

## Mini Tracheostomy for Obstructive Sleep Apnea: An Evidence Based Proposal.

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### Abstract

**Objective.** To search for articles evaluating the use of tracheostomies (either permanent stomas or tracheostomy tubes) in adult obstructive sleep apnea (OSA) patients and to evaluate the potential for the use of mini tracheostomies as treatment for OSA. **Study Design.** Systematic review. **Methods.** Nine databases were searched from inception through July 21, 2015. **Results.** The overall tracheostomy search yielded 516 articles, of which eighteen studies provided polysomnographic data. No study was identified (empty review) for the use of mini tracheostomies for treating OSA. The mini tracheostomy search yielded ninety-five articles which describe findings for either mini tracheostomy kits (inner cannula diameter of 4 mm) or the performance of mini tracheostomies. Six articles described the use of mini tracheostomies as a temporary procedure to relieve acute upper airway obstruction and none described the use for OSA. For tracheostomy stomal sites, suturing the skin directly to the tracheal rings with defatting can minimize stomal site collapse. The smallest tracheostomy stomal size that can successfully treat OSA has not been described. **Conclusion.** Mini tracheostomies as small as 4 mm have been successfully used in the short term to relieve upper airway obstruction. Given that polysomnography data are lacking, additional research is needed.

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## Maxillomandibular advancement and tracheostomy for morbidly obese obstructive sleep apnea: a systematic review and meta-analysis.

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## Abstract

### OBJECTIVE:

The objective of this study is to systematically review polysomnography data and sleepiness in morbidly obese (body mass index [BMI]  $\geq 40$  kg/m<sup>2</sup>) patients with obstructive sleep apnea (OSA) treated with either a maxillomandibular advancement (MMA) or a tracheostomy and to evaluate the outcomes.

### DATA SOURCES:

MEDLINE, Scopus, Web of Science, and the Cochrane Library.

### REVIEW METHODS:

A search was performed from inception through April 8, 2014, in each database.

### RESULTS:

Six maxillomandibular advancement studies (34 patients, age  $42.42 \pm 9.13$  years, mean BMI  $44.88 \pm 4.28$  kg/m<sup>2</sup>) and 6 tracheostomy studies (14 patients, age  $52.21 \pm 10.40$  years, mean BMI  $47.93 \pm 7.55$  kg/m<sup>2</sup>) reported individual patient data. The pre- and post-MMA means  $\pm$  SDs for apnea-hypopnea indices were  $86.18 \pm 33.25$ /h and  $9.16 \pm 7.89$ /h ( $P < .00001$ ), and lowest oxygen saturations were  $66.58\% \pm 16.41\%$  and  $87.03\% \pm 5.90\%$  ( $P < .00001$ ), respectively. Sleepiness following MMA decreased in all 5 patients for whom it was reported. The pre- and posttracheostomy mean  $\pm$  SD values for apnea indices were  $64.43 \pm 41.35$ /h and  $1.73 \pm 2.68$ /h ( $P = .0086$ ), oxygen desaturation indices were  $69.20 \pm 26.10$ /h and  $41.38 \pm 36.28$ /h ( $P = .22$ ), and lowest oxygen saturations were  $55.17\% \pm 16.46\%$  and  $79.83\% \pm 4.36\%$  ( $P = .011$ ), respectively. Two studies reported outcomes for Epworth Sleepiness Scale for 5 patients, with mean  $\pm$  SD values of  $18.80 \pm 4.02$  before tracheostomy and  $2.80 \pm 2.77$  after tracheostomy ( $P = .0034$ ).

### CONCLUSION:

Data for MMA and tracheostomy as treatment for morbidly obese, adult OSA patients are significantly limited. We caution surgeons about drawing definitive conclusions from these limited studies; higher level studies are needed.

**KEYWORDS:**

maxillomandibular advancement; morbid obesity; obstructive sleep apnea; sleep apnea syndromes; tracheostomy

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