

4

Steps Prior To Any Treatment:

1.
If there
are worn teeth:
Refer to a sleep lab,
ENT (Otolaryngologist) or pulmonologist
for an overnight sleep
study (diagnostic polysomnogram).

2.
Check for
inflammation
(capsulitis):
Palpate the lateral
poles of the condyles
(mouth closed) and the
posterior joint space
(mouth open).

3.
Take
Mandibular ROM:
Measure maximum
opening (normal ranges
42-52 mm), lateral
movements (normal
ranges 11-14 mm) and
protrusive (normal
ranges 9-11 mm). Look
for asymmetric movement.

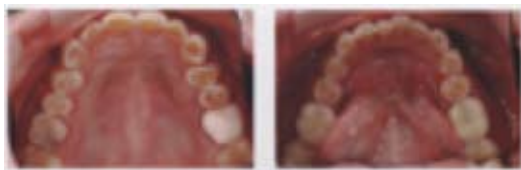
4.
Ask the patient:
Do you have headaches?
Do you take medications for pain relief or as an aid for sleeping?
Do you wake feeling rested?

Bruxism

What is it really?

Headaches, facial pain, limited mandibular opening, jaw noises (popping and clicking), bruxism/attrition, broken teeth and OSA (obstructed sleep apnea) are all reasons that patients seek dental care (see figure 1). Palliative treatment is prescribed from one of the various options of: oral appliances, dental equilibration, medication regimens and physical medicine treatments (botox). Too frequently these treatments are prescribed without addressing the most important question: Why is the patient grinding their teeth? To provide optimum care and direction for patients, it is important to understand the mechanism behind this parafunctional activity.

Figure 1
(This person just walked in your door. How are you going to restore him? How did he get this way?)



Bruxism may be the result of: chronic pain, struggling to breathe through a compromised airway, life's anxieties or any combination thereof. These patients present with complaints and /or symptoms of: headaches, facial pain, limited opening, jaw noises (popping and clicking), bruxism (clenching and grinding), worn dentition, broken teeth and sleep disordered breathing. The cormorbidity and pathophysiology of these conditions is well documented. Differential diagnosing can be the key to stopping the vicious cycle of acute and chronic problems these patients face.

Producing an NTI for headache or grinding symptoms for a patient who is suffocation during sleep is criminal. We must be thoughtful in producing appliances of any kind (NTI, anterior deprogrammers, nightguards) without a diagnosis of the reason why they are bruxing.

First consider that the head/face is the monitor of the health of the body. The muscles of mastication (temporalis, masseter, medial pterygoid and lateral pterygoid) are in balance with the suprahyoids/infrahyoids of the front of the neck and the extensor muscles at the back of the neck. These muscles have activity and a level of tonus based on the (CNS) central ner-

By Steven R. Olmos, DDS, DABCP,
DAAPM, FAAOP, FAACP, FICCMO, FADI
Adjunct Professor, University of Tennessee
Memphis College of Dentistry

vous system stimulation. People clench, grind or brux (both) because of increased CNS stimulation the direct result of various amounts of pain, breathing dysfunction or anxiety^{i/ii}. The parafunctional activity of continued compressive forces day and night due to chronic pain (painful nerve in foot, compressed inflamed disc in their spine or a painful osteoarthritic hip), the result of apnea (cessation of breathing for 10 seconds or longer) or sleep disturbance, the result of life's hurdles (divorce, job, relationships) all contribute to the breakdown of the toughest joint in the body (fibrocartilage vs. hyaline).

There are predominantly 2 types of headaches by the IHS (International Headache Society): primary and secondary. Secondary headaches are the result of organic pathology such as a tumor or bleeding of the vessels surrounding the brain. This is rare in the absence of major trauma. Primary headaches are idiopathic (of unknown origin) and are categorized by frequency, location, duration, a person's response to it and what medication relieves it. That means that a person has had MRIs and CT scans of the brain and the results are all normal. Headaches in this category are the ones most commonly treated: migraine, tension type, cluster etc. Migraine prevalence in men is 6% and women 18% and the rate in children is rapidly increasingⁱⁱⁱ. The results of the Nuprin Pain Report (a national epidemiologic study on the prevalence of headache 1985), are; headache prevalence in the US is 78% for adult females and 68% for adult males.

