

Introduction

Obstructive sleep apnea (OSA) is a sleep-related breathing disorder characterized by loud snoring and apneas/hypopneas despite respiratory movements. Untreated OSA may lead to cardiovascular (CV) and metabolic comorbidities¹.

- Associated with HTN, DMII, PE/DVT, asthma, obesity, RLS, hypothyroidism
- Worldwide prevalence estimated between 936 million-1 billion people (some countries’ >50% prevalence)
- GERD/LPR: comorbid in 40-60% OSA patients/associated with erosive wear²

OSA has implications on prosthodontic treatment: untreated OSA is often associated with caries, temporomandibular joint pathology, loss of restorative space from heavy wear, and breakdown of natural and restored dentition, while successful treatment of OSA may cause significant changes in occlusion. Therefore, considerations for treatment of these patients must be made pre-prosthetically, during treatment, and in the maintenance phase.

Case Report

A 58-year-old male of the Tule River Tribe presents with chief complaint of “I want to keep my teeth.”

Medical history positive for severe OSA, GERD.

Findings include severe wear (correlates with OSA and GERD⁵), large mandibular tori, loss of tongue mobility, and diurnal apneic episodes.

Mandibular tori removal indicated.

After removal of one torus, patient reports improved breathing, tongue mobility, daytime sleepiness, & continuous positive airway pressure (CPAP/PAP) tolerance



Figure 1: Intraoral view, MIP



Figure 2: Occlusal view, maxilla



Figure 3a: Initial occlusal view, mandible; Note lingual frenum



Figure 3b: Mid-treatment occlusal view, mandible

Understanding the Untreated Patient

- Screening**
¹
- Evaluate for related dental symptoms
 - Severe wear of the teeth, physical airway obstruction (large tori, high Mallampati class, large tonsils), comorbid conditions (RLS, asthma, GERD, HTN, DMII)
 - Epworth Sleepiness Scale, 0-3: >10 indicates excessive sleepiness
 - STOP-BANG: 0-2 Low risk; 3-4 Intermediate risk; 5-8 High risk

How often do you doze?
Sitting and reading
Watching television
Sitting in a public inactive place (theater or meeting)
Riding in a car for one hour without a break (as a passenger)
Lying down in the afternoon when circumstances permit
Sitting and talking to someone
Sitting quietly after lunch, without alcohol
Stopped in traffic for a few minutes



STOP	
S	So you snore loudly (louder enough to be heard through closed doors or louder than talking)?
T	Do you often feel tired , fatigued or sleepy during the daytime?
O	Has anyone observed you stop breathing or choking or gasping during your sleep?
P	Do you have or are you being treated for high blood pressure ?

Bang	
B	BMI more than 35?
a	Age – over 50 years old?
n	Neck circumference – is it greater than 17” if you are a male or 16” if you are a female?
g	Gender – are you a male?

- Referrals**
- Sleep medicine: Positive result on Epworth, STOP-BANG
 - Gastroenterologist: Erosion, reported reflux, hoarse voice, throat clearing, excess mucus or postnasal drip

- Diagnosis**
¹
- Gold standard: Polysomnography (PSG) in-lab (at-home possible)
 - Obstructive sleep apnea (most common) vs. Central sleep apnea
 - Severity based on Apnea-Hypopnea Index (AHI) : Mild (5-10), Moderate (15-30), Severe (>30)

- Treatment**
^{1,4}
- Non-invasive: Positional therapy
 - Mild-mod: Oral Appliance Therapy (OAT - mandibular advancement)
 - Severe/symptomatic: Positive Airway Pressure (PAP)
 - Severe, intolerant to PAP, or adjunctive: Hypoglossal nerve stimulation, upper airway surgery, tracheostomy, bariatric surgery

Problem Solving in the Treated Patient

- | Problem | Evidence-Based Recommendation |
|---|--|
| Altered occlusion due to CPAP secondary to pressure on teeth/PDL or OAT secondary to lateral pterygoid shortening and masseter/temporalis/medial pterygoid lengthening ^{1,4} | <ul style="list-style-type: none">○ PAP: Daytime intraoral orthotic; Titration of CPAP with occlusal splint (only protects splinted arch)○ OAT: Conservative titration of mandibular advancement; Daytime intraoral orthotic; Isometric and passive jaw stretching (lat. pterygoid, masseter, temporalis) |

- | | |
|---|---|
| Caries and erosion secondary to increased intraoral acid challenge and/or dry mouth due to OAT/PAP/ medications | <ul style="list-style-type: none">○ Fluoride gel in intraoral orthotics; If patient does not need OAT or occlusal splint, patient can wear orthotics at night |
|---|---|

- | | |
|--|--|
| Bruxing (awake/sleep) ^{3,5} <ul style="list-style-type: none">○ OSA: Complete/partial airway collapse & associated decrease in oxygen leads to mandibular displacement and upper airway patency○ Medication: Phenethylamines, anticonvulsants, and SSRIs may contribute to bruxing | <ul style="list-style-type: none">○ OSA: Occlusal splints associated with aggravation of OSA by airway obstruction; Recommend CPAP titration with occlusal splint in place○ Medication: Ask prescribing physician if a change in medication is possible; Prescribe occlusal splint if patient does not have OSA |
|--|--|

- | | |
|--|--|
| OVD evaluation and/or restoration maintenance ⁵ | <ul style="list-style-type: none">○ Recommend daytime occlusal splint use○ Recommend CPAP titration with occlusal splint in place |
|--|--|

¹Epstein et al. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med 2009
²Mahfouz et al. The Relationship Between Obstructive Sleep Apnea (OSA) and Gastroesophageal Reflux Disease (GERD) in Inpatient Settings: A Nationwide Study. Cureus. 2022.
³Wetselaar et al. Associations between tooth wear and dental sleep disorders: A narrative overview. J Oral Rehabil. 2019
⁴Sheats, Rose & Schell. (2017). Management of Side Effects of Oral Appliance Therapy for Sleep-Disordered Breathing. Journal of Dental Sleep Medicine.
⁵Nikolopoulou et al. Effects of occlusal stabilization splints on obstructive sleep apnea: a randomized controlled trial. J Orofac Pain. 2013.