overall survival (OS) will be analyzed using Kaplan-Meier curves. A correlative translational analysis will be conducted to identify early biological

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mechanisms that may contribute to the activity of the combination therapy (pembrolizumab plus chemotherapy).

Results: The study has started in November 2024 (expected accrual: 3 years). In December 2025, 11 patients have been enrolled (6 F, mean age 54, 1 screening failure). 6 patients (54%) responded well avoiding surgery, and are currently alive (NED) in the adjuvant phase or follow up. 3 patients (27%) discontinued the study: 1 for progression of disease, 1 for unacceptable toxicity, and 1 for withdrawal of the consent. The remainder is in the neoadjuvant phase.

Conclusions: Preliminary data from this clinical trial suggest that intensification of treatments with immunotherapy in undifferentiated sinonasal carcinomas is safe. Long-term follow up is needed to evaluate the impact on DFS and OS.



6865

TREATMENT STRATEGIES FOR CRANIOPHARYNGIOMA ACHIEVING BOTH FUNCTIONAL PRESERVATION AND LONG-TERM TUMOUR CONTROL

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Objective: Treatment goal for craniopharyngiomas should aim for long-term tumor control while preserving visual, cognitive, and hypothalamic functions, furthermore pituitary functions as much as possible. In recent years, treatment options have diversified, including endoscopic surgical strategies, effective use of stereotactic radiosurgery, and the use of BRAF/MEK inhibitors. Total tumour resection is not always have to achieve as the primary goal. We report our treatment strategy and long-term outcomes.

Method: We report on 28 cases of craniopharyngioma treated surgically at our institution since 2014, with endoscopic surgery as the primary approach. The cases comprised 10 males and 18 females.

Methods: We included 28 craniopharyngioma cases treated surgically at our institution since 2014, where endoscopic surgery was the primary approach. The cohort comprised 10 males and 18 females, with a mean age of 51.3 years (range 3–81). The median follow-up period was 60 months (range 3–120). Based on patients' age, tumour morphology, and origins, treatment strategies were broadly divided into two groups: maximal surgical resection in 23 cases (Group A) and endoscopic transventricular tumor biopsy and fenestration of the cyst plus adjuvant therapy in 5 cases (Group B).

Results: In Group A, endoscopic endonasal tumour resection was performed in 19 cases and craniotomy tumour resection in 4 cases. Postoperative radiotherapy was added in 5 cases (21.7%), and BRAF/MEK inhibitors in 1 case. The pituitary stalk was preserved where possible. In Group B, postoperative IMRT was selected for 4 cases and BRAF/MEK inhibitor therapy for 1 case. Combining both groups, 3 cases (10.7%) required re-treatment during the follow-up period; none showed recurrence after re-operation. Twelve cases (42.9%) did not develop post-operative diabetes insipidus, 8 cases (34.8%) could preserved whole anterior pituitary functions. Excluding 5 cases requiring pituitary replacement therapy for preoperative hypopituitarism, anterior pituitary function was maintained in 5 cases (21.7%) in Group A, whereas 2 cases

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developed delayed anterior pituitary dysfunction after radiation therapy in group B.

Conclusion: With increased treatment options, long-term tumour control and preservation of visual, cognitive, and hypothalamic functions were prioritised. Pituitary function preservation was achievable in approximately one-third of cases. Feasibility of pituitary function preservation largely depends on tumour origins and its relationship with the pituitary stalk. Preoperative assessment is essential to determine this and formulate the treatment strategy.



6866

SURGICAL APPROPRIATENESS IN DUPILUMAB CANDIDATES WITH CRSWNP: BALANCING ENDOSCOPIC SINUS SURGERY EXTENT AND BIOLOGIC THERAPY OUTCOMES

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Introduction: Current guidelines recommend endoscopic sinus surgery before initiating biologic therapy in patients with severe uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP). However, the optimal extent and timing of surgery in candidates for Dupilumab remain debated. Furthermore, according to the literature currently available, it remains unclear whether the efficacy of Dupilumab treatment in these patients is influenced by the number of prior FESS/ESS procedures. Defining surgical appropriateness is crucial to optimize outcomes, avoid unnecessary procedures and ensure rational integration between surgery and biologic treatment.

Materials and Methods: Multicenter retrospective data from CRSwNP patients treated with Dupilumab after at least one prior ESS were analyzed. Surgical history was evaluated in terms of number of previous procedures and extent of surgery, quantified using the ACCESS score on pre-treatment CT scans. Clinical outcomes included objective measures (Nasal Polyp Score, NPS) and patient-reported outcomes (SNOT-22, visual analogue scale [VAS] for nasal obstruction, rhinorrhea, olfactory dysfunction, craniofacial pain, and sleep disturbance), collected at baseline and during follow-up up to 12 months. Correlations between surgical variables and Dupilumab response were investigated.

Results: Dupilumab was effective in all patients, with significant improvements in NPS and quality-of-life measures over time. Patients who had undergone more extensive ESS showed better control of polyp size and improved subjective indicators during treatment, despite demonstrating a reduced likelihood of olfactory recovery. Conversely, a history of multiple surgeries was associated with poorer olfactory outcomes and higher residual symptom burden in some domains, particularly smell-related complaints. These findings suggest that excessive surgical burden may negatively influence specific patient-reported outcomes without conferring additional benefit once biologic therapy is initiated.

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Conclusions: Surgical appropriateness in Dupilumab candidates should not be defined solely by the requirement of prior surgery, but rather by the quality and adequacy of ESS. An appropriately extensive, well-executed initial ESS may optimize subsequent response to Dupilumab and reduce the need for repeated procedures. Conversely, multiple or overly aggressive surgeries may impair selected outcomes, particularly olfaction. A balanced, patient-tailored strategy integrating ESS and biologic therapy is essential to maximize clinical benefit in severe CRSwNP.



6868

BEYOND SINGLE-SITE DEFECTS: MANAGING MULTIPLE AND RECURRENT ANTERIOR SKULL BASE CSF FISTULAS

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Introduction: Multiple and recurrent anterior skull base cerebrospinal fluid fistulas represent a rare but challenging clinical entity in rhinology and endoscopic skull base surgery. Compared with single, isolated defects, these conditions raise specific diagnostic, pathogenetic and therapeutic issues, with an increased risk of delayed recurrence and potentially severe complications such as meningitis. A better understanding of their behavior is essential to optimize management strategies.

Materials and Methods: This presentation is based on a critical overview of the available literature combined with insights derived from clinical experience in tertiary referral centers. Particular attention is paid to spontaneous anterior skull base fistulas presenting either as multiple simultaneous defects or as metachronous recurrences at different sites. Diagnostic work-up, radiological patterns, intraoperative findings, surgical techniques, and postoperative management are discussed, with emphasis on endoscopic endonasal approaches and reconstruction strategies.

Results: Multiple and recurrent fistulas frequently share features with spontaneous single-site leaks, including associations with obesity and radiological signs of altered intracranial pressure. However, they demonstrate heterogeneous patterns of defect distribution and recurrence. Systematic endoscopic exploration of the skull base allows effective identification and repair of multiple defects in a single procedure. Recurrences, when present, often occur at sites distant from the original repair, supporting a multifactorial pathogenesis beyond simple local failure.

Conclusions: Multiple and recurrent anterior skull base CSF fistulas should be regarded as a distinct subset within spontaneous skull base defects. Successful management relies on comprehensive preoperative imaging, meticulous endoscopic exploration and tailored reconstruction, rather than on the extent of reconstruction alone.

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Awareness of the potential for delayed, site-shifting recurrences is crucial, underscoring the need for long-term follow-up.



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DIAGNOSTIC DISCREPANCY IN SINONASAL CANCER SURGERY: PRELIMINARY RESULTS FROM THE MUSES EUROPEAN MULTICENTER COHORT

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Introduction. In sinonasal malignancies, therapeutic strategies and prognosis are strongly histology-driven. Diagnostic discrepancy between pretreatment biopsy and final pathology may therefore influence treatment allocation and surgical planning. This study aims to investigate the occurrence, distribution, and potential clinical implications of diagnostic discrepancy within the MULTI-institutional collaborative Study on Endoscopically treated Sinonasal cancers (MUSES).

Materials & Methods. This retrospective multicenter study included patients treated with endoscopic-assisted approaches for sinonasal malignancies. Diagnostic discrepancy was defined as any discordance between preoperative biopsy and final histology according to the WHO 2017 classification and categorized as minor, major, or severe. Analyses were performed overall and stratified by final histology, assessing the association between diagnostic discrepancy and oncologic outcomes and included Kaplan–Meier estimates, log-rank tests and multivariable Cox regression models.

Results. A total of 1416 patients were analyzed. Preoperative pathological revision was performed in 913/1416 patients (64.5%), among whom a diagnostic discrepancy was identified in 85/913 cases (9.3%), including 35 major (35/913, 3.8%), 26 minor (26/913, 2.8%), and 24 severe discrepancies (24/913, 2.6%). Diagnostic discrepancy affected several histologies, with rates ranging from 3.1% in intestinal-type adenocarcinoma (16/512) to 13.8% in neuroendocrine carcinoma (4/29), and included squamous cell carcinoma (23/194, 11.9%), olfactory neuroblastoma (14/178, 7.9%), mucosal melanoma (4/124, 3.2%), and non-intestinal-type adenocarcinoma (4/39, 10.3%). Discrepancies were observed across multiple histological subtypes, confirming a transversal distribution rather than a histology-specific pattern. The prognostic

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relevance of these discrepancies is currently being investigated through ongoing statistical analyses.

Conclusions. Diagnostic discrepancy represents a non-negligible and histology-transversal issue in endoscopic-assisted sinonasal cancer management, even after preoperative pathological revision. Within the MUSES framework, these results prompt further investigation into whether diagnostic discrepancy acts as an upstream determinant of margin status and, ultimately, oncologic outcome.



6871

ENDOSCOPIC MANAGEMENT OF JUVENILE NASOPHARYNGEAL ANGIOFIBROMA: A RADKOWSKI-BASED SURGICAL STRATEGY

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Introduction Juvenile nasopharyngeal angiofibroma (JNA) is a rare, benign but locally aggressive vascular tumor predominantly affecting adolescent males. Surgical resection remains the mainstay of treatment. With advances in endoscopic skull base surgery, the endonasal approach has progressively replaced traditional open techniques. This study presents a stage-oriented endoscopic surgical strategy for JNA based on the Radkowski classification, emphasizing practical decision-making supported by representative surgical cases from our clinic.

Materials and Methods We retrospectively analyzed patients with JNA treated exclusively or predominantly via an endoscopic endonasal approach. Tumors were classified according to Radkowski staging. Preoperative evaluation included nasal endoscopy and contrast-enhanced CT and MRI; selective preoperative embolization was routinely performed. Surgical techniques were adapted to tumor extent: standard endoscopic resection for Stage I, extended endonasal approaches with medial maxillectomy and transpterygoid access for Stage II, and advanced skull base techniques for selected Stage III lesions with limited extradural intracranial extension. Surgical steps and intraoperative strategies were illustrated using representative cases.

Results Complete tumor resection was achieved endoscopically in all Stage I and Stage II cases, with good visualization, effective hemorrhage control, and low morbidity. Selected Stage IIIA tumors were successfully managed using an exclusive endoscopic approach, while avoiding major neurovascular complications. No external incisions were required. Early outcomes demonstrated satisfactory local control and favorable postoperative recovery. Surgical complexity and approach extension correlated closely with Radkowski stage.

Conclusions A Radkowski-based, stage-adapted endoscopic strategy provides safe and effective management of juvenile nasopharyngeal angiofibroma. Endoscopic surgery offers excellent access, reduced

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morbidity, and reliable tumor control, supporting its role as the preferred approach for most JNA stages when performed in experienced centers.



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OSTEOPLASTIC FLAP WITH BONE CEMENT CRANIOPLASTY

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Introduction: Although endoscopic techniques are now central to frontal sinus surgery, open approaches remain indicated in selected complex and revision cases. In particular, combined frontal sinus procedures with obliteration are reserved for patients with unfavorable frontal sinus anatomy, laterally located disease, extensive pneumatization, or failure of previous surgical interventions. Our aim is to present the experience of a tertiary referral center with osteoplastic flap and bone cement cranioplasty surgical technique and patient outcomes. We propose acrylic bone cement based on polymethylmethacrylate (PMMA) cranioplasty for defect reconstruction as a new technique in order to reduce infection rates and improve functional and aesthetic outcomes.

Materials and Methods: We retrospectively reviewed patients undergoing external frontal sinus surgery at our tertiary care hospital. Indications for surgery, prior treatments and type of frontal sinus pathology were analyzed. Special attention was dedicated to cases managed with an osteoplastic flap with bone cement cranioplasty reconstruction and obliteration of the demucosed FS with abdominal fat. The surgical technique adopted at our institution is described, including preoperative planning, flap design, disease management and reconstruction strategy. Outcomes were evaluated in terms of surgical success, complications, need for revision surgery and postoperative quality of life defined by questionnaires on aesthetic results and patient satisfaction.

Results: External frontal sinus approaches were reserved for selected patients with complex or refractory disease. The osteoplastic flap provided wide exposure, enabling complete disease removal and safe management of challenging anatomy, with high surgical success, low complication rates, and significant postoperative improvement in quality of life.

Conclusions: Despite the widespread adoption of advanced endoscopic techniques, external approaches to the frontal sinus remain

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a valuable component of the rhinologic surgical armamentarium. When performed using a standardized and meticulous technique, the osteoplastic flap provides effective disease control with favorable functional outcomes. Given the reported 1–7% infection rate following bifrontal craniotomies—approximately half of which are attributable to bone flap osteomyelitis—we propose a novel technique of simultaneous cranioplasty using bone cement (Palacos) aimed at reducing postoperative infectious complications.



6874

MALIGNANT TRANSFORMATION IN SINONASAL INVERTED PAPILLOMA: A RETROSPECTIVE ANALYSIS FROM A TERTIARY REFERRAL CENTER

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Background Sinonasal inverted papilloma (IP) is a benign epithelial tumor characterized by a tendency for recurrence and a recognized risk of malignant transformation. Contemporary data on clinical features associated with malignancy remain limited, particularly in recent cohorts managed endoscopically.

Methods We conducted a retrospective review of patients diagnosed with sinonasal inverted papilloma between 2023 and 2025 at a tertiary referral center. Collected variables included papilloma subtype, sex, age at diagnosis, smoking status and pack-years, occupational exposure, epistaxis, laterality, primary site, symptom duration, recurrence characteristics, and radiological evidence of bone erosion. All patients were treated endoscopically. Malignant transformation was defined by histologically confirmed carcinoma. Statistical analysis was descriptive and exploratory; categorical variables were compared using contingency tables and continuous variables using independent samples tests, acknowledging the limited sample size.

Results Twenty-four patients were included (16 males, 8 females), with a mean age at diagnosis of 59.3 years. The predominant subtype was inverted papilloma (75%), followed by oncocytic (16.7%) and exophytic (8.3%) types. Smoking history was present in 58.3% of patients, with a median exposure of 14 pack-years. Epistaxis was reported in 25%, occupational exposure in 45.8%, and radiological bone erosion in 33.3%. Recurrence occurred in four patients (16.7%). Malignant transformation was observed in two patients (8.3%). One case was synchronous with the initial diagnosis of inverted papilloma, while the second occurred metachronously during follow-up. Both patients had documented occupational exposure. Epistaxis was present in the synchronous case but not in the metachronous case. The synchronous case was a former smoker, whereas the metachronous case was a non-smoker. Exploratory comparisons between benign and malignant cases did not reveal

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statistically significant differences for demographic, clinical, or radiological variables (all $p > .05$).

Conclusion In this recent tertiary-center cohort, malignant transformation of inverted papilloma was uncommon. Although no statistically significant predictors were identified, both malignant cases occurred in patients with occupational exposure and were associated with clinically concerning features. These findings emphasize the importance of vigilant follow-up and careful assessment of high-risk features in patients with inverted papilloma.



6875

ENDOSCOPIC ENDONASAL APPROACH FOR PARAOLINOID ANEURYSM LATERAL TO OPTIC NERVE - TECHNICAL NUANCES AND OPERATIVE VIDEO

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Introduction: Endoscopic endonasal approach (EEA) has been utilized in carefully selected intracranial aneurysm (IA). There are no reported cases of a paraolinooid aneurysm clipping lateral to the optic nerve (ON). Here, we present the case report, discuss surgical challenges and technical nuances.

Case Report: Patient is a 36yr old female who presented with bilateral paraolinooid aneurysms, a larger left 7x7mm with 4mm neck and a smaller 2x3mm. She was not considered an ideal candidate for flow diverters due to her young age. After discussion with our neuro-interventional colleagues, clipping was recommended for the larger IA. Open vs EEA was discussed in detail with the patient and she decided to proceed with EEA. A wide sphenoidotomy was completed. Tuberculum was drilled along with left optic canal. Parasellar and paraolival carotids were exposed. Suprasellar dura was opened and extended laterally into the optic sheath. Medial aspect of aneurysm neck was visible by gently elevating the ON. Complete bony decompression of the optic canal was performed and sheath opened further to mobilize the ON. This allowed complete visualization of the aneurysm neck. Cavernous sinus was opened sharply up to the proximal dural ring. Cavernous bleeding was controlled using liquid hemostatic agent. A temporary clip was applied on the paraolival carotid, taking care of accidentally clip the posteriorly coursing 6th nerve which was monitored electrophysiologically. A bayonet clip was applied by gently elevating the ON. Tips of the clip was inspected to make sure complete occlusion of the neck and exclude any damage to the 3rd nerve which was also being monitored. An intra-operative angiogram was performed which confirmed complete occlusion of the aneurysm, patent ophthalmic artery, without any complications. Abdominal fat was placed at the dural edges and around the aneurysm clip. A vascularized flap was placed on top. No CSF diversion was used and patient discharged to home on post-operative day 2.

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Conclusion. To our knowledge this is the first reported case of an IA clipping using EEA of an aneurysm lateral to the optic nerve. It required complete bony decompression of the ipsilateral optic canal and opening the optic sheath to minimize the risk of traction on the ON. Contrary to previously published data, we did not use fascia lata and instead used abdominal fat to surround the aneurysm clip followed by coverage from flap. This approach requires intimate knowledge of skull base and neurovascular structures. A multidisciplinary team is critical to maximize the chances of success. Cases should be carefully reviewed with neuro-interventional colleagues to explore endovascular options. Open trans-cranial options should also be discussed with the patient with its potential risks and benefits.

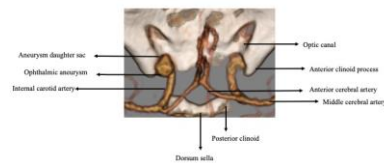


Figure A: Axial computer tomography (CT) digital reconstruction demonstrating a large ophthalmic artery aneurysm with a daughter sac.

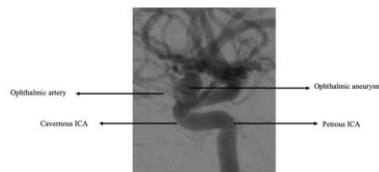


Figure B: Lateral digital subtraction angiography of the right internal carotid artery (ICA) injection

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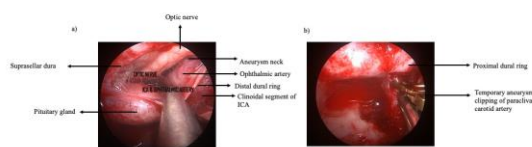


Figure C: a) Endoscopic endonasal view of key structures that were identified prior to clipping of the OAA. b) Proximal control was obtained by placing a temporary aneurysm clip on the paraclival carotid artery.

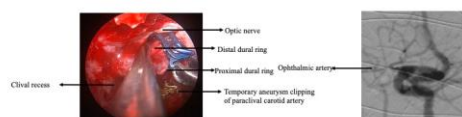
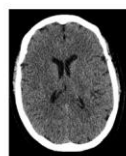
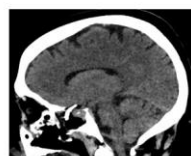


Figure D: a) Single bayonet aneurysm clip was applied over the OAA. b) Lateral digital subtraction angiography of the right internal carotid artery (ICA) injection following aneurysm clipping showing patency of OA.



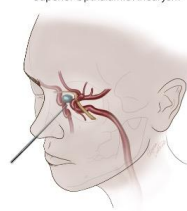
a) Axial non contrast head CT scan



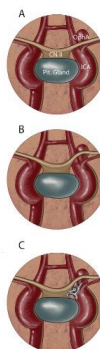
b) Sagittal non contrast head CT scan

Figure E: One week post-operatively non-contrast head computed tomography (CT) scan showing lack of pneumocephalus.

Endoscopic Endonasal Clipping of
Superior Ophthalmic Aneurysm



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AUTO-OBSTRUCTION OF THE FRONTAL SINUSES: INSIGHTS FROM A CASE SERIES

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Objectives : To describe the phenomenon of auto-obstruction of frontal sinus in a case series of patients with recalcitrant chronic rhinosinusitis (CRS), highlighting its clinical presentation, natural progression, and disease management.

Methods: A retrospective review of eight patients with difficult to treat CRS with recurrence and multiple prior surgeries was conducted. Clinical outcomes, imaging, and symptom progression were reviewed to assess the natural course and impact of auto-obstruction of frontal sinus on disease management

Results : Auto-obstruction of the frontal sinuses was observed in all eight patients, characterised by gradual reduction of sinus volume due to progressive neo-osteogenesis. Symptom control improved in most with reduced inflammation and decreased need for additional sinus surgeries. Serial imaging studies confirmed progressive sinus obstruction, naturally limiting the source of chronic inflammation. The patients continue to remain on regular follow-up

Conclusions: Auto-obstruction of sinuses in patients with recalcitrant CRS may represent a unique natural disease progression, leading to symptom control and decreased surgical interventions. Understanding this phenomenon offers insights into managing difficult-to-treat CRS and highlights the potential role of natural sinus obstruction in reducing disease morbidity. Further research should be directed at exploring the mechanisms and predictors of auto-obstruction. Reference:1. Skillern, Samuel Ruff. Obstructive frontal sinusitis. Archives of Otolaryngology-head & Neck Surgery 23. 1936: 267-284.2. Volk BM, Mukerji S. Obstructive frontal sinusitis; report of a case and review of literature. AMA Arch Otolaryngol. 1951 Aug;54(2):188-90.3. Buras M, Simoncini A, Gungor A. Auto-obstruction of maxillary sinuses through osteoneogenesis in children with cystic fibrosis: A possible new way to

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NON RESECTABLE SINONASAL MALIGNANT MELANOMA, THE MANAGEMENT CHALLENGES

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Sinonasal malignant melanoma is a highly aggressive melanocytic tumour. With its non specific initially presentation, patient can often present late. Most doctors prefer aggressive surgical resection and adjuvant radiotherapy for this disease. However, in view of its often late presentation and potential extensive involvement, surgery may not be an option at all. Till date, there is no single standardized protocol for definitive treatment for this disease especially when it is not feasible for surgery. We would like to discuss the various potential treatment options available and its challenges.



6878

ENDOSCOPIC ENDONASAL REPAIR OF SPONTANEOUS CSF RHINORRHOEA: A 13-YEAR EXPERIENCE FROM A UK TERTIARY CENTRE

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Introduction (Background & Aims) Spontaneous cerebrospinal fluid leaks (SCSFL) occurs without an identifiable trigger. The pathophysiology is thought to be multifactorial, with suggested contributions from dural vulnerability and altered venous circulation. It can be often seen in relation to idiopathic intracranial hypertension (IIH), but whether IIH is a driver, a consequence, or a coincidental association remains unresolved. Endoscopic endonasal repair is the mainstay of treatment, but recurrence remains a key concern. We report outcomes from a UK tertiary centre (University Hospitals Birmingham; Queen Elizabeth Hospital Birmingham, QEHB), describing patient characteristics, radiological localisation, intraoperative findings, reconstruction strategies, and repair outcomes.

Methods A retrospective review was undertaken of consecutive patients managed for spontaneous CSF rhinorrhoea between 2012 and 2025. Data from a central database included demographics (age, sex, BMI), presenting features, pre-operative imaging (CT/MRI localisation), intraoperative leak site, reconstruction approach, adjuncts (intrathecal fluorescein, acetazolamide), length of stay, complications, recurrence after primary repair, and revision outcomes. Descriptive statistics are reported.

Results Sixty patients were included. There was a strong female predominance (n=50/60, 83.3%). Mean age was 54.3 years (SD 13.9, range 31–88). Mean BMI was 35.5 kg/m² (SD 7.1, range 23.8–56.3) and 58/60 patients (96.7%) had BMI > 30 kg/m². Watery rhinorrhoea was the commonest presenting symptom (95.0%) along with headache (16.7%), and meningitis (15.0%). Pre-operative CT was performed in 59/60 cases (98.3%), identifying a leak site in 50 (84.7%). MRI was performed in 45/60 cases (75.0%), confidently identifying a site in 39/45 (86.7%). No site was identified on CT or MRI in 6/60 cases (10.0%). Imaging and intraoperative concordance was 45/54 (83.3%) when a site was confirmed on imaging. Leak sites were most commonly at the cribriform plate (26/60, 43.3%) and

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sphenoid sinus (20/60, 33.3%), followed by the fovea ethmoidalis (9/60, 15.0%) and frontal sinus (3/60, 5.0%); 1/60 (1.7%) had multiple sites and 1/60 (1.7%) had no site identified. Reconstruction used one layer in 34/60 (56.7%), two layers in 24/60 (40.0%), and three layers in 2/60 (3.3%). Common materials included mucosal free grafts (31/60, 51.7%), nasoseptal flap (20/60, 33.3%), and fat graft (6/60, 10.0%) along with onlay grafts (Duragen, Biodesign, TachoSil). Intrathecal fluorescein was used in 23/60 (38.3%) and acetazolamide prescribed in 36/60 (60.0%). Mean length of stay was 1.55 days (range 1–7). Post-operative complications including epistaxis (n=2), meningitis (n=1), pulmonary embolism (n=1), and urinary retention (n=1). Primary repair success was 53/60 (88.3%). Recurrence occurred in 7/60 (11.7%), confined to sphenoid (n=4) and fovea ethmoidalis (n=3) leaks. All recurrent cases underwent revision surgery with no further recurrence recorded. Observationally, patients with recurrence had higher mean BMI (39.4 vs 34.9) and were younger on average (46.3 vs 55.3) in our cohort.

Conclusions Endoscopic endonasal repair for spontaneous CSF rhinorrhoea at our centre achieved high primary success, short hospital stays, and low complication rates. Recurrence was infrequent and limited to sphenoid and fovea ethmoidalis sites; revision surgery was successful in all recorded cases. Further work should explore predictors of recurrence.



6879

TOWARD PRECISION BIOLOGIC THERAPY IN CRSWNP: REAL-WORLD PREDICTIVE PATTERNS

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Introduction: Biologic therapies have transformed the management of severe chronic rhinosinusitis with nasal polyps (CRSwNP), yet treatment response remains variable. Current evidence provides limited guidance on which patients derive the greatest long-term benefit, leaving biologic selection largely empirical. This study explores real-world predictors of biologic response.

Materials and Methods: We conducted a retrospective observational pilot study including 31 patients with severe CRSwNP treated with biologics (dupilumab, n=19; mepolizumab, n=12). Standardized assessments were performed at baseline and weeks 4, 16, 26, and 52, including nasal polyp score (NPS), SNOT-22, NOSE score, VAS obstruction and olfaction, Sniffin' Sticks, and IgE. Longitudinal changes were analyzed using repeated-measures tests with correction for multiple comparisons. Predictive associations were explored using correlation and exploratory ROC analyses. Statistical significance was defined as $p < 0.05$.

Results: Biologic therapy resulted in significant and sustained improvement across all domains ($p < 0.01$). NPS decreased rapidly, while patient-reported outcomes showed early parallel improvement. Olfactory function improved later, reaching significance between weeks 16 and 52, suggesting delayed but durable recovery. Greater baseline nasal obstruction predicted larger SNOT-22 improvement at week 52; early NPS reduction predicted long-term endoscopic response. Distinct biologic-specific patterns emerged: lower baseline IgE was associated with improved olfactory outcomes in dupilumab-treated patients, whereas higher baseline disease burden were associated with endoscopic and patient-reported response in mepolizumab-treated patients.

Conclusions: Biologic therapy for CRSwNP produced early and durable clinical benefits in real-world practice. Baseline disease severity and

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biologic-specific predictive patterns may support personalized treatment strategies, representing an early step toward precision medicine in CRSwNP.



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REAL-WORLD OUTCOMES AND INDICATIONS FOR PROPEL™ STEROID-ELUTING SINUS IMPLANTS IN ENDOSCOPIC SINUS SURGERY: EXPERIENCE FROM A UK TERTIARY CENTRE

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Introduction (Background & Aim) Steroid-eluting sinus implants such as PROPEL™ (Medtronic Limited) are used in endoscopic sinus surgery (ESS) to reduce inflammation and support postoperative sinus patency. We report real-world outcomes and indications for PROPEL™ use at a UK tertiary centre (Queen Elizabeth Hospital Birmingham, QEHB).

Methods We conducted a retrospective review of consecutive ESS cases utilising PROPEL™ at QEHB from October 2023 to November 2025. Data were extracted from a central database. The primary outcome was documented sinus patency without stenosis at the latest follow-up.

Results Thirty-two cases were included (18 male, 14 female), with a mean age of 49.3 years (range 18–83). Of these, 14 were primary ESS and 18 were revision ESS. Six patients (18.8%) had aspirin-exacerbated respiratory disease (AERD). The mean pre-operative Lund–Mackay score was 13.1 for the entire cohort. Forty-two PROPEL™ implants were used: unilateral in 22/32 cases and bilateral in 10/32 cases. Implant location was most commonly the frontal sinus cavity or recess, with additional placements in the nasolacrimal duct, sphenoid sinus, or post-nasal space for choanal atresia. Where frontal sinus work was performed, Draf 2a was the most common procedure (n=13), followed by Draf 2b (n=11) and Draf 3 (n=1). Indications for PROPEL™ use included a narrow frontal recess, hyperostotic bone, denuded mucosa or exposed bone, severe allergic fungal disease, following mucocoele drainage, and to provide support during reconstruction. There were no intraoperative complications. Postoperative complications included numbness (n=2), recurrent CSF leak (n=1), and acute sinusitis (n=1). Mean follow-up was 6.6 months (range 0.2–17.2; IQR 3.1–10.3). Thirty-eight out of 42 implantation sites (90.5%) had no stenosis at the latest follow up. There were four sites of implantation that stenosed (9.5%). For those with stenosis at follow-up, the mean preoperative Lund–Mackay score was

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16.25 and most patients had severe, recalcitrant chronic rhinosinusitis (CRS). All four had a history of ESS prior to PROPEL™ use.

Conclusions In our centre, PROPEL™ was predominantly used in frontal sinus surgery where stenosis risk was anticipated, but it was also used in other areas such as the nasolacrimal duct and post-nasal space in selected cases. Thirty-eight out of 42 implantation sites had no stenosis at latest follow up. Stenosis was seen in four PROPEL™ sites, in patients with recalcitrant CRS, suggesting that the risk of stenosis may have been high regardless of PROPEL™ implant use. Overall, our experience with PROPEL™ implants has been positive, with a good safety profile and reassuring patency at 6-month follow-up. However, efficacy in severe CRS may be less durable than in more standard cases, emphasising the importance of clinical judgement when considering use in these circumstances.



6881

EFFECT OF BUDESONIDE NASAL IRRIGATION IN PATIENTS WITH CHRONIC RHINOSINUSITIS WITH NASAL POLYPS WITHOUT PRIOR SINUS SURGERY: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY

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Background: The indication for nasal irrigation with corticosteroids after sinus surgery in patients with Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) is well established, as surgery facilitates distribution throughout the sinonasal cavity. However, it remains unknown whether this approach could also provide therapeutic benefit prior to surgery. This study aims to compare the effect of budesonide versus saline nasal irrigation in surgically naive CRSwNP patients.

Methods: A randomized, double-blind, placebo-controlled parallel-group study was conducted in patients with diffuse type 2 CRSwNP with no previous sinus surgery. Patients were randomized to receive either 1 mg budesonide or saline nasal irrigation twice daily for four weeks. The primary outcome was the change in the 22-item Sinonasal Outcome Test (SNOT-22). Secondary outcomes included the Visual Analogue Scale (VAS), Nasal Polyp Score (NPS), and the Connecticut (CCCRC) olfactory test.

Results: A total of 52 patients were randomized (mean age 50.1 ± 12.9 years; 51.9% female). The intention-to-treat (ITT) analysis showed that the budesonide nasal irrigation group demonstrated a significantly greater improvement in SNOT-22 [mean difference: 18.1 points (95% CI: 3.4 to 32.8); $p=0.017$], VAS [mean difference 2.24 points (95% CI: 0.35 to 4.13; $p=0.018$) and NPS [mean difference: 0.73 points (95% CI: 0.25 to 1.21); $p=0.003$]. No significant differences were observed between groups in CCCRC. **Conclusion:** Budesonide nasal irrigation may be an important tool for controlling sinonasal symptoms in patients with CRSwNP who are not candidates for sinus surgery or while awaiting surgical treatment.



6883

MULTICOMPARTMENT INTRACRANIAL EPIDERMIDS – SURGICAL APPROACHES AND ROLE OF ENDOSCOPE

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Background: Intracranial epidermoid cysts (IEC) are rare benign tumors. Surgery remains the primary treatment modality but maximizing resection while maintaining function can be challenging due to their intimate relationship with neurovascular structures. Multicompartment nature of some IECs adds another layer of complexity to extent of resection. Endoscopes have revolutionized neurosurgical management of complex tumors both with endoscopic endonasal and endoscopic assisted transcranial approaches. Here, we review complex multicompartment IECs and discuss surgical management strategies.

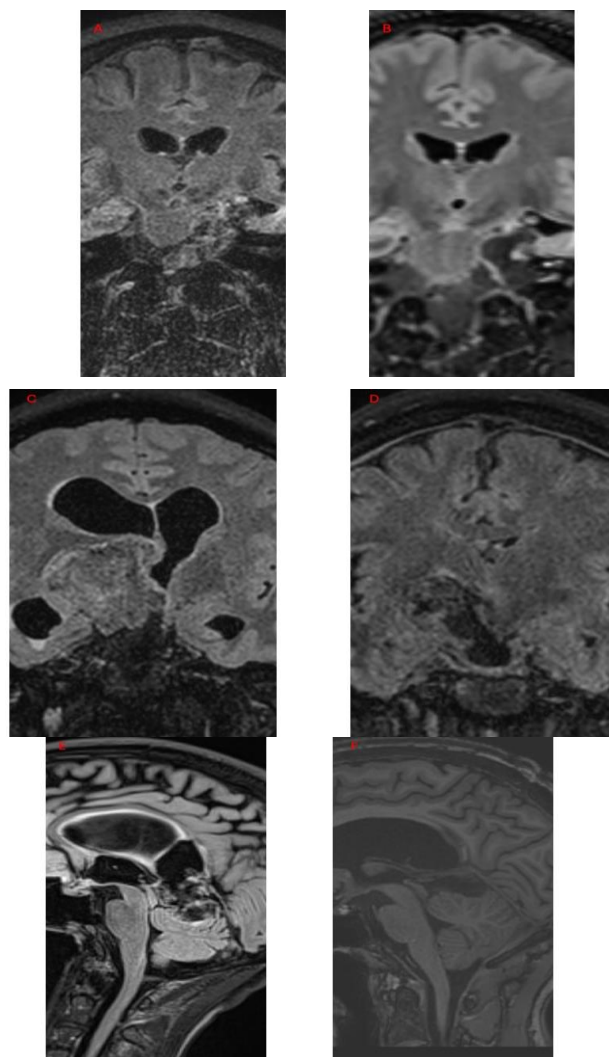
Methods: Cases performed in last 18 months since completion of fellowship of the senior author were reviewed. Total of 5 cases of IEC were identified and three were found in multicompartmental.

Results: Case 1 (Fig A and B) involved a large IEC in cerebellopontine angle (CPA) which extension to middle cranial fossa (MCF) through the tentorial incisura in a 55-year-old male. A retrosigmoid approach (RSA) was performed to remove the cerebellopontine angle (CPA) component. Further, the tentorium was cut to perform a trans-tentorial approach (TTA). Using 0 and 45-degree endoscopes, supratentorial MCF portion of the tumor was removed. A small adherent tumor was left at the origin of lower cranial nerves. Patient was discharged home POD3 without any neurological deficits. Case 2 (Fig C and D) presented with hydrocephalus and involved a large suprasellar IEC with extension into interpeduncular and prepontine cisterns in a 24yr old male. Pre-operative external ventricular drain (EVD) was placed. An endoscopic endonasal approach (EEA) was adopted to remove the suprasellar portion of the tumor. Further, a pituitary transposition was performed along with removal of posterior clinoids, dorsum sella and upper clivus to remove the retroclival portion of the tumor. A small residual adherent to the thalamus was left in place. A ventriculoperitoneal shunt (VPS) was required to address the hydrocephalus. Patient had blurry vision in the right eye which improved by 3 months post-op. Case 3 (Fig E and F) involved a large quadrigeminal IEC with extension rostral and caudal to



the tentorium and lateral ventricles in a 32yr old male. Patient presented with hydrocephalus and seizures. An EVD was placed. A supracerebellar transtentorial approach was performed to remove the infratentorial posterior fossa portion of the tumor, followed by use of 0 and 45-degree endoscopes to resection the supratentorial component via a transtentorial approach. Initially patient was weaned off the EVD but required a VPS in a delayed fashion. Gross total resection was achieved, and no neurological complications were noted.

Conclusions: We have demonstrated that complex multicompartiment IECs can be successfully removed using a single surgical corridor, either through endonasal or endoscope assisted transcranial approaches. Endoscope is a vital tool in accessing these deep-seated tumors which allows for smaller surgical corridors and faster recovery. Familiarity with surgical anatomy and comfort using angled endoscopes is critical.





6884

ENDOSCOPIC TRANS-ORBITAL APPROACH – LEARNING CURVE AS NEW FACULTY, TECHNICAL CHALLENGES AND LESSONS LEARNT

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Introduction: Endoscopic trans-orbital approach (ETOA) is a relatively new approach based on the keyhole concept. It provides access to anterior and middle skull base and infratemporal fossa. The anatomy can be confusing; familiar bones are viewed through a different perspective. Here, we describe our experience with 5 patients performed by the senior author within first two years of finishing fellowship.

Methods: Cases performed in first 2 years of faculty position were reviewed and 5 cases of endoscopic assisted trans-orbital approach were identified (Fig. 1).

Results: Surgical approach – all approaches were performed by neurosurgeons. An incision is made in the eyelid from its midpoint, gradually curving down to the lateral extent of the eyelid. We do not extend our eyelid incision laterally into the forehead as this puts the frontalis branch of facial nerve at risk. Periosteum extending into peri-orbita is elevated. A retractor is put in place primarily to protect the orbital contents. Orbital bone is drilled based on the location of the pathology. Lateral orbital rim (LOR) was removed in only one case by drilling the sphenoid wing down to temporalis muscle. Care must be taken not violate the deep temporalis fascia. Orbital rim was removed using oscillating saw. Drilling, dissection and definitive steps are all performed with endoscopic assistance. A pediatric endoscope can be used in cases where only biopsy is required. It provides more working area due to its low profile and avoids removing the lateral orbital rim in every case. Cases – are described in chronological order to demonstrate the learning curve. First case involved a large trigeminal schwannoma originating from V2 branch. Initial approach was performed via an endoscopic endonasal corridor. A small residual which was extending into the sphenoid wing was accessed through endoscope assisted trans-orbital approach (ETOA). Second case involved temporal dural biopsy. Third case involved a large trigeminal schwannoma extending from superior orbital fissure back to posterior

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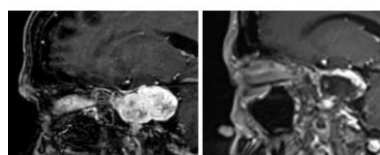


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fossa and causing brainstem compression. This is the only case where LOR was removed. A small residual was left along the trigeminal nerve and surface of brainstem (Fig. 2). The trigeminal nerve function was preserved. Forth case involved an intradural intra-axial lesion in the frontal lobe which was accessed by drilling the orbital roof. Fifth case involved extradural drilling of hyperostotic sphenoid wing causing proptosis.

Outcomes – no post-op cerebrospinal leak was noted in any case. Blurry vision was noted in 1 case which improved at the time of 6-week follow-up. No frontalis injury was noted. Excellent cosmetic results were achieved in all cases (Fig. 3). Limitations – this is based on keyhole concept. Familiarity with orbital anatomy and comfort in working narrow surgical corridor is essential. Use of long low profile endonasal instruments is also important to gain access to deeper structures.

Conclusion: ETOA can be safely performed in carefully selected patients and complexity can be gradually increased as the surgeon becomes familiar with anatomy and gains more experience. Cadaveric dissection is an essential step in learning these approaches. Lateral extension of incision into the forehead is not necessary. Lateral orbital rim can be spared for biopsies and smaller lesions.





6885

EXTENDED TRANS-FRONTAL SINUS, SUPRA-ORBITAL CRANIOTOMY FOR SUB-FRONTAL, TRANS-LAMINA TERMINALIS APPROACH FOR ISOLATED 3RD VENTRICULAR LESIONS – TECHNICAL NUANCES AND CASE PRESENTATIONS

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Introduction: Lamina terminalis provides an excellent corridor to access isolated 3rd ventricular (TV) masses. Tumor location in the TV and its long axis determines the choice of surgical approach. Endoscopic endonasal approach (EEA) provides an excellent midline approach to anterior TV but can cause visual deficits due to compression of optic apparatus and high flow CSF leak. A traditional bicoronal craniotomy provides excellent midline trans-lamina terminalis access but requires a large incision and craniotomy. A standard eyebrow supraorbital and pterional craniotomy can put significant stress on the ipsilateral optic tract. Here, we advocate the use of an extended eyebrow supra-orbital craniotomy (SOC) with extension through frontal sinus to provide a more midline access through lamina-terminalis (Fig. A).

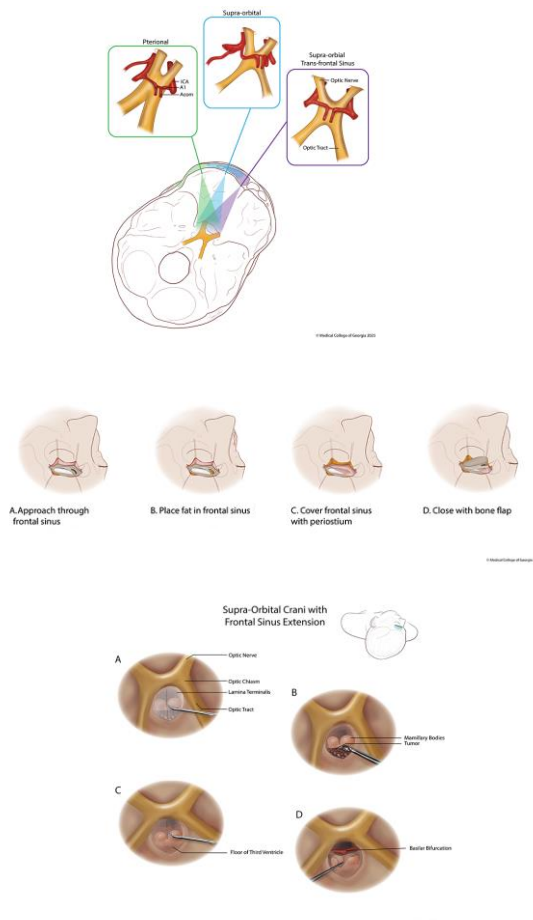
Methods: We identified 3 cases of TV masses in past 18 months, a choroid plexus papilloma (Fig. 4A&B), a craniopharyngioma (Fig. 4C&D) and a pineal parenchymal tumor of intermediate differentiation (PPTID).

Results: Surgical approach (Fig. B) - A standard eyebrow incision is extended to the medial extent of the eyebrow. A pericranial flap (PCF) is elevated with its base towards the orbital rim. The supra-orbital craniotomy is extended medially into the frontal sinus. The mucosa of the lateral frontal sinus is removed. Dura is opened in a traditional fashion and lamina terminalis is opened. Using microscope and endoscopic assistance, the masses were removed in a piecemeal manner. No fixed retraction was used in any of the cases. Lamina terminalis is covered with oxidized cellulose. Primary closure of dura is performed. Lateral frontal sinus is packed with abdominal fat, taking care not to block frontal recess which can result in frontal mucocele formation. The frontal sinus defect is further covered with PCF and the bone flap is secured. Follow-up ranged from 3 months to 4 years. None of the patients have developed a frontal mucocele. In the case of PPTID, patient had presented with hydrocephalus. Tumor was debulked and 3rd ventriculostomy performed through the same approach using a 45-



degree endoscope (Fig. C). This prevented a secondary approach to perform an ETV. Complications included numbness of forehead due to sacrifice of supra-orbital nerve from medial extension into the frontal sinus. Limitations – This approach is based on the keyhole concept. Familiarity and comfort with surgical anatomy, operating in narrow corridor and endoscope are essential. Frontal mucocoeles can develop in delayed fashion, therefore attention to follow-up is needed.

Conclusions: This approach provides a minimally invasive corridor through lamina terminal for masses isolated in the TV. This medial extension into the frontal sinus provides better visualization due to its midline approach and prevents compression of the optic apparatus. Importantly, frontal sinus should not be overpacked which can inadvertently block the drainage of frontal sinus through frontal recess and may result in frontal mucocoele.





6888

TRIGEMINAL NERVE FUNCTION FOLLOWING INFERIOR TURBINATE SURGERY

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Background – The key role of Intranasal trigeminal function in human chemosensory perception has become widely acknowledged. The mechanism whereby inhaled air activates moderate cold trigeminal receptors (TRPM8) and links nasal airflow to perception of nasal patency has gained the most traction. T.Hummel and M.Scheilve posited that anterior parts of the nose (the anterior septum, inferior turbinate and the anterior lateral nasal wall) exhibited significantly higher trigeminal sensitivity than those located posteriorly.

Aims: 1. To investigate the effects of inferior turbinate reduction surgery on nasal trigeminal function. 2. To explore the effect of turbinate reduction surgery on nasal patency perception and further explore its association with empty nose syndrome.

Methods –Patients (N=22) who been scheduled to undergo elective turbinate reduction surgery were randomized into 3 groups according to one of three turbinate reduction techniques: bipolar electrocautery (n=8) Colorado needle electrocautery (n=8) and microdebrider (n=6). Demographic data was collected on all subjects. At baseline and postoperatively, subjective data was collected using ENS6Q, NOSE and SNOT-22 questionnaires, Olfactory and trigeminal function were assessed as was nasal airflow using rhinomanometry. A comparative Statistical analysis was performed between groups Results- Inferior turbinate partial reduction had no significant effect on either trigeminal sensitivity or on olfactory function irrespective of the surgical technique used ($p=0.779$). A statistically significant ($p=0.002$, 0.001 respectively) improvement in subjective measures (SNOT-22 and NOSE questioners) was observed. Although a significant objective change in nasal resistant was not observed post-operatively using anterior passive rhinomanometry ($p=0.174$). None of the patients developed Empty Nose Syndrome (ENS) according to Enq6 questionnaire.

Conclusion- inferior turbinate partial reduction did not change the nasal trigeminal nerve sensitivity post-operatively regardless to the operative method used. a significant subjective improvement in there nasal breathing was observed post-operatively.



6889

DO ALL PITUITARY CASES NEED A NASOSEPTAL FLAP? OUR EXPERIENCE

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¹Other

Background: The nasoseptal flap (NSF) is widely adopted for skull base reconstruction following endoscopic transnasal pituitary surgery. In many centres, it is harvested routinely, regardless of intraoperative cerebrospinal fluid (CSF) leak characteristics. The necessity of routine flap use in all pituitary cases remains debatable.

Objective: To evaluate the outcomes of a selective, leak-based reconstruction strategy and assess whether routine nasoseptal flap use is required in all endoscopic transnasal pituitary surgeries.

Methods: A retrospective review was performed of 50 consecutive patients who underwent endoscopic transnasal pituitary surgery over a two-year period. Skull base reconstruction was guided by intraoperative CSF leak grade and dural defect characteristics. Cases with no CSF leak or low-flow leaks were managed using multilayer free graft techniques, while high-flow leaks and larger dural defects were reconstructed using a vascularized nasoseptal flap. Postoperative CSF leak rates and early sinonasal outcomes were assessed.

Results: The majority of cases were managed without routine nasoseptal flap harvest. Low-risk cases achieved successful skull base closure using free graft reconstruction alone. Nasoseptal flaps were selectively utilized in patients with high-flow CSF leaks or extensive dural defects. No increase in postoperative CSF leak rates was observed with this selective approach. Avoidance of routine flap harvest preserved septal anatomy and reduced unnecessary sinonasal intervention.

Conclusion: Routine nasoseptal flap harvest is not required in all endoscopic transnasal pituitary surgeries. A selective, strategy based on intraoperative findings provides safe and effective skull base closure while minimising flap-related sinonasal morbidity.



6893

EFFICACY OF PIEZOSURGERY VERSUS CONVENTIONAL OSTEOTOMY IN PRELACRIMAL APPROACH TARGETING DIFFERENT MAXILLARY SINUS PATHOLOGIES: A RANDOMIZED CONTROLLED TRIAL.

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Abstract Introduction: The prelacrimal recess approach (PLA) is a minimally invasive approach to maxillary sinus lesions especially those of the anterior and inferior wall. Innovative advances e.g. the piezosurgery ultrasonic device (PZD) have been developed aiming at facilitating surgical procedures in terms of efficient hemostasis, dissection, safety, and reduction in surgical time. The current study aimed to evaluate the efficacy of PZD versus conventional osteotomy while performing a prelacrimal approach.

Methods: A prospective comparative study was conducted in the Otorhinolaryngology Department, Mansoura University, Egypt on 40 patients diagnosed with different maxillary sinus pathologies amenable to a prelacrimal approach. Patients were randomly allocated into 2 groups: group A underwent Piezosurgery while conventional osteotomy was used in group B. **Results:** Operative time was significantly higher in the PZD group (16.30 ± 2.16 versus 9.05 ± 1.88 ; $p=0.001$) whereas the blood loss was much less (14 ± 3.84 vs 42 ± 16.81 ; $p=0.001$). Both groups witnessed a significant improvement in their NOSE and SNOT-22 scores in the 3-months and 6-months follow-up visits compared to the preoperative ones ($P<0.001$). Postoperative pain, hyposthesia, and epiphora were significantly less in the PZD group ($P<0.001$, $P=0.006$, $P=0.002$). Other complications were comparable in both groups including cheek swelling, minimal epistaxis, dry nose, wound dehiscence, alar collapse, and recurrence of the original pathology.

Conclusion: The PZD was associated with less bleeding, pain, hyposthesia, and epiphora in comparison to traditional osteotomy. It also allowed for precision cutting with no bone loss; however, the

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procedure was time consuming when compared to conventional osteotomy.

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Conclusions Telemedicine-based preoperative consultations for rhinologic surgery provide patient satisfaction, preparedness, anxiety reduction, and perioperative outcomes comparable to traditional face-to-face visits. While in-person evaluation remains essential in selected cases, telemedicine represents a safe and effective alternative for preoperative assessment and counseling, supporting its integration into routine rhinology practice.



6897

CHALLENGES IN MANAGEMENT OF LOCALLY ADVANCED RECURRENT CHONDROSARCOMA WITH LITERATURE REVIEW

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Sinonasal chondrosarcoma is an extremely rare cartilage forming mesenchymal malignant tumour. Its initial symptoms is often vague and commonly present late to health care provider with locally advanced disease. Treatment options mainly aim for complete surgical removal, with consideration of radiotherapy and rarely chemotherapy. In this presentation we mainly focus on discussion of management if orbital involvement of this tumour. Challenges of complete surgical removal with increase potential of orbital complications or vision loss versus less aggressive surgery with recurrent risk will be discussed.



6898

TRANSNASAL ENDOSCOPY-GUIDED PERCUTANEOUS ACCESS TO THE SPHENOPALATINE GANGLION FOR NEUROSTIMULATION IN THE TREATMENT OF PRIMARY HEADACHE: OPERATIVE TECHNIQUE AND FEASIBILITY

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Introduction: Cluster headache is considered a trigeminal autonomic cephalalgia and may present with characteristic symptoms of sympathetic/parasympathetic activation on the affected side of the face, such as nasal discharge, tearing, and conjunctival injection. Invasive therapies targeting the sphenopalatine ganglion have been performed in these headache syndromes and can have a medication-sparing effect, especially in refractory, difficult-to-manage cases. The gate control theory of pain suggests that electric pulses delivered to nerve tissues can modulate neuronal activity, thus aiding in management of nociceptive or neuropathic pain, and studies have demonstrated the efficacy and safety of sphenopalatine ganglion neurostimulation. Within this context, we sought to assess the feasibility of a new surgical technique for neurostimulation of the sphenopalatine ganglion in a cadaver dissection model.

Methods: The technique was developed through dissection of two cadaver heads. We divided the procedure into two stages: an endonasal endoscopic approach to expose the sphenopalatine ganglion and confirm electrode placement, and a cervicofacial approach to introduce the electrode array and position the internal pulse-generator unit. Computed tomography was performed to confirm implant placement at the end of the procedure.

Results: The pulse-generator unit was successfully placed through a retroauricular incision, as is already standard for cochlear implant placement. This should reduce the incidence of perioperative sequelae, especially pain and swelling in the oral region, which are a common complication of previous approaches used for this purpose. Control imaging confirmed proper electrode placement. The device used in this

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study allows the patient to modulate the intensity of the stimulus, reducing or even obviating the need for drug therapy.

Conclusion: The novel technique described herein, based on percutaneous access guided by transmaxillary endoscopy, can provide great precision in electrode array positioning and decreased perioperative morbidity, combining the advantages of endoscopic approaches with those of the retroauricular route.



6899

EVALUATION OF POSTOPERATIVE INTRACRANIAL PRESSURE IN PATIENTS WITH RADIOLOGICAL DIAGNOSIS OF IDIOPATHIC INTRACRANIAL HYPERTENSION

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Introduction: This study aimed to assess postoperative intracranial pressure in patients with clinical and/or radio-logical features of idiopathic intracranial hypertension (IIH) undergoing endoscopic endonasal surgery for pri-mary cerebrospinal fluid (CSF) leak repair.

Methods: Data was prospectively collected from 9 patients diagnosed with CSF nasal leaks who underwentcorrective endonasal surgery between January 1, 2021, and October 31, 2022. Postoperative intracranial pressure was measured via lumbar puncture at least one month after surgery. Preoperative and postoperative MRIs were compared to evaluate changes.

Results: Postoperative lumbar puncture revealed elevated intracranial pressure in 67 % of patients, and 100 %showed persistent signs of intracranial hypertension on MRI.

Conclusion: Managing elevated intracranial pressure in patients with CSF nasal leaks should be prioritized alongside surgical correction. Consideration of permanent peritoneal shunt or pharmacological treatment may be necessary for patients with classic IIH phenotype. Longitudinal studies are essential for further understanding long-term outcomes.



