

Tracheostomy as treatment for adult obstructive sleep apnea: a systematic review and meta-analysis.

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Abstract

OBJECTIVES/HYPOTHESIS:

To systematically review outcomes for polysomnography, sleepiness, and mortality in patients who undergo tracheostomy for the treatment of adult obstructive sleep apnea (OSA).

DATA SOURCES:

MEDLINE, Scopus, and the Cochrane Library were searched from inception to March 2013, followed by extensive hand searching for the identification of relevant English language studies that met predefined criteria.

REVIEW METHODS:

Adult studies of tracheostomies or tracheotomies as treatment for OSA with outcomes for apnea index (AI), apnea-hypopnea index (AHI), oxygen desaturation index (ODI), effect on daytime sleepiness or mortality were identified, abstracted and pooled (as appropriate). Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed.

RESULTS:

The systematic search identified 18 relevant studies that were primarily case series, using retrospective review. Posttracheostomy AI improved from 73.0 ± 27.1 to $0.2 \pm 1.2/h$ and an AI mean difference of -83.47 (95% CI, -106.07 to -60.87 ; $P < 0.0001$). Mean AHI decreased from 92.0 ± 34.8 to $17.3 \pm 20.5/h$ and an AHI mean difference -79.82 (95% CI, -63.74 to -95.90 ; $P < 0.0001$) compared with preoperative status was observed. Postsurgically, there was a development of central apneas; however, the central AI demonstrated near normalization to a mean of $2.1 \pm 3.5/h$ after 14 weeks. ODI decreased from $78.2 \pm 25.8/h$ to $20.8 \pm 25.5/h$. Four studies demonstrated a statistically significant improvement in subjective sleepiness posttracheostomy. Postoperative statistically significant reductions in overall and in cardiovascular mortality compared with untreated historical cohorts was reported.

CONCLUSION:

Tracheostomies significantly decrease apnea index, oxygen desaturation index, sleepiness, and mortality in OSA subjects.

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KEYWORDS:

Tracheostomy; obstructive sleep apnea

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Does Nasal Surgery Improve OSA in Patients with Nasal Obstruction and OSA? A Meta-analysis.

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Erratum in

- [Corrigendum](#). [Otolaryngol Head Neck Surg. 2015]

Abstract

OBJECTIVE:

To perform a systematic review and meta-analysis to determine if isolated nasal surgery in patients with obstructive sleep apnea and nasal airway obstruction improves obstructive sleep apnea.

DATA SOURCES:

Computerized searches were performed in PubMed, EMBASE, and the Cochrane Library through October 2014. Manual searches and subject matter expert input was also solicited.

REVIEW METHODS:

A search protocol was defined a priori, and 2 independent investigators performed the data extraction, focusing on relevant data, including quality data polysomnography data, and taking note of methodological quality and risk for bias.

RESULTS:

The 10 studies meeting criteria included a total of 320 patients. There were 2 randomized controlled trials, 7 prospective studies, and 1 retrospective study. There was a significant improvement in the pooled results of both Epworth Sleepiness Scale (ESS; difference 3.53, 95% confidence interval [CI] [0.64, 6.23]) and Respiratory Disturbance Index (RDI; 11.06, 95% CI [5.92, 16.19]) scores with

isolated nasal surgery. There was no significant improvement in the Apnea Hypopnea Index (AHI) in the random effects model (4.83, 95% CI [-1.6, 11.62]).

CONCLUSIONS:

The pooled results showed that isolated nasal surgery for patients with nasal obstruction and obstructive sleep apnea improved some sleep parameters, as shown by significant improvements in ESS and RDI, but had no significant improvements on AHI. Future controlled studies with larger groups are needed to confirm the benefits of isolated nasal surgery in this patient population.

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KEYWORDS:

nasal obstruction; nasal surgery; obstructive sleep apnea; sleep apnea

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Clinical effect of surgical correction for nasal pathology on the treatment of obstructive sleep apnea syndrome.

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Abstract

OBJECTIVES:

This study aimed to evaluate the hypothesis that relief of nasal obstruction in subjects with obstructive sleep apnea (OSA) would lead to reduce OSA severity and to discuss the available evidence on the clinical efficacy of nasal surgery as a treatment modality for OSA.

STUDY DESIGN:

Twenty-five subjects who had reduced patency of nasal cavity and narrowing of retroglottal or retropalatal airways were diagnosed with OSA and underwent nasal surgery, such as septoplasty or turbinoplasty to correct nasal pathologies. The effect of the surgery on nasal patency was quantified by measuring minimal cross-sectional area (MCA) using acoustic rhinometry. The watch-PAT-derived respiratory disturbance index (RDI), apnea and hypopnea index (AHI), lowest oxygen saturation, and valid sleep time were measured before and after nasal surgery.

RESULTS:

The present study shows that the AHI and RDI decreased significantly and the lowest oxygen saturation and valid sleep time rose after nasal surgery in 25 OSA subjects. In addition, a reduction in

subjective symptoms was observed in subjects and mean MCA increased after nasal surgery. Fourteen subjects were classified as responders and 11 subjects as non-responders. Responders showed considerable improvement of their subjective symptoms and the AHI and RDI were significantly lower after surgery. We found that the changes between pre- and post-operative AHI and RDI values were minimal in 11 non-responders. However, daytime somnolence and REM sleep time improved after nasal surgery in non-responders.

