

## Management of Sleep Bruxism in Children

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### Abstract

Sleep bruxism is the involuntary movement of grinding teeth while sleeping. It is a bad habit that may result in tooth attrition. Dentist considers sleep bruxism to be important because of its clinical consequences.

The purpose of this report is to describe two cases of sleep bruxism in children with different histories and to discuss the factors that may have been involved in its persistence.

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### Introduction

Sleep bruxism is a nocturnal parafunction that can cause abrasion of teeth, diminishes the capacity of teeth to guide and stabilize inter cuspatation, and creates a wear facet, which exacerbates the condition.<sup>1</sup> According to the American Academy of Sleep Medicine, the diagnosis of sleep bruxism is based on the report of teeth grinding in combination with at least one of the following symptoms: abnormal tooth wear, sounds associated with bruxism, and jaw muscle discomfort.<sup>2</sup>

Sleep bruxism was recently classified as a sleep-related movement disorder, according to the International Classification of Sleep Disorders. Sleep bruxism and grinding have been associated with peripheral factors such as occlusal interference, psychosocial influences such as stress or anxiety and central or pathophysiological causes involving brain neuro transmitters.<sup>3</sup> The disorder is reported in up to 20% of children.<sup>2</sup> Although prevalence decreases with age, long-term untreated bruxism can erode both tooth enamel and dentin, and expose the pulp.<sup>4-6</sup> Tooth grinding is an activity that should be concerned to dentists because it

can cause tooth damage, temporo mandibular disorders, and the break age of dental restorations.<sup>3</sup>

There is no effective treatment that cures sleep bruxism permanently. Management of this condition is focusing on reduction of bruxism, tooth protection, and pain relief. Treatment for sleep bruxism usually takes the form of occlusal therapy (i.e., occlusal adjustment and/or rehabilitation) and occlusal splints.<sup>7</sup> In this report, we describe two cases of sleep bruxism in children with different histories and discuss the possible factors that may have triggered this parafunctional condition in each of them.

### Case reports

#### Case 1

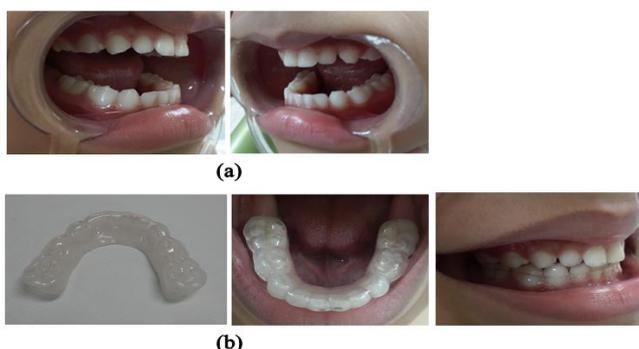
A five-year-old boy was brought to the pediatric dental clinic of Universitas Indonesia, Jakarta, by his mother. His mother revealed that he gnashed his teeth while sleeping at night and this behavior had started about a year earlier. She observed it happened almost every night. Although the mother described the child as prone to anxiety, he was uninhibited during the consultation. No previous dental treatment was reported. His medical history was uneventful. Intraoral clinical examination showed that the patient was in the primary-dentition stage. No malocclusions, mouth-opening limitation, or any other clinical signs of temporo mandibular dysfunction were observed during the

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examination. Good oral hygiene was observed, and no carious lesions were present. Pronounced wear was observed in teeth 53, 52, 63, 73, 82, and 83. The child did not report a history of pain in either the worn teeth or the temporomandibular joint. Radiographic examination confirmed the absence of injury to supporting tissues (Figure 1).

The treatment plan for this patient involved dental health education and the placement of a hard soft-protection bite plate, 1.8 mm thick, on the mandibular arch for use at night only. Follow-up visits were scheduled for once every two months to monitor tooth wear, the eruption of permanent teeth, and bone growth. The patient's mother reported a reduction of teeth grinding at night.



**Figure 1.** (a) Wear facets in teeth 53, 52, 63, 73, 82, and 83. (b) Occlusal appliances as protective splints

### Case 2

A seven-year-old girl and her mother visited the pediatric dental clinic of Universitas Indonesia, Jakarta, with a complaint of pain and discomfort in the girl's primary lower right molar. Intraoral clinical examination showed multiple carious lesions on 55, 54, 53, 52, 51, 62, 64, 65, 75, 74, 84, and 85, attrition on her deciduous canines and pronounced loss of occlusal vertical dimension (OVD). A loss of tooth structure on 75 had led to over-eruption of 65 and occlusal interferences. Her mother revealed that the girl was grinding her teeth in her sleep almost every night. The child's medical history was unremarkable and she had no history of regular medication. No mouth opening limitation, jaw deviation, pain, or any symptoms of temporomandibular dysfunction were observed (Figure 2).

