



Case Vignette: Treating OSA with Oral Appliance

Presenting Complaints

A 54 year old female patient, part time schoolteacher by profession, presented with complaints of waking up with frequent headaches, fatigue, inability to concentrate, anxiety and mood swings. *"I'm tired all day,"* is what she emphasized.

Past History

A year ago, she was referred to a sleep physician to be evaluated for sleep related disorders due to daytime hypersomnolence and fatigue. After undergoing a HSAT, she was diagnosed with mild obstructive sleep apnea with an AHI of 10.5 and O₂ Nadir of 80%. A CPAP was prescribed. However, she describes herself as intolerant, and has stopped using it. She has tried several different masks and is not able to get used to wearing any. *"It makes me feel sweaty, claustrophobic and prevents me from falling asleep"* she said. Consequently, she has not been following up with her sleep physician and currently her OSA remains untreated.

In the past, she was diagnosed with anxiety and depression off and on since age 40. She was diagnosed by a physician and was briefly treated with medications. Currently she is not taking any medication or being treated for these conditions. Over the past 6-12 months she has been under significant amount of stress since her father's brain cancer diagnosis and ultimate death six weeks ago.

The patient is currently under the care of a cardiologist for intermittent palpitations and irregular heartbeat. She recently completed a cardiac workup to evaluate complaints of substernal chest discomfort without radiation to the left arm, neck, jaw or back. Her discomfort has made her quite apprehensive, and she is experiencing more frequent episodes of palpitations and hot flashes, especially during nighttime. She controls her mild hypertension via diet modifications. She is a former smoker, quit in 2005 and denies vaping or use of drugs. She is an occasional red wine drinker.

Physical Exam

Patient denies any weakness, fever, chills, weight loss, malaise. She has gained 20 pounds in the past one year. Treatment modalities included medication and counseling. She also has bilateral lower extremity edema.

Vital Signs:

- Height: 67 inches
- Weight 210 lbs.



Obstructive Sleep Apnea Awareness

- BMI: 32.89
- O₂ Sat: 99%
- Temp: 97.2 F
- Pulse rate: 90/min
- BP Sitting: 140/85 (left arm)

Testing

Her most recent cardiovascular evaluation included a 2D Echocardiogram, EKG and a treadmill stress test demonstrated a normal ejection fraction (EF) without recognition of any significant valvular disease.

The attending physician administered the Epworth Sleepiness Scale (ESS) tool.

The ESS subjectively assesses excessive daytime sleepiness by asking patients to rate their chance of dozing off from 0 (would never doze) to 3 (high chance of dozing) for 8 commonly encountered scenarios, with a total maximal score of 24.

Would never doze	Slight chance of dozing	Moderate chance of dozing	High chance of dozing	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Sitting and reading
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Watching TV
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Sitting inactive in a public place (e.g. cinema or in a meeting)
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Being in a car for an hour as a passenger (without a break)
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Lying down to rest in the afternoon (when possible)
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sitting and chatting to someone
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Sitting quietly after lunch (not having had alcohol)
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	In a car when you stop in traffic for a few minutes
<input type="button" value="Calculate Score"/>				
Your Score				
16				

Figure 1. Results of Epworth Sleepiness Scale



Obstructive Sleep Apnea Awareness

The ESS score generated was 16/24 (Figure 1). A score in the range of 16-24 is interpreted as Severe Excessive Daytime Sleepiness. [[About the ESS](#)]

Test results:

A repeat sleep study (was ordered to establish a new baseline as she has gained 20lbs in the past year. She completed a new HSAT as recommended. The results showed an AHI of 14.9 (up from 10.5) and O2 Nadir is 76% (down from 80%). Her physician strongly recommended her to follow up with the sleep physician to discuss alternative treatments to manage her OSA. To manage her hypertension, Norvasc 5mg *qid* was prescribed along with a low sodium diet.

Discussion of Treatment Plan

She followed up with the sleep physician to discuss a plan of care and communicated her intolerance of CPAP. He advised her that OSA needs to be treated and agreed that an oral appliance would be an appropriate option. Along with nutritional and sleep hygiene counseling, the patient was referred to a qualified dentist for further evaluation and treatment.

Outcome of Case

Patient followed up with a [qualified dentist](#) who did a thorough evaluation of her teeth, oral structures, TMJ and determined that she was good candidate for oral appliance therapy (also referred to as mandibular advancement device/MAD therapy). An intraoral scan and appropriate bite were taken to make a custom fitted MAD.

A six-month follow up sleep study yielded the following results: AHI - 1/h while using the appliance, 0 apneas/h and 1 hypopneas/h, 94% minimum oxyhemoglobin saturation. The patient was had been compliant with therapy. She was no longer waking up with headaches. Her daytime hypersomnolence had significantly decreased as well as episodes of palpitations. She reported that she had much more energy and was going to start focusing on weight loss/exercise. At her one year follow up, she had lost 10 lbs.

