Availability of a Meta-analysis of the Surgical Treatment of Obstructive Sleep Apnea

The field of clinical practice guideline development has advanced rapidly over the recent past. Not too long ago, it was acceptable to disseminate the consensus of a panel of “experts” as the last word on a given topic in clinical medicine. Currently, only guidelines derived from an evidenced-based critical review of the literature are acceptable. Several professional organizations, including the American College of Chest Physicians (ACCP), have standing committees to facilitate practice guideline development. When considering new topics for this process recently, members of the Health and Science Policy Committee of ACCP placed the topic of surgical treatment of obstructive sleep apnea (OSA) high on the priority list for practice guideline development, only to discover that this task had already been undertaken by the Standards of Practice Committee of the American Sleep Disorders Association.

The purpose of this communication is to alert the readership of CHEST to the existence of the evidence-based clinical practice guideline addressing the surgical management of OSA. The paper, “An American Sleep Disorders Association Review: The Efficacy of Surgical Modifications of the Upper Airway in Adults with Obstructive Sleep Apnea Syndrome,” was endorsed by the Board of Directors of the American Sleep Disorders Association.

The authors reviewed articles written in English assessing the surgical treatment of OSA and published from 1966 through February, 1995. Criteria for manuscript selection for review were developed. For instance, studies had to evaluate results of surgical treatment of OSA on at least nine adult subjects and contain results of pre- and postoperative objective evaluations. Grading of the articles was done, based on the extent of data presentation. Those with individual subject data received a higher score than articles in which only group summary data were presented. The meta-analysis statistical evaluation took this grading and the number of subjects evaluated within a given study into account. In total, 54 articles were selected for review. These were screened from an original list of 175 papers identified by MEDLINE in the subject categories of sleep apnea syndromes, snoring, and surgery. Reasons for exclusion of papers from analysis were: (1) fewer than nine subjects, (2) lack of objective postoperative evaluation, (3) data already included in another study, and (4) lack of original data, such as would occur in review articles. After categorization of the articles by surgery type, data were extracted so that statistical evaluation of the combined data could be performed to derive a single p value for all of the data. As would be expected, the majority of papers, 37, examined the response to uvulopalatopharyngoplasty (UPPP).

Depending on the definition of responders and nonresponders, 40 to 66% of patients were shown to improve with UPPP. Statistically, there were no differences in the preoperative clinical characteristics between the responders and nonresponders to UPPP, although the nonresponders tended to have worse OSA than the responders.

When the site of the pharyngeal obstruction was identified preoperatively, and even though several different techniques were used to identify the site of obstruction, UPPP results improved. In 111 patients with isolated retroglottal obstruction, the favorable response to UPPP was a 74.6±27% compared with 22.8±29% success rate of UPPP in patients with isolated retrolaryngeal or a combined obstruction in the retrolaryngeal and retroglottal airway (p<0.0001). Although impressive, these data only reflect short-term success. Minimal information was available on long-term follow-up. In one study, data spanning 46 months from one group of 50 OSA patients demonstrated that weight gain was a major factor in the relapse of OSA following UPPP. Subsequent weight loss was helpful in improving the OSA in these patients.

Results of retroglossal surgery are hard to analyze...
because these procedures were usually performed in patients who were UPPP failures or were performed simultaneously with UPPP. In addition, multiple procedures have been developed for the correction of retroglossal collapse. This factor added an extra layer of complexity to the evaluation of retroglossal surgery that did not exist for the assessment of UPPP. One has the sense from examining the analysis of Sher et al1 that surgical procedures that increased retroglossal airway caliber in those patients with retroglossal narrowing improved the outcome, especially if the maxillomandibular osteotomy and advancement procedure was included in the operation.

Drawbacks to this analysis are addressed by the authors. Randomized, controlled studies of the treatment of OSA do not exist. Follow-up data reported in most studies are incomplete and short-term in nature. Reporting of pre- and postoperative polysomnographic data is nonuniform, concentrates on the quantity of abnormal respiratory events, and does not routinely include sleep quality data. No quality-of-life variables have been examined in this setting. In addition, inclusion and exclusion criteria vary widely across studies and the details of the surgical procedures vary in different centers.

In spite of these drawbacks, valuable conclusions can be drawn from this meta-analysis: (1) Results of UPPP improve if the site of upper airway collapse is identified preoperatively and the UPPP is restricted to those patients with isolated retropalatal obstruction; (2) Both short-term and long-term follow-up polysomnograms should be conducted postoperatively; and (3) OSA patients with retroglossal obstruction benefit best from surgical procedures that increase the caliber of the retroglossal airway.

Recommendations for further research are a valuable outcome of the practice guideline development process. From this review it is clear that we do not have a final evaluation of the role of pharyngeal surgery in the treatment of OSA. Specific recommendations that one might draw from this discussion are: (1) The method of preoperative determination of the pharyngeal site of obstruction is not standardized. Should this evaluation be done in sleep or is an office procedure such as upper airway endoscopy with the Müller maneuver adequate? (2) The surgical approach to retroglossal obstruction needs further study. Do these patients need UPPP or is an isolated approach to the retroglossal airway sufficient? If so, what operative procedure is best? (3) The long-term course of OSA patients who undergo pharyngeal surgery needs further documentation. If relapse of the OSA occurs, is further surgery beneficial, and at what site? (4) Variables other than respiratory abnormality indices, such as quality-of-life variables, need to be studied as outcome variables to better assess whether pharyngeal surgery is truly helping these individuals in an overall sense.

In all, the meta-analysis evaluation of the surgical treatment of OSA conducted by Sher et al1 is outstanding and is an extremely valuable contribution to the literature and to our understanding of the treatment of OSA. The authors and the American Sleep Disorders Association are to be congratulated on their high standards of scientific approach to sleep medicine. This review should improve our approach to the sleep apnea patient interested in a surgical correction of his or her OSA. It should also help investigators in the field plan research that will advance our knowledge beyond the status quo.

This paper is strongly recommended as a valuable reference to the readership of CHEST.

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REFERENCES


Who Should Treat Sleep Apnea and How?

The article by Loube and Strauss in this issue of CHEST (see page 382) raises three important issues: (1) Who should diagnose and treat obstructive sleep apnea? (2) How should it be treated? and (3) How should the effectiveness of that treatment be assessed?

Because sleep apnea is a serious and highly prevalent disorder, those who display either loud snoring or excessive sleepiness are members of an attractive pool of potential patients at a time when many practices are shrinking. In the last 20 years whole new industries have sprung up, manufacturing equipment to identify and treat these patients without any face-to-face examination by a sleep specialist. Portable home monitoring equipment with automated scoring of respiratory events is being heavily marketed to ear, nose, and throat (ENT) and pulmonary physicians as income-producing aids. These, along with the development of “self-titrating” nasal continuous positive airway pressure (CPAP) devices,