

NON SURGICAL APPROACH TO TREAT OBSTRUCTIVE SLEEP APNOEA PATIENTS - A NARRATIVE REVIEW

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ABSTRACT

Obstructive sleep apnoea [OSA] syndrome is defined as a disorder of breathing during sleep characterised by prolonged partial upper airway obstruction or intermittent obstructive apnoea that disrupts normal ventilation during sleep and healthy sleep patterns. It is a highly prevalent medical disorder and a challenge to treat. Dentists play a vital role in the identification of risk factors by screening patient for OSA syndrome through appropriate history taking, general and physical examination and evaluation of the anatomy of oral cavity and jaws during dental visits. Patients with OSA may exhibit both extraoral and intraoral features such as adenoid facies, high-arched palate, unilateral or bilateral crossbite, macroglossia, micrognathia and retrognathia.

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INTRODUCTION

Diagnosis and evaluation of sleep apnea syndrome is determined through POLYSOMNOGRAPHY (Figure: 1).



Figure 1 Polysomnography(PSG)

According to the American Academy of Sleep Medicine (AASM) the diagnosis of OSA is confirmed if the number of obstructive events (apneas, hypopneas + respiratory event related arousals) on PSG is greater than 15 events/hour or greater than 5/hour in a patient who reports any of the following: unintentional sleep episodes during wakefulness; daytime sleepiness; unrefreshing sleep; fatigue; insomnia; waking up breath holding, gasping or choking; or the bed partner describing loud snoring, breathing interruptions or both during the patient's sleep.

OSA severity is defined as:

- Mild for AHI or RDI 5 and < 15
- Moderate for AHI or RDI 15 and 30
- Severe for AHI or RDI > 30/hr.¹

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There are different treatment options available to treat OSA. Lifestyle modifications (weight loss, avoidance of alcohol or other agents that decrease upper airway patency), positional therapy, Surgical and Non surgical management.

Lifestyle Adjustments

In many cases, lifestyle adjustments may be the first step to treating obstructive sleep apnea.

Weight Loss: Weight management could be the first step to help reduce sleep apnea. Excessive weight around your throat constricts air as you sleep. Sleep apnea may go away if you return to a healthy weight.

Quit Smoking: Smoking can make obstructive sleep apnea worse.

Avoid Alcohol: Alcohol can relax the muscles in the back of your throat which can interfere with breathing.

Exercise: Regular exercise can help ease the symptoms of obstructive sleep apnea even without weight loss.

Nasal Spray: Talk to your doctor about using any nasal decongestants or antihistamines because these medications are generally recommended only for short-term use.²

Surgical intervention will be opted in severe OSAS conditions. There are different surgical procedures. They are as follows:

- Nasal surgery
- Oral /palatal surgery
- Hypopharyngeal
- Orthognathic
- Tracheostomy.³

Hence this narrative review aimed to discuss various non surgical therapies available to treat OSA.

Non-surgical treatment include:

1. CPAP (Continuous positive airway pressure)
2. Oral appliances.
3. Drug therapy.⁴

Continuous positive airway pressure

The most commonly followed medical intervention includes CPAP which was introduced by Sullivan et al in 1981 (Figure:2).



Figure 2 Continuous positive airway pressure machine.

It acts as a pneumatic splint to prevent collapse of the pharyngeal airway and become the first choice therapy for OSA. CPAP decreases daytime sleepiness, especially in those who have moderate to severe sleep apnea. People with coronary artery disease who use CPAP for sleep apnea are less likely to have heart problems such as heart failure.⁵

Oral Appliances

Oral appliance are categorized into 3 types

1. Mandibular advancement devices/splints(MAD)
2. Tongue retaining device (TRD)
3. Soft palate lifters.⁶

Mandibular Advancement Devices/Splints

The Oral appliance most commonly in use today is MAD. It protrudes the mandible forward, thus preventing or minimizing upper airway collapse. The amount of protrusion can be either fixed or variable. There are some different types of mandibular advancement devices: Mandibular advancement with anterior window (Figure: 3), Monoblock appliance (Figure:4), Luco hybrid osa appliance, Elastic mandibular advancement device.⁶



Figure 3 Mandibular advancement with anterior window.



Figure 4 Monobloc appliance

Luco hybrid osa appliance is made from cast chrome cobalt framework, which means it is durable and long lasting. It is designed to advance the mandible and tongue utilizing pharyngeal reflexes. This feature allows very effective and comfortable treatment of OSA and snoring. Other features: Open front - allows mouth breathing, emergency evacuation. Patented 90 degree curved wings, which keeps jaw forward if the jaw falls open during sleep. (Figure: 5)



Figure 5 Luco hybrid osa appliance. Elastic mandibular advancement device increases airway space by advancing the mandible using interchangeable elastic straps. EMA elastic straps come in 9 different lengths and 4 different strengths. The shorter the EMA elastic strap, the farther the mandible is advanced.⁸(Figure: 6)



Figure 6 Elastic mandibular advancement device.

Tongue Retaining Device

It consists of a mouthpiece that covers the entire upper and lower dental arches, with a defined mandibular protrusion. It pulls the tongue slightly forward due to the negative pressure created by the displacement of air from the lingual compartment of the device. The TRD is custom made from casts of the tongue and teeth using a soft copolymer. The initial mandibular protrusion is 50% to 75% of maximal protrusion. This protrusion distance is reduced if the patient complains of pain and is increased if snoring remains unchanged.⁹(Figure: 7)



Figure 7 Tongue retaining device.

Soft Palate Lifters

Palatal lift appliances act by lifting the soft palate upward and backward. When the soft palate is moved superiorly and posteriorly, the paired superior constrictor walls move medially to contract and press into the lateral portion of the elevated soft palate, thus effecting a proper velopharyngeal closure.¹⁰(Figure: 8)



Figure 8 Soft palate lifter.

Drug Therapy

Drugs commonly used in the treatment of Obstructive sleep apnea are:

- Paroxetine,
- Fluoxetine,
- Protriptyline,
- Modafinil,
- Armodafinil.¹¹

Summary

Continuous positive airway pressure (CPAP) is the preferred first line therapy for OSA. Although not as efficacious as CPAP, Oral appliances are most effective in the treatment of mild to moderate sleep apnea, although they do provide a treatment alternative for patients with severe OSA who cannot or will not tolerate positive airway pressure therapy. Oral appliances used to treat sleep apnea are worn in the mouth

during sleep. Most appliances work by positioning the lower jaw slightly forward of its usual rest position. This small change is, in many people, enough to keep the airway open during sleep. Sometimes for more complicated sleep apnea, an oral appliance and CPAP are used in combination.

CONCLUSION

The public health impact of obstructive sleep apnoea (OSA) is increasingly recognised and will rise in conjunction with the obesity epidemic. Current clinical management of OSA focuses on device-based interventions, which do not correct underlying obesity. The multi-comorbidity of OSA lends itself to a multi-disciplinary approach incorporating dieticians, physiotherapists, psychologist, sleep physicians and surgeons.

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