CONCLUSIONS:

Our study provides evidence that the surgical treatment of nasal pathology improves nasal airway patency and reduces OSA severity in 56% subjects. Furthermore, correction of nasal pathology appears to result in improved sleep quality in both responder and non-responders OSA subjects.

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The effect of nasal surgery on continuous positive airway pressure device use and therapeutic treatment pressures: a systematic review and meta-analysis.

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Abstract

BACKGROUND:

The relationship between nasal surgery and its effect on continuous positive airway pressure (CPAP) device therapeutic treatment pressures and CPAP device use has not been previously systematically examined.

STUDY OBJECTIVES:

To conduct a systematic review and meta-analysis evaluating the effect of isolated nasal surgery on therapeutic CPAP device pressures and use in adults with obstructive sleep apnea (OSA).

METHODS:

MEDLINE, Scopus, Web of Science, and The Cochrane Library were searched through July 15, 2014. The MOOSE consensus statement and PRISMA statement were followed.

RESULTS:

Eighteen studies (279 patients) reported CPAP data after isolated nasal surgery. Seven studies (82 patients) reported preoperative and postoperative mean therapeutic CPAP device pressures and standard deviations (SD), which reduced from 11.6 ± 2.2 to 9.5 ± 2.0 centimeters of water pressure (cwp) after nasal surgery. Pooled random effects analysis demonstrated a statistically significant pressure reduction, with a mean difference (MD) of -2.66 cwp (95% confidence interval (CI), -3.65 to -1.67); $P < 0.00001$. Eleven studies (153 patients) reported subjective, self-reported data for CPAP use; and a subgroup analysis demonstrated that 89.1% (57 of 64 patients) who were not using CPAP prior to nasal surgery subsequently accepted, adhered to, or tolerated it after nasal surgery. Objective, device meter-based hours of use increased in 33 patients from 3.0 ± 3.1 to 5.5 ± 2.0 h in the short term (<6 mo of follow-up).

CONCLUSION:

Isolated nasal surgery in patients with OSA and nasal obstruction reduces therapeutic CPAP device pressures and the currently published literature's objective and subjective data consistently suggest that it also increases CPAP use in select patients.

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KEYWORDS:

continuous positive airway pressure; nasal surgery; obstructive sleep apnea; sleep apnea syndromes

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The effect of nasal surgery on nasal continuous positive airway pressure compliance.

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Abstract

OBJECTIVES/HYPOTHESIS:

Nasal continuous positive airway pressure (CPAP) is the standard therapy for sleep apnea; however, compliance rates are historically poor. Among the most commonly cited reasons for nonadherence is nasal obstruction. Our study sought to examine if nasal surgery actually increases CPAP compliance.

STUDY DESIGN:

Prospective case series.

METHODS:

Nasal CPAP-intolerant obstructive sleep apnea (OSA) patients, with documented nasal obstruction, underwent septoplasty plus inferior turbinoplasty. Preoperative and postoperative data were collected on CPAP usage per night and subjective nasal obstruction with the Nasal Obstruction Symptom Evaluation (NOSE) Scale questionnaire.

RESULTS:

Eighteen patients met inclusion criteria and underwent septoplasty. CPAP usage increased significantly from 0.5 hours per night preoperatively to 5 hours per night postoperatively ($P < .05$). Subjective nasal obstruction on the NOSE Scale decreased from 16.1 preoperatively to 5.4 following surgical intervention ($P < .05$). CPAP pressure decreased from 11.9 preoperatively to 9.2 after surgery, with a trend toward significance ($P = .062$).

CONCLUSIONS:

This study demonstrates improved CPAP compliance rates following septoplasty in OSA patients with nasal obstruction. Correction of nasal obstruction should be offered in nasal CPAP-intolerant individuals to improve CPAP compliance.

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KEYWORDS:

Obstructive sleep apnea; continuous positive airway pressure; nasal surgery; septoplasty

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Risk of post-operative pneumocephalus in patients with obstructive sleep apnea undergoing transsphenoidal surgery.

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Abstract

Patients undergoing transsphenoidal surgery (TSS) have an anterior skull base defect that limits the use of positive pressure ventilation post-operatively. Obstructive sleep apnea (OSA) can be seen in these patients and is treated with continuous positive airway pressure (CPAP). In our study we documented the incidence of pre-existing OSA and reported the incidence of diagnosed pneumocephalus and its relationship to OSA. A retrospective review was conducted from a surgical outcomes database. Electronic medical records were reviewed, with an emphasis on diagnosis of OSA and documented symptomatic pneumocephalus. A total of 324 patients underwent 349 TSS for sellar mass resection. The average body mass index of the study cohort was 32.5kg/m². Sixty-nine patients (21%) had documented OSA. Only 25 out of 69 (36%) had a documented post-operative CPAP plan. Out of all 349 procedures, there were two incidents of pneumocephalus diagnosed. Neither of the patients had pre-existing OSA. One in five patients in our study had pre-existing OSA. Most patients returned to CPAP use within several weeks of TSS for resection of a sellar mass. Neither of the patients with pneumocephalus had pre-existing OSA and none of the patients with early re-initiation of CPAP developed this complication. This study provides preliminary evidence that resuming CPAP early in the post-operative period might be less dangerous than previously assumed.

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