SLEEP BRUXISM: IS IT THE ENTRY POINT FOR THE DENTIST?

THE UNKNOWN SLEEP DISORDER

Entry Point for the Dentist Into the World of Sleep Medicine
AND
Sleep Breathing Disorders

The Expert on Sleep Bruxism
Gilles Lavigne, DMD, PhD

From John Edmeads, MD

"Most lectures are characterized by the information on the slides going from the mouth of the lecturer to the ears of the listener without going through the minds of either"

Sleep Breathing Disorders Present in the Dental Office as Sleep Bruxism

- Treatment is a Single Continuum of Care
- OSA presents in the Dental Office as
  Increased BMI – Abdominal Girth
  High Epworth Sleepiness Scale score
  Increased Neck Size

Facts About the Prevalence of OSA

- 1 of 5 dental patients in the dental office is either undiagnosed or untreated
- 1 in 4 young/middle aged men at risk for OSA
- 7 in 10 of Medicare population at risk for OSA

SLEEP BRUXISM: A NEW PARADIGM

What We Need
To Know

SLEEP BRUXISM

No Longer A Parasomnia

ICSD-3: A Movement Disorder
Sleep Bruxism - 327.54

60% Sleep On Their Back
(Like Snoring and Sleep Apnea)

Parasomnias

- Night Terrors (after 1st NREM period)
- Nightmare (associated with REM)
- Sleep walking
- Sleep talking

The Nightmare
Henry Faselli circa 1781

Teeth Grinding Linked to Sleep Apnea

- 1 in 4 with OSA also have nocturnal Bruxism
- Study at Baylor: 300 people
  25.6% had Bruxism
- 35% had GERD

Presented at CHEST 2009
Shyam Subramanian, MD

From National Sleep Foundation (August 24, 2010)

- Three tips for Coping with Bruxism:
  1. Ease symptoms: relax before bedtime to reduce stress
  2. Proper sleep hygiene
  3. Stay off the Back

SLEEP BRUXISM

Greek Word: brychein
(to gnash the teeth)
Gnashing of the Teeth Usually During Sleep

BRUXOMANIA
Neurotic Habit Performed
During the Day

Prevalence of Bruxism

5 to 8% in the general population (Based on Reports of Audible Grinding)

- Childhood: 14 to 17%
- Under age 11: 14 to 20%
- Teens & Young Adults: 12%
- Middle Age: 8%
- Elderly: 3%

Sleep Bruxism during childhood persists in 35-90% of adults

In Children - Associated Findings

- Nail Biting 9 - 28%
- Thumb Sucking 21%
- Snoring 14%

Types of Bruxism

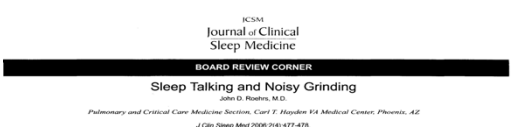
- Awake Time:
  tooth clenching - tapping - Jaw bracing
- Sleep Time: tooth grinding
  phasic (rhythmic)
  tonic (sustained)
  mixed

Types of Bruxism

- Primary – Idiopathic
  - No Known Medical or Dental Cause
  - May be Psychological in Some Patients
  - Includes Daytime Clenching
- Secondary – Iatrogenic (assoc. with drug intake or withdrawl)
  - Movement Disorder (Parkinsons)
  - Oromandibular Dystonia
  - Sleep Related Disorder
  - Neurologic Relationship - Tics
  - Chemical Substances or Medications

Classification of Bruxism

Awake time Bruxism (clenching)
Sleep time Bruxism
Primary and/or Idiopathic
Secondary (With medical condition)
Iatrogenic (following drug intake/withdrawl)


AASM
Journal of Clinical Sleep Medicine
BOARD REVIEW CORNER
Sleep Talking and Noisy Grinding
John D. Roehrs, M.D.
Pulmonary and Critical Care Medicine Section, Carl T. Hayden VA Medical Center, Phoenix, AZ
J Clin Sleep Med 2018;14(4):477-478.

