

## Case Report

### Chronic Nasal Obstruction Caused by Concha Bullosa Mucocele of the Middle Turbinate

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#### Abstract

Concha Bullosa Mucocele (CBM) of the middle turbinate is a rare disease. Herein, we report on a 29-year-old Caucasian man with long term nasal obstruction, refractory headache and frequent acute unilateral sinusitis. Physical examination demonstrated a large mass occupying the Middle Turbinate (MT) with opposite nasal septum deviation. Computed tomography (CT-scan) led us to suspect the diagnosis of concha bullosa. The patient was treated by endoscopic reduction and marsupialization of the CBM. Histological analysis of the resected mass confirmed the diagnosis. No recurrence has been noted until the date of the manuscript writing. In summary, CBM is a rare diagnosis that should be suspected in chronic nasal obstruction with refractory headache. Ct-scan is helpful in considering the diagnosis however, endoscopic surgery is essential in both confirming the diagnosis and treating concha bullosa mucocele.

**Keywords:** Concha bullosa; Endoscopic surgery; Headache; Mucocele; Nasal obstruction; Recurrent unilateral sinusitis

#### Introduction

Pneumatized middle turbinate, called Concha Bullosa (CB), is a frequent anatomic variation of the lateral nasal wall. It is observed in 14 to 53% of the population, being more common in Caucasians [1]. CB and opposite septal deviation often coexist [2]. CB is a radiological diagnosis and can exist without rhinological symptoms [3]. However, if the pneumatization of the middle turbinate is very large, it can present with nasal obstruction, headache, compromise the ostiometal unit drainage and the development of sinusitis. However, mucocele of the middle turbinate concha bullosa is a rare disease. In the event of obstruction of the drainage of a CB, accumulation of mucoid secretion and desquamated epithelium may result in the development of mucocele, leading to sinonasal symptoms such as; nasal obstruction, rhinorrhoea, hyposmia, headache and recurrent sinusitis. A mucocele is a cyst like expansile and destructive lesion. CBM of the middle turbinate if not diagnosed early and treated accordingly can be secondary infected and changes to pyomucocele or may expand and invade surrounding tissues as the orbital wall. Imaging (CT-scan or magnetic resonance imaging) is useful for the diagnosis but, to confirm the diagnosis, surgery is often necessary [4].

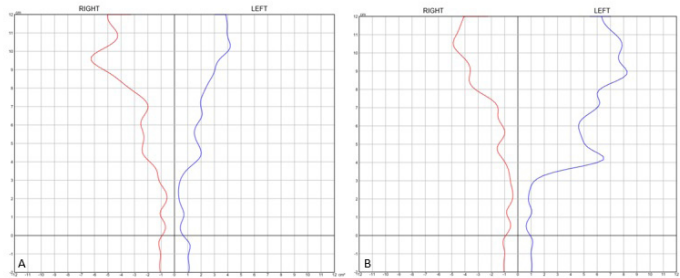
#### Case Report

##### Case History

A 29-year-old Caucasian man presented to the Department of Otorhinolaryngology Head and Neck Surgery, University Hospital of Liege (Belgium). He complained of sinonasal symptoms dominated by nasal obstruction, refractory headache and recurrent acute sinusitis. These symptoms were present for several years, and not related to allergen exposure. He never had a previous nasal trauma or nasal surgery. Previous long term nasal use of topical corticosteroids has proved unsuccessful. His medical history reveals three previous consultations with different otorhinolaryngologists during the year of his presentation to our clinic, for acute rhinosinusitis, effectively treated by oral antibiotics (Amoxicillin-Clavulanate 875 mg three times a day during 7 days) and corticosteroids. The rest of his personal and family medical history was not significant.

The physical examination demonstrated a right deviation of the nasal septum, a left middle turbinate with large lateral mass in contact with the middle meatus. The rest of the ENT examination was normal. We performed a skin prick test for the common aeroallergens that was negative. The patient underwent rhinomanometry and acoustic rhinometry tests. They confirmed

the left nasal obstruction. The nasal air flow was nearly 5 times lower at the left nostril when compared with the right one and the minimal area in the nasal cavity was evaluated at 0.30 mm<sup>2</sup> at the left side and 0.55 mm<sup>2</sup> at the right side (Figure 1).

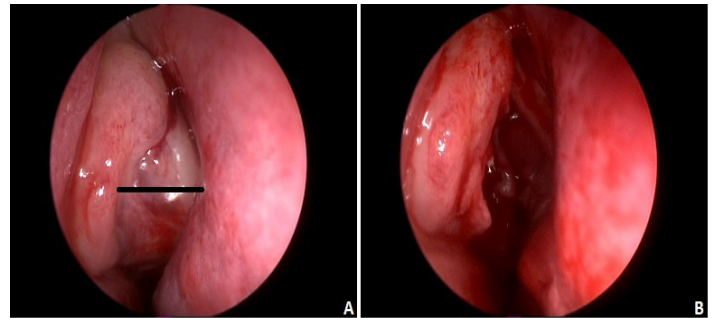


**Figure 1:** Preoperative (A) and post-operative (B) acoustic rhinometry, showing the improvement of the minimal area in the nasal cavity after surgery (postoperative minimal area is more than 2.5 times larger than the preoperative value).