6900

OUTCOMES OF ENDOSCOPIC SINUS SURGERY (ESS) ON SINO-ORBITAL OSTEOMAS: A 12-YEAR MULTICENTER EXPERIENCE

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Aim: To share our multicenter experience about manifestations of sino-orbital osteomas and outcomes of endoscopic sinus surgery (ESS) for management of these lesions and literature review.

Methods: This 12-year multicenter cohort evaluated 12 patients with symptomatic sino-orbital osteomas managed with ESS, including advanced approaches such as Draf techniques and orbital transposition when indicated. Demographics, clinical and radiological presentation, tumor characteristics, surgical outcomes and complications during follow-up were collected and reviewed.

Results: The cohort population (7 men, 5 women; mean age 29.75 years) predominantly presented with proptosis, followed by diplopia, blurred vision and eyelid swelling. They originated most frequently from the frontoethmoidal and frontal sinuses with average dimensions of $4.2 \times 2.9 \times 1.9$ cm. Complete excision was achieved in all cases via ESS. More than 90% of patients experienced resolution or substantial improvement of visual symptoms. No recurrences, cerebrospinal fluid leaks, major postoperative orbital complications or cosmetic deformities were observed.

Conclusion: ESS may be a highly effective and safe minimally invasive approach and offers substantial rates of visual symptom resolution and minimal morbidity; hence, it promises a breakthrough to management of sino-orbital osteomas. Comprehensive ophthalmic evaluation is recommended as multidisciplinary approach to enhance the final outcome of suspected cases. Our findings favor the expanding role of endoscopic techniques for cases with orbital involvement.

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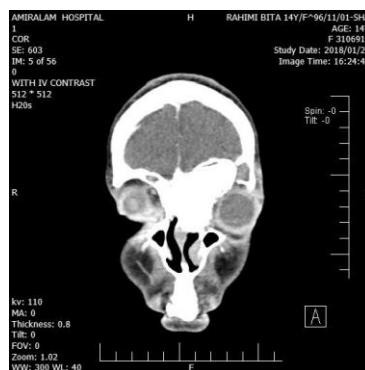
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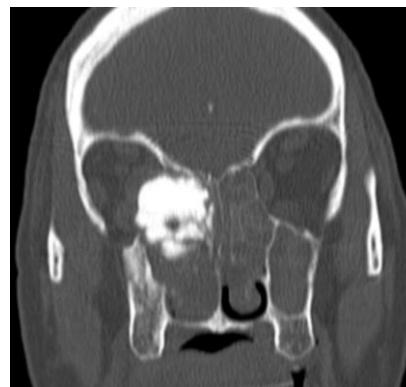
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6904

WHEN ENDOSCOPIC CSF LEAK REPAIR FAILS: LESSONS FROM A REFRACTORY CASE SERIES

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Introduction

Endoscopic endonasal repair of cerebrospinal fluid (CSF) leaks has high reported success rates for both primary and revision surgery. Failure after multiple repair attempts is rare and typically reflects complex underlying pathology. We present a case series of refractory CSF leaks requiring three or more operative attempts, highlighting specific factors contributing to failure and the strategies that ultimately achieved success.

Materials and Methods / Case Study A retrospective review was performed of four patients undergoing endoscopic CSF leak repair who failed both primary and revision procedures and required at least three surgical attempts. Clinical presentation, skull base anatomy, intraoperative findings, reconstructive techniques, and adjunctive interventions were analysed.

Results Four distinct challenging scenarios were identified. One patient with an irresectable pituitary somatotroph macroadenoma due to ICA herniation within the tumour and high-flow CSF leak failed two repairs before successful closure following cerebrospinal fluid diversion with ventriculoperitoneal shunting. A second patient developed a delayed postoperative CSF leak after standard pituitary surgery; repair was unsuccessful until Medpor from the original reconstruction was removed. The third patient had bilateral lateral sphenoid encephaloceles, where targeted patch repairs failed and definitive closure required sphenoid sinus obliteration. The fourth patient demonstrated multiple anterior cranial fossa and sphenoid sinus defects, necessitating sphenoid sinus obliteration combined with an open pericranial flap repair.

Conclusions Refractory CSF leaks are uncommon but may arise in the setting of high-flow leaks, retained reconstructive materials, complex

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lateral sphenoid disease, or pathological CSF dynamics. Early recognition of these factors and timely escalation beyond standard endoscopic patch techniques—including CSF diversion, removal of foreign materials, sinus obliteration, and combined open approaches—may be critical to achieving durable closure.



6906

TWENTY YEARS OF ENDOSCOPIC DACRYOCYSTORHINOSTOMY: EVOLUTION OF SURGICAL TECHNIQUE AND OUTCOMES IN A HIGH- VOLUME TERTIARY CENTER

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Introduction: Nasolacrimal duct obstruction (NLDO) is a leading cause of persistent epiphora in adults and often requires dacryocystorhinostomy (DCR) to restore lacrimal drainage. Advances in endoscopic visualization and powered instrumentation have progressively transformed endonasal endoscopic DCR (EE-DCR), enabling minimally invasive access and concurrent management of sinonasal disease. This study examines the full cohort of endoscopic DCR procedures performed in the last two decades in a tertiary referral center to determine how the stepwise refinement of surgical technique has shaped operative performance, complication rates, and long-term patency.

Methods: This retrospective, single-center study included consecutive adults who underwent EE-DCR between 2004 and 2024. Collected data included the surgical approach to the lacrimal sac (anterior vs. posterior), use of powered instrumentation, use of lacrimal transillumination, operative time, postoperative complications, and duration of bicanalicular stenting. Outcomes were assessed at 6 months (T1) and 12 months (T2). Surgical success was classified as anatomical success, defined as patency on lacrimal irrigation, and functional success, defined as complete or near-complete resolution of epiphora. Surgical failure was defined as persistent obstruction on irrigation. Sensitivity analyses restricted to procedures performed after 2014 were conducted to limit learning-curve effects and reduce confounding.

Results: A total of 440 patients underwent 600 EE-DCRs (bilateral: 160/440, 36.4%). Over the study period, surgical practice shifted toward routine adoption of posterior access and powered instrumentation, whereas

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transillumination was progressively abandoned. Surgical failure significantly decreased in the second decade (≤ 2014 : T1=49/196, T2=55/196; $>$: T1=47/404, T2=51/353; $p < 0.001$). Mean operative time also declined (≤ 2014 : 33.33 ± 16.19 min; $>$: 29.13 ± 11.46 min; $p = 0.019$). Sensitivity analyses confirmed higher success rates with powered techniques and shorter procedures with posterior approaches, independent of confounders. Complication rates remained low and stable across decades.

Conclusions: Over 20 years, progressive refinement and standardization of EE-DCR were associated with improved surgical efficacy and shorter operative times without increased morbidity. In a large cohort with frequent concomitant sinonasal disease, EE-DCR proved to be a safe, effective, and versatile.



6908

SURGICAL STRATEGY FOR INTRAORBITAL TUMORS USING THE ENDONASAL ENDOSCOPIC APPROACH

Kuga Daisuke¹

¹Other

Background: Intraorbital tumors present significant surgical challenges because of their close anatomical relationship to critical neurovascular structures, particularly the optic nerve and extraocular muscles. The endonasal endoscopic approach (EEA) has emerged as a minimally invasive alternative for selected intraorbital lesions; however, its applicability may be limited in tumors with complex extension. This study aims to evaluate the effectiveness and safety of EEA in the surgical management of intraorbital tumors and to clarify the complementary roles of the transorbital approach (TOA) and extended modified medial maxillectomy (EMMM) in cases requiring broader surgical corridors. Methods: We retrospectively reviewed 13 consecutive cases of primary intraorbital tumors surgically treated using EEA as the principal approach. Adjunctive approaches, including TOA and EMMM, were selectively employed according to tumor location, extent, and anatomical complexity. Detailed analyses were performed regarding patient demographics, tumor size, intraconal or extraconal location, and spatial relationship to critical structures such as the optic nerve. Surgical techniques, extent of tumor resection, postoperative visual outcomes, and procedure-related complications were systematically evaluated. Results: EEA was successfully applied as the primary surgical approach in all cases, particularly in eight intraconal tumors located medial to the optic nerve. Five extraconal tumors required additional approaches to achieve adequate exposure and safe resection. TOA was utilized for lesions with anterior orbital extension, while EMMM provided enhanced access for tumors extending toward the inferior orbital wall. Gross total resection was achieved in 80% of cases. Postoperatively, visual function improved in 69.2% of patients, remained stable in most others, and did not significantly deteriorate overall. Surgical morbidity was minimal, with only one case each of mild enophthalmos and slight visual field deficit. Conclusion: The combination of EEA with TOA and EMMM offers a versatile and effective surgical strategy for the management of

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intraorbital tumors with diverse anatomical characteristics. This tailored, multi-portal approach facilitates maximal tumor resection while preserving visual function and cosmetic outcomes. These findings support the value of a multidisciplinary, endoscopic-based strategy and underscore the need for further studies with larger cohorts to establish standardized guidelines for combined surgical approaches.



6910

PREDICTIVE VALUE OF TISSUE EOSINOPHILIA FOR DUPILUMAB RESPONSE IN CHRONIC RHINOSINUSITIS WITH NASAL POLYPS: A RETROSPECTIVE MONOCENTRIC STUDY

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Objective: To evaluate the predictive value of baseline tissue eosinophilic infiltration (cells/high-power field [HPF]) in determining clinical response to dupilumab in patients with chronic rhinosinusitis with nasal polyps (CRSwNP). **Methods:** This retrospective, single-center observational study included patients with severe, refractory CRSwNP treated with dupilumab between December 2020 and December 2024. Based on histopathological analysis of nasal polyp biopsies, patients were stratified into two groups according to tissue eosinophil density: <0 cells/HPF and ≥50 cells/HPF. Clinical response was assessed through patient-reported outcomes (SNOT-22) and objective measures including Nasal Polyp Score (NPS), Lund-Kennedy Score (LKS), and Lund-Mackay Score (LMS), evaluated at baseline and after 1, 3, and 12 months of treatment. Repeated-measures ANOVA was used to evaluate within- and between-group differences over time.

Results: Eighty-six patients were included in the analysis: 57 with low eosinophilic infiltration (<0 cells/HPF) and 29 with high infiltration (≥50 cells/HPF). Patients with high tissue eosinophilia showed significantly greater improvement in SNOT-22 scores across all time points ($p = 0.045$). No significant between-group differences were found in endoscopic (NPS, LKS) or radiologic (LMS) outcomes throughout the follow-up period. **Conclusions:** Dupilumab confirmed high clinical efficacy, rapid symptom improvement, and good tolerability in patients with CRSwNP. Higher tissue eosinophil counts were associated with greater symptom improvement, as measured by SNOT-22. These findings suggest a

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potential role for tissue eosinophilia as a predictive marker of clinical response.



6911

PEDIATRIC SKULLBASE SURGERY- OUR EXPERIENCE OF 18 CASES IN A TERTIARY PEDIATRIC HOSPITAL

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¹Other,

²Jaslok Hospital and Research Centre Mumbai, India

Objective: Pediatric skull base surgery poses unique challenges due to anatomical intricacies and developmental considerations. This study reviews the management of various pediatric skull base cases managed at a tertiary referral center in Mumbai, assessing outcomes and exploring the field's future potential.

Methods: 18 pediatric patients with diverse skull base pathologies (traumatic, infective, inflammatory, neoplastic, congenital etiology) were treated at our center. The cases required specialized, minimally invasive surgical approaches tailored to pediatric anatomy. A multidisciplinary team approach, involving neurosurgeons, ENT specialists, and pediatric anesthesiologists, was adopted to optimize surgical planning, minimize complications, and ensure comprehensive perioperative care. All procedures utilized endoscopic trans nasal techniques to reduce invasiveness and postoperative morbidity.

Results: Successful resolution of lesions was achieved in the cases, that were managed either surgically, conservatively or both with minimal complications. Postoperative follow-up indicated favorable neurological and functional outcomes, with improved quality of life. Effective teamwork and the use of minimally invasive techniques were key factors in managing these challenging cases, underscoring the importance of specialized skills and infrastructure in pediatric skull base surgery.

Conclusion: This case series demonstrates that pediatric skull base surgery can yield positive outcomes when managed by a multidisciplinary team with expertise in minimally invasive techniques. The future of pediatric skull base surgery holds promise, with advancements in endoscopic technology and tailored pediatric surgical protocols. Establishing specialized pediatric skull base units in tertiary centers will be essential for further improving patient outcomes.

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and advancing the field. Continued focus on training, research, and innovation will drive progress in managing complex pediatric skull base pathologies.



6915

IMAGING PITFALLS AFTER ENDOSCOPIC RESECTION OF SINONASAL SQUAMOUS CELL CARCINOMA: A MUCOCELE MIMICKING LOCAL RECURRENCE

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Introduction: Sinonasal squamous cell carcinoma (SNSCC) is characterised by a high rate of local recurrence, particularly within the first two years of follow-up, although late recurrences may still occur. After R0 endoscopic oncologic resection, optimal surveillance relies on a combination of nasal endoscopy and imaging. However, postoperative inflammation, scarring, flap or granulation tissue enhancement, and complications - particularly mucocèles - can be challenging to differentiate from tumour recurrence on imaging.

Objective: To present a representative case highlighting challenging postoperative imaging findings following SNSCC resection and to emphasise the importance of protocol-driven follow-up.

Case: A 50-year-old man presented with a 3-month history of progressive left-sided nasal obstruction and ipsilateral retro-orbital pain. Biopsy confirmed sinonasal squamous cell carcinoma centred in the left nasal cavity, with extension to the posterior ethmoid and sphenoid sinus. An expanded endoscopic endonasal oncologic resection was performed with clear margins. Postoperative endoscopic surveillance showed no evidence of recurrence. During follow-up, Magnetic Resonance (MR) performed with a limited, non-protocolled sequence reported a suspicious focal local recurrence, despite the absence of endoscopic findings. Ongoing diagnostic uncertainty led to revision endoscopic surgery. Intraoperatively, a left carotid-optic recess mucocèle was identified and successfully marsupialised without complications, with no evidence of residual or recurrent tumour. The accompanying video illustrates key endoscopic landmarks, surgical decision points, and intraoperative findings from both procedures.

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Conclusion: This two-procedure video case demonstrates how non-contrast, non-protocolled MR can falsely suggest tumour recurrence after endoscopic SNSCC resection in a complex postoperative field.

Mucocele - potentially facilitated by mucosal sequestration beneath reconstructive flaps - represent not only imaging mimics but also clinically significant complications. In this case, revision endoscopic surgery allowed definitive diagnosis and simultaneous treatment, with neuronavigation proving essential for safe dissection within the carotid-optic recess. Optimal follow-up after endoscopic SNSCC resection requires close integration of endoscopic surveillance with protocolled, contrast-enhanced MR.



6918

HIDDEN FRONTAL SINUS APLASIA: A SINGLE INSTITUTION RADIOANATOMIC STUDY

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Introduction: Hidden unilateral frontal sinus aplasia is the absence of the frontal sinus on one side, with an increase in pneumatization of the contralateral sinus. Previous literature shows that these frontal sinus variations carry a significant surgical impact by creating a misleading representation of the anatomy; however, they remain underreported. The objective of this study is to assess the morphology of these variants and to raise awareness of this finding.

Methods: Retrospective chart review of patients with hidden frontal sinus aplasia from 2019-2024. Aplasia was defined as a lack of pneumatization of one frontal sinus below the level of the supraorbital line with increased pneumatization of the contralateral side. The sinus was classified as hypoplastic if it extended from the supraorbital line.

Results: Overall, 28 patients were identified with hidden frontal sinus developmental anomalies, of which 21 (75.0%) were classified as aplastic and 7 (25.0%) hypoplastic. The total cohort had a mean age of 53.7 years (SD 18.4) and was predominantly female (71.4%) and White (78.6%). The right side was affected in 18 (64.3%) patients and the left in 10 (35.7%). Chronic rhinosinusitis was present in 21 (75.0%), nasal polyps in 11 (39.3%), septal deviation in 19 (67.9%), frontal recess obstruction in 15 (53.6%), and concha bullosa in 6 (21.4%). Of the total cohort, 16 (57.1%) had at least one endoscopic sinus surgery, and of the 24 CT scan reports available, only 5 (17.9%) reported frontal sinus variation.

Conclusion: Frontal sinus aplasia and hypoplasia are rare anatomical variations. However, they carry great surgical significance and should be evaluated preoperatively.



6919

SELECTION OF ENDOSCOPIC/TRANSCRANIAL APPROACHES FOR TRIGEMINAL SCHWANNOMA: BASED ON MENINGEAL ANATOMY AND CLINICAL EXPERIENCES

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Background: Endoscopic endonasal approach (EEA) indicated for trigeminal schwannomas(TS) is unclear yet, as tumor radicality and complications, including injury to the cranial nerve sand cerebrospinal (CSF) leakage, are not feasible in EEA.

Objective: To explore the anatomically rational indication of EEA for TS.

Methods: We analyzed the EEA surgical techniques for each lesion. Parasellar meninges were histologically sectioned to examine the relationship between meninges and trigeminal nerve. Moreover, we analyzed six clinical cases operated by the transcranial approach (TCA) or EEAto compare the damage to the cranial nerves and complications between TCA and EEA.

Results: The trigeminal nerve can be classified into the following three zones: zone 1; theepidural part of three branches, zone 2; the interdural part of the parasellar portion afe closure against CSF leakage. Contrastingly, TCA was safer for tumors invading zone 3by epiarachnoid dissection, thus avoiding CSF leakage and injury to neurovascular complications, particularly to the abducens nerve.

Conclusion: EEA indications are not influenced by the tumor size, but by membrane-based zones. Thus, EEA can be indicated for tumors in zones 1 and 2, not in zone 3.



6920

COULD PRESERVATION RHINOPLASTY BE THE GAME-CHANGER FOR THE CROOKED NOSE?

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Introduction: The management of the crooked nose remains one of the most formidable challenges in rhinoplasty, demanding a harmonious balance of aesthetic refinement and functional restoration. Traditional structural rhinoplasty relies on extensive dorsal work, osteotomies, and complex cartilage grafting to reconstruct the nasal framework. While often effective, this approach can be destabilizing, prone to long-term asymmetry, and may result in an over operated appearance.

Methods: This presentation explores the paradigm shift offered by Preservation Rhinoplasty (PR) in treating nasal deviation. The core premise of PR is rebooting the nasal skeletal bonds relying on the different concepts of Biomechanics. Through techniques such as the SPQR, Spare roof, Push-down or let-down, the surgeon addresses the deviation not by resecting and reassembling, but by repositioning the entire dorsal complex as a unified unit into a stable, midline position. This approach inherently preserves the crucial ligamentous and soft-tissue support, which is often disrupted in traditional methods. We will demonstrate how this philosophy provides a powerful alternative for the crooked nose. Key advantages to be discussed include: Enhanced Stability: By maintaining natural biomechanics, the risk of post-operative twisting and relapse is significantly reduced. Superior Aesthetics: Preservation of the dorsal lines and keystone area leads to a more natural, un-operated contour, avoiding the inverted-V deformity or mid-vault irregularities. Improved Function: The let-down technique inherently widens the internal nasal valve, often improving airflow without requiring spreader grafts.

Conclusion: Through a series of clinical cases and video analyses, we will illustrate the surgical algorithm for applying PR to deviated noses, including patient selection criteria, technical nuances, and management of associated tip deformities. While not a panacea, this presentation will argue that Preservation Rhinoplasty offers a reproducible, biomechanically superior framework that has the

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potential to be a true game-changer in achieving predictable, elegant,
and long lasting results.



6922

IMPACT OF CAVERNOUS SINUS MEDIAL WALL RESECTION ON BIOCHEMICAL REMISSION IN FUNCTIONING PITUITARY ADENOMAS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction Cavernous sinus medial wall (MW) invasion is a major barrier to biochemical remission following transsphenoidal pituitary adenoma resection. Endoscopic medial wall resection (MWR) has been proposed to improve outcomes, but its advantage over standard surgery remains uncertain. **Objective** To evaluate biochemical remission rates following MWR and compare them with conventional surgery that preserves the MW.

Methods We systematically searched MEDLINE, Embase, and Web of Science for randomized or observational studies including patients who underwent endoscopic or microscope-assisted transsphenoidal MWR. We used odds ratio (OR) with 95% confidence intervals (CIs) as the effect size measure for binary outcomes, employing a random-effects model. Statistical significance was set at $p < 0.05$. For single-arm studies, we calculated the rates with 95% confidence intervals (CI) using the score statistic and the exact binomial method. Heterogeneity was assessed with the Cochran Q test and I^2 statistics. $I^2 \geq 50\%$ was considered significant for heterogeneity in all analyses. **Results** We included ten studies with a total of X patients. Four studies included control groups without MWR, yielding 243 MWR and 185 non-MWR patients for pairwise analysis. Across these studies, MWR significantly increased the odds of biochemical remission six-fold (OR 6.04, 95% CI: 2.23–16.38). For single-arm analysis, the pooled biochemical remission after MWR was 0.79 (95% CI: 0.68–0.88). The remission rate in Knosp $\leq 3A$ tumors was 0.86 (95% CI: 0.69–0.98).

Conclusion MWR significantly improves biochemical remission, multiplying cure odds by approximately six compared to conventional surgery. The benefit is most consistent in Knosp $\leq 3A$ tumors, though select grade 4 lesions may also respond. MWR should be considered for functional pituitary adenomas or macroadenomas involving the cavernous sinus MW, particularly by experienced teams. Further

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prospective studies are needed to confirm long-term outcomes and refine patient selection.



6924

NEW PROPOSALS FOR TRANSNASAL SURGERY FOR ORBITAL PATHOLOGY

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Transorbital endoscopic surgery is new in the world, involving multiple specialties. It is divided into transorbital surgery for orbital approach and transorbital surgery for cranial approach (1). Within the orbital approaches there are different approaches that are classified according to whether they treat the superior, inferior, lateral or medial wall of the orbit (2). Medial wall approaches can be orbital approaches with eyelid incisions or pure trans nasal approach. We will present the pure trans-nasal approach for orbital pathology, which was useful for the management of our patients, who presented pathologies not described in the literature such as: mucormycosis, malignant orbital tumors, optic nerve compression and post-sinusitis orbital complications. Based on clinical and imaging evaluation. The signs of severity that suggested surgical management were decreased vision, involvement of other cranial nerves, and blepharoptosis, regardless of the etiology. We were able to classify patients into posterior (2) and anterior pole diseases. With this diagnosis, we performed in patients with posterior pole involvement: extended maxillary antrostomy, anterior and posterior ethmoidectomy, complete sphenoidotomy, resection of the medial wall and 1/3 middle of the lower wall of the orbit, opening of the orbital aponeurosis even with opening of Zinn's ring, fat resection, and thus we decompressed the optic nerve and removed the infraorbital pathology. In patients with anterior pole involvement, we performed: extended antrostomy, anterior ethmoidectomy, resection of the middle turbinate head, removal of the medial wall of the orbit, requires opening of the broad frontal sinuses type Draft 2 to have access to the anterior pole of the orbit. These procedures in all cases managed to decompress the optic nerve and the eyeball, have an etiopathological diagnosis and be able to carry out specific treatment. The contribution of this work is: Expand the etiology that can be treated by this pure trans nasal approach for orbital pathology. Observe signs and symptoms of severity that lead to surgical management. Classify the surgical

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management of the medial wall of the orbit into anterior and posterior with its appropriated surgical approach.



6927

IS ENDOSCOPIC DIVING TECHNIQUE EFFECTIVE IN SURGICAL MANAGEMENT OF FUNCTIONING PITUITARY ADENOMAS? A PROSPECTIVE RANDOMIZED STUDY

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Introduction: This study aimed to evaluate the effectiveness of the Endoscopic Diving Technique (EDT) as an adjunct to endoscopic endonasal transsphenoidal surgery in improving remission rates in patients with functional pituitary adenomas. The primary research question was whether EDT enhances early endocrinological and radiological remission without increasing surgical complications.

Methods: A prospective randomized trial was conducted at Vilnius University Hospital Santaros Klinikos between 2021 and 2023, with 141 patients diagnosed with functional pituitary adenomas. Seventy-eight patients met inclusion criteria and were randomly assigned to either the EDT group (n=43), which included an additional endoscopic hydroscopy step, or the non-EDT group (n=35). Follow-up assessments were performed at 3, 12, and 24 months to evaluate endocrinological and radiological remission. Additional parameters analyzed included surgical complications, operative duration, and water volume used for EDT.

Results: The EDT group demonstrated significantly higher early endocrine remission rates (83.7% vs. 60.0%, $p=0.023$) and fewer radiological relapses at 3 months (86.0% vs. 68.6%, $p=0.097$), 12 months (81.4% vs. 62.9%, $p=0.078$), and 24 months (69.8% vs. 42.9%, $p=0.022$). Surgical complication rates were comparable between the groups (4.7% vs. 2.9%, $p=1.000$).

Conclusion: The implementation of EDT as an adjunct to transsphenoidal surgery is associated with improved endocrinological and radiological remission rates in functional pituitary adenomas without increasing surgical risk. EDT enhances visualization of the sellar cavity, facilitates tumor removal, and reduces venous hemorrhage, making it a valuable addition to standard surgical practice.



6930

EVALUATION OF EXTENDED DUPILUMAB DOSING INTERVALS Q2W (BIWEEKLY) VERSUS Q4W (MONTHLY) IN CHRONIC RHINOSINUSITIS WITH NASAL POLYPOSIS: A REAL-WORLD STUDY FROM SAUDI ARABIA

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Background Chronic rhinosinusitis with nasal polyposis (CRSwNP), often Linked to asthma, significantly affects quality of life. While dupilumab 300 mg every two weeks (Q2W) is effective, it is costly. This real-world Saudi study evaluated whether extending dosing to every four weeks (Q4W) maintains effectiveness in patients with or without asthma.

Methods In this retrospective single-cohort study, 42 adults with CRSwNP who completed at least one year of stable Q2W dupilumab therapy were transitioned to Q4W and followed for one additional year. Clinical, biomarker, and imaging out-comes were analyzed.

Results Clinical outcomes between Q2W and Q4W were largely comparable. Eight CRSwNP patients had comorbid asthma (19%). Median nasal polyp scores remained stable, and symptom scores for nasal congestion, discharge, smell loss, and fatigue showed no significant changes. Sino-Nasal Outcome Test (SNOT)-22 and Lund-Mackay scores trended lower in the Q4W group compared to Q2W group but were not statistically significant. Blood eosinophils were modestly reduced, while asthma control remained stable, with high asthma control test scores. Total IgE levels (IU/mL) were significantly lower in the Q4W group (32.5 [10.1–76.4] vs. 52.7 [19.8–215], $p < 0.001$), suggesting immunologic benefit. Fractional exhaled nitric oxide (FeNO) levels were unchanged. Overall, 92.9% maintained symptom control on Q4W for one year; three reverted to Q2W due to worsening of asthma control symptoms.

Conclusion Transitioning from Q2W to Q4W dupilumab dosing is effective for most CRSwNP patients, including those with asthma, after one year of stable therapy. This approach may reduce treatment burden without compromising clinical outcomes.



6931

OUTCOMES AFTER PERICRANIAL FLAP RECONSTRUCTION OF THE ANTERIOR SKULL BASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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¹Other

Introduction: Reconstruction of anterior skull base defects is critical to prevent cerebrospinal fluid (CSF) leakage and intracranial infection following tumour resection or complex surgery. Although intranasal flaps such as the nasoseptal flap are widely used, they may be unavailable in revision surgery, extensive septal involvement, or oncological contraindications. In such cases, the vascularised pericranial flap offers a robust extracranial alternative, though reported outcomes remain heterogeneous.

Methods: A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. Electronic databases were searched for studies reporting outcomes following anterior skull base reconstruction using a vascularised pericranial flap. Pooled proportions were calculated using random-effects models. The primary outcome was postoperative CSF leak, with secondary outcomes including overall complications, revision surgery, meningitis, tension pneumocephalus, and flap failure.

Results: Eight observational studies comprising 87 patients were included. The pooled rate of postoperative CSF leak was 8% (95% CI 2–17%) with no significant heterogeneity. Overall postoperative complications occurred in 17% (95% CI 7–31%). Revision surgery was required in 8% (95% CI 2–18%). Postoperative meningitis and tension pneumocephalus were uncommon, occurring in 4% and 3% of patients, respectively. Only one case of partial flap necrosis was reported, and no complete flap failures were identified.

Conclusion: Pericranial flap reconstruction of anterior skull base defects is a safe and reliable technique with low rates of CSF leak, infection, revision surgery, and flap failure. Its robust vascularity and extracranial harvest make it a valuable option in complex or salvage settings where intranasal flaps are unavailable. These findings support the pericranial flap as an important reconstructive strategy for surgeons managing challenging anterior skull base defects.



6932

THE IMPACT OF SEPTUM IN RHINOPLASTY ESTHETICS

Christos Ikonomidis¹

¹Other

Introduction Septoplasties are generally considered as purely functional and "junior" interventions. However, handling of the septum in rhinoplasty cases plays a major role in the final functional and esthetic outcomes, independently of the technique or the approach used.

Materials and methods We overview cases and techniques that impact the final rhinoplasty outcome on the frontal and lateral view, mainly analysing the handling of the dorsal and caudal septum.

Results -Conclusions Precise septum handling is a major part of all structural and preservation techniques. Mastering its height and position has a major impact in the final functional and esthetic outcome.



6933

A CLINICALLY RELEVANT CLASSIFICATION AND STAGING SYSTEM FOR CHRONIC RHINOSINUSITIS WITH NASAL POLYPOSIS: A CROSS SECTIONAL STUDY

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Background/Objectives Tissue eosinophilia plays a central role in chronic rhinosinusitis with nasal polyposis (CRSwNP), yet the spectrum of disease, particularly central compartment atopic disease (CCAD), remains underexplored. This study aimed to classify CRSwNP into three distinct phenotypes, eosinophilic CRSwNP (ECRSwNP), non eosinophilic CRSwNP (NECRSwNP), and CCAD, based on radiologic and endoscopic features. It also proposes a novel severity-based staging system to guide clinical decision-making.

Methods: A cross-sectional observational study was conducted in a single private clinic between January 2019 and August 2025. Patients were assessed using clinical history, paranasal sinus computed tomography (CT), and intranasal endoscopy. Key variables included symptom clusters, comorbidities, hematologic and atopy profiles, radiologic and endoscopic findings, histopathology, and pre-treatment SNOT-22 scores.-

Results: A total of 2060 patients (mean age: 29.8 ± 11 years; 51.8% male) were included. Asthma was the most frequent comorbidity (23.5%). Classification into ECRSwNP, NECRSwNP, and CCAD was achieved using integrated clinical, radiologic, and histopathologic criteria.

Conclusions: This study presents a phenotype- and severity based classification system for CRSwNP that incorporates endoscopic and radiologic features. This framework may enhance diagnostic accuracy and enable more tailored therapeutic strategies



6935

PRESERVATION OF OLFACTORY FUNCTION AFTER ENDOSCOPIC ENDONASAL PITUITARY SURGERY: A PROSPECTIVE UNIVERSITY HOSPITAL EXPERIENCE

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¹Other

Introduction: Endoscopic endonasal surgery is currently the main surgical approach for pituitary tumors, allowing direct midline access to the sellar and parasellar regions with reduced brain retraction and favorable neurological outcomes. From a neurosurgical perspective, preservation of sinonasal function and olfactory integrity is essential, as postoperative nasal morbidity may affect patient satisfaction and overall functional recovery. However, the impact of endonasal skull base surgery on olfactory function and sinonasal quality of life remains insufficiently characterized, particularly in prospective cohorts from public academic centers in developing countries.

Objective: To assess the effects of endoscopic endonasal skull base surgery for pituitary tumor resection on olfactory function and sinonasal quality of life six months after surgery in patients treated at a university hospital in Brazil.

Methods: This prospective longitudinal study was conducted at a tertiary university hospital in Brazil. 26 adult patients undergoing endoscopic endonasal resection of pituitary tumors were enrolled. Olfactory function and sinonasal quality of life were evaluated preoperatively and six months postoperatively using validated instruments: the Sino-Nasal Outcome Test-22 (SNOT-22), Brazilian Portuguese version, and the Connecticut Chemosensory Clinical Research Center (CCCRC) olfactory test, adapted for the Brazilian population. The CCCRC assesses both odor detection threshold and odor identification, providing a composite score of olfactory performance. Paired comparisons were performed to analyze changes between pre- and postoperative evaluations. **Results:** At six months of follow-up, no clinically relevant deterioration in olfactory function was observed. CCCRC scores remained stable compared with baseline values, and the majority of patients preserved the same olfactory classification identified preoperatively. Likewise, sinonasal quality of life assessed by SNOT-22 showed no postoperative worsening. There was no meaningful increase

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in nasal obstruction, rhinorrhea, facial pain, or smell-related complaints. Overall sinonasal morbidity was low, indicating effective preservation of nasal and olfactory function following endoscopic skull base access and reconstruction.

Conclusion: In this prospective cohort from a Brazilian university hospital, endoscopic endonasal skull base surgery for pituitary tumors demonstrated a favorable functional profile, with preservation of olfactory function and sinonasal quality of life six months after surgery. These findings support the neurosurgical safety of the endoscopic endonasal approach and reinforce the importance of standardized functional outcome assessment as part of comprehensive postoperative evaluation in skull base surgery.



6936

PROLACTINOMA FROM THE PATIENTS' PERSPECTIVE: CLINICAL MANIFESTATIONS, TREATMENT EXPERIENCES AND ASSOCIATED ADVERSE EFFECTS, INCLUDING A NOVEL IMPULSE CONTROL DISORDER QUESTIONNAIRE (THE PROMISE-SURVEY)

Michel Roethlisberger¹, Sara-Jessica Camerin², Katharina Schilbach³, Timo Deutschbein⁴, Emanuele Varaldo⁵, Stephan Petersenn⁶, Mario Detomas⁷, Paul Loughrey⁸, Julie Celine Refardt⁹, Bettina Winzeler¹⁰, Georgios Papadakis¹¹, Maria Mavromati¹², Kristina Isand¹³, Queralt Asla Roca¹⁴, Rebeca Marín Bueno¹⁴, Ulf Elbelt¹⁵, Martin Fassnacht¹⁶, Philipp Schuetz¹⁷, Niki Karavitaki¹⁸, John Newell-Price¹⁹, Maria Fliseriu²⁰, Juliana Drummond²¹, Beatriz Santana Soares²¹, Emanuele Ferrante²², Miles Levy²³, Levis Blewins²⁴, Juergen Honegger²⁵, Mirjam Christ-Crain²⁶, Emanuel Christ²⁶, Luigi Mariani²⁶, Cihan Atila²⁶

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Introduction (Background and Aim): Prolactinomas are commonly treated with dopamine agonists (DA), which normalize prolactin levels in most patients. However, patient-reported long-term tolerability remains poorly characterized. Adverse effects - particularly impulse control disorders (ICDs) - may be underrecognized due to the lack of disease specific screening tools and the limited feasibility of existing instruments developed for other conditions. This study assesses patient-reported treatment experiences and side effects across treatment modalities and introduces and evaluates a novel, brief ICD screening tool tailored to patients with prolactinoma.

Materials and Methods: International, cross-sectional survey study between 01/06/2025-02/01/2026, coordinated by the University Hospital Basel, Switzerland. Adults (≥ 18 years) with prolactinoma were recruited by their local physicians. The survey assessed symptoms at diagnosis, treatment history, DA-associated adverse effects, and behavioral changes. Impulsivity and ICDs were assessed using the Barratt Impulsiveness Scale (BIS), the Questionnaire for Impulsive-Compulsive Disorders in Parkinson's Disease (QUIP), and the newly developed BASEL-ICD-S questionnaire. Patients were analyzed according to current DA exposure. Receiver operating characteristic (ROC) analyses were used to derive cut-offs for detecting high impulsivity and pathological ICD sub-domains in randomly assigned development and validation cohorts.

Results: 528 patients were included (median age 40 years [31–49], 73% female, median disease duration 5 years [2–11]). Common manifestations at diagnosis included menstrual irregularities in women (82%), reduced libido in men (80%), as well as tiredness (70%) and mood changes (64%) overall. Primary treatment was medical in 87% and surgical in 9%, while 4% were newly diagnosed and had no treatment started. Among DA treated patients ($n=406$), the most frequent side effects were fatigue (51%), dizziness (43%), headache (38%), and gastrointestinal complaints (36%). BIS, QUIP, and BASEL-ICD-S total scores were higher in DA-treated than not DA-treated patients ($n=406$) (all $p<0.001$). High impulsivity (BIS score $>$) was more frequent in DA-treated patients (22% vs 7%). A BASEL-ICD-S total score of ≥ 25 identified high impulsivity with good discrimination in both development (AUC 0.88) and validation cohorts (AUC 0.89), and with high negative predictive value (96%). Pathological ICDs in DA-treated patients included gambling (7.4% vs 1.6%), compulsive buying (28.1% vs 13.9%), and hypersexual behavior (17.7% vs 5.7%). BASEL-ICD-S subscores demonstrated good to excellent discrimination across ICD domains (AUC ranges 0.75–0.99), with stable performance in the validation cohort (AUC 0.76–0.91).

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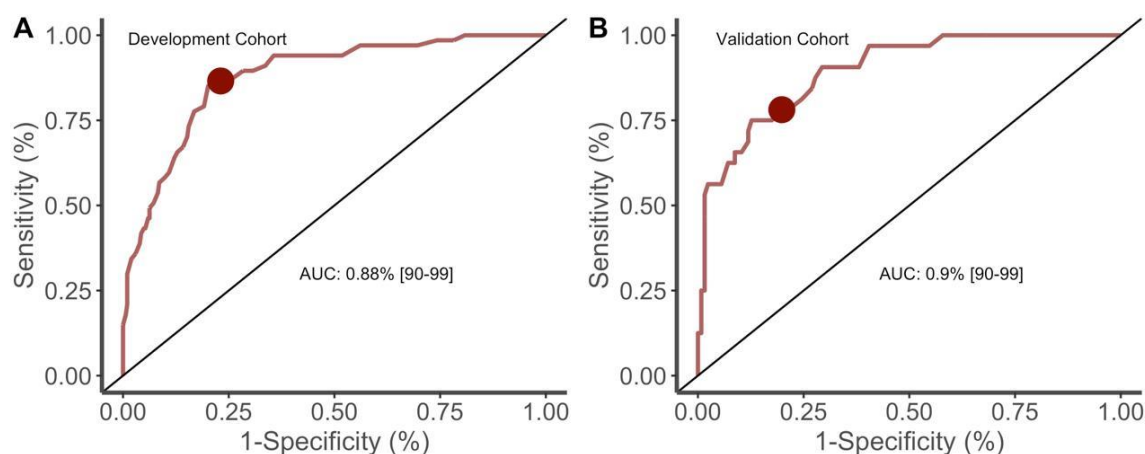
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Conclusions: Prolactinomas were associated with a substantial symptom burden. DA therapy was frequently accompanied by adverse effects, increased impulsivity, and other ICDs. The BASEL-ICD-S demonstrated robust performance as a brief screening tool for behavioral side effects in patients with prolactinoma. Figure 1: Performance of the BASEL-ICD-S questionnaire: The receiver-operating characteristics curve is shown with the AUC in the (A) development cohort and the (B) validation cohort. A BASEL-ICD-S total score of ≥ 25 identified high impulsivity with good discrimination in both development (AUC 0.88) and validation cohort (AUC 0.90). AUC=area under the curve





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ENDOSCOPIC ENDONASAL APPROACH FOR RECURRENT CRANIOPHARYNGIOMAS IN ADULTS

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Introduction: Endoscopic endonasal approach (EEA) is a widely adopted surgical route for most craniopharyngiomas, thanks to its favorable clinical outcome. However, its role in recurrent tumors has not been fully assessed. This study is aimed at analyzing the outcome of EEA in recurrent craniopharyngiomas, assessing the factors associated with radical resection and progression-free survival (PFS).

Methods: All consecutive cases of craniopharyngiomas operated in our center with an EEA were retrospectively collected and divided into two cohorts: the recurrent and the naïve tumors. Preoperative patient- and tumor-related features, surgical and clinical outcomes at follow-up and complications were considered and compared between the two groups.

Results: The series includes 126 patients (24.6% recurrences and 75.4% naïve). In the recurrent group, radical resection was achieved in 24 cases (77.4%). The most common complications were 6 post-operative CSF leaks (19.4%). No significant differences were observed for the resection and morbidity rate in the two groups. Radical removal of recurrent craniopharyngiomas was associated with a previous transcranial approach ($p = 0.030$) and a lower BMI at surgery ($p = 0.014$). Analyzing the entire series, longer PFS was correlated with no previous surgery ($p = 0.020$), no intraventricular extension ($p = 0.004$) and radical resection ($p = 0.0001$).

Conclusions: EEA proved to be a valid option for strictly selected recurrent craniopharyngiomas, with surgical and clinical outcome similar to those observed for naïve patients. Radical resection and PFS resulted associated with both biological and technical factors, which should be considered for the surgical planning and pre-operative counselling.



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DETERMINING FACTORS FOR SUCCESS OF ENDOSCOPIC LATERAL RECESS SPHENOID CSF LEAK REPAIR. A SINGLE CENTER STUDY OF 64 PATIENTS SPANNING OVER 2 DECADES.

Sai Spoorthi Nayak¹, Nishit Shah¹

¹Λοιπά

Introduction: Lateral recess sphenoid sinus leak is a well recognised but technically challenging site for CSF leak repair. Although endoscopic repair has become the standard of care, factors influencing long term success rate have remained largely undefined.

Materials and Methods: A retrospective study was conducted of patients undergoing lateral recess CSF leak repair between 2004-2025 at a single tertiary care center. Demographic data, etiology, surgical approach, reconstruction materials and follow up outcomes were measured. A repair construct score was devised depending on the number and layers of reconstruction complexity. **Results:** A total of 64 patients underwent endoscopic trans-pterygoid repair of lateral recess of sphenoid sinus CSF leak. Multilayer reconstruction using fat, fascia, cartilage, mucosal grafts, sealants and pedicled flaps were used. A primary success of 96.9% (62/64 patients) was achieved. Two recurrences happened despite a multilayer, high construct score. Recurrences of cases done outside that we operated at our centre were mostly, due to improper identification of the defect and the meningo/encephalocoele.

Conclusion: The success of CSF leak repair depends primarily on identification and good accessibility of the site of the leak. Where multilayer repair is concerned, the sequence of material used is inconsequential for the success of the repair. The exposure of the bony defect and the identification of the encephalocoele and demucosalisation of the sinus is more important than the sequence of graft placement. Once the bony defect is closed in a water tight manner, with the first graft, (cartilage/fat/ underlay fascia), the rest of the graft placement only helps in reinforcement of the repair. We haven't used HBF for all cases since ipsilateral harvesting of the flap is made redundant due to sacrifice of the ipsilateral SPA in pterygoid drilling. A contralateral HBF may not cross over to reach the defect site since most of these defects are present as a result of hyper-pneumatisation of the

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sphenoid sinus. In most of our cases we have used multilayered reconstruction 86% rather than mandatory HBF 14 %, which has given long term successful results.



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A DEDICATED THREE-DIMENSIONAL SIMULATOR FOR ENDOSCOPIC ABLATION ADENOIDECTOMY: DEVELOPMENT AND TRAINING APPLICABILITY IN A HIGH-VOLUME PEDIATRIC PROCEDURE

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Introduction (Background & Aim): Adenoidectomy is among the most frequently performed surgical procedures in the pediatric population. The incorporation of endoscopic visualization and plasma radiofrequency ablation has improved surgical precision, but requires specific technical skills, including endoscopic orientation, bimanual coordination, and controlled energy use in a confined surgical field. Traditional training opportunities are limited by ethical, logistical, and anatomical constraints. We developed a dedicated three-dimensional simulator for endoscopic ablation adenoidectomy and aimed to describe its construction and present an initial assessment of its applicability for surgical training.

Material & Methods: The e-A.L.Ex model was created using computed tomography data, digital anatomical segmentation, 3D modeling, and printing with photopolymer resin and silicone to reproduce bone and soft tissues. The nasopharyngeal region was designed to receive biological tissue (bovine thymus), enabling the use of real plasma radiofrequency devices. Key anatomical landmarks, including choanal arches, posterior septum, torus tubarius, and Passavant's ridge, were incorporated. After development, the simulator was used in a hands-on surgical training course. Participants completed a structured questionnaire evaluating anatomical realism, usability, and simulation quality.

Results: The simulator allowed reproduction of the main surgical steps under transnasal and transoral endoscopic visualization using real instruments. Participants reported high agreement regarding anatomical fidelity, endoscope positioning, instrument handling, and similarity to the operative environment.

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Conclusions: This simulator proved to be a realistic and applicable tool for training in endoscopic ablation adenoidectomy, combining anatomical fidelity with the use of real surgical technology, and may contribute to safer skill acquisition in a high-volume pediatric procedure.



Figure1

Comparative procedure in a real patient (A, B) versus e-A.L.Ex training (C, D), with 30° transnasal endoscopy and controlled ablation. A, adenoid; C, choanal arch; e-A.L.Ex, endoscopic adenoidectomy learning experience; IT, inferior turbinate; MT, middle turbinate; S, septum; T, torus tubarius.

(E,F) Three-dimensional-printed model after placement of the mouth opener and passage of a catheter for palate retraction, allowing adequate exposure of the adenoid during surgical training.



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DETERMINING FACTORS FOR SUCCESS OF ENDOSCOPIC LATERAL RECESS SPHENOID CSF LEAK REPAIR. A SINGLE CENTRE STUDY OF 64 PATIENTS SPANNING OVER 2 DECADES.

Sai Spoorthi Nayak¹, Nishit Shah¹

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PLATELET-RICH PLASMA TREATMENT FOR PERSISTENT OLFACTORY DYSFUNCTION: A PROSPECTIVE COHORT STUDY WITH MATCHED CONTROLS

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Introduction and aim: Persistent olfactory dysfunction (OD) remains difficult to treat once spontaneous recovery and standard therapies have failed. Platelet-rich plasma (PRP) has been proposed as a regenerative therapy, but clinical evidence remains limited. This study aimed to evaluate the effect of PRP on olfactory function compared to matched controls receiving standard therapy only.

Material and methods: Patients with OD undergoing PRP treatment were followed prospectively at a tertiary referral center in Belgium. Olfactory function was assessed using Sniffin' Sticks at baseline, after standard therapy, and 3 months after PRP treatment. A matched control group was identified based on age, sex, etiology, and baseline TDI score, with assessments at baseline and 3-months after standard therapy. Changes in TDI scores were analyzed using paired t-tests and mixed-effects models.

Results: Twenty-seven PRP-treated patients were included and matched to 27 controls. Mean TDI scores did not improve after standard therapy (-0.3 ± 4.2 ; $p = 0.74$), but increased significantly following PRP treatment ($+2.3 \pm 5.0$; $p = 0.0041$). Mixed-effects analysis confirmed a significant overall effect of time on TDI scores ($p = 0.0226$). Improvement in TDI scores was numerically greater in PRP-treated patients than in matched controls, although without statistical significance. Clinically meaningful improvement (TDI increase ≥ 5.5 points) occurred in 5/27 (18.5%) PRP-treated patients versus 2/27 (7.4%) controls. Additionally, 13/27 (47%) PRP-treated patients reported subjective improvement. **Conclusions:** PRP treatment was associated with significant improvement in olfactory function in patients with therapy-resistant OD, although clinical relevance remains to be confirmed in larger cohorts.



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OPTIMISING CSF LEAK RATES AND SINONASAL OUTCOMES IN EEA FOR SUPRASellar LESIONS VIA A MULTIDISCIPLINARY APPROACH

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Introduction The expanded endoscopic endonasal approach (EEA) has redefined the management of suprasellar pathology, enabling direct ventral skull base access without cerebral retraction. However, postoperative cerebrospinal fluid (CSF) leak and sinonasal morbidity remain pivotal determinants of success. As sinonasal quality of life significantly influences functional recovery and patient satisfaction, its preservation is fundamental to contemporary skull base practice. We present outcomes from our multidisciplinary ENT-neurosurgical EEA service.

Material & Methods A retrospective analysis was conducted of all patients undergoing EEA for suprasellar tumours between September 2020 and 2025 at a UK tertiary skull base centre. Reconstruction was tailored to intraoperative CSF flow and defect characteristics using a graded multilayer strategy incorporating autologous fascia lata and vascularised nasoseptal flaps for high-flow defects. Demographic data, tumour pathology, postoperative CSF leak rate, and pre- and postoperative SNOT-22 scores were analysed.

Results Thirty-four patients comprised the initial cohort (4 paediatric). Pathology included craniopharyngioma (38%), tuberculum sellae meningioma (21%), and other suprasellar lesions. The postoperative CSF leak rate was 2.94% (1/34), with no leaks in the paediatric subgroup. Mean preoperative SNOT-22 score was 20; among patients with paired data (n=19), 58% returned to baseline or improved postoperatively. Updated 2025 cases further expand the cohort, with ongoing longitudinal evaluation.

Conclusions A structured multidisciplinary model combined with meticulous, flow-adapted multilayer reconstruction achieves low CSF leak rates while preserving sinonasal function. Sinonasal morbidity should remain a core outcome metric alongside oncological and neurological endpoints in advanced skull base surgery.



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ENDOSCOPIC SURGICAL CONTROL OF EPISTAXIS IN HEREDITARY HEMORRHAGIC TELANGIECTASIA: A TWENTY-YEAR HIGH-VOLUME TERTIARY EXPERIENCE WITH VIDEO DEMONSTRATION

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Introduction Hereditary Hemorrhagic Telangiectasia is a multisystem vascular condition in which epistaxis represents the most frequent cause of morbidity. Endoscopic surgery is central to disease control, yet optimal technique and long-term management strategies remain variable. This study presents a 20-year, high-volume tertiary referral experience in the endoscopic surgical management of HHT-related epistaxis, highlighting a standardised operative approach supported by intraoperative video demonstration.

Materials & Methods A retrospective review was conducted of all patients with HHT managed surgically at a tertiary referral centre between 2004 and 2024. All patients underwent endoscopic intervention for epistaxis, predominantly using potassium-titanyl-phosphate (KTP) laser photocoagulation. Coblation, intralesional bleomycin injection, and Young's procedure were employed in selected refractory cases. All patients underwent computed tomography of the chest for screening of pulmonary arteriovenous malformations, with magnetic resonance imaging of the brain and referral to other specialties as indicated. Operative technique and disease distribution were reviewed, and representative high-definition endoscopic video footage was curated for educational presentation.

Results Approximately 200 patients were managed during the study period, representing one of the largest single-centre surgical HHT cohorts reported. KTP laser photocoagulation provided effective control of epistaxis with low perioperative morbidity. Repeat interventions were commonly required, reflecting disease chronicity. Adjunctive techniques improved control in patients with diffuse or refractory disease. Multidisciplinary screening identified clinically significant extracranial arteriovenous malformations in a substantial proportion of patients.

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Conclusions Endoscopic surgical management of HHT-related epistaxis using a standardised, multimodal approach is effective and safe in a high-volume tertiary setting. Intraoperative video demonstration enhances understanding of operative technique and may facilitate wider adoption of best-practice endoscopic strategies.



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STAGED MULTI-CORRIDOR MANAGEMENT OF A RECURRENT PAEDIATRIC CEREBROSPINAL FLUID LEAK INVOLVING THE SUPERIOR ORBITAL FISSURE: A VIDEO-SUPPORTED CASE PRESENTATION

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Introduction Paediatric cerebrospinal fluid (CSF) leaks involving the lateral skull base are rare and pose significant diagnostic and surgical challenges, particularly when recurrent and associated with respiratory complications. We present a complex case requiring staged endoscopic and open skull base approaches, highlighting evolving surgical strategies supported by intraoperative video.

Case Presentation A three-year-old previously fit and well girl presented with recurrent lower respiratory tract infections, persistent wheeze, and multiple episodes requiring paediatric intensive care admission, followed by CSF rhinorrhoea. Initial CT and MRI imaging failed to localise a skull base defect. Examination under anaesthesia with intrathecal fluorescein and CT cisternography demonstrated a CSF leak originating from the right superior orbital fissure, with possible involvement of the foramen rotundum. An expanded endonasal right-sided trans-pterygoid approach was initially performed, requiring sacrifice of the vidian nerve and maxillary division of the trigeminal nerve (V2), followed by multilayer repair using a vascularised nasal septal flap. Fourteen months later, the patient re-presented with recurrent respiratory symptoms, with CSF leak confirmed on surveillance MRI and fluorescein-assisted endoscopy. A lateral orbital approach with VP shunting was subsequently undertaken. Unfortunately, further recurrence occurred eight months later with aspiration. A final endoscopic endonasal exploration with intrathecal fluorescein was performed, and definitive repair achieved using a pedicled temporoparietal fascial flap, tunnelled through the infratemporal fossa into the nasal cavity using a Seldinger technique. Key operative steps are demonstrated on intraoperative video.

Results The patient remains clinically well with no recurrence of CSF leak or respiratory symptoms at two-year follow-up.

Conclusions Recurrent paediatric lateral skull base CSF leaks may require staged, multi-corridor surgical strategies combining endoscopic and

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open approaches. Advanced reconstructive techniques can achieve durable repair in complex cases. Intraoperative video provides valuable educational insight into surgical planning and execution in this rare scenario.



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LONG-TERM OUTCOMES OF MINIMALLY INVASIVE ENDOSCOPIC SURGERY COMBINED WITH STEREOTACTIC RADIOTHERAPY FOR CAVERNOUS SINUS MENINGIOMAS

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Background: Traditional aggressive resection of cavernous sinus meningiomas (CSMs) frequently results in permanent cranial nerve morbidities without improving neurological function. We present long-term outcomes of a conservative paradigm prioritizing functional preservation through endoscopic decompression with adjuvant stereotactic radiotherapy (SRT).

METHODS: Retrospective analysis of symptomatic CSM patients treated with endoscopic endonasal and/or transorbital approaches followed by adjuvant SRT from January 2017 to December 2024. Primary endpoints included neurological recovery, tumor control, and treatment-related morbidity.

Results: Sixty-three patients underwent surgery via endoscopic endonasal (60.3%), transorbital (25.4%), or combined approaches (14.3%). Adjuvant SRT was administered to 82.5% of patients. Mean follow-up was 68 months (range: 24-96 months). Neurological recovery occurred in 68.3% of patients with preoperative cranial nerve III-VI deficits and 71.4% with visual impairment. New permanent deficits occurred in only 4.8% of cases. Five-year tumor control was achieved in 89.7% of patients. Ten patients (15.9%) demonstrated progression (7 WHO grade II, 3 WHO grade I), all successfully salvaged. Post-radiation complications included visual deterioration in 2 patients (3.8%).

Conclusions: This single-institution series with extended follow-up demonstrates that minimally invasive endoscopic surgery combined with adjuvant SRT achieves excellent functional outcomes and tumor control with minimal morbidity. This approach represents the contemporary standard of care for symptomatic cavernous sinus meningiomas.



