

Autumn meeting OMFS

SURGICAL HISTORY OF OSAS : FROM TRACHEOTOMY TO BIMAXILLARY ADVANCEMENT



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SUMMARY

01

Introduction

02

Tracheotomy 1960

03

Uvulo-palato-pharyngoplasty 1981

04

Mini- tracheotomy 1984

05

Partial glossectomy 1985

06

Hyoidopexia 1986

07

Functional palatoplasty 1991

08

Bimaxillary advancement 1988-92

09

Stimulator of the XII nerve 1993

10

Conclusion





L'apnée du sommeil

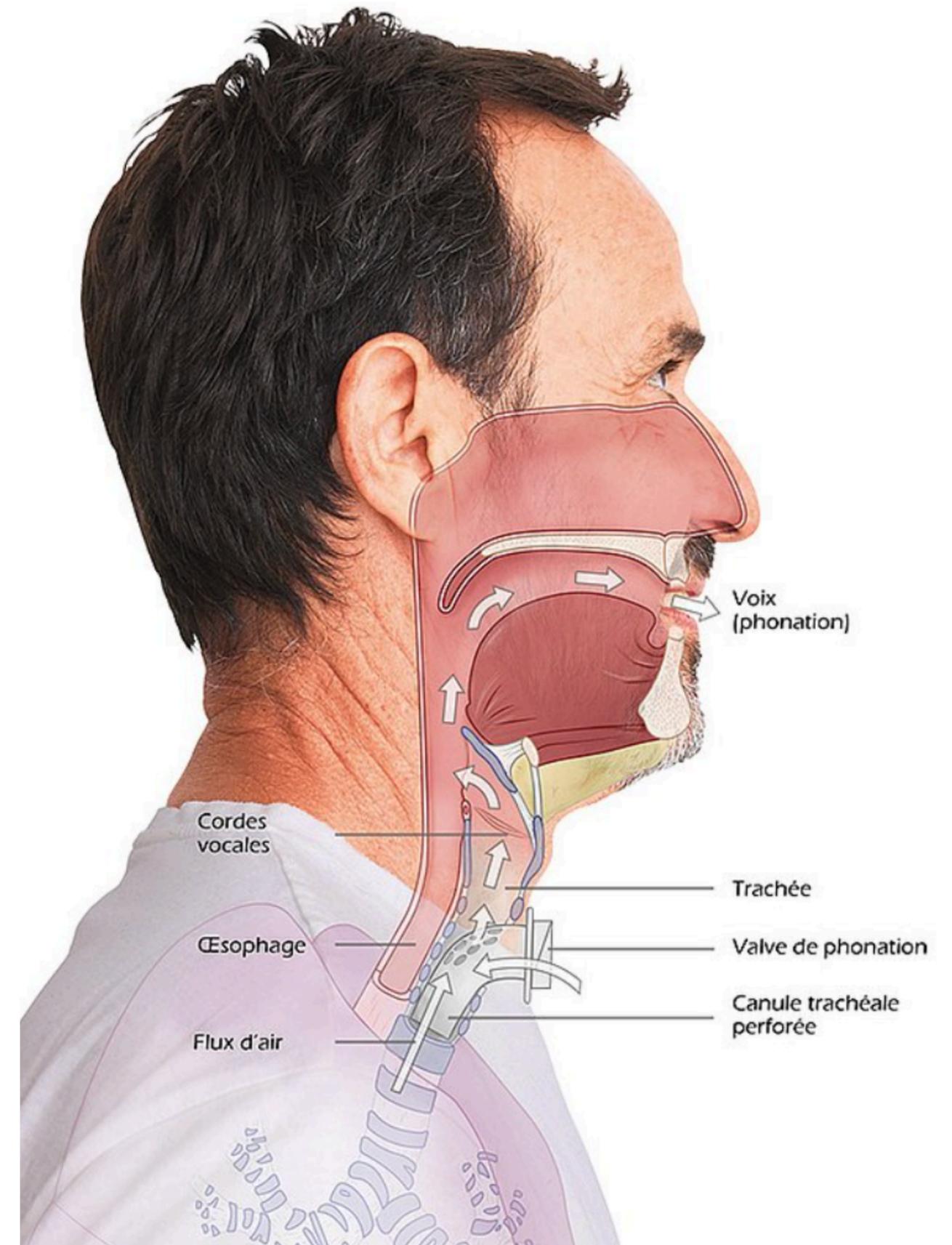
01 Introduction:

- ✓ Hippocrate and Romanian Doctor
- ✓ Sidney Burwell en 1950 "Hypersomnolence with obesity"
- ✓ 1956 Burwell AOS
- ✓ 1965 Henri Gastaut / Colin Sullivan



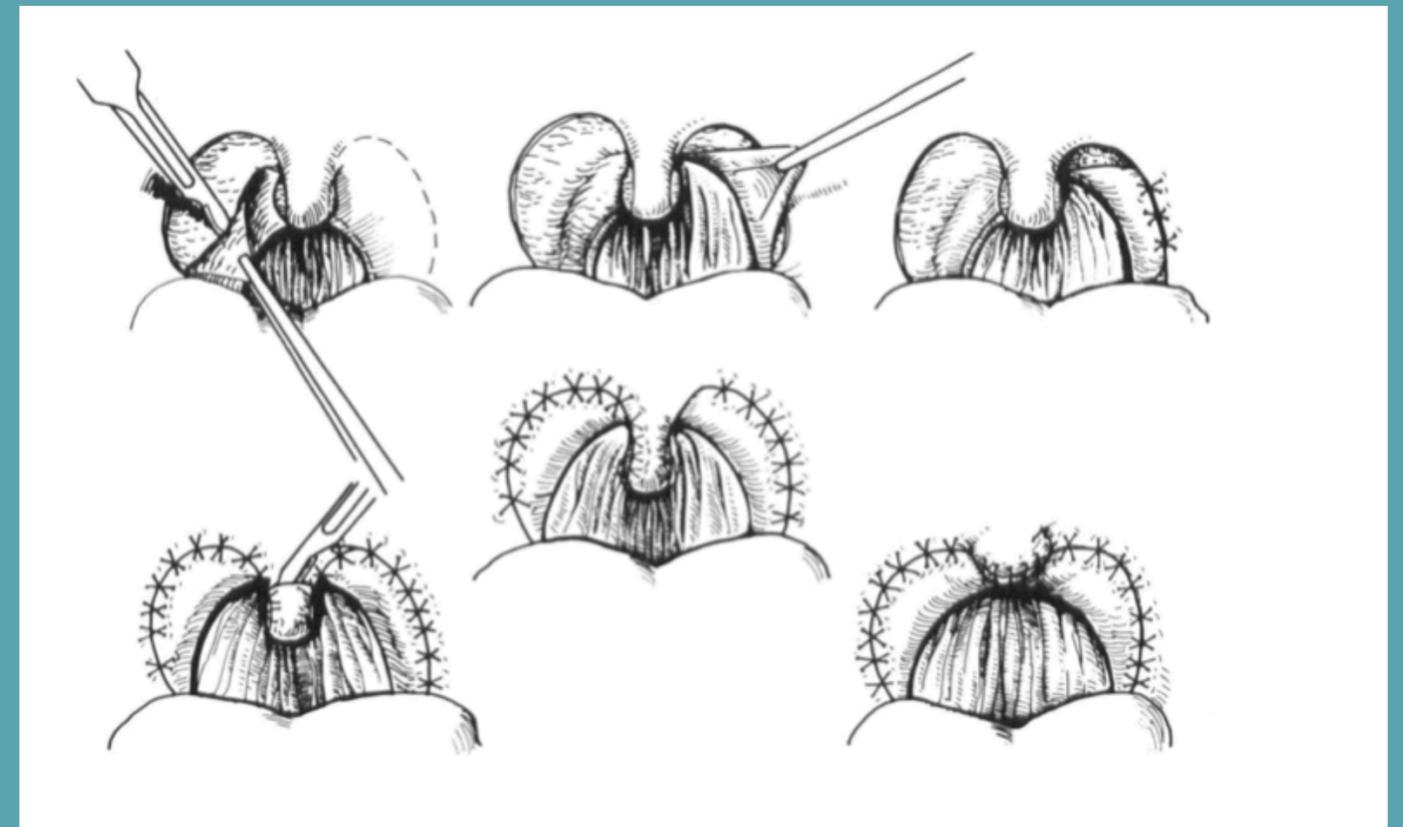
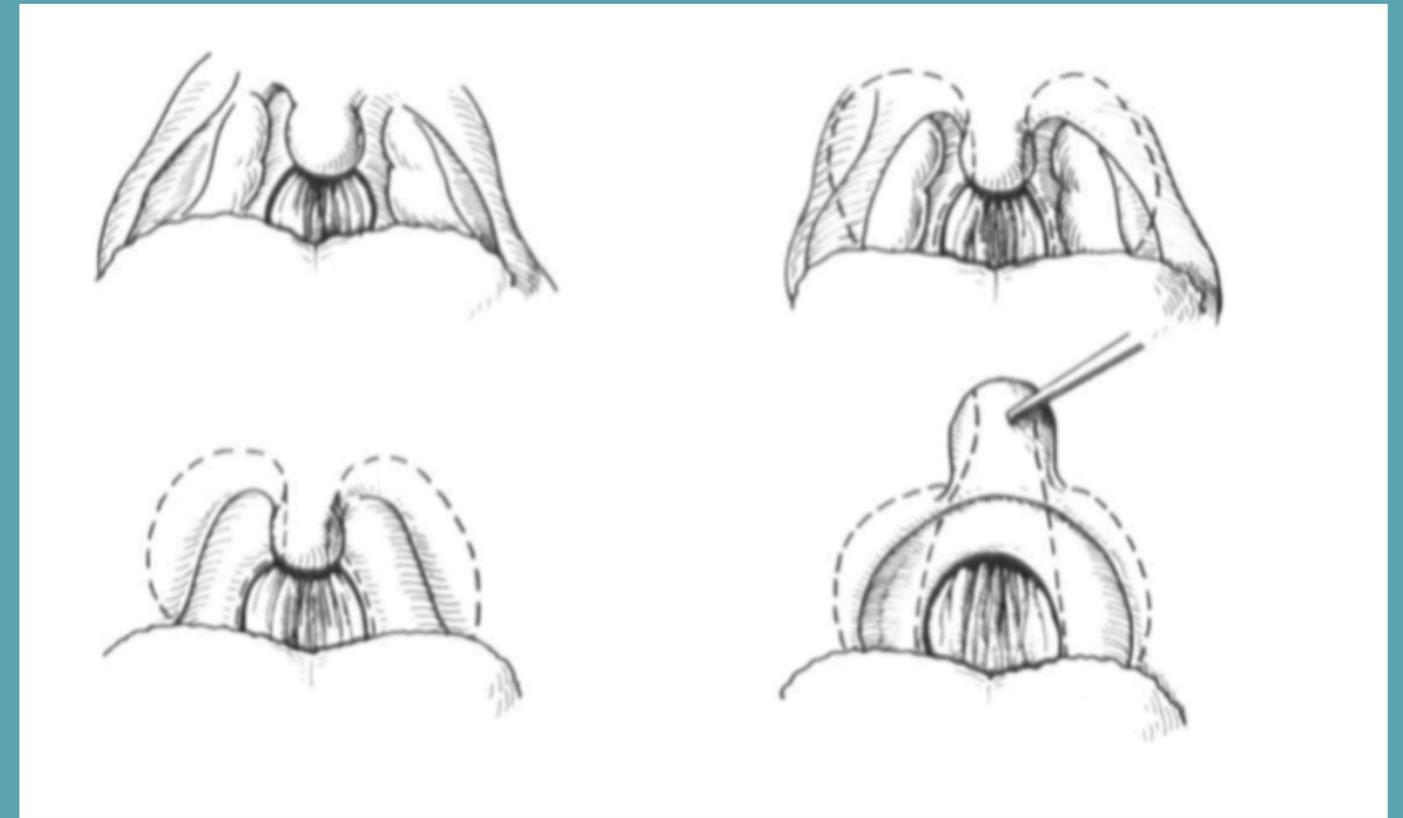
02 Tracheotomy 1960

