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OBSTRUCTIVE SLEEP APNEA & SLEEP BRUXISM

Dentistry's Opportunity & Responsibility

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TREATMENT TRENDS & NEW DENTAL CONCERNS: Obstructive Sleep Apnea (OSA) is a condition that has received an unprecedented level of attention over the past decade. For some of our patients the health implications of OSA are wide and potentially severe. A growing body of research is linking OSA to Cardiovascular disease and cerebrovascular disease, and OSA to sleep bruxism.

The patient demographics are as follows:

The Numbers

- 59% of adults report snoring.
- 24% snore every, or almost every night.
- 57% report snoring is bothering others.
- 26% of adults are at risk for sleep apnea.
- As many as 38 Million Americans have sleep apnea.[1]

Relative Prevalence is USA

- Asthma - 10 million
- Diabetes - 16 million
- Sleep Apnea - 38 million (15M Moderate – Severe)

The gold standard of treatment for OSA is a ventilator like device known as Continuous Positive Air Pressure (nCPAP). While successful at a level of 90 – 100%, it is difficult for some patients to comply with the treatment. While CPAP remains the treatment of choice for the more severe OSA patients, Oral Appliance therapy (OAT) has been gaining acceptance within the Medical community for the past decade. In February of 2006 the American Academy of Sleep Medicine issued a position paper on the efficacy of OAT that recommended *"Oral appliances are indicated for use in patients with mild to moderate OSA who prefer them to continuous positive airway pressure (CPAP) therapy, or who do not respond to, are not appropriate candidates for, or who fail treatment attempts with CPAP"*. As a result of this important endorsement, insurers that previously have denied Extended Health Plan coverage for OAT appliances now are frequently accepting these devices for insurance coverage. Oral appliances should be considered as a complimentary treatment option to CPAP, treating their respectively appropriate patient

[1] Canaccord Adams Daily Letter, 21 June 2007 & National Sleep Foundation – Sleep In America Poll,

populations. It is estimated that entering the year 2007 only 18% of OSA are under treatment.[2] As dentistry embraces it's role in OSA Screening a greater number of patients will be seeking further diagnosis and therapy throughout the spectrum of sleep apnea severity. As such the demand for both CPAP and Oral Appliance treatment devices will be on the increase.

The positive response of the airway to mandibular advancement has been well documented. The accompanying endoscopic images assist us in understanding the response of the airway to the muscle tone generated from a clenching of the jaw muscles. The images display the airway at the level of the velopharynx. You may note that as compared to the airway at rest *(Figure 1)*, a significantly reduced aperture is created when the patient undergoes a maneuver (Mueller Maneuver) that produces a negative pressure in the lungs, inviting a collapse and blockage of the airway *(Figure 2)*. Such a blockage is similar to the constriction of the airway during an OSA event. However when the patient clenches the jaw muscles the airway tends to open due to the muscular contractions involved in the clench *(Figure 3)*. This action is very similar to the airway response to mandibular advancement.

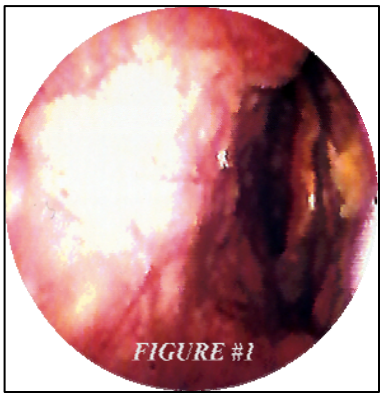
FIGURE #1

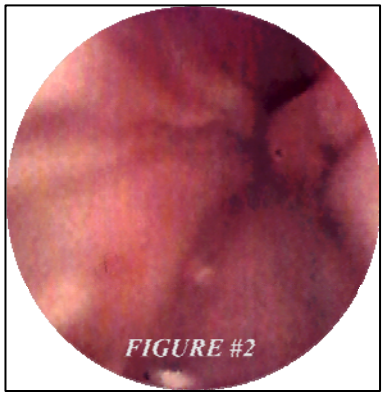
FIGURE #2

A natural reflex response of the mammal is to protect the supply of air. If a clench will, even minimally, work to relieve the obstruction then that reflex action *will* occur. This is of particular significance to the dental profession. This reflex action may go a long way to explain the often puzzling buxism we see in children as well as in adults. If a child has large and extended tonsils that block the airway it is quite natural to expect that the organism will resort to clenching and grinding to relieve the blockage. Similarly, in adults, if the airway is collapsing during sleep the reflex action will be to initiate clenching and grinding.

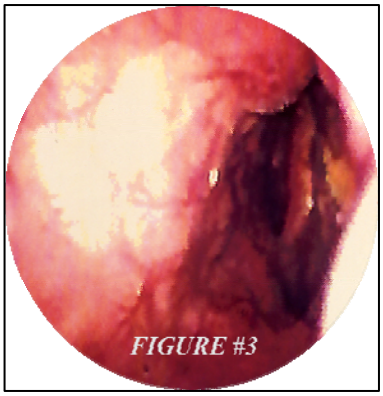
FIGURE #3

The implications of sleep apnea induced bruxism are important when major restorative procedures are contemplated. The long held standard of practice in a bruxing patient has been to place a single arch night guard to protect the patient from the ravages of clenching and grinding. Research conducted at the University of Montreal indicates that, for the apenic patient, such a night guard has the potential to increase their sleep apnea by a factor of 50% - 50% of the time.[3] For patients with moderate sleep apnea, increasing their sleep apnea by such a factor could lead them to a level of "severe" sleep apnea, thus potentially placing the life of the patient at risk.

In another recently published University of Montreal paper it is revealed that two component night guards, which may additionally offer mandibular advancement treatment for obstruction of the airway, are twice as effective as single component guards in reducing bruxism events.[4]

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[2] Canaccord Adams Daily Letter, 21 June 2007

[3] Aggravation of Respiratory Disturbances by the use of an Occlusal Splint in Apneic Patients: A Pilot Study – Yves Gagnon DM/Pierre Mayer, MD/Florence Morisson, DMD, PhD/Pierre H. Rom-pre, MSc/Gilles J. Lavigne, DMD, MSc, PhD.

[4] Qualitative Polygraphic Controlled Study on Efficacy and Safety of Oral Splint Devices in Tooth-grinding Subjects – C.Dube, PH Rompre, C.Manzini, F. Guitard, P.deGrandmont and GJ. Lavigne

As a “Best Practices” approach towards the overall health of our patients the profession of dentistry has a unique opportunity and responsibility, with simple screening techniques, to uncover patients within their practice who may potentially suffer from OSA. As illustrated by the University of Montreal research, obstructive sleep apnea can have direct practice protocol implications for the bruxing patient.

Loud snoring is the earliest sign of a blocked airway. Please ask your patients today if they snore, leading to the next questions “do you stop breathing at night?”, and “are you sleepy during the day”. A yes answer is a good indication for further sleep assessment.

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