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SEPTAL PLEOMORPHIC ADENOMA: A DIAGNOSTIC DILEMMA

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¹Other

Introduction: Pleomorphic adenoma is the most common benign salivary gland neoplasm, predominantly arising from the major salivary glands. Its occurrence within the nasal cavity is exceedingly rare (<1%), most frequently originating from the nasal septum. Owing to its indolent growth and nonspecific clinical and radiological features, it can closely mimic an inflammatory nasal polyp, posing a diagnostic challenge.

Case Presentation and chair side investigations: A 53-year-old hypertensive male presented with progressive left-sided nasal obstruction of one-year duration. There was no history of epistaxis, anosmia, facial pain, headache, or visual symptoms. Nasal endoscopy revealed a smooth, polypoidal, non-tender mass arising from the anterior-to-middle aspect of the left nasal septum, completely occupying the ipsilateral nasal cavity. The lesion was non-bleeding on touch, and no cervical lymphadenopathy was detected.

Radiological Investigations: Computed tomography of the paranasal sinuses demonstrated a well-circumscribed soft tissue lesion in the left nasal cavity, radiologically suggestive of a nasal polyp, with mild adjacent sinus mucosal thickening. **Management and Histopathology:** Endoscopic complete excision was performed under general anaesthesia. The excised specimen measured approximately 3 × 1.5 × 1 cm. Histopathological examination confirmed pleomorphic adenoma, characterized by basaloid epithelial elements arranged in trabecular and tubular patterns within a fibromyxoid stroma. Peripheral benign seromucinous glands were noted.

Conclusion: Although rare, septal pleomorphic adenoma should be considered in unilateral nasal masses. When a seemingly routine nasal polyp behaves atypically, histopathology becomes the decisive tool that transforms a presumed benign polyp into an unexpected neoplasm.



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DRAF IIA AND DRAF IIB RELATED OUTCOMES: A SYSTEMATIC REVIEW

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Introduction Draf Ila and Draf Iib frontal sinusotomies represent different extents of frontal sinus opening. Although Draf Iib is technically more demanding and often reserved for severe or recurrent disease, concerns remain regarding long-term patency. This systematic review evaluated patency rates and revision outcomes of Draf Ila and Draf Iib procedures. **Materials and Methods** A systematic review was conducted following PRISMA 2020 guidelines. PubMed and Cochrane databases were searched for studies reporting outcomes of Draf Ila and/or Draf Iib. Primary outcomes were sinus patency, restenosis, and revision surgery. Due to heterogeneity in indications, study design, follow-up, and outcome definitions, a descriptive stratified synthesis was performed. **Results** Eight studies including 934 frontal sinus procedures (351 Draf Ila; 583 Draf Iib) were analyzed, including two systematic reviews on Draf Iib. Among primary studies, four were retrospective and two prospective. Reported patency rates were 90–92.3% for Draf Ila and 87.5–100% for Draf Iib. Complications were uncommon, including transient hyposmia (1.55%) and orbital cellulitis (0.2–2.7%). Revision surgery rates were low (Ila: 1.9–7.14%; Iib: 2–4.5%). Two prospective studies (n=95) using mucosal flap reconstruction with Draf Iib showed sustained patency of 97.8–100%. **Conclusions** Draf Iib is associated with patency and restenosis outcomes that fall within the range reported for Draf Ila. When combined with mucosal flap reconstruction, Draf Iib achieves durable frontal sinus patency with minimal restenosis, suggesting that surgical technique may be more influential than the extent of frontal sinusotomy.



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EDUCATIONAL EFFECTIVENESS AND FIDELITY OF 3D SINUS MODEL IN ADVANCED FRONTAL SINUS SURGERY: A POST-COURSE EVALUATION

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Introduction: To evaluate participant-reported educational effectiveness and fidelity of a high-fidelity three-dimensional (3D) sinus model used in advanced frontal sinus surgery training.

Methods: A cross-sectional post-course evaluation was conducted among 20 participants using a structured 5-point Likert scale questionnaire assessing five domains: (1) course organisation and educational value, (2) model fidelity (face and functional validity), (3) anatomical understanding and surgical planning, (4) technical skill development, and (5) confidence outcomes. Participants were stratified by surgical experience (<5 years, 5–10 years, > years). Descriptive statistics were calculated. Internal consistency was assessed using Cronbach's alpha, and subgroup comparisons were performed using the Kruskal–Wallis test.

Results: The overall course rating was 4.85 ± 0.49 , with a 100% recommendation rate. Domain mean scores ranged from 4.56 to 4.85, and 95% of participants rated most items as agree or strongly agree. Model fidelity demonstrated good internal consistency ($\alpha = 0.874$), while the technical skill development domain showed excellent reliability ($\alpha = 0.988$). No statistically significant differences were observed across experience levels (all $p > .05$), indicating consistent perceived benefit irrespective of career stage.

Conclusions: The high-fidelity 3D sinus model demonstrated excellent participant-rated educational value, realism, and perceived impact on technical skills and confidence in advanced frontal sinus surgery. These findings support its role as a versatile adjunct in rhinology training. Future studies incorporating objective performance metrics are warranted.



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AN ANATOMY-GUIDED MEDIAL FLAP INFERIOR TURBINOPLASTY: TECHNICAL NUANCES FOR OPTIMIZED FLAP POSITIONING AND SELECTIVE VASCULAR CONTROL

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Introduction (Background & Aim) Medial flap inferior turbinoplasty is a well-established mucosa-preserving technique for inferior turbinate hypertrophy. However, surgical precision in plane identification, bone management, and vascular control significantly influences flap accommodation and technical reproducibility. We present an anatomy-guided refinement of this technique emphasizing strict subperiosteal dissection, targeted superior osteotomy, and selective arterial control.

Material & Methods A standardized endoscopic approach is described. Following septal-surface infiltration, the medial mucosa is elevated in a strict subperiosteal plane under 0° visualization. Turbinate out fracture is avoided whenever possible to maintain structural stability. Meatal mucosa and turbinate bone are removed while preserving the medial flap. A targeted osteotomy of the superior bony curvature is performed to allow tension-free flap accommodation and improved visualization of the superior arterial branch. Arterial branches are individually identified and selectively cauterized with low-power energy. The medial flap is repositioned without routine packing; when minor anterior bone exposure persists, a single securing suture may be placed to optimize flap coverage. An alternative stepwise technique without microdebrider is also detailed.

Results This anatomy-driven approach preserves medial mucosal integrity and allows stable, tension-free flap repositioning with minimal exposed surface area.

Conclusions Anatomy-guided medial flap turbinoplasty focusing on precise subperiosteal dissection, targeted osteotomy, and selective vascular control provides a reproducible technique for optimized flap accommodation, applicable both with and without powered instrumentation.



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NOVEL ENDOSCOPIC APPROACH TO POSTERIOR SKULL BASE LESIONS

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Background: Retrocerebellar arachnoid cysts are common benign posterior fossa lesions that can become clinically significant by disrupting cerebrospinal fluid (CSF) dynamics or by exerting mass effect. While conventional surgical interventions such as shunting or microsurgical fenestration are available, they are often associated with higher recurrence rates and significant morbidity. **Aim:-** This study highlights the role of Endoscopic Cysto-cisternostomy (ECC) as a primary management strategy for symptomatic retrocerebellar cysts.

Materials and Methods: We conducted a retrospective analysis of five patients who underwent ECC over a period of 10 years in our centre via a suboccipital approach using 0° and 70° Storz endoscopes.

Result :- Postoperative results showed that 100% of patients experienced immediate symptom relief, primarily from occipital headaches. The only significant complication was one of the patient developed a pseudo meningocele.

Conclusion: Our findings suggest that ECC is a superior treatment modality that restores natural CSF pathways, eliminates the need for permanent shunts, and offers shorter operative times with faster recovery. This is a standard surgical technique used in our department irrespective of size or location of the cyst.



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ENDOSCOPIC ENDONASAL APPROACH FOR PARANASAL SINUSES OSTEOMAS: FOLLOW-UP 300 CASES

Sergey Karpishchenko¹, Elizaveta Bolozneva¹

¹Other

Background. Endonasal endoscopic surgery is a modern method for treating osteomas of the paranasal sinuses, minimizing the morbidity of the procedure while maintaining high efficacy.

Study Objective. To evaluate the efficacy and safety of endonasal endoscopic removal of osteomas in various locations of the paranasal sinuses.

Material and Methods. The results of surgical treatment of 293 patients with osteomas of the paranasal sinuses were analyzed. Distribution by location: • sphenoid sinus - 6 cases; • maxillary sinus - 44 cases; • ethmoid labyrinth - 113 cases; • frontal sinus - 130 cases. All interventions were performed via an endoscopic endonasal approach without the need for conversion to an open surgical approach.

Results. All removed tumors were histologically verified as benign osteomas. The following complications were noted in the early postoperative period: • pneumoencephalon - 1 case; • CSF fistulas — 6 cases (all successfully closed intraoperatively); • Residual tumors — 3 cases. No late postoperative complications were recorded.

Conclusions. The endonasal endoscopic approach demonstrates high efficacy and safety in the removal of paranasal sinus osteomas of various locations. This method avoids conversion to an open approach and ensures reliable intraoperative correction of any complications that arise. The obtained results confirm the feasibility of widespread use of this technique in clinical practice.



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EXTENDED ENDOSCOPIC TRANSPHENOIDAL APPROACH FOR PITUITARY ADENOMAS: A 9-YEAR EXPERIENCE FROM A TERTIARY CENTRE

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Introduction: Pituitary adenomas represent the third most common type of intracranial neoplasm. The extended endoscopic endonasal transsphenoidal approach (EEETSA) has gained widespread acceptance for the surgical management of these lesions.

Methods: A retrospective analysis was conducted of patients who underwent EEETSA for pituitary adenomas between 2017 and 2025. **Results:** A cohort of 161 surgically treated patients was analysed, of whom 52.80% (n=85) were female. Among functioning adenomas (n=59), 47.46% were Cushing disease, 44.07% acromegaly and 8.47% were prolactinomas. Macroadenomas accounted for 135 cases (83.85%), in which the majority classified as Knosp type 2 and 3 (34.07% and 37.04%, respectively) and Hardy-Wilson type II-C (59.26%-50.37%, respectively). Preoperative visual field defects were present in 51.55% (n=83). Preoperative endocrine assessment revealed pituitary insufficiency in 72 patients (47.72%), most commonly involving multiple hormonal deficits (n=40; 24.84%). Macroadenomas were significantly associated with preoperative endocrine dysfunction (p= 0.009; OR = 5.58; IC 95%: 1.83–17.07) and visual field impairment (p<0.001; OR=87; IC 95%: 5.2–1457.9). Among patients (n=83) with preoperative visual deterioration, 62.65% (n=52) experienced postoperative visual improvement. The most frequent complications were diabetes insipidus (14.91%, predominantly transient), epistaxis (6.21%) and cerebrospinal fluid leakage (4.97%). There was no significant difference in intraoperative (p=0.24) or postoperative complications (p=0.18) between macroadenomas and microadenomas. Regarding tumoral persistence, with an overall persistence rate of 38.51% (n=62), with significant higher rates for Knosp types 3 and 4 (25.47%; p < 0.001; OR = 0.17; IC 95%: 0.09–0.35). Biochemical remission was achieved in 74.78% in functioning adenomas whereas persistent endocrinological disease

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was managed with radiotherapy (n= 7), conservative treatment (n= 6), or revision surgery (n= 2).

Conclusion: EEETSA proved to be a safe and effective approach for pituitary adenomas, with significant visual and endocrinological improvement and low complication rates. Tumour persistence was mainly associated with cavernous sinus invasion (higher Knosp grades), highlighting the importance of invasion patterns in surgical outcomes.



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ENDOSCOPIC TRANSORBITAL AND ENDONASAL APPROACHES FOR ISOLATED INTRAORBITAL LESIONS: APPROACH SELECTION BASED ON LESION POSITION RELATIVE TO THE OPTIC NERVE

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Objective: Isolated intraorbital lesions pose surgical challenges due to proximity to the optic nerve. Endoscopic transorbital (ETA) and endonasal (EEA) approaches offer minimally invasive corridors. The relationship between lesion position relative to the optic nerve and approach selection has been described. We present our experience with extraconal and intraconal lesions and evaluate how our results align with current evidence.

Methods: From 14 consecutive orbitocranial cases (2020–2025), 6 with isolated intraorbital lesions (4 extraconal, 2 intraconal) were reviewed, excluding meningiomas and sphenoid wing lesions. Approach was based on lesion position relative to the optic nerve: ETA for lateral/superolateral, EEA for medial/inferomedial, and combined ETA+EEA when the lesion bridged multiple compartments. Pathology, extent of resection, and complications were recorded.

Results: Pathologies included ossifying fibroma (n=2), orbital hemangioma (n=2), lymphoma and venous angioma (n=1 each). Three patients with medial/inferomedial lesions underwent EEA, two with lateral/superolateral lesions underwent ETA, and one superior lesion extending across the lamina papyracea and frontal sinus required combined ETA+EEA. Gross-total resection was achieved in 3 cases; remaining patients had effective decompression. One intraconal case (venous angioma, ETA) achieved complete proptosis resolution (3.6 mm). One CSF leak was managed with transnasal multilayer closure. Mean follow-up was 21.5 months (range 1–48).

Conclusion: Despite the limited sample, our results are consistent with literature supporting that lesion position relative to the optic nerve guides corridor selection. Lateral/superior lesions were managed via ETA, medial/inferior via EEA, and bridging lesions via a combined approach, reinforcing existing evidence in both extraconal and intraconal settings.

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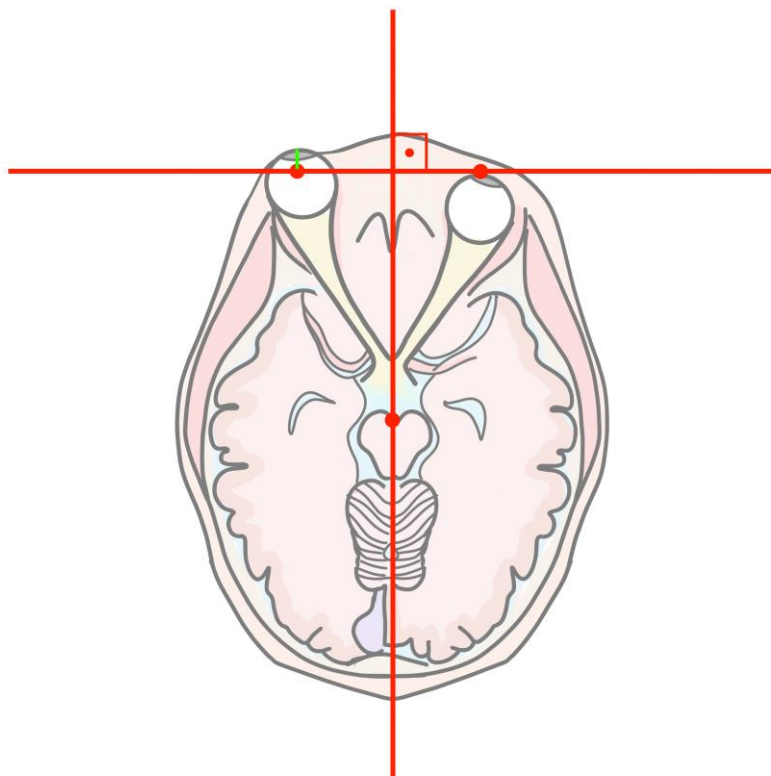
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WHERE DO WE LOSE TIME? DIAGNOSTIC PATHWAY FAILURES IN CSF RHINORRHEA AND IMPACT ON MENINGITIS RISK

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Background Cerebrospinal fluid (CSF) rhinorrhea carries a substantial risk of meningitis, particularly when diagnosis is delayed. However, nonspecific presentation often leads to misdiagnosis and prolonged diagnostic delay. The clinical consequences of delayed diagnosis and factors contributing to diagnostic failure remain unclear.

Methods This single-center retrospective study included 34 patients with CSF rhinorrhea. Patients were categorized into early (≤ 90 days, $n=16$) and delayed (>90 days, $n=18$) diagnosis groups. Diagnostic delays (patient-, physician-, and system-related), initial diagnosis, first physician specialty, visit count, meningitis development, and meningitis episodes were analyzed. Continuous variables were reported as median and interquartile range (IQR).

Results Meningitis occurred exclusively in the delayed diagnosis group (28% vs. 0%, $p=0.046$), and the number of meningitis episodes was significantly associated with longer diagnostic delay ($p=0.026$). Median total diagnostic delay was 135 days (IQR: 47–198.5). Patient-related delay showed the longest duration (31 days, IQR: 21–102.5), followed by physician-related delay (19.5 days, IQR: 8.2–49) and system-related delay (11 days, IQR: 5–23). Both patient-related ($p=0.0001$) and physician-related delays ($p=0.0005$) were significantly higher in delayed cases. Missed initial diagnosis was more frequent in the delayed group (61% vs. 6%, $p=0.0011$), most commonly due to misdiagnosis as allergic rhinitis. The first consulted specialty was significantly associated with delayed diagnosis ($p=0.012$), with the highest misdiagnosis rates observed in family medicine and internal medicine.

Conclusion Diagnostic delay in CSF rhinorrhea is strongly associated with meningitis risk and is mainly driven by missed early recognition. Early suspicion and timely evaluation are essential to prevent complications.



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LONG-TERM EFFICACY AND SAFETY OF MEPOLIZUMAB IN TYPE 2 CHRONIC RHINOSINUSITIS WITH NASAL POLYPS: A REAL-LIFE RETROSPECTIVE STUDY.

Ida Faralli¹

¹Other

Rationale : Type 2 chronic rhinosinusitis with nasal polyps (CRSwNP) is characterized by a high rate of post- surgical recurrence and a severe impact on quality of life. Mepolizumab, an anti-IL-5 monoclonal antibody, demonstrated significant reductions in polyp size and need for re-intervention at 52 weeks in pivotal trials (SYNAPSE). However, long-term real-life data (>24 months) are lacking, and it remains unclear whether baseline blood eosinophil count (BEC) influences the durability of response, particularly in patients with a hyper-eosinophilic phenotype (BEC> cells/ μ L). Study objective: to evaluate the efficacy and safety of mepolizumab 100 mg subcutaneously every 4 weeks in type 2 CRSwNP up to 48 months, with a stratified analysis by baseline BEC (>600 vs $\leq$ 600 cells/ μ L).

Materials And Methods: This was a single-center retrospective study including adult patients with refractory type 2 CRSwNP treated with mepolizumab. Clinical outcomes (SNOT-22, Nasal Polyp Score – NPS, Sniffin' Sticks Identification Test – SSIT-16), radiological outcomes (Lund–Mackay score), and laboratory parameters (BEC, total IgE) were assessed at baseline and at 1, 3, 6, 12, 24, 36, and 48 months. The analysis compared two subgroups: baseline BEC> cells/ μ L vs $\leq$ 600 cells/ μ L. Efficacy data, early eosinophilic rebound, and the long-term safety profile were reported.

Results : Mepolizumab induced a clinically significant and sustained improvement up to 48 months in both baseline eosinophilia subgroups, with marked reductions in symptom scores (SNOT-22), polyp burden (NPS), and a progressive recovery of olfactory function (SSIT-16), evident from the first months of treatment and stable over time.

Conclusions: Mepolizumab maintains clinically relevant and sustained efficacy up to 48 months in real-life type 2 CRSwNP, with a paradoxically greater benefit in patients with baseline BEC> cells/ μ L despite greater initial disease severity. Early eosinophilic rebound requires close monitoring during the first 12 months but does not compromise long-term response. These data support prolonged use of

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the drug even in more aggressive phenotypes and highlight the importance of strict therapeutic adherence. Prospective extension studies beyond 4 years are needed to confirm the potentially indefinite durability of response.



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PROLACTINOMA FROM A PATIENTS' PERSPECTIVE: THE ROLE OF FIRST-LINE TRANSSPHENOIDAL SURGERY, ASSOCIATED COMPLICATIONS AND OVERALL TREATMENT PREFERENCES - RESULTS FROM AN INTERNATIONAL SURVEY STUDY (THE PROMISE SURVEY)

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Background Prolactinomas are the most common functioning pituitary adenomas. Transsphenoidal surgery has emerged as a safe and effective first-line alternative to dopamine agonists (DA) in selected patients; however, comparative data on patient-reported outcomes across treatment strategies remain limited. Improved understanding of patient experiences is essential to support shared decision-making and long-term disease management.

METHODS International, cross-sectional survey study including adults with prolactinoma and conducted from 01/06/2025 02/01/2026. The anonymized online survey assessed symptoms/signs at diagnosis, treatment history, adverse effects and complications, treatment satisfaction, quality of life and preferences regarding medical versus surgical management.

Results 528 patients participated (median age 40 [IQR 31-49] years; 73% females; disease duration 5 [2-11] years since diagnosis). Presenting clinical manifestations included reduced libido (114/142 [80%]), menstrual irregularities/amenorrhoea in women (317/387 [82%]), and erectile dysfunction (94/142 [66%]) in men, as well as tiredness (370/528 [70%]) and mood changes (338/528 [64%]). Eighty-seven percent (458/528) received initial DA treatment, predominantly cabergoline (87%), while 9% (50/528) underwent surgery as a first-line therapy. Sixty-five patients had second-line surgery. Among surgically treated patients, 41% (47/115) had microprolactinomas, 43% (50/115) had macroprolactinomas, 13% (15/115) had giant prolactinomas, and 3% (3/115) could not recall the initial size. Among patients with microprolactinomas, most common short-term postoperative complications were nasal congestion (25/47 [53%]), bloody nasal discharge (20/47 [43%]), impaired sense of smell/taste (13/47 [28%]), and new pituitary hormone deficiencies requiring medication (5/47 [11%]), whereas reoperation for complications (3/47 [6%]), cerebrospinal fluid leakage (4/47 [9%]), and meningitis (0/47 [0%]) remained rare or absent. Regarding management preferences, 20% (103/528) prefer long-term medication; 24% (128/528) prefer surgery; 46% (243/528) rather prefer medication but are open for surgery, and 10% (54/528) rather prefer surgery but are open for medication. While 73% (383/528) were aware of surgical options, only 27% (145/528) knew that surgery could probably offer higher remission rates than medication for microprolactinomas. Among initially DA-treated patients, 20% (90/458) would retrospectively have preferred primary surgery. Most patients were interested in

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comparative trials (383/528 [73%]), preferred joint endocrinology–neurosurgery collaborative discussion (412/528 [78%]), and 55% (289/528) would consider computer-assisted treatment selection after counselling.

Conclusion This large international patient-reported survey highlights substantial symptom burden, knowledge gaps, and heterogeneity in treatment preferences among patients with prolactinoma. Despite predominant use of medical therapy, a meaningful proportion of patients would retrospectively consider primary surgery, particularly for microadenomas. Awareness of surgical efficacy remains limited. These findings support the need for improved patient education, multidisciplinary counselling, and prospective comparative studies to enable individualized, preference-sensitive first-line treatment decisions.



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PORCINE SMALL INTESTINAL SUBMUCOSA (BIODESIGN®) MATRIX FOR ENDOSCOPIC SKULL BASE DURAL REPAIR: A REGENERATIVE ALTERNATIVE TO AUTOLOGOUS GRAFTS

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Background Anterior skull base reconstruction is a critical step in endoscopic endonasal oncologic surgery to prevent postoperative cerebrospinal fluid (CSF) leaks. Autologous grafts, particularly the iliotibial tract, are traditionally considered the gold standard; however, they require a separate thigh incision, may prolong recovery, and result in a visible scar. Porcine small intestinal submucosa matrices (Biodesign®) are bio inductive, absorbable scaffolds that promote revascularization and tissue regeneration. Their use enables effective dural repair without the need for autologous tissue harvesting, particularly in unilateral anterior skull base defects.

Materials and Methods Two patients were included in the present study and were treated at San Raffaele Research Hospital in Milan, Italy. Both patients underwent endoscopic endonasal resection for sinonasal tumors with anterior skull base extension—one a solitary fibrous tumor (SFT) and the other an intestinal-type adenocarcinoma (ITAC)—requiring dural resection with negative intraoperative frozen-section margins. In both cases, the dural defect was unilateral and considered suitable for multilayer reconstruction using two layers of Biodesign® matrix placed intracranially (one intradural and one extradural). An extracranial overlay protective layer using septal mucosa was applied: as a free graft in one case and as a pedicled flip flap harvested from the contralateral side in the other case. Postoperative clinical, endoscopic, and radiological follow-up was performed in both patients.

Results The postoperative course was uneventful in both patients and followed the same management protocol as standard duraplasty using iliotibial tract grafts. No postoperative CSF leaks or intracranial infections were observed. Early postoperative CT scans demonstrated expected postsurgical findings without evidence of acute intracranial complications. Minimal pneumocephalus was observed in the

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immediate postoperative period, with progressive resolution on subsequent imaging. No intracranial hemorrhage was detected. Endoscopic follow-up showed progressive graft integration and satisfactory mucosal re-epithelialization. The reconstruction remained stable throughout the available follow-up period.

Conclusions In our preliminary experience, Porcine Small Intestinal Submucosa (Biodesign®) Matrix appears to provide a non-inferior, non-autologous alternative to iliotibial tract grafts for watertight anterior skull base closure, particularly in unilateral dural defects following endoscopic endonasal approaches. The main advantages include absence of donor-site morbidity, reduced operative time, ease of handling and shaping, good tissue integration, and effective CSF leak prevention. However, coverage with an additional autologous mucosal layer appears advisable to reduce the potential risk of infection.

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FROM DACRYOCYSTOGRAPHY TO DACRYOCYSTORHINOSTOMY: ONE DISEASE AT THE CROSSROADS OF OPHTHALMOLOGY AND RHINOLOGY

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Introduction: Nasolacrimal duct obstruction (NLDO) represents a frequent cause of epiphora and recurrent dacryocystitis, bridging the fields of ophthalmology and rhinology. Advances in diagnostic modalities and surgical techniques have reshaped management, demanding an interdisciplinary approach. This review aims to synthesize current literature on diagnostic strategies and evolving therapeutic perspectives from both specialties.

Materials and Methods: A structured search of PubMed, Scopus, and Web of Science was conducted for studies published between 2000 and 2024. Keywords included "nasolacrimal duct obstruction," "dacryocystorhinostomy," "endoscopic management," and "ophthalmology-rhinology collaboration." Articles were screened for relevance, with priority given to systematic reviews, randomized trials, and large case series.

Results: Ophthalmologic contributions have emphasized imaging modalities such as dacryocystography, dacryoscintigraphy, and endoscopic lacrimal evaluation. Rhinologic advances include high-definition nasal endoscopy and CT-based anatomical mapping, enhancing surgical planning. External dacryocystorhinostomy (DCR) remains the gold standard, with success rates exceeding 90%. However, endoscopic DCR, supported by powered instrumentation and adjunctive mitomycin C or stenting, has demonstrated comparable outcomes with reduced morbidity. Recent literature highlights the value of combined ophthalmologic-rhinologic expertise in optimizing outcomes, particularly in complex and revision cases.

Conclusion: Contemporary management of NLDO increasingly relies on interdisciplinary collaboration. Advances in diagnostic imaging and minimally invasive endoscopic techniques have broadened treatment options, achieving high success rates while minimizing complications.

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Future directions include personalized surgical planning, biomaterials for lacrimal stents, and integration of image-guided systems.



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CONCHA BULLOSA AND SEPTAL PERFORATION: RESTORATION OF THE OSTEOMEATAL COMPLEX AND SEPTAL PERFORATION REPAIR USING A 3D-FABRICATED POLYCAPROLACTONE MESH

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Introduction Concha bullosa (CB) is a common anatomical variation of the middle turbinate and an important component of the osteomeatal complex. Although often asymptomatic, it may contribute to symptoms such as headache, nasal obstruction, chronic rhinosinusitis, and hyposmia when significantly enlarged. Septal perforation is defined as a defect in the nasal septum that creates communication between the two nasal cavities. It is most commonly caused by trauma, previous nasal surgery, infection, inflammatory disease, or substance abuse. Septal perforation secondary to mechanical pressure from a large CB has been rarely described in the literature.

Case Presentation A 52-year-old male with a history of septoplasty performed 20 years earlier was referred to our clinic due to progressive nasal obstruction, hyposmia, nasal congestion, and noisy nasal breathing over the preceding three years. His medical history was significant for dyslipidemia.

Results Clinical examination revealed an anterior septal perforation and signs consistent with CRS. A CT scan demonstrated a 1.2 cm septal perforation and bilateral CB, with the right middle turbinate markedly enlarged, completely occluding the osteomeatal complex and exerting pressure on the nasal septum. After three months of unsuccessful conservative management, the patient underwent endoscopic sinus surgery. Bilateral middle meatal antrostomy, excision of the CB and septal perforation repair using a 3D-fabricated polycaprolactone (PCL) mesh were performed. Postoperative outcomes demonstrated significant improvement. The Glasgow Benefit Inventory score was 38.8. The NOSE score improved from 16 to 10, and the SNOT22 score decreased from 76 to 31. VAS scores for taste, smell, mouth dryness, snoring, and overall health improved by 3–4 points.

Conclusions In this case, the markedly enlarged CB may have contributed to septal perforation through prolonged mechanical

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pressure, potentially inducing chondrocyte apoptosis and septal cartilage damage. Repair of the septal perforation using a PCL mesh proved effective and was not associated with apparent adverse effects. This approach may represent a promising option for selected cases requiring structural septal support and reconstruction.



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ENDOSCOPE-ASSISTED MICROSURGERY FOR SKULL BASE TUMORS: A 10-YEAR RETROSPECTIVE STUDY OF A SINGLE CENTER

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Introduction: Skull base surgery remains a demanding neurosurgical field requiring the expertise of experienced skull base surgeons because of the proximity to important vascular and neural structures. In order to minimize the retraction of the brain and to enable a greater degree of tumor resection, the endoscope-assisted surgery has been used. The aim of this study was to showcase the advantages of endoscope-assisted skull base surgery and the clinical outcomes.

Material-methods: This was a 10-year retrospective review of our department's database (12/2015-12/2025). Patients with skull base tumors that were treated surgically at our department were included. Tumor size and the extent of resection were evaluated using pre- and post-operative MRI. Long-term outcomes and complications were evaluated.

Results: 18 patients were included in the study with a mean age of 56,2 years. They were mostly treated for CPA tumors (9 patients) and anterior fossa meningiomas (8 patients). The most used approaches were the retrosigmoid (9 cases) and the supraorbital (6 patients). A total resection was achieved in 12 cases (66,7%), while a near total resection was performed in 6 patients (mostly CPA tumor patients). In 44,4% the use of the endoscope revealed a hidden residual tumor. In all the cases the use of the endoscope had high educational value because of the greater imaging of these narrow skull base areas. Post-operatively, 5 patients had neural deficits (4 had transient facial nerve paresis and 1 case of blindness due to disturbance of the optic chiasm blood supply).

Conclusion: The endoscope-assisted skull base microsurgery can enable a more extended tumor resection with less brain tissue retraction and less invasive approaches.



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RECONSTRUCTION STRATEGY IN PITUITARY ADENOMA SURGERY: IS THE NASOSEPTAL FLAP ALWAYS NECESSARY?

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Introduction: Endoscopic endonasal transsphenoidal surgery remains the preferred approach for treating pituitary adenomas. Cerebrospinal fluid (CSF) leak is a relevant complication with rates reaching 40–50%. Recently, postoperative CSF leak rates have declined, a trend attributed to refinements in endoscopic technique as well as the more comprehensive use of reconstruction materials. The use of pedicled nasoseptal flap (PNF) has been linked to reductions in postoperative CSF leak. However, its systematic use results in longer operative times and donor-site morbidity. Accumulating experience suggests that, in selected cases, free mucosal grafts (FMG)—or even no sellar reconstruction—may provide comparable closure success while promoting better mucosalization and reducing crusting.

Materials and Methods: Single-center retrospective review of endoscopic endonasal transsphenoidal pituitary adenoma resections between September 2017 and December 2025. **Results:** A total of 160 patients were included: 60.6% (n=97) underwent PNF reconstruction, 27.5% (n=44) FMG reconstruction, and 11.9% (n=19) no reconstruction. Overall, 8 postoperative CSF leaks occurred, and leak rates were similar across reconstruction strategies (PNF 5.2% [5/97]; FMG 4.5% [2/44]; no reconstruction 5.3% [1/19]), with no evidence of association on the Fisher–Freeman–Halton exact test ($p=0.987$). Intraoperative CSF leak and obesity were associated with a higher postoperative leak rate ($p=0.028$; $p=0.015$). No statistically significant associations were observed for tumor size, sleep apnea, or revision surgery.

Conclusion: Postoperative CSF leak rates did not differ by reconstruction strategy, whereas intraoperative CSF leak significantly increased postoperative risk. Therefore, FMG or no reconstruction may be effective options in selected patients while potentially limiting nasal morbidity.



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SAFETY AND EFFICACY OF AN INSTITUTIONAL AUTOLOGOUS FIBRIN SEALANT FOR SKULL BASE RECONSTRUCTION: A PRELIMINARY COMPARATIVE ANALYSIS

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Background: Fibrin sealants have long been utilized in neurosurgery to provide secure dural closure. While synthetic sealants are well-established, concerns remain regarding the risk of viral or bovine infections and potential allergic reactions. Additionally, the high cost of these products can be a burden in many regions. This led us to develop a fully autologous fibrin sealant. In this investigation, we examined the safety and efficacy of our institutionally produced autologous sealant.

Methods: Digital records of patients undergoing skull base reconstruction for CSF leakage from November 2014 to February 2026 were collected. Patients treated by the senior researcher were included for final analysis. The study was divided into two historical cohorts: from 2014 to 2019, patients were treated with synthetic fibrin glue, while those admitted from 2019 onwards received autologous fibrin sealant. Comprehensive follow-up and data collection are currently ongoing. Direct material costs for both sealant types were recorded for a preliminary economic comparison.

Results: The study included 33 patients in the synthetic group and 51 in the autologous group. The cohorts were comparable regarding etiology (spontaneous vs. non-spontaneous), gender, surgical site, reconstruction technique (single-layer vs. multi-layer), and age. Groups were also comparable in the use of soft grafts (muscle, fascia, and fat), rigid grafts (cartilage, concha), and vascular flaps. Reconstruction failure, defined as a postoperative leak, occurred in only one patient in the autologous group, which was not a significant difference ($P=1.000$). Complications were observed in three patients, all from the synthetic group: one brain abscess, one surgical site infection (rhinosinusitis), and one case of meningitis. The autologous group demonstrated significantly fewer adverse events ($P=0.048$). Length of hospital stay was not statistically different between the groups ($P=0.837$). The institutional production of

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autologous sealant reduced direct material costs by over 40-fold. Conclusion: Institutional autologous fibrin sealant is a safe, effective, and cost-efficient alternative to synthetic sealants for skull base reconstruction. Its use was associated with significantly lower complication rates while maintaining equal success in CSF leak prevention.



6989

EVOLUTION OF DRAF 2A FRONTAL SINUSOTOMY OVER 30 YEARS

Mohamed Morsy¹

¹Other

Endoscopic frontal sinus surgery is very challenging due to the anatomical position of frontal sinus requiring angled scopes and angled instruments, the wide variation in the anatomy of frontal recess cells, and the higher risk of scarring, fibrosis, and neo-osteogenesis. In this lecture, we present how Draf 2A frontal sinusotomy has evolved over the years since Wolfgang Draf popularized his classification of endoscopic frontal sinus surgery in 1991, including :- intact bulla technique- uncapping the egg (Heinz Stammberger)- vertical bar concept- axillary flap (PJ Wormald)- agger nasi punch out procedure- Carolyn's window (Richard Harvey)



6991

PEDICLED FLAPS IN EXTENDED ENDOSCOPIC FRONTAL SINUS SURGERY : OUTCOMES OF LONGTERM PATENCY

Mohamed Morsy¹

¹Other

Complex frontal sinus lesions requires extended endoscopic frontal sinus surgery to ensure wide drainage and long-term patency. This includes Draf 2B and Draf 3 procedures, which require bone drilling. Bone drilling is associated with osteoblastic reaction and new bone formation , which might cause stenosis of frontal sinus drainage pathway and further disease recurrence. This presentation shows the advantage of pedicled flaps in Draf 2B and Draf 3 in maintaining long-term patency of frontal sinus and reducing the risk of disease recurrence. We use 2 types of pedicled flaps to cover bare bone after drilling of frontal sinus floor, each flap could be used separately or both of them could be combined together :- septoturbinal flap : a medially based flap involving the mucosa of the septum and axilla as well as lateral wall of middle turbinate- laterally based flap : involving the mucosa of the lateral nasal wall and crosses midline to involve the opposing mucosa of the septum , anterior to the olfactory cleftThe use of these 2 pediled flaps helped reduce risk of recurrence and maintain long-term patency of frontal sinus after drilling.



6992

POSTOPERATIVE EPISTAXIS AFTER ENDOSCOPIC ENDONASAL TRANSSPHEOIDAL SURGERY: INCIDENCE, SEASONAL DISTRIBUTION, AND MANAGEMENT

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Objective: Postoperative epistaxis following endoscopic endonasal transsphenoidal surgery (EETS) is an uncommon but potentially serious complication, primarily attributed to injury of the posterior septal branch (PSB) of the sphenopalatine artery during anterior sphenoidotomy. This study aimed to evaluate the incidence, temporal distribution, and pathology-specific rates of postoperative epistaxis and to report outcomes of endoscopic PSB coagulation.

Methods: A retrospective review of 661 consecutive patients who underwent EETS between January 2024 and January 2026 at a single tertiary center was performed. Pathologies included non-functioning pituitary neuroendocrine tumors (PitNET) (n=198), somatotroph PitNET (n=87), lactotroph PitNET (n=67), corticotroph PitNET (n=40), Rathke cleft cyst (n=34), and craniopharyngioma (n=24). All epistaxis episodes were managed with endoscopic sphenopalatine artery PSB coagulation.

Results: Postoperative epistaxis occurred in 21 patients (3.2%). Mean time to onset was 14.3 ± 10.5 days (range 1–39; median 12). Delayed epistaxis (>7 days) accounted for 71.4% of cases. Seasonal analysis revealed a winter predominance, with 42.9% (9/21) of episodes occurring during December–February. The highest pathology-specific incidence was observed in craniopharyngioma (8.3%), followed by Rathke cleft cyst (5.9%), non-functioning PitNET (5.6%), corticotroph PitNET (5.0%), lactotroph PitNET (4.5%), and somatotroph PitNET (1.1%). Endoscopic PSB coagulation was successfully performed in all cases with no recurrence.

Conclusion: Postoperative epistaxis after EETS demonstrated a delayed pattern and notable winter clustering, possibly related to mucosal dryness and environmental factors. Craniopharyngioma showed the highest pathology-specific incidence. Endoscopic PSB coagulation proved to be an effective management strategy. Awareness of PSB anatomy and seasonal risk factors may guide preventive measures.

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Table 1. Incidence of Postoperative Epistaxis by Tumor Pathology (N=661)

Pathology	Total Cases (n)	Epistaxis (n)	Incidence (%)
Non-functioning PitNET	198	11	5.6
Somatotroph PitNET	87	1	1.1
Lactotroph PitNET	67	3	4.5
Corticotroph PitNET	40	2	5.0
Rathke Cleft Cyst	34	2	5.9
Craniopharyngioma	24	2	8.3
Other pathologies	211	0	0.0
Total	661	21	3.2

Seasonal Distribution of Epistaxis Episodes

Season	Months	Episodes (n)	Proportion (%)
Winter	Dec – Feb	9	42.9
Spring	Mar – May	5	23.8
Summer	Jun – Aug	3	14.3
Autumn	Sep – Nov	4	19.0

PitNET = pituitary neuroendocrine tumor; PSB = posterior septal branch. All epistaxis cases were managed with endoscopic sphenopalatine artery PSB coagulation with no recurrence. Mean time to onset: 14.3 ± 10.5 days (range 1–39; median 12). Delayed epistaxis (>7 days): 71.4% (15/21).



6993

EARLY ENDOSCOPIC FRONTAL SURGERY FOR COMPLICATED ACUTE FRONTAL SINUSITIS – THE OXFORD EXPERIENCE

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Introduction: Complicated acute frontal sinusitis is uncommon but can give rise to intracranial suppuration, orbital complications and frontal subperiosteal abscess. Emergency surgery aims to establish effective frontal sinus drainage, yet the necessity and extent of an early endoscopic frontal sinus procedure in the acute setting remain debated.

Methods: We performed a retrospective case series of consecutive patients undergoing emergency surgery for complicated acute frontal sinusitis or frontal mucoceles at Oxford University Hospitals NHS Trust (2014–2025). Clinical, radiological, microbiological, operative and outcome data were extracted. Subgroup analyses were performed to explore trends with regards to ENT intervention.

Results: Forty patients were included (mean age 35.8 years; 70.0% male). The primary diagnosis was intracranial extension in 34 patients (85%), orbital complications in 5 patients (12.5%), and frontal subperiosteal abscess in 1 patient (2.5%), although several patients had dual pathology. The majority underwent ESS/trephine (87.5%). 20 patients (50%) underwent early endoscopic frontal surgery, most commonly Draf 1 or 2a. At 3 months, 87.5% had no persistent neurological deficit, and 97.5% had no persistent vision loss. Compared with limited ESS and/or trephine, early endoscopic frontal surgery of any subtype (Draf1-3) showed a trend towards lower reoperation rate (25.0% vs 53.3%) and fewer ICU admissions (25.0% vs 60.0%).

Conclusion: Our tertiary unit advocates early ENT intervention for complicated acute frontal sinusitis and achieves favourable functional outcomes. Early sinonasal 'source control' by means of endoscopic frontal surgery may confer early peri-operative benefits and influence resource utilisation, but interpretation is limited by the cohort size.



6994

HIGH FIDELITY ENDONASAL TRANSSPHENOIDAL SIMULATION OF PITUITARY TUMOR SURGERY IN A THIEL EMBALMED CADAVERIC SKULL BASE MODEL

Camilo Untoria Reynaldo¹, Shirley De la Cruz Anticono¹, Joana Franco Salinas¹, Jordi Grau Monge¹

¹Other

Introduction The learning curve of the endoscopic endonasal transsphenoidal approach for pituitary and skull base tumors is steep and requires high-fidelity simulation environments. Thiel-embalmed cadavers provide soft-tissue preservation, realistic color and joint mobility, making them attractive models for neurosurgical training. This study describes the feasibility and perceived educational value of a standard endoscopic endonasal transsphenoidal approach to the sella in a Thiel-embalmed cadaver performed by an experienced neurosurgeon.

Material and Methods A single human head embalmed with the Thiel technique was prepared in our anatomy laboratory according to standard protocols (arterial perfusion followed by immersion; storage at low temperature until use). An endoscopic endonasal transsphenoidal approach to the sella was performed by a skull base neurosurgeon from a national oncological center of Perú using 0° and 30° X 4MM X 15 CM endoscopes and conventional pituitary instrumentation including a high-speed fine drill and neuronavigation. The procedure was video-recorded and divided into predefined steps: nasal phase, sphenoidal phase, sellar exposure, simulated tumor removal and reconstruction. Anatomical landmarks, quality of visualization and maneuverability were documented for each step. After the procedure, the surgeon completed a structured questionnaire and a modified Global Rating Scale assessing anatomical fidelity, tissue realism and educational usefulness of the model.

Results The complete transsphenoidal approach to the sella was achieved without technical limitations. Key anatomical landmarks—including middle turbinate, sphenoid ostium, opticocarotid recesses, sellar floor, optic nerves and internal carotid artery prominences—were consistently visualized and safely exposed. Tissue handling, bone drilling and sellar opening were reported by the surgeon as highly similar to live surgery in terms of resistance and elasticity. The post-procedure

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questionnaire yielded maximal scores (5/5) across all items of anatomical fidelity, technical feasibility and educational value, underscoring excellent realism of bony and soft-tissue structures, unrestricted use of standard instruments and strong perceived usefulness for resident and fellow training. The modified Global Rating Scale also showed top ratings (5/5) for endoscope handling, instrument control, operative flow and respect for tissues, confirming that the model supports expert-level performance in a high-fidelity simulation environment.

Conclusions A Thiel-embalmed cadaver provides a realistic and feasible platform for endoscopic endonasal transsphenoidal simulation, allowing full exposure of the sella with high anatomical fidelity. This pilot model, supported by structured video documentation and expert educational assessment, offers a foundation for future multi-cadaver, multi-learner training programs in endoscopic skull base neurosurgery.



6995

GRANULOMATOSIS WITH POLYANGIITIS PRESENTING TO ENT: DIAGNOSTIC CHALLENGES ACROSS THE SPECTRUM FROM AIRWAY-THREATENING TO ORBITAL AND DESTRUCTIVE SINONASAL DISEASE

Beatriz Nicolau¹, Cláudia Gerales¹, Tiago Velada¹, Jorge Mexia¹, Herédio de Sousa¹
1ENT Department, ULS São José

Introduction: Granulomatosis with polyangiitis (GPA) is a rare necrotizing vasculitis with a marked predilection for the upper respiratory tract. ENT manifestations frequently represent the earliest and most prominent features but may mimic benign inflammatory disease, leading to delayed diagnosis and irreversible structural damage. Early recognition of characteristic ENT findings is essential to prevent severe morbidity and life-threatening complications.

Material and Methods: We retrospectively reviewed three patients with GPA presenting at a tertiary referral center. Clinical presentation, endoscopic and radiological findings, histopathology, treatment, and outcomes were analyzed, focusing on diagnostic challenges and disease evolution.

Results: Patients demonstrated distinct and severe ENT phenotypes across a wide age spectrum. A 16-year-old presented with massive epistaxis, destructive nasal inflammation, and airway involvement requiring intensive care admission. After initial disease control, she developed persistent sinonasal disease and, at age 24, a non-pulsatile middle ear mass consistent with granulomatous involvement, highlighting evolving otologic disease. A 66-year-old presented with refractory nasal obstruction, purulent rhinorrhea, and epistaxis initially misdiagnosed as chronic rhinosinusitis. Imaging revealed extensive destructive sinonasal disease with orbital wall erosion. Histopathology confirmed GPA, enabling timely immunosuppressive treatment. A 61-year-old presented with septal perforation and progressive unilateral proptosis due to an intraorbital inflammatory mass. Biopsy confirmed necrotizing granulomatous vasculitis, and systemic therapy achieved clinical stabilization.

Conclusions: ENT manifestations of GPA are heterogeneous and potentially life-threatening. Recognition of key endoscopic and radiological findings, prompt biopsy, and multidisciplinary management

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are essential to prevent irreversible complications. ENT specialists play a central role in early diagnosis and improving patient outcomes.



6996

MODIFIED NASOSEPTAL FLAP SKULL BASE RECONSTRUCTION WITH PRESERVATION OF THE ANTERIOR SEPTAL CARTILAGINOUS MUCOSAL BUTTRESS 8 YEAR EXPERIENCE.

Chester Griffiths¹, Daniel Kelly¹, Garni Barkhoudarian¹, Sivakumar Walavan², Michael Yong¹

¹Pacific Neuroscience Institute,

²Other

Beginning in 2017, preservation of the anterior nasal septal cartilaginous buttress during planning of nasoseptal flap skull base reconstruction planning was attempted by preoperative CT measurements of the potential skull base defect with intraoperative verification. Prior to 2017, Standard Nasoseptal flaps extending to the mucocutaneous columellar junction with reverse cartilage protection flap were routinely performed in 44 cases (44/501) 9%. Beginning in October of 2017, preoperative CT measurements were performed to estimate the length of the flap required for skull base reconstruction and verified intraoperatively. From October 2017 until December of 2024, 54 (54/514) 10% of EESS cases required Nasoseptal flap skull base reconstructions. 16 (3% cases/30% flaps) Standard NSF were performed due to measurement of the length skull base defect related to the length of the NSF. 38 (7% cases/70% Flaps) Modified NSF were performed with preservation of the anterior septal cartilaginous buttress without a reverse flap preserving the contralateral pedicle for possible future use. Anatomic location of pathology utilizing the Modified NSF in the 38 procedures in 6 clival tumors, 11 sellar tumors, 4 lateral tumors, 17 planum tumors. 16 Standard NSF were requiring extended length or sphenoid sinus anatomy in 0 clival tumors, 3 Sellar tumors, 3 lateral tumors, 10 Planum tumors. The length of the Modified Nasoseptal flap had a median length of 5 cm (4 to 5.5cm). There was one partial distal standard NSF failure with CSF leak and no modified NSF failures or CSF leak occurrences. To date, there has been no evidence of saddle nose deformities with either procedure in our series. Modified Nasoseptal flaps with preservation should be considered with preoperative measurement planning to preserve the anterior septal cartilage mucosa buttress and the contralateral vascular pedicle for future NSF use.



6997

OLFACTORY BULB VOLUMETRY ON MRI DURING DUPILUMAB THERAPY IN CRSWNP: 6-MONTH PROSPECTIVE DATA

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Introduction (Background & Aim) Chronic rhinosinusitis with nasal polyps (CRSwNP) is frequently associated with severe olfactory dysfunction. While dupilumab provides robust clinical improvement, objective imaging correlates of olfactory recovery are still limited. This prospective study aimed to quantify magnetic resonance imaging (MRI) changes in olfactory bulb (OB) volume after 6 months of dupilumab and to explore the relationship between OB volumetry and olfactory outcomes, accounting for residual sinonasal disease burden.

Material & Methods Adult patients with severe CRSwNP treated with dupilumab underwent sinonasal MRI at baseline and at 6 months (± 1 week). OB volumes were derived from high-resolution volumetric T2 sequences and averaged across sides. Clinical/endoscopic/radiologic outcomes included Sniffin' Sticks 16-item identification test, Lund-Mackay score (LMS), SNOT-22, nasal polyp score (NPS), and blood eosinophils. Paired pre-post comparisons used non-parametric testing. Associations between changes (Δ) were assessed by Spearman correlation. An adjusted linear model evaluated Sniff score at 6 months as a function of OB volume and LMS at 6 months.

Results Eighteen patients were analyzed (mean age 60.9 ± 12.2 years; 61.1% male). OB mean volume increased from 47.90 ± 6.83 to 52.71 ± 6.93 mm³ ($\Delta +4.82 \pm 4.96$; $p = 0.000076$). Significant improvements were observed in LMS (18.33 ± 3.50 to 5.94 ± 4.47 ; $p = 0.000008$), Sniff identification (4.11 ± 2.63 to 8.44 ± 3.38 ; $p = 0.00143$), SNOT-22 (62.94 ± 17.80 to 20.28 ± 14.02 ; $p = 0.000008$), and NPS (5.44 ± 1.62 to 2.33 ± 2.40 ; $p = 0.000413$). Δ OB did not correlate with Δ Sniff ($\rho = -0.372$; $p = 0.128$). However, in an adjusted model, OB volume at 6 months independently predicted higher Sniff scores ($\beta = 0.197$; $p = 0.031$) alongside LMS ($\beta = -0.470$; $p = 0.002$; $R^2 = 0.569$).

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Conclusions Dupilumab was associated with a significant increase in MRI-derived OB volume and marked clinical improvement in severe CRSwNP. OB volumetry may provide an objective imaging correlate of olfactory performance when interpreted together with residual radiologic disease burden.



6998

MODIFIED NASOSEPTAL FLAP SKULL BASE RECONSTRUCTION WITH PRESERVATION OF THE ANTERIOR SEPTAL CARTILAGINOUS MUCOSAL BUTTRESS: AN 8-YEAR EXPERIENCE.

Chester Griffiths¹, Daniel Kelly¹, Garni Barkhoudarian¹, Sivakumar Walavan², Michael Yong¹

¹Pacific Neuroscience Institute,

²Other

From 2011 until present day, our institution has progressively adopted sinonasal physiology preservation approaches in the treatment of skull base pathologies with over 1100 cases. Review of these techniques including bilateral, arterial pedicle preserving rescue flaps, preservation of both middle turbinates, utilization of vomer septal bone grafts for skull base reconstruction, safely performing concomitant sinusotomy for sinonasal inflammatory-infectious disease, preservation of sphenoid sinus mucosa to be utilized as a vascularized mucosal graft for reconstruction and designing the modified nasal septal flap preserving the anterior nasal septal buttress will be individually presented. Olfactory (Post op Anosmia unrelated to tumor 0.1%), post operative epistaxis (0.25%), post operative meningitis (0.6%) and post operative CSF leak (1.7%) data will be presented.



6999

IMPACT OF CAVERNOUS SINUS MEDIAL WALL RESECTION ON BIOCHEMICAL REMISSION IN FUNCTIONING PITUITARY ADENOMAS: A PAIRWISE COMPARATIVE META-ANALYSIS

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Introduction: Cavernous sinus (CS) medial wall (MW) invasion limits biochemical remission in functioning pituitary adenomas. While endoscopic MW resection (MWR) of the CS is increasingly adopted, prior meta-analyses predominantly lack formal pairwise comparisons against MW-preserving surgery. Thus, the comparative advantage of intentional MWR remains incompletely quantified.

Objective: To evaluate biochemical remission following MWR and quantify its comparative efficacy versus MW-preserving surgery using pairwise meta-analysis.

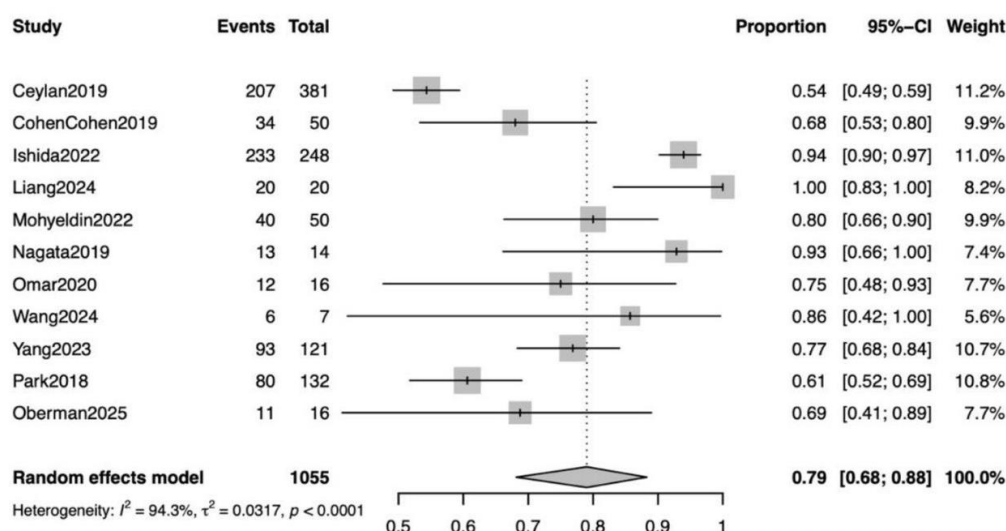
Methods: A systematic review (PubMed, Embase, Web of Science through Dec 2025) identified 10 MWR series. Four studies (two matched, two retrospective cohorts) included non-MWR controls, yielding 243 MWR and 185 non-MWR patients. Single-arm remission was pooled via random-effects proportions. Comparative efficacy was assessed using pooled random-effects odds ratios (ORs). **Results:** Across 10 studies, pooled MWR biochemical remission was 79% (95% CI: 68–88%). Knosp ≤3A tumors achieved 86% remission; one Knosp 4 series reported 77%. In the four comparative studies, MWR significantly increased remission odds versus MW-preserving surgery (OR 6.04, 95% CI: 2.23–16.38). This sixfold benefit was consistent across matched (OR 6.47) and retrospective cohorts (OR 6.06), with no significant difference by design ($p = 0.95$). High heterogeneity reflected variability in invasion grades and remission definitions.