- This radical and invasive treatment has been available since the late 1960s and involves a complete bypass of the airways.
- The results show a 100% cure rate for obstructive apnoea.
- However, tracheotomy has debilitating repercussions for the patient, both in terms of aesthetics and phonation, as well as social disability and predisposition to various pathologies such as chronic bronchitis.



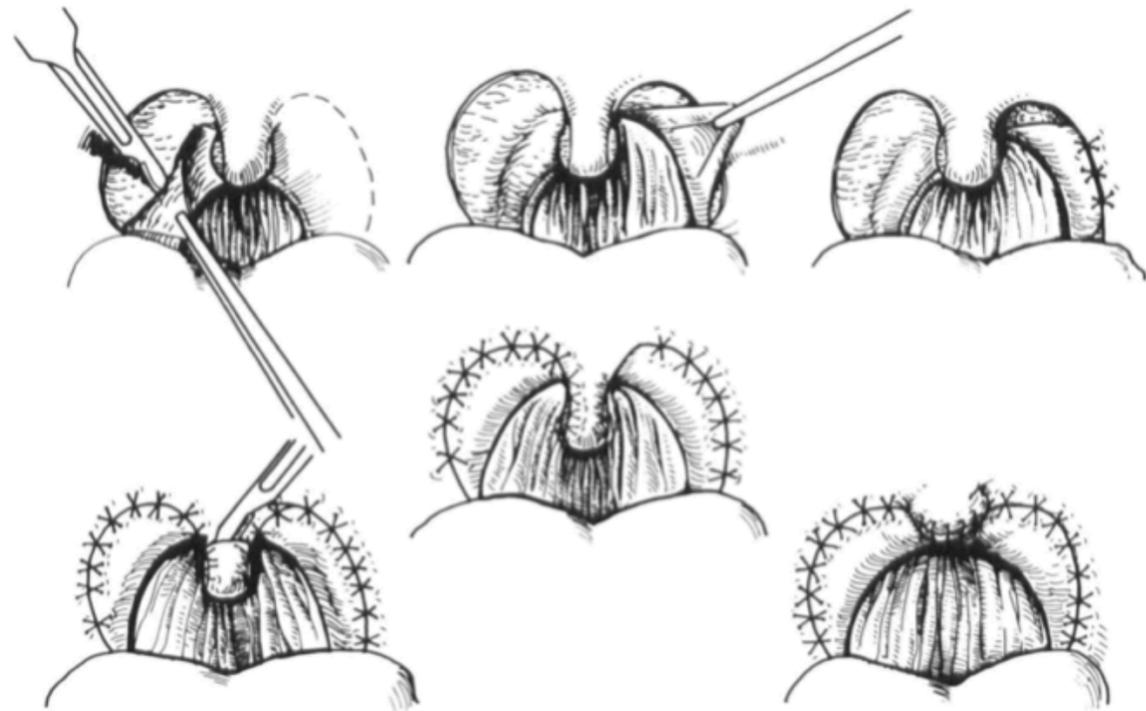
03 Uvulo-palato- pharyngoplasty 1981

- ✓ Purpose: to widen the aeropharyngeal space.
- ✓ If the tonsils are still present, the surgeon will perform a tonsillectomy. He will then make a lateral incision along the edge of the soft palate from its base in the tonsillar fossa to the base and finally to the tip of the uvula, continuing the incision on the posterior surface of the uvula to the inferior palatopharyngeal arch. The mucosa incised at the posterior pillar is then lifted superolaterally. The suture between the two palatine arches is performed, allowing them to be advanced.



03

Uvulo-palato-pharyngoplasty 1981



According to a systematic review of the literature conducted by He et al., out of 2,600 studies on UPPP surgery for OSA between 1981 and 25 December 2018, 11 studies (with a total of 435 patients) with objective outcomes and unique surgical procedures were included in a meta-analysis comparing preoperative outcomes with postoperative outcomes to assess the long-term efficacy of UPPP in OSA (mean follow-up of 34 months).



03

Uvulo-palato-pharyngoplasty 1981

✔ Most clinical studies examine the success of UPPP over a period of 6 months post-operatively. On average, there is a significant improvement in the apnoea-hypopnoea index (AHI) of 46.1%. Long-term results differ slightly, with a re-increase in AHI to 63.8%, indicating that the effectiveness of this surgical technique tends to decrease over time.

Outcomes: Enrolled Studies, n	Short-term	Long-term	Change, %
AHI (events/h)			
4	13.8 ± 8.8 (157)	22.6 ± 13.2 (157)	63.8
3	12.9 ± 8.9 (137)	18.5 ± 8.0 (137)	43.4
AI (events/h): 1	5.1 ± 1.8 (40)	6.8 ± 2.2 (40)	33.3
RDI (events/h): 1	12.1 ± 19.1 (55)	26.7 ± 32.3 (7)	121
ODI (events/h): 2	9.9 ± 9.4 (79)	13.5 ± 11.3 (88)	36.4
LOS, %: 3	86.7 ± 7.8 (117)	85.2 ± 7.7 (117)	-1.7



