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Address all communications to *Journal of Clinical Orthodontics*, 1828 Pearl St., Boulder, CO 80302. Phone: (303) 443-1720; fax: (303) 443-9356; e-mail: info@jco-online.com. See our website at www.jco-online.com.

THE EDITOR'S CORNER

The Orthodontist and Sleep Apnea

Over the last several years, the orthodontist's role in the treatment of obstructive sleep apnea (OSA) has expanded. The subject was never mentioned in my dental school or orthodontic graduate school, and it has only recently been added to the curricula of many orthodontic programs across the country.

According to Ralph Downey III, an associate clinical professor at Loma Linda University and a practitioner of sleep medicine in Las Vegas, as quoted on the WebMD site, OSA is the most common type of sleep-disordered breathing. Recurrent episodes of upper-airway collapse are associated with oxyhemoglobin desaturations and arousals from sleep. These apnea attacks may occur hundreds of times nightly—as often as one or two times a minute in severe cases. The resulting variation in oxygen saturation can cause wide swings in heart rate and brief electroencephalographic arousals, along with severe snoring. It's the snoring that frequently prompts the sufferer's spouse to initiate the search for treatment.

Dr. Downey points to three cardinal signs of sleep apnea, called the "3 Ss": Snoring, Sleepiness, and Significant-other reports. He notes that this mnemonic device can be helpful in teaching residents—and we might include orthodontic graduate students—to be sensitive in the identification and appropriate referral of these patients. OSA is an important condition for any treating doctor to consider because of its association with such debilitating medical conditions as hypertension, cardiovascular disease, coronary-artery disease, insulin-resistant diabetes, depression, and accidents caused by daytime drowsiness.

The American Sleep Apnea Association lists a number of treatment options on its website. Since about 70% of people with OSA are overweight or obese, the first line of treatment is usually an effective weight-loss regimen. Other minimally invasive approaches include the use of over-the-counter nasal decongestants and "positional therapy", which involves the alteration of sleeping positions—generally getting patients to sleep on their sides rather than their backs.

Surgery (commonly uvulopalatopharyngoplasty) is often effective in treating snoring, but less effective in treating full OSA. The challenge for the surgeon is to determine which part of the upper airway is obstructing airflow. Many possible sites will not be identified by conventional sleep testing, and if there are multiple obstructions, the surgery may have limited success.

Continuous positive airway pressure (CPAP) machines are the most widely used treatment modality for moderate-to-severe sleep apnea. One of a number of types of breathing masks is worn over the nose and mouth during sleep, and airway pressure is applied through a flexible tube. The CPAP devices are effective, but many patients are unable to sleep while wearing such contraptions.

Enter the orthodontist. A variety of oral appliances, most of which are simple mandibular propulsors—functionally similar to activators or bionators—have been endorsed by the American Academy of Sleep Medicine. Even a few millimeters of mandibular advancement during sleep may be enough to increase the functional cross-section of the mandible and produce relatively normal breathing patterns.

One of JCO's frequent reviewers, Sarah Shoaf of Winston-Salem, North Carolina, has more experience treating sleep disorders than any other orthodontist I know. In Dr. Shoaf's opinion, we first need to recognize the difference between OSA and snoring: "OSA is a medical problem with severe consequences (sudden death), whereas simple snoring is just a social problem. OSA and snoring are both made worse by alcohol intake, as the musculature of the neck hyper-relaxes and creates the obstruction faster than with normal muscle tone."

How do we supplement our education on this subject? "Orthodontists should spend time

with an accredited sleep-disorder clinic," Shoaf believes, "to learn more about the condition and to have a consistent referral of OSA patients who have had medical diagnoses. Often, insurance companies will not pay for the appliance until they see a physician-graded polysomnogram, to make sure the physician and not the dentist is making the medical diagnosis. I actually would recommend a 'weekend warrior' course to get people up to speed, but they should realize that there are hundreds of different types of oral appliances and should not be married to one appliance. There are long-term consequences to these appliances, particularly if they are not full dental coverage—hypereruption of posterior teeth can lead to open bites, and the proclination of mandibular incisors, together with the retroclination of the maxillary incisors, can create anterior crossbites. Practitioners need to know that if they place an appliance, they may be called to task for long-term effects if they do not follow the patient on a regular basis (twice yearly). There is an American Association of Dental Sleep Medicine that has its own journal, and I encourage orthodontists to become accredited."

In this issue of JCO, Sridevi Padmanabhan and colleagues present a unique method of treating severe OSA in a patient with mandibular micrognathia secondary to developmental issues. Instead of a removable mandibular propulsor, the authors used a combination of distraction osteogenesis and comprehensive orthodontics. The repositioning of the mandible provided by this creative combination of surgical and orthodontic techniques effectively addressed the patient's debilitating OSA. I found the authors' diagnostic and therapeutic approach fascinating, and I trust that you will as well.

RGK