The CT-scan findings of the paranasal sinuses are presented in (Figure 2). It confirmed the septal deviation with a right convexity. It also showed a large left middle turbinate with central liquid density and an overdeveloped ipsilateral Haller cell. At this stage the most likely diagnosis was a left mucocele of the middle turbinate leading to the obstruction of the left nasal cavity and of the ipsilateral middle meatus. The patient was operated by endoscopic nasal surgery in the form of septoplasty, middle turbinate CB reduction and marsupialization of the mucocele (Figure 3). A middle meatal antrostomy of the ipsilateral mucocele with opening of the Haller cell. The CB reduction led to the release of a thick mucoid secretion that was aspirated and send for microbiology analysis and the mucocele was sent for histopathology. Associated anatomical variation witnessed during surgery was ipsilateral accessory maxillary sinus orifice.



**Figure 2:** Computerized tomography (CT) of the paranasal sinuses (coronal section: A. and axial section: B.) showing a large left middle turbinate with central homogenous fluid or soft tissue density (white arrow) and an opposite nasal septum deviation without inferior turbinate hypertrophy.

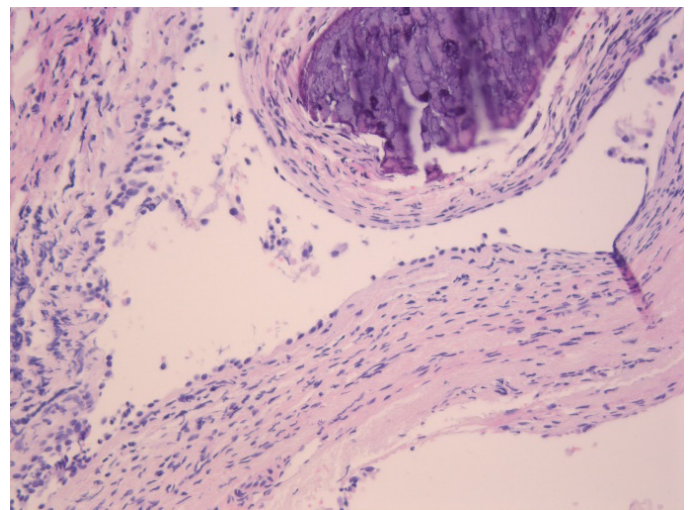


**Figure 3:** Intraoperative endoscopic view (0-degree rigid nasal endoscope) the black bar is pointing to a large mucocele of the middle turbinate concha bullosa (view is after nasal decongestion with adrenaline soaked pack). (A) before the endoscopic surgery (B) at the end of the surgery.

### Outcome and Follow-Up

The post-operative recovery was smooth. Quick improvement of all his symptoms were achieved within a week.

The microbiology culture revealed a classic nasal bacterial flora without any pathogenic germ. Histopathology confirmed the diagnosis of mucocele (Figure 4). The patient already had a one-year follow-up and had no recurrence. The physical examination revealed a straight septum and unobstructed left osteomeatal complex with improvement of airway patency as was objectively confirmed by rhinomanometry and acoustic rhinometry (the minimal area in the nasal cavity was evaluated at 0.80 mm<sup>2</sup> at the left side, more than 2.5 times larger than the preoperative measured value and 0.37 mm<sup>2</sup> at the right side) (Figure 2).



**Figure 4:** Haematoxylin and eosin stained turbinate sample (magnification x200), showing a cystic lesion lined by respiratory or cuboidal epithelium.

## Discussion

CB is a frequent variation of the lateral nasal wall affecting approximately a third of the population and is often alone asymptomatic [1]. During the eighth and tenth weeks of intrauterine life of the embryo, the ethmoturbinal precursor appears. It gives rise to the uncinat process, the middle turbinate and the superior turbinate. The middle turbinate is part of the medial part of the ethmoid bone. Pneumatization of the middle turbinate is due to variation in the ethmoidal air cell system development. Anterior and posterior ethmoidal cells may pneumatize the middle turbinate, thus the CB mucociliary transport system drains into the frontal recess or the middle meatus via the sinus lateralis [5] or the retrobulbar recess, respectively. Mucocele, is a rare evolution of CB due to mucociliary flow obstruction. A chronic disease process of the paranasal sinuses can affect the CB resulting in mucosal thickening, retention of mucous secretion, mucocele and pyocele within the CB. However, the real risk factors of CBM development in absence of chronic nasal inflammation is not clear.

Mucocele could continue to grow and rare cases of lamina papyracea eroding and orbital extension have been described [6]. Due to a secondary infection of a mucocele a mucopyocele may develop [7]. In our patient the fluid examination was negative for a current infection. The CT scan and the surgery confirmed the absence of lamina papyracea involvement. Physical examination confirms the nasal obstruction but is insufficient for diagnosis of a mucocele. Imaging is useful to assess adjacent bony structure impairment and to suspect a mucocele but surgery is necessary to confirm diagnosis and is also the conventional treatment of a mucocele [8]. We performed an endoscopic reduction and marsupialization of the mucocele.

Our patient had an opposite septal deviation, confirming that concha bullosa is often coexisting with an opposite deviation of the septum [2]. This was also corrected during surgery for the best airway improvement. Inferior turbinate hypertrophy often develops to the opposite side of a nasal septal deviation and is often the main cause of bilateral nasal obstruction seen in these patients. But in the event of concha bullosa, nasal septal deviation tends to be higher with no impact in the inferior turbinate [9]. This is in consistence with our case since physical examination and CT-scan showed a non-significant inferior turbinate hypertrophy. In conclusion, few cases of CBM have been described. However, it should be

included in the differential diagnosis of patients with an intranasal mass, sinonasal symptoms or refractory headache. Imaging is necessary prior to surgery and we prefer the use of computed tomography to assess bony structure integrity. Endoscopic surgery is the recommended treatment to validate the diagnosis, to stop mucocele growth, to prevent mucocele infection and to release the patient from his complaints.

## Conflict of Interest Statement

The authors declare that they have no conflict of interest.

## Disclosure Statement

The authors declare no financial support.

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