



Surgical Treatment for Obstructive Sleep Apnea

Introduction

Obstructive sleep apnea (OSA) is a serious health condition characterized by a repetitive stopping or slowing of breathing that can occur hundreds of times during the night. This often leads to poor quality sleep and excessive daytime sleepiness. Risks of untreated sleep apnea include high blood pressure, stroke, heart disease, and motor vehicle accidents. It is estimated that 1 in 5 Americans have at least mild OSA.

A variety of surgical and non-surgical options are available for the treatment of snoring and sleep apnea. Medical options include positive pressure (i.e. CPAP), oral appliances, and weight loss. Many of these treatment options depend on regular, long-term adherence to be effective. In patients having difficulty with other treatments, surgical procedures for the nose and throat can be a beneficial alternative. Surgical therapy can also be effective when used as an adjunct to improve tolerance and success with CPAP or an oral appliance.

Surgical Treatments

Nose

Increased nasal congestion has been shown to cause or contribute to snoring, disrupted sleep, and even sleep apnea. It is also a leading cause of failure of medical treatments for OSA, such as CPAP or an oral appliance. Nasal obstruction may result from many causes including allergies, polyps, deviated septum, enlarged adenoids, and enlarged turbinates.

Medical treatment options, such as a nasal steroid spray or allergy management, may be helpful in some patients. Structural problems, such as a deviated septum, often benefit from surgical treatment. One surgical option, known as radiofrequency turbinate reduction (RFTR), can be performed in the office under local anesthesia. RFTR uses radiofrequency to shrink swollen tissues in each side of the nose.

Upper throat (palate, tonsils, uvula)

In many patients with OSA, airway narrowing and collapse occurs in the area of the soft palate (back part of the roof of the mouth), tonsils, and uvula. The specific type and combination of procedures that are indicated depend on each individual's unique anatomy and pattern of collapse. Therefore the

procedure selection and surgical plan must be customized to each patient. In general, these procedures aim to enlarge and stabilize the airway in the upper portion of the throat.

The surgery is performed in an operating room under general anesthesia, either as an outpatient or with an overnight hospital stay. The recovery varies depending on the patient and the specific procedures performed. Many patients return to school/work in approximately one week and return to normal diet and activity at two weeks. Throat discomfort, particularly with swallowing, is common in the first two weeks and usually managed with medications for pain and inflammation. Risks include bleeding, swallowing problems, and anesthesia complications, although serious complications are uncommon.

The tonsils and adenoids may be the sole cause of snoring and sleep apnea in some patients, particularly children. In children, and in select adults, with OSA and enlarged tonsils/adenoids, tonsillectomy/adenoidectomy alone can provide excellent resolution of snoring, sleep apnea, and associated symptoms.

Lower throat (back of tongue and upper part of voice box)

The lower part of the throat is also common area of airway collapse in patients with OSA. The tongue base may be larger than normal, especially in obese patients, contributing to blockage in this area. The tongue may also collapse backward during sleep as the muscles of the throat relax, particularly when some patients sleep on their back. The epiglottis, or upper part of the voice box, may also collapse and contribute to airway obstruction.

Multiple procedures are available to reduce the size of the tongue base or advance it forward out of the airway. Other procedures aim to advance and stabilize the hyoid bone which is connected to the tongue base and epiglottis. A more recent technology involves implantation of a pacemaker for the tongue ('hypoglossal nerve stimulator') which stimulates forward contraction of the tongue during sleep. As with palatal surgery, the most appropriate type of procedure varies from one individual to another, and is primarily determined by each patient's anatomy and pattern of obstruction.

The procedures are done under general anesthesia, often with overnight hospital observation. Recovery and risks vary depending on the procedure(s) performed, but are generally similar to procedures in the upper throat.

Skeletal procedures

For the most part, the above procedures involve surgical enlargement and stabilization *inside* the airway. For some patients, particularly those with developmental or structural changes of the jaw or other facial bones, surgical or orthodontic procedures on the bones of the face, jaw, or hard palate (roof of the mouth) may be beneficial.



Orthodontic procedures to widen the palate (palatal or maxillary expansion) may be useful treatment options in some pediatric patients. Maxillomandibular advancement surgery includes a number of procedures designed to move the upper jaw (maxilla) and/or lower jaw (mandible) forward, thus opening the upper and/or lower airway, respectively. Although full maxillomandibular advancement surgery can provide effective enlargement and stabilization of the airway, the potential benefits must be cautiously weighed against the potential increased risks of complications, longer recovery, and changes in the cosmetic appearance of the face.

What should I know before considering surgery?

Surgery is an effective and safe treatment option for many patients with snoring and sleep apnea, particularly those who are unable to use or tolerate CPAP. Proper patient and procedure selection is critical to successful surgical management of obstructive sleep apnea. Talk to your Ear, Nose and Throat doctor for a complete evaluation and to learn what treatment may be best for you.



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