

Oral Appliance Therapy as an Alternative Therapy to Continuous Positive Airway Pressure in Severe Obstructive Sleep Apnea With Morbid Obesity: A Case Report

Supakit Peanchitlertkajorn, DDS

Hayward Braces, Hayward, California

Oral appliance therapy (OAT) is not recommended as a primary treatment option for severe obstructive sleep apnea (OSA). Patients with obesity are also unlikely to respond to the therapy. This report presents a case of a continuous positive airway pressure-intolerant male patient with severe OSA (apnea-hypopnea index = 55.1, lowest oxyhemoglobin saturation = 77%), and morbid obesity (body mass index = 36.26 kg/m²), successfully treated with OAT. A custom titratable mandibular repositioning appliance was utilized for the treatment. The appliance was titrated to maximal mandibular protrusion. The follow-up sleep study shows the reduction of apnea-hypopnea index to 9.1 events/h, and the lowest oxyhemoglobin saturation level increased to 84%. This report suggests that OAT should not be ruled out in morbidly obese patients and severe OSA with continuous positive airway pressure intolerance.

KEYWORDS: custom titratable mandibular repositioning appliance, morbid obesity, oral appliance therapy, severe OSA

CITATION: Peanchitlertkajorn S. Oral appliance therapy as an alternative therapy to continuous positive airway pressure in severe obstructive sleep apnea with morbid obesity: a case report. *Journal of Dental Sleep Medicine*. 2017;4(2):51–52.

INTRODUCTION

According to the most recent recommendations from the American Academy of Sleep Medicine, oral appliance therapy (OAT) can be recommended as a primary treatment option for patients with mild to moderate obstructive sleep apnea (OSA).¹ Continuous positive airway pressure (CPAP) remains a primary treatment for patients with severe OSA. However, OAT in severe OSA can be recommended when CPAP fails or by patient preference.¹ It has been reported that patients with high body mass index are not likely to respond to OAT.² The OAT efficacy rate also depends on amount of mandibular protrusion. The success rates were reported to be significantly higher with further advancement of the mandible.^{3,4} This case report discusses a successful treatment using a titratable mandibular repositioning appliance (MRA) in a CPAP-intolerant patient with severe OSA and morbid obesity. The MRA was maximally titrated to increase the treatment efficacy. This report challenges a conventional assertion that OAT is mostly recommended in mild to moderate cases.

REPORT OF CASE

A 52-year-old male presented with a 5-year history of severe OSA. Sleep-related symptoms included loud and disruptive snoring, witnessed apnea, nocturnal awakening, and daytime sleepiness. In addition to severe OSA, a diagnosis of morbid obesity (body mass index = 36.26 kg/m²) and hypertension was made. The patient currently takes several medications to normalize his blood pressure, and a low dose of aspirin to prevent heart attack and stroke. Although CPAP therapy provided some improvement, the patient sought alternative treatment options because of his inability to use CPAP regularly

and its cumbersomeness because of his frequent travels. His sleep physician eventually referred him for OAT with a custom titratable MRA. Baseline diagnostic polysomnography (PSG) showed an apnea-hypopnea index of 55.1, and lowest oxyhemoglobin saturation of 77%. The baseline Epworth Sleepiness Scale score was 10 on the day of diagnostic PSG.

The patient reported no history, signs, or symptoms of temporomandibular disorder syndrome. The sagittal range of mandibular excursion is determined to be 15 mm. The patient was fitted with the Fusion appliance (Somnomed, Frisco, Texas) to allow for greater mandibular advancement. The initial mandibular protrusion was set at 66% (10 mm advancement). Accommodation to the appliance was successful, with good subjective adherence without reporting any intraoral or extraoral discomfort. After the patient had 2 weeks of getting accustomed to nightly use of the MRA, the titration began and the appliance was titrated to maximal mandibular protrusion (100%, 15 mm) over a period of 2 months. Although maximal mandibular advancement is usually not a titration goal for all patients, but because of the OSA severity and obesity, it was explained to the patient that the titration goal was to advance the mandible maximally to increase the treatment efficacy. He was encouraged and motivated at every subsequent follow-up to reach the goal. After the titration was completed, the patient reported nightly use of the MRA, averaging approximately 7 h/night. He reported significant improvement in his sleep quality and reduction of daytime tiredness and sleepiness without significant side effects and discomfort. The Epworth Sleepiness Scale score was 2 after 2.5 months using the appliance. The patient was then referred for a follow-up PSG. The PSG reveals a significant apnea-hypopnea index reduction to 9.1 events/h, lowest oxyhemoglobin saturation increase to 84%, and mean oxygen saturation of 92%.

DISCUSSION

This report demonstrates that OAT with custom titratable MRA can be used successfully in a case of severe OSA with morbid obesity. The patient in this report has a larger than average range of mandibular protrusion, allowing for increased mandibular advancement. The maximal MRA advancement and tolerability could contribute to treatment success. Several authors reported dose-dependent relationship between degrees of mandibular protrusion and OAT efficacy.^{3,4} In addition, Almeida et al. reported that additional titration during a follow-up PSG can increase the treatment success rate.⁵ The author also believes that repeatedly encouraging the patient to reach a titration goal also contributes to the treatment success. This helped to increase the patient's motivation and appliance tolerability during titration. A similar approach has been shown to increase adherence among patients using CPAP.⁶ This report suggests that OAT can be efficacious in morbidly obese patients with severe OSA and CPAP intolerance.

REFERENCES

1. Ramar K, Dort LC, Katz SG, et al. 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.
2. Tsuiki S, Ito E, Isono S, Ryan CF, et al. Oropharyngeal crowding and obesity as predictors of oral appliance treatment response to moderate obstructive sleep apnea. *Chest.* 2013;144(2):558–563.

3. Kato J, Isono S, Tanaka A, et al. Dose-dependent effects of mandibular advancement on pharyngeal mechanics and nocturnal oxygenation in patients with sleep-disordered breathing. *Chest.* 2000;117(4):1065–1072.
4. Walker-Engström M, Ringqvist I, Vestling O, et al. A prospective randomized study comparing two different degrees of mandibular advancement with a dental appliance in treatment of severe obstructive sleep apnea. *Sleep Breath.* 2003;7(3):119.
5. Almeida FR, Parker JA, Hodges JS, et al. Effect of a titration polysomnogram on treatment success with a mandibular repositioning appliance. *J Clin Sleep Med.* 2009;5(3):198–204.
6. Lai AY, Fong DY, Lam JC, et al. The efficacy of a brief motivational enhancement education program on CPAP adherence in OSA: a randomized controlled trial. *Chest.* 2014;146(3):600–610.

SUBMISSION & CORRESPONDENCE INFORMATION

Submitted for publication October 31, 2016

Submitted in final revised form December 5, 2016

Accepted for publication December 28, 2016

Address correspondence to: Supakit Peanchitlertkajorn, DDS, MDS, 1866 B Street, Suite 201, Hayward, CA, 94541; Tel: (510) 581-7851; Fax: (510) 581-6114; Email: supakit@att.net

DISCLOSURE STATEMENT

Institution at which the work was performed: Hayward Braces, Hayward, CA. This was not an industry supported study. Dr. Peanchitlertkajorn has indicated no financial conflicts of interest.