

## Childhood Bruxism: A Clinical Review and Case Report

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### ABSTRACT

*The present case report refers to a patient who reported to the department with the complaint of teeth grinding (Bruxism). A brief review of the literature is reported concerning the aetiology, clinical diagnosis and the therapeutic approach of the disease.*

**Keyword:** Sleep bruxism

## Bruxismo Infantil: Revisión Clínica y Reporte de un Caso

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### RESUMEN

*El presente reporte de caso se refiere a un paciente que acudió al departamento aquejado por el hábito de apretar y rechinar los dientes (bruxismo). Se hace una breve revisión de la literatura relacionada con la etiología, diagnóstico clínico, y enfoque terapéutico de la enfermedad.*

**Palabra clave.** Bruxismo durante el sueño.

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### INTRODUCTION

Sleep bruxism (SB) is an oral activity associated with jaw movements and teeth grinding. Sleep bruxism is believed to be highly variable over time, with subjects showing no activity on some nights and intense activity on others. It is important to differentiate SB from other normal sleep orofacial activities and concomitant sleep disorders. Most of the clinical signs (eg, tooth wear, masseter hypertrophy) are not exclusive to SB but could be concomitant with other habits or activities during wakefulness (1).

Interestingly, during sleep, the jaw is usually open due to motor suppression, tooth contact most likely occurs in association with sleep arousal. This suggests that the central and/or autonomic nervous systems, rather than peripheral sensory factors, have a dominant role in SB genesis. However, some peripheral sensory factors may exert an influence on SB through their interaction with sleep-wake mechanisms (2). The consequences of SB may include tooth destruction, jaw pain, headaches or the limitation of mandibular move-

ment, as well as tooth-grinding sounds that disrupt the sleep of bed partners (3–4).

Bruxism is a pathological activity of the stomatognathic system that involves tooth grinding and clenching during parafunctional jaw movements. Clinical signs of bruxism are mostly related to dental wear and muscular and joint discomforts but a large number of aetiological factors can be listed, as local, systemic, psychological and hereditary factors. The association between bruxism, feeding and smoking habits and digestive disorders may lead to serious consequences to dental and related structures, involving dental alterations (wear, fractures and cracks), periodontal signs (gingival recession and tooth mobility) and muscle-joint sensitivity, demanding a multidisciplinary treatment plan (5–6).

In children, bruxism may be related to growth and development of the jaws and teeth. Children may brux because their maxillary and mandibular teeth do not occlude properly and comfortably as they are erupting. Children may also grind their teeth because of tension, anger or as a response to pain from an earache or teething (5–6).

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### Case Report

A 12-year old boy visited the Department of Pedodontics, SDM College of Dental Sciences, Dharwad, along with his parents. During the case history taking, his mother revealed that he clicked his teeth at night for the last four years. The

child's medical history showed chronic respiratory problems, due to allergy. The history also ruled out the presence of any systemic disease like Parkinson's disease or Huntington's disease or any gastro-oesophageal reflux. The drug history ruled out the usage of any antidepressant medication. No previous dental treatment was reported. Ingestion of acid drinks or medication was denied.

Although the parents described the child as highly excitable, during the consultation he was extremely shy. He was a mediocre student in the school. Clinical examination revealed that the patient had late mixed dentition with Class I molar relationship on both sides. There was no midline deviation or malocclusion. No occlusal interferences, mandibular deviation, mouth-opening limitation or any other clinical sign indicating temporo-mandibular dysfunction was noticed during intra-oral clinical examination. Good oral hygiene was observed. No carious lesions or gingival inflammation was present.

The occlusal surfaces of all molar teeth were worn but sensitivity was not present. A slightly increased overbite (2–3 mm) was present (Figs. 1, 2). The child had no history



Fig. 1: Increased overbite due to bruxism.



Fig. 2: Wear facets on the primary molars.

of pain, even with mechanical stimulation. The treatment plan for this patient was the placement of a bruxism splint made of clear transparent sheet, composed of polyvinyl chloride, fabricated by vacuum press in which the sheet was heated and sucked over the mandibular cast. The splint was trimmed along the gingival margins (Fig. 3). It was given



Fig. 3: The bruxism splint has been placed.

primarily for the night use and the patient was referred for psychological monitoring and allergy treatment.

Follow-up visits were scheduled every third month to verify tooth wear and the result was satisfactory. With the combined effect of the bruxism splint, psychological counselling sessions and treatment for the allergy, no further damage to the dentition and temporo-mandibular joint was seen. The splint was modified to allow adequate bone growth.

## DISCUSSION

The prevalence of bruxism in children is estimated to range from 7% to 15.1% (3–5). A few studies confirm a higher rate in females than males (7).

Certain personality characteristics like aggression, anxiety and hyperactivity which are mainly triggered by life events are the main predisposing factors for this parafunctional habit. Some authors described bruxism as a condition of multifactorial aetiology, determined by an association of psychological, local and systemic factors (8–12).