Conclusion: Endoscopic MWR significantly improves biochemical remission in functioning adenomas, increasing cure odds sixfold versus

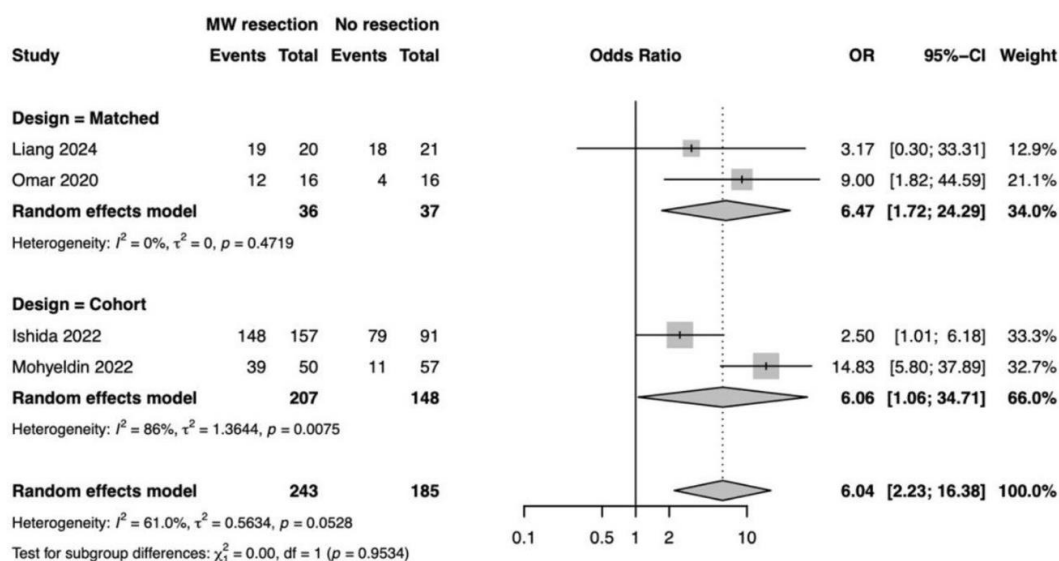


MW-preserving surgery. The benefit is robust, particularly in Knosp $\leq 3A$ tumors. These findings support MWR for appropriately selected patients at experienced centers. Prospective studies are warranted to refine selection criteria.

A) Pooled proportion of remission in patients who underwent endoscopic resection of the medial wall of the cavernous sinus during pituitary surgery



B) Sub-group analysis of studies that provided a comparison group





7000

VARIOUS VASCULARISED NASAL FLAPS FOR RECONSTRUCTION AND HOW TO PRESERVE OLFACTION

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Objective -1.To discuss the different nasal flaps available for anterior skull base reconstruction and their evolution over time. 2.Tips for preservation of olfaction during anterior skull base surgery. **Discussion** - The evolution of skull base surgery from open surgery to the more conservative minimally invasive endoscopic skull base surgery, has been one to marvel. With the advent of endoscopic skull base surgery, arose the need for flaps to reconstruct the skull base defects, mainly to prevent postoperative CSF rhinorrhea. Here we will discuss the evolution of the various vascularised nasal flaps available for reconstruction of surgical defects of the anterior skull base operated via endonasal endoscopic route. We will also focus on preservation of olfaction, as we look to improve the quality of life of our patients undergoing endo skull base surgery. **Results** - The advent of vascularised flaps have proven very beneficial for reconstruction of anterior skull base defects, in preventing postoperative complications, reduced the need for postoperative hospital stay and contributed to significant reduction in morbidity of patients operated by endoscope assisted endonasal route for anterior skull base lesions.



7003

MANAGEMENT OF FRONTAL SINUS CEREBROSPINAL FLUID LEAKS: CONTEMPORARY ENDOSCOPIC EXPERIENCE AND RECONSTRUCTION STRATEGY

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Background: Frontal sinus cerebrospinal fluid (CSF) leaks are surgically challenging due to complex anatomy and limited access, particularly to the lateral recess. Historically managed through external approaches such as osteoplastic flap and obliteration, advances in endoscopic instrumentation and surgical expertise now allow expanded endonasal management.

Objective: To present our institutional experience in the diagnosis and endoscopic management of frontal sinus CSF leaks, with emphasis on etiology, approach selection, and reconstruction strategy.

Methods: A review of frontal sinus CSF leak cases managed at our tertiary referral center was performed. Data analyzed included etiology, clinical presentation, imaging modality, surgical approach, and repair technique. Findings were interpreted alongside current evidence on endoscopic skull base reconstruction.

Results: Frontal sinus leaks represent an uncommon subset of anterior skull base defects. In our series, spontaneous leaks accounted for 71% of cases, while 29% were traumatic. Watery rhinorrhea was the most frequent presenting symptom. High-resolution CT was the primary diagnostic modality, supplemented by MRI cisternography when necessary for soft tissue evaluation. CT cisternography was not routinely used based on evidence-based recommendations. All cases were managed endoscopically, with tailored frontal sinus approaches based on defect location. A modified Lothrop (Draf III) procedure was selectively employed when enhanced access or postoperative drainage was required. Reconstruction was performed using a meticulous single-layer overlay technique, which provided reliable closure without routine use of multilayer underlay grafting. Vascularized flaps were reserved for selected complex or high-flow defects.

Conclusion: Frontal sinus CSF leaks can be successfully managed through a predominantly endoscopic approach. A carefully executed

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single-layer overlay repair provides effective closure in most cases, minimizing the need for extensive reconstruction. Multidisciplinary management remains essential, particularly in spontaneous leaks associated with idiopathic intracranial hypertension, to reduce recurrence risk and optimize long-term outcomes.



7004

IMPACT OF CHRONIC RHINOSINUSITIS TREATMENT ON DEPRESSION SCORES: A PROSPECTIVE COHORT STUDY

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Background: Chronic rhinosinusitis (CRS) significantly impairs quality of life through persistent symptoms, which are often associated with psychological distress including depression. However, the effect of standard medical and surgical management of CRS on patients' depressive symptoms remains under-characterized.

Objective: To assess the prevalence of depressive symptoms in adult patients with CRS and to evaluate how maximal medical and surgical treatment influences depression severity over time.

Methods: A prospective cohort of adult patients (≥ 14 years) with CRS treated at a tertiary care center in Riyadh was followed between November 2021 and June 2022. Validated instruments — the Sinonasal Outcome Test-22 (SNOT-22) and Patient Health Questionnaire-9 (PHQ-9) — were administered at baseline and at 3- to 6-month follow-up after treatment. Changes in depression scores were analyzed, and relationships between sinonasal symptom improvement and depression were examined using correlation and regression analyses.

Results: Thirty-eight patients (mean age 32.7 ± 12 years) were enrolled. The most common CRS phenotype was CRS with nasal polyps (55.3%), followed by allergic fungal CRS (31.6%) and CRS without polyps (13.2%). Six patients (15.7%) had PHQ-9 scores ≥ 10 , consistent with clinically significant depression at baseline. Following treatment, both PHQ-9 and SNOT-22 scores improved significantly (mean PHQ-9 reduction -2.7 ± 7 , $p = .001$; SNOT-22 reduction -24.9 ± 29.8 , $p < .0001$). There was a moderate positive correlation between change in SNOT-22 and change in PHQ-9 scores ($r = 0.522$, $p < .001$), and change in SNOT-22 was significantly associated with change in PHQ-9 on regression analysis.

Conclusion: CRS is associated with significant psychological morbidity, including depression in a notable subset of patients. Treatment that includes both maximal medical therapy and endoscopic sinus surgery results in meaningful improvement in both sinonasal symptoms and depressive symptoms. These findings highlight the importance of a

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multidimensional management approach that considers both functional outcomes and mental health in patients with CRS.



7006

SCHWANNOMA OF PTERYGO-PALATINE FOSSA

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²

Schwannomas are Slowly growing usually solitary well circumscribedencapsulated benign neoplasms that are derived from peripheral nerve sheath. They usually arise from side of nerve and thus do not entrap the nerves but push them . They expand and thin the bony confines of the cavities and foramina in which they arise. They rarely undergo malignant transformation.25% schwannomas are found in the head and neck region with only 4%arise in sinonasal tract. In pterygopalatine fossa they arise from branches of maxillary nerve or vidian nerve. Only less than 200 cases are reported in literature related to sphenoid, vidian and pterygo-palatine fossa. Schwannomas in these areas are usually asymptomatic until they reach a large size that can cause nasal obstruction (usually unilateral), epistaxis, proptosis or compressive symptoms on related nerves. Treatment usually is complete excision which can be done endoscopically if adequate exposure is achieved with very low recurrence rate after complete surgical removal. We present a case of a schwannoma arising in PPF, extending to sphenoid and infratemporal fossa with extra-dural intracranial extension in a 46 year old male who presented with unilateral nasal obstruction. Complete endoscopic excision was achieved through a 2 surgeons single nostril approach with no recurrence up to 5 years follow up.



7010

SPONTANEOUS CEREBROSPINAL FLUID RHINORRHEA AND IDIOPATHIC INTRACRANIAL HYPERTENSION: A RETROSPECTIVE REVIEW OF RADIOLOGIC SIGNS

Elisa Coden¹

¹

Introduction. Spontaneous cerebrospinal fluid (CSF) rhinorrhea is closely associated with idiopathic intracranial hypertension (IIH). Accurate diagnosis and management of IIH in patients with spontaneous CSF leaks is essential to prevent recurrence, though challenging, as the leak may mask clinical manifestations of IIH. Thereby, indirect radiological signs of intracranial hypertension have gained increasing clinical importance. This study aimed to evaluate the preoperative prevalence of indirect radiological markers of IIH in patients with spontaneous CSF rhinorrhea, their association with postoperative recurrence, and postoperative imaging changes.

Materials and methods. A retrospective review was conducted of patients surgically treated for spontaneous CSF rhinorrhea at a tertiary referral center (2003-2023). Preoperative and postoperative magnetic resonance imaging (MRI) scans were independently reviewed by two neuroradiologists for indirect signs of intracranial hypertension. **Results.** A total of 165 preoperative and 60 postoperative MRI scans were analyzed (mean follow-up, 4 years; range, 1-14 years). At least one indirect radiological sign of IIH was present preoperatively in 87.3% of patients, most commonly empty sella (62.4%), optic nerve tortuosity (42.4%), partial empty sella (12.7%), and posterior globe flattening (17%). Recurrence rates were significantly higher in patients with ≥ 3 radiological signs compared with those with ≤ 2 signs (31.1% vs. 3.8%, $p < .001$). No significant postoperative imaging changes were observed.

Conclusions. These findings support the value of multiple indirect radiological markers as indicators of IIH and predictors of recurrence, with potential implications for management. Prospective multicenter studies with appropriate control groups are required for further validation. Fig.1 Radiologic signs of intracranial hypertension: A)B) empty sella; C) optic nerve tortuosity; d) posterior globe flattening; e) f) optic nerve protrusion/enhancement; g) diagram showing preoperative prevalence of radiologic signs of intracranial hypertension.

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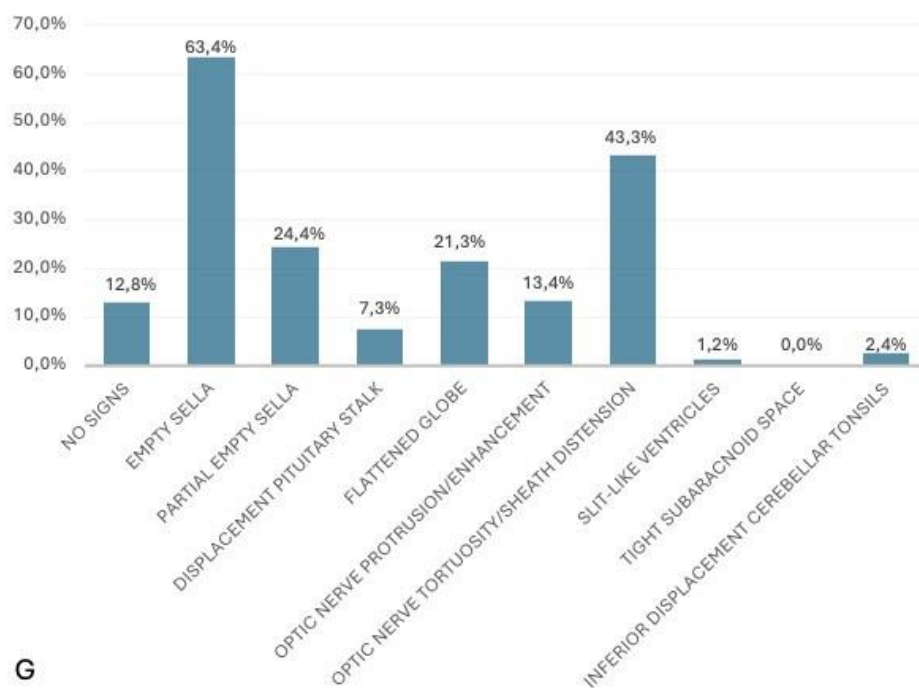
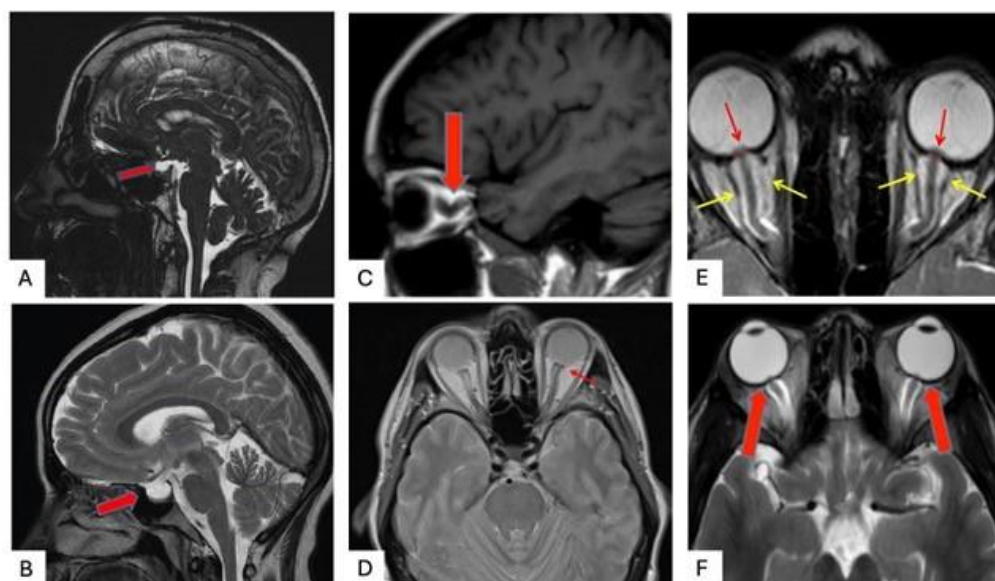


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Keywords: spontaneous CSF rhinorrhea; idiopathic intracranial hypertension; radiologic signs; ICP diagnosis; ICP management





7027

A RARE BUT MISLEADING CAUSE OF CHRONIC NASAL OBSTRUCTION: RHINOLITHIASIS

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Introduction: Rhinolithiasis is a rare condition resulting from the progressive calcification of an intranasal foreign body, which may be exogenous (introduced object) or endogenous (blood clot, epithelial debris). Its slow evolution explains the often delayed diagnosis and misleading clinical presentation.

Objective: To illustrate the clinical, diagnostic, and therapeutic features of rhinolithiasis.

Materials and Methods: This retrospective study included all patients surgically treated for rhinolithiasis in our department between 2014 and 2026. **Results:** Eighteen patients were included, with a slight female predominance (sex ratio = 0.8) and a median age of 31 years. The median consultation delay was 15 months. Only one patient reported a history of nasal foreign body insertion (olive pit). Clinical presentation was dominated by unilateral nasal obstruction, foul-smelling rhinorrhea, and cacosmia (88%), with epistaxis observed in 8 cases. Nasal endoscopy revealed a whitish, hard mass lodged between the nasal septum and the inferior turbinate, more frequently on the left side (55%). Choanal atresia was associated in two patients. Imaging (CT scan or cone beam), performed in most cases, showed a calcified intranasal mass, revealing an unrecognized foreign body in two cases. Pansinusitis was observed in two patients. One patient had no preoperative imaging, with incidental intraoperative discovery during septoplasty. All patients underwent endoscopic removal under general anesthesia, combined with choanal recanalization (2 cases) and middle meatal antrostomy (1 case). Histopathological examination confirmed calcified lithiasis.

Conclusion: Rhinolithiasis is a rare entity caused by progressive calcification of a nasal foreign body. Diagnosis relies on clinical examination and imaging, and treatment is surgical.

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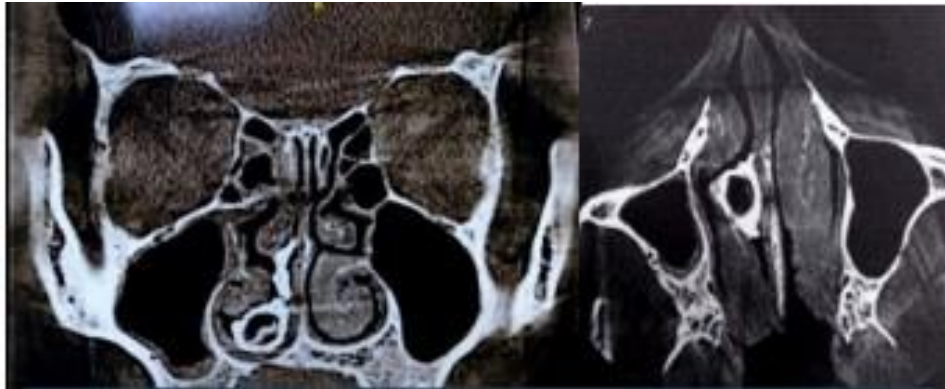
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7028

MAXILLARY SINUS HEMANGIOMA: REPORT OF TWO CASES

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Aim: Highlight the clinical presentation, radiological features, surgical management and the role of histopathology in establishing the diagnosis of maxillary sinus hemangioma.

Methods: We report the following 2 cases of patients managed for maxillary sinus hemangioma. **Results:** Case 1: 62-year-old female presented with a one month history of unilateral epistaxis and headache. Examination revealed bulging of the left middle meatus. CT scan showed an expansile left sinonasal process with heterogeneous enhancement after injection and erosion of the intersinonasal wall. MRI demonstrated a 35 mm lesion filling the maxillary sinus, with heterogeneous T2 and diffusion hypointensity, T1 hypointensity, with peripheral enhancement. Case 2: 17-year-old female presented with unilateral nasal obstruction and bloody rhinorrhea, evolving for 4 months. Examination showed bulging of the right lateral nasal wall filling the middle meatus. CT scan revealed an opacification of the right maxillary sinus with a polypoid formation extended to the nasal fossa. MRI showed a 48 mm heterogeneous mass filling the right maxillary sinus and nasal fossa with extension to nasopharynx through the choana, with peripheral enhancement. Both patients were operated with endoscopic surgery, Histopathology confirmed a capillary hemangioma associated with aspergillosis in the first case, and cavernous hemangioma in the second. Postoperative course was uneventful. Average follow-up was of 2 years.

Conclusion: Maxillary sinus hemangiomas are rare and often radiologically misdiagnosed. Endoscopic surgery is effective, and histopathology remains essential for definitive diagnosis.

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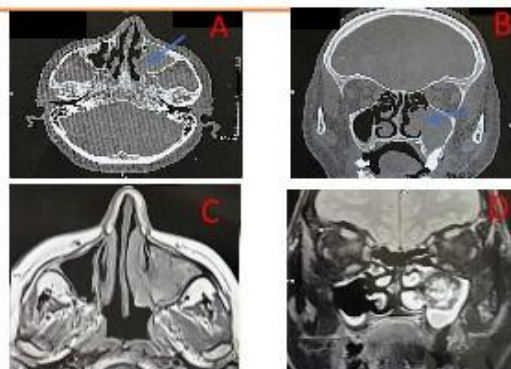


Figure 1:

- CT SCAN on Axial (A) and coronal (B) sections : Soft-tissue mass filling the left maxillary sinus, extending into the nasal cavity, with erosion of the intersinonasal wall (blue arrow).
- MRI (T1 with injection) on Axial (C) and coronal (D) sections: Heterogeneous lesion filling the left maxillary sinus with peripheral enhancement and central hypointensity.

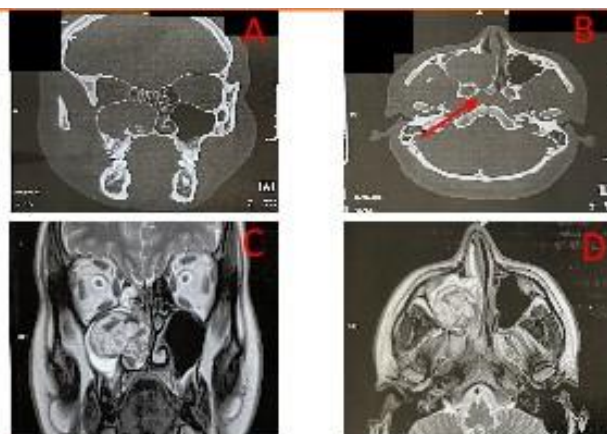


Figure 2:

- CT SCAN on Coronal (A) and axial (B) sections : Complete opacification of the right maxillary sinus with a polypoid formation extended to the nasal fossa and nasopharynx (red arrow).
- MRI on coronal T2 (C) and axial T1 with injection (D) sections: Heterogenous vascular mass filling the right maxillary sinus and nasal fossa.



Poster Abstracts

EP001

ATTIC RECONSTRUCTION TECHNIQUES IN CHOLESTEATOMA SURGERY: A COMPARATIVE ANALYSIS OF CARTILAGE VERSUS BONE PATE

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Abstract Background Cholesteatoma surgery involves canal wall down (CWD) and canal wall up (CWU) mastoidectomy. CWU is associated with higher cholesteatoma recurrence, often linked to attic retraction pockets. Attic reconstruction with cartilage or bone pate lacks comparative evidence.

Aims/Objectives To compare the effectiveness of cartilage and bone pate in attic reconstruction during CWU mastoidectomy for cholesteatoma.

Material and Methods We conducted a retrospective study at King Abdullah University Hospital (KAUH) in Jordan, analyzing surgeries performed from 2011 to 2021. Patients who underwent CWU mastoidectomy with attic reconstruction using tragal cartilage with perichondrium or bone pate were included.

Results Of 48 patients analyzed, 26 had cartilage graft attic reconstruction, and 22 received bone pate. Recurrent cholesteatoma occurred in 19.23% of the cartilage group but none in the bone pate group ($p = .001$). Ear discharge was observed in 19.23% of the cartilage group and 18.18% of the bone pate group, while tympanic membrane perforations and external auditory canal cholesteatoma were more prevalent in the cartilage group.

Conclusions and Significance Our study indicates that bone pate results in significantly lower cholesteatoma recurrence than cartilage grafting in CWU mastoidectomy attic reconstruction. Bone pate offers stability and favorable long-term outcomes for outer attic wall repair.

EP002

ASPIRIN DESENSITISATION FOR NASAL POLYPOSIS IN ASPIRIN EXACERBATED RESPIRATORY DISEASE

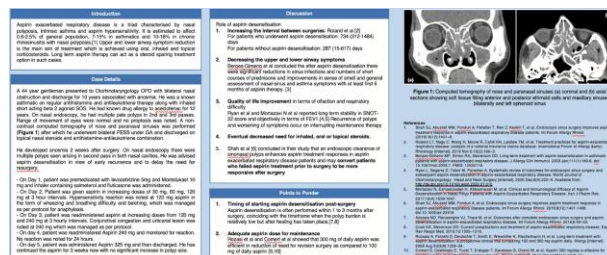
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Introduction: Aspirin exacerbated respiratory disease is a triad characterised by nasal polyposis, intrinsic asthma and aspirin hypersensitivity. It is estimated to affect 0.6-2.5% of general population, 7-15% in asthmatics and 10-16% in chronic rhinosinusitis with nasal polyposis. Long term aspirin therapy can act as a steroid sparing treatment option in such cases.

Case details: A 44 year gentleman presented with bilateral nasal obstruction and discharge for 10 years associated with anosmia. He was a known asthmatic. He had known drug allergy to aceclofenac for 12 years. He underwent bilateral FESS under GA and discharged on topical nasal steroids and antihistamine-antileukotriene combination. He developed anosmia 2 weeks after surgery. with multiple polyps seen arising in second pass in both nasal cavities. He was advised aspirin desensitisation in view of early recurrence and to delay the need for resurgery. He has continued the aspirin for 3 weeks with no significant increase in polyp size. **Discussion:** Role of aspirin desensitisation# Increasing the interval between surgeries#Decreasing the upper and lower airway symptoms-#Quality of life improvement in terms of olfaction and respiratory difficulty -#Eventual decreased need for inhaled, oral or topical steroids.

Conclusion: Aspirin desensitisation is often performed within 1 to 3 months after surgery, 300 mg of daily aspirin was efficient in reduction of need for revision surgery.





EP003

ENDOSCOPIC ENDONASAL REPAIR OF COMPLEX TRAUMATIC SKULL BASE DEFECT WITH RECURRENT CSF RHINORRHEA AND MENINGITIS: A CASE REPORT

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Background: Traumatic skull base defects causing cerebrospinal fluid (CSF) rhinorrhea carry a high risk of recurrent meningitis and are challenging to manage, especially in patients with complex craniofacial fractures.

Case Presentation: We present the case of a 35-year-old male with schizophrenia and prior severe craniofacial trauma after a voluntary defenestration, complicated by two episodes of *Streptococcus agalactiae* meningitis. Imaging revealed a skull base defect between the frontal sinuses and cribriform plate, with multiple potential CSF leak sites. The patient had persistent right-sided CSF rhinorrhea. On June 26, 2025, he underwent endoscopic endonasal skull base repair. Intraoperative findings included a pulsatile meningocele of the anterior ethmoidal roof and a large arachnoidocele of the olfactory cleft. After septoplasty, ethmoidectomy, and Draf IIC frontal sinusotomy, the meningocele was reduced and stabilized with a gasket seal, while the arachnoidocele was coagulated and shrunk with bipolar forceps. Both defects were sealed with Tachosil and covered with a nasoseptal flap. A residual deciduous canine root (tooth 53) was extracted.

Results: Postoperative CT showed stable bilateral frontal fractures, no pneumocephalus, and no new intracranial lesions. The patient recovered without postoperative meningitis.

Conclusion: Endoscopic endonasal repair with gasket seal technique and nasoseptal flap coverage is an effective for complex post-traumatic CSF leaks.



EP004

DIFFERENT SURGICAL PATHWAYS, ONE OBJECTIVE: MANAGEMENT OF PETROUS APEX CHOLESTEROL GRANULOMA

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Objective: This study aims to present a case series of petrous apex cholesterol granulomas (CGs) and to review the literature on imaging findings, indications, current surgical approaches, and outcomes.

Methods: We retrospectively reviewed three cases of CGs diagnosed at the Ospedale Civico of Lugano between 2020 and 2025. Two patients underwent different surgical treatment via different approaches - endonasal, transsphenoidal, and retroauricular - while one patient was managed conservatively. Preoperative and postoperative imaging findings, clinical outcomes, and follow-up data were analyzed. A narrative review of the literature was conducted to contextualize our findings within current evidence.

Results: All surgical cases demonstrated favourable outcomes with no significant complications. The choice of surgical approach was tailored to lesion topography and extension, patient anatomy, and hearing status. The literature review indicates an increasing preference for minimally invasive, hearing-preserving techniques, although high-level comparative data remain limited.

Conclusions: The management of petrous apex CGs should be tailored to each case, with careful consideration of lesion characteristics and patient specific factors. In properly selected patients, endoscopic and minimally invasive techniques are associated with favourable outcomes and lower morbidity. Preoperative imaging and surgical expertise are crucial for selecting the optimal approach.



EP005

OTOLOGIC AND SINONASAL MANIFESTATIONS OF PEDIATRIC PRIMARY CILIARY DYSKINESIA: A SCOPING REVIEW

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Introduction: Primary ciliary dyskinesia (PCD) is a rare, genetically heterogeneous disorder of motile cilia that impairs mucociliary clearance and causes recurrent airway infections. Children with PCD often present with ear and sinus disease resembling common pediatric conditions, yet the true burden and management remain incompletely defined.

Methods: A systematic search of PubMed, Embase, Scopus, and Web of Science identified pediatric cohort studies published from 2020 to 2025 reporting otologic and sinonasal features of PCD. Twelve studies met inclusion, encompassing 524 children with confirmed diagnoses. Extracted data included demographics, otologic and sinonasal manifestations, vestibular findings, imaging, and interventions.

Results: Across cohorts, 60.3% had a history of otitis media and 39.1% had hearing loss, predominantly conductive. Tympanostomy tubes were used in more than half of patients, with many requiring multiple sets due to recurrent effusions or tube occlusion. Sinonasal disease was nearly universal, with 78.5% demonstrating chronic rhinosinusitis and most reporting congestion and rhinorrhea, whereas nasal polyps were uncommonly noted. Vestibular symptoms were infrequently assessed but occasionally present.

Conclusion: Otologic and sinonasal disease are highly co-prevalent in pediatric PCD, highlighting the need for early recognition, regular surveillance, and standardized reporting to guide long-term management.



EP006

NASOPHARYNGEAL CARCINOMA – NEW THERAPIES

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¹general Hospital Of Kavala,

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Introduction: Nasopharyngeal carcinoma is rare. It is located back of the nose. It presents often in Asia, Middle East and Africa. Heredity, diet, smoking, virus infectious like Epstein-Barr virus and human papillomavirus are risk factors. It usually occurs at people 15-24 and 65-79 years old. The patient suffers from headaches, otitis, trismus, neck nodular metastasis, nasal obstruction and bleeding, cranial nerves paralysis. The examinations include endoscopy, MRI, CT, PET scans. There are three types : keratinizing, nonkeratinizing squamous cell carcinoma and undifferentiated carcinoma. Chemotherapy, radiotherapy, immunotherapy and surgery - endoscopic biopsy, neck dissection are used for the treatment. New clinical trials develop new treatment techniques with drugs like toripalimab-tpzi. This is a new class of drugs that block PD-1, PDL-1, so the patients' immune system attacks nasopharyngeal cancer cells.

Case study: A 48-year-old female presented to emergency department with a neck mass on the right side. CT and MRI revealed nasopharyngeal carcinoma with nodular metastasis. She was suffering from earache and headache on the right side. The patient underwent endoscopic biopsy and biopsy from the swollen nodules. Furthermore, chemotherapy, radiotherapy, immunotherapy have been given to this patient until now.

Results - Conclusion : Diagnoses of nasopharyngeal carcinoma is often late because it does not give early symptoms. New therapies improve the prognosis.



EP007

SLEEP APNOEA SYNDROME

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Introduction: Sleep apnoea is a disorder in which breathing repeatedly stops and starts, for at least 10 sec, when you are asleep. Apnoea cuts off the oxygen supply to the body and stops the removal of carbon dioxide. The brain briefly wakes the patient up and re-opens the airways, Causes are nasal deformity, polyps, nasopharyngeal, laryngeal stenosis, motor neuron diseases. Risk factors are: cigarettes, alcohol, sedatives. Symptoms are: snoring, episodes in which breathing stops during sleep, headache, insomnia, daytime sleepiness.

Complications are: fatigue, high blood pressure, heart arrhythmia, sleep-deprived partners, dipression, accidents. The diagnosis is made through nocturnal polysomnography. Epworth Sleepiness Scale is aimed to diagnose mild to severe episodes of sleep apnoea. Continuous positive airway pressure , exercise, no alcohol and smoking are prerequisites for the treatment. Surgical therapy consists of tonsillectomy, adenoidectomy, uvulo-palatopharyngoplasty, rhinoplasty, septoplasty, turbinates cauterization, tongue reduction, soft palate implants, nerve stimulation, tracheotomy.

Material – Methods: According to our study, during the years 2008-2025, 658(94%) out of 700 patients had been operated, 511(77,6%) adults and 147(22,3%) children underwent surgery.

Results: There were more adults than children which had been operated. More adults suffered from sleep apnoea than children.

Conclusions: After operation, our patients had better breathing.



EP008

SKULL BASE DEFECTS IN AFRS PATIENTS: HOW TO REPAIR

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Introduction: Allergic fungal rhinosinusitis (AFRS) causes thinning of sinus walls leading to expansion and remodelling, which eventually causes erosion and may even extend to the orbit and cerebral cavity. For patients of severe allergic fungal sinusitis with cerebral extension, both endoscopic and open techniques have previously been recommended. Here we describe endonasal and open repair techniques and indications. Case 1: A adult immunocompetent male in his forties, presented with b/l proptosis and extensive AFRS with intracranial extension with multiple defects in skull base, largest measuring 3*3 cm. Patient underwent ESS with cranialization of frontal sinus. A coronal incision was made to reveal the frontal sinus, and when the posterior wall and mucosa were entirely removed, the frontal sinus was totally covered in fat. Following sinus obliteration, the anterior sinus wall was replaced. The pericranial or galeopericranial flap used to cover the ventral defect. Case 2: A adult immunocompetent male in his thirties, presented with extensive AFRS with skull base defect, measuring 2*2cm. Patient underwent ESS and skull base defect covered using nasoseptal flap.

Conclusion: Large defects in skull base and supraorbital region need to be repaired to prevent future encephalocele and pulsatile exophthalmos. Choice of technique is based on defect size. Both endonasal and open approaches have relevance in the endoscopic era.



EP009

ENDOSCOPIC ENDONASAL APPROACH FOR MANAGEMENT OF PETROUS APEX CHOLESTEROL GRANULOMA: CASE SERIES & LITERATURE REVIEW

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²cholesterol granuloma ,

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Introduction: Petrous apex cholesterol granuloma (PACG) is a rare condition. It can present with a wide range of symptoms. Various treatment approaches have been described for management of this condition. Endoscopic endonasal access to the petrous apex has described. The purpose of this study is to evaluate endoscopic endonasal approaches outcome in drainage of petrous apex cholesterol granuloma. **Methods:** A retrospective review of patients with symptomatic PACG who underwent expanded endoscopic endonasal approaches was performed.

Results: In our study, 12 patients with symptomatic PACG between 2010 to 2024 in Imam Khomeini hospital complex, Tehran were evaluated. The most common symptom was headache (8 patients), followed by sixth nerve palsy (5 patients). All patients managed via endoscopic approaches. The surgical approaches included transsphenoidal (3 cases), transclival (7 cases) and transpterygoid (2 cases). Nasoseptal flap was utilized in 6 patients alone and in 3 patients in combination with silastic stent. In all patients, headache improved immediately after surgery. Diplopia resolved immediately in 2 patients, while in 3 others, it gradually improved over 3 months. The most common complications were dry eye in 2 cases and septal abscess in one case.

Conclusion: Expanded endoscopic endonasal approaches could provide adequate access for PACG drainage with little complications. Complete cyst drainage can result in immediate headache relief. To prevent restenosis of the cyst opening, designing a nasoseptal flap and placing it at the cyst opening is recommended.

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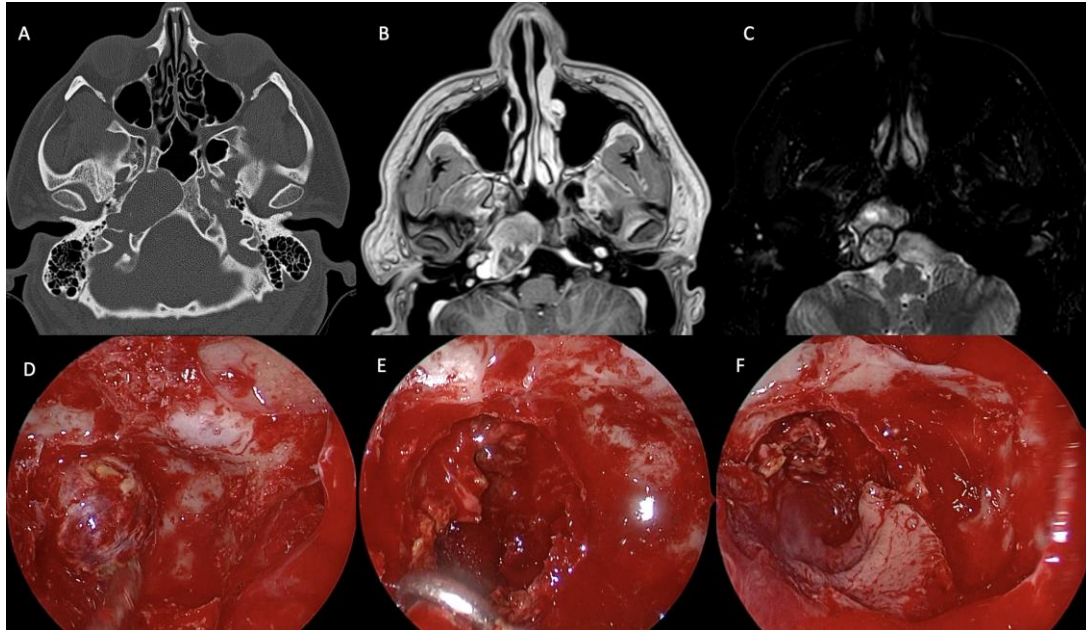
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EP010

MODIFIED TRANS-PTERYGOID APPROACH TO SPHENOID MENINGOENCEPHALOCELES: SHORT STEPS FOR LONG GAINS

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Background&Aim Cerebrospinal fluid (CSF) leaks and meningoencephaloceles originating in the lateral recess of the sphenoid sinus can be challenging. The traditional trans-pterygoid approach through the pterygopalatine fossa (PPF) is time consuming and places important structures at risk, which can lead to significant morbidity. We report our experience using a simplified, endoscopic modified transpterygoid approach (MTPA), which spares the PPF contents in the management of lateral sphenoid sinus meningoencephaloceles and CSF leaks.

Material & Methods We report a series of lateral sphenoid recess CSF leaks and meningoencephaloceles evaluating the repair technique and outcome. **Results** Different repair materials were used free septal mucosal graft, gasket seal with middle turbinate free mucosa and bone and vascularized naso-septal flap. There was 100% success rate with no recurrence of CSF leak.

Conclusions The MTPA reduces morbidity and greatly simplifies access to the lateral sphenoid sinus for the management of CSF leaks and meningoencephaloceles, without compromising exposure. This technique avoids the need for extensive PPF dissection. **Keywords** Endoscopic endonasal approach, skull base surgery, encephalocele, CSF leak, sphenoid lateral recess.

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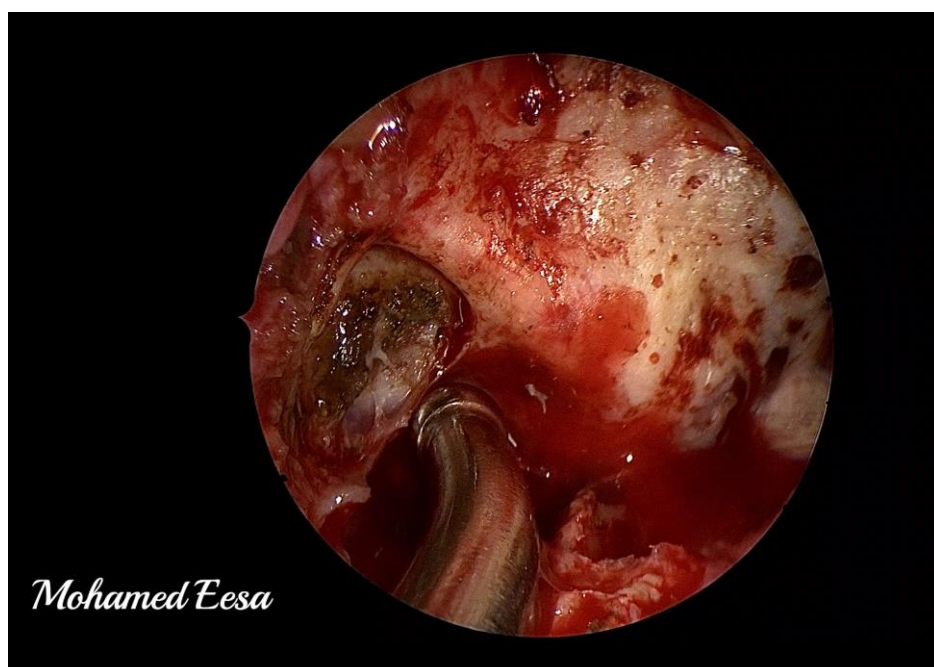
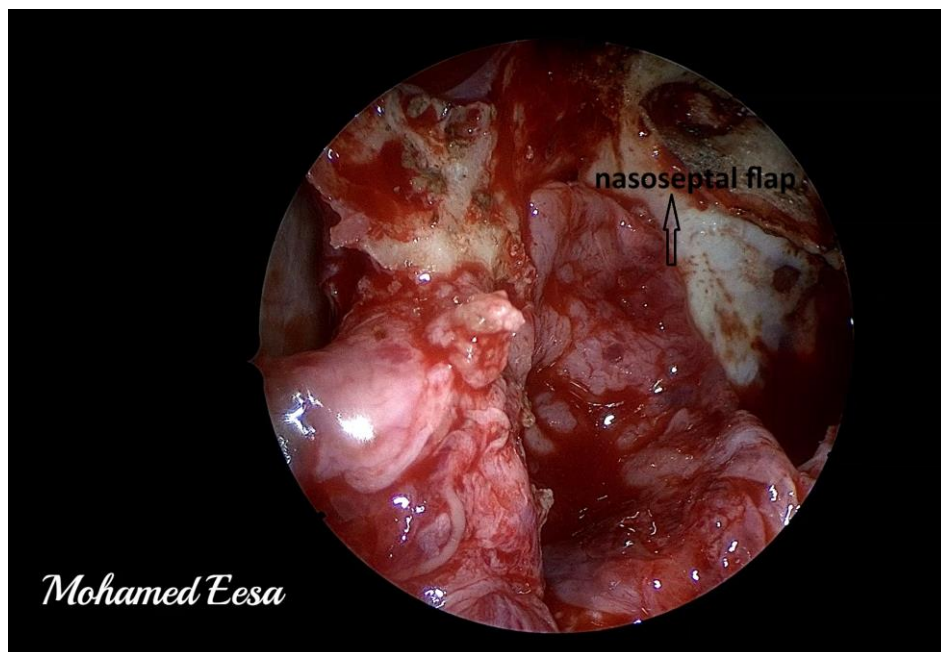
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EP011

RECONSTRUCTION IN ENDOSCOPIC ENDONASAL SURGERY

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Background: Endoscopic endonasal surgery (EES) has been increasingly applied to various skull base pathologies; however, postoperative cerebrospinal fluid (CSF) leakage remains a major complication. This study reevaluates strategies for preventing postoperative CSF leakage in the modern era of EES.

Methods: We retrospectively reviewed 814 EES cases performed at our institution and affiliated hospitals between April 2014 and October 2025. Skull base reconstruction was tailored according to the intraoperative Esposito CSF leak grade. In most grade 0–2 cases, reconstruction consisted of dural suturing supplemented with artificial dura, collagen matrix, bony nasal septum, and sphenoid mucosa. For a portion of grade 2 and nearly all grade 3 cases, multilayer reconstruction using sutured fascia lata and a nasoseptal mucosal flap was employed.

Results: Postoperative CSF leakage occurred in 13 cases (1.60%): two in grade 1, four in grade 2, and seven in grade 3. The underlying pathologies included pituitary adenoma (n=8), craniopharyngioma (n=3), Rathke's cleft cyst (n=2), and arachnoid cyst (n=1).

Conclusion: In grade 2–3 cases, rigid multilayer reconstruction using sutured fascia lata, bony septum, and a nasoseptal mucosal flap appears to markedly reduce postoperative CSF leakage. Although no leaks occurred after clival or lateral skull base procedures, several cases—particularly pediatric craniopharyngiomas and patients with postoperative delirium—still developed leakage, likely due to intracranial pressure fluctuations. CSF leaks in lower-grade cases may be related to the use of newly introduced reconstruction materials or technical factors. We present our current reconstruction strategies and discuss future directions for further reducing postoperative CSF leakage.



EP012

SURGICAL OUTCOMES IN KNOSP GRADE 3 OR 4 MACROPROLACTINOMAS: WHAT ROLE DOES DEBULKING SURGERY PLAY?

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Purpose: To determine the clinical outcomes of patients who had surgery to treat Knosp 3 and 4 prolactinomas with a particular focus on hormonal outcomes. **Methods:** Retrospective cohort review of South Australian patients who had surgery to treat Knosp 3 and 4 prolactinomas from January 2000 to June 2025. Tumours were resected via an endoscopic, endonasal trans-sphenoidal approach. Demographic and clinical parameters were recorded. Hormonal outcomes were measured through assessment of prolactin levels and weekly cabergoline dose preoperatively and then at 3 months postoperatively. We also synthesised a set of criteria that can be used to assess outcomes in prolactinoma surgery. **Results:** Of 54 total operated prolactinomas, 11 were Knosp 3 or 4 prolactinomas. Mean age at surgery was 43.3 years (± 16.2 , range 26-77). Knosp grade was 3 in three cases and 4 in eight cases. The most common surgical indications were dopamine agonist resistance (5 cases) or intolerance (3 cases). Six patients had visual deficits preoperatively, with improvement following surgery in five cases (83%). PRL level prior to surgery was a mean of 82.2 times the upper limit of normal (± 168.5 , range 0-576.1), with a decline to 28.4 (± 50.0 , range 0.0-162.6) at 3 months postoperatively. In six patients on cabergoline preoperatively, three were on a reduced dose at 3 months postoperatively, with three on a stable dose. **Conclusion:** Surgery was effective at addressing visual compromise in cavernous sinus invasive prolactinomas but had a limited effect on prolactin control and the ability to reduce dopamine agonist use.



EP013

CHALLENGING ANTERIOR SKULL BASE CSF LEAKS-AN ENDOSCOPIC APPROACH

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Introduction Csf leaks of the anterior skull base present a significant risk for meningitis ,pneumocephalus and persistent morbidity if not identified and treated early .Advances in endoscopic endonasal surgery have transformed the management of these defects offering a minimally invasive route with excellent visualisation , reduced morbidity and high rates of successful repair. Despite these advantages , anterior skull base CSF leaks remain challenging due to variations in defect location, etiology, and patient anatomy. A precise diagnostic work up, meticulous surgical technique and appropriate reconstruction strategy are essential to achieving durable closure. This presentation reviews our experience with endoscopic repair of various skull base defects including evaluation of patient outcomes and factors influencing success.

Case study/Materials and methods A retrospective review was conducted on patients who underwent endoscopic endonasal repair of anterior skull base CSF leaks at our institution over the past 5 years. Patients with traumatic, iatrogenic, spontaneous or tumour related defects were included. Pre-operative evaluation consisted of clinical examination, high resolution CT scans,MRI wherever relevant and beta-2 transferrin testing for diagnostic confirmation. Surgery was performed using a binarial ,two handed/four handed endoscopic endonasal approach under general anaesthesia. Various approaches like transcribriform, transpterygoid, trans-sellar and clival leaks were managed endoscopically The defect site was identified and reconstruction was tailored to defect size and etiology and included overlay , multilayer techniques utilizing autologous materials like fascia lata, fat, cartilage),synthetic grafts or vascularised flaps. Lumbar drainage was selectively used in high flow leaks /large leaks. Patients were followed post operatively at regular intervals for assessment of symptom resolution, graft integrity and detection of complications. Primary outcome measures included successful closure of the CSF leaks , need for revision surgery and post operative morbidity.

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Results Among the 35 odd patients treated, successful closure was achieved in all but one case ,yielding a primary success rate of 96 percent. One patient required a revision surgery and was successfully repaired during the second attempt. All patients reported resolution of rhinorrhoea and no cases of post operative meningitis, flap necrosis or intracranial complications were observed. Mean follow up was for 24 months with no recurrence of symptoms.

Conclusion Endoscopic repair provides high success rates , low complication rates and durable outcomes for anterior skull base CSF leaks. When combined with appropriate imaging ,accurate localisation and multilayer reconstruction , it remains the gold standard in practice.



EP014

THE RELATIONSHIP BETWEEN FUNCTION OF EUSTACHIAN TUBE AND CHRONIC SINUSITIS.

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Introduction: The main function of the Eustachian tube is the ventilation and maintaining the proper internal pressure of the middle ear. Chronic sinusitis may affect its function and in turn the proper functioning of the middle ear.

Aim: The aim of the study was to describe the relationship between chronic sinusitis and the function of auditory tube. **Methods:** 84 chronic sinusitis patients were prospectively analysed. All patients underwent surgical treatment. During the study the preoperative results of Impedance Audiometry (IA) were compared with the data from the medical history of chronic sinusitis, symptoms reported by the patients, results of Computed Tomography (CT), and Lund and Mackay score (the stage of inflammatory changes in the sinuses).

Results: 65 out of 84 patients in our study had advanced auditory tube symptoms, while 4 patients presented symptoms significantly impacting daily life. The results of Lund-Mackay score were higher in chronic sinusitis patients with tympanometry type B (12.67) and C (12.4) than with type A (9.2). Tympanometry type B was more often observed in allergy sufferers.

Conclusion: As a result of the study the profile of chronic sinusitis patient in whom Eustachian tube dysfunction is more often observed was created. The main conclusion is that the result of Lund and Mackay score and the age of patients are the 2 main factors favouring the dysfunction of the Eustachian tube. Allergy, alcohol and cigarettes overuse also impact the dysfunction of the auditory tube.



EP015

VENTRICULOCISTERNOSTOMY AS A DECISIVE STRATEGY IN OBSTRUCTIVE HYDROCEPHALUS FROM A PINEAL REGION AVM: A PEDIATRIC CASE REPORT

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^{1/}

Introduction: Obstructive hydrocephalus secondary to pineal region arteriovenous malformations (AVMs) is exceptionally rare in children. Progressive symptoms reflect rising intracranial pressure, and careful selection of cerebrospinal fluid (CSF) diversion is crucial. Traditional ventriculoperitoneal shunting (VPS) may provoke dangerous pressure shifts around fragile vascular structures. This report aims to highlight the role of endoscopic third ventriculostomy (ventriculocisternostomy, ETV) in such high-risk pediatric cases.

Material & Methods: A 9-year-old girl presented with progressive headaches, nausea, and visual disturbances. MRI revealed aqueductal obstruction from a pineal region AVM. Initial VPS placement resulted in two intraventricular hemorrhages and shunt dysfunction, likely due to abrupt intracranial pressure changes. Subsequently, a minimally invasive endoscopic third ventriculostomy was performed via a frontal approach, with controlled fenestration of the third ventricular floor and intraoperative confirmation of basilar artery visualization.

Results: ETV led to immediate clinical improvement, with resolution of headaches and papilledema. Postoperative imaging confirmed a patent stoma and reduction in ventricular size. No further hemorrhagic events occurred, and the patient remained stable for definitive AVM management.

Conclusions: ETV provided a safe and effective CSF diversion in a pediatric patient with obstructive hydrocephalus from a pineal region AVM, avoiding the complications associated with VPS. This case underscores the critical role of endoscopic techniques in complex neurovascular pediatric cases, demonstrating that careful CSF diversion selection can directly improve outcomes.



EP016

PREDICTION OF VISUAL OUTCOMES AFTER ENDOSCOPIC TRANSSPHENOIDAL SURGERY FOR SELLAR LESIONS WITH CHIASMAL COMPRESSION USING PRE-OPERATIVE MAGNETIC RESONANCE IMAGING MEASUREMENTS: A MULTIVARIATE ANALYSIS

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Introduction: Prediction of visual outcomes after transsphenoidal surgery remains difficult due to lack of strong predictors, and its correlation with magnetic resonance imaging (MRI) measurements has been understudied. This study aims to review the post-operative visual outcomes of sellar lesions with compressive optic neuropathy, and to identify predictors of post-operative visual recovery.

Methods: Patients with sellar lesions causing compressive optic neuropathy that underwent transsphenoidal excision in Queen Mary Hospital from March 2010 to March 2025 were reviewed retrospectively. Patients with significant ophthalmological comorbidities, inadequate decompression and prior radiation/operations to sellar region were excluded. Pre- & post-operative visual assessment results (visual acuity, visual field, colour vision and relative afferent pupillary defect) were compared. Pre-operative MRI measurements of sellar lesions and optic chiasm were taken. Uni- and multivariate analyses were performed to determine predictors of improvement in visual outcomes.

Results: 76 patients with pre- & post-op ophthalmological assessment and pre-operative MRI available were identified. 91.7% of patients had visual field improvement, and 25.0% had complete visual field recovery. Upon uni- & multivariate analyses, chiasmal thickness (OR = 1193.790, $p = 0.024$) predicts post-operative visual field improvement, which was validated using receiving operator characteristic (ROC) curve with area under curve being 0.878. Chiasmal thickness of ≥ 1.0 mm is significantly associated with post-operative visual field improvement ($p = 0.001$).
Conclusions: Endoscopic transsphenoidal surgery is effective for chiasmal decompression in sizable sellar lesions. As an easily measurable parameter on pre-operative MRI, chiasmal thickness offers early



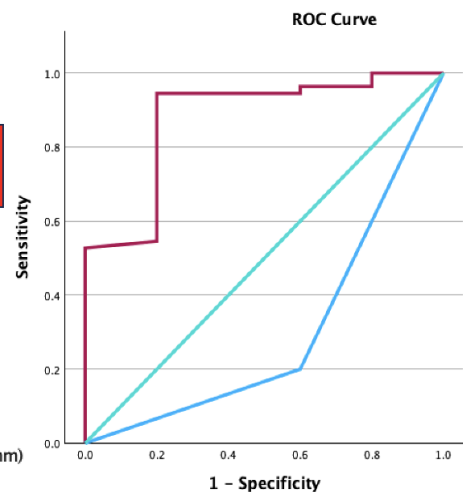
predictive value for post-operative visual field recovery. Further studies for external validation are warranted.

VF improvement: Forward stepwise multivariate binary logistic regression

Variables	OR (95% CI)	p value	Area under ROC curve
Apoplexy	0.116 (0.011 – 1.218)	0.073	0.300
Chiasmal thickness	1193.790 (2.552 – 558347.108)	0.024	0.878

**Thicker chiasm
predicts higher likelihood of
VF improvement**

— Apoplexy
— Chiasm thickness (mm)
— Reference Line



EP017

SPHENOID SINUS PNEUMATIZATION PATTERN AND ITS SURGICAL IMPLICATIONS IN SKULL BASE APPROACH

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Background The sphenoid sinus exhibits significant anatomical variability, with pneumatization extending in multiple directions. These variations directly influence surgical planning and the risk of complications involving the internal carotid artery, optic nerve, and cavernous sinus. This study aimed to analyze sphenoid sinus pneumatization patterns and their surgical implications in endoscopic skull base approaches.

