

Surgical Treatments of Obstructive Sleep Apnea

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DESCRIPTION

Obstructive Sleep Apnea (OSA) is a disorder characterized by intermittent and repetitive narrowing of the airways during sleep. Surgical treatment to treat OSA aims to improve airway patency by targeting selected sites of obstruction. The following surgeries are the gold standard to treat the Obstructive sleep apnea.

Craniofacial surgery

Craniofacial morphology is also an important factor contributing to the size and shape of the upper airways. Retrognathism and mandibular dysplasia are craniofacial abnormalities associated with many syndromes, including cranial synthesis, Pierre Robin sequence, and Treacher Collins syndrome. A narrow upper or lower jaw compresses the nasopharynx and oropharynx, pushing the base of the tongue back and increasing the risk of OSA. Distraction osteogenesis and mandibular propulsion are surgery that intentionally destroys the mandible and advances the jaw to a new position. Mandibular advancement surgery immediately moves the jaw to a new position. Distraction osteogenesis is reserved for more severe cases, where plates and screws are used to gradually advance the jaw and safely advance the mandible farther. Mandibular displacement surgery should be considered in children with craniofacial abnormalities with mandibular reflux and severe OSA.

Tongue base reduction

The tongue plays an important role in the pathophysiology of OSA. Macroglossia and glossoptosis result in a posteriorly placed tongue that is more likely to collapse into the airways during sleep. It can be seen in conditions that lead to OSA, such as Down syndrome, Pierre Robin Sequence, and Beckwith-Wiedemann syndrome. Enlargement of the lingual tonsils can occur similarly to enlargement of the adenoids or palatine tonsils. Surgery to reduce the base of the tongue involves surgical removal of the lingual tonsils and reduces the degree of posterior tongue collapse with or without some of the muscle tissue behind the tongue. According to the previous studies 114 patients from nine different studies experienced a mean reduction in AHI of 48.5%. The majority of patients had the

underlying syndrome. However, Apnea-Hypopnea Index (AHI) was more reduced in non-symptomatic children (59% vs. 40%). This treatment option can be difficult because the degree of loss of the base of the tongue is limited by the risk to important nerves and blood vessels in the tongue and maintains proper swallowing and speech function.

Tracheostomy

A tracheostomy involves surgically placing a tube from the midline neck through an incision into the trachea. Tracheostomy completely avoids upper airway collapse and is the definitive treatment for the management of OSA. In children, the use of tracheostomy was reserved for the most severe and refractory patients, primarily those with craniofacial abnormalities or neuromuscular dysfunction who do not respond to other treatments. Tracheostomy is therapeutic, is associated with long-term complications such as frequent infections, accidental extubation, and death. In addition, the quality of life is reduced. The burden on families for tracheostomy care is also increasing. For these reasons, tracheostomy is an underutilized modality in the management of pediatric OSA, and physicians consider the severity of the disease burden and the complications of tracheostomy when making the decision to pursue this therapy.

Supraglottoplasty

Laryngomalacia is a congenital disorder characterized by excessively redundant or loose tissue in the upper airways leading to obstruction. It usually presents as wheezing in neonates and infants and is a recognized cause of OSA in this age group. Congenital laryngomalacia usually improves as the patient grows and surgery is reserved only for patients with failure to thrive or with significant respiratory distress. Supraglottoplasty is a surgical treatment that reduces excess upper airway tissue and prevents collapse. A study showed improvement in AHI in patients with laryngomalacia and OSA after supraglottoplasty. Determining the patient is having laryngomalacia may be difficult, if it especially occurs only during sleep. Therefore, laryngomalacia may be underestimated as an etiology of OSA, and for further evaluation, additional diagnostic tests such as Drug-Induced Sleep Endoscopy (DISE) and others such as cine-MRI further evaluation.

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Received: 28-Jun-2022; **Manuscript No.** JSJT-22-18584; **Editor assigned:** 30-Jun-2022; **Pre QC No.** JSJT-22-18584 (PQ); **Reviewed:** 14-Jul-2022; **QC No.** JSJT-22-18584; **Revised:** 21-Jul-2022; **Manuscript No.** JSJT-22-18584 (R); **Published:** 28-Jul-2022, DOI: 10.35248/2167-0277.22.11.378.

Citation: Claura M (2022) Surgical Treatments of Obstructive Sleep Apnea. *J Sleep Disord Ther.* 11:378.

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