The treatment plan prescribed involved

dental health education and occlusal rehabilitation. Increasing the occlusion vertical dimension (OVD) that was lost due to caries and generalized tooth wear was also part of the occlusal treatment. The OVD was increased with glass ionomer cement (GIC) restoration on 54, 55, 65, and a metal crown on 64. Extraction was performed on 51, 62, 75, 85; GIC restoration was performed on 53; pulpotomy and metal crown on 74 and 84 (Figure 3). On her follow-up visit, the girl's mother revealed that after occlusal rehabilitation, the child's sleep bruxism habit was reduced to once a week or less.



**Figure 2.** Intraoral examination on first visit.



**Figure 3.** Intraoral after occlusal rehabilitation

### Discussion

Long-term untreated bruxism can erode tooth enamel, dentin and expose the pulp of nerves and vessels. Not only does this compromise the integrity of the teeth, but it can also cause intense pain.<sup>4-6</sup> The association between bruxism intensity, frequency, and damage to dental structures is not yet fully understood in scientific literature, but it is essential to establish the timing of clinical interventions.

The aims of bruxism management include reduction of bruxism activity, protection and

restoration of teeth, remission of painful symptoms, and avoidance of disorders in the temporo mandibular joint and periodontal structure. Although the relationship between bruxism and temporo mandibular disorder (TMD) is not well understood, some studies have shown that the prevention of sleep bruxism habits in childhood can decrease the likelihood of TMD in the future.<sup>7,8,9</sup>

Our report focused on two children with a history of sleep bruxism, which had caused pronounced attrition on primary teeth. In accordance with the minimal criteria proposed by the American Academy of Sleep Medicine (AASM), both cases were diagnosed with sleep bruxism because they involved complaints of teeth-grinding during sleep, abnormal wear of the teeth, and sounds associated with bruxism.<sup>10</sup>

Both of these patients used dental treatment for sleep bruxism: occlusal splints in Case 1 and occlusal rehabilitation in Case 2. Occlusal splints on either the maxillary or mandibular arch have been used extensively in clinical practice to remove occlusal interferences, protect dental surfaces, and relax masticatory muscles.<sup>11</sup>

The design of the splints is customized based on the severity of the bruxism: a soft rubber mouth guard is the best choice for a patient that clenches his or her teeth rather than grinds them; a hybrid laminate guard with a hard exterior and soft interior is the best choice for moderate grinding, as this newly developed combination of thermoforming materials is biocompatible and can increase patient comfort; and hard acrylic guards are best for heavy grinding. All of these guards provide a layer between upper and lower teeth that prevents them from grinding and causing the tooth enamel to erode.<sup>4-6</sup>

Occlusal rehabilitation may include approaches like dental carious treatment and advocated when teeth has lost it's structure due to caries and attrition. Occlusal rehabilitation may establish occlusal equilibrium, which is aimed at achieving a harmonious relationship between occluding surfaces. Occlusal vertical dimension (OVD) is the distance between two selected anatomic origin when the mandibular teeth are occluding with the maxillary teeth and the main determinant to achieve occlusal equilibrium. From a clinical perspective, increasing the OVD has been reported to facilitate the treatment of

patients who present with dental abnormalities, from generalized tooth wear to significant occlusal irregularities.<sup>12,13</sup>

In case 1, sleep bruxism is mainly due to anxiety, it is prudent to use oral splints in the management of sleep bruxism to the protection or limitation of dental attrition that is possibly caused by the disorder. In case 2, sleep bruxism is caused by occlusal interferences. Occlusal rehabilitation is required to correct the occlusal interferences and also treat the severe dental caries of this patient.

## Conclusion

Sleep bruxism is a sleep-related movement disorder that can cause damage to the integrity of tooth structure. The effects of bruxism may range from mild to severe. A combination of methods may be necessary to reduce bruxism activity, protect and restore teeth, and relieve pain. In Case 1, occlusal splints were used to protect the unaffected teeth and relax the masticatory muscles. In Case 2, full occlusal rehabilitation was performed to restore OVD, treatment of dental caries, and achieve occlusal equilibrium. Both methods can help to reduce the frequency of sleep bruxism.

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