Migraine, cluster headache, hypnic headache, morning (tension) headache in adult^{iv/1}, and children are all related to apnea or disturbed sleep^v. Headache has been found in 65% of patients with nocturnal bruxism (Bader, Lavigne 2000, Camparis et al. 2006). People parafunctionally contract with greater force (approx. 57,600 lbs./sec/day) than normal function (approx. 17,200 lbs./sec/day)². Patients with TMD brux longer, 38.7 minutes compared to controls 5.4 minutes^{vi}. Diurnal and nocturnal parafunctional (bruxing) activities occur at a subconscious (brainstem/autonomic) level therefore unawareness of the activity is common^{vii/viii/ix}. People brux more when they are on their backs (supine)^{x/xi/xii} and they have more obstructed apnea in that position (see figure 2). This is the reason why sleep

Brux•ism is oromotor activity (clenching/grinding) that is most likely to occur at the transition of deeper to lighter sleep.

labs have the patient sleep in different positions to determine the position of worst apnea.

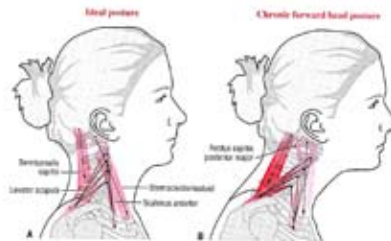
Figure 2 (Mandible and base of tongue falls back with the patient in the supine position blocking the airway)



Over 75 million Americans (25%) have sleep apnea and many more have sleep disturbances^{xiii}. A survey of the literature demonstrates the prevalence of TM symptoms in the general population is 41% and those having a sign 56%². The most frequent symptom (96%) of TM dysfunction (inflammation/capsulitis, disc displacement etc.) is right sided back of head pain (occipital cephalgia)^{xiv}. The body assumes a forward head posture when there is inflammation in the TM joints. When the inflammation/dysfunction is corrected through decompression (day and night orthotics using the sibilant phoneme technique) there is a return of head posture by 4.43^{xv} inches. The forward head posture places increased stress on the cervical spine and the insertion of the muscles at the back of the neck/head (see figure 3). This forward head posture changes occlusion^{xvi/xvii/xviii}. So it is clear why the ADA and the

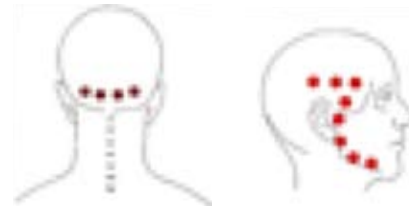
AAOP (American Academy of Orofacial Pain) recommend that no permanent occlusal therapy (equilibration) be performed on a patient with TM joint inflammation.

Figure 3 (Forward head posture the result of TM joint inflammation changes occlusion and causes increased pain in neck)



Botox injections for migraine are at the base of the skull and the temporalis and masseter muscles and carpal tunnel the result of cervical nerve compression from a forward head posture (see figure 4).

Figure 4 (Botox treatment for migraine is at the base of skull from forward head posture, temporalis/masseter muscles from bruxing and carpal tunnel from compression of cervical nerves again the result of forward head posture)



The ADA guideline parameters of treatment state that; "The dentist should consider a differential disease classifi-

cation that may include neuromuscular pain, myofascial pain, neurogenic pain, neurovascular pain, sympathetic and/or referred pain involving the trigeminal and/or oropharyngeal systems, or other medical conditions, which may contribute to or mimic TM disorders."

The ADA further states; "Before restorative and/or occlusal therapy is performed, the dentist should attempt to reduce, through the use of reversible modalities, the neuromuscular, myofascial and temporomandibular joint symptoms."