04 Mini-tracheotomy 1984

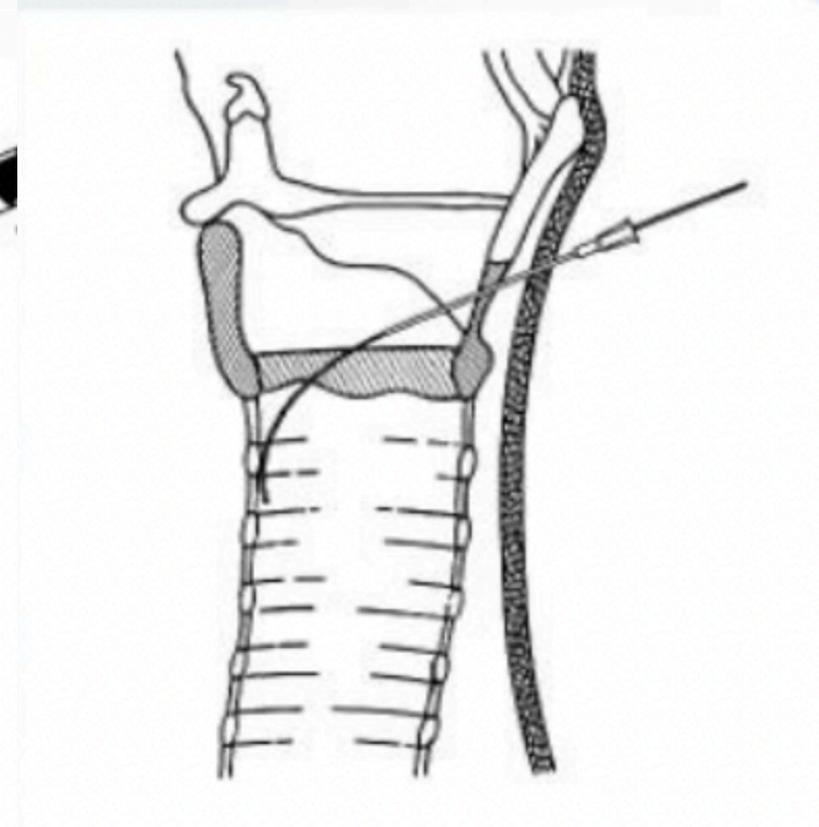
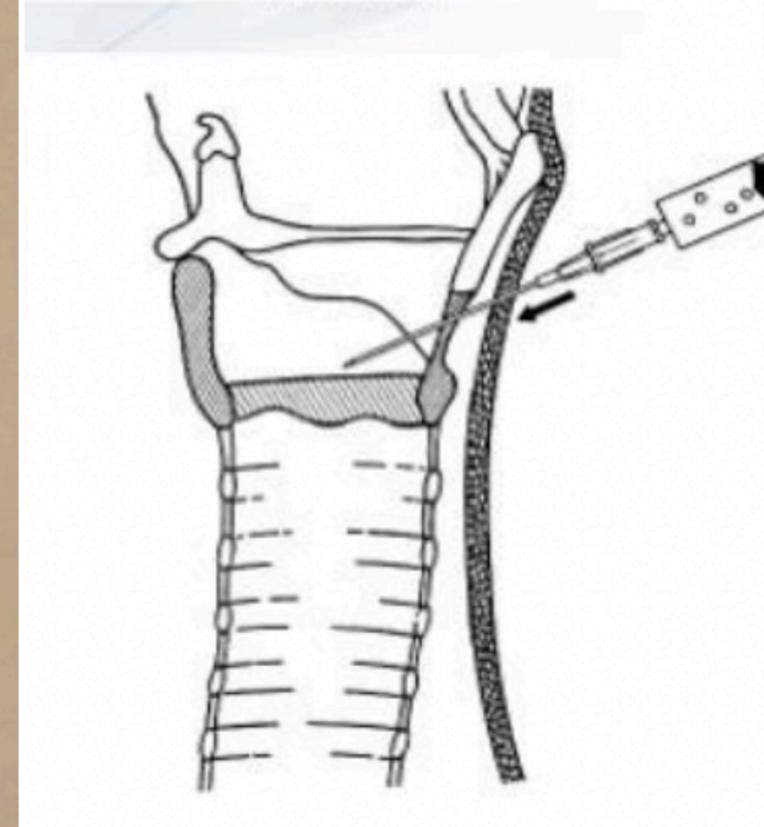
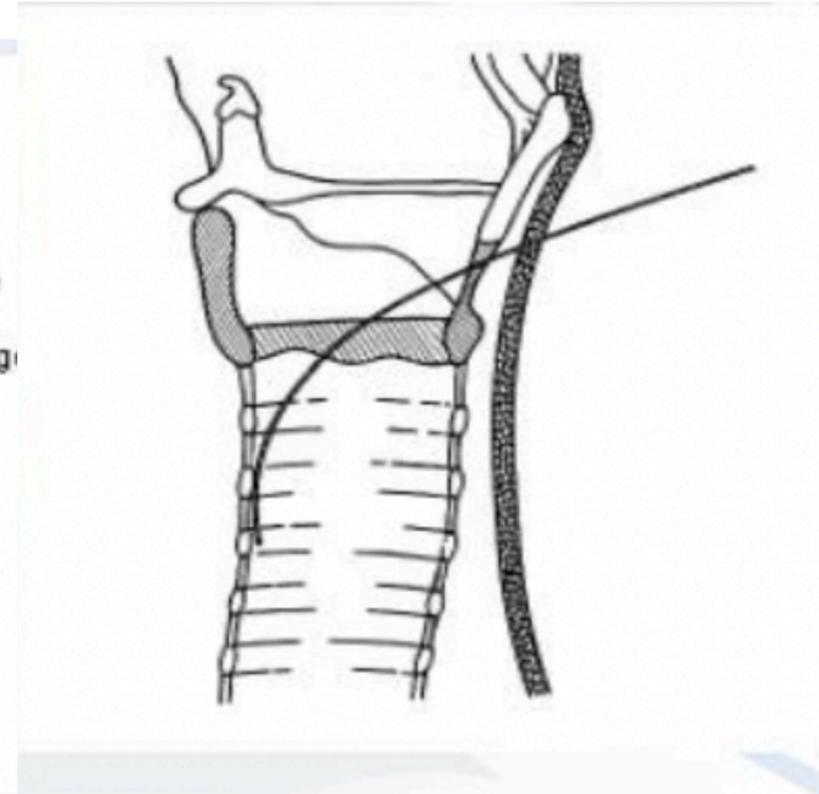
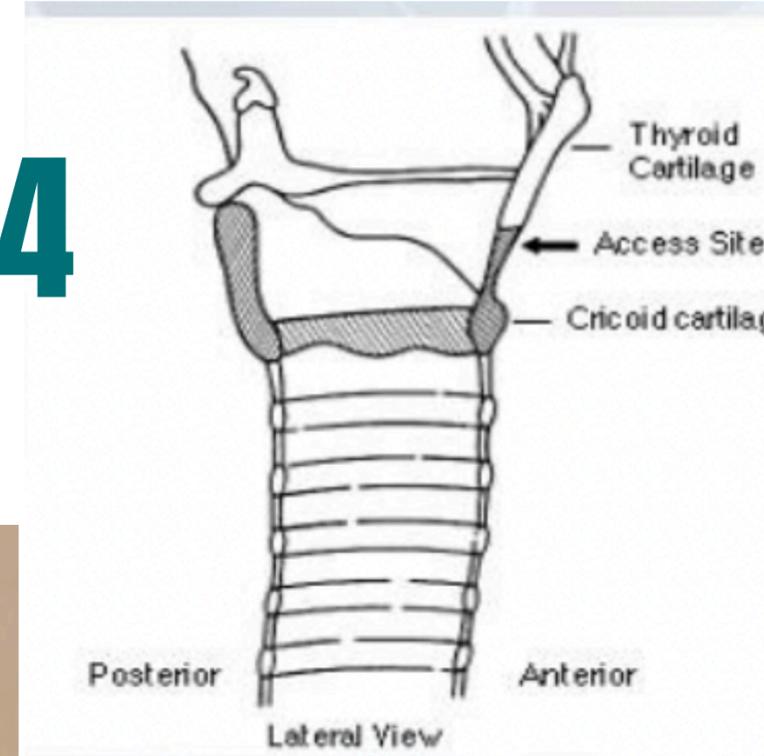
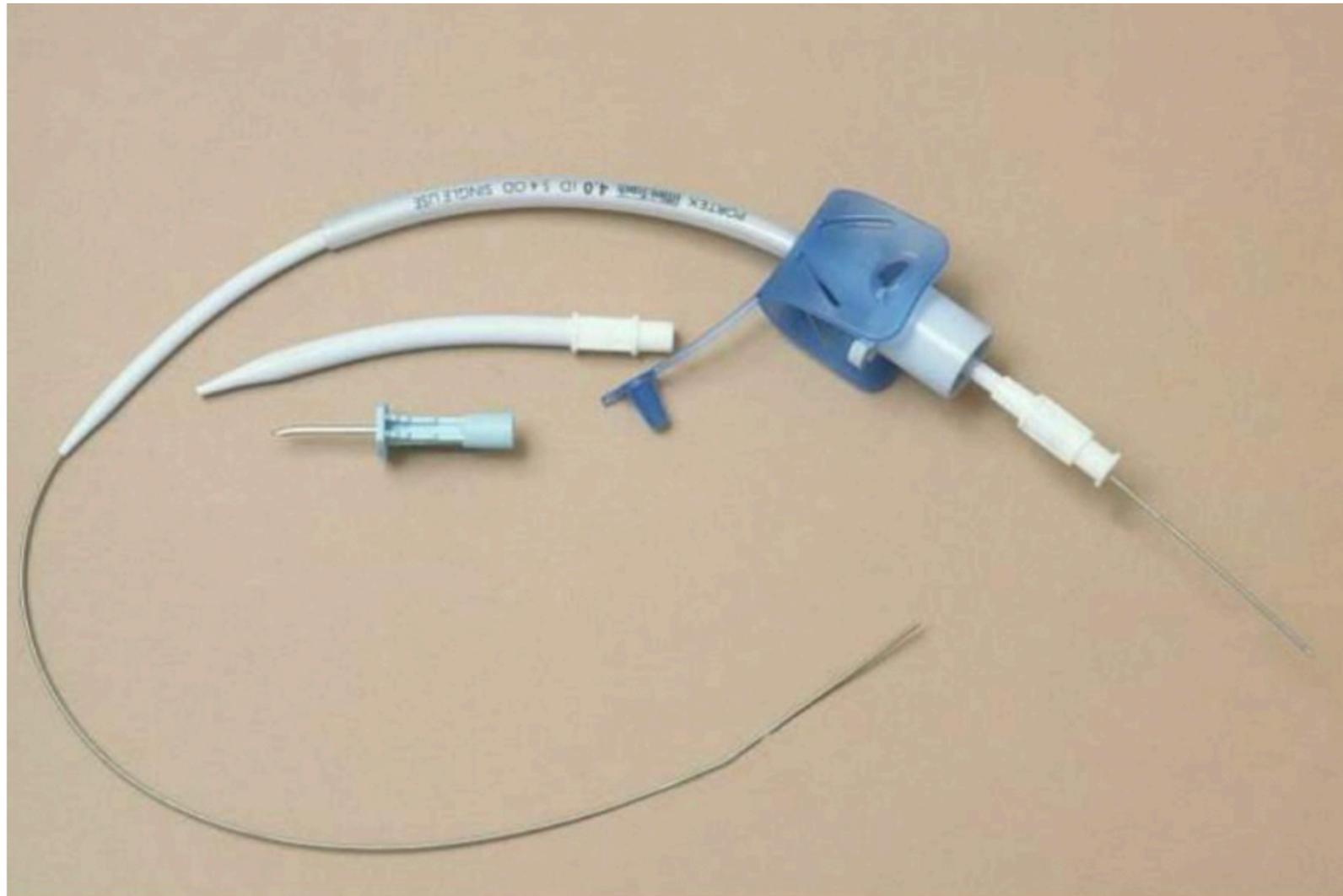
- An opening diameter of between 2 and 4 mm and an average length of 90 mm.
- Placed through the cricothyroid membrane using a protected introducer blade.