Methods A retrospective review of six patients with skull base defects involving the sphenoid sinus operated between 2019 and 2025 at the Head and Neck Surgery Department, Ilyinskaya Hospital, was conducted. Preoperative CT imaging was used to classify the type and extent of sphenoid sinus pneumatization according to the Bilgir et al. classification. A literature review was performed to correlate pneumatization degree with surgical risks and intraoperative findings.

Results All six patients demonstrated a combined full lateral type of pneumatization, extending into the greater wing, pterygoid process, and anterior clinoid process. This extensive pneumatization pattern was associated with an increased frequency of bony dehiscence and skull base defects, correlating with previously reported risk factors for meningocele formation and intraoperative complications.

Conclusion Comprehensive preoperative assessment of sphenoid sinus pneumatization is essential for safe endoscopic skull base surgery. While extensive pneumatization facilitates surgical access by reducing drilling, it simultaneously increases the risk of neurovascular exposure and bony dehiscence. Identifying pneumatization type preoperatively can optimize surgical planning and minimize complications.



EP018

USE OF MEROCEL IN PITUITARY SURGERY TO REDUCE CSF LEAKS .

Gaurav Wadkar

Abstract Background : In endoscopic transsphenoidal Pituitary surgery, postoperative cerebrospinal fluid (CSF) leakage remains a significant complication, associated with increased morbidity, prolonged hospitalization, and need for revision surgery. Various modification of surgical techniques have been developed to prevent injury to diaphragm and prevent CSF leak . Merocel-an expandable polyvinyl alcohol sponge-has been used as a supportive material due to its biocompatibility, and ability to provide gentle, evenly distributed pressure protecting dura and minimizing csf leaks.

Objective: To evaluate the effectiveness of Merocel pieces as an adjunct in skull base surgery for reducing intraop CSF leak during pituitary surgery. **Methods:** A review and synthesis of clinical experience and available literature was conducted focusing on patients undergoing endoscopic transsphenoidal pituitary surgery where Merocel pieces were used as tamponade to protect the dura. Techniques included placement of Merocel against the diaphragm as a tamponade and minimizing direct injury to dura with instruments or suctions thereby reducing csf leak incidence. **Results:** Use of Merocel pieces provided reliable mechanical support for dura and facilitated tumor removal and at the same time minimizing injury to dura with curettes and suctions . Their controlled expansion improves access without exerting excessive pressure on surrounding structures. Across reported cases, postoperative CSF leak rates were reduced compared with traditional methods like using neuropatties alone. The material was well tolerated, with minimal risk of adhesion formation .

Conclusion: Merocel pieces represent a useful and effective adjunct in pituitary surgery offering structural support that protects dura and decreases the incidence of intraoperative CSF leakage. Incorporating Merocel into a standardized surgical technique may improve overall surgical outcomes, particularly in large sellar and suprasellar tumors.



EP019

UNZIP TECHNIQUE DURING ENDOSCOPIC FRONTAL SINUSOTOMIES IN THE SETTING OF OBSTRUCTIVE TYPE 3 KUHN FRONTAL CELLS

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Introduction: Endoscopic frontal sinusotomies in cases of obstructive Kuhn Type 3 frontal cells also known as supra-agger frontal cells (SAFCs) are challenging because of the variability in anatomy of the frontal sinus and proximity of the frontal outflow tract to the skull base. Given the complexity of these circumstances, the aim was to design a safe, effective technique to ease the performance of endoscopic frontal sinusotomies in cases of obstructive SAFCs.

Method: To describe the surgical steps of the "unzip" technique to perform during endoscopic frontal sinusotomy in the setting of large supra-agger frontal cells. The "unzip" frontal sinusotomy technique is a surgical method used in endoscopic sinus surgery where the surgeon sequentially removes the thin partitions between ethmoid and frontal air cells, utilizing the natural frontal outflow tract in a fashion much like unzipping a zipper. This approach allows for a controlled and consistent opening of the frontal sinus in the presence of large supra-agger nasi frontal cells with direct visualization and access while minimizing trauma to surrounding structures such as the orbit and skull base.

Material: Case study technical report.

Results: The "unzip" frontal sinusotomy technique is a surgical method used in endoscopic sinus surgery where the surgeon sequentially removes the thin partitions between ethmoid and frontal air cells, utilizing the natural frontal outflow tract in a fashion much like unzipping a zipper. This approach allows for a controlled and consistent opening of the frontal sinus in the presence of large supra-agger nasi frontal cells with direct visualization and access while minimizing trauma to surrounding structures such as the orbit and skull base.

Conclusion: This "unzip" frontal sinusotomy technique is a safe and effective method of reliably opening in the frontal sinus in cases of large

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supra-agger frontal cells that is mucosal-sparing and minimizes complications.



EP020

STERIWAVE® REDUCES ANTIBIOTIC USAGE AND MENINGITIS RATES FOLLOWING ENDOSCOPIC ANTERIOR SKULL BASE SURGERY

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Introduction Nasal decolonization is recommended in the 2016 WHO Global guidelines for the prevention of surgical site infections. Nasal colonisation with *S. aureus* increases the overall risk of surgical site infections, including those caused by MRSA. The standard of nasal decolonization care recommended by NICE, UK is a topical ointment containing the antibiotic mupirocin. This regime relies upon patient compliance to apply the ointment twice daily for 5 days before an operation. Such regimes have a patient compliance of only 49%. Steriwave® is an innovative medical device delivering broad-spectrum nasal decolonisation via photodisinfection with methyl blue. It takes 5 minutes prior to surgery to achieve decolonisation and does not induce antibiotic resistance.

Material & Methods Prospective cohort of consecutive patients undergoing an endonasal endoscopic resection of a skull base lesion including nasal septal flap reconstruction. Patients administered intranasal photo disinfection therapy in the pre-operative patient holding area on day of the operation utilising the Steriwave® system. All patients received a single dose of a single agent antibiotics at induction only. Primary outcome: Rate of post operative meningitis. Secondary outcome: Rate of post operative sinus and respiratory and number of ENT OPD visits required to clean the post op nasal cavity. Results 69 consecutive patients enrolled 3/69 required post operative antibiotics for sinusitis 0/69 developed meningitis Patients required an average of 1 ENT OPD post operatively

Conclusions In this small pilot study compared to historical data, Steriwave® reduces the post operative antibiotic usage within 30 days of skull base surgery and reduces the requirement for ENT OPD appointments. Patient compliance is 100%



EP021

HOW FAR ARE WE FROM CONSIDERING ENDOSCOPIC DISCECTOMY THE GOLD STANDARD?

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Introduction: Endoscopic discectomy has emerged as a prominent minimally invasive alternative to conventional microdiscectomy for treating lumbar disc herniation. With continued advancements in optics, instrumentation, and surgical ergonomics, the technique has expanded in popularity and indications. Despite promising clinical outcomes, the question remains whether endoscopic discectomy is ready to become the gold standard. This study aims to evaluate current evidence, identify barriers to universal adoption, and assess how close the field is to achieving this benchmark.

Methods: A narrative review methodology was employed, examining randomized controlled trials, cohort studies, systematic reviews, and meta-analyses published over the last two decades. Studies comparing endoscopic discectomy with conventional microdiscectomy were included. Key parameters assessed included operative time, complication rates, postoperative pain, functional outcomes, recurrence, learning curve characteristics, and cost-effectiveness. Additional evaluation focused on technological advancements, training requirements, and limitations related to specific disc pathologies.

Results: The majority of comparative studies demonstrate that endoscopic discectomy provides equivalent or superior outcomes to microdiscectomy in terms of postoperative pain reduction, early mobilization, shorter hospital stays, and quicker return to work. Complication rates, including dural tears and infection, are comparable or lower in many series. However, variability exists due to the steep learning curve, with higher complication and recurrence rates noted during early surgeon experience. Heterogeneity among techniques and lack of standardized procedural protocols further complicate direct comparisons. While endoscopic approaches are highly effective for contained or moderately migrated disc herniations, challenges persist for severely migrated, calcified, or multilevel lesions. Technological

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advances such as improved visualization, integrated navigation, and ergonomic instrumentation continue to expand feasibility but are not yet uniformly accessible. Cost analyses show potential long-term savings, though initial training and equipment investments remain significant barriers.

Conclusion: Endoscopic discectomy is approaching the status of a gold standard technique. Its clinical effectiveness, patient-centered benefits, and expanding indications support its growing acceptance. Nonetheless, widespread training availability, standardized operative protocols, and more robust long-term, multicenter comparative studies are required before universal adoption is feasible. With ongoing technological progress and refinement of surgical education, endoscopic discectomy continues to move closer to becoming the preferred first-line surgical option for lumbar disc herniation.



EP022

ISOLATED HYPOTHALAMIC-PITUITARY LANGERHANS CELL HISTIOCYTOSIS IN AN ADULT FEMALE: CASE REPORT

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Introduction: Langerhans cell histiocytosis (LCH) is a rare, potentially multisystem disease characterized by clonal proliferation of immature dendritic cells. Isolated involvement of the hypothalamic-pituitary region in adults is extremely uncommon and represents a significant diagnostic challenge.

Case Report: A 32-year-old previously healthy female presented in 2022 with polyuria, polydipsia, amenorrhea, and weight gain. Magnetic resonance imaging revealed nodular thickening of the pituitary stalk associated with absence of the posterior pituitary bright spot. Disease progression was observed, and an endoscopic biopsy was performed, confirming Langerhans cell histiocytosis. The patient was treated with radiotherapy, achieving good local disease control.

Conclusion: This case highlights the rarity of isolated pituitary stalk Langerhans cell histiocytosis in adults, the associated diagnostic challenges, and the importance of histological confirmation and multidisciplinary management.



EP023

THE ASSOCIATION OF RADIOLOGIC INDICES WITH POSTOPERATIVE OUTCOMES OF ENDOSCOPIC ENDONASAL SURGERY IN CRANIOPHARYNGIOMA

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Background: The aim of this study was to evaluate the correlation of radiologic parameters and surgical outcome of endoscopic endonasal surgery in craniopharyngioma patients treated in our referral center. **Materials & Method:** Basic data, radiologic indices, data on extent of tumor resection, and surgical outcome of patients with craniopharyngioma between 2012 and 2023 were collected.

Results: The total number of 50 patients included 27 males (54%) and 23 females (46%) with a mean age of 22.34 ± 15.69 years. Tumor calcification, lobulation, tumor extension to lateral carotid and bifurcation, tumor extension to the third ventricle, tumor extension to infradorsum sellae, and vascular encasement were found in 86%, 88%, 42%, 76%, 28%, and 26% of the patients respectively. The mean of radiologic indices including suprachiasmatic line tumor extension (SCL-TE), infrachiasmatic line tumor extension (ICL-TE), subfrontal tumor extension (SF-TE), intercarotid distance at chiasmatic sulcus (ICD), supranasochiasmatic line tumor extension (SNCL-TE), infranasochiasmatic line tumor extension (INCL-TE), nasochiasmatic line tumor axis angle (NCL-TA), tuberculum-sellae floor distance (T-SFD) were 17.41 ± 14.73 , 20.07 ± 11.48 , 16.15 ± 10.85 , 22.02 ± 7.93 , 13.90 ± 11.67 , 22.38 ± 12.54 , 67.08 ± 24.84 , and 28.11 ± 13.48 mm respectively. GTR, NTR, STR, and PR were achieved in 57.1%, 23.8%, 9.5%, and 9.5% of patients respectively. In the current sample of patients, despite some differences between the radiologic indices, none of the aforementioned indices showed statistically significant association with extent of resection or recurrence.

Conclusion: Although radiologic characteristics of tumors may influence the extent of resection, none of the indices in the current study were

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associated with the extent of resection or recurrence. A larger sample size may demonstrate the potential association more accurately.



EP024

IATROGENIC A-COM ARTERY PSEUDO-ANEURYSM AFTER ENDOSCOPIC ENDO-NASAL PITUITARY SURGERY: CLINICAL COURSE AND MANAGEMENT

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Introduction Iatrogenic intracranial pseudo-aneurysms are rare yet potentially fatal complications related to surgical manipulation of parasellar vascular structures. Although the endoscopic endo-nasal approach is widely considered safe for pituitary surgery, the proximity to the anterior circulation poses a risk of iatrogenic vascular injury. We present a case of a traumatic anterior communicating artery (A-Com) aneurysm developing after endoscopic resection of a pituitary macroadenoma, and we highlight diagnostic challenges and management strategies for these complications.

Materials and Methods / Case Presentation A 30-year-old woman underwent endoscopic endo-nasal resection of a large pituitary macroadenoma causing visual impairment. The surgery was uneventful. Routine postoperative imaging demonstrated subarachnoid hemorrhage in the basal cisterns and hematoma in the surgical site. Digital subtraction angiography (DSA) confirmed an iatrogenic pseudo-aneurysm in the A-com artery. Given the fragile anatomy and high risk of rupture, early treatment was planned. **Results** An endovascular attempt using flow diverter and adjunctive techniques was initially pursued but was unsuccessful due to A1 vasospasm and inadequate access to distal segment for safe device deployment. The patient subsequently underwent open microsurgical clipping via a tailored transcranial approach. Complete aneurysm obliteration with preservation of parent vessels was achieved without intraoperative complications. The postoperative course was uneventful, and follow-up angiography at 3 months showed durable occlusion and no recurrence. **Conclusion** Traumatic aneurysm formation following endoscopic pituitary surgery is exceedingly rare and requires prompt recognition. Early vascular imaging is essential when postoperative changes are atypical. Management should be individualized: while endovascular therapy is often preferred as a first-line approach, microsurgical clipping remains a definitive and highly effective option when endovascular access or stability is limited. This case underscores the importance of a

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multidisciplinary strategy and readiness to transition to open surgery in managing iatrogenic traumatic aneurysms.



EP025

THE ALARMING RISE OF RHINO-ORBITAL-CEREBRAL MUCORMYCOSIS DURING THE COVID-19 PANDEMIC: A RETROSPECTIVE STUDY.

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Introduction: The COVID-19 pandemic has left an indelible mark on global health, not only through its primary respiratory complications but also through secondary opportunistic infections, among which mucormycosis is the most severe and lethal. This study analyzed the clinical features, extent, management, and outcomes of rhino-orbital-cerebral mucormycosis (ROCM) in post-COVID-19 patients.

Objectives: The objectives were to (1) characterize the demographic and clinical profile of ROCM; (2) evaluate surgical and medical interventions; (3) identify key prognostic factors such as diabetes, steroid use, and intracranial involvement; and (4) suggest strategies for early diagnosis and prevention.

Materials and Methods: A retrospective review of 68 patients with rhino-orbital-cerebral mucormycosis (ROCM) treated at Saidu Group of teaching hospital swat KPK Pakistan, a tertiary care hospital between January 2021 and August 2024 was conducted. Data on demographics, comorbidities, COVID-19 history, clinical presentation, disease extent, surgical interventions, and outcomes were collected and analyzed.

Results: Most patients were male (61%) and aged 35–73 years. Diabetes mellitus was present in 91.17%, and 88.3% had a history of COVID-19. Common symptoms included hemifacial pain, orbital complications, and vision loss. Extensive involvement of sinuses, orbit, and intracranial structures was common. All patients underwent surgical debridement, mainly via modified endoscopic Denker's approach (88.23%). Mortality was 32.3%, and 62% achieved disease-free status. Intracranial extension ($p < 0.001$) and uncontrolled diabetes ($p = 0.016$) were significant mortality predictors. Steroid use showed a non-significant trend ($p = 0.12$).

Conclusions: COVID-19-associated mucormycosis predominantly affected diabetic males with aggressive presentations. Early diagnosis, multidisciplinary management, and strict glycemic control are critical. Future research should prioritize rapid diagnostics and improved therapies to reduce morbidity and mortality.



EP026

NASOPHARYNGEAL SCHWANNOMA WITH PTERYGOPALATINE FOSSA AND SKULL-BASE ADJACENT EXTENSION IN A 22-YEAR-OLD FEMALE: A RARE CLINICORADIOLOGIC AND ENDOSCOPIC MANAGEMENT CASE.

Ubaid Ullah Mian¹

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Introduction: Nasopharyngeal schwannomas are exceptionally rare benign nerve sheath tumors that may mimic common nasopharyngeal conditions such as adenoid hypertrophy, nasal polyps, or chronic sinusitis. Their nonspecific symptoms often delay diagnosis, making endoscopic evaluation and imaging crucial for early identification.

Case Presentation: We report a 22-year-old female presenting with six months of bilateral nasal obstruction, anosmia, snoring, and a single episode of epistaxis. She had been treated repeatedly with antibiotics and anti-inflammatory medications without improvement. Endoscopic examination revealed a smooth, well-circumscribed nasopharyngeal mass extending across the midline. CT imaging demonstrated a heterogeneously enhancing lesion occupying the nasopharynx with extension into the posterior nasal cavity, paranasal sinuses, pterygopalatine fossa, and skull base, without intracranial involvement.

Case Management: The patient underwent endoscopic surgical excision under general anesthesia. The mass was completely removed with preservation of surrounding structures. Histopathology showed spindle cells with nuclear palisading, cystic degeneration, and hyalinized vessels, while immunohistochemistry confirmed strong S-100 positivity, establishing the diagnosis of schwannoma. Postoperative recovery was uneventful, and the patient was discharged on the third postoperative day with resolution of symptoms.

Conclusion: This case highlights the importance of considering nasopharyngeal schwannoma in the differential diagnosis of persistent or refractory nasopharyngeal masses, especially when symptoms fail to respond to routine medical treatment. Early endoscopic assessment, appropriate imaging, and complete surgical excision provide accurate diagnosis and excellent clinical outcomes.



EP027

ANAPLASTIC THYROID CARCINOMA (STAGE 4C) IN A 23-YEAR-OLD PREGNANT WOMAN: A RARE PRESENTATION WITH DIAGNOSTIC CHALLENGES AND TREATMENT BARRIERS LEADING TO POOR DISEASE CONTROL AND FATAL OUTCOME.

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Abstract Introduction: Anaplastic thyroid carcinoma (ATC) is an extremely rare and aggressive malignancy, accounting for less than 2% of thyroid cancers, with most cases occurring in elderly patients (typically > 60 years). Its presentation in young adults, particularly during pregnancy, is exceptionally uncommon, posing significant diagnostic and therapeutic challenges.

Case Presentation: A 23-year-old female in her second trimester presented with a rapidly enlarging neck mass, dysphagia, dyspnea, and weight loss. Initial investigations revealed anemia and leukocytosis, while thyroid function tests were normal. Imaging and biopsy confirmed ATC with systemic metastases, including liver involvement (Stage 4c). Pregnancy-related constraints delayed definitive treatment.

Case Management: A multidisciplinary approach was adopted, including tracheostomy for airway obstruction and palliative care. Post-delivery, CT scans revealed significant tumor progression with liver metastases. Despite aggressive supportive measures, the patient's condition deteriorated rapidly, leading to a fatal outcome. **Key Clinical Message:** ATC in young, pregnant patients is rare but devastating. Normal thyroid function tests and pregnancy-related physiological changes can mask malignancy, delaying diagnosis. Early suspicion, timely biopsy, and multidisciplinary collaboration are critical for improving outcomes.

Conclusion: This case underscores the aggressive nature of ATC and the complexities of managing it during pregnancy. Ethical, social, and therapeutic barriers further complicate care, emphasizing the need for early intervention and tailored strategies. **Future Recommendations:** Research into pregnancy-specific management guidelines for ATC is urgently needed. Enhanced awareness among clinicians about atypical presentations in young patients and improved

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access to multidisciplinary care are essential to address such challenging cases.



EP028

ASYMPTOMATIC ADVANCED STAGE 4B JUVENILE NASOPHARYNGEAL ANGIOFIBROMA IN A CHILD: DIAGNOSTIC PITFALLS AND SURGICAL MANAGEMENT – CASE REPORT AND LITERATURE REVIEW

Ubaid Ullah Mian¹

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Background: Juvenile Nasopharyngeal Angiofibroma (JNA) is a rare, benign yet locally aggressive tumor predominantly affecting adolescent males. Typically presenting with recurrent epistaxis and nasal obstruction, it is usually diagnosed early. However, in rare cases with minimal bleeding, diagnosis may be delayed, allowing progression to advanced stages. Management of stage 4B JNA is complex due to its vascularity and potential intracranial extension.

Case Presentation: We report an 11-year-old male with a 3-year history of progressive right nasal obstruction, headaches, and only mild epistaxis episodes (3–4 annually). Due to this atypical presentation, diagnosis was delayed until advanced tumor spread. Contrast-enhanced CT and MRI revealed a lobulated, vascular stage 4B JNA involving the pterygopalatine fossa, infratemporal fossa, orbit, and intracranial extension near the cavernous sinus. A multidisciplinary team opted for an endoscopic endonasal approach to minimize facial morbidity. The tumor was excised through careful stepwise dissection, addressing all extensions while maintaining hemostasis.

Results: The patient had an uneventful postoperative recovery without major bleeding or CSF leak. Imaging confirmed near-total resection. At 1, 3, and 6-month follow-ups, the patient showed no recurrence, resolution of nasal obstruction, improved facial symmetry, and no neurological deficits.

Conclusion: This case underscores the importance of recognizing atypical JNA presentations, where minimal epistaxis may mask advanced disease. Endoscopic techniques provide effective, minimally invasive management, even for extensive tumors, offering favorable functional and cosmetic outcomes. Advanced imaging and a multidisciplinary approach are critical for diagnosis, planning, and successful intervention.

Key Message: Early identification of nasal obstruction and facial asymmetry in adolescent males is vital. Minimally invasive endoscopic

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resection, guided by imaging and a multidisciplinary team, is a safe and effective strategy for managing advanced-stage JNA.



EP029

SINONASAL INTESTINAL-TYPE ADENOCARCINOMA (ITAC): A CASE REPORT

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Introduction Sinonasal ITAC represents an uncommon subtype of sinonasal adenocarcinoma (<4% of malignant tumors in this region). It resembles colorectal adenocarcinoma histologically and in its high mucin production. A strong link exists between its development and prolonged workplace exposure to hardwood dust, leather particles, and other chemical irritants. This condition predominantly affects middle-aged men and most often involves the olfactory mucosa of the ethmoid sinuses. Symptoms are vague, and the progression of the disease is slow; hence, diagnosis is typically set in advanced stages.

Case study A 60-year-old man employed in the woodworking industry presented with a six-month history of progressive obstruction of the left nasal cavity, accompanied by intermittent epistaxis and rhinorrhea in the past month. Nasal endoscopy revealed an irregular, necrotic, and friable mass in the middle meatus of the left nasal cavity. A CT scan showed involvement of the left ethmoid sinus and middle meatus. Biopsies were obtained from the lesion, and histopathological examination revealed ITAC. Subsequent MRI demonstrated a multilobulated, solid mass in the left ethmoid sinus, involving the middle and inferior turbinates, without intracranial extension. Further imaging with PET-CT excluded distant primary foci. The patient underwent endoscopic endonasal en bloc excision of the tumor, followed by postoperative radiotherapy and long-term endoscopic and imaging follow-up.

Conclusions Sinonasal ITAC should be considered in middle-aged men presenting with unilateral nasal symptoms and a relevant occupational history. Early diagnosis, complete surgical excision, and appropriate adjuvant therapy are essential for optimal prognosis. Lifelong follow-up is necessary since there is significant risk of late recurrence.



EP030

ULTRASONOGRAPHY USED IN THE DIAGNOSIS OF CHRONIC RHINOSINUSITIS: FROM EXPERIMENTAL IMAGING TO CLINICAL PRACTICE

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Daniela Vrinceanu¹

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Abstract Background: The increasing incidence of rhinosinusitis in outpatient settings highlights the need for rapid, accessible, and radiation-free screening tools. Although computed tomography (CT) remains the imaging gold standard, ultrasonography has regained interest due to modern high-resolution equipment and its utility in emergency and special populations.

Objective: To evaluate the diagnostic performance of sinus ultrasonography as a screening method in patients with suspected rhinosinusitis and to assess its impact on referral for CT imaging.

Methods: Sonographic findings were correlated with clinical diagnosis and subsequent CT referral. Statistical analysis included Chi-square testing, Spearman's correlation, and ROC curve analysis.

Results: Sinus ultrasonography demonstrated a high sensitivity and specificity compared with clinical and endoscopic findings. Significant correlations were found between ultrasound diagnosis and age group ($P=0.04$), as well as gender ($P=0.01$). ROC analysis confirmed the utility of ultrasonography as a screening tool.

Conclusions: Sinus ultrasonography is a fast, non-irradiating, cost-effective imaging method with high specificity for ruling out rhinosinusitis. It may serve as a valuable screening and triage tool in outpatient clinics, emergency departments lacking ENT services, and in vulnerable populations such as pregnant women and pediatric patients. Its broader implementation could reduce unnecessary CT referrals and support more efficient management of sinus pathology.



EP031

ENDOSCOPIC MULTIPORT APPROACH TO THE FAR LATERAL FRONTAL SINUS LESION.

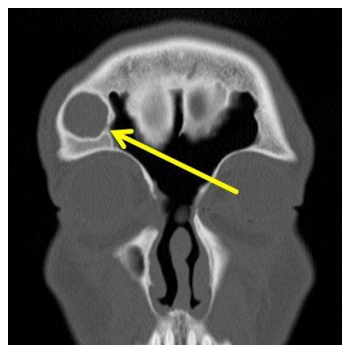
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Introduction: Although lesions in the far lateral frontal sinus are rare, they can include cysts, osseous lesions, and tumors. This region is a challenging area to access due to the protrusion from the medial and superior orbital walls and the anterior skull base. Various endonasal techniques have been devised to approach this area, such as using curved instruments through the contralateral nostril in a Draf type III procedure or fracturing the ipsilateral orbital wall to access directly.

Case: In this report, we present a case in which we successfully accessed the most lateral portion of the frontal sinus using a contralateral endoscopic transorbital approach. The patient was a 30-year-old male with a cyst located in the far lateral frontal sinus. A Draf type III endoscopic endonasal approach was initially performed, but due to limited maneuverability of the curved burr, adequate opening could not be achieved. Three years postoperatively, CT imaging revealed recurrence. Therefore, a contralateral precaruncular conjunctival incision was made, and endoscopic transorbital approach was employed to access the far lateral frontal sinus. Under excellent visualization and improved instrument mobility, a wide opening was achieved. One year postoperatively, the cyst remains well-drained.

Conclusions: When endonasal approaches are limited in accessing the far lateral frontal sinus, a contralateral transorbital approach may serve as a viable alternative."





EP032

FEASIBILITY OF ROBOT-GUIDED LASER OSTEOTOMY FOR ANTERIOR CLINOIDECTOMY AND OPTIC CANAL DELINEATION IN A PRECLINICAL CADAVERIC STUDY

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Introduction: Anterior clinoidectomy and optic canal unroofing are specific neurosurgical techniques, and crucial for addressing complex pathologies of the central skull base. Current approaches using high-speed drills and manual piece-meal resection poses the risk of mechanical and thermal damage. Laser bone cutting demonstrates superior precision and improved bone healing compared to traditional mechanical methods.

Methods: Preclinical cadaveric study investigating the feasibility of robot-guided cold ablation laser osteotomy for anterior clinoid excavation and optic canal delineation. Four fresh-frozen human skulls were used. Access to the target structures was achieved via pterional craniotomy and extradural preparation. A robot-guided Erbium-doped yttrium aluminium garnet laser (Er:YAG laser) was used for the excavation of the anterior clinoid process and optic canal delineation. Safety and accuracy were maintained by optical coherence tomography, a navigation system and a coaxial camera. The bone ablations were visually analyzed intraoperatively, postoperatively by CT scans, and microscopically after skull maceration. **Results:** Four anterior clinoid processes were excavated and four optic canals were delineated with the Er:YAG laser. On average, 63% of the spongy bone of the anterior clinoid process was removed. The cutting edges of the excavation and the delineation were sharply defined and correspond to the planned trajectories of the preoperative planning. Cortical perforation was observed in two specimens. Restricted literature data emphasizes the need for further investigation into in-vivo laser osteotomies, especially for orbito-cranial surgery.

Conclusion: This preclinical study demonstrates on the feasible of robot-guided Er:YAG laser removal of osseous tissue at the skull base following

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preoperative computer-assisted planning. This technique may provide significant advantages in skull base surgery with a high degree of cutting precision. Further research is needed to refine preoperative planning, workflow, and safety aspects.



EP033

ENHANCING PITUITARY GLAND PRESERVATION: A DYNAMIC MRI-DRIVEN, PSEUDOCAPSULE-ORIENTED ENDOSCOPIC TECHNIQUE

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Introduction: Preserving the normal pituitary gland during endoscopic pituitary adenoma surgery remains a central challenge, particularly in macroadenomas where anatomical distortion and tumor expansion obscure gland boundaries. Advances in high-temporal dynamic MRI and the understanding of the pseudocapsule layer have offered new opportunities to enhance functional gland preservation, yet their combined application is not systematically reported. Therefore the objective of this study was to evaluate a hybrid imaging-surgical strategy that integrates dynamic MRI-based gland localization with a pseudocapsule-oriented extracapsular dissection technique to improve functional pituitary preservation.

Materials and Methods: Fifty-six patients with pituitary macroadenomas undergoing endoscopic transsphenoidal surgery at our center were reviewed. Preoperatively, dynamic contrast-enhanced pituitary MRI was used to identify the normal gland based on differential enhancement timing and displacement patterns. Intraoperatively, a standardized extracapsular dissection technique was applied (video demonstrations of the surgical procedure will be available on presentation), targeting the natural plane between the pseudocapsule and native pituitary tissue (Figure 1). Hormonal profiles were assessed before surgery and at follow-up to determine functional preservation. **Results:** Dynamic MRI successfully localized the normal gland in 49 of 56 patients (87.5%). In 40 patients, a clear pseudocapsular plane allowed safe extracapsular tumor removal. Postoperative hormonal function was preserved at preoperative or higher levels in 36 of these patients (90%), with no increased incidence of CSF leakage or surgical complications. Cases without identifiable gland on MRI or lacking a discrete pseudocapsule demonstrated lower preservation rates.

Conclusion: The combined use of dynamic MRI for precise gland localization and pseudocapsule-oriented extracapsular dissection significantly enhances functional pituitary gland preservation in

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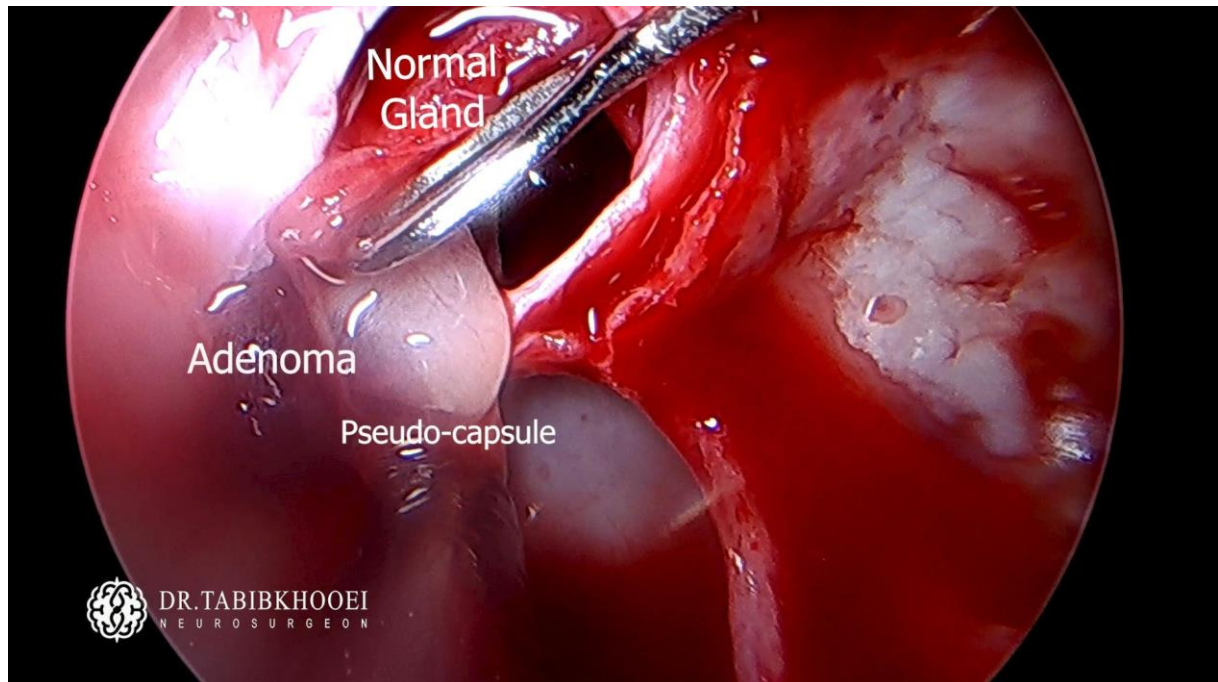


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macroadenoma surgery. This integrated workflow provides a reliable, physiology-guided method to maximize resection while maintaining endocrine stability.





EP034

POST-COVID OLFACTORY AND TASTE DYSFUNCTION IN STUDENTS AT A SOUTH AFRICAN MEDICAL SCHOOL

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Introduction Olfactory and taste dysfunctions are frequently reported in patients with COVID-19. The aims of this study were to determine the prevalence, duration, treatment and effect on quality of life of olfactory and taste dysfunctions after COVID-19 in medical students at the University of the Free State in 2024, five years after the start of the pandemic.

Materials and Methods This was a cross-sectional cohort study of all medical students at the University of the Free State (UFS) in 2024 who completed a questionnaire about their experiences of post-COVID-19 olfactory and taste dysfunctions.

Results Of the 613 participants that completed the questionnaire, 248 (40.5%) reported having COVID-19. Of these participants 132 (53.2%) had olfactory dysfunction and 125 (50.4%) had taste dysfunction. The duration of olfactory and taste dysfunction was less than 6 months in 94 (71.2%) and 104 (74.4%) participants, respectively. However 34 (25.8%) had persisting olfactory and 27 (21.6%) taste dysfunction when the study was conducted. Forty (30.3%) participants reported decreased appetite due to olfactory dysfunction. The most common emotion experienced because of both olfactory and taste dysfunctions was frustration. Safety issues attributed to olfactory dysfunction were reported in 29 (22.0%) participants. Sixteen (12.8%) participants reported decreased weight loss attributed to their change in taste.

Conclusion Although COVID-19-related olfactory and taste dysfunctions recovered in most participants, many participants had persisting symptoms that adversely affected their quality of life. Most participants were not offered any treatment for these dysfunctions. Further research is required on treatment of chronic COVID-19-related olfactory and taste dysfunctions.



EP035

PLATELET-RICH FIBRIN FOR SEPTAL PERFORATION: TWO CASE REPORTS AND SYSTEMATIC REVIEW

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Introduction: Septal perforations, particularly large or chronically inflamed defects, remain challenging to repair due to poor mucosal quality and compromised vascularity. Platelet-rich fibrin (PRF), an autologous fibrin matrix rich in growth factors, has been proposed as an adjunct to enhance regeneration. This study reports two cases of PRF-assisted septal repair and presents a systematic review of the literature.

Material & Methods: Case 1: A 64-year-old man with two previous nasal surgeries presented with a very large septal perforation, fetid crusting, cacosmia, and recurrent inflammation. Granulomatous disease was excluded. Endoscopy confirmed extensive perforation. Cross-over technique was performed, but incomplete flap coverage required supplemental PRF membrane placement. A residual 1-cm perforation persisted, but the patient showed marked improvement with complete resolution of symptoms. Case 2: A 24-year-old man with a history of childhood septoplasty developed bilateral vestibular synechiae and a large septal perforation. He underwent cross-over repair with unilateral PRF membrane application. Follow-up demonstrated full septal closure, excellent flap integration, and improved nasal airflow. For the systematic review, PubMed, Embase, Web of Science, Cochrane Library, and Google Scholar were searched. Eligible studies included experimental, observational, and clinical research evaluating PRF for septal perforation repair.

Results: The review identified a small but growing body of literature. Experimental animal models showed that PRF enhances epithelialization, increases fibroblastic activity, and promotes more complete perforation closure compared with standard healing. Studies combining PRF with hyaluronic acid or polypropylene mesh demonstrated additive or synergistic effects, including reduced inflammation and improved structural support. Histological analyses

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revealed denser collagen deposition, better-organized mucosal layers, and decreased inflammatory infiltrate in PRF-treated groups. Clinical evidence, although limited to case reports and small series, reported high rates of symptomatic improvement, improved mucosal stability, and favorable integration of PRF membranes, with minimal complications. Several reports described accelerated healing and reduced crusting when PRF was used as an adjunct to traditional techniques.

Conclusions: PRF appears to be a safe and biologically beneficial adjunct in septal perforation repair, improving mucosal regeneration and clinical outcomes. Despite promising results from experimental and early clinical data, robust prospective trials are needed to confirm its efficacy and establish standardized protocols.



EP036

EXTRACRANIAL VERTEBRAL ARTERY PSEUDOANEURYSM COMPLICATING A PREVERTEBRAL ABSCESS: A CASE REPORT

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Introduction Spinal/paraspinal infections are exceedingly rare precursors of extracranial vertebral artery pseudoaneurysms. Management is challenging given the need to control the primary infection while addressing the vascular lesion, often in an anatomically complex and infection-compromised surgical field. We report a rare case of a prevertebral abscess complicated by a vertebral artery pseudoaneurysm.

Case study A 62-year-old diabetic woman presented with one-week of fever, progressively worsening right-sided neck swelling and pain, dysphagia and odynophagia. On examination, she exhibited soft intermittent stridor and trismus. There was a large, tender and indurated swelling centered over the right level V cervical region, extending superiorly to level II and the angle of the mandible. Naso endoscopy revealed a right retropharyngeal bulge encroaching into the laryngeal inlet. CT neck showed a 9.7cmx3.7cmx8.3cm pre-vertebral abscess extending to bilateral paraspinal muscles and cervical epidural space. Adjacent to the abscess, there was a rounded hyperdense focus along the right vertebral artery(VA) V3 segment, possibly a pseudoaneurysm. Due to concerns of impending airway compromise, the patient underwent an emergent awake fibre optic intubation. A craniocervical vessel angiography revealed a short segment 16x14mm circumferential aneurysmal dilatation of the right VA V3 segment. A 5x150 helical coil was deployed to occlude a 5mm segment of the VA distal to the aneurysm neck. Thereafter, additional coils were deployed within the pseudoaneurysm sac, followed by dense coil packing into a

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1.5cm-long segment just before the proximal sac. Post-procedure angiography demonstrated complete exclusion of the pseudoaneurysm with retrograde filling of the right VA V4 segment from the contralateral VA. We then drained the right prevertebral abscess via a posterior cervical approach. She was transferred to the intensive care unit and was successfully extubated on POD0 without any neurological deficit. Intra-operative cultures grew *Streptococcus agalactiae*. She received 10 days of intravenous Benzylpenicillin and was discharged with six weeks of PO amoxicillin. . At one-month follow-up, neck swelling and inflammatory markers had resolved.

Conclusion This report adds to the limited literature on extracranial VA pseudoaneurysms and highlights the importance of recognizing rare but serious vascular complications in deep neck space infections.



EP037

COMPLEX HYDROCEPHALUS: LIMITS OF ENDOSCOPIC THIRD VENTRICULOSTOMY

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Introduction: Hydrocephalus arising from intraventricular septations is known as complex or loculated hydrocephalus, called also compartmentalized or loculated hydrocephalus. It's a challenging neurosurgical problem. Definitive treatment is surgical. Complex hydrocephalus is classified : 1-Uniloculated hydrocephalus: presence of a single cyst inside the ventricular system. It is generally congenital. 2-Multiloculated hydrocephalus : presence of multiple cysts or locules isolated by multiple intraventricular septations. It is generally post infectious or post inflammatory with obliterated subarachnoid spaces. Fenestration consists of the transformation of multiloculated hydrocephalus to an uniloculated one. Before the advancement of neuroendoscopy, microsurgery was the primary method for fenestration of intraventricular cysts (Rhoton and Gomez 1972).If neuroendoscopic third ventriculostomy is considered the treatment of choice for hydrocephalus, would it also be the best option for the complex form?

Materials and methods:40 patients were treated surgically in our department, between 2022 and 2025, whose causes varied between neonatal meningitis, intraventricular hemorrhage, multiplaner epithelial cyst, and perinatal meningitis. The clinical expression of the pathology is mainly due to the consequences of intracranial pressure on adjacent structures. All patients were treated endoscopically.

Results: The results were marked by morbidity and mortality with frequent recurrences. 12 patients underwent reoperation. 5 patients died.

Conclusion The endoscopic treatment has the advantage of being minimally invasive, but multiloculated hydrocephalus carries a worse prognosis than uniloculated hydrocephalus.



EP038

ENDOSCOPIC MANAGEMENT OF COLLOID CYSTS: A SINGLE-SURGEON SERIES OF 15 CONSECUTIVE CASES (2023-2025)

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Introduction: Colloid cysts of the third ventricle represent a well-recognized cause of obstructive hydrocephalus and acute neurological deterioration. Endoscopic resection has become an increasingly favored technique, offering minimally invasive access with reduced morbidity. We report our single-surgeon experience with endoscopic removal of colloid cysts over a two-year period.

Methods: A retrospective review was conducted on 15 patients operated between January 2023 and November 2025. All procedures were performed using a purely endoscopic transventricular approach. Clinical presentation, ventricular size, operative details, extent of resection, postoperative complications, and radiological follow-up were analyzed.

Results: Complete macroscopic resection was achieved in all cases. There were no intraoperative complications and no cases of conversion to microsurgical craniotomy. Postoperative outcomes were excellent, with full clinical recovery in all patients and rapid symptom resolution, particularly in those presenting with intracranial hypertension. Radiological follow-up demonstrated complete cyst removal with no recurrence during the surveillance period. There were no cases of postoperative CSF leak, infection, or persistent memory deficits. All patients were discharged within a short postoperative period.

Conclusion: Endoscopic transventricular resection of colloid cysts is a safe and effective technique, providing excellent clinical and radiological outcomes with minimal morbidity. This series supports the growing evidence that endoscopic management should be considered a first-line approach for third ventricular colloid cysts. Further prospective studies with larger cohorts may strengthen these findings.



EP040

REDEFINING THE ROLE OF NEOADJUVANT CHEMOTHERAPY IN OLFACTORY NEUROBLASTOMA: A MULTISTUDY OUTCOME ANALYSIS

Billy Wong, Dimitrios Ioannidis

Introduction Olfactory neuroblastoma (esthesioneuroblastoma, ENB) is a rare malignant tumor of the sinonasal tract. Standard management consists of surgical resection followed by radiotherapy, although neoadjuvant chemotherapy (NACT) has gained interest, particularly for patients with advanced or initially unresectable disease.

Methods A literature review was conducted to assess the use and oncologic outcomes of NACT in ENB. Extracted data included patient demographics, Hyams grade, Kadish stage, chemotherapy regimens and cycles, treatment response, surgical outcomes, and oncologic outcomes.

Results One case report and six case series comprising 88 patients were identified, with a mean age of 42.3 years. Most patients had advanced Kadish C disease and intermediate-to-high Hyams grades; only three had Kadish B disease. Platinum-etoposide-based regimens, most commonly cisplatin/etoposide or carboplatin/etoposide, were predominantly used, with some incorporating ifosfamide. Patients typically received 2–4 cycles of chemotherapy. Among studies with reported responses, complete response was achieved in 10 patients (26.3%), partial response in 14 (36.7%), and no response in 8. Surgical margin status were reported in three studies, with 83.3% achieving complete resection with negative margins. Reported toxicities included neutropenia, nausea, alopecia, and metabolic disturbances. Oncologic outcomes varied but demonstrated encouraging disease control. Disease-free survival ranging from 8 to 30 months was reported following NACT, with a median follow-up of approximately 30 months.

Conclusion NACT appears to provide meaningful cytoreduction in selected patients with ENB, improving resectability and contributing to disease control. However, evidence remains limited to small retrospective studies, highlighting the need for larger prospective trials to better define its role.



EP041

COLLAGEN MATRIX COMBINED WITH HYDROXYAPATITE AND NASOSEPTAL FLAP FOR SKULL BASE RECONSTRUCTION

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Introduction: Extended endoscopic endonasal transsphenoidal approaches (ExEETSA) commonly result in high-flow cerebrospinal fluid (CSF) leaks that demand robust reconstruction strategies. Although nasoseptal flap (NSF) is a standard reconstructive technique, high-flow grade 3 CSF leaks require additional rigid reconstruction. This study evaluated the long-term outcomes of collagen matrix-hydroxyapatite (HXA)-NSF for rigid skull base reconstruction without lumbar drain.

Methods: A retrospective cohort study was conducted on 100 patients undergoing ExEETSA involved intraoperative high-flow grade 3 CSF leak that were managed using a collagen matrix for dural repair followed by HXA and NSF reconstruction without lumbar drainage between January 2016 and December 2023. The primary outcomes assessed were postoperative CSF leakage, meningitis, and HXA-related complications. **Results:** The median skull base defect diameter was 22.9 mm. Tuberculum sellae meningioma represented the predominant pathology (39.0%), with the transplanum/transtuberculum region being the most commonly affected area (77.0%). Postoperative CSF leakage occurred in 4% of cases. HXA exposure accompanied by partial NSF necrosis was observed in eight patients (8.0%). Of these, complete remucosalization of the exposed HXA surface was achieved in five patients (62.5%), with a mean healing time of 23.6 months. There were no cases of meningitis or local infection requiring reoperation.

Conclusion: The combination of collagen matrix, HXA, and NSF without lumbar drainage represents a safe and effective reconstruction strategy for managing intraoperative high-flow grade 3 CSF leaks in ExEETSA. This reconstructive technique yielded favorable outcomes, characterized by a low incidence of postoperative CSF leakage, manageable complications, and sustained long-term effectiveness.



EP042

VISUALIZATION OF INSTRUMENTS-ENDOSCOPE INTERFERENCE IN NEUROENDOSCOPIC SURGERY

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Introduction: In neuroendoscopic surgeries, instrument-endoscope interference can prevent instruments from reaching certain areas visible within the endoscopic view, leading to the perception of a "restricted zone" (RZ). We aimed to visualize the RZ and systematically examine the instrument-endoscope interference.

Methods: Using an endoscope and light source within a simulated surgical field, light was projected from the instrument's entry point, allowing illuminated regions to represent areas reachable by a straight instrument. Shadows cast by the endoscope or other instruments indicated unreachable areas—RZs—that were visualized within the endoscopic view. The study examined changes in the RZs under various conditions. Additionally, cadaver studies were conducted to investigate the typical endoscope-target distance, a factor affecting RZ formation.

Results: The RZ consistently appeared on the side opposite the instrument in the endoscopic view and was primarily determined by the instrument-endoscope positional relationship at the entry, as well as the endoscope's proximity to the target. Oblique scope, zoom, or thin scope altered RZ. During three-hand operations, additional RZs were created by other instruments. In cadaver experiments, the typical distance between the endoscope tip and the target was found to be approximately 7–20 mm.

Conclusions: Adjusting entry positions is the most universal strategy for controlling interference. When extra space is available, an oblique scope is proper. When sufficient space to avoid interference is not available, using a zoom or a thin scope is an effective strategy for reducing interference. Understanding these principles may reduce reliance on surgical experience alone.



EP043

BIPHENOTYPIC SINONASAL SARCOMA: A SYSTEMATIC REVIEW AND META-ANALYSIS OF TREATMENT MODALITIES AND CLINICAL OUTCOMES

Chrisanda Lee, Yong Hong Ng, Kaijun Tay, Neville Teo, Tze Choong Charn, Jian Li Tan

Background: Biphenotypic sinonasal sarcoma (BSNS) is a rare low-grade spindle cell sarcoma of the nasal cavity and paranasal sinuses, defined by distinctive PAX3 fusions. First described in 2012 and formally recognised in the 2017 World Health Organisation Classification of Head and Neck Tumours, BSNS remains poorly understood due to its rarity, with the literature comprising predominantly single-case reports and small case series. As a result, optimal management strategies and prognostic indicators remain unclear. This systematic review aims to synthesise the global evidence on BSNS, characterising its demographic, clinical, histopathological and molecular features, evaluating the efficacy of current treatment modalities, and determining clinical outcomes, particularly recurrence and survival.

Methodology: This review follows PRISMA 2020 guidelines. A comprehensive search of Medline (Ovid), Embase (Ovid), PubMed, and the Cochrane Library was conducted from inception to October 2025. Search terms included: sinonasal sarcoma, biphenotypic sinonasal sarcoma, BSNS, PAX3-MAML3, PAX3-NCOA1, PAX3-FOXO1, sinonasal tumour/tumor, neural and myogenic differentiation, and sarcoma nasal cavity/paranasal sinus. Studies were eligible if they reported adult patients (≥ 18 years) with histopathologically confirmed BSNS and documented clinical management. Case reports and case series were included; reviews and non-original studies were excluded. A total of 3924 records were identified, of which 1987 were duplicates and another 1933 were excluded during title and abstract screening. 93 full-text articles were assessed for eligibility, of which 44 were excluded, leaving a total of 49 studies being included for data extraction.

Results : Data extraction is currently underway and includes demographics, tumour characteristics, molecular features, surgical approach, use of adjuvant therapy, recurrence patterns, and survival outcomes. There were 174 patients, of which 65% were female and 35% were male. The mean age was 54.6 years and the most commonly involved sites were the nasal cavity and ethmoid sinus. Preliminary

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review indicates that surgical treatment was the primary treatment for most patients, with heterogeneity in surgical approaches and variable use of adjuvant radiotherapy. Final pooled analysis will be completed prior to the conference and presented in full.

Conclusion: This review represents the most comprehensive synthesis to date of the global BSNS literature. By integrating clinical, pathological, and treatment-related data, the findings aim to clarify current management patterns and provide more robust estimates of recurrence and survival outcomes. The results are expected to inform clinical decision-making and highlight knowledge gaps that warrant further research in this rare sinonasal malignancy.



EP044

THE EFFECT OF PTERYGOPALATINE GANGLION INJECTION ON SURGEON SATISFACTION IN FESS

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Introduction: Proper surgical field in FESS is essential to identify surgical landmarks, perform safe dissection and avoid possible serious complications. We aimed to evaluate the effect of pterygopalatine ganglion injection on surgeon satisfaction in elective FESS.

Methods: The consecutive adult patients who had medically resistant CRS with or without nasal polyposis and scheduled for elective FESS were randomized into two groups. Before the beginning of surgery, group A had 1.5 mm injection of 2% xylocaine in 100:000 epinephrine at the PPG using the transnasal endoscopic approach whereas group B had placebo saline injection. The surgeon who was blind to the content of both syringes asked to rate his surgical field satisfaction at the end of surgery using a 10 cm VAS. **Results:** 54 patients were enrolled in this study. The range of patients aged was 18-60 years old. Both groups were matched in characteristics, Disease status, LMS as well as duration of anesthesia and surgery. There was a significant difference in the average surgeon satisfaction between both groups. No cardiovascular events or complications have been reported.

Conclusion: Injection of epinephrine in the pterygopalatine ganglion through the nasal cavity at the beginning of FESS is safe procedure and can improve surgeon satisfaction in elective FESS.



EP045

NASAL CHONDROMESENCHYMAL HAMARTOMA: A CASE REPORT

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We report the case of a 6-year-old child with a history of nasal obstruction, chronic rhinorrhea, and snoring, presenting with a lobulated, smooth, firm lesion completely obstructing the right nasal cavity. CT scan and MRI revealed an expansive, polypoid, remodeled inflammatory mass measuring $5.5 \times 1 \times 3.2$ cm, filling the right nasal cavity and extending from the piriform aperture to the choana, associated with inflammatory and retention-related changes of the right paranasal sinuses. The tumor was completely removed via an endonasal endoscopic approach, during which its attachment to the posterior portion of the olfactory cleft was identified. The definitive histopathologic diagnosis was nasal chondromesenchymal hamartoma (NCMH). This extremely rare benign tumor of the sinonasal tract is characterized by a mixture of mesenchymal components, including cartilage, similar to those observed in mesenchymal hamartoma of the chest wall in infancy. Recently, a genetic association between NCMH and DICER1 mutations has been established, and this mutation was identified in this child. This tumor-predisposition syndrome involves an increased risk of pediatric tumors, the most frequent being pleuropulmonary blastoma, and it warrants long-term, multidisciplinary surveillance. At 12 months of follow-up, the patient showed good recovery without recurrence.



EP046

LYMPHOEPITHELIAL CARCINOMA OF THE NASAL CAVITY

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Introduction Lymphoepithelial carcinoma of the nasal cavity (LEC NC) is an exceptionally uncommon malignancy, predominantly reported in individuals from Southeast Asia. Like its nasopharyngeal counterpart, LEC NC demonstrates a strong association with Epstein–Barr virus. We present an additional case and highlight the diagnostic challenges posed by this rare tumor. **Case Study** A 43-year-old man presented with a two-month history of left-sided nasal obstruction accompanied by a single episode of epistaxis. Nasal endoscopy demonstrated a smooth, erythematous, lesion arising from the inferior turbinate. Clinical examination revealed a left palpable lump. Magnetic resonance imaging identified a 20 × 30 mm mass occupying the left nasal cavity, originating from the inferior turbinate without erosion of the nasal floor. Moreover there were 2 lymph nodes of left 1b and 2a level . An FNA of the nodes was performed as well as a biopsy of the nasal lesion. After excluding nasopharyngeal origin, a diagnosis of primary EBV-positive lymphoepithelial carcinoma of the nasal cavity was made. The tumor was staged as T1N1M0. The patient underwent excision the left inferior turbinate with random biopsies from the nasal septum and the nasal cavity and a left elective neck dissection of 1b and 2a level. Results The patient was treated with chemotherapy and radiotherapy, with no evidence of recurrence after 12 months of follow-up.

Conclusion Lymphoepithelial carcinoma of the nasal cavity (LEC NC) is an extremely rare tumor. Due to the rarity of reported cases, optimal treatment remains uncertain and challenging.



EP047

NASAL DERMOID CYST WITH INTRACRANIAL EXTENSION: SINGLE-STAGE MANAGEMENT VIA COMBINED NEUROSURGICAL AND OPEN RHINOPLASTY APPROACH

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Introduction Nasal dermoids are rare congenital midline lesions, and intracranial extension—a critical factor in management—is reported in 4–45% of cases. Due to the risk of severe intracranial complications, comprehensive preoperative imaging and surgical planning are essential.

Case Study A 6.5-year-old boy presented with a midline nasal cystic lesion and a six-month history of recurrent brief episodes of loss of consciousness associated with transient tonic–clonic movements. MRI showed a nasal dermoid excessively involving the anterior cranial fossa. A single-stage combined rhinologic/neurosurgical approach was selected. The extracranial part was excised through an inverted-V columellar incision, allowing excellent visualization and precise dissection of the sinus tract under direct and endoscopic guidance. Complete excision of the extracranial part, up to the skull base, required partially resecting the nasal bones. Nasal framework was reconstructed with septal cartilage grafts to maintain structural stability and restore dorsal contour. Concurrently, a frontal craniotomy was performed by the neurosurgeons, resulting in complete excision of the lesion.