Associated Conditions

- Clenching
- Oromandibular Dystonia (OMD) have
  secondary Bruxism slow, sustained, twisting and repetitive orofacial activity of the mandible, tongue and upper face
  OMD patients may report burning mouth and/or TMJ disorder

Bruxism is mainly regulated centrally, not peripherally

J. Oral Rehab 2001 – Lobbozoo & Naieji

Part of a sleep arousal response

Linked to disturbances in the Dopaminergic System

Sleep Bruxism

From a study in CHEST, Jan. 2001

1/3 of the Bruxism group were Sleepy during the day

OSAS more prevalent in the tooth grinding group (3.4% to 4.8%) as compared to those without (1.4%)

Risk Factors for Sleep Bruxism in the General Population*

Maurice M. Ohayon, MD, DSc, PhD; Kasey K. Li, DDS, MD; and Christian Guilleminault, MD

Objective: **Sleep bruxism can have a significant effect on the patient's quality of life. It may also be associated with a number of disorders. However, little is known about the epidemiology of sleep bruxism and its risk factors in the general population.**
Design: **Cross-sectional telephone survey using the Sleep-EVAL knowledge based system.**
Settings: **Representative samples of three general populations (United Kingdom, Germany, and Italy) consisting of 158 million inhabitants.**
Participants: **Thirteen thousand fifty-seven subjects aged ≥ 15 years (United Kingdom, 4,972 subjects; Germany, 4,115 subjects; and Italy, 3,970 subjects).**
Intervention: **None.**
Measurements: **Clinical questionnaire on bruxism (using the *International Classification of Sleep Disorders* [ICSD] minimal set of criteria) with an investigation of associated pathologies (ie, sleep, breathing disorders, and psychiatric and neurologic pathologies).**
Results: **Grinding of teeth during sleep occurring at least weekly was reported by 8.2% of the subjects, and significant consequences from teeth grinding during sleep (ie, muscular discomfort on awakening, disturbing tooth grinding, or necessity of dental work) were found in half of these subjects. Moreover, 4.4% of the population fulfilled the criteria of ICSD sleep bruxism diagnosis. Finally, subjects with obstructive sleep apnea syndrome (odds ratio [OR], 1.8), loud snorers (OR, 1.4), subjects with moderate daytime sleepiness (OR, 1.3), heavy alcohol drinkers (OR, 1.8), caffeine drinkers (OR, 1.4), smokers (OR, 1.3), subjects with a highly stressful life (OR, 1.3), and those with anxiety (OR, 1.3) are at higher risk of reporting sleep bruxism.**
Conclusions: **Sleep bruxism is common in the general population and represents the third most frequent parasomnia. It has numerous consequences, which are not limited to dental or muscular problems. Among the associated risk factors, patients with anxiety and sleep-disordered breathing have a higher number of risk factors for sleep bruxism, and this must raise concerns about the future of these individuals. An educational effort to raise the awareness of dentists and physicians about this pathology is necessary.** ***(CHEST 2001; 119:53–61)***

Key words: bruxism; epidemiology; obstructive sleep apnea syndrome

Abbreviations: CI = confidence interval; DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition; ICSD = *International Classification of Sleep Disorders*; OR = odds ratio; OSA = obstructive sleep apnea; REM = rapid eye movement

SB:

Risk Factors	Evidence
Craniofacial features	None
Occlusion	None
Anxiety / Stress	Some
Personality	Some
Trauma / Injury	Available
Genetics	Some
Sleep related arousal	Available
Neurochemicals (dopamine	Available
Medications	Available
Drugs	Available
Chemicals	Available
	Available

SB:

Risk Factor	Odds Ratio
OSA	1.8
Loud snoring	1.4
Snoring (less loud)	1.2
Mod Sleepiness	1.3
Alcohol (1-2 daily)	1.5
Alcohol $\geq$ 3 daily)	1.8
Caeffine use	1.4
Smoker	1.3
High Stress	1.3
Anxiety	1.3

Rhythmic Masticatory Muscle Activity (RMMA)

- Chewing Movements During Sleep Without Tooth Grinding – Found in 60% of the Normal Population at a Frequency of 1.8 per hour
- Associated with Sleep Bruxism
- May be related to Salivary Flow – Temporarily Increases Saliva Flow and Lubrication

Sleep Med Review 2002 Vol 16 #3

Rhythmic Masticatory Muscle Activity (RMMA)

- No Bruxism in 60% of patients
- RMMA in Sleep Bruxism preceded by sequence of microarousals 4 seconds before the event
- Followed by autonomic-cardiac activation (1 second before RMMA) then RMMA in the Masseters

Descriptive Physiologic Data on a Sleep Bruxism Population

Bader, et al, Sleep, 1997

Common Findings:

1. Alpha activity 10 seconds prior to a bruxing event
2. Tachycardia developed at onset & lasted for 10 seconds
3. Mean number of shifts in sleep staging = 70

Sleep Bruxism - Facts

- 1/3 are sleepy during the day
- Alpha EEG activity 10 seconds prior to bruxing event
- 4 seconds prior to bruxing event ⇧ EEG activity
- Tachycardia developed at onset - lasts for 10 seconds
- Mean number sleep shifts = 70
- 1 second prior to bruxing ⇧ heart rate