Complications are rarer (around 10%) than with traditional tracheotomy. The disadvantage is that the reduced diameter makes blockages more frequent (particularly with secretions and mucus) and cleaning more difficult.

In the case of OSAHS, a device that propels pressurised air is connected to this opening during the night at a rate of 10 to 15 litres per minute.



04 Mini-tracheotomy 1984



05 Partial glossectomy 1985

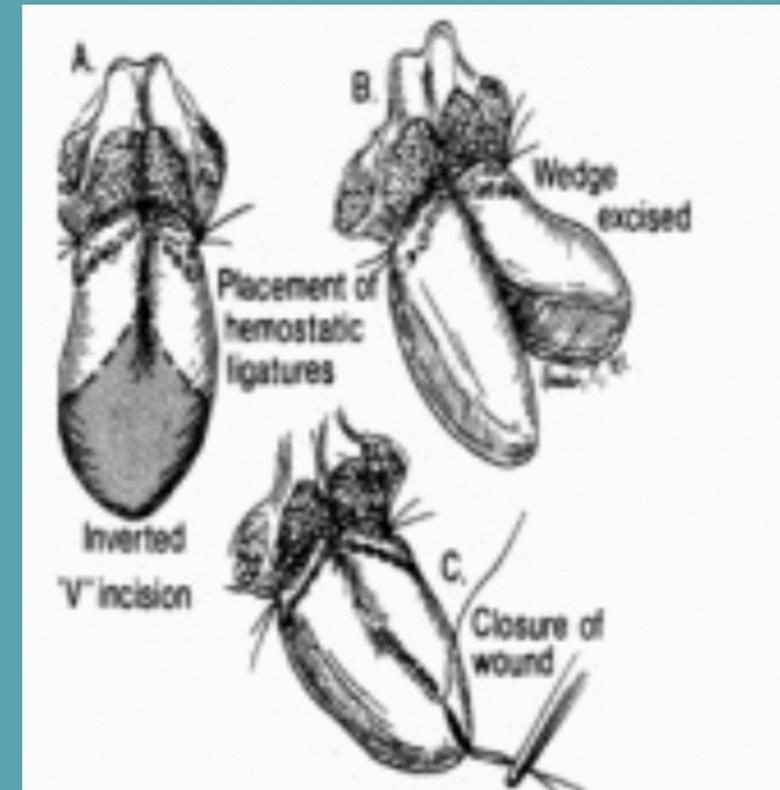
Reduction of the volume of the base of the tongue by resecting its middle third starting from the lingual V.

- Under general anaesthesia and with a temporary tracheotomy for the first three days after surgery. The subhyoid portion of the epiglottis is also resected.

A more aggressive variant involves resecting approximately 20 cm³ of the base of the tongue via the cervical route and verticalising the epiglottis. In this case, the enlargement of the retrobasilingual pharynx is both anteroposterior and transverse.

Serious haemorrhagic complications, dysfunction and necrosis of the tongue.

Few studies, quickly abandoned due to its invasive nature. Short series of 12 patients with a 41.7% success rate in reducing the HAI to 50%.



06

Hyoidopexia 1986

General anaesthesia (rarely local)
Modification of the position of the hyoid bone to increase the available airway space and reduce resistance.

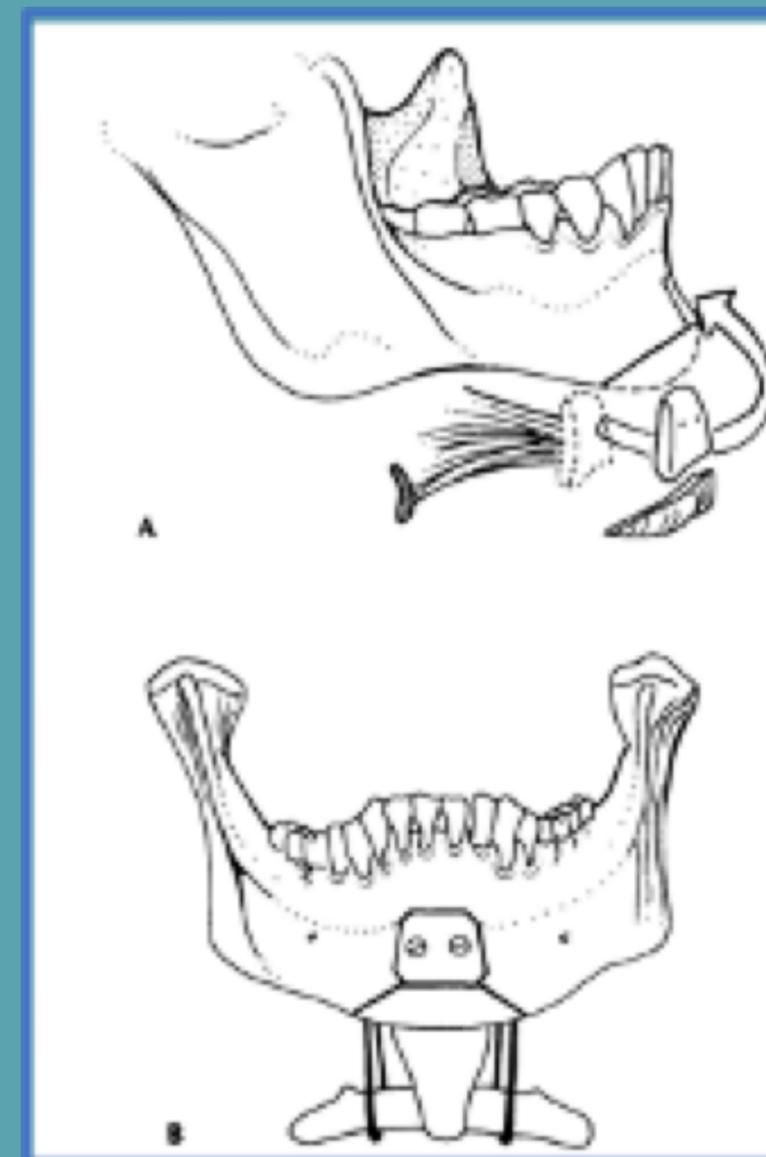
Operative criteria: BMI <35kg/m²
AHI >10
Intolerance to CPAP.
Initial studies in dogs

Initial version: Riley 1986

Suspension of the hyoid bone to the mandible

- 1) Mandibular osteotomy, geniopexy type
- 2) Sectioning of the sternohyoid, omohyoid, posterior belly of the digastric, stylohyoid and thyrohyoid muscles.
- 3) Fixation with nylon sutures or fascia latae strip