Results The postoperative course was uneventful. The patient stayed in intensive care for 48 hours and was discharged on day eight. No recurrent neurological symptoms or seizures were observed. Follow-up MRI confirmed complete resection. The cosmetic outcome was excellent, preserving nasal contour and avoiding visible scarring.

Conclusions Neurological symptoms in these patients should raise a strong suspicion for intracranial extension and mandate thorough radiological evaluation. A combined ENT-neurosurgical approach provides safe and effective management, allowing superior visualization, precise skull base dissection, optimal reconstruction, and a reduced risk of recurrence.



EP048

PATIENT-SPECIFIC 3D-PRINTED OSSICULAR PROSTHESES FOR ENDOSCOPIC-COMPATIBLE OSSICULOPLASTY: A SCOPING REVIEW

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Introduction: Ossicular chain disruption is a common cause of conductive hearing loss. Prefabricated prostheses are limited by generic geometries and may be complicated by suboptimal coupling, displacement, extrusion, or inflammatory response. Patient-specific three-dimensional (3D) printing offers anatomy-matched designs that may improve fit and sound transfer; however, the maturity of the evidence base remains unclear.

Methods: A PRISMA-ScR-aligned scoping review of English-language studies (2010–2025) was performed using PubMed, Embase, and Scopus. Eligible studies used patient-specific imaging to design custom 3D-printed ossicular prostheses intended for human application or translational development (including cadaveric models). Two reviewers independently screened, extracted data, and undertook appropriate critical appraisal.

Results: Of 678 records, 363 remained after deduplication; 53 full texts were assessed and 14 studies were included. Evidence was exclusively preclinical: cadaveric fit/anatomic evaluations (n=4), cadaveric functional testing (n=4), in-vitro/phantom testing (n=3), imaging/segmentation workflow studies (n=2), and computational modelling (n=1). CT-based workflows predominated. Manufacturing fidelity reached mean absolute deviations ≤ 0.04 mm in a titanium prosthetic incus (n=10 prints), and iterative prototyping improved acceptable print yield from 54% (43/80) to ~99% (129/130). Cadaveric vibrometry reported frequency-dependent performance; one study found no significant differences versus the intact chain across tested frequencies ($p > 0.05$) despite velocity attenuation of approximately 6–11 dB. In one HRCT modelling study, malleus/incus landmarks showed $\geq 90\%$ agreement, whereas stapes footplate depiction was limited (25%). **Conclusion:** Patient-specific 3D-printed ossicular prostheses demonstrate promising preclinical anatomic fidelity and acoustic performance, supporting further translational development. However,

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no clinical implantation or audiometric outcome studies were identified;
prospective human studies with standardized endpoints and long-term
safety follow-up are needed.



EP049

ENDOSCOPIC MANAGEMENT OF ISOLATED MALLEUS HEAD FIXATION VIA TRANSCANAL ATTICOTOMY AND MOBILISATION

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Introduction: Isolated malleus head fixation is the rarest form of ossicular chain fixation, accounting for only 0.4–1.6% of conductive hearing loss (CHL) cases with an intact tympanic membrane. Advances in transcanal endoscopic ear surgery have enabled superior visualisation of the anterior epitympanum, facilitating precise, minimally invasive management.

Case Presentation: A 44-year-old woman presented with progressive right-sided CHL over several years, confirmed on serial audiometry and associated with a hypercompliant Jerger Ad tympanogram. Otoscopy was unremarkable, and high-resolution temporal bone CT demonstrated subtle attic changes suggestive of ossicular fixation. Given symptomatic impact, surgical exploration was undertaken. Using a fully endoscopic transcanal approach, a posterosuperior tympanomeatal flap was elevated with preservation of the chorda tympani. Limited atticotomy provided wide-angle, high-magnification access to the anterosuperior epitympanum. Ossified adhesions tethering the malleus head to the anterior attic wall were meticulously dissected under endoscopic guidance, restoring ossicular mobility without requiring prosthetic reconstruction. **Results:** The procedure was uncomplicated. At two months, audiometry demonstrated near-normal hearing thresholds with significant air–bone gap closure. The tympanic membrane remained intact with no evidence of retraction or recurrent fixation.

Conclusion: Transcanal endoscopic atticotomy with targeted removal of malleus head fixation is a safe and effective technique that preserves the native ossicular chain. This case illustrates the advantages of endoscopic visualisation for precise, minimally invasive management yielding improved functional outcomes with minimal morbidity.

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EP053

ENDOSCOPIC ORBITAL SURGERY APPROACHES-CADAVERIC STUDIES

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¹

Aim of this cadaveric study is to describe the advantages of endoscopic orbital surgery approaches. 10 cadaver findings were presented in this study. The endoscopic orbital approach offers many advantages compared to conventional surgical interventions such as :1) optimal surgical exposure, 2) enhanced illumination,3) simultaneous visualization of operative field by multiple members of the surgical team, 4) superior cosmetic results conventional surgical interventions. Minimal morbidity is also an advantage of this approach. The continuous education in orbital neurosurgical anatomy, in classical surgical anatomy and in basic endoscopic techniques are essential in order to achieve better results.



EP054

NASAL CAVITY CHANGES FOLLOWING THE USE OF REGENERATED OXIDIZED CELLULOSE (SURGICEL) IN NASOSINUSAL SURGERIES

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Introduction: regenerated oxidized cellulose is a topical hemostatic widely used in otorhinolaryngological surgeries; its acidic character influences the pH of the application site and has a possible antimicrobial action. Therefore, it would be of great interest to analyze potential changes in the nasal cavities after surgery, as well as to investigate their anti-hemorrhagic nature.

Objectives: The purpose of this research was to analyze the post-surgical aspect of the use of Surgicel in sinus surgeries and identify possible changes, as well as confirm its hemostatic nature.

Methodology: data were collected from a pH measuring tape and a medical questionnaire made available to attending physicians of patients undergoing partial turbinectomy at Edmundo Vasconcelos Hospital between 08/15/2023 and 12/12/2023, with part of the patients using of Surgicel and the other part did not. **Results:** the control group presented an average bleeding rate, according to the Visual Analogue Scale, of 4.71 in the first week, followed by 0.53 in the first month; in addition to an average pH with negligible variation at all stages. The group using Surgicel had an average bleeding rate of 1.88 in the first week and 0.06 in the first month; in addition to an initial pH average of 7.35 with drops in the first week to 5.59 and 5.65 in the first month.

Conclusions: the use of Surgicel resulted in less postoperative bleeding and lower pH of the nasal mucosa when compared to the control group. **Keywords:** Oxidized Regenerated Cellulose; Partial Turbinectomy;



EP055

ENDOSCOPIC TRANSORAL RESECTION OF HAIRY POLYP FROM THE NASOPHARYNGEAL SURFACE OF THE SOFT PALATE

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¹,

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Introduction: Hairy polyps are rare congenital bigeminal choristomas that may cause neonatal stridor and feeding-related desaturation through intermittent upper airway obstruction. Soft-palate lesions arising from the nasopharyngeal surface are uncommon and may be difficult to access without risking palatal morbidity. We describe an exclusively endoscopic transoral technique and contextualise this approach with a systematic literature review.

Methods & Case Study: A retrospective review of the patient's electronic medical record, perioperative endoscopy, imaging, operative report, histopathology, and follow-up was performed. A PRISMA-aligned PubMed search (inception to 29 November 2025) identified published cases of hairy polyps involving the soft palate; lesions were classified as soft-palate origin when arising from any palatal surface.

Results: A female neonate (38+4 weeks) presented with persistent inspiratory stridor. Flexible nasoendoscopy demonstrated a pale, tubular, pedunculated mass originating from the left nasopharyngeal surface of the soft palate, extending inferiorly to the supraglottis. Contrast-enhanced computed tomography confirmed a 13 × 7 × 6 mm fat-density lesion obstructing the nasopharyngeal airway. On day 5 of life, endoscopic transoral resection was performed using a Dingman mouth gag, dual-angle endoscopy (0° transnasal; 120° transoral), and velotraction with a suction catheter to expose the lesion base. Cold-steel circumferential stalk dissection enabled en bloc extraction with mucosal preservation; the base was treated with needle-tip bipolar diathermy for haemostasis. The soft palate remained intact with no intraoperative complications. Postoperatively, stridor and feeding-related events resolved; histopathology confirmed hairy polyp with clear margins. Systematic literature review identified 32 soft-palate cases across 18 publications.

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Conclusion: Endoscopic transoral resection with velotraction provides excellent visualisation of the nasopharyngeal soft palate while minimising palatal trauma and functional risk. Hairy polyp should be considered in neonatal stridor with a structurally normal larynx. Endoscopy and cross-sectional imaging support safe planning and definitive management.



EP056

ORBITAL, OSSEOUS, AND INTRACRANIAL COMPLICATIONS IN ACUTE RHINOSINUSITIS: A CASE OF ORBITAL ABSCESS, POTT'S PUFFY TUMOR, AND SUBDURAL EMPYEMA

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Introduction: Acute rhinosinusitis (ARS) can lead to serious extracranial and intracranial complications, particularly in the pediatric and adolescent populations, demanding prompt and coordinated multidisciplinary care. Pott's Puffy Tumor (PPT), characterized by a frontal subperiosteal abscess and underlying osteomyelitis, is a well-recognized, though uncommon, complication of frontal sinusitis, often serving as an indicator of potential intracranial extension. Intracranial involvement, such as a subdural empyema (SDE), represents a life-threatening sequela that necessitates immediate recognition and aggressive management, including surgical drainage and prolonged antimicrobial therapy, to ensure optimal outcomes.

Case Study: A 12-year-old male presented with ARS symptoms exhibited left periorbital edema and erythema with preserved ocular mobility and visual acuity. Initial CT imaging revealed pan-sinus opacification and periorbital cellulitis. Treatment was initiated with intravenous ceftriaxone, clindamycin and hydrocortisone. The patient demonstrated progressive improvement in periorbital and general symptoms until Hospital Day 5, when he developed severe frontal headache and localized, fluctuant swelling over the forehead. A repeat CT confirmed the development of a PPT with a minimal bony defect. The following day (Hospital Day 6), the left ocular edema and erythema worsened, and the patient developed pain upon eye movement. MRI revealed a small subdural empyema and a left orbital subperiosteal abscess, in addition to the PPT.

Results: A combined surgical procedure involving Otolaryngology and Neurosurgery was performed on Hospital Day 7. The approach included Functional Endoscopic Sinus Surgery (FESS) and a supraorbital access to achieve complete drainage of the frontal and involved sinuses, the orbital subperiosteal abscess, the PPT, and the small subdural empyema. The postoperative course was uneventful, with total and progressive clinical and radiological improvement confirmed by

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subsequent CT and MRI scans. The patient was maintained on intravenous antibiotics for a total of 14 days post-surgery, followed by a 14-day course of oral antibiotics, as directed by Infectious Diseases. Follow-up examinations with both surgical teams confirmed resolution.

Conclusion: This case demonstrates the rapid, complex progression of ARS to multiple, concurrent complications, specifically highlighting the development of PPT and SDE. The simultaneous presence of a PPT and SDE mandates an aggressive, coordinated surgical strategy, combining FESS for source control with open drainage for the extra- and intracranial collections. Prompt multidisciplinary intervention, as successfully implemented here, is critical for managing these rare and life-threatening complications and achieving full recovery.

Keywords: Acute Rhinosinusitis; Pott's Puffy Tumor; Subdural Empyema; Orbital Subperiosteal Abscess;



EP057

EVALUATION OF THE QUALITY OF EDUCATIONAL YOUTUBE VIDEOS ON ENDOSCOPIC CHOANAL ATRESIA

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Background and Objectives: YouTube has become a widely used educational platform for medical trainees in endoscopic surgery. However, the quality of surgical videos on this platform remains unregulated. This study evaluates the educational quality of YouTube videos on endoscopic choanal atresia repair using a validated assessment tool.

Methods: In this descriptive cross-sectional study, 50 YouTube videos on endoscopic choanal atresia surgery were analyzed. Video quality was assessed using the LAParoscopic surgery Video Educational Guideline S (LAP-VEGaS) checklist, which evaluates content structure, procedural clarity, and outcomes reporting.

Results: Among 108 initially identified videos, 50 met the inclusion criteria. Video quality scores ranged from 1 to 16, with a median score of 7. The most frequently included elements were step-by-step approach (96%), patient anonymity (96%), and descriptive title (76%). Procedural clarity received moderate scores overall, with only the "step-by-step approach" achieving consistent quality. Outcomes reporting was notably deficient, with 90% of videos failing to address postoperative morbidity or complications.

Conclusion: Most YouTube videos on endoscopic choanal atresia surgery lack the quality required for effective surgical education. As digital platforms increasingly supplement traditional training, academic institutions and specialists should prioritize creating and sharing high-quality, standardized educational content on public platforms like YouTube.



EP058

CONGENITAL DACRYOCYSTOCELE WITH INTRANASAL EXTENSION: A CASE REPORT HIGHLIGHTING ENDOSCOPIC MANAGEMENT

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Abstract Introduction: Congenital Nasolacrimal Duct Obstruction (CNLDO) is the primary cause of tearing (epiphora) in infants. Within this spectrum, Congenital Dacryocystocele (CDC), a rare but clinically significant variant, results from simultaneous proximal and distal obstruction of the nasolacrimal duct (NLD), leading to cystic distension of the lacrimal sac. The relevance of CDC is its potential to extend into the nasal cavity (intranasal cystocele), causing nasal obstruction, and its risk of transforming into acute dacryocystitis. Given these morbidities, early diagnosis and management are crucial, often requiring collaborative intervention between Pediatric Ophthalmology and Otolaryngology.

Case Study: 1-month and 27-day-old female infant with a history of recurrent right CNLDO, characterized by an intermittent, smooth, non-inflammatory, reddish mass at the right medial canthus since birth. Symptoms previously improved with local massage and topical antibiotics, leading to the expression of viscous fluid via the superior lacrimal system. The patient presented with a three-day history of re-distension of the right medial canthus mass that was unresponsive to massage, appearing firm and without discharge upon attempted expression by the Ophthalmology team. The patient was afebrile, active, and feeding well, showing no systemic signs of acute infection. Computed Tomography (CT) of the paranasal sinuses confirmed right lacrimal system obstruction with a corresponding intranasal cystic mass on the same side.

Results: Due to the persistent and irreducible mass with confirmed intranasal extension, an urgent surgical approach was adopted, involving both Otolaryngology and Ophthalmology. The procedure successfully included endoscopic management of the intranasal component and patency restoration of the NLD. The operation involved marsupialization of the intranasal cyst and opening of the distal NLD, resulting in the egress of a large volume of purulent material, achieving complete liberation and patency, with immediate visual

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improvement of the medial canthus intraoperatively. The patient was discharged after one day of observation on topical ocular antibiotics and saline nasal irrigation, with complete resolution of symptoms. Follow-up at one month demonstrated full symptom resolution and satisfactory post-surgical healing.

Conclusion: This case highlights the critical need for a high index of suspicion for intranasal extension in patients with persistent or irreducible congenital dacryocystocele. Confirmatory imaging (CT) and prompt, collaborative surgical intervention utilizing nasal endoscopy-assisted NLD probing and intranasal marsupialization are essential to prevent infectious complications and respiratory distress, offering a minimally invasive, definitive treatment and avoiding the need for more complex procedures like dacryocystorhinostomy.

Keywords: Congenital Dacryocystocele; Intranasal Cystocele; Nasolacrimal Duct Obstruction;



EP059

THE LIMITED ROLE OF HYPOCORTISOLISM IN THE DEVELOPMENT OF DELAYED POSTOPERATIVE HYPONATREMIA AFTER ENDOSCOPIC PITUITARY SURGERY

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Introduction Delayed postoperative hyponatremia (DPH) is a common complication following pituitary surgery. Although hypocortisolism has been proposed as a contributing factor, the temporal interplay between cortisol and sodium levels remains unclear. This study aimed to elucidate the relationship between postoperative cortisol and sodium dynamics, identify independent predictors of DPH and assess potential protective factors.

Material & Methods We retrospectively analyzed 261 patients who underwent fully endoscopic surgery for clinically non-functioning pituitary neuroendocrine tumors between 2021 and 2024. Serial measurements of serum sodium and morning cortisol were collected from the immediate postoperative period through 3-month follow-up. Comparative analyses between patients with and without DPH were performed to characterize hormonal and electrolyte trends. The frequency of hypocortisolism during hyponatremic episodes was compared, and multivariate logistic regression identified independent predictors. The potential protective role of preoperative steroid replacement was also evaluated.

Results DPH occurred in 54 patients (20.7%), with symptomatic cases accounting for 4.2% of the cohort. The median time to nadir sodium was 8 days with a median nadir of 129 mEq/L. The serum cortisol level between hyponatremia and non-hyponatremia group did not show significant differences. No meaningful linear correlation was found between cortisol and sodium levels ($R^2 = 0.016$). For propensity score matched comparison, median nadir cortisol levels were lower in the DPH group (6.10 vs 7.34 $\mu\text{g/dL}$, $p = 0.29$), and hypocortisolism during hyponatremic episodes was more frequent (48.2% vs 40.7%, $p = 0.52$), though neither difference reached statistical significance. Multivariate

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analysis identified age > years (OR 2.09, 95% CI 1.11–3.96, $p=0.023$) and postoperative pneumocephalus (OR 3.28, 95% CI 1.59–6.81, $p=0.001$) as independent predictors, with the model achieving an AUC of 0.709. Preoperative cortisol replacement failed to demonstrate a protective effect against DPH.

Conclusions Hypocortisolism does not appear to be the primary mechanism underlying DPH following pituitary surgery, as evidenced by the lack of temporal correlation. Instead, advanced age and postoperative pneumocephalus emerge as key risk factors, supporting a multifactorial etiology. Although preoperative ACTH–cortisol axis impairment was linked to a higher incidence of DPH, standard cortisol replacement failed to provide protection.



EP060

EFFICACY AND SAFETY OF ENDOSCOPIC VERSUS OPEN SURGICAL REPAIR OF ANTERIOR SKULL BASE CEREBROSPINAL FLUID FISTULAS

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Introduction: CSF fistulas pose significant infection risks. While open repair was the standard, the endoscopic endonasal approach offers a minimally invasive alternative.

Methods: A PubMed search (2013–2025) used keywords ('Cerebrospinal Fluid Leak', 'Endoscopic Endonasal Approach', 'Meta-analysis'). We included studies comparing only fully endoscopic versus open surgery for cranial fistulas, excluding endoscopic-assisted techniques. Outcomes analyzed were repair success, recurrence, and morbidity/mortality.

Results: Data synthesis from over 1,500 patients revealed that efficacy is comparable between techniques, with both achieving primary success rates of approximately 90%. However, the endoscopic approach demonstrated a superior safety profile. One large systematic review (n=1,178) reported significantly lower rates of postoperative meningitis (1.1% vs. 3.9%; p=0.034), abscess/wound infection (0.7% vs. 6.8%; p<0.001), and sepsis (0% vs. 3.8%; p=0.003) in the endoscopic group compared to open repair. Additionally, perioperative mortality was absent (0%) in endoscopic cohorts versus 1.4% in open surgeries. A subsequent meta-analysis (n=360) reinforced these findings, calculating an Odds Ratio of 0.27 (95% CI 0.11–0.69) for overall complications favoring the endoscopic technique. Although endoscopic repair is associated with smaller defects, current trends favor this approach even for complex locations, reserving open surgery for specific multifocal or extensive traumatic cases.

Conclusion: Endoscopic repair demonstrates non-inferior efficacy and significantly lower morbidity, supporting it as the preferred strategy for selected anterior skull base defects.



EP061

ORBITAL TRAUMA COMPLICATED BY CHRONIC RHINOSINUSITIS WITH NASAL POLYPS: AN OVERLOOKED THREAT

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Introduction: Orbital trauma frequently leads to damage involving the optic nerve and extraocular muscles. Successful fracture management requires a detailed understanding of the anatomy and pathophysiology to ensure the restoration of the patient's pre-trauma functional and aesthetic condition.

Materials and Methods: This paper presents the case of a 24-year-old male patient admitted to the "Prof. Dr. Dorin Hociotă" ENT Clinic in Bucharest, who presented with a sudden decrease in VA and significant ocular pain following trauma to the eye, allegedly caused accidentally by the horns of a brushcutter. The patient awoke the following morning with marked proptosis. Imaging investigations (cranial CT scan revealed a heterogeneous mass in the left frontal sinus and left superior orbit, with a well-defined mass effect on the left antero-inferior orbital contents, as well as a left upper eyelid hematoma. The orbital trauma was secondarily infected and its severity was potentiated by the patient's previously undiagnosed and untreated chronic rhinosinusitis with associated nasal polyposis.

Results: The patient underwent surgical treatment, including orbital decompression with the drainage of a large quantity of purulent secretions, periorbital lifting, and drainage of the localized subcutaneous hematoma in the left upper eyelid region. Trepanation of the left anterior frontal sinus was performed with aspiration of purulent material. Bilateral polypoid formations were excised. Postoperatively, the patient's symptoms resolved. Follow-up at 4 days showed preservation of visual acuity.

Conclusions: The surgical approach represents a challenge for the ENT surgeon due to the proximity of the orbital neurovascular bundle and ocular muscles.



EP062

THE CHALLENGES OF NASAL RECONSTRUCTION AFTER WIDE TUMOR EXCISION: THE APPLICATION OF THE PARAMEDIAN FOREHEAD FLAP

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Introduction: Finding it in Sushruta Samhita, described as a method repairing nasal defects acquired from punitive mutilation, the paramedian flap remains a useful reconstructive technique for complex defects. Conditions requiring nasal reconstruction vary widely: infections, trauma, congenital malformations and tumors, necessitating individualized surgical approaches based on defect size and structural involvement. This paper aims to present different strategies for addressing nasal defects using the Indian forehead flap.

Materials and Methods: We report on four cases treated in our clinic: a 73-year-old patient diagnosed with squamous cell carcinoma of the nasal pyramid, a 84-year-old patient with basocellular carcinoma of the nasal dorsum, a 71-year-old patient with squamous carcinoma of the nasal pyramid and a 35-year-old patient with recurrent nasal osteosarcoma. For each case, the surgical technique employed, postoperative care, and additional conditions such as comorbidities or irradiation were described.

Results: Distinct reconstructive methods, each involving the paramedian flap, were selected based on patient-specific features. In the first two cases, a median forehead flap was chosen to repair the nasal dorsum, and in the last two cases, extensive resection necessitated a complex nasal pyramid reconstruction using costal cartilage graft combined with Indian forehead flap.

Conclusions: Nasal pyramid reconstruction can range from relatively simple to highly complex procedures, depending on factors such as defect size, structural involvement, comorbidities, surgical history or prior local irradiation. The ENT surgeon must strive to preserve nasal function, both respiratory and olfactory, while also restoring facial aesthetics to support the patient's social reintegration.



EP063

RESECTION OF VESTIBULAR SCHWANNOMAS AFTER STEREOTACTIC RADIOSURGERY: SYSTEMATIC REVIEW

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Background: Stereotactic radiosurgery (SRS) and microsurgical resection are established treatment options for vestibular schwannoma (VS). A subset of patients experience tumour progression or symptom deterioration following SRS and require salvage microsurgery. Surgical outcomes in this setting remain incompletely characterised.

Objective: To systematically review operative characteristics and clinical outcomes of microsurgical resection of VS following prior SRS.

Methods: A systematic review was conducted in accordance with PRISMA guidelines. Four electronic databases were searched. Studies reporting outcomes of microsurgical resection performed after prior SRS for VS were included. Case reports and studies without extractable post-SRS salvage surgery data were excluded. Data were extracted on patient characteristics, SRS parameters, surgical approach, extent of resection, facial nerve outcomes, complications, recurrence, and mortality.

Results: Nineteen studies comprising approximately 480–490 patients undergoing salvage microsurgery after SRS were included. The most common indications for surgery were sustained tumour growth and progressive neurological symptoms. Time from SRS to surgery ranged from months to over 10 years. Intra-operative findings frequently described dense adhesions, arachnoid thickening, capsular fibrosis, and facial nerve adherence with loss of normal dissection planes. Surgical approaches were predominantly translabyrinthine and retrosigmoid. Gross total resection rates varied widely across studies, generally ranging from approximately 40% to 60%, reflecting differing surgical strategies in the post-radiation setting. Good facial nerve function (House–Brackmann grade I–II) at last follow-up was reported in approximately 55–65% of patients, with substantial inter-study variability (range approximately 33–95%). Cerebrospinal fluid leak occurred in approximately 8–15% of cases. Peri-operative mortality was rare.

Conclusions: Salvage microsurgery following SRS for vestibular schwannoma is feasible but frequently technically challenging due to

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radiation-induced fibrosis and adhesions. Facial nerve outcomes and extent of resection vary considerably across series, supporting careful patient selection and an emphasis on maximal safe resection.



EP064

ENDOSCOPIC APPROACH FOR GIANT PITUITARY ADENOMA

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Introduction: Giant pituitary adenomas (GPAs) are adenomas with diameter larger than 40mm and are surgically challenging tumors. Transsphenoidal surgery is the first-line treatment. Although pituitary adenomas are benign tumors that arise from adenohypophysial cells, GPAs have worse outcomes due to factors such as tumor morphology, invasion and histopathological characteristics.

Methods: A retrospective analysis was conducted on the clinical records of six patients (M/F: 4/2), with a mean age of 46 years, diagnosed with GPA who underwent surgery at the General Hospital of Nikaia from 2020 to date.

Results: All patients underwent endoscopic transsphenoidal surgery. In one patient, the question of using a transcranial approach was raised due to multiple reoperations. The maximal mean preoperative tumor diameter in this series was 5.02cm, the mean volume was 296.9 cm³ and Knosp scale was III in 5 and IV in one patient. Five out of six experienced visual disturbances preoperatively; one patient had MENI. In five of six patients the tumour consistency was hard making debulking rather difficult therefore a subtotal excision was achieved. No major complications were observed. Postoperatively, four of the five patients with preoperative visual disturbances showed improvement. Four of the adenomas were non-functioning, one was a TSHoma, and one was a GH-secreting adenoma.

Conclusions: Our experience shows that endoscopic transsphenoidal surgery is an effective treatment for patients with GPAs, achieving high resection rates and visual field improvement and should be the first choice in the treatment strategy of these patients, who may need a transcranial approach as well.



EP065

DUPILUMAB VS OMALIZUMAB IN PATIENTS WITH SEVERE CHRONIC RHINOSINUSITIS WITH NASAL POLYPS AND COEXISTING ASTHMA FROM THE EVEREST STUDY: A POST HOC ANALYSIS IN THE COEXISTING ALLERGIC RHINITIS COHORT

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Introduction: In the EVEREST head-to-head trial, dupilumab demonstrated rapid, sustained improvements over omalizumab in upper and lower airway outcomes in patients with severe chronic rhinosinusitis with nasal polyps (CRSwNP) and coexisting asthma. This post hoc analysis compared outcomes in patients with coexisting allergic rhinitis (AR).

Materials & Methods: EVEREST (NCT04998604) randomized adults with severe CRSwNP and coexisting asthma to dupilumab 300 mg every 2 weeks (W) or omalizumab 75–600 mg every 2W or 4W for 24W on background intranasal corticosteroids. Primary endpoints: 24W change in nasal polyp score (NPS) and University of Pennsylvania Smell Identification Test (UPSIT). Pre-bronchodilator forced expiratory volume in 1 second (FEV1), 7-item Asthma Control Questionnaire (ACQ-7), and 22-item Sino-Nasal Outcome Test (SNOT-22) were also assessed.

Results: Of 360 patients randomized (n=181/179 dupilumab/omalizumab), 165 (45.8%) had coexisting AR (n=84/81). Patients with AR had higher prevalence of aspirin-exacerbated respiratory disease than the overall population (AR cohort: 54%/43% dupilumab/omalizumab; overall: 41%/40%). Baseline disease measures were comparable between the overall and AR cohorts. Improvements at 24W in the AR cohort were better with dupilumab than omalizumab: estimated mean treatment differences (dupilumab over omalizumab; 95% confidence interval), upper airway outcomes: NPS -1.57 (-2.11, -1.02), UPSIT 8.28 (5.84, 10.73), SNOT-22 -12.75 (-18.56, -6.94); lower airway outcomes: FEV1 0.18 L (0.04, 0.32), ACQ-7 -0.45 (-0.69, -0.20). **Conclusions:** Dupilumab improved upper and lower airway outcomes

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EP066

RECURRENT SINONASAL ANGIOLEIOMYOMA ENDOSCOPIC SURGICAL CHALLENGES- CASE REPORT

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Introduction Sinonasal angioleiomyoma is a benign mesenchymal tumor derived from vascular smooth muscle, with only a limited number of cases described in the literature. Its nonspecific clinical presentation and lack of distinctive radiological features make preoperative diagnosis challenging. Consequently, data regarding recurrence patterns and long-term outcomes remain limited.

Case study We present the case of a 66-year-old male with a history of recurrent sphenoidal tumor, previously treated by endoscopic surgery on two occasions (July 2024, May 2025). Histopathological and immunohistochemical analysis confirmed the diagnosis of angioleiomyoma. ENT examination and videoendoscopy revealed a bilateral tumor mass apparently originating from the sphenoid sinus, extending into both choanae and causing near-complete obstruction, with inability to visualize the nasopharynx. Preoperative contrast-enhanced MRI demonstrated a newly developed lesion involving the sphenoid sinus and nasopharynx, with mass effect on adjacent structures, suggestive of residual or recurrent disease. Complete tumor excision was performed via functional endoscopic sinus surgery, including resection at the presumed site of origin within the sphenoid sinus. Results Postoperative evolution was favorable. Despite benign histology, this case is notable for its rapid and repeated recurrence over a short interval, highlighting a potentially aggressive local behavior.

Conclusions Endoscopic surgery provides optimal visualization and access; however, close follow-up is essential, even in histologically benign sinonasal tumors.



EP067

SINONASAL OSTEOMAS: DIAGNOSTIC CHALLENGES AND SURGICAL OUTCOMES IN A RETROSPECTIVE SERIES

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Introduction: Osteomas are frequent, benign, osteogenic tumours of connective tissue developed from the proliferation of cancellous or cortical bone. Craniofacial osteomas occur frequently in the paranasal sinuses (fronto-ethmoidal region - 95% of cases, maxillary sinus- in 5% of cases) . Due to their slow asymptomatic growth, in most cases they are detected accidentally.

Materials and methods: We conducted a retrospective descriptive case series including 15 patients, male and females, diagnosed with sinonasal osteomas who underwent surgical treatment between 2019 and 2025 at the Institute of Phonoaudiology and Functional ENT Surgery "Prof. Dr. D. Hociotă". Age, gender, clinical symptoms, computed tomography findings, surgical approaches, and postoperative outcomes were analyzed using descriptive methods.

Results: A total of 15 patients were included, with an average age of 50 years old and a male predominance. The most frequent clinical symptom was frontal headache (80%), followed by chronic nasal obstruction (65%) and rhinorrhea (45%). CT examination identified osteoma localization in the frontal sinus in 93% of cases. Among these, 30% showed extension into the ethmoidal sinus and 15% with orbital involvement, while 7% of the osteomas were localized in the maxillary sinus.. The surgical approach was external in 45% of cases, endoscopic in 30%, and combined approach in 25% of patients. Postoperative evolution was favorable in all patients. No major complications were described. In 20% of cases, minor bleeding occurred.

Conclusions: This study highlights the the nonspecific clinical presentation of osteomas, the importance of selecting the surgical approach according to tumor size and anatomical location, and postoperative complications. Retrospective case series remain valuable in improving clinical understanding of this rare pathology.



EP068

A RARE CASE REPORT OF PRIMARY EPITHELIOID HEMANGIOENDOTHELIOMA IN THE MAXILLARY SINUS

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Introduction: Epithelioid hemangioendothelioma (EHE) is a rare vascular soft tissue neoplasm. It is arising from the endothelial layer of blood vessels and it has variable clinical behavior. It can behave ranging from that of a low-grade malignancy to that of a high-grade sarcoma. Systemic involvement is not unusual. The most affected organs were liver, bone and lung. To date, there were only three cases reported in the literature in which EHE primarily arising from the paranasal sinus.

Case Summary: A 85-years-old man presented to outpatient clinic with a history of left facial fullness. No other nasal symptoms were noted. On physical examination, no facial swelling and his nasal endoscopy examination is normal. Magnetic resonance imaging (MRI) was done and showed an extensive mass in the left maxillary sinus extending into the infratemporal fossa. The patient was ultimately diagnosed with epithelioid hemangioendothelioma (EHE) and underwent transnasal endoscopic tumour resection. He received adjuvant radiotherapy. He had regional cervical lymph node metastasis after a year which he underwent neck dissection. A year later he developed lung metastasis and he underwent thoracoscopic wedge resection successfully. Two years of close follow-up, he is well and tumour free clinically and radiographically.

Conclusion: The treatment of choice for confirmed unifocal EHE is surgery. The key for treatment is complete surgical resection with clear microscopic margins. Post operative adjuvant radiotherapy is recommended. The overall 5 years survival rate is around 70-80%. However, patients with pleural metastasis or lymph node metastasis had poor 5 years survival rate of 22% and 30% respectively.



EP069

NEUROENDOSCOPIC SURGERY VERSUS CRANIOTOMY FOR INTRACEREBRAL SUPRATENTORIAL HEMORRHAGE

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Introduction: Spontaneous intracerebral hemorrhage (ICH) causes high morbidity. Neuroendoscopic surgery (NE) offers a minimally invasive alternative to standard craniotomy (CT), yet its clinical superiority remains debated.

Objectives: Synthesize three recent meta-analyses on NE vs CT efficacy/safety in supratentorial/basal ganglia ICH.

Methods: We searched Pubmed (2018-2025) for Intracerebral Hemorrhage AND Neuroendoscopy AND Meta-analysis. We included studies comparing fully endoscopic surgery vs. craniotomy for supratentorial hemorrhages. Studies comparing other techniques or involving posterior fossa bleeds were excluded. Primary outcomes included mortality, good functional outcome (GFO), evacuation rates, and complications.

Results: Pooled data consistently favored NE regarding safety, showing significantly lower infection rates (e.g., RR 0.38, $p < 0.0001$ in Lobo et al.¹; 9.59% vs. 27.88, $p < 0.00001$ in Sun et al.²) and higher hematoma evacuation rates ($p = 0.007$). However, survival and functional benefits varied. While Sun et al. (2020) reported significantly reduced mortality with NE (7.55% vs. 17.75%, $p < 0.00001$), recent RCT-focused analyses by Monteiro et al. (2024) and Lobo et al. (2025) found no statistical difference in mortality (RR 0.81, $p = 0.32$ and 4.95% vs. 9.04%, $p = 0.12$, respectively). Similarly, while Monteiro et al. observed improved GFO (RR 1.42, $p < 0.001$), Lobo et al. found no significant functional benefit ($p = 0.18$) specifically for basal ganglia hemorrhage.

Conclusion: NE showed superior evacuation and safety profiles. However, it demands careful patient selection.



EP070

ENDOSCOPIC AND ENDONASAL SURGICAL TREATMENT OF CONGENITAL DACRYOCYSTOCELE A SYSTEMATIC REVIEW

Duffy¹

¹

Introduction Congenital dacryocystocele is a rare obstruction of the nasolacrimal system that can lead to significant complications such as dacryocystitis and neonatal respiratory distress. Advances in minimally invasive surgery have increased the use of endoscopic and endonasal techniques, which may offer improved outcomes compared with traditional external or conservative treatments. This systematic review evaluates the efficacy, safety, and clinical outcomes of these minimally invasive approaches in the management of congenital dacryocystocele.

Material and Methods A systematic search of PubMed and Google Scholar was conducted in accordance with PRISMA guidelines. Studies were included if they evaluated endoscopic or endonasal surgical management of congenital dacryocystocele, were published in peer-reviewed journals, and were written in English. Reviews, non-primary studies, and articles unrelated to endoscopic techniques were excluded. Nine studies met all inclusion criteria and were analyzed for surgical outcomes, complications, and comparative effectiveness.

Results Across the included studies, endoscopic and endonasal surgical approaches demonstrated success rates exceeding 90%. These techniques were associated with favorable cosmetic results, shorter recovery periods, and lower complication rates compared with external procedures or conservative management. Factors associated with improved outcomes included younger patient age at intervention, surgeon experience, and adherence to appropriate postoperative care. Limitations identified in the literature included small sample sizes and the need for specialized equipment and surgical expertise.

Conclusion Endoscopic and endonasal surgical approaches appear to be highly effective and safe methods for treating congenital dacryocystocele, providing both clinical and aesthetic advantages over traditional techniques. However, further large-scale studies are

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needed to standardize surgical protocols, expand accessibility, and address limitations stemming from training and equipment requirements.



EP071

THE USE OF COBLATION IN ENDOSCOPIC PITUITARY SURGERY - HOW WE DO IT

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Introduction Pituitary tumours are amongst the most common types of intracranial neoplasms. They account for approximately 10-15% of all intracranial tumours and affect around 0.1% of the population (1). The trans-sphenoidal approach is now the standard technique for resection of pituitary tumours. Over the past decade, Sheffield Teaching Hospital has adopted a collaborative Neurosurgery-ENT model for all pituitary surgeries, integrating coblation technology into both primary and revision procedures. This presentation will show how we use this technique. Method Local ethical committee approval was obtained and the case notes of all patients who underwent trans-nasal pituitary surgery were retrospectively reviewed. Each procedure was performed at the Royal Hallamshire Hospital, Sheffield, United Kingdom and every case was jointly performed by an ENT surgeon and neurosurgeon. All patients underwent surgery under general anaesthesia. The surgical technique in both primary and revision cases is described using the Procise EZ wand (Smith & Nephew) in all cases.

Results We have found the use of coblation during pituitary surgery to provide several advantages, especially in revision operations. These include improved surgical field control, enhanced operative efficiency, clearer anatomical navigation, and division of nasal adhesions. Collectively, this improved the surgical field whilst reducing the amount of collateral damage.

Conclusion The coblation-assisted trans-nasal endoscopic approach offers an efficient and safe method for accessing the sella turcica, particularly in complex revision pituitary surgeries. The technique used at Sheffield Teaching Hospital demonstrates how coblation can support bloodless dissection, precise navigation, and effective multidisciplinary collaboration. Limited literature is available on the use of coblation in trans-sphenoidal surgery despite its established role in other ENT surgeries.



EP072

THE MANAGEMENT OF RENDU-OSLER-WEBER DISEASE IN A PACIENT WITH NASAL POLYPOSIS

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Introduction: Hereditary hemorrhagic telangiectasia (Rendu–Osler disease) is a rare autosomal dominant vascular disorder characterized by multisystemic vascular malformations and heterogeneous clinical manifestations. It presents with epistaxis, iron deficiency and anemia. The disease affects small-caliber vessels of the nasal, oral, and gastrointestinal mucosa and cutaneous surfaces of the face, lips, fingertips and solid organs. Recurrent epistaxis represents the most frequent clinical manifestation of the disease (95%).

Materials and methods: This paper wishes to discuss the case of a 70-year-old man with a history of Rendu–Osler–Weber syndrome admitted to I.F.A.C.F.- ENT „ Prof. Dr. D. Hociota” with massive epistaxis. The patient had a mechanical aortic valve with long-term anticoagulation and nasal polyps. Bilateral nasal packing with Merocele was performed and bipolar coagulation. Oral anticoagulation was replaced with low-molecular-weight heparin. **Results:** The patient's severe epistaxis was successfully managed with nasal packing maintained for 72 hours and removed under endoscopic guidance . Minor bleeding was controlled using bipolar cautery.

Conclusions: Hereditary hemorrhagic teleangectasia is a genetic disorder that affects the small vessels and produces recurrent epistaxis. Management of this disease should be individualized based on systemic and local manifestations, comorbidities, ongoing therapies, and surgical needs.



EP073

THE ROLE OF OTOLARYNGOLOGY IN ENDOSCOPIC ENDONASAL MANAGEMENT OF CRANIOPHARYNGIOMAS: EXPERIENCE FROM A TERTIARY REFERRAL CENTER

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Introduction: Craniopharyngiomas are benign but locally aggressive tumors arising predominantly in the sellar and suprasellar region, adjacent to critical neurovascular structures, including the optic apparatus and pituitary stalk. The endoscopic endonasal approach (EEA) allows direct midline access, improved visualization and precise tumor dissection, potentially reducing approach-related morbidity.

Material & Methods: A retrospective review was conducted of patients with histologically confirmed adamantinomatous craniopharyngioma who underwent resection via EEA between 2018 and 2025 at a tertiary centre. Clinical presentation, surgical technique, reconstruction methods, complications and follow-up were analysed.

Results: Six patients were included (median age 40 years, range 9-63). Visual impairment and manifestations of hypopituitarism were the most common presentations (50%). All tumors extended suprasellarly with variable ventricular and parasellar involvement. Notably, 67% (n=4) had prior subtotal transcranial resection and radiotherapy. Skull base reconstruction used a multilayer technique with dural substitute and a pedicled nasoseptal flap in 83% of cases. One patient (16%) developed postoperative cerebrospinal fluid leak, who had prior surgery and radiotherapy. Gross total resection was achieved in three patients (50%). After a median follow-up of four years, only one patient required additional transcranial surgery. All patients developed persistent diabetes insipidus and pituitary deficit requiring long-term hormonal replacement. Visual outcomes were favourable, with 67% showing stability or improvement, and no new permanent deficits.

Conclusion: In this series, the EEA was associated with low surgical morbidity, reliable skull base reconstruction and preservation of visual function, despite predictable endocrine sequelae, representing a safe and effective alternative to transcranial routes in high-complexity cases.



EP074

CSF LEAKS - ANALYSING THE OPTIMAL SURGICAL APPROACH

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Introduction A cerebrospinal fluid (CSF) leak is defined as the efflux of the CSF resulting from the disruption of the meningeal layers which creates a direct communication between the subarachnoid space and the external environment. Predominantly, they result from craniofacial trauma (80%), followed by iatrogenic causes (16%). The closing technique can be selected according to the characteristics of the fistula (the dimension and the site).

Materials and Methods A 10 year-study was conducted in our clinic, including 35 male and female patients diagnosed with spontaneous, iatrogenic and post-traumatic CSF leaks located in the ethmoid; sphenoid and frontal sinuses. The study aimed to assess the viability of different types of endoscopic surgical techniques used to close the defect based on its location and dimension. **Results** The quantitative statistical analysis revealed that Hadad flap was the most frequently used flap for ethmoidal and sphenoidal CSF leaks, with no associated ethmoidal recurrence. The multilayered technique that included fascia lata, Hadad and middle turbinate flap presented no recurrence in the sphenoidal and frontal site.

Conclusions The endoscopic approach is the gold standard for large CSF leaks, while the surgical techniques can vary significantly depending on the location and the dimension of the defect. Autografts, namely the Hadad flap and a multilayer approach are associated with a higher degree of efficiency and lower rates of recurrency in large CSF leaks. Furthermore, usage of autologous biological tissue is both cost-effective and correlated with a lower rate of immune incompatibility.



EP075

SINONASAL MUCOSAL MELANOMA PRESENTING AS RECURRENT UNILATERAL EPISTAXIS: A CASE REPORT

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Introduction: Sinonasal mucosal melanoma (SNMM) is a rare and highly aggressive malignancy that frequently presents with nonspecific symptoms such as unilateral epistaxis and is often diagnosed at advanced stage, with high recurrence rates and poor survival.

Case Study: A 70-year-old male presented with mild, recurrent unilateral epistaxis for approximately two months. Initial anterior rhinoscopy was unremarkable and nasal endoscopy showed blood clot on left middle meatus. CT demonstrated subtotal opacification of the left maxillary sinus with mucosal thickening, initially suggestive of inflammatory/polypoid disease. Given a significant oncologic history (multiple cutaneous melanomas, including one invasive previously treated with wide local excision and negative sentinel lymph node biopsy), he underwent endoscopic left maxillary sinus surgery with tumor excision. Histopathology revealed malignant melanoma infiltrating respiratory-type mucosa, with immunohistochemistry positive for Melan-A, HMB-45, SOX-10, and Preferentially expressed antigen in melanoma (PRAME), confirming SNMM. The disease was staged as stage IV and systemic therapy was initiated with nivolumab plus ipilimumab. A focused literature review was conducted in PubMed, Embase, Google Scholar, and SciELO using the keywords "sinonasal mucosal melanoma", "maxillary sinus melanoma", "primary sinonasal melanoma" or "mucosal melanoma of the paranasal sinuses". Priority was given to contemporary reviews, cohort studies, and clinically informative case series.

Results: Contemporary literature characterizes SNMM as uncommon and biologically aggressive, with recurrence rates commonly >50% and 5-year overall survival often around 20–30% (or lower across series). Surgery remains the cornerstone of local control; adjuvant radiotherapy is frequently employed to improve locoregional control. PRAME is increasingly described as a useful adjunct immunomarker in sinonasal melanoma panels. For advanced/metastatic disease, immune

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checkpoint inhibitors (including nivolumab/ipilimumab) are commonly used in contemporary cohorts.

Conclusions: Persistent unilateral epistaxis with maxillary sinus opacification warrants endoscopic assessment and consideration of malignancy, particularly in patients with prior melanoma. PRAME-supported immunophenotyping can strengthen diagnostic confidence, and multidisciplinary management integrating surgery and modern immunotherapy is central in stage IV SNMM.



EP076

CHOANAL ATRESIA: LITERATURE REVIEW AND CASE REPORT

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Choanal atresia is a congenital condition characterized by occlusion of nasal and nasopharynx openings by membranous soft tissue, bone, or a combination of both due to failed recanalization of the nasal fossae during fetal development and is presented bilaterally or unilaterally. 1 It is a rare congenital anomaly with an estimated incidence of approximately 1 in 5.000-8.000 live births, with a female predominance and unilateral presentation being more common than bilateral presentations. 2 Choanal atresia is diagnosed with nasal endoscopy and/or computed tomography. Bilateral choanal atresia is observed shortly after birth, requires immediate airway management and the treatment is surgical repair, typically through transnasal endoscopic techniques. On the other hand, unilateral atresia may not be clinically evident until the child is older and the treatment is also surgical. 3 Case report A 6-year-old boy was referred to the ENT department of Penteli's Children Hospital with a persistent unilateral nasal obstruction. Nasal endoscopy showed choanal obstruction ipsilaterally. Computed tomography scan confirmed the diagnosis of choanal atresia. The patient underwent transnasal endoscopic repair. A Follow-up will take part in a few months. BIBLIOGRAPHY StatPearls [Internet]. Choanal Atresia. NCBI Bookshelf; 2025. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK507724/> Hadid F, Hakimi M, Benhommad O, Rochdi Y, Raji A. Neonatal Choanal Atresia: A Series of 13 Cases. Eur J Med Health Sci. 2021;3(3):... doi:10.24018/ejmed.2021.3.3.851 Cummings CW et al., Cummings Otolaryngology: Head and Neck Surgery, 7th ed., Elsevier, 2021.



EP077

ROLE OF ANATOMICAL VARIANTS IN THE ETIOPATHOGENESIS AND RECURRENCE OF ANTROCHOANAL POLYP: A STUDY OF 46 CASES

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Introduction: Antrochoanal polyp (ACP) is a benign pseudotumoral lesion arising from the mucosa of the maxillary sinus walls and extends into the nasal cavity and, in some cases, posteriorly toward the choanae, reaching the nasopharynx and potentially prolapsing into the oropharynx. Although the diagnostic criteria and therapeutic management of ACP are well established, its etiopathogenesis remains incompletely understood. Several hypotheses are currently under investigation, particularly those emphasizing the role of sinonasal anatomical variants on both the development and recurrence of ACP. The aim of our study was then to identify anatomical variants associated with ACP and its recurrence.

Material and Methods: This was a retrospective descriptive study conducted over a 10-year period (January 2014–December 2024). Patients who underwent surgery for unilateral ACP and had no history of previous sinonasal surgery were included. Anatomical variants were compared between the affected side (ACP group) and the contralateral healthy side (non-ACP group) in each patient.

Results: Forty-six patients were included. The mean age was 27.8 years, with a slight female predominance (sex ratio = 0.92). Nineteen patients had a history of chronic rhinosinuitis. Unilateral nasal obstruction (98%) and rhinorrhea (37%) were the main presenting symptoms. Univariate analysis showed a statistically significant association between ACP and several anatomical variants, namely inferior turbinate hypertrophy ($p = 0.021$), middle turbinate hypertrophy ($p = 0.013$), accessory maxillary ostium ($p = 0.024$), and nasal septal deviation ($p = 0.012$). Multivariate analysis revealed a significant association with nasal septal deviation ($p = 0.014$), inferior turbinate hypertrophy ($p = 0.040$), and accessory maxillary ostium ($p = 0.042$). All patients underwent endoscopic sinus surgery with complete excision of the ACP and middle meatal antrostomy, combined with septoplasty in one patient and turbinoplasty in another. Recurrence occurred in five patients (11%), with a younger

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mean age (21.6 years). All patients with recurrence had persistent anatomical variants, namely nasal septal deviation and accessory maxillary ostium; however, due to the small sample size, no statistically significant association was established. A minimum follow-up duration of 24 months was required to detect recurrence ($p = 0.04$).

Conclusion: This study confirms a significant association between certain anatomical variants and the development of antrochoanal polyps. These anomalies may also contribute to recurrence. Preoperative identification of these variants could help tailor the surgical strategy and reduce recurrence rates.



EP078

ENDOSCOPIC TRANSNASAL TRANSSPHENOIDAL APPROACH FOR BIOPSY OF THE PETROUS APEX IN A PEDIATRIC PATIENT: A CASE REPORT

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Introduction The petrous apex is a complex, deeply located region of the skull base surrounded by critical neurovascular structures. In pediatric patients, surgical access is further challenged by narrow anatomical corridors, variable sphenoid pneumatization, and concerns regarding craniofacial growth. Recent advances in endoscopic endonasal skull base surgery have enabled minimally invasive transsphenoidal approaches to the petrous apex, providing midline access with reduced morbidity.

Case Study We report a 6.5-year-old patient referred for evaluation of recent-onset daily headaches. Imaging demonstrated an expansile lesion of the left petrous apex with bone erosion and extension to the clivus, occipital condyle, and internal auditory canal, mimicking a malignant process. Initial otologic approaches were unsuccessful due to anatomical limitations, including a high-riding jugular bulb. An endoscopic endonasal transsphenoidal transclival approach was therefore selected. Using a binarial technique, a wide sphenoidotomy was performed, followed by targeted drilling of the clival recess under neuronavigation. The internal carotid arteries were identified, skeletonized, and protected, allowing safe exposure of the petrous apex. Multiple biopsy specimens were obtained under direct endoscopic visualization without cerebrospinal fluid leakage or neurovascular injury. Histopathology revealed nonspecific inflammatory changes without evidence of malignancy. The postoperative course was uneventful.

Results The postoperative course was uneventful. The patient was monitored in the intensive care unit for 48 hours and discharged on postoperative day eight. No recurrent neurological symptoms or seizure activity were observed. Follow-up MRI confirmed complete resection with no residual disease. The cosmetic outcome was excellent, with preservation of nasal contour and no visible scarring.

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Conclusions Neurological symptoms in patients with nasal dermoid cysts should raise strong suspicion for intracranial extension and mandate thorough radiological evaluation. An endoscopic-assisted ENT-neurosurgical approach provides safe and effective management of lesions with intracranial involvement, offering superior visualization, precise dissection at the skull base, optimal reconstruction, and reduced risk of recurrence or intracranial complications.



EP079

COMBINED APPROACH OF THE FRONTAL SINUS – THE TECHNIQUE OF CHOICE IN SELECTED CASES OF ACUTE FRONTAL SINUSITIS

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Introduction: Although we live in the era of endoscopic sinus surgery there are particular situations which impose external or combined (external and endoscopic) approach of the frontal sinus. Complicated frontal sinusitis, inflammatory disease in the lateral aspect of the frontal sinus, trauma and neoplasia are among the pathologies that may benefit from external/combined approach of the frontal sinus. The anatomical features of the diseased frontal sinus play an important role in choosing the most suitable approach.

Material and method: The aim of this paper is to emphasize the role of the external approach in the management of acute complicated frontal sinusitis and to underline the value of combined approach in the management of selected cases.

Results: The indications for external approach of the frontal sinus are well established; proper selection of the patients considering both the location and extent of the inflammatory disease and the particularities of the frontal sinus and frontal recess, leads to positive results in treating this. The combination of external and endoscopic approach is preferred especially in cases with osteomyelitis of anterior table of the frontal sinus.

Conclusions: The combined approach of the frontal sinus (external and endoscopic) represents the proper management solution in selected cases of inflammatory sinus disease.



EP080

LIMITATIONS OF THE ENDOSCOPIC ENDONASAL APPROACH OF THE ORBIT: TWO CASE REPORTS

Nefeli Grammatika Pavlidou, Katharina Stölzel, Marc Bloching

Introduction: Endoscopic endonasal approaches (EEA) are increasingly applied for orbital interventions, including decompression in vision-threatening endocrine orbitopathy and biopsy of orbital lesions. The approach provides minimally invasive access to the orbital apex, though the surgical corridor is constrained by anatomical variability and proximity to critical neurovascular structures, which can influence exposure and functional outcomes.

Methods: We present two patients who underwent orbital EEA: a 57 year old with bilateral vision-threatening Graves' orbitopathy requiring optic nerve decompression, and a 14 year old pediatric patient with stage IV alveolar rhabdomyosarcoma (PAX3:FOXO1 fusion) with a suspected medial rectus orbital mass. Image-guided endoscopic surgery included ethmoidectomy, lamina papyracea exposure, periorbital incision, and targeted tissue manipulation. Intraoperative findings and postoperative outcomes were documented.

Results: In the Graves' orbitopathy case, the extent of medial rectus prolapse differed between orbits, affecting intraoperative exposure. Bilateral optic nerve decompression was successfully performed without major complications. In the rhabdomyosarcoma case, targeted endoscopic biopsy allowed histological confirmation without external incisions. Postoperatively, diplopia on medial gaze occurred due to manipulation of the medial rectus, but no further deficits were noted. Both cases illustrate that EEA provides direct orbital access while highlighting how anatomical variation can influence surgical strategy and exposure.

Conclusions: EEA facilitates precise orbital apex access for decompression and biopsy, though the confined surgical corridor and variable orbital anatomy require careful intraoperative management. Handling of extraocular muscles may transiently alter ocular motility, and access to lateral or posterior orbital regions can be inherently limited. These considerations underscore the importance of detailed preoperative imaging and navigation-assisted surgery to achieve optimal functional and diagnostic outcomes.



EP081

SPONTANEOUS CSF LEAK FROM ECCHORDOSIS PHYSALIPHORA OF THE CLIVUS: PRESENTATION OF A RARE CASE

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Background: Ecchordosis physaliphora is a rare benign lesion which is usually an incidental finding. In the event of clival erosion, complications may occur, including CSF rhinorrhea. This is accompanied by a high incidence of meningitis, underscoring the necessity for timely surgical intervention. Our aim is to present a case of ecchordosis physaliphora in the clival area managed by our departments.