- \* The signs and symptoms of bruxism may include:
- \* abraded teeth
- \* facial pain
- \* oversensitive teeth
- \* tense facial and jaw muscles
- \* headaches
- \* dislocation of the jaw
- \* damage to the tooth enamel, exposing the inside of the tooth (dentin)
- \* a popping or clicking in the temporo-mandibular joint (TMJ)
- \* tongue indentations
- \* damage to the inside of the cheek (8–12)

There is also evidence that, in younger children, bruxism may be a consequence of the immaturity of the masticatory neuromuscular system (13). Nevertheless, Vanders and others have demonstrated that stress and anxiety may be directly related to bruxism, as patients suffering from bruxism show a higher catecholamine level, generally ascribed to emotional stress (14).

A study by Restrepo *et al* demonstrated that several psychological techniques have been efficacious in reducing signs of bruxism when they were applied to 33 children aged 3–6 years. According to Hachmann *et al* and McDonald *et al*, a bite-plate covering the occlusal surfaces of all teeth should be used by patients suffering from bruxism to prevent continuous abrasion (15–17).

Craniofacial growth involves distinct structures and follows a complex chronological pattern, peaking in prepuberty. Thus, when removable prostheses are placed in young children, osseous discrepancies may arise. The bite-plates are usually removable and quarterly revision appointments are scheduled to monitor patients' bone growth and the eruption of permanent teeth (18).

#### **The various treatment modalities documented are:**

##### *Behaviour modification*

Teaching the patient how to rest his/her tongue, teeth, and lips properly, and learning how to rest the tongue upward may relieve discomfort on the jaw while keeping the teeth apart and lips closed.

- \* stress management
- \* lifestyle changes
- \* improved coping mechanisms (13)

##### *Tooth wear*

The technique of choice for restoration of the worn teeth is the use of direct hybrid composite resin restorations. Hybrid composites better enable the reproduction of areas that receive normal occlusal load because they have a reinforcement of the organic matrix resulting on better physical properties. Worn dentitions are usually related to the presence of bruxism but its association with acid feeding, smoking habit and episodes of gastric reflux increases the loss of tooth structure leading to occlusal instability, reduced vertical dimension, muscle tenderness, TMJ pain and dysfunction. Thus, the treatment plan must involve control of symptoms and removal of causes, as much as possible. (13)

##### *Occlusal splints*

A specially-fitted plastic mouth appliance may be worn at night to absorb the force of biting. This appliance may help to prevent future damage to the teeth and aid in changing the patient's behaviour. A bite-plate covering the occlusal surfaces of all teeth should be used by patients suffering from bruxism to prevent continuous abrasion. The use of bite-plates reduces muscular activity, thus giving more comfort to

the patient. A soft-based material is chosen to protect the primary teeth, the thickness has to be sufficient to prevent perforation and increase resistance to impact.

Harada *et al* investigated the effect of the stabilization splint (SS) and palatal splint (PS), which had the same design as SS except for the elimination of the occlusal coverage on sleep bruxism (SB) using a portable electromyographic (EMG) recording system H<sup>-1</sup>. Both splints significantly reduced SB immediately after the insertion of devices. There was no statistical difference in the effect on SB between the SS and PS (P both splints reduced the masseter EMG activities associated with SB; however, the effect was transient (19).

Landry and Rompre compared the effect on sleep bruxism and tooth-grinding activity of a double-arch temporary custom-fit mandibular advancement device (MAD) and a single maxillary occlusal splint (MOS). Short-term use of a temporary custom-fit MAD is associated with a remarkable reduction in sleep bruxism motor activity. To a smaller extent, the MOS also reduces sleep bruxism (20).

The efficacy of occlusal splints in diminishing muscle activity and tooth-grinding damage remains controversial. Dube *et al* compared the efficacy and safety of an occlusal splint (OS) *versus* a palatal control device (PCD). No difference was observed between the devices. Moreover, no changes in respiratory variables were observed. Both devices reduced muscle activity associated with SB (21).

The impact of an occlusal splint (OS) compared with cognitive-behavioural treatment (CBT) on the management of sleep bruxism (SB) has been poorly investigated. The CBT comprised problem-solving, progressive muscle relaxation, nocturnal biofeedback and training of recreation and enjoyment. However, the effects were small and no group-specific differences were seen in any dependent variable (22).

##### *Biofeedback*

Biofeedback involves an electronic instrument that measures the amount of muscle activity of the mouth and jaw – indicating to the patient when too much muscle activity is taking place so that the behaviour can be changed. This is especially helpful for daytime bruxers. Further research is needed to develop a treatment programme for bruxers who clench during the night (13).

##### *Medications*

A few medications (*eg*, benzodiazepines, muscle relaxants) may be helpful for a short-term period, particularly when there is secondary pain (1). Acute clonazepam therapy significantly improved not only the bruxism index but also objective and subjective sleep quality, with unchanged mood, performance and psychophysiological measures upon awakening, suggesting good tolerability of the drug (23).

As this article deals with an isolated clinical case, its findings cannot be generalized. We suggest that more epidemiological investigations should be made to provide a better understanding of the aetiological, predisposing, risk and clinical factors in bruxism. Bruxism is becoming an increasingly common condition in children. In treating this parafunctional habit, clinicians play a leading role in determining possible aetiological factors. At certain times, the dentist may be the first person to notice this multifactorial disease due to the presence of the oral findings, therefore it is the moral duty of the dentist to warn and make the parents aware of this disease so that timely intervention can be taken for the healthy upbringing of the child.

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