

Consider a mandibular positioning device to alleviate sleep-disordered breathing

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Snororing, snorting, gasping, and obstructive sleep apnea are caused by collapse of the pharyngeal airway during sleep.¹ Pathophysiology includes a combination of anatomical and physiological variables.¹ Common anatomical predisposing conditions include abnormalities of pharyngeal, lingual, and dental arches; physiological concerns are advancing age, male sex, obesity, use of sedatives, body positioning, and reduced muscle tone during rapid eye movement sleep. Coexistence of anatomic and physiological elements can produce significant narrowing of the upper airway.

Comorbidities include vascular, metabolic, and psychiatric conditions. As many as one-third of people with symptoms of sleep apnea report depressed mood; approximately 10% of these patients meet criteria for moderate or severe depression.²

In short, sleep-disordered breathing has a globally negative effect on mental health.

When should you consider obtaining a sleep apnea study?

Refer patients for a sleep study when snoring, snorting, gasping, or pauses in breathing occur during sleep, or in the case of daytime sleepiness, fatigue, or unrefreshing sleep that cannot be explained by another medical or psychiatric illness.² A sleep specialist can determine the most appropriate intervention for sleep-disordered breathing.

An *apneic event* is characterized by complete cessation of airflow; *hypopnea* is a partially compromised airway. In either event, at least a 3% decrease in oxygen saturation occurs for at least 10 seconds.³ A diagnosis of obstructive sleep apnea or hypopnea is required when polysomnography reveals either of:

- ≥ 5 episodes of apnea or hypopnea, or both, per hour of sleep, with symptoms of a rhythmic breathing disturbance or daytime sleepiness or fatigue
- ≥ 15 episodes of apnea or hypopnea, or both, per hour of sleep, regardless of accompanying symptoms.²

What are the treatment options?

- **Continuous positive airway pressure (CPAP) machines.**
- **Surgical procedures** include adenotonsillectomy in children and surgical maxilla-mandibular advancement or palatal implants for adults.
- **A novel implantable electrical stimulation device** stimulates the hypoglossal nerve, which activates the genioglossus muscle, thus moving the tongue forward to open the airway.
- **An anterior mandibular positioning (AMP) device** increases the diameter of the retroglossal space by preventing posterior movement of the mandible and tongue, thereby limiting encroachment on the airway diameter and reducing the potential for collapse.^{1,4}

When should you recommend an AMP device?

Consider recommending an AMP device to treat sleep-disordered breathing when (1) lifestyle changes, such as sleep hygiene, weight loss, and stopping sedatives, do not work and (2) a CPAP machine or a surgical procedure is contraindicated or has been ineffective.¹ An AMP device can minimize snoring and relieve airway obstruction, especially in patients with supine position-related apnea.⁴ To keep the airway open in

Figure

Thornton adjustable positioners



Left: Model Tap 3. Right: Model Tap 3 Elite. Source: Dental Arts Laboratories, Inc., Peoria, Illinois.

non-supine position-related cases, an AMP device might be indicated in addition to CPAP delivered nasally.¹

This plastic oral appliance is either a 1- or 2-piece design, and looks and is sized similarly to an athletic mouth-protection guard or an oral anti-bruxism tooth-protection appliance. It is affixed to the mandible and maxillary arches by clasps (*Figure*).

An AMP device often is most beneficial for supine-dependent sleep apnea patients and those with loud snoring, without sleep apnea.⁴ Response is best in young adults and in patients who have a low body mass index, are free of sedatives, and have appropriate cephalometrics of the oral, dental, or pharyngeal anatomy. Improved sleep architecture, continuous sleep with less snoring, and increased daytime alertness are observed in patients who respond to an AMP device.

An AMP device is contraindicated when the device cannot be affixed to the dental arches and in some patients with an anatomical or pain-related temporomandibular joint disorder.⁵ The device is easy to use, noninvasive, readily accessible, and less expensive than alternatives.³

How can you help maintain treatment adherence?

AMP devices can induce adverse effects, including dental pain or discomfort

through orthodontic alterations; patient reports and follow-up can yield detection and device adjustments can alleviate such problems. Adherence generally is good, with complaints usually limited to minor tooth discomfort, occlusive changes, and increased or decreased salivation.⁵ In our clinical experience, many patients find these devices comfortable and easy to use, but might complain of feeling awkward when wearing them.

Changes in occlusion can occur during long-term treatment with an AMP device. Proper fitting is essential to facilitate a more open airway and the ability to speak and drink fluids, and to maintain safety, even if vomiting occurs while the device is in place.

References

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