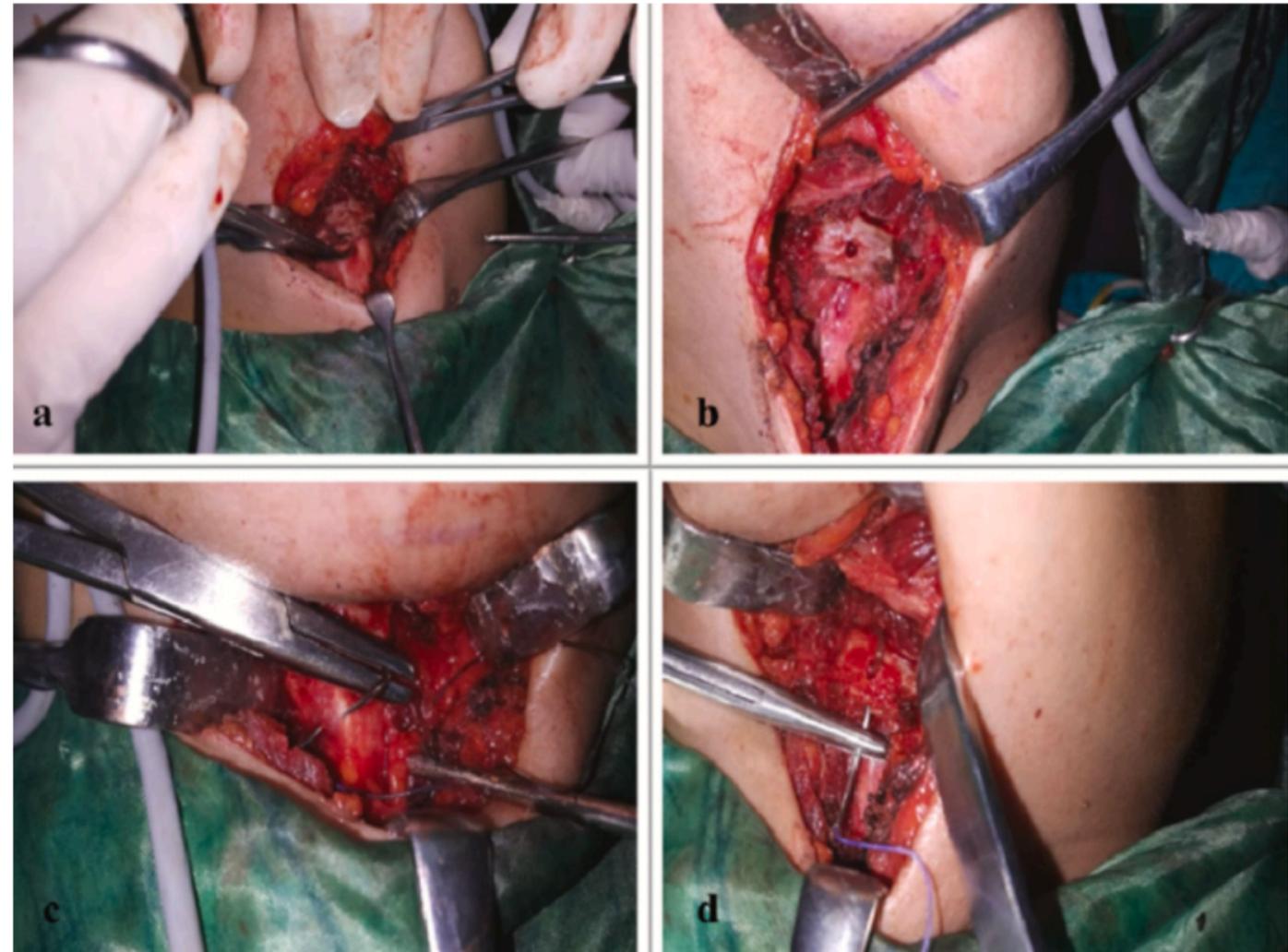
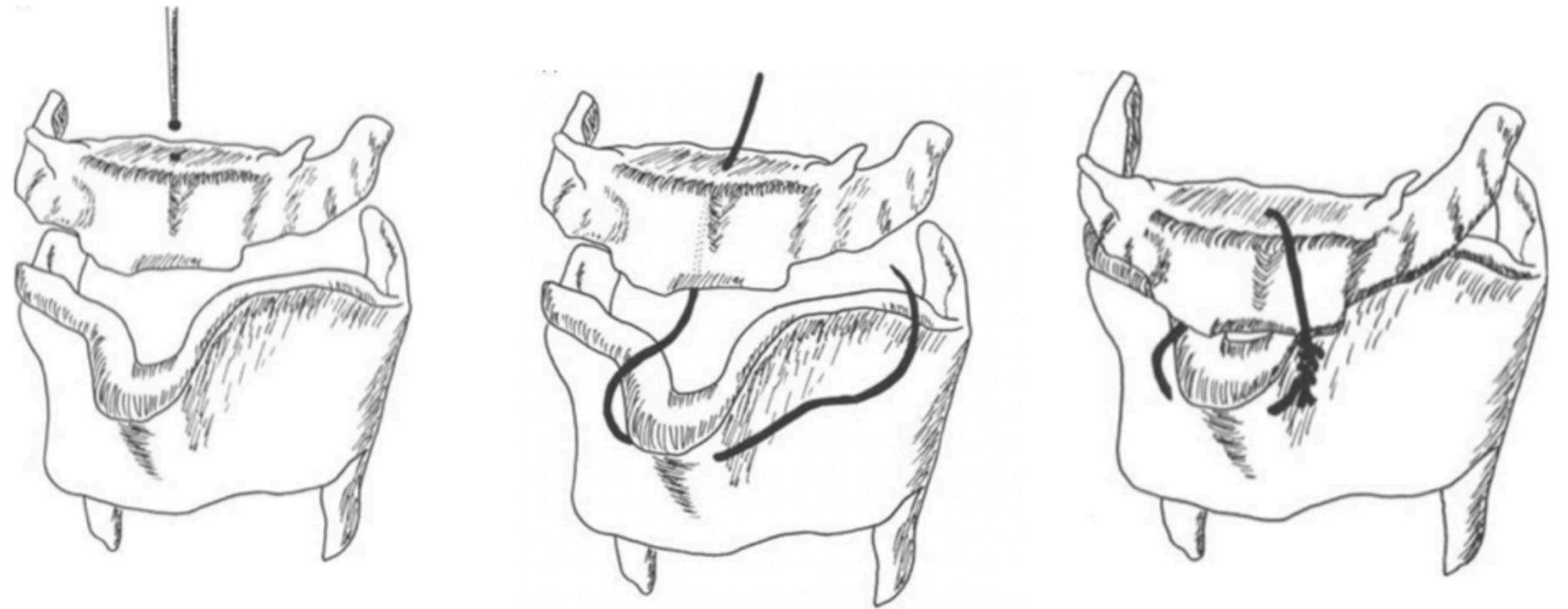
Head flexed for 24 hours



06 Hyoïdopexia 1994

Hörmann's version, 1994

Less invasive.
Exposure of the hyoid bone
Section of the stylohyoid ligaments.
Suture of the hyoid bone to the
thyroid cartilage.



06

Hyoidopexia

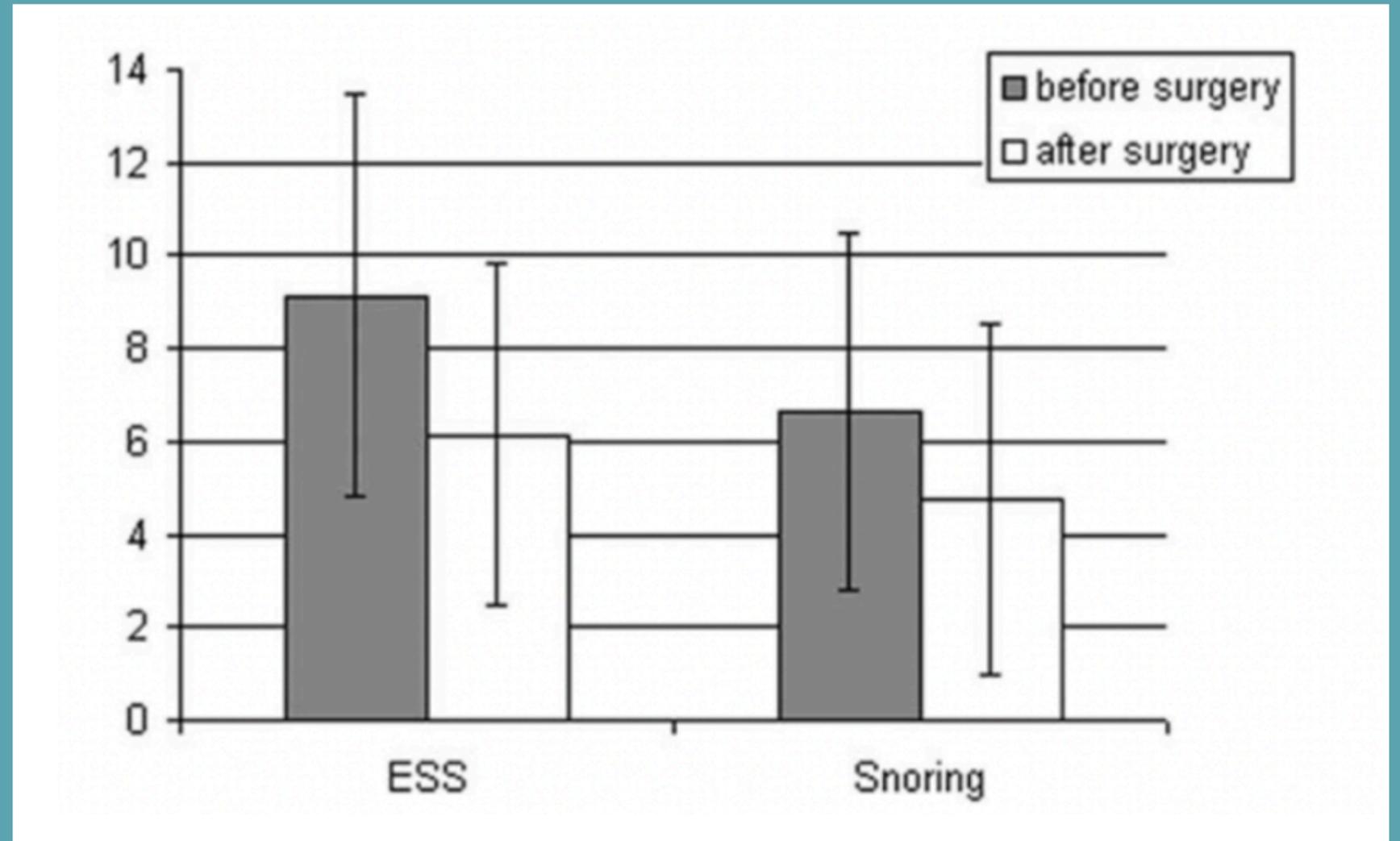
A reduction of 40.8% in obese patients compared to a reduction of 59.8% in people of normal weight or who are slightly overweight.

