

Oral Appliance Therapy: A Case of False Negatives

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A patient's subjective response to treatment is not necessarily indicative of objective response. This case illustrates treatment with an oral appliance in a CPAP intolerant patient who reported a positive subjective response. Follow-up sleep testing revealed an increase in the severity of sleep disordered breathing related to an emerging medical condition.

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The objectives of oral appliance (OA) therapy for obstructive sleep apnea (OSA) include the relief of subjective symptoms such as snoring and sleepiness as well as improvement in objective disease measurements such as apnea-hypopnea index (AHI) and nocturnal oxygen saturation.¹ Subjective symptom relief, while satisfying for patients, does not necessarily indicate improvement in objective disease parameters.² Patients may be reluctant to undergo follow-up testing due to convenience and financial factors but objective follow-up testing is an essential component of quality OA therapy. This case illustrates the necessity of follow-up sleep testing.

REPORT OF CASE

A 51-year-old male presented for OA consultation. His chief concern was loud snoring that kept his wife awake. He had two polysomnographs (PSGs); a full night four years previously and a split night study ten months previously. The first PSG showed an AHI of 29 events/hour and the split night an AHI of 13 events/hour. During the split night study his oxygen saturation did not fall below 90%. Continuous positive airway pressure (CPAP) therapy at 10 centimeters of water effectively treated his OSA.

At the time of OA consultation the patient had become intolerant of CPAP therapy. He reported that he routinely removed the mask after only one or two hours use. He did not take the CPAP during frequent work-related travel.

His BMI was 35.7 kg/m², neck circumference 42 cm, and blood pressure 110/81. He had been diagnosed with atrial fibrillation and had a pacemaker.

He was fitted with an OA and reported immediate control of snoring. Over the following eight weeks, he was seen three times to make minor adjustments to his OA. He and his wife reported ongoing successful results during this time.

A follow-up PSG was scheduled to assess his progress with his OA in place. He elected to postpone his follow-up study for 10 months.

The follow-up PSG results were unexpected. His sleep efficiency was good at 89% with a sleep onset latency of 11 minutes. Breathing during sleep was characterized by repetitive hypopneas. These occurred with a waxing and waning pattern most consistent with Cheyne-Stokes breathing (i.e., “breathing pattern characterized by regular ‘crescendo-decrescendo’

fluctuations in respiratory rate and tidal volume”).³ There were obstructive apneas and some central apneas seen near the end of the study (although these were infrequent). His oxygen saturation during rapid eye movement (REM) was observed to fall as low as 71%, despite the presence of his OA and in contrast to PSGs prior to treatment. During the PSG incremental adjustments were made to the patient's OA increasing protrusion by 1.25 mm. The overall AHI during this study was 81 per hour with a range of 50–90 per hour depending on the level of OA adjustment. Contrary to what was expected, disturbed breathing persisted despite OA therapy.

The marked increase in sleep disordered breathing made this sleep study distinctly different from those observed previously. The pattern was more consistent with Cheyne-Stokes respiration than obstructive or central sleep apnea. The patient had a history of cardiomyopathy being followed by his cardiologist, and had gained approximately 30 pounds since the previous sleep studies.

Treatment was begun directed at congestive heart failure. The medical sleep specialist recommended continued use of the OA and placed the patient on nightly oxygen therapy. He further recommended immediate follow-up with his cardiologist. The sleep specialist reported that it was not obstructive apnea, but documentation of heart failure occurring during the recent PSG. The patient's cardiologist agreed with this assessment and began treatment to improve his heart function.

DISCUSSION

This case highlights the importance of working as a part of a medical team, which includes close interactions with the patient's physicians. The patient's positive subjective OA therapy results could have lulled me into a false sense of security; however, the absence of anticipated findings through follow-up studies over time indicated a larger health problem. Regular communication with the patients' physicians enabled diagnosis and treatment of a significant new health problem.

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