Sleep Bruxism

Associated with microarousals

Occurs during N2 and REM

Bruxism – TMD – Sleep Disorders

Bruxism a Movement Disorder

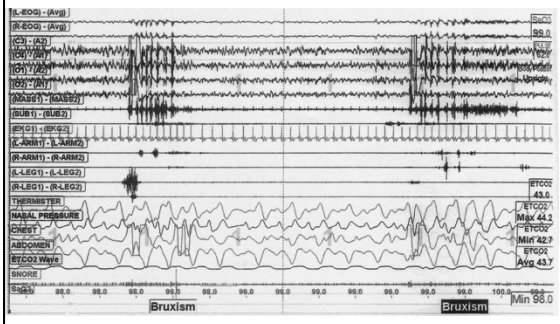
Bruxism a Sleep Disorder

Occurs during: N2 and REM

Related to Dopamine Activity

A Centrally Related Mechanism

PSG Findings



Medications

- Amphetamines - Ritalin - others for ADD / ADHD
- Antipsychotics - Lithium - Thorazine
- Antidepressants - SSRIs
- Cardioactive
  - Calcium blockers
  - Antiarrhythmics

CARDIOVASCULAR AND SLEEP-RELATED CONSEQUENCES OF TEMPOROMANDIBULAR DISORDERS

NHLBI WORKSHOP

Sponsors:
National Heart, Lung and Blood Institute (NHLBI)
NHLBI Division of Heart and Vascular Diseases (DHVD)
NHLBI National Center on Sleep Disorders Research (NCSDR)

December 3-4, 2001
Bethesda, Maryland

FINAL REPORT

TMD Patients at Risk for CV Disease

- Exhibit sleep dysfunction associated with persistent pain
- Associated with increased tendency to back sleep (stay off the side)
- Effects of acute & persistent pain upon autonomic & motor control impose ↑ CV risk
- Increased mandibular movement contributes to genioglossus activity

NHLBI Report Dec 3-4, 2001

During Sleep: Sleep Bruxism Associated With:

- Restless Leg Syndrome (RLS)
  10% have Sleep Bruxism
- Periodic Limb Movement Disorder (PLMD)
- Sleep Apnea
- REM Sleep Behavior Disorder
- Night Terrors

Medications and Substances that Affect Bruxism

- Alcohol
- Cigarettes (nicotine)
- Caffeine
- Cocaine
- Amphetamines
- SSRIs

Reports of SSRI-Associated Bruxism

- Well Documented
- Impact mainly on Dopamine Centers in the Brain
- The Antidote: BuSpar

J Orofacial Pain 2001;15:340-346

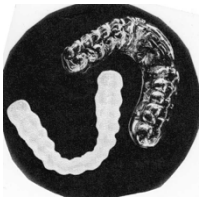
Management

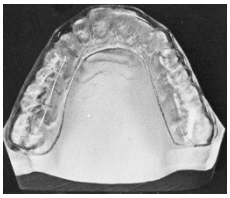
- Behavioral:
  Biofeedback / Hypnosis
  Physical Therapy (improve posture)
  Stress Management
- Dental:
  Splints - Night Guards - Orthotics
- Pharmacologic:
  Many medications have been tried

Management of Bruxism

- Splint Therapy (no SBD)
- Oral Appliance if OSAS
- Occlusal / Bite Adjustment (controversial)
- Botox A injections
- Medications (not effective – often attempted)

Single Arch Bite Splint





Risk of Aggravation of Sleep Apnea with Occlusal Splint

- 10 patient study: 4 patients developed more severe apnea with splint
- AHI increased > 50%
- Conclusion: question patients about SRBD prior to splint therapy

IADR March 10-13, 2004

Pharmacologic Management

- Valium (case reports)
- Ativan (short term use)
- Clonidine (risk hypotension)
- Botox A (unproven)
- Beta Blockers (effective - respiratory depression)
- Klonopin - Gabitril
- Future - Medications for RLS / PLMD ?