Improvement of between 1 and 2% in oxygen saturation

The Epworth score would decrease by a maximum of 3.2 points

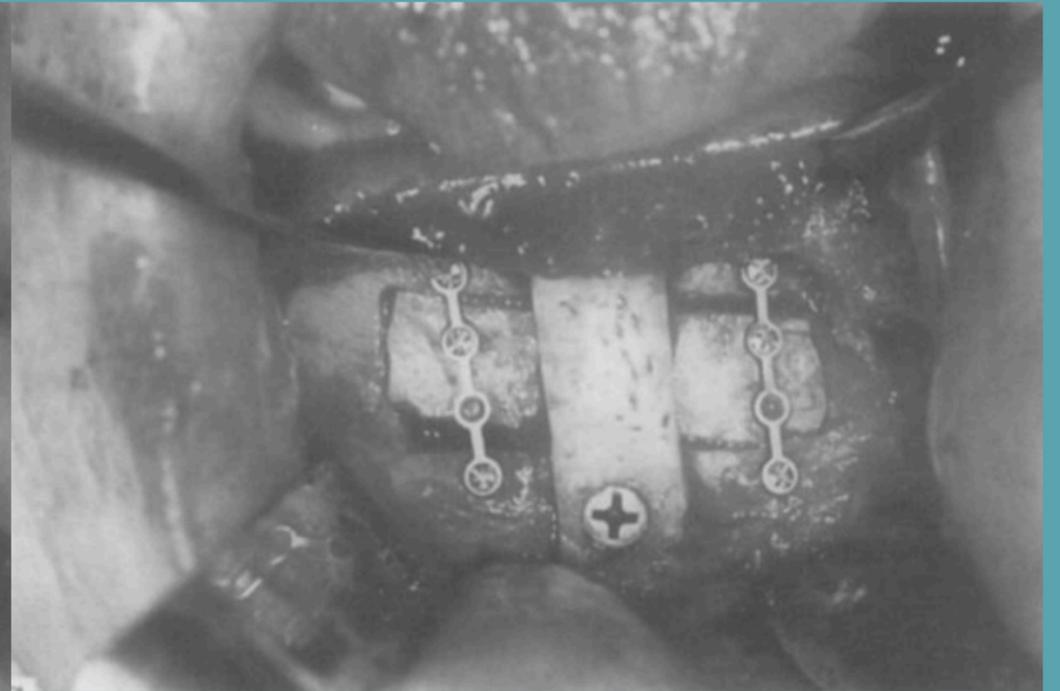
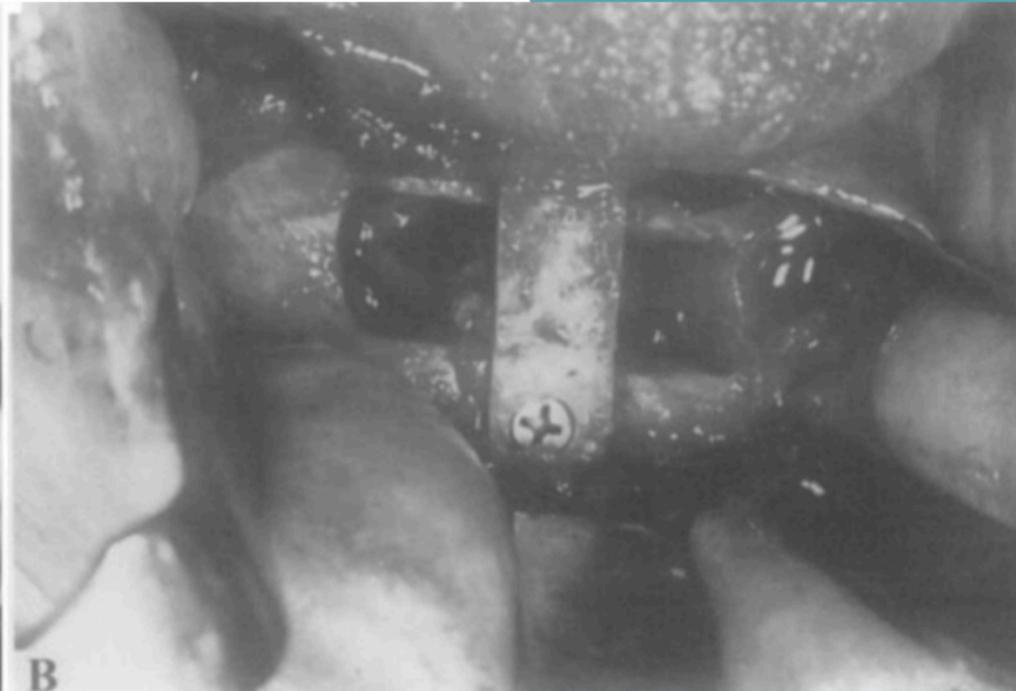
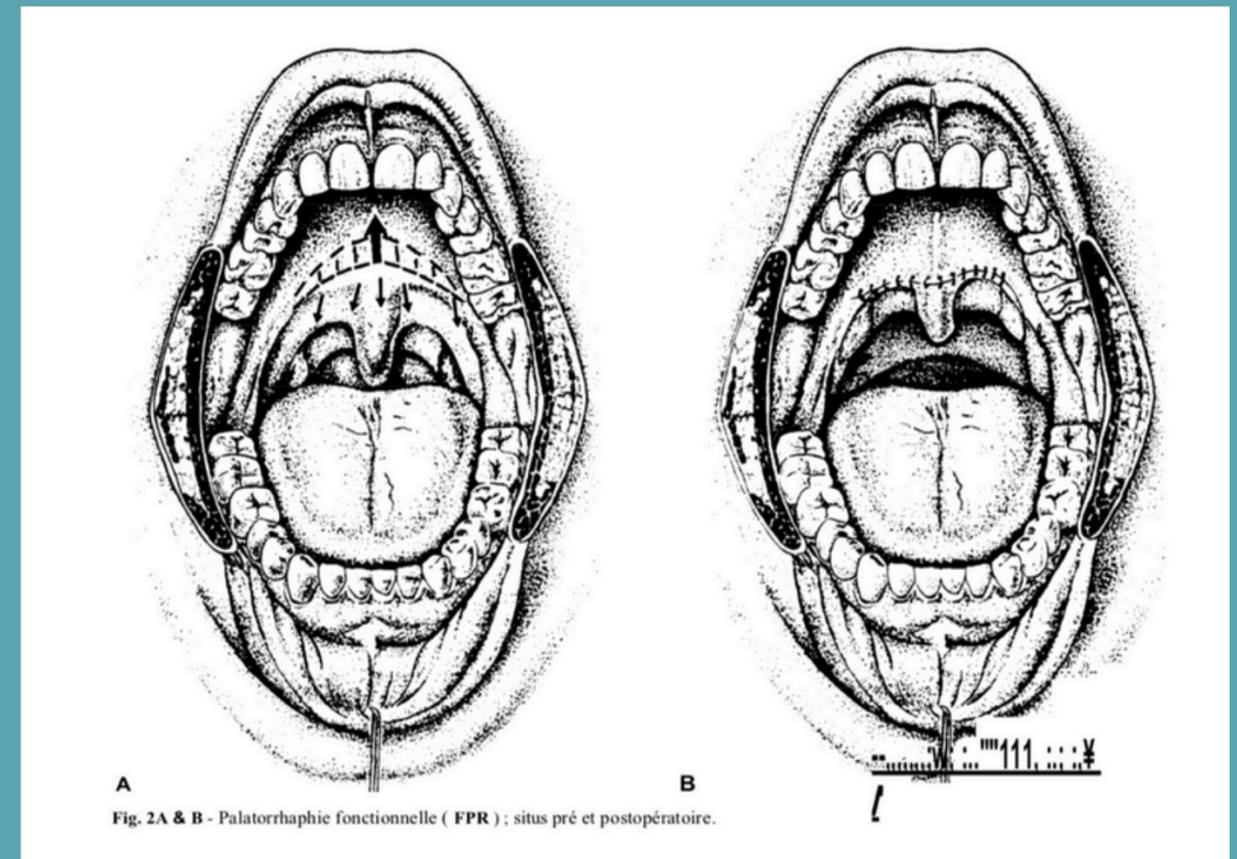
2005 study: No increase in VAS

Complication: dysphagia, SADAM



07 Functional palatoplasty 1991

Repair of the soft palate while preserving its posterior portion. Combined with a bicortical chin osteotomy for advancement.



