

Section 2 – ORAL CAVITY/OROPHARYNX

Chapter 21 – Surgery for Obstructive Sleep Apnea

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PATIENT SELECTION

Uvulopalatopharyngoplasty (UPPP) has evolved as the surgical technique of choice for the management of limited obstructive sleep apnea (OSA) in selected patients.^[1–4] Patients presenting with socially unacceptable snoring, a history of restless sleep (often indicative of myoclonus), and daytime hypersomnolence should be referred for overnight polysomnography (Fig. 21-1).



Figure 21-1 Socially unacceptable snoring and daytime hypersomnolence are the cardinal symptoms of obstructive sleep apnea.

When OSA is diagnosed, most patients should undertake a trial of continuous positive airway pressure (CPAP)

before considering surgical management. Whereas CPAP effectively reduces or eliminates apnea with its attendant desaturation in 75% to 80% of patients, no more than 40% to 60% of the patients who respond to CPAP will accept this therapy (Fig. 21-2). Another nonoperative consideration for patients with OSA is the use of an oral retaining device (ORD). A wide variety of designs are available, the proponents of which are often responsible for device design. Generally, these ORDs work either by holding the tongue forward (with negative-pressure suction between device and tongue) or through anterior displacement of the mandible. Efficacy of these devices is marginal when compared with CPAP.[5]



Figure 21-2 Some patients find nasal continuous positive airway pressure intrusive and uncomfortable.

Patients unwilling or unable to tolerate CPAP are candidates for surgery. Unfortunately, UPPP alone is not uniformly successful in correcting OSA.[6–10] This may reflect the multifactorial causes of OSA. We estimate that 50% of patients treated with UPPP have persistent apneic episodes following surgery. Review of the literature that addresses outcomes following UPPP is confounded in that there is no standard format for the reporting of results of surgical therapy for sleep apnea. For instance, some surgeons report that some patients are “improved.” Unfortunately, improvement does not necessarily mean normal. Normal individuals have fewer than five apneic episodes per hour and each episode lasts less than 10 seconds. Some patients are encountered with an apneic index (AI) of greater than 100 episodes per hour. Reduction of the AI to less than 50 episodes per hour is a “great improvement.” It is, nevertheless, not normal and the patient remains at risk for the cardiovascular and other sequelae of persistent OSA.

The population of individuals seeking treatment for OSA is heterogeneous. At one end of the spectrum are patients with morbid obesity, carbon dioxide retention, hypertension, and right-sided heart failure with an AI of more than

100. At the other end of the spectrum are those individuals with minimal sleep-disordered breathing whose chief complaint is snoring. Evaluation of treatment outcomes is further confounded because many patients undergo more than one procedure and some patients do not return for postoperative evaluation in the sleep laboratory. This is understandable, perhaps, because polysomnography is intrusive and expensive; however, it has been clearly demonstrated that reduction in snoring does not accurately indicate a reduction of apneic episodes. Our experience has been that approximately 85% of patients have a remarkable reduction in snoring. This includes complete elimination of snoring in approximately 50% of patients and a vast improvement in another 35%. For some reason, 10% to 15% of patients continue to snore.

In the cohort of patients who undergo postoperative polysomnography, we have designated individuals as either “responders” or “successes.”^[11] Those who “respond” are defined as individuals with 50% reduction in the AI. Those labeled as “successes” have an AI of less than five per hour, reduction of respiratory disturbance greater than 50%, and nadir desaturation greater than 82%. Patients with a history of prior tonsillectomy were less likely to benefit from surgery. In patients without previous tonsillectomy, 88% responded compared with only 59% response in the group of 27 patients who had previous tonsillectomy. Isolated UPPP was successful (as defined previously) in 52% of patients without prior tonsillectomy, whereas success was achieved in only 7% of patients after prior tonsillectomy. It seems medically plausible to speculate that the persisting tonsil contributes to the obstruction of the airway at the level of the oropharynx, hence tonsillectomy in these individuals results in a higher success rate. Conversely, our experience has been that the variety of maneuvers employed to assess the airway such as flexible endoscopy, the Mueller maneuver, and computed tomography evaluation of the airway do not significantly improve the surgeon’s ability to predict success. All forms of preoperative evaluation of airway obstruction are imperfect and patients must, therefore, be counseled about the possibility that surgery will fail to completely control the symptoms and they may still require CPAP.