Teaching Points



Case Presentation



Copyright of the American Academy of Dental Sleep Medicine (AADSM). Used with permission.



This case demonstrates how a multi-disciplinary approach can improve patients' quality of life and overall health status outcomes. Providers can offer their patients FDA approved PAP alternative treatments and prevent abandonment of therapy. While continuous positive airway pressure (CPAP) therapy is the most commonly prescribed treatment, adherence to PAP therapy is a limiting factor in its efficacy. In cases where patients abandon PAP therapy or have mild or moderate OSA, providers can offer oral appliances as an option to these patients.

Oral appliances (OA) have been in existence for three decades. There is enormous amount of data supporting their efficacy along with guidelines (from AASM and AADSM) recommending oral appliance therapy (OAT) as first line therapy for mild-moderate OSA or for anyone who is refusing a CPAP.

Adapted from "Risk of Sudden Cardiac Arrest" by Rubina Nguyen, DDS, D-ABDSM. © Rubina Nguyen. Used with permission.

Additional Reading

- Pavwoski P, Shelgikar AV. Treatment options for obstructive sleep apnea. *Neurol Clin Pract.* 2017 Feb;7(1):77-85. doi: 10.1212/CPJ.0000000000000320. PMID: 29849228; PMCID: PMC5964869.
- Ramar K, Dort LC, Katz SG, Lettieri CJ, Harrod, CG, Thomas SM, Chervin RD. Clinical practice guideline for the treatment of obstructive sleep apnea and snoring with oral appliance therapy: an update for 2015. *J Clin Sleep Med* 2015;11(7):773–827



Obstructive Sleep Apnea Awareness

- Manetta IP, Ettlin D, Sanz PM, Rocha I, Meira E Cruz M. Mandibular advancement devices in obstructive sleep apnea: an updated review. *Sleep Sci.* 2022 Apr-Jun;15(Spec 2):398-405. doi: 10.5935/1984-0063.20210032. PMID: 35371398; PMCID: PMC8906377.
- Marklund M, Braem MJA, Verbraecken J. Update on oral appliance therapy. *Eur Respir Rev.* 2019 Sep 25;28(153):190083. doi: 10.1183/16000617.0083-2019. PMID: 31554705; PMCID: PMC9488498.
- Ng JH, Yow M. Oral Appliances in the Management of Obstructive Sleep Apnea. *Sleep Med Clin.* 2019 Mar;14(1):109-118. doi: 10.1016/j.jsmc.2018.10.012. PMID: 30709525.
- Lorenzi-Filho G, Almeida FR, Strollo PJ. Treating OSA: Current and emerging therapies beyond CPAP. *Respirology.* 2017 Nov;22(8):1500-1507. doi: 10.1111/resp.13144. Epub 2017 Sep 12. PMID: 28901030.
- Sheats RD, Schell TG, Blanton AO, Braga PM, Demko BG, Dort LC, Farquhar D, Katz SG, Masse JF, Rogers RR, Scherr SC, Schwartz DB, Spencer J. Management of side effects of oral appliance therapy for sleep-disordered breathing. *Journal of Dental Sleep Medicine.* 2017;4(4):111–125.
- Radmand, R, et al. "Defining and Measuring Compliance with Oral Appliance Therapy." *JDSM Special Article 1, Issue 8.3 (2021)*
- Barrett-Connor E., Dam T., Stone K., Harrison S., Redline S., Orwoll E., et al. (2008) [The association of testosterone levels with overall sleep quality, sleep architecture, and sleep-disordered breathing.](#) *J Clin Endocrinol Metab* 93: 2602–2609
- Payne K, Lipshultz LI, Hotaling JM, Pastuszak AW. Obstructive Sleep Apnea and Testosterone Therapy. *Sex Med Rev.* 2021 Apr;9(2):296-303. Epub 2020 Jul 5. PMID: 32636155.
- Han M. Hanafy, MD, [Testosterone Therapy and Obstructive Sleep Apnea: Is There a Real Connection?](#) *The Journal of Sexual Medicine*, Volume 4, Issue 5, September 2007, Pages 1241–1246
- Kim SD, Cho KS. [Obstructive Sleep Apnea and Testosterone Deficiency.](#) *World J Mens Health.* 2019 Jan;37(1):12-18. doi: 10.5534/wjmh.180017. Epub 2018 May 16. PMID: 29774669; PMCID: PMC6305865.
- Stern, J.C. (2023). Case 3. Testosterone and Gender: Not What You Think. In: Rodriguez, A.J. (eds) *Sleepless and Sleepy* . Springer, Cham. https://doi.org/10.1007/978-3-031-18374-4_3