My simple triage system is based on intake data collected that screens all patients for chronic pain, airway disorders, malocclusion and anxiety. This information along with comprehensive clinical examination assists in the process for differential diagnosing.

Dr. Olmos is the founder of the TMJ & Sleep Therapy Centres with locations in three countries. His private practice in La Mesa is limited to the treatment of orofacial/cranio-mandibular/TM disorders and OAT (oral appliance therapy) for the treatment of OSA. He has been in practice for 27 years with the last 16 years devoted exclusively to these areas. He is a sought after international lecturer who has distinguished himself by establishing effective reproducible protocols for the diagnosis and treatment these disorders. References available upon request. Email: steven@tmjtherapycentre.com. Additional articles by Dr. Olmos outlining the identification of TM and Sleep/Airway disorders, diagnosis of TMD and associated head pain, and appropriate appliance therapy have been published by PennWell and are available on line through Dental CE Digest.

i Lavigne G., Sessle B., ed; Sleep and Pain. IASP Press (International Association for the Study of Pain); 2007:311-340.
 ii Okeson J., ed; Management of Temporomandibular Disorders and Occlusion. 6th ed.
 iii Lipton RB, Stewart WF. Prevalence and impact of migraine. Neuro Clin. Feb, 1997;15(1):1-13,
 iv Alberti A. Headache and sleep. Sleep Medicine Reviews. 2006;10:431-437
 v Carotenuto M. Headache disorders as risk factors for sleep disturbances in school age children. J Headache Pain. 2005;6:268-270.
 vi Trenouth MJ: The relationship between bruxism and temporomandibular joint dysfunctions shown by computer analysis of nocturnal tooth contact patterns, J Oral Rehabil. 1979;6:81.
 vii Rugh JD, Solberg VVK: Electromyographic studies of bruxist behavior before and during treatment, J Calif Dent Assoc. 1975;3:56-59.
 viii Solberg VVK, Clark GT, Rugh JD: Nocturnal electromyographic evaluation of bruxism patients undergoing short term splint therapy, J Oral Rehabil. 1975;2:215-223.
 ix Clark GT, Beemsterboer PL, Solberg VVK, Rugh JD: Nocturnal electromyographic evaluation of myofascial pain dysfunction in patients undergoing occlusal splint therapy, J Am Dent Assoc. 1979;99:607-611.
 x Okeson JP, Phillips BA, Berry DT, Cook YR, Cabelka JF: Nocturnal bruxing events in subjects with sleep-disordered breathing and control subjects, J Craniomandib Disord. 1991;5:258-264
 xi Okeson JP, Phillips BA, Berry DT, Baldwin RM: Nocturnal bruxing events: a report of normative data and cardiovascular response, J Oral Rehabil. 1994;21:623-630.
 xii Okeson JP, Phillips BA, Berry DT, Cook Y, Paesani D et al: Nocturnal bruxing events in healthy geriatric subjects, J Oral Rehabil. 1990;17:411-418.
 xiii Hiestand D.M. Prevalence of Symptoms and Risk of Sleep Apnea in the US Population. Chest. 2006;130:780-786.(Results From the National Sleep Foundation Sleep in America 2005 Poll).
 xiv Simmons H.C. Anterior Repositioning Appliance Therapy for TMJ Disorders: Specific Symptoms Relieved and Relationship to Disk Status on MRI. J Cranio Practice. 2005;
 xv Olmos S. The Effect of Condyle Fossa Relationships on Head Posture. J Cranio Practice. Jan 2005;23(1):
 xvi Sonnesen I, Bakke M, Solow B: Temporomandibular disorders in relation to craniofacial dimensions, head posture and bite force in children selected for orthodontic treatment. Eur J Orthod 2001;23:179-92.
 xvii Kibana Y, Ishijima T, Hirai T: Occlusal support and head posture. J Oral