Clonazepam (Klonopin) for Sleep Bruxism

- Improved sleep quality
- Improved sleep efficiency
- Less Bruxism (improved by 1/3)
- Klonopin is a
  Muscle relaxer
  Sleep promoting
  Decreases anxiety

Eur Arch Psychiatry Clin Neurosci (2010) 260:163-174

Gabapentin vs Splint for SB

- N = 20 – 10 with splint and 10 used medication
- Both treatments significantly reduced the intensity of masseter muscle contractions during SB
- Those treated with Gabapentin showed significant improvement in total sleep time, SWS and sleep efficiency
- Gabapentin helpful especially in those with poor sleep quality

J Prosthodontic 2013 Feb;22(2)

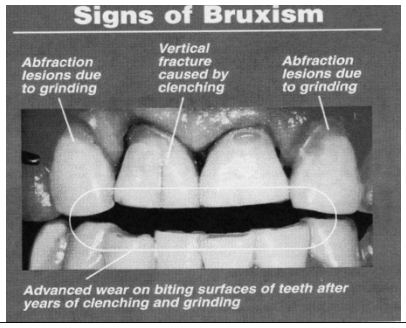
Management of Sleep Bruxism

- Usually Associated With a Sleep Breathing Disorder – The Oral Appliance Selected Should Address Both issues – Posterior Support and Allow Free Movement
- If a Single Problem – Use the Appropriate Bite Splint

Clinical Features of Bruxism

- During sleep: Tooth Grinding - Tapping
- Awake:
  Tooth wear
  Jaw / muscle pain
  Muscle hypertophy
  ⇩ jaw mobility
  Tooth hypersensitive
  Crenations (scalloped) tongue
  Burning tongue

Clinical Findings in Bruxism

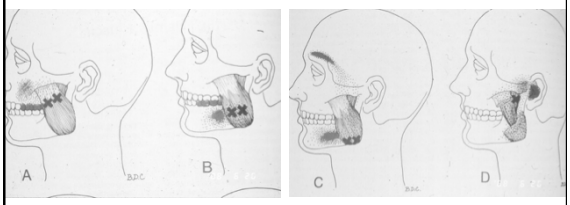


Abfractions or Errosion

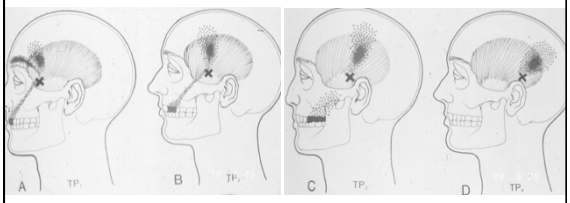
Secondary Effects of
Sleep Bruxism

- Headaches
- Jaw Pain
- TMD

Myofascial Pain & Trigger Points



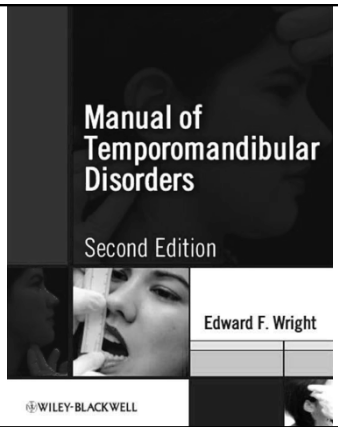
Myofascial Pain & Trigger Points



Vapocoolant Spray and Stretch

Vapocoolant Spray and Stretch
Helps to Differentiate MPD from TMJ

To Learn
More



Sleep Bruxism in Children

Outcomes

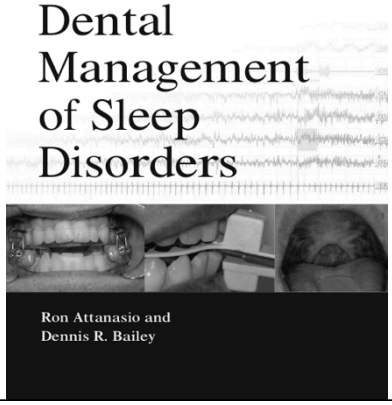
Tooth Wear
Disturbed / Non-Restorative Sleep
Deep Bites
Progressive Airway Obstruction
Tongue Thrusting

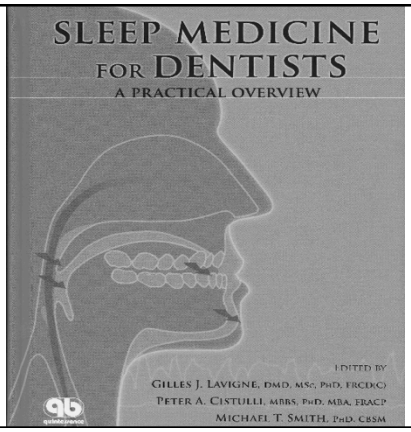
Bruxism and ADHD

- Teens diagnosed with ADHD earlier in life more likely to have sleep problems and disorders: insomnia, sleep terrors, snoring and bruism
- Sleep problems occurred and did not correlate to the severity of the ADHD symptoms

Sleep 2009

Reported in Clin Psych Review 2012





What the Brain Does Not Know

The Eye Cannot See

William Osler, MD