Materials-Methods: In our study, medical records, radiologic studies and procedural data were examined retrospectively with the consent of the patient.

Results: A 70-year-old female patient was referred to our department with a history of rhinorrhea but no signs of meningitis. Beta-2-transferrin was detected in the nasal discharge and further imaging investigation with HRCT and MRI revealed an osseous defect in the clival region with a non enhancing small lesion. Consequently, an endoscopic transsphenoidal excision of the mass was conducted, followed by a multilayered skull base reconstruction using fat, Tachosil, fascia lata and a nasoseptal flap. The patient had an uneventful postoperative course and no evidence of recurrence at the 3-month follow-up.

Conclusion: Ecchordosis physaliphora of the clivus is a rare pathology with benign features which may warrant an intervention when the risk of infection due CSF leak becomes apparent. Careful reconstruction of the defect with multiple layers as in other skull base CSF leak repair cases is essential. Further treatment with proton beam is not advocated in EP cases

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EP082

FLOSEAL IN PITUITARY AND ANTERIOR SKULL BASE SURGERY.

Andrea Cavalli

Introduction: Floseal is a flowable hemostatic matrix made of bovine-derived gelatine granules and human thrombin which promotes rapid clot formation when applied to bleeding surfaces. It's use has been well established in ENT surgeries. In the nose and anterior skull base surgeries it is prepared in a syringe and applied using nasal delivering ends.

Method: In this poster we describe our experience of Floseal, which we now routinely use in all our transnasal endoscopic pituitary and anterior skull base surgeries. After the pituitary tumour is removed, the cavity is coated with Floseal to minimise the formation of a post-operative haematoma and the risk of blindness. Moreover it is particularly useful when problematic bleeding is encountered on the approach to the sella, tumour removal, bleeding from the intercavernous sinus veins, and cavernous sinus bleeding. We also use it in the nasal cavity to minimise post-op epistaxis particularly after nasoseptal flap harvest.

Results: Since utilising Floseal, it has significantly decreased our numbers of post-operative complications of epistaxis and haematomas

Conclusion: We advocate the use of Floseal in pituitary and anterior skull base surgeries since we use it regularly and post-operative complications have decreased significantly decreasing the morbidity and mortality of these patients.



EP083

SPHENOID SINUSITIS COMPLICATED BY HYPOPHYSITIS AND CORTICOTROPIC INSUFFICIENCY: A CASE REPORT

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Introduction: Isolated sphenoid sinusitis is a rare entity but is particularly known for causing intracranial complications. Its severity is dual, affecting both functional and vital prognosis. The aim of this work was to describe a case of sphenoid sinusitis complicated by an intrasellar abscess and hypophysitis.

Case study: A 52-year-old male patient with no significant medical history, presented with acute, paroxysmal fronto-orbital headaches, pulsatile and lateralized to the left side, associated with bilateral blurred vision, profound asthenia, and vomiting. Symptoms had been evolving for three weeks and did not improve with antibiotic therapy prescribed at the emergency department. Clinical examination revealed purulent rhinorrhea, predominantly on the right side, with near-obstructive deviation of the nasal septum on the same side. Cranial nerve examination showed abduction eye palsy. Specialized ophthalmological evaluation revealed a preserved visual acuity without diplopia. Computed tomography revealed a collection in the right sphenoid sinus with posterior wall erosion, contiguous with an 11 mm intrasellar abscess. MRI revealed a pyocoele of the right sphenoid sinus with osteitis of the skull base and hypophysitis with an 18 mm intrasellar collection. Laboratory tests showed central hypothyroidism and severely reduced cortisol levels. The patient received triple intravenous antibiotic therapy at meningeal doses (levofloxacin, vancomycin, and metronidazole) for three weeks, resulting in resolution of headaches, asthenia, and vomiting. Oral therapy with levofloxacin and rifampicin was then continued for three additional weeks. Hormonal replacement therapy with L-thyroxine and hydrocortisone was initiated. The patient had a favorable clinical course and continues to be monitored regularly in both endocrinology and otorhinolaryngology. Follow-up over a three-year period, including clinical and laboratory evaluations as well as annual MRI scans, has shown no evidence of recurrence. **Conclusion:** Sphenoid sinusitis, due to its misleading symptomatology,

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can be difficult to diagnose, leading to delayed management and increased risk of endocranial complications. Imaging plays a crucial role, and prompt, appropriate treatment is essential.



EP084

THE PREOPERATIVE ASSESSMENT OF SCANS IN PITUITARY SURGERY

Christine Fabri¹

¹

Introduction: Preoperative CT scan and MRI scan aids anatomical knowledge and surgical planning to optimise outcomes and minimise complications in pituitary surgery.

Method: We present our preoperative checklist when assessing scans before surgery, which include the following:- CT Scan-Check there is no significant sinusitis requiring treatment before pituitary surgery-Septoplasty required for access?-Concha middle turbinates require compression?-Sphenoid ostiums visible? Close to skull base?-Sphenoethmoidal cells need to be opened to fully access the sella?-Intersphenoid septation(s) anatomy and attached to the ICAs?-Sella anatomy-clear junction with planum? pneumatization inferior to the sella?-'Teddy bear sign' present? -indicating the ICAs are visible at the lateral aspect of the sella-Dehiscence of the ICAs/Optic nerves? MRI Scan-How low is the CSF in the sella region?-Extent of tumour including suprasellar component, cavernous sinus involvement-The presence of the normal pituitary gland. Results: Using this checklist for every pituitary surgery we have found that it helped us visualise the anatomy and resulted in less intra-operative complications namely CSF leaks and cavernous and carotid bleeds.

Conclusion We propose the regular use of this checklist for pituitary surgery since the anatomy is known to be variable in the endoscopic trans-sphenoidal approach



EP085

HOW WE DO IT – ENDOSCOPIC PITUITARY SURGERY BY A NEUROSURGEON AND OTOLARYNGOLOGIST

Christine Fabri¹

¹

Introduction: We present a number of aspects of our transnasal endoscopic pituitary surgery technique that may aid other pituitary surgeons.

Method: -Extending the neck with a shoulder bag affords a better view and access for large suprasellar tumours. -A Procise Coblation wand is utilised to removed the mucosa over the sphenoid ostiums and posterior septectomy sites with minimal bleeding. -Anterior sphenoid wall mucosa is retracted inferiorly to maintain the septal artery branch should a vascularised nasoseptal flap be required subsequently. -The sella dura is incised with a 15C (slim and fine) scalpel blade. -On removing some of the pituitary tumour the diaphragm may descend abruptly and impede further tumour removal. The 'half' technique may overcome this and involves removing either the left or right half of a macroadenoma first. The cavity is then packed with neuropatties to maintain diaphragm elevation whilst the other half is removed. -Round ended suckers and malleable suckers (Figure 2) are relatively atraumatic and remove tumour safely. -45 and 70 degree endoscopes placed into the tumour cavity aid greater visualisation and more complete tumour removal. -The sella cavity is coated with Floseal to minimise haematoma formation and lightly packed with absorbable Fibrillar. Any remaining Floseal is applied to the sphenoidotomy edges and the sphenoid and nasal cavity are lightly packed with Fibrillar and absorbable Nasopore packs but positioned so as not to completely block the nose.

Results: Using this surgical technique and method has given us several improvements in how we deal with pituitary and anterior skull base tumours. It has also resulted in less intra-operative and post-operative complications.

Conclusion: With this method and surgical technique we feel that less intra-operative complications can be made and we also found that it has resulted in less post-operative complications



EP086

SPHENO-TUBERCULAR-PLANUM MENINGIOMAS – IMPORTANCE OF OPTIC NERVE DECOMPRESSION TO PRESERVE VISION

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Introduction: Spheno-tuberculum-planum (STP) meningiomas usually present with vision changes due to optic nerve compression, either from soft tumor compression in the cerebrospinal fluid spaces or due to hyperostosis of bony optic canal. It is critical not only to decompress the cisternal portion of the nerve but also to decompress the bony optic canal to help preserve or improve vision.

Methods: A retrospective analysis of the cases performed by the author in past 6 months were reviewed and 3 cases were identified with STP meningiomas with vision changes.

Results: 2 out of 3 patients had been operated on before presenting to primary author. First patient had initially been presented to an outside hospital (OSH) with a large STP meningioma. She underwent a staged transcranial and endoscopic endonasal approach for removal of the majority of soft tumor. Unfortunately, a thin layer of soft tumor was left along the parasellar carotid and optic canal and no bony decompression was performed from either approach (A). Patient presented with tumor progression and worsening vision. She underwent expanded endoscopic endonasal approach for resection of residual tumor. At the same time, bilateral optic canal decompression with optic nerve sheath opening was performed (B). Second patient presented with STP meningioma and vision changes and found to have a large tumor with significant anterior clinoid hyperostosis, narrowing of bony optic canal, intra-orbital soft tumor and involvement of middle cranial fossa. A transcranial approach was adopted at the OSH but no bony decompression was performed and intra-orbital portion of the tumor left. Patient presented with progressively worsening vision loss and tumor recurrence. She was also noted to have a large intracranial loculated abscess (C). She underwent redo transcranial approach for anterior clinoidectomy, decompression of superior orbital fissure and maxillary strut resection along with resection of soft tumor from the orbit and drainage of abscess. Third patient presented with STP meningioma with significant optic canal narrowing and soft tumor compressing the optic

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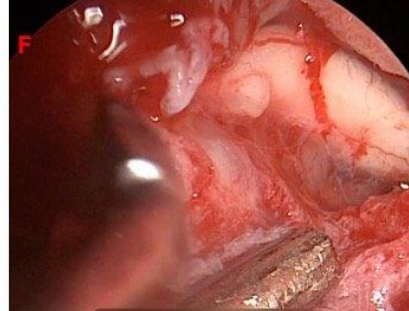
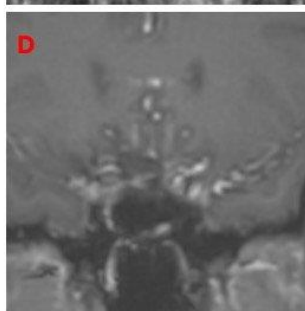
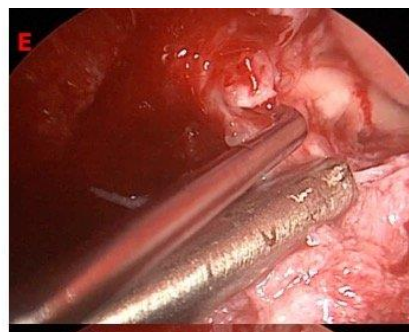
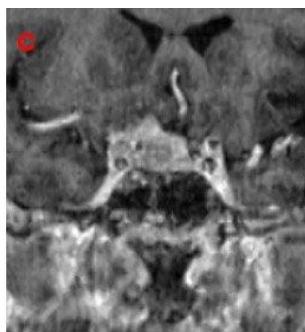
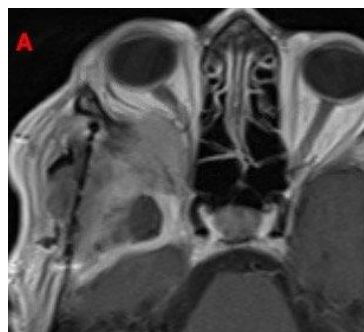
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nerve (D). She underwent her naïve expanded endoscopic endonasal approach for removal of soft tumor in sphenoid sinus, tuberculum and planum. Further, extensive bilateral bony optic canal decompression was performed along with nerve sheath opening. All patient noted subjective improvement immediately post-op. 2 patient who had neuro-ophthalmological exams post-op, demonstrate stable vision loss while the exam on third patient is pending.

Conclusions: Patients presenting with speno-tuberculo-planum meningiomas with optic canal narrowing should undergo bony optic canal decompression. Patients undergoing transcranial approach should have optic canal decompression with anterior clinoidectomy. Similarly, for those undergoing endoscopic endonasal approach should also have bony optic canal decompression along with resection of tuberculum and planum. This provides the patients with the best chances of vision preservation and improvement.





EP087

HOW WE DO IT: MAKING A SMILE FACE OPENING IN THE DURA TO PREVENT THE PREMATURE ARACHNOID BULGE, FACILITATING IN COMPLETE EXCISION OF PITUITARY TUMOURS AND REDUCING CHANCES OF POST OPERATIVE CSF LEAK IN ENDOSCOPIC TRANS- NASAL TRANS SPHENOIDAL PITUITARY SUR

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Background: In trans sphenoidal pituitary adenoma surgery, the dura may be opened in many ways like vertical linear incision with crossed extensions, cruciate incision, two lateral vertical cuts joined by a transverse cut. However, the chances of premature arachnoid bulge in these techniques are high.

Method: We open the dura transversely from the center, and then extend the incision superio-laterally on both sides, stopping a few millimeters before the bony margins near the optico-carotid recess resembling a smiling face. First, the basal and posterior part of the tumor is removed from the inferior opening of the dura. Then the lateral and superio-lateral portions of the tumour are removed using superio-lateral dural openings. During this step, the superior dural flap supports the superior or anterior part of the tumor like a retractor preventing the premature arachnoid bulge. Gradually the suprasellar part of the tumor then starts falling down which is then removed by retracting the superior dural flap. The sellar floor reconstruction is done on the preserved superior dural flap which provides solid support.

Conclusion This technique of preserving the superior dural flap helps in complete excision of the tumour, robust skull base reconstruction and reduces the chances of CSF Leak.



EP088

BEYOND THE NOSE: PROGRESSIVE CRANIOFACIAL, VISUAL, AND AUDITORY MORBIDITY IN COCAINE-INDUCED DISEASE

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¹

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Introduction (Background & Aim) Cocaine-induced midline destructive lesions (CIMDL) cause progressive osseocartilaginous necrosis of the nasal cavity, paranasal sinuses, and palate and may closely mimic granulomatosis with polyangiitis (GPA), including antineutrophil cytoplasmic antibody (ANCA) positivity. Delayed recognition can result in cumulative, multisystem morbidity extending beyond the upper aerodigestive tract. We present an extreme case of CIMDL with irreversible visual loss, complex hearing impairment, and refractory oroantral fistulae, highlighting diagnostic pitfalls and long-term consequences.

Material & Methods (Case Study) A 52-year-old man presented with progressive mid-facial pain, nasal crusting, and bilateral oroantral fistulae. Despite early toxicology confirming cocaine exposure, the patient denied illicit drug use and was initially managed as sarcoidosis, later reclassified as GPA. He received long-term immunosuppression including corticosteroids and methotrexate. Serial imaging, audiology, ophthalmologic assessments, and operative reports were reviewed over an 11-year disease course.

Results Progressive maxillary collapse, palatal perforation, and pan-midline sinonasal destruction developed, with repeated failure of local reconstructive procedures. An anterolateral-thigh free flap was required for nasal dorsum support. The patient subsequently developed fixed ophthalmoplegia, optic neuropathy, and irreversible bilateral blindness attributed to orbital fibrosis and ischemic injury. Later complications included mixed bilateral hearing loss secondary to eustachian-tube dysfunction and tympanosclerosis, necessitating hearing aids. Final imaging demonstrated complete loss of the nasal septum, turbinates, medial maxillary walls, and hard palate, forming a single confluent sinonasal cavity. Repeated questioning ultimately revealed prolonged intranasal cocaine use predating symptom onset.

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Conclusions This case illustrates the devastating, multisystem trajectory of unrecognised CIMDL and the challenges posed by diagnostic overlap with GPA. Persistent denial of cocaine use and stigmatizing terminology contributed to delayed etiologic recognition and prolonged immunosuppression. Early consideration of CIMDL in destructive midline disease is essential to prevent irreversible morbidity. Sensitive, non-judgmental history-taking is critical in complex patients with suspected substance-related pathology.



EP089

REVISION FRONTAL SINUSOTOMY AND DRAF III FOR RECURRENT MUCOCELE – CASE PRESENTATION AND LITERATURE REVISION

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Introduction: Frontal mucocèles have a significant recurrence rate (3.1-23.5%), which is related to the anatomic complexity of the frontal sinus, orbital and intracranial extension, and postoperative stenosis. Here we present a case of a frontal mucocèle submitted to a Draf IIa procedure, with subsequent recurrence requiring a Draf III procedure, and a literature revision of the need for revision surgery in frontal mucocèles.

Case Report: A 52-year-old man presented with right proptosis and periorbital oedema for 3 months. CT revealed a right frontal mucocèle eroding the floor and posterior wall of the frontal sinus. He was submitted to a Draf IIa procedure with marsupialization of the mucocèle. After 3 months a recurrence of the mucocèle was confirmed, and the patient was submitted to a Draf III procedure. At 4-month follow-up there is no evidence of recurrence and the patient is asymptomatic.

Literature Revision/Discussion: Frontal mucocèle recurrence is higher in patients with unfavourable anatomy (reduced anteroposterior diameter of the frontal ostium, high septum deviation) and orbital and intracranial extension, such as in this case. With Draf IIa, restenosis occurs in 10%–30% of patients, with the risk being highest if the final frontal sinus opening is less than 4–5 mm wide. A Draf III procedure is a challenging surgery with high success rates for mucocèles (83-97%) and few complications (5-14%).

Conclusion: Draf III is a complex surgery that creates a wide cavity, thus decreasing the risk of mucocèle recurrence. In cases of unfavourable anatomy, it may be the first line treatment.





EP090

TITLE IN ENGLISH: ENDOSCOPIC AND PATIENT-REPORTED ASSESSMENT OF NASAL MUCOSAL AND TURBINATE INJURY FOLLOWING ELECTIVE NASOTRACHEAL INTUBATION: A PROSPECTIVE OBSERVATIONAL STUDY

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Introduction Nasotracheal intubation (NTI) is frequently used during general anesthesia for otolaryngologic and maxillofacial procedures and may result in injury to the nasal mucosa or turbinates. While acute complications such as epistaxis are well documented, the prevalence and clinical relevance of residual or persistent nasal findings detected by endoscopic evaluation after recovery from surgery are not well established. The aim of this study was to prospectively evaluate endoscopic nasal findings one month after elective NTI and to assess their association with intubation-related factors and patient-reported nasal symptoms.

Materials & Methods This prospective, single-center observational study included 50 adult patients undergoing elective nasotracheal intubation. Preoperative bilateral nasal endoscopy and validated nasal symptom questionnaires (SNOT-22 and NOSE) were obtained. Intraoperative variables, including tube diameter, side of insertion, insertion difficulty, and immediate epistaxis, were recorded. Follow-up nasal endoscopy and repeat questionnaires were performed one month postoperatively. Endoscopic findings were systematically documented and categorized.

Results At one-month follow-up, endoscopic abnormalities potentially attributable to NTI were identified in 22% of patients. The most common findings included focal mucosal erythema or edema (10%), localized mucosal ulceration or crusting (8%), and mild turbinate contact changes (6%). No cases of turbinate fracture, septal perforation, or clinically significant synechiae were observed. Higher rates of endoscopic abnormalities were associated with larger tube diameter and increased insertion difficulty. Patients with endoscopic findings demonstrated a modest but consistent increase in nasal symptom scores at one month, with mean increases of 4.5 points in SNOT-22 and 5.9 points in NOSE scores compared with baseline.

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Conclusions Residual nasal mucosal changes detectable by endoscopic examination are relatively common one month after elective nasotracheal intubation. Although these findings are generally mild, they are associated with measurable short-term worsening of nasal symptoms. Awareness of potential post-intubation nasal sequelae may support careful technique selection and consideration of postoperative nasal evaluation in selected patients.



EP091

AN UNUSUAL PRESENTATION OF EBV-POSITIVE LYMPHOEPITHELIAL CARCINOMA

Elizabeth Ming Hui Fong¹, Jian Li Tan¹

¹Other

A 59 year old Chinese male taxi driver first presented to the accident and emergency department with complaints of severe headache affecting his sleep. He also reported a background of longstanding blocked and runny nose associated with hyposmia. Of note, he had a significant past medical history of poorly-controlled diabetes mellitus (HbA1c 8.0%), hypertension, hyperlipidaemia and glaucoma. Clinical examination revealed a right sphenoethmoidal recess polyp and mucopus. Initial CT brain showed extensive mucosal thickening and opacification within the paranasal sinuses and associated lytic appearance of the skull base and medial orbital walls. He developed progressive blurring of vision in the following weeks. Subsequent radiological imaging was suggestive of possible chronic invasive fungal sinusitis and he was admitted to the ward urgently for anti-fungal treatment while awaiting definitive diagnosis. He was reviewed by the eye doctors and found to have with bilateral cranial nerve II, III and VI involvement. He underwent urgent bilateral middle meatal antrostomy, left ethmoidectomy and biopsy in the operating theatre. Final histological diagnosis returned as Epstein Barr Virus positive lymphoepithelial carcinoma (LEC). We present an unusual case of a diagnostic conundrum where the initial diagnosis was thought to be possible chronic invasive fungal sinusitis based on the radiological appearances especially in light of the patient's poorly-controlled diabetes mellitus. The diagnosis was eventually reached after obtaining specimens for histology. LEC is classified as a rare poorly-differentiated squamous cell carcinoma or histologically undifferentiated carcinoma and can occur in various subsites of the head and neck. This should be considered as a differential diagnosis in a patient presenting with headache, epistaxis and diplopia.



EP092

THE CHINESE CARPET FLAP FOR ANTERIOR CRANIAL FOSSA RECONSTRUCTION IN CASES OF DEPRESSED FRONTAL FRACTURES: 10 YEARS' EXPERIENCE AT A TERTIARY REFERRAL CENTER

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Introduction: Frontal sinus fractures account for 5–15% of facial injuries and endanger adjacent vital structures.

Method: We retrospectively analyzed 89 depressed frontal sinus fractures reconstructed with a pericranial flap (PCF) harvested in 29 of them at a tertiary center between 2014 and 2024.

Results: Most patients were young men (mean 18.3 ± 4.1 years); mechanisms included falls (42.7%) and motor-vehicle collisions (39.3%). Fracture types were isolated anterior table ($n=54$), combined anterior/posterior tables ($n=35$), and nasofrontal outflow tract (NFOT) involvement ($n=8$). Using a bicoronal approach, we cranialized NFOT-disrupted sinuses, repaired dura in 33 cases, and rebuilt orbits as required. The vascularized "Chinese-carpet" PCF was split or folded to achieve multilayer anterior skull-base coverage without donor-site morbidity. Forehead projection improved by 3.4 ± 1.7 mm. Over a 39.2-month mean follow-up, no cerebrospinal fluid leaks occurred. Minor complications included transient alopecia ($n=33$), scalp paresthesia ($n=57$), and five mucoceles managed conservatively.

Conclusion: Our decade-long experience supports the PCF as a versatile, dependable option for complex frontal sinus reconstruction; larger multicenter studies should confirm its long-term efficacy.



EP093

ENDOSCOPIC SURGICAL STRATEGY AND CLINICAL EXPERIENCE FOR PINEAL REGION TUMORS

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Background: Microsurgical approaches such as the occipital transtentorial approach (OTA), infratentorial supracerebellar approach, and transcallosal approach have traditionally been used for the treatment of pineal region tumors. However, this region is characterized by a deep and narrow operative corridor surrounded by critical neurovascular structures including the deep venous system, brainstem, and tectal plate. These anatomical features make surgery technically demanding and potentially invasive. In recent years, minimally invasive fully endoscopic surgery has increasingly been applied to this region, and our institution has gradually transitioned from conventional mic

Methods: Between May 2020 and April 2025, three patients with pineal region tumors underwent fully endoscopic tumor resection at our institution. A pineal parenchymal tumor of intermediate differentiation (maximum diameter 42 mm) with rapid progression was treated via OTA using a rigid endoscope. Two smaller lesions were resected via the Trans-Monro approach using a flexible endoscope: a desmoplastic myxoid tumor of the pineal region with tumor-associated hemorrhage (25 mm including hematoma), and a residual tumor following treatment for embryonal carcinoma (15 mm).

Results: One patient required re-operation due to postoperative hemorrhage from residual tumor. However, all three procedures were successfully completed as minimally invasive keyhole endoscopic surgeries, and gross total resection (GTR) was ultimately achieved in all cases.

Conclusion: Fully endoscopic tumor resection has inherent technical limitations in terms of available instrumentation and surgical strategy. However, our experience suggests that, with appropriate case selection and careful preoperative planning, it may represent a safe and feasible treatment option for pineal region tumors. This approach may help minimize surgical invasiveness while preserving adequate visualization of

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deep neurovascular structures, thereby contributing to favorable surgical outcomes.



EP094

PAINFUL OPHTHALMOPLÉGIA MIMICKING CAVERNOUS SINUS PATHOLOGY: A SURGICALLY CURABLE SPHENOID FUNGAL SINUSITIS

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Background Painful ophthalmoplegia often raises strong clinical suspicion for cavernous sinus pathology, including Tolosa–Hunt syndrome, neoplasm, or inflammatory lesions. However, secondary and surgically treatable causes originating from the sphenoid sinus may closely mimic these entities. Failure to recognize such conditions can lead to unnecessary steroid therapy or delayed definitive treatment.

Case Presentation A 73-year-old woman presented with a two-week history of severe right periorbital pain and binocular diplopia. Neurological examination revealed isolated right abducens nerve palsy without other cranial nerve deficits. Her medical history included diabetes mellitus, stage III chronic kidney disease, and hypertension. Nasal endoscopy showed no abnormal findings such as nasal polyp, tumor mass or purulent discharge in nasal cavity. Paranasal sinus computed tomography demonstrated a soft-tissue density lesion with internal calcifications confined to the right sphenoid sinus. Magnetic resonance imaging revealed an intermediate signal intensity lesion within the sphenoid sinus, without definitive radiologic evidence of cavernous sinus invasion. Despite the absence of direct cavernous sinus involvement, the clinical presentation closely resembled cavernous sinus-related painful ophthalmoplegia. Given the suspicion of a secondary, surgically remediable cause, endoscopic sphenoid sinus surgery was performed. Intraoperatively, dense fungal debris was identified and completely removed. Histopathological examination using periodic acid–Schiff and Gomori methenamine silver stains confirmed aspergillosis.

Results Postoperatively, the patient experienced rapid resolution of periorbital pain within 48 hours. Diplopia gradually improved, and complete recovery of extraocular movement was achieved by three months after surgery. No recurrence or neurological deficits were observed during follow-up.

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Conclusion This case demonstrates that isolated sphenoid fungal sinusitis can present as painful ophthalmoplegia mimicking cavernous sinus pathology. Careful radiologic assessment and consideration of sinonasal disease are essential before diagnosing idiopathic cavernous sinus disorders. Endoscopic sinus surgery can provide both definitive diagnosis and curative treatment, emphasizing the importance of recognizing surgically treatable mimics in patients with painful ophthalmoplegia.



EP095

SURGICAL APPROACH TO THE ANTEROLATERAL AND ANTEROINFERIOR WALLS OF THE MAXILLARY SINUS WITH PRESERVATION OF THE MAXILLARY STRUT

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Introduction: Accessing the anterolateral and anteroinferior walls of the maxillary sinus is challenging due to limited exposure by standard approaches. Although the modified Denker's approach improves access, it often leads to alar retraction and collapse, causing patient dissatisfaction. We present a modified endoscopic Denker's technique that preserves the maxillary strut to improve access while minimizing aesthetic complications in managing benign maxillary sinus tumors.

Materials and Methods: Six patients with benign maxillary sinus tumors—recurrent/residual antrochoanal polyps and inverting papillomas—attached to the anterolateral or anteroinferior walls underwent surgery using the modified approach. Preoperative imaging identified tumor extent. Surgery was performed under general anesthesia, preserving the maxillary strut to maintain structural support. Visualization was achieved with 30° and 70° endoscopes, and tumor attachment sites were drilled using a 15° diamond burr. Particular attention was given to preserving the infraorbital and descending palatine nerves. Postoperative evaluation focused on aesthetic outcomes (alar retraction and collapse) and tumor recurrence.

Results :Patients included two with recurrent antrochoanal polyps on the anterolateral wall medial to the infraorbital nerve, three with recurrent inverting papillomas (two anterolateral, one anteroinferior), and one with a newly diagnosed anterior wall inverting papilloma. Complete tumor excision was achieved in all cases without intraoperative complications. Follow-up revealed no residual tumors and markedly reduced postoperative alar retraction and collapse. Preservation of the maxillary strut maintained maxillary integrity and contributed to favorable aesthetic outcomes.

Conclusion: The modified endoscopic Denker's approach with maxillary strut preservation is a safe and effective technique for accessing benign tumors in difficult maxillary sinus locations. It enables complete tumor removal while minimizing postoperative complications, particularly alar

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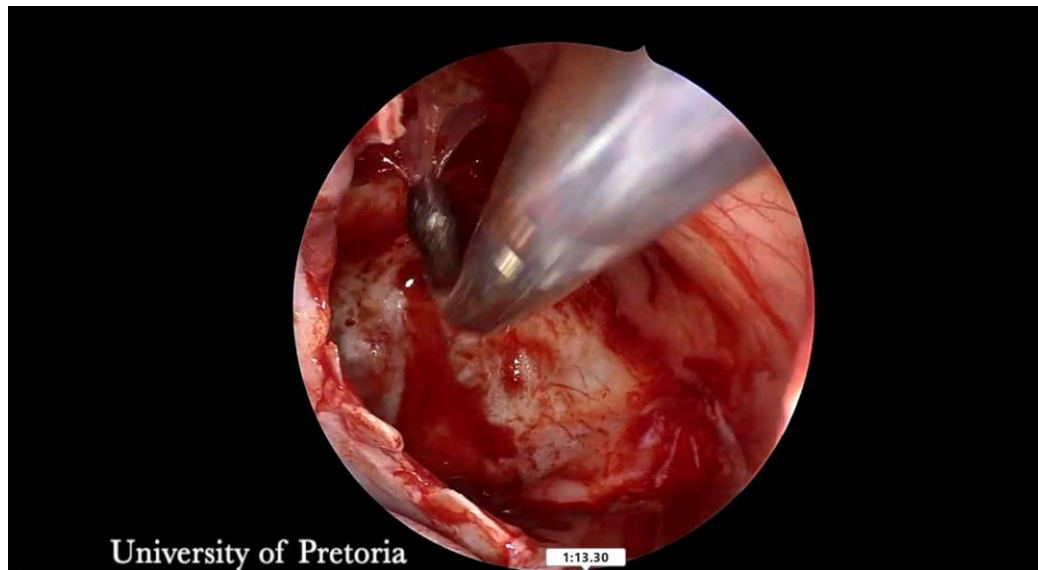


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deformities, thereby enhancing aesthetic and structural results. This method represents a promising alternative for managing tumors in anatomically challenging regions of the maxillary sinus.





EP096

TRANSPTERYGOID APPROACH FOR DERMOID CYST OF PTERYGOPALATINE FOSSA

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Background: Dermoid cysts are rare congenital ectodermal inclusion tumors. Their occurrence in the pterygopalatine fossa (PPF) is exceptional, particularly in the pediatric population. Due to the proximity of the maxillary and mandibular nerves at the skull base, surgical management requires a balance between complete resection and the preservation of neurological function.

Case Description: A 9-year-old girl presented with a symptomatic dermoid cyst located in the right PPF, situated at the junction of the foramen rotundum and foramen ovale. An endoscopic endonasal transpterygoid approach was utilized to access the deep, extradural space posterior to the pterygoid plates. Intraoperatively, the lesion was found to contain characteristic hair follicles and sebaceous material. Due to dense adherence of the cyst capsule to the surrounding trigeminal nerve branches and neurovascular structures, a strategic resection was performed to avoid postoperative deficits. **Results:** Histopathology confirmed the diagnosis of a dermoid cyst. The patient experienced an excellent recovery with no new cranial nerve deficits or neurovascular complications. Reflecting the low morbidity of the endoscopic corridor and the focused surgical strategy, she was discharged on postoperative day two.

Conclusion: The endoscopic transpterygoid approach provides an effective surgical corridor for rare pediatric PTF lesions. In cases where the dermoid capsule is adherent to critical neurovascular structures, subtotal resection combined with cauterization of the cyst wall is a safe and viable strategy that facilitates rapid recovery and a short hospital stay.



EP097

ENDOSCOPIC MULTIPORTAL APPROACHES TO MECKEL'S CAVE: A CADAVERIC STUDY AND A THREE-DIMENSIONAL ANATOMICAL VIDEO

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Objective: This cadaveric study aimed to illustrate the lateral transorbital (LTO), transantral transpterygoid (TATP), and endoscopic endonasal approaches (EEA) to Meckel's cave (MC), defining their surgical freedom, area of exposure, and advantages and limitations; thus, refining their respective indications.

Methods: Bilateral dissections of five injected cadavers (10 sides). Main Outcome included measuring Distance to targets, surgical freedom, and area of exposure provided by the EEA, TATP, and LTO approaches. **Results:** The TATP approach provides superior surgical freedom to foramen rotundum (167.70_29.762 mm). However, surgical freedom to foramen ovale was best when using the LTO approach (75.01_15.773 mm). The EEA provides a superior exposure of the medial MC (mean area of 587.69_38.59mm²). The LTO and TATP approaches provide equivalent access to the lateral MC (ranging from 468.90_26.98mm² for TATP to 650.11_35.76mm² for the LTO approach). Combining approaches increases the area of exposure significantly (1,237.79_48.41mm² and 1,056.59_48.12mm² for EEA and LTO vs. EEA and TATP).

Conclusion: This study thoroughly emphasizes the pros and cons of the aforementioned approaches. Each approach may be applied in selected cases as a single or as part of a combined technique. However, conventional approaches are still indicated according to extent and pathology.



EP098

ENDOSCOPIC ENDONASAL OPTIC NERVE DECOMPRESSION FOR VISION PRESERVATION IN NEUROFIBROMATOSIS TYPE 2 – CASE REPORT

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Introduction Neurofibromatosis type 2 (NF2) is a rare genetic disorder characterised by the development of multiple intracranial schwannomas and meningiomas. Involvement of the orbital apex and optic canal may result in compressive optic neuropathy. Endoscopic endonasal surgery (EES) allows direct optic nerve decompression with reduced morbidity and has been associated with improved visual outcomes.

Objective To present a case of optic neuropathy in a patient with NF2, including a video-assisted description of bilateral endoscopic endonasal optic nerve decompression and a brief literature review. **Case** A 31-year-old woman with NF2, previously operated on for bilateral vestibular schwannomas and skull base meningiomas, presented with a four-year history of progressive visual deterioration and persistent diplopia. Ophthalmological examination revealed left trochlear nerve palsy with compensatory head posture and left optic disc oedema. Magnetic Resonance (MR) demonstrated multiple anterior skull base dural-based meningiomas extending to the olfactory fossae, nasal roof and superior and medial orbital walls, resulting in bilateral optic nerve compression at the orbital apex. Medical management with acetazolamide and systemic corticosteroids failed to halt disease progression on visual compromise and surgical treatment was therefore indicated. The patient underwent bilateral optic nerve decompression via an endoscopic endonasal approach. Postoperatively, visual acuity improved to 10/10 bilaterally, with complete resolution of diplopia and regression of left optic disc oedema. At six-month follow-up, the patient remained asymptomatic, with preserved visual function and a self-reported improvement in quality of life.

Conclusion Endoscopic endonasal surgery is a safe and effective option for optic nerve decompression, providing excellent anatomical access

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to the anterior skull base and medial orbital region while minimising morbidity. In this case, otolaryngologic intervention was pivotal for visual recovery and quality-of-life improvement, underscoring the central role of the endonasal route in functional preservation and neurosensory recovery in patients with anterior skull base pathology.



EP099

BILATERAL OLFACTORY NERVE HYPOPLASIA

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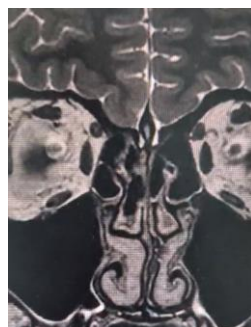
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³CUF Almada

Introduction: In a patient presenting with anosmia, after ruling out common conditions such as chronic rhinitis and rhinosinusitis, it is mandatory to perform MR imaging to screen for olfactory pathway aberrations.

Case Presentation: A fifteen-year-old female presented to the Otorhinolaryngology appointment with anosmia, which was first noted 5 years earlier, when she failed to detect a burnt smell. During this episode she didn't have any other nasal symptoms. She also didn't have any chronic nasal symptoms. The patient did not have any relevant history, such as previous nasal surgery or trauma. On nasal examination, there were no secretions, nasal masses or other anatomic alterations. The patient started olfactory training, and a CT and MRI scan were solicited with olfactory pathway study. On MRI, an asymmetric decrease in the size of the olfactory bulb was noted, more pronounced on the left, as well as bilateral olfactory nerve hypoplasia, most likely congenital. No other alterations were detected. An evaluation by Medical Genetics was solicited to rule out Kallmann syndrome and other genetic conditions associated with olfactory nerve hypoplasia.

Discussion: Olfactory nerve hypoplasia or agenesis is a rare cause of anosmia that mandates screening for genetic conditions such as Kallmann syndrome. Treatment may include olfactory training and psychotherapy. Safety measures are of utmost importance.





EP100

EFFICACY OF ENDOSCOPIC SINUS SURGERY FOR CHRONIC RHINOSINUSITIS IN LUNG TRANSPLANT PATIENTS

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Introduction: Prior literature suggests there is a link between inflammatory processes and infectious conditions in the paranasal sinuses with lung disease. Limited studies have focused on how sinonasal disease can affect lung transplant rejection. We evaluated short-term outcomes of endoscopic sinus surgery for the management of chronic rhinosinusitis in lung transplant patients.

Methods: Retrospective chart review of lung transplant patients with chronic rhinosinusitis who underwent medical therapy or endoscopic sinus surgery, regardless of their lung condition, divided into medical responders or non-medical responders. Descriptive and statistical analysis were conducted, including Chi-square, t-test and linear regression.

Results: Of 49 lung transplant patients with chronic rhinosinusitis, 26 patients were classified as non-medical responders requiring endoscopic sinus surgery, and 15 were classified as medical responders. None had invasive fungal sinusitis. No significant differences in demographics, FEV1 at time of treatment, or days in hospital post-transplant. There was a significant difference ($p=0.009$) in Lund-McKay score between medical (8.6) and non-medical (14.2) responders. Among non-medical responders, 4 (15.4%) of the patients were in acute rejection at the time of surgery, compared with 1 (6.7%) among medical responders. **Conclusion:** The findings in this study suggest that there is a higher sinus disease burden in those requiring endoscopic sinus surgery. Additionally, a higher proportion of the non-responders were in acute rejection at the time of CRS management and had more than one FESS. Future studies are needed to establish if there is relationship between acute lung rejection and sinonasal disease.

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EP101

IMPACT OF INTERNATIONAL CONTINUING EDUCATION ON TRANSSPHEOIDAL ENDOSCOPIC SURGERY FOR SELLA TUMORS IN BOLIVIA. 15 YEARS EXPERIENCE

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²Other

Trans-sphenoidal endoscopic surgery (CETE) as an approach for skull base tumors has been widespread in the last 25 years (1) (2) (3), which is why many international consensuses CETE (4) is the first choice. We present 248 cases in Santa Cruz Bolivia, from 2010 to 2025, with 47% of them male, with an age range of 10 to 69 years. Our patients previously used antidopaminergics in 9%, with the surgical indication being 82% visual impairment. A prior CT scan and MRI scan was performed in all patients and angiography was performed in 20%. Imaging showed O ROAD TO STELLA (6) highlighting conchal sphenoid 2%, lateral pneumatization 3%, 60% were macroadenomas, 3% were functioning tumors. The approach technique was monochoanal, without turbinate resection in 80%, posterior resection of the septum and enlargement of the sphenoid osteum with chisel and hammer, complete septoplasty was performed in 15%. In the sphenoid, the sphenoidal and ethmoid septa and the superior turbinate were resected with Kerrison. The posterior wall of the sphenoid was opened with a chisel and hammer after recognition of orbito-carotid angles. The tumor was resected with curettes and aspiration. The closure was with surgycel, and gelfoam in the chair and nostrils when there was no fistula. In cases with fistula 22%, vascularized septal graft was also used, lumbar drainage in 60% and absolute rest for 5 days in 87%. Histopathological, 87% had adenomas, 13% craniopharyngioma. The complications were 87% of our patients had diabetes insipidus, meningitis occurred in 6%, epistaxis in 2%. The average surgical time was 3 hours, and a hospital stay of 5 days. Presenting vision improvement in 60%, anosmia in 2%, massive crusting 3%, septal perforation 2%, synechiae 2%, long-term endocrinological alterations in 1%. Our results were comparable with the literature. It shows the usefulness of training abroad and of maintaining continuing education with the tutelage of American teams. We highlight the material used (especially chisel and hammer instead of

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drilling) that was adjusted to national needs without lowering the quality of the results.



EP102

STERIWAVE® NASAL PHOTO DISINFECTION PRIOR TO ENDOSCOPIC ANTERIOR SKULL BASE SURGERY: IMPACT ON POST OPERATIVE MENINGITIS AND ANTIBIOTIC USAGE

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Introduction Nasal decolonization is recommended in the 2016 WHO Global guidelines for the prevention of surgical site infections. Nasal colonisation with *S. aureus* increases the overall risk of surgical site infections, including those caused by MRSA. The standard of nasal decolonization care recommended by NICE, UK is a topical ointment containing the antibiotic mupirocin. This regime relies upon patient compliance to apply the ointment twice daily for 5 days before an operation. Such regimes have a patient compliance of only 49%. Meningitis following anterior skull base surgery is a significant complication and varies from 1.8 to 13% Steriwave® is a novel non antibiotic broad spectrum antimicrobial technology utilising photo disinfection to destroy pathogens. It is simple and quick to administer, has immediate action and does not promote antibiotic resistance(2). Will it have an impact on endoscopic anterior skull base surgery. Methods Consecutive cohort study of adult patients undergoing endoscopic anterior skull base surgery requiring a nasoseptal flap with additional preoperative nasal Steriwave® photo disinfection compared to historical cohort group. Primary outcomes: rate of meningitis and any antibiotic usage within 30 days of procedure. Secondary outcome: utilisation of post operative ENT Outpatient appointments. Fishers exact test used for comparative statistics.

Results 104 patients received standard nasal decolonisation and 83 received Steriwave® nasal photo disinfection. 17 /104 (16.3%) required post operative antibiotics compared to 3/83 (3.6%) in the Steriwave® group, $p < 0.01$. 3/104 (2.9%) in historic cohort developed meningitis compared to 0/83 with Steriwave®. 1.8 ENT outpatient appointments were generated pre person in the historic cohort compared to 1.05 in the Steriwave group.

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Conclusion Compared to historical cohort data and published infection rates Steriwave® has a significant impact in reducing post operative infections and antibiotic usage in endoscopic anterior skull base surgery by 80%. Steriwave also reduces hospital bed days and post operative outpatient appointments. This is the first data on the use of preoperative Steriwave® photo disinfection to reduce post operative infections following endoscopic anterior skull base surgery.



EP103

IMPACT OF CHRONIC RHINOSINUSITIS WITH NASAL POLYPS ON QUALITY OF LIFE: A CASE-CONTROL STUDY USING SNOT-22

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Introduction (Background & Aim) Chronic rhinosinusitis with nasal polyps (CRSwNP) is a chronic inflammatory disorder of the sinonasal mucosa characterized by nasal obstruction, facial pressure, olfactory dysfunction, and posterior nasal drainage (postnasal drip). These symptoms substantially impair daily functioning and overall quality of life. Objective clinical findings alone often fail to reflect the true patient burden; therefore, patient-reported outcome measures such as the Sino-Nasal Outcome Test-22 (SNOT-22) have become essential tools in modern rhinologic practice. This study aimed to evaluate the impact of CRSwNP on disease-specific quality of life by comparing SNOT-22 scores between patients with nasal polyposis and healthy controls, and to assess the influence of demographic factors, including age and sex.

Material & Methods This cross-sectional case-control study included 105 adult participants: 70 patients diagnosed with CRSwNP scheduled for functional endoscopic sinus surgery and 35 healthy controls without sinonasal disease. All subjects completed the validated SNOT-22 questionnaire. Demographic data (age and sex) were recorded. Continuous variables were presented as mean $\pm$ standard deviation. Between-group differences were analyzed using independent t-tests, while categorical variables were compared using the chi-square test. Statistical significance was defined as $p < 0.05$.

Results Patients with CRSwNP were significantly older than controls (48.3 ± 15.3 vs 34.5 ± 14.0 years, $p < 0.001$). The mean SNOT-22 score was

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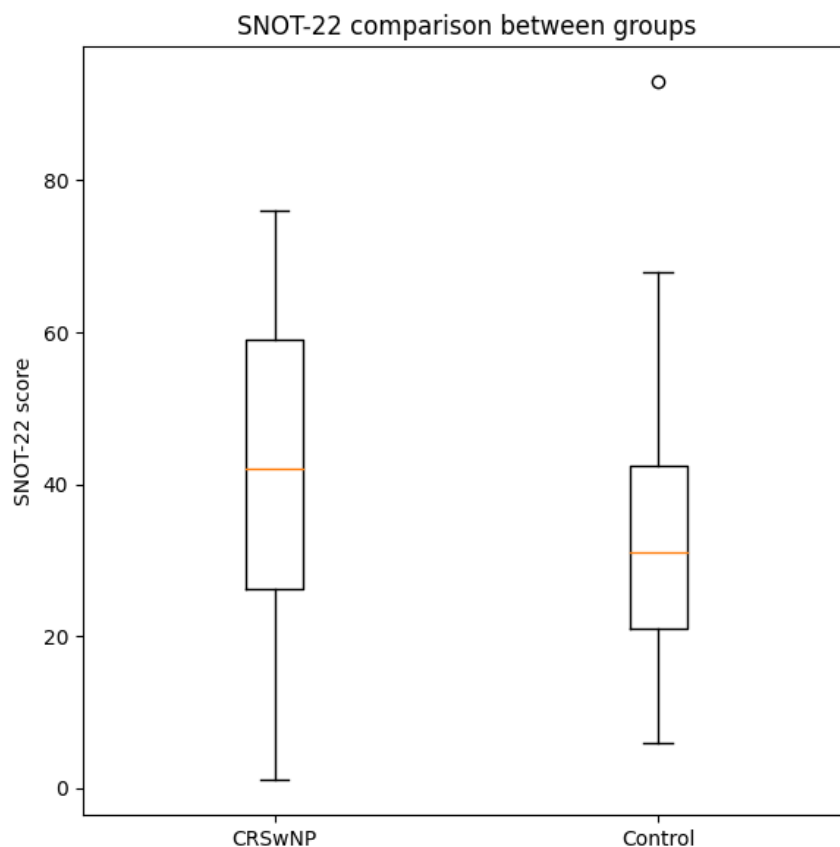
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significantly higher in the CRSwNP group compared to the control group (41.63 ± 19.72 vs 32.77 ± 18.59 , $p = 0.029$), indicating greater symptom severity and poorer quality of life. No significant difference in sex distribution was observed between groups ($p = 0.119$). These findings demonstrate a clear negative impact of nasal polypsis on patient-reported outcomes.

Conclusions CRSwNP is associated with significantly impaired quality of life compared with healthy individuals. The SNOT-22 questionnaire effectively differentiates affected patients from controls and represents a valuable tool for clinical assessment and treatment monitoring. Incorporating patient-reported outcome measures alongside routine clinical evaluation provides a more comprehensive understanding of disease burden.





EP104

ENDOSCOPIC DENKER APPROACH AND SINONASAL BIOPSY: CRITICAL TOOLS FOR THE DIAGNOSIS OF RARE HIGH-GRADE B-CELL MALIGNANCIES

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¹Other

INTRODUCTION High-grade B-cell lymphomas, such as intravascular B-cell Lymphoma (IVLBCL) and Burkitt Lymphoma (BL), are rare malignancies that often mimic inflammatory sinonasal disease. Differentiating these aggressive malignancies from chronic rhinosinusitis through endoscopic evaluation and precise tissue sampling is crucial for survival.

MATERIAL AND METHOD SWe describe two cases where endoscopic intervention was definitive for diagnosis: Case 1: A 57-year-old patient initially managed for chronic rhinosinusitis with polyposis. Following the development of neurological symptoms (myoclonic encephatopathy), an endoscopic-guided biopsy of the sinonasal mucosa revealed IVLBCL within the capillary lumina. Case 2: A 79-year-old male with refractory trigeminal neuralgia. MRI showed and extensive mass (6x4 cm) involving the left masticator space, extending to the nasopharynx, pterygoid muscles and the skull base (clivus, cavernous sinus and temporal lobe). Endoscopic Denker approach was performed after maxillary artery embolization. This expanded endoscopic technique allowed for adequate debulking and tissue sampling of the pterygoid and parapharyngeal regions, confirming Burkitt Lymphoma.

RESULTS Endoscopic approaches provided sufficient tissue for a complex immunohistochemical diagnosis in both cases. While Case 1 achieved disease control through chemotherapy, Case 2 showed the high mortality of late-stage BL despite successful surgical sampling.

CONCLUSIONS These cases highlight that Endoscopic Sinus Surgery (ESS) is not only therapeutic but a vital diagnostic pillar. For the rhinologist, maintaining a high index of suspicion in atypical cases of chronic rhinosinusitis and mastering expanded approaches (such as the Endoscopic Denker) are essential for the early diagnosis of high-grade malignancies that debut with sinonasal or skull base symptoms.



EP105

EXTENDED TRANSSPHENOIDAL APPROACH FOR OPTIC CANAL MENINGIOMA

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Introduction Optic nerve sheath meningiomas are rare tumors, representing 1-2% of all meningiomas. If left untreated, they can lead to total vision loss. Transsphenoidal endoscopic approaches help improve morbidity.

Materials and Methods We present a case of a patient who presented with a two-month history of visual acuity loss. Magnetic resonance imaging revealed a meningioma in the optic canal at the transition between the canalicular and prechiasmatic segments.

Results Extended transsphenoidal nasal endoscopic surgery was performed to achieve complete tumor resection and preservation of adjacent essential structures (optic nerve, ophthalmic artery). After one year, the patient has recovered her vision and is completely disease-free.

Conclusions Transsphenoidal endonasal approaches offer the possibility of cure with minimal morbidity.



EP106

RECONSTRUCTION OF THE SELLAR REGION POST-ENDONASAL TUMOR EXCISION: INSIGHTS FROM A 95-PATIENT COHORT

Dr. Jay Kothari¹, Nishit Shah¹

¹Other

Introduction: Effective reconstruction of Sellar region following endonasal tumor excision is essential to prevent postoperative CSF leaks and related complications. This study evaluates reconstruction strategies and clinical outcomes in a consecutive patient series.

Methods: 95 patients undergoing trans nasal endoscopic surgery for Sellar tumors were reviewed. Demographic data, intraoperative CSF leak status, and reconstruction techniques were documented. Postoperative endoscopic assessments were performed for 6 weeks to evaluate healing and flap viability. Categorical variables—including CSF leak status, reconstruction method, tumor type, and postoperative complications—were summarized as frequencies and percentages. Group comparisons were performed using Chi-square test or Fisher's exact test. Complication rates were reported with 95% confidence intervals. Statistical significance was defined as $p < 0.05$.

Results: Of the 95 patients, 64 had no intraoperative CSF leak and 31 had a leak. In the non-leak group, only rescue flaps were raised in 45 cases and reconstruction done with different materials, pedicled Naso septal flaps in 18, and free repair like, fascia in 1 case. In patients with intraoperative leaks, pedicled Naso septal flaps were used in 29 cases and free repair in 2 cases. Postoperatively, 2 patients developed CSF leaks and 1 developed meningitis. No flap necrosis was observed. **Conclusion:** Pedicled Naso septal flap proved highly reliable for Sellar reconstruction, particularly in the presence of intraoperative CSF leak. Different reconstruction materials and fascia served as effective alternatives when appropriately selected. The overall complication rate was low, indicating that individualized reconstruction strategies support favourable surgical outcomes.



EP107

NOVEL USE OF RESIDUAL INFERIOR TURBINATE LATERAL MUCOSA FOR DONOR SITE RECONSTRUCTION FOLLOWING LATERAL NASAL WALL FLAP IN RECURRENT SPHENOID-SELLAR CEREBROSPINAL FLUID LEAK: A CASE REPORT

Dr. Jay Kothari¹, Nishit Shah¹

¹Other

Introduction Recurrent cerebrospinal fluid (CSF) leak following endoscopic transsphenoidal surgery poses a significant reconstructive challenge, particularly when the Hadad-Bassagasteguy nasoseptal flap is unavailable in revision cases. Lateral nasal wall flaps are reliable alternatives; however, donor site morbidity due to exposed lateral nasal wall bone remains underreported. We describe a novel technique utilizing residual inferior turbinate lateral mucosa to reconstruct the donor site after harvesting a lateral nasal wall inferior turbinate flap. **Case study** A 61-year-old male presented with persistent CSF rhinorrhea following endoscopic transsphenoidal pituitary adenoma excision and three failed repair attempts. Imaging confirmed a sphenoid-sellar defect. Multilayer skull base reconstruction was performed using autologous fat and fascia, followed by a lateral nasal wall inferior turbinate-based flap. The residual lateral mucosa of the inferior turbinate was mobilized and rotated to cover the exposed frontal process of the maxilla at the donor site.

Result The patient had complete resolution of CSF leak without the need for lumbar drainage. Endoscopic follow-up at 1 week, 1 month, and 3 months demonstrated a well-vascularized skull base flap and complete mucosalization of the donor site. There were no complications such as crusting, synechiae, infection, or flap necrosis.

Conclusion The lateral nasal wall inferior turbinate flap is an effective option in revision skull base reconstruction. Use of residual inferior turbinate lateral mucosa for donor site coverage is a simple, reproducible technique that minimizes raw bone exposure, enhances healing, and adds no additional morbidity. This novel modification may improve postoperative outcomes in inferior turbinate-based skull base reconstruction.



EP108

CLINICAL OUTCOMES AFTER TEZEPelumab CESSATION FOLLOWING 52 WEEKS OF TREATMENT IN ADULTS WITH SEVERE CRSWNP

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Introduction In the phase 3 WAYPOINT study (NCT04851964) of adults with severe chronic rhinosinusitis with nasal polyps (CRSwNP), tezepelumab significantly reduced nasal polyp (NP) size, nasal congestion and need for NP surgery or systemic corticosteroids, and improved patient-reported sino-nasal symptoms over 52 weeks versus placebo. This WAYPOINT analysis assessed the effects of tezepelumab following treatment cessation.

Methods Adults with severe CRSwNP were randomized (1:1) to tezepelumab 210 mg or placebo subcutaneously every 4 weeks for 52 weeks (last dose: week 48). The first 200 participants who completed the study could enrol in a 24-week off-treatment extended follow-up. Change from baseline in total nasal polyp score (NPS), biweekly mean nasal congestion score (NCS), SNOT-22 score and University of Pennsylvania Smell Identification Test (UPSIT) score were assessed.