It is critical that patients be counseled preoperatively that postoperative sleep study evaluation is necessary because it is possible that the surgery may not fully alleviate the problem. Accordingly, the procedure itself should be considered a form of therapeutic empiricism. There is general agreement among experts in sleep physiology that patients tend to over-report the success of their surgery, inasmuch as postoperative results reported by patients do not correlate well with objective findings at polysomnography.

Concurrent nasal septoplasty is frequently undertaken in patients undergoing UPPP. The decision to perform septoplasty is based on the patient’s history of nasal obstruction and the physical examination. Scattered reports indicate that a nasal airway obstruction may contribute to OSA. More importantly, however, many patients with significant OSA cannot tolerate nasal CPAP (N-CPAP). If the nasal airway is improved, N-CPAP may be better tolerated postoperatively if the results of UPPP are inadequate and further intervention for OSA is necessary.

PREOPERATIVE EVALUATION

Patients with retrognathia and other cranial facial anomalies that result in relative reduction in the size of the oropharyngeal airway may not be good UPPP candidates and should be considered for maxillomandibular reconstructive procedures. Reported results with advancement genioplasty and maxillary-mandibular advancement have been encouraging, especially in the subgroup of patients with significant retrognathia. The fundamental principle is to advance the muscular attachments of the tongue and suprahyoid soft tissue in an anterior direction.

Before surgical therapy for OSA, the upper aerodigestive tract should be carefully evaluated. The patient with sleep apnea may demonstrate disproportion of the oropharyngeal soft tissue (Fig. 21-3). The structures may be morphologically normal but out of proportion.



Figure 21-3 Oropharyngeal disproportion is the most commonly observed finding in patients with obstructive sleep apnea.

Consideration should be given to the repair of severe nasal septal deviation before or at the same time as UPPP. Occasional patients may be encountered who respond to correction of nasal airway obstruction alone. Fairbanks has suggested that a physiologic estimate of the efficacy of nasal surgery may be obtained by the patient using the "Afrin test."^[11] A long-acting nasal decongestant spray is used at bedtime. If snoring and OSA are improved, nasal surgery alone may be effective.

Under some circumstances, nasal septoplasty may be undertaken concurrently with UPPP. Nasal septoplasty is frequently of benefit to OSA patients undergoing UPPP. Relief of nasal airway obstruction rarely goes unnoticed. Inasmuch as UPPP fails to alleviate apnea in a significant number of patients, septoplasty may facilitate subsequent use of N-CPAP through relief of nasal obstruction. N-CPAP is better tolerated at lower pressures. Unfortunately, the relative effect on the OSA of correcting the nasal airway is largely unquantitated under these circumstances.

In our experience, physical examination, the use of the Mueller maneuver, and various imaging techniques are imperfect, but do help. The flexible fiberoptic laryngoscope is introduced through the nose and the airway is evaluated. When the obstruction seems primarily in the oropharynx (palate, uvula, and tonsils) and there is a normal retrolingual airway, we believe UPPP (with tonsillectomy if present) is indicated.

Patients demonstrating retrolingual collapse may be predicted to have incomplete response to UPPP and should be recommended for skeletal surgery. Observations are made at the level of the epiglottis, tongue base, tonsils, and velum with successive inspirations. The patient is also to inhale sharply and snore. The site of collapse and snoring is often identified. These observations may help predict the site of obstruction and the relative efficacy of intervention.^[12]

As previously noted, patients with a history of prior tonsillectomy are less suitable for UPPP.^[13] Nevertheless, we have encountered occasional patients who benefit from UPPP despite prior tonsillectomy. Accordingly, we continue to perform UPPP on patients with OSA with a variety of oropharyngeal morphology. Overall, the best candidates for UPPP are patients with a normal-appearing tongue, an obstructive palate, normal occlusion, and limited OSA.^[9]

SURGICAL APPROACHES

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