07

Functional palatoplasty 1991

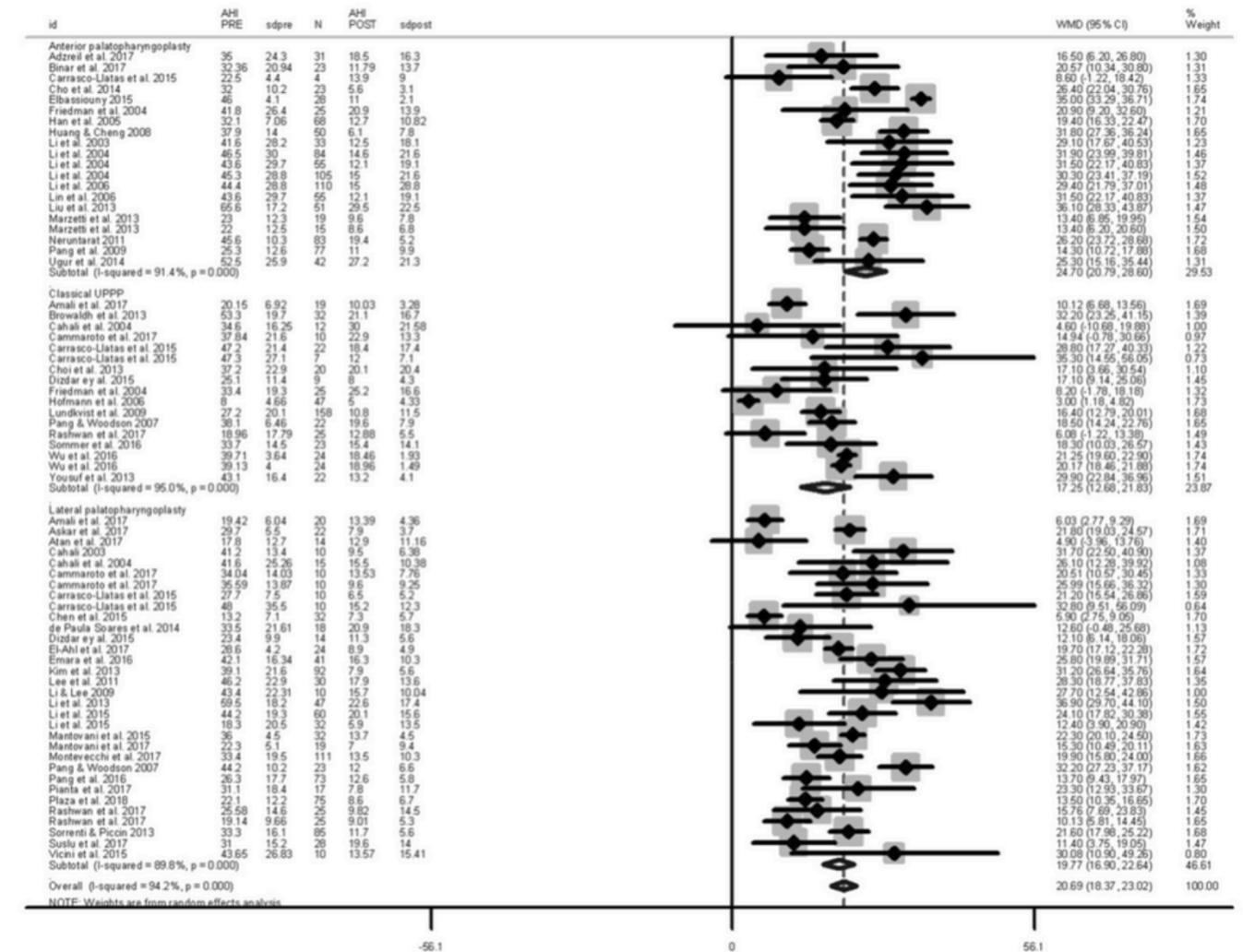
Wiltfang, Merten and Luhr :
the concept behind this surgical procedure has been a success, notably through a considerable improvement in OSA for 7 out of 8 patients, with an IDR reduced to 20/hour of sleep and no episodes of desaturation below 80% oxygen.

According to a systematic review of the literature and a meta-analysis of 59 relevant articles (with a total of 2,715 patients) on palate and upper airway surgery for OSA between January 2001 and February 2018, the success rates of palate surgery have increased significantly.



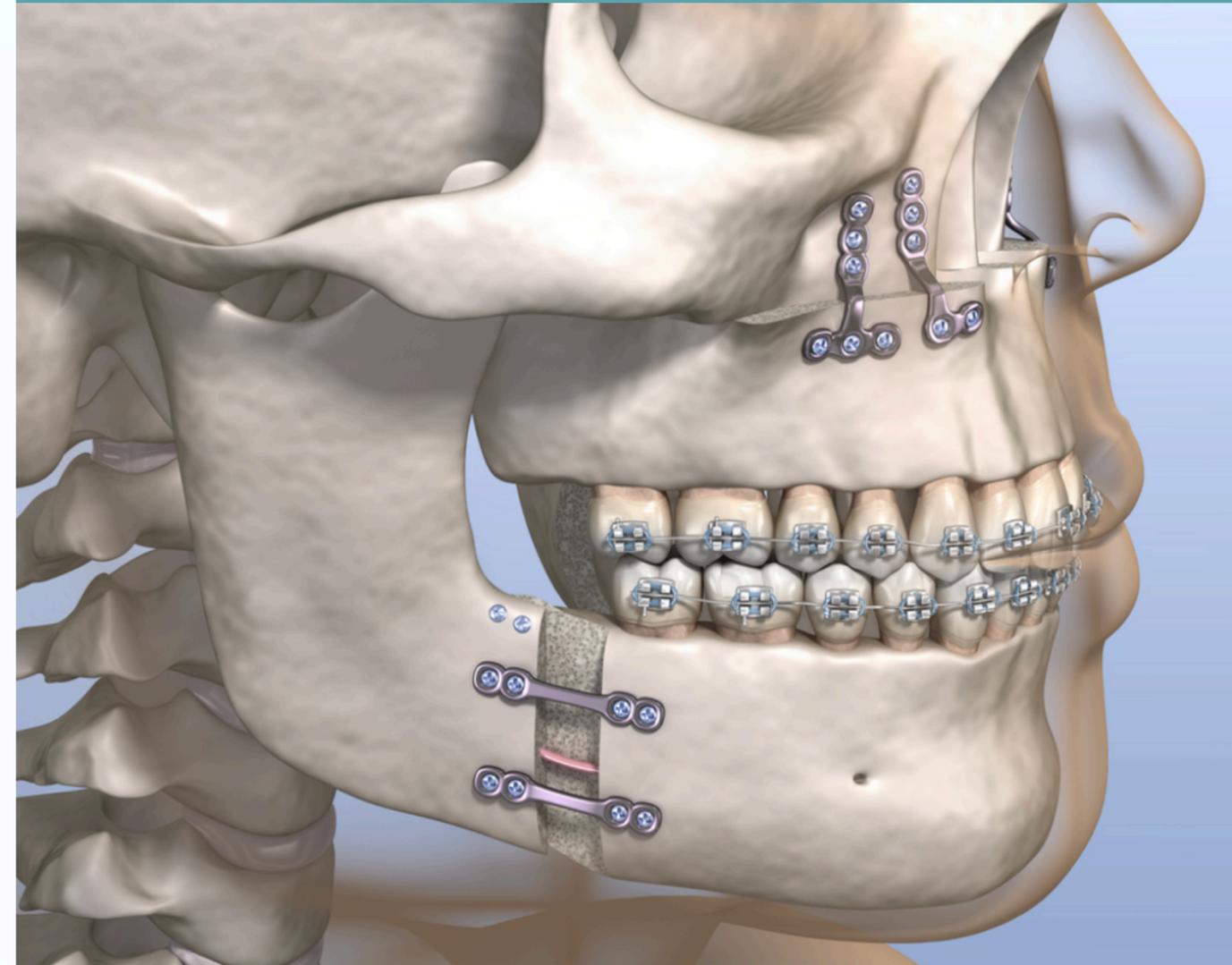
07 Functional palatoplasty 1991

The three main categories included in the meta-analysis of palatal procedures are anterior palatoplasty, lateral pharyngoplasty/expansion, and conventional uvulopalatopharyngoplasty. According to Bang et al., most surgeons have adopted these new procedures to treat velopharyngeal narrowing and collapse of the lateral pharyngeal wall. The variation in AHI showed an average reduction of 24.7, 19.8 and 17.2 for these three surgical procedures, respectively.