Results Overall, 163 patients (tezepelumab, n=90; placebo, n=73) entered the off-treatment extended follow-up. From week 52, tezepelumab-associated improvements in NPS and NCS gradually

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decreased, but did not reach levels observed for placebo recipients at week 76 (24 weeks after treatment cessation/28 weeks after last dose). Additionally, at week 76, the LS mean (SE) change from baseline in SNOT-22 score was -38.7 (2.8) for tezepelumab and -13.7 (3.2) for placebo, while the UPSIT score was 6.3 (1.0) and -0.3 (1.1), respectively. Conclusion This analysis highlights the benefits of continued tezepelumab treatment in CRSwNP management versus stopping treatment after 52 weeks. The extension of treatment effects through 24 weeks after treatment cessation underscores the efficacy in reducing CRSwNP severity and symptoms by blocking TSLP activity with tezepelumab. Funding This study was funded by AstraZeneca and Amgen Inc.



EP109

TEZEPelumab INCREASES PROBABILITY OF SNOT-22 LOW DISEASE SEVERITY SCORES AMONG PATIENTS WITH CRSWNP (WAYPOINT)

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Introduction: Tezepelumab significantly improved outcomes versus placebo in adults with uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP) in the phase 3 WAYPOINT study (NCT04851964). This post hoc analysis evaluated the proportion of patients achieving low disease activity based on validated Sinonasal Outcome Test-22 (SNOT-22) thresholds.

Methods: Participants were randomized (1:1) to tezepelumab 210 mg or placebo subcutaneously every 4 weeks for 52 weeks. SNOT-22 score thresholds were 8–20 for mild, > 20 to 50 for moderate, and > 50 for severe disease. Odds ratios [ORs] were calculated for the odds of achieving a threshold for tezepelumab versus placebo recipients.

Results: At baseline, all participants had moderate (tezepelumab: n=36/203, 17.7%; placebo: n=38/205, 18.5%) or severe disease (tezepelumab: n=167/203, 82.3%; placebo: n=167/205, 81.5%). For tezepelumab versus placebo groups at week 52, 8 (3.9%) versus 0 patients had a SNOT-22 score of 0 (asymptomatic; OR not calculable); 51 (25.1%) versus 12 (5.9%) had a score <8 (very mild; OR: 8.49 [95% CI: 3.76–19.19]); 100 (49.3%) versus 41 (20.0%) had a score of ≤20 (mild; OR: 5.93 [3.61–9.74]); and 170 (83.7%) versus 113 (55.1%) had a score ≤50 (non-severe; OR: 9.97 [5.28–18.83]). In the subgroup with severe disease (SNOT-22 score > 50) at baseline, 78 (46.7%) tezepelumab recipients versus 30 (18.0%) of placebo recipients had a score ≤20 at week 52 (OR: 5.66 [3.25–9.87]).

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Conclusions: Tezepelumab treatment significantly reduced disease severity, with increased proportions and odds of patients achieving low disease activity based on SNOT-22 scores versus placebo in adults with uncontrolled CRSwNP.

Funding This study was funded by AstraZeneca and Amgen Inc.



EP110

EFFICACY OF TEZEPelumab IN NORTH AMERICAN AND EUROPEAN PATIENTS WITH CRSWNP, OVERALL AND BY HISTORY OF NASAL POLYP SURGERY: RESULTS FROM THE WAYPOINT STUDY

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Rationale: Tezepelumab significantly improved sinonasal outcomes versus placebo in adults with chronic rhinosinusitis with nasal polyps (CRSwNP) in WAYPOINT (NCT04851964). This post hoc analysis assessed efficacy in patients from North America and Europe overall and by prior nasal polyp (NP) surgery, given the geographic variation in type 2 inflammation in CRSwNP between Western and Asian populations. **Methods:** Adults with uncontrolled CRSwNP received tezepelumab 210 mg or placebo subcutaneously every 4 weeks for 52 weeks; patients from North America or Europe were included. Key outcomes included change from baseline to week 52 in total NP score (NPS), biweekly mean nasal congestion score (NCS), Sinonasal Outcome Test-22 (SNOT-22) score, and biweekly mean patient-reported loss of smell score. **Results:** Overall, 312 patients received tezepelumab (n=157) and placebo (n=155), of whom 72.6% (n=114) and 74.2% (n=115), respectively, had prior NP surgery. At week 52, significant improvements were observed in patients overall and among those with and without prior surgery in total NPS (least-squares mean change [95% CI]: overall, -2.20 [-2.57, -1.84]; with, -2.38 [-2.80, -1.95]; without, -1.71 [-2.41, -1.01]), biweekly mean NCS (overall, -1.17 [-1.36, -0.97]; with, -1.32 [-1.55, -1.09]; without, -0.74 [-1.11, -0.38]), SNOT-22 score (overall, -30.37 [-36.21, -24.53]; with, -33.19 [-40.02, -26.37]; without, -22.57 [-33.88, -11.25]), and loss of smell

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score (overall, -1.16 [-1.36 , -0.96]; with, -1.25 [-1.48 , -1.01]; without, -0.91 [-1.30 , -0.53]).

Conclusions: Tezepelumab was highly efficacious overall and in those with and without prior NP surgery history; these findings provide specific estimates for patients in North America and Europe. Funding This study was funded by AstraZeneca and Amgen Inc.



EP112

ENDOSCOPIC REPAIR OF ANTERIOR NASAL SEPTAL PERFORATION USING THE BOOT-ON-DONUT FLAP TECHNIQUE: A CASE REPORT

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Background: Nasal septal perforation is an uncommon clinical entity with diverse etiologies including traumatic, iatrogenic, inflammatory, infectious, and substance abuse-related causes. Symptomatic perforations warrant surgical intervention when conservative management fails. We report the successful endoscopic repair of an anterior septal perforation using the boot-on-donut flap technique in a patient with a history of intranasal cocaine abuse.

Case Presentation: A 45-year-old male presented with a two-year history of nasal pain and intermittent malodorous discharge following remote intranasal cocaine use. Endoscopic examination revealed a 1.7 × 2.0 cm anterior septal perforation. The patient underwent endoscopic repair employing the boot-on-donut flap technique, which combines circumferential mucosal advancement with a posteriorly based supplementary flap. Complete closure was achieved without interposition grafts. At three-month follow-up, the patient remained asymptomatic with complete resolution of symptoms and no evidence of re-perforation.

Conclusion: This case demonstrates that endoscopic repair using the boot-on-donut flap technique represents a safe and effective option for anterior, moderate-sized nasal septal perforations. The technique enables tension-free closure using well-vascularized local mucosal tissue while preserving structural integrity and avoiding external incisions.



EP113

DEVELOPMENT OF A CNS-LED MULTIDISCIPLINARY CLINIC FOR SPONTANEOUS CEREBROSPINAL FLUID RHINORRHOEA: IMPLEMENTING INTERNATIONAL CONSENSUS STANDARDS

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Background: Spontaneous cerebrospinal fluid (CSF) rhinorrhoea results from chronically elevated intracranial pressure (ICP), most commonly idiopathic intracranial hypertension (IIH), but also obstructive sleep apnoea, renal failure, chronic anaemia and other causes of raised ICP. The 2021 International Consensus Statement on Spontaneous CSF Rhinorrhoea (50 consensus recommendations) emphasised early diagnosis, standardised imaging protocols, prompt surgical defect closure and assessment of underlying ICP elevation within a coordinated care pathway [1]. Despite this guidance, fragmented care pathways result in diagnostic delays, inadequate ICP management and recurrence rates exceeding 10–15% in some series [2,3]. Delayed diagnosis increases meningitis risk, with up to 33% of patients presenting with intracranial infection [4].

Aim: To develop and implement an ENT-led, CNS-coordinated clinic aligned with international consensus recommendations, integrating ad hoc multidisciplinary input to standardise care, reduce recurrence, and improve patient outcomes.

Methods: A structured pathway was established with a core team of ENT skull base surgeon and dedicated Clinical Nurse Specialist (CNS), supported by ad hoc input from neurosurgery, neuro-ophthalmology and neuroradiology as clinically indicated. Standardised protocols include thin-slice CT and high-resolution MRI with CISS/FLAIR sequences [1], comprehensive assessment of ICP elevation (including lumbar puncture opening pressure, screening for obstructive sleep apnoea, renal function and haematological assessment), ophthalmologic evaluation, vaccination (pneumococcal/meningococcal), weight

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management referral and structured long-term surveillance. Early endoscopic repair is prioritised, with contemporaneous ICP control through medical therapy, CPAP, or CSF diversion when indicated [5,6]. The CNS coordinates triage, imaging, multidisciplinary liaison, vaccination, perioperative care, patient education and longitudinal follow-up. A prospective registry captures recurrence, visual outcomes, BMI trends, and patient-reported outcomes. Expected

Outcomes: The service aims to reduce time-to-surgery to <4 weeks, achieve universal assessment of ICP elevation causes (100%), lower 2-year recurrence rates to <5% (versus 10–15% in standard care) [2,3], improve vaccination compliance (>95%), and reduce meningitis incidence and emergency admissions.

Conclusion: This ENT-CNS core model with flexible multidisciplinary input translates international consensus guidance into a reproducible, evidence-based care pathway with measurable quality indicators, offering a pragmatic template for wider adoption. References:[1] Georgalas C, Oostra A, Ahmed S, et al. International Consensus Statement: Spontaneous Cerebrospinal Fluid Rhinorrhea. *Int Forum Allergy Rhinol*. 2021;11(4):1-XX. doi:10.1002/alr.22704[2]Soliman AY, Ebeid K, Abu Elfadle A. Recurrent spontaneous CSF rhinorrhoea: combined endo-nasal endoscopic repair with lumbo-peritoneal shunt insertion. *Egypt J Neurol Psychiatry Neurosurg*. 2021;57:298. doi:10.1186/S41983-021-00298-0[3]Cave T, Marino MJ, Lal D, et al. Surgical Management of Spontaneous Cerebrospinal Fluid Rhinorrhea. *Contemp Neurosurg*. 2022;44(11). doi:10.1097/01.CNE.0000902656.27844.bd[4] Englhard AS, Volgger V, Leunig A, et al. Spontaneous nasal cerebrospinal fluid leaks: management of 24 patients over 11 years. *Eur Arch Otorhinolaryngol*. 2018;275(9):2487-2494. doi:10.1007/S00405-018-5089-Y[5] Ghalae



EP115

SINGLE-STAGE ENDOSCOPIC ENDONASAL MANAGEMENT OF A GIANT FRONTAL BRAIN ABSCESS SECONDARY TO POST-TRAUMATIC MENINGOENCEPHALOCELE

Ana Luiza De Bortoli De Paula¹, Leonardo Lopes Balsalobre¹, Beatriz Sperini¹, Gustavo Wagner Baratti Rocha², Alex Ribeiro Romero³, João Oliveira de Lima Neto³, Valentina Cunali Tobar Stávale Joaquim⁴, Marcos Augusto Stávale Joaquim⁵

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Introduction (Background & Aim) Anterior skull base trauma may lead to progressive osteodural defects, predisposing to post-traumatic meningoencephaloceles and intracranial infection through contiguous spread. We report a case of a giant frontal brain abscess secondary to a post-traumatic meningoencephalocele successfully managed through an endoscopic endonasal transtethmoidal corridor.

Material & Methods (Case Study) A 71-year-old male with a history of remote mild craniofacial trauma developed chronic rhinosinusitis adjacent to a prior ethmoidal fracture and a contrast-enhancing lesion at the frontal lobe base. Within 15 days, rapid clinical and radiological progression revealed a giant frontal abscess with ventricular proximity. Endoscopic endonasal surgery with neuronavigation guidance was performed. The procedure included resection of the meningoencephalocele, identification of the skull base defect, ultrasonic aspiration of purulent content, and multilayer reconstruction using a vascularized pedicled nasoseptal flap. Capsulectomy was avoided due to proximity to eloquent cortex.

Results Complete abscess evacuation was achieved without the need for transcranial craniotomy. No postoperative cerebrospinal fluid leak occurred. The patient underwent prolonged targeted antibiotic therapy, with favorable clinical and radiological evolution on serial imaging.

Conclusions Although frontal craniotomy could have been performed for abscess drainage, the endoscopic endonasal approach proved to be a viable alternative. This corridor allowed direct access to the intracranial pathology while enabling simultaneous management of sinonasal disease and definitive skull base reconstruction within the same surgical stage. In carefully selected cases, this approach may

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represent an effective alternative to traditional transcranial surgery. Neuronavigation was a valuable adjunct for surgical planning and intraoperative accuracy.



EP116

COMBINED TRANSORBITAL NEUROENDOSCOPIC SURGERY (TONES) AND CAROLYN'S WINDOW APPROACH FOR RESECTION OF DEEP ORBITAL DERMOID CYST

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Introduction: We report a case of an infected, ruptured superior orbital dermoid cyst managed using a combined transorbital neuroendoscopic surgery (TONES) approach and the Carolyn's window technique. This minimally invasive strategy enabled complete excision while addressing the diagnostic and anatomical challenges posed by the lesion. A brief literature review is presented.

Materials and Methods: A 77-year-old man presented with a two-week history of a right upper eyelid mass associated with inferior globe displacement. Imaging demonstrated a rim-enhancing lesion consistent with a ruptured orbital dermoid cyst in the superomedial extraconal space, extending medially into the frontal sinus. There were contiguous rim-enhancing collections in the right lateral canthal pre-septal space consistent with secondary orbital abscesses. After intravenous antibiotics and initial drainage via exploratory anterior orbitotomy, definitive resection was performed using a combined TONES and Carolyn's Window approach by a joint Ophthalmology-Otolaryngology team.

Results: An anterior orbitotomy was performed via the superior eyelid crease. Access to the cyst was limited due to the orbital roof concavity posterior to the superior orbital rim. Hence, TONES was performed via the orbitotomy to provide visualization and access to excise the main body of the cyst. Its frontal sinus extension was excised via endoscopic sinus surgery (ESS) utilizing the Carolyn's window technique.

Conclusions: TONES is an effective technique when access and visualization of the skull base are limited, particularly within the deep orbital cavity. Appropriate, adjunctive ESS should be considered when addressing deeper extensions into the paranasal sinuses. A multidisciplinary approach integrating complementary surgical expertise is invaluable in the management of complex orbital-sinonasal pathology.



EP117

BILATERAL SPONTANEOUS OTORRHEA: CLINICAL FEATURES, DIAGNOSTIC CHALLENGES, AND MANAGEMENT - A CASE-BASED SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND: Bilateral spontaneous otorrhea, characterized by unprovoked cerebrospinal fluid (CSF)-leakage from both external auditory canals, constitutes a rare and clinically challenging condition. Owing to its low incidence, the existing literature lacks a comprehensive overview of underlying etiologies, optimal diagnostic pathways, and management strategies. This study presents an illustrative case alongside a systematic review of the literature addressing current evidence and clinical experience related to this uncommon condition.

METHODS: In addition to our institutional experience with a case of bilateral spontaneous CSF-otorrhea, a PRISMA-guided systematic review across multiple databases was conducted to identify studies on bilateral, spontaneous CSF-otorrhea. Data on epidemiology, anatomical localization, surgical approaches and outcomes were collected and comparatively analyzed following quality assessment using the GRADE framework.

RESULTS: We report the case of a 60-year-old woman who presented with unprovoked bilateral middle ear effusion and hearing loss. Following tympanostomy tube placement, the patient developed continuous bilateral fluid discharge. Initial imaging demonstrated bilateral chronic mastoiditis, left-predominant, without evidence of skull base defects. Despite unilateral mastoidectomy, symptoms persisted. Subsequent beta-trace protein testing and CT cisternography suspected bilateral tegmen tympani defects, confirming bilateral spontaneous CSF-otorrhea with early intracranial hypotension. The patient was referred to our department and underwent staged bilateral repair via a middle fossa approach, leading to improvement of intracranial hypotension-related symptoms, with persistent hearing loss, chronic mastoiditis, and right-sided otorrhea at early follow-up. Out of 74

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Publications, eight case reports published between 2003 and 2025 met the inclusion criteria. Including the present case, five patients (3 males, 2 females; mean age 65 years) with bilateral spontaneous CSF-otorrhea were ultimately deemed eligible. Conductive hearing loss was a common presenting symptom, neurological symptoms were infrequent, and tegmen defects were reported in all cases. Surgical repair most commonly involved a middle fossa approach, alone or combined with a transmastoid approach, using various closure materials.

CONCLUSION: Spontaneous bilateral otorrhea represents a rare and demanding condition in skull base surgery, requiring a high index of clinical suspicion. This review underscores the importance of early CSF-specific testing, targeted radiological assessment for CSF-leakage, and an individualized, multidisciplinary surgical management strategy to optimize diagnostic accuracy and treatment outcomes.



EP118

ENDOSCOPIC THIRD VENTRICULOSTOMY AND POST-OPERATIVE FAILURE IN ADULTS: A SINGLE-CENTER 5-YEAR EXPERIENCE

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Introduction: Endoscopic third ventriculostomy (ETV) is a minimally invasive neurosurgical procedure used to treat mostly obstructive and selected cases of communicating hydrocephalus. Though ETV has been proved to be effective, there is a post-operative failure rate up to 25.3% in adult populations. Thus, the careful candidate selection is of grave importance. The aim of this study was to review our department's experience and identify the ETV failure cases and their risk factors.

Material-Methods: This was a retrospective study of our department's database, covering a period of 5 years (01/2020-12/2025). Only adult patients with hydrocephalus that treated with ETV in our department were included. All patients underwent pre-operative and post-operative MR imaging of their brain including FIESTA and/or CISS sequences when available. The ETV Success Score (ETVSS) for adults was calculated in all cases. The diagnosis of ETV failure was based on clinical and imaging presentation.

Results: 11 patients were included in the study with a mean age of 52.6 years. Most of them were diagnosed with obstructive hydrocephalus caused by aqueduct stenosis (63.6%). The mean ETVSS was 84.5. The mean post-operative follow-up was 38,7 months. The failure rate was 9,1% with only one case need a second operation to place a ventricular-peritoneal shunt (V-P shunt) at the 7th post-operative day due to failure of the stoma.

Conclusion: ETV can be an effective and safe treatment of hydrocephalus, but the careful patient selection is critical. The etiology of hydrocephalus, the surgeons' experience and the history of previous shunting have been shown to influence the success rates of ETV.



EP119

COMPLEX CO-PRESENTATION OF CYSTIC FIBROSIS, NASAL POLYPOSIS, AND CLEFT PALATE: A CASE REPORT

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Introduction Cystic fibrosis (CF) is a genetic disorder marked by the production of thick, sticky mucus that leads to severe respiratory and gastrointestinal complications. Chronic sinusitis (CS), with or without nasal polyps (NPs), is nearly universal in CF patients, and NPs are often the presenting symptom. The combination of CF, nasal polyps, and cleft palate presents a unique and challenging scenario for treatment.

Case Study This report details the case of a 24-year-old patient diagnosed with CF, nasal polyps, and cleft palate. The patient experienced chronic rhinosinusitis with nasal polyposis, which severely impacted her quality of life and respiratory function. Despite previous treatment in childhood, the recurrence of the cleft palate further complicated the patient's condition, leading to recurrent sinus infections and difficulties in maintaining adequate respiratory control.

Results After careful preoperative preparation, including control of respiratory function and detailed anatomical mapping of the nose and paranasal sinuses using computed tomography, functional endoscopic surgery was performed. The oronasal communication was not restored due to concerns about further insufficiency of the palate from prior unsuccessful surgery during childhood. The postoperative course proceeded as expected, and the patient remains under close follow-up.

Conclusion Surgical intervention was utilized to address the nasal polyps and improve sinus drainage. The patient's cleft palate was managed with a multidisciplinary approach involving otolaryngologists, pulmonologists, and speech therapists to ensure comprehensive care. Management strategies included a combination of airway clearance techniques, nebulized antibiotics, and corticosteroids to control inflammation and infection. This case underscores the importance of a tailored treatment plan for patients with CF and associated comorbidities.



EP120

SURGICAL STRATEGIES AND FUNCTIONAL OUTCOMES IN THE MANAGEMENT OF CRANIOPHARYNGIOMAS: A FIVE-YEAR EXPERIENCE WITH ENDOSCOPIC TRANSNASAL, TRANSCRANIAL, AND COMBINED APPROACHES

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Background: The expanding role of endoscopic surgery in the management of craniopharyngiomas allows tailored approaches aimed not only at tumor control but also at preservation of visual and endocrinological function, particularly in lesions involving the optic apparatus and pituitary region. **Material & Methods:** We retrospectively reviewed 26 patients treated over a five-year period for craniopharyngiomas using endoscopic transnasal (n=10), transcranial (n=8), combined approaches (n=5) or endoscopic transcranial with or without ommaya reservoir placement (n=3). Surgical strategy was selected based on tumor location, extent, and neurovascular involvement. Surgical techniques, including exposure, tumor resection, and reconstruction, were analyzed. Functional outcomes focused on visual field deficits and endocrinological status assessed pre- and postoperatively.

Results: Endoscopic transnasal approaches were mainly applied to midline sellar and parasellar lesions, whereas transcranial and combined approaches were reserved for tumors with lateral or multicompartmental extension. Improvement or stabilization of visual function was achieved in most patients presenting with preoperative visual field deficits, particularly following effective optic apparatus decompression. Endocrinological outcomes varied according to tumor characteristics and extent of resection, with new postoperative hormonal deficits observed mainly in cases requiring extensive pituitary manipulation or combined approaches. Overall complication rates were acceptable.

Conclusions: An individualized skull base surgical strategy integrating endoscopic transnasal, transcranial, and combined approaches can

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achieve satisfactory functional outcomes. Careful technique selection is essential for optimizing visual and endocrinological preservation.



EP121

WHEN ACUTE RHINOSINUSITIS IS NOT "JUST" INFECTION: ETHMOIDAL FIBROUS DYSPLASIA AS AN UNDERLAYING CONDITION FOR PEDIATRIC ORBITAL ABSCESS

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¹Otorhinolaryngology Department, Unidade Local de Saúde Santa Maria, Lisbon, Portugal

Introduction: Sinonasal fibrous dysplasia (FD) is a rare fibro-osseous disorder where normal bone is replaced by fibrocellular tissue. It can compromise sinus drainage pathways through progressive narrowing of the osteomeatal unit. When acute rhinosinusitis occurs concomitantly, impaired sinus outflow may contribute to persistent symptoms and complications despite appropriate medical treatment and may render endoscopic intervention more challenging due to distorted anatomy.

Case Study: Pediatric case of acute rhinosinusitis complicated by orbital abscess in the setting of sinonasal FD

Results: A healthy 11-year-old male presented with right frontal headache, purulent rhinorrhea, progressive right periorbital edema, proptosis, conjunctival chemosis, and limited right eye movements. CT revealed acute rhinosinusitis complicated by a right superior orbital subperiosteal abscess and a calcified lesion in the right ethmoidal labyrinth suggestive of fibrous dysplasia. He was admitted for IV antibiotics and underwent external abscess drainage plus endoscopic sinus surgery (maxillary antrostomy, anterior ethmoidectomy, and Draf IIa). On postoperative day 4, worsening with decreased visual acuity prompted surgical revision with Draf III, right orbital decompression and excision of the dysplastic ethmoidal lesion. Histopathology confirmed FD. Visual acuity normalized the next day; at 3 months he remained asymptomatic without recurrence.

Conclusions: In complicated pediatric rhinosinusitis with orbital involvement and radiologic evidence of a fibro-osseous sinonasal lesion, surgical management should address the underlying pathology. In this case, excision of ethmoidal fibrous dysplasia was crucial to restore frontal sinus outflow, achieve adequate frontal sinus drainage, and eliminate a persistent infectious focus, enabling definitive resolution.



EP122

RETROMAXILLARY MUCOCELE: AN ATYPICAL PRESENTATION – CASE REPORT

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Background: Paranasal sinus mucocèles are benign, epithelium-lined, mucus-filled expansile lesions resulting from obstruction of sinus ostia and impaired mucociliary drainage. They most commonly involve the frontal and ethmoidal sinuses, whereas maxillary mucocèles account for approximately 10% of cases. Retromaxillary extension is rare and may radiologically simulate neoplastic disease due to progressive expansion and bone remodeling. We report an atypical case of retromaxillary mucocèle and emphasize its diagnostic considerations.

Case study: A female patient presented with a 10-year history of right-sided lancinating facial pain associated with clear rhinorrhea, anosmia, intermittent odynophagia, and unintentional 4-kg weight loss within one month. Medical history included type 2 diabetes mellitus, systemic arterial hypertension, and hypothyroidism. Physical examination was unremarkable. Computed tomography of the paranasal sinuses demonstrated a well-defined hypodense expansile lesion in the right maxilla measuring 3.0 × 2.9 cm, with smooth margins and bone remodeling without overt cortical destruction. A sinonasal schwannoma was initially suspected. The patient underwent endoscopic sinus surgery combined with a Caldwell–Luc approach. Intraoperatively, mucinous material originating from the retromaxillary region was identified and drained. Tissue samples were submitted for histopathological analysis. **Results:** Histopathological examination revealed sinonasal mucosa with chronic inflammatory infiltrate and fibrous thickening of the lamina propria, consistent with mucocèle. No evidence of dysplasia or malignancy was observed.

Conclusion: Retromaxillary mucocèle is an uncommon condition that may mimic aggressive pathology on imaging studies. Accurate radiologic interpretation and histopathological confirmation are

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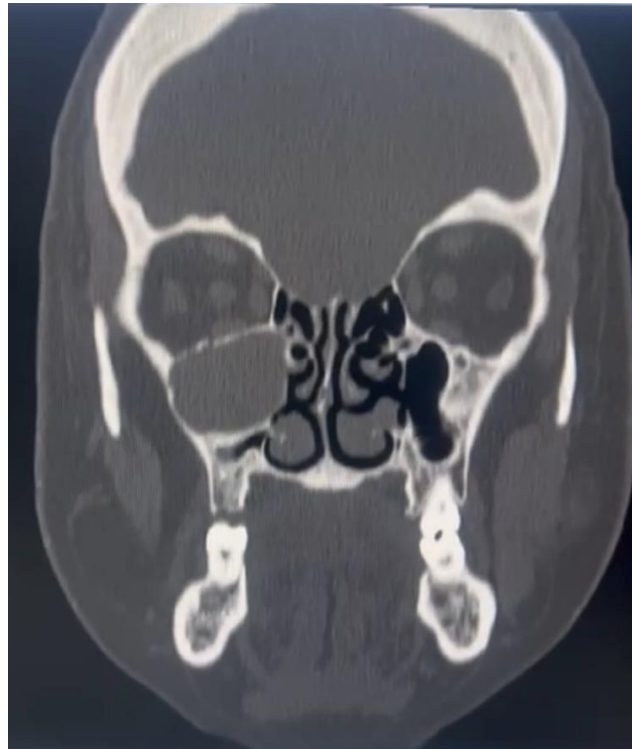


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essential to establish diagnosis and guide appropriate surgical management, preventing potential orbital or intracranial complications.





EP123

SINONASAL EXTRAMEDULLARY PLASMACYTOMA: CLINICAL FEATURES AND MANAGEMENT

David Farinha¹, Vitor Oliveira¹, Mariana Calha¹, César Silva¹, Maria José Lucas dos Santos¹, Rodrigo Serra-Franco¹, Rita Tomas², Francisco Martins², A. Nicolau Fernandes², Leonel Luís¹

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²Other

Background: Sinonasal extramedullary plasmacytoma (SN-EMP) is a rare plasma cell neoplasm characterised by monoclonal proliferation of plasma cells outside the bone marrow. The sinonasal region represents the most common site for extramedullary plasmacytoma, accounting for approximately 80% of head and neck cases. The condition predominantly affects males (male-to-female ratio 3:1) with a median age of 60-66 years. Common presenting symptoms include nasal obstruction, epistaxis, and rhinorrhoea. Diagnosis requires histopathological confirmation with immunohistochemical staining typically demonstrating CD38, CD138, and CD79a positivity, whilst CD20 and CD10 are negative. Critical to management is excluding systemic multiple myeloma through bone marrow examination, skeletal survey, and serum protein electrophoresis, as progression to multiple myeloma occurs in 11-35% of cases.

Methods: We conducted a retrospective review of six patients diagnosed with sinonasal extramedullary plasmacytoma.

Results: Six patients with histologically confirmed sinonasal plasmacytoma were included (66.7% male), with a mean age of 64.2 years (range 37-75). The most common primary sites were the nasal cavity (n=3), followed by the maxillary sinus (n=2) and sphenoid sinus (n=1). Presenting symptoms included nasal obstruction (n=2), facial pain (n=2), epistaxis (n=1), headache (n=1), and one incidental finding. Local bone invasion was observed in three cases, involving structures such as the clivus, skull base, carotid canal, orbit, and occipital bone. Three patients (50%) had associated multiple myeloma, including one with medullary involvement at diagnosis. All cases were classified as solitary plasmacytoma at the sinonasal site. Radiotherapy was administered in five patients (including one adjuvant setting), while two received systemic chemotherapy (VRD regimen) also. Endoscopic surgical

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resection was performed in two cases. During follow-up, five patients showed no evidence of recurrence, while one patient, who refused oncologic treatment, demonstrated persistent disease.

Conclusion: Sinonasal extramedullary plasmacytoma is an uncommon entity that should be considered in patients presenting with nonspecific sinonasal symptoms and locally aggressive lesions. Our series highlights the frequent need for thorough systemic evaluation, given the substantial association with multiple myeloma observed in our cohort. Radiotherapy remains the mainstay of treatment, with surgery reserved for selected cases, achieving favourable local control in most patients. Early diagnosis, multidisciplinary management, and close long-term surveillance are essential to optimise outcomes and to detect progression to systemic disease.



EP124

ANALYSIS OF COMPLICATIONS IN THE TREATMENT OF PITUITARY AND SKULL BASE TUMORS USING THE EXTENDED ENDOSCOPIC ENDONASAL APPROACH

Barbara Buchalska¹, Maria Maksymowicz², Wiesława Grajkowska¹, Tomasz Mandat¹, Jacek Kunicki¹

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Introduction The endoscopic endonasal approach is the most common method of treating parasellar tumors. It is safe and provides high resection effectiveness; however, it carries a risk of complications. The aim of this study was to analyze complications in patients operated using the extended endoscopic endonasal approach for pituitary and skull base tumors.

Material and methods This is a retrospective analysis of complications in a series of 296 patients treated with the extended endoscopic endonasal approach at the National Research Institute of Oncology between 2010 and 2024. Complications were observed in 146 patients (49.3%). The mean patient age was 51 years, and the mean follow-up period was 7 years (range: 0–16 years). **Results** The most common complications were transient diabetes insipidus, observed in 76 patients (25.7%), cerebrospinal fluid (CSF) leak in 31 patients (10.5%), and meningitis in 25 patients (8.4%). Other complications included SIADH (n=19; 6.4%), cranial nerve palsies (n=10; 3.4%), epistaxis (n=8; 2.7%), and strokes (n=3; 1.0%). Four cases of major vessel hemorrhage (1.4%) were observed, including 2 internal carotid artery (ICA) ruptures (0.7%). Three patients (1.0%) died in the immediate postoperative period. The highest complication rates were observed in patients with craniopharyngiomas (n=33/64; 51.6%) and tuberculum sellae meningiomas (n=32/66; 48.5%). **Conclusions** Severe complications, including CSF leak, ICA injury, or fatal outcomes, are rare, confirming the safety of this treatment method. The most frequently observed complication in extended endoscopic endonasal resections is transient diabetes insipidus.

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EP125

NON CANCEROUS SINONASAL LESIONS ERODING SKULL BASE, MIMICKING SKULL BASE MALIGNANCY

Mohamed Morsy¹

¹Other

This presentation aims to discuss different types of sinonasal lesions that can cause skull base erosion, mimicking skull base malignancy. This includes :- CRS with extensive polyps- Allergic fungal rhinosinusitis- Aute invasive fungal rhinosinusitis (mucor myosis)- Granulomatosis with polyangitis- Cholesterol granuloma- skull base osteomyelitis- IgG4 diseaseWe present different cases and examples of each of these diseases, mimicking skull base malignancy. The message is to to have a low threshold for the possibility of malignancy, but we should also keep in mind other possible differential diagnoses



EP126

SINONASAL EPITHELIAL-MYOEPITHELIAL CARCINOMA: A CASE REPORT

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Introduction: Epithelial-myoepithelial carcinoma (EMC) is a rare malignant neoplasm, accounting for approximately 1% of all salivary gland tumors. It is characterized histologically by a biphasic pattern composed of inner ductal epithelial cells surrounded by clear myoepithelial cells. Sinonasal involvement is exceptionally uncommon, with limited cases reported in the literature. Although generally considered a low- to intermediate-grade malignancy, EMC may demonstrate local aggressiveness and metastatic potential. We report a rare case of sinonasal EMC and discuss its clinicopathological and radiological features.

Case study: A patient presented with progressive right-sided nasal obstruction, recurrent epistaxis, hyposmia, and right maxillary facial pain. Physical examination revealed a hypervascularized, smooth lesion occupying the right nasal cavity. Computed tomography demonstrated a solid expansile mass with heterogeneous enhancement, involving the right nasal cavity, ethmoidal cells, nasal septum, and maxillary frontal process, with bone remodeling and focal erosion. Magnetic resonance imaging showed an isointense lesion on T1-weighted images and slightly hyperintense on T2, with diffuse contrast enhancement and mass effect without definitive orbital invasion. The initial radiologic hypothesis was esthesioneuroblastoma. Endoscopic surgical resection was performed with neurosurgical support.

Results: Histopathological analysis confirmed epithelial-myoepithelial carcinoma with compromised margins. Immunohistochemistry revealed focal smooth muscle actin positivity, CK7 positivity, p63 positivity, strong diffuse S100 expression, and Ki-67 index of 5%. The patient was referred for adjuvant radiotherapy.

Conclusion: Sinonasal EMC is an exceedingly rare entity that may mimic other malignant tumors radiologically. Definitive diagnosis relies on histopathological and immunohistochemical evaluation. Surgical resection remains the cornerstone of treatment, with adjuvant radiotherapy indicated in cases of close or positive margins.

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EP127

EXTENDED ENDOSCOPIC ENDONASAL APPROACH IN THE TREATMENT OF GIANT PITUITARY ADENOMAS

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Introduction Giant pituitary adenomas (GPAs) represent a significant surgical challenge. Owing to their size and anatomical complexity, GPAs frequently require extended endoscopic endonasal approaches. The aim of this study was to analyze the complications associated with the surgical management of GPAs using the extended endoscopic endonasal approach.

Material and methods This is a retrospective analysis of a series of 11 patients (3 women, 8 men) treated with the extended endoscopic endonasal approach for GPAs at the National Research Institute of Oncology between 2010 and 2022. They were chosen from 176 patients treated for GPAs with endoscopic endonasal approach (n=11/176; 6.3%). The mean patient age was 60 years, and the mean follow-up period was 5 years (range: 1–13 years).

Results Gross total resection was not achieved in any case; subtotal resection was performed in 10 patients (91%), and partial resection in 1 patient (9%). The majority of patients (n = 9; 82%) had invasive tumors, most commonly involving the diaphragma sellae and cavernous sinuses. The most frequent complication was transient diabetes insipidus, observed in 3 patients (27%), followed by hematoma and meningitis, each occurring in 2 patients (18%). Cerebrospinal fluid (CSF) leak was reported in 1 patient (9%), requiring reoperation. One patient (9%) died in the postoperative period due to intracerebral hemorrhage and hydrocephalus following tumor apoplexy.

Conclusions The extended endoscopic endonasal approach enables a satisfactory extent of resection in the management of GPAs with high anatomical complexity. The rate of serious complications is low.



EP128

SINONASAL ALVEOLAR RHABDOMYOSARCOMA WITH BREAST METASTASIS IN AN ADOLESCENT: CASE REPORT

Lucas Neves¹, Lauro Setton¹, Isaac Couto¹, Kamilla Correia¹, Lais Silva¹, Adilson Gomes Júnior¹

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Introduction: Rhabdomyosarcoma (RMS) is the most common soft tissue sarcoma in children and adolescents. The alveolar subtype is associated with a more aggressive clinical course, higher metastatic potential, and poorer prognosis, frequently linked to PAX3-FOXO1 translocation. Sinonasal involvement is uncommon and may present with nonspecific symptoms, often delaying diagnosis. Breast metastasis from RMS is rare, particularly in adolescents. We report a case of sinonasal alveolar rhabdomyosarcoma with secondary breast involvement. **Case Presentation:** A 14-year-old female presented with progressive right-sided nasal obstruction, contralateral facial hypoesthesia, and intermittent epistaxis. Clinical examination revealed inferior eyelid edema, hyperemia, proptosis, visual impairment, and oculomotor nerve palsy. Contrast-enhanced computed tomography demonstrated a lobulated solid mass involving the nasal cavity and ethmoidal cells, extending to the nasopharynx, maxillary sinus, and orbit, with bone destruction. Endoscopic biopsy was performed.

Results: Histopathological analysis revealed a malignant small round blue cell tumor, confirmed by immunohistochemistry as alveolar rhabdomyosarcoma, with positivity for myogenic markers. Systemic chemotherapy was initiated. During follow-up, the patient developed palpable nodules in the left breast. Ultrasound showed irregular hypoechoic lesions with Doppler vascularization. Biopsy confirmed metastatic rhabdomyosarcoma. Multimodal treatment was maintained.

Conclusion: Sinonasal alveolar rhabdomyosarcoma is an aggressive malignancy that may rapidly progress with orbital and distant metastatic involvement. Breast metastasis is rare but should be considered in adolescents with RMS. Early diagnosis through imaging and immunohistochemical confirmation is essential to guide multimodal therapy and improve clinical outcomes.

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EP129

FUNCTIONAL ENDOSCOPIC SINUS SURGERY EFFECT'S ON SLEEP QUALITY

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Introduction: Chronic rhinosinusitis (CRS) is a highly prevalent inflammatory condition of the paranasal sinuses that significantly impairs patients' quality of life. Beyond nasal obstruction, facial pressure, and olfactory dysfunction, sleep disturbance is increasingly recognized as a major comorbidity. Poor sleep quality in CRS patients is multifactorial, involving nasal blockage, inflammatory mediators, and possible interactions with sleep-disordered breathing. Functional Endoscopic Sinus Surgery (FESS) has been established as an effective treatment for medically refractory CRS, primarily improving sinonasal symptoms. However, its impact on sleep quality remains an area of growing scientific interest.

Materials and Methods: A prospective cohort study was conducted including adult patients with medically refractory CRS who underwent FESS. Sleep quality was assessed preoperatively and three months postoperatively using validated questionnaires, including the Pittsburgh Sleep Quality Index (PSQI), the Epworth Sleepiness Scale (ESS) and the Sinonasal Outcome Test-22 (SNOT-22), focusing on sleep-related items. Statistical analysis compared pre- and postoperative scores and examined correlations between symptom improvement and sleep quality changes.

Results: Postoperative analysis demonstrated a statistically significant improvement in global PSQI scores (mean reduction: 4.1 points, $p < 0.001$) and ESS scores (mean reduction: 3.2 points, $p < 0.01$). Improvements in sleep quality correlated positively with reductions in SNOT-22 scores. Patients with higher preoperative disease burden showed greater postoperative sleep improvement.

Conclusion: Patients demonstrated statistically significant improvement in overall PSQI and SNOT-22 sleep-related scores following FESS. Improvements in nasal obstruction and overall inflammatory burden were strongly associated with better sleep outcomes. FESS appears to significantly enhance sleep quality in CRS patients, highlighting the

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importance of addressing sleep disturbances as part of comprehensive CRS management. Further randomized studies are warranted to confirm long-term outcomes.

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EP130

MANAGEMENT OF FAR LATERAL FRONTAL SINUS LESIONS ; ENDOSCOPIC VERSUS EXTERNAL APPROACHES

Mohamed Morsy¹

¹Other

Far lateral frontal sinus lesions are very challenging to manage, including ; fibro-osseous diseases and osteomas, inverted papillomas, mucoceles and CSF leaks. The old dictum states that far lateral frontal sinus lesions lateral to mid-pupillary line require external approach. In this lecture , we present various endoscopic approaches to address far lateral frontal sinus lesions , including :- Draf 2 B with a superior septal window (Eloy 2 C)- Draf 3- Orbital transposition This includes their indications, limitations and when to consider external approaches in far lateral frontal sinus lesions



EP131

PRIMARY SYSTEMIC AMYLOIDOSIS INVOLVING THE NASAL CAVITY AND THE LARYNX : A CASE REPORT

Houda Chahed¹, Maha Mejbri¹, Mabrouk chamekh¹, wafa sleimi¹, Rihab Lahmar¹,
azza Mediouni¹, Mohamed Ben Amor¹, Najeh Beltaief¹
¹ENT department, la Rabta hospital, Tunis, Tunisia

Introduction: Amyloidosis is a disorder of protein folding in which various proteins aggregate into a highly abnormal fibrillar conformation. amyloidosis of the head and neck regions is rare and usually occurs in a localized form. It most commonly involves the larynx. In this case report we present a case of primary systemic amyloidosis involving both the nasal mucosa and the larynx.

Observation: A 62-year-old woman had left nasal obstruction, recurrent epistaxis and dysphonia. Flexible endoscopy concluded to a large expansile submucosal left nasal mass with bilateral hypertrophy of the ventricular folds of the larynx. Computed tomography concluded to a soft heterogeneous tissue mass arising from the floor of the left nasal cavity with submucosal deposition of calcification. In addition, there was an irregular hypodense glottic and supraglottic laryngeal thickening extending to the paralaryngeal space. Nasal endoscopy and biopsy evoked the diagnosis of amyloidosis. Endoscopic sinus surgery was performed with total removal of the nasal tumor. In the same time, the patient underwent a suspended microlaryngoscopy with bilateral ventricular tumor removal. Pathology revealed fibrocollagenous tissue with calcifications that were positive on Congo red staining. A systemic workup for additional amyloid deposits revealed a splenic involvement concluding to primary systemic amyloidosis. The patient was referred to the internal medicine department for further investigations and management.

Conclusion: Systemic amyloidosis rarely involves the head and neck region and specially the nasal mucosa. Although it is rare, nasal amyloidosis should be considered nasal obstruction and epistaxis, which are the main symptoms of nasopharyngeal carcinoma.



EP132

NASAL MYIASIS IN AN IMMUNOCOMPETENT INDIVIDUAL

Maha Mejbri¹, Youssef Makhoulf¹, azza Mediouni¹, Rihab Lahmar¹, Houda Chahed¹,
Ben Amor Mohamed¹, Najeh Beltaief¹

¹ENT department, la Rabta hospital, Tunis, Tunisia

Introduction: Nasal myiasis is one type of cavitary myiasis, a rare parasitic infestation caused by dipteran larvae. It usually occurs following exposure to infected livestock and is more frequently reported in rural settings. Although often described in debilitated or immunocompromised individuals, it may also occur in healthy patients. Clinical presentation consists of non specific rhinological symptoms.

Case Presentation: We report the case of a 30-year-old immunocompetent woman in a rural setting, with no prior history, who presented to the ENT emergency department with an acute bilateral nasal obstruction and a foreign body sensation. She reported recent exposure to animal nasal secretions. Anterior rhinoscopy demonstrated multiple small motile larvae within both nasal fossae. Laboratory investigations were normal, including eosinophil count. The patient underwent endoscopic removal of the larvae which occupied both nasal cavities, extending to the nasopharynx. Isotonic saline irrigation and careful manual extraction were performed. The patient was subsequently referred to the pulmonology department for flexible bronchoscopy to exclude lower airway involvement. In the absence of tissue invasion and given the self-limiting life cycle of *Oestrus ovis* in humans, systemic antiparasitic therapy was withheld after multidisciplinary discussion with infectious disease specialists.

Conclusion: Nasal myiasis can occur in immunocompetent individuals and should be suspected in cases of acute nasal obstruction following animal exposure. Prompt endoscopic removal is necessary to avoid complications such as cellulitis, perforation of nasal septum, orbital and pharyngeal inflammation.



EP133

MULTIPLE TEMPORAL BONE OSTEODURAL DEFECTS ASSOCIATED WITH SUPERIOR SEMICIRCULAR CANAL DEHISCENCE: A RARE CHALLENGING PRESENTATION

Imen Zoghalmi¹, E. Rejeb¹, E. Dridi¹, O. Tilouch¹, D. Chiboub¹, S. Nefzaoui¹, N. Romdhane¹, I. Hriga¹, C. Mbarek¹
¹Habib Thameur Hospital

Introduction: Cerebrospinal fluid (CSF) leaks of the temporal bone are increasingly recognized as a distinct clinicoradiological entity. They typically result from osteodural defects involving the tegmen tympani or mastoid roof and may lead to meningoencephaloceles and severe complications such as meningitis. Associations with other skull base abnormalities have been described, although their underlying mechanisms remain poorly understood. Coexistence with superior semicircular canal dehiscence syndrome (SSCDS) is exceptionally rare. This report describes a rare case of this association and highlights its diagnostic complexity and radiological features.

Case presentation: A 57-year-old obese woman (BMI 30.2) with a history of remote head trauma presented with right-sided clear rhinorrhea exacerbated by the Valsalva maneuver. Symptoms included pulsatile tinnitus, fluctuating hearing loss, vertigo, and autophony. Clinical and neurological examinations were unremarkable, except for bilateral dull tympanic membranes on otoscopy. Nasal endoscopy was normal. Audiometry demonstrated normal bilateral hearing. High-resolution CT and MRI of the temporal bones revealed multiple bilateral defects of the tegmen tympani and mastoid roof, associated with bilateral meningoencephaloceles, along with left-sided superior semicircular canal dehiscence. No anterior skull base defect was identified. MRI also showed indirect signs of intracranial hypertension. Measured intracranial pressure was 19 mmH₂O, and fundoscopic examination revealed no papilledema. Despite insufficient middle ear fluid for β 2-transferrin analysis, the diagnosis was retained based on clinical and radiological findings. Preventive vaccination was administered, and the patient was referred for neurosurgical repair.

Conclusion: Most reported cases are unilateral and surgically managed, whereas bilateral and multiple defects are rare, particularly when

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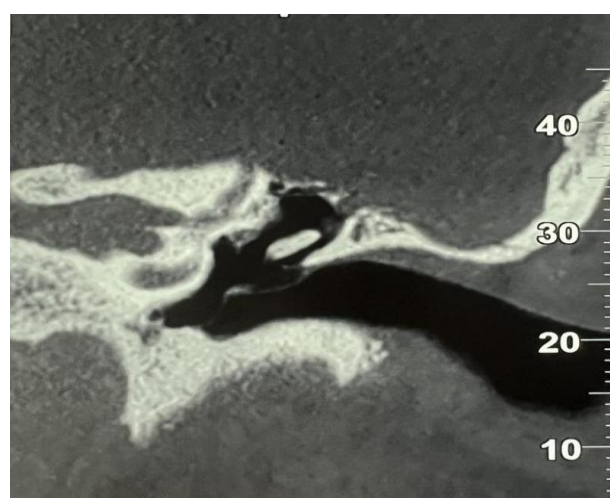
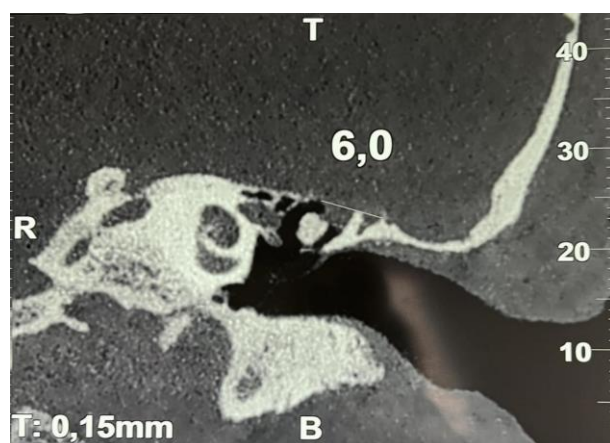
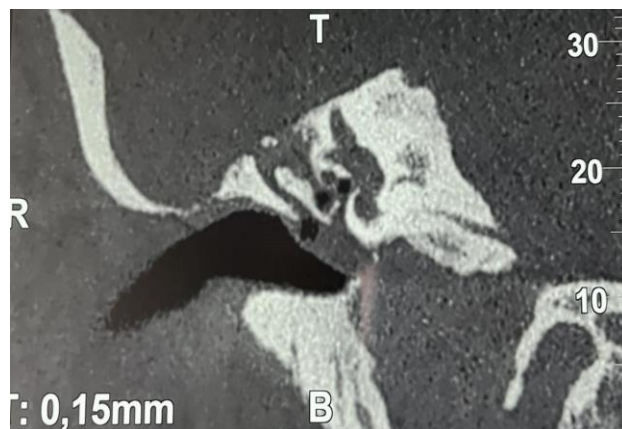


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associated with SSCDS. Imaging findings in this case favored a spontaneous intracranial hypertension-related origin.



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EP134

CONTRIBUTION OF IMAGING IN SINONASAL MUCORMYCOSIS: A RETROSPECTIVE STUDY OF 28 CASES

Imen Zoghlimi¹, E. Rejeb¹, S. Bouziri¹, O. Tilouch¹, D. Chiboub¹, N. Romdhane¹, S. Nefzaoui¹, I. Hriga¹, C. Mbarek¹

¹Habib Thameur Hospital

Objective: To describe the radiological features of sinonasal mucormycosis and to evaluate the role of imaging in assessing loco-regional extension and associated complications.

Materials and Methods: We conducted a retrospective descriptive study between January 1997 and December 2024, including 28 patients managed for sinonasal mucormycosis. Diagnosis was confirmed in all cases by histopathological and/or microbiological evidence.

Results: The mean age was 54.9 years, with a male-to-female sex ratio of 1.4. Diabetes mellitus was the main predisposing factor, present in 87% of patients. Imaging assessment was mainly based on computed tomography (CT), performed in 25 patients (89%). Magnetic resonance imaging (MRI) alone was performed in one case (4%), while combined CT and MRI evaluation was performed in two cases (7%). Sinus involvement was present in 96% of patients and was multifocal in 86%. The most frequent patterns were maxillo-ethmoido-frontal (43%) and maxillo-ethmoidal (30%). Total sinus opacification was observed in 71% of cases. Bone destruction was identified in 46% of patients, mainly involving sinus walls and orbital structures. Orbital extension was present in 50% of cases, predominantly characterized by infiltration of the extraconal fat (36%). Involvement of deep facial spaces and soft tissues was observed in 32% of cases (n=9), including masticator space (11%), pterygopalatine space (4%), parotid space (4%), and infratemporal fossa (11%). One case (4%) showed an anterior-lateral nasal soft tissue collection. Cerebrovascular and neurological complications were noted, including cavernous sinus thrombosis in 14% of patients. One case of cerebral abscess, one case of central retinal artery occlusion, and one case of trigeminal neuritis were also recorded.

Conclusion: Sinonasal mucormycosis is a severe invasive fungal infection primarily affecting immunocompromised patients. It is characterized by rapidly progressive and polymorphic radiological findings, mainly involving multifocal sinus disease with frequent orbital and deep facial

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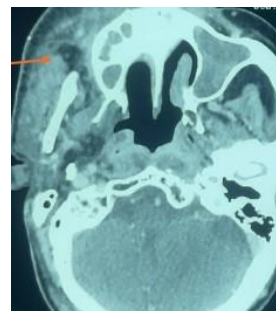
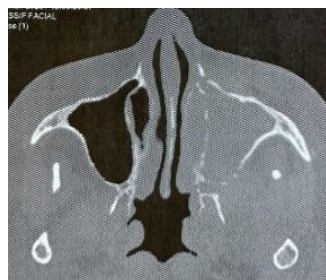


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extension. Imaging plays a central role in prognostic assessment and therapeutic guidance.





EP135

RETROPHARYNGEAL ABSCESS COMPLICATED BY SKULL BASE OSTEITIS AND A MYCOTIC PSEUDOANEURYSM OF THE INTERNAL CAROTID ARTERY

Imen Zoghلامي¹, E. Rejeb¹, E. Dridi¹, O. Tilouch¹, D. Chiboub¹, S. Nefzaoui¹, N. Romdhane¹, I. Hriga¹, C. Mbarek¹

¹Habib Thameur Hospital

Objective: Deep neck space infections are ENT emergencies due to their proximity to the skullbase and major vessels, exposing patients to severe complications. Infectious involvement of the carotid artery, although rare (pseudoaneurysm or occlusion), is life-threatening and often diagnosed late because of non-specific symptoms. We report a case of a retropharyngeal abscess complicated by osteo-vascular involvement, emphasizing the importance of early diagnosis and multidisciplinary management.

Results: A 71-year-old man with type 2 diabetes and a history of ischemic stroke without sequelae presented with persistent odynophagia despite antibiotic therapy, associated with intermittent fever evolving over two months, headaches, and confusion. Mild left-sided epistaxis was noted. On examination, the patient was afebrile, hemodynamically stable, with a Glasgow Coma Scale score of 14/15. A left abducens nerve palsy causing convergent strabismus was observed. Endoscopy revealed a bulging, blood-tinged mass in the nasopharynx. Laboratory findings showed a marked inflammatory syndrome. CT imaging demonstrated a 50×34×23 mm retropharyngeal collection with skull base lysis and a left internal carotid artery pseudoaneurysm, confirmed by MRI. Angiography revealed carotid occlusion with effective collateral circulation, making intervention unnecessary. The patient received prolonged intravenous antibiotics and orthoptic rehabilitation, with favorable clinical and radiological outcomes.

Conclusion: This case highlights the severity of retropharyngeal abscesses and their rare vascular complications. Early imaging and multidisciplinary management are crucial to improving prognosis.

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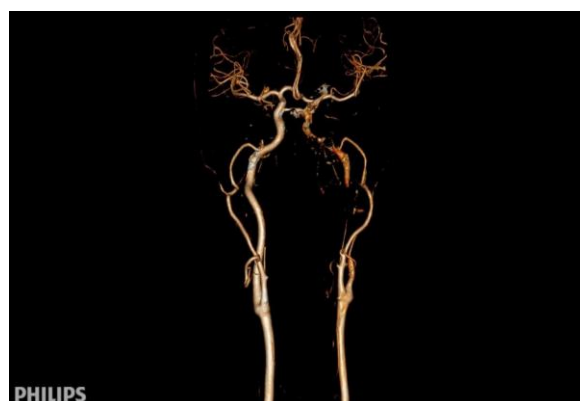
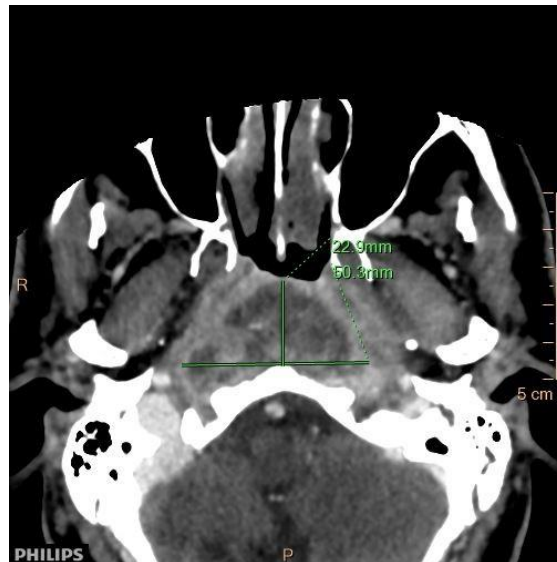
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