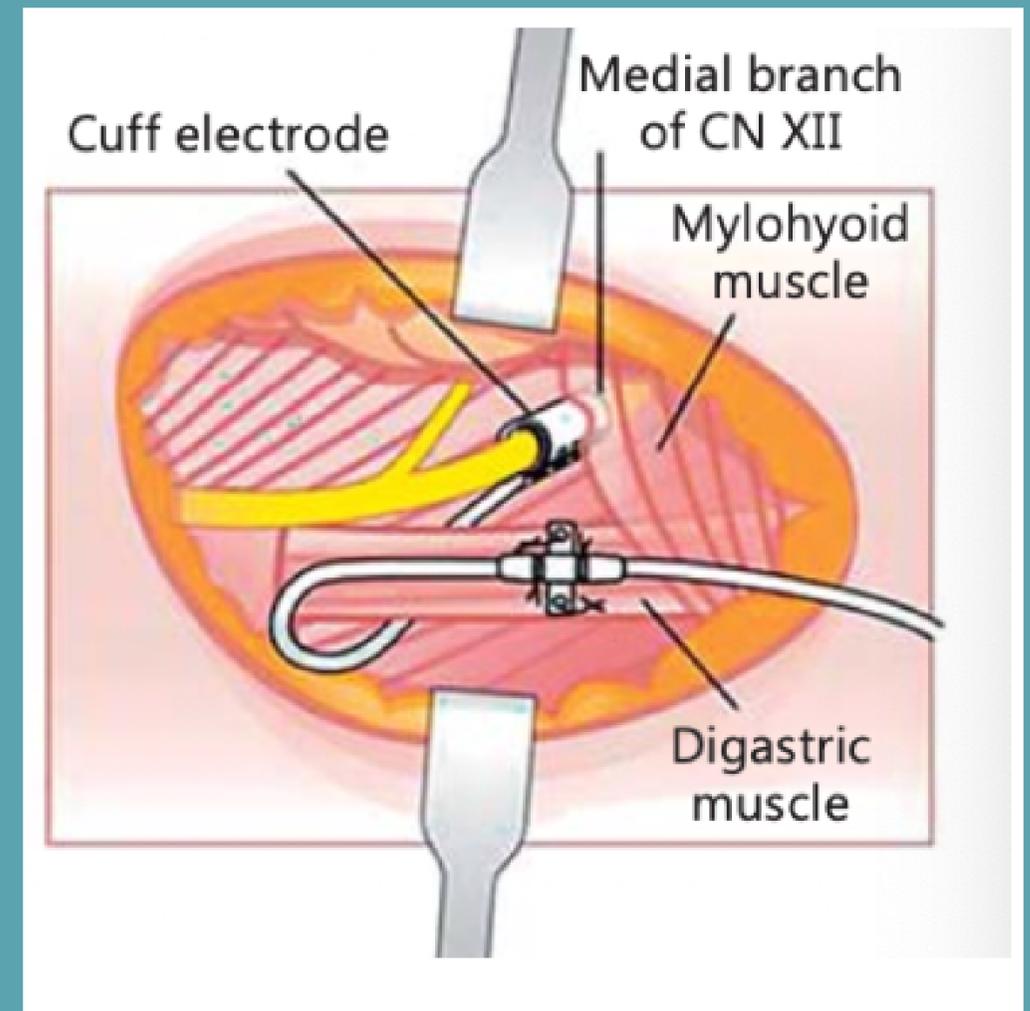
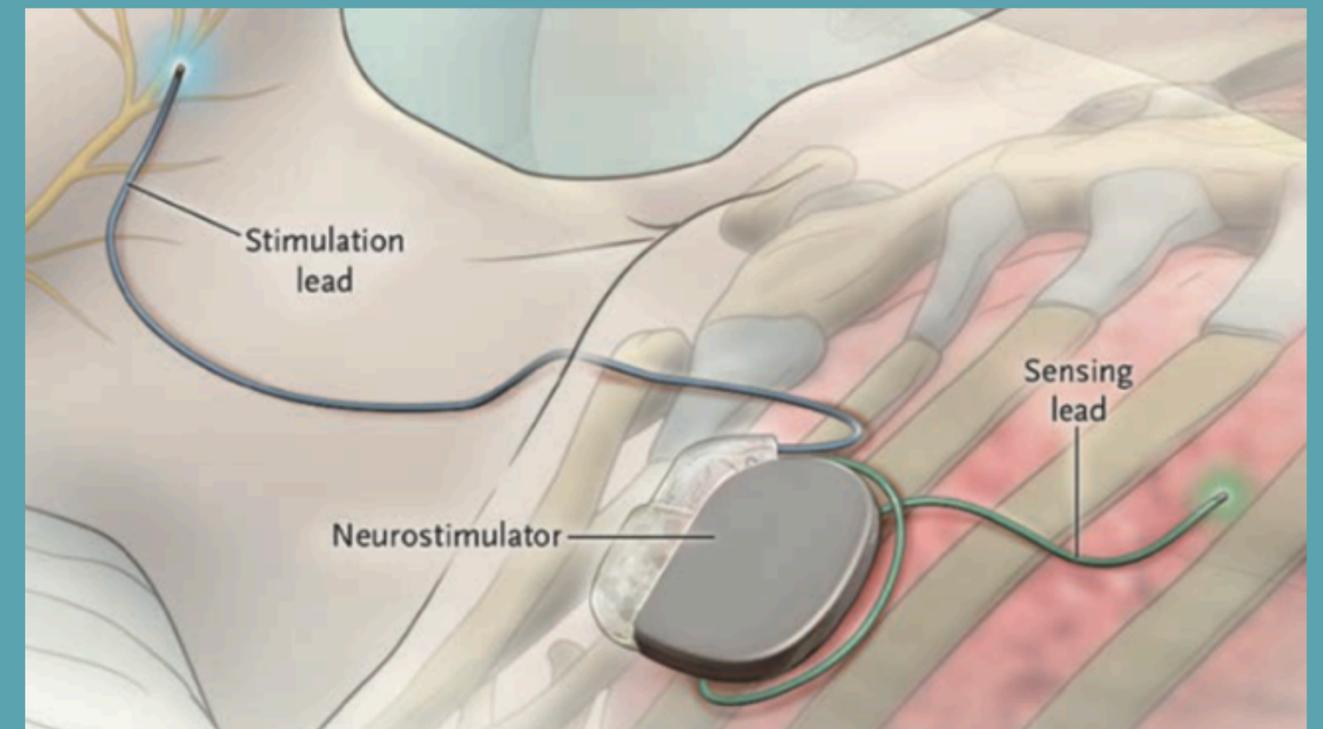
08 Bimaxillary advancement

- 1988 - 1992
- Many studies of short-term efficacy on large cohorts, or very small long-term studies.
- Discussed in the upcoming two-part presentation.
- A genuine follow-up after more than 20 years!

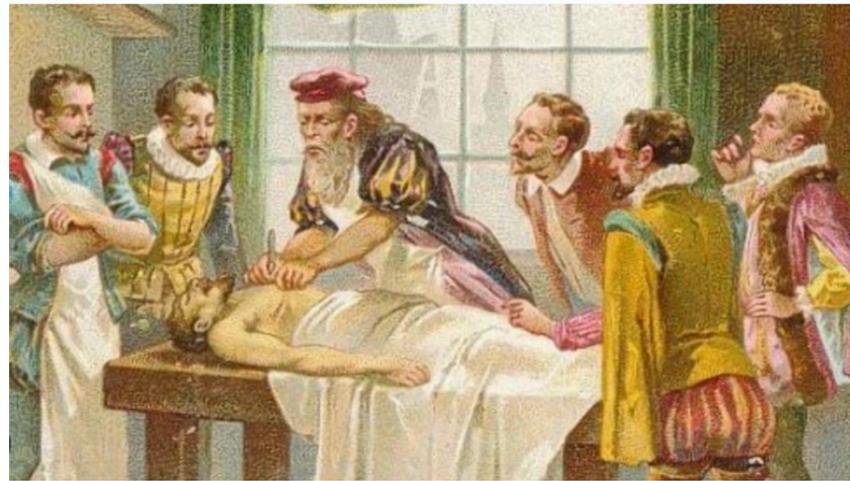


09 Stimulator of the XII nerve

- 1993 (on cat)
- The Amsterdam experience, which consists of a retrospective descriptive cohort study, describes a decrease in AHI from an average of 37.6 events per hour to 8.3.
- Numerous adverse effects still poorly understood: premature termination of sleep, tongue weakness, respiratory imbalance, insomnia, etc.
- Promising method with good patient selection.



10 Conclusion



A rich history of techniques!

- Numerous attempts that are theoretically valid but practically difficult to apply/ineffective.
- A demand that is becoming less and less invasive.



What about bimaxillary advancement?

- Discussed in the upcoming two-part presentation.
- A genuine follow-up after more than 20 years!



Any other ideas?

- The combination of different techniques is currently being developed.
- The best screening and surgical selection of patients is essential.