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A Case Report of Bruxism and Its Management with The Help of Occlusal Splints.

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Abstract: Bruxism is considered a normal habit, but in case of certain circumstances like increased frequency of episodes and strength of the masticatory muscles, it can turn into a pathological phenomenon. Bruxism is an umbrella term for the parafunctional habits of grinding and clenching teeth. It can occur during wakefulness (clenching) or sleep (bruxism). A 31-year-old male patient complained of severe loss of coronal tooth structure in the upper anterior region of the jaw. Medical, drug and social history were within normal limits. However, clinical examination revealed maxillary anterior teeth showing severe "attrition", while other teeth had less attrition and infrequent pain in the temporomandibular joint with a clicking sound. By thorough examination and history of the patient, the diagnosis of the bruxism was made, and the patient was planned for the treatment with the help of a permissive occlusal splint. Occlusal splint therapy is used to stabilize the "TMJ " and protect the teeth, relax the masseter and temporalis muscles, increase inter-vertebral and inter-discal space, and allow the balance of bite forces and decrease bruxism activity. Therefore, early diagnosis and treatment can prevent the consequences of the breakdown of dentition and orofacial pain. This case report presents the successful treatment of occlusal splint therapy in patients with severe bruxism.

Keywords: Bruxism, attrition, clenching, malocclusion, splints, treatment.

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1. INTRODUCTION

Tooth grinding and clenching are important to the dental specialist as it involves tooth damage, breakage of dental restorations, temporomandibular disorders and possible induction of temporal headache. [1] Bruxism is considered an involuntary nonfunctional "activity" involving the masticatory system and is regarded as teeth clenching or grinding. It is classified as a psychophysiological disorder, which may occur consciously or unconsciously during waking or sleeping. This habit is quite common during childhood and can negatively affect the stomatognathic system. Prevalence of bruxism in children is from 7% to 15.1%, and girls are more commonly affected than boys. [2] It is always a challenge for both the dentist and the patient to treat such type of occlusal-related disorders. Various treatment modalities were considered in managing bruxism with an occlusal splint. The art and science of dentistry can be considered in the occlusal splint design and function.[3] This case report presents the successful treatment of occlusal splint therapy in a patient with severe bruxism.

2. CASE REPORT

A 31-year-old male patient complained of severe loss of coronal tooth structure in the upper anterior region of the jaw. The patient was also complaining of the sensitivity of the anterior maxillary teeth to hot and cold beverages. Medical, drug and social history were within normal limits. However, clinical examination revealed maxillary anterior teeth showing severe attrition while other teeth had less attrition (Figure 1).

Fig 1: Clinical picture of the patient showing severe attrition of the anterior maxillary teeth and all other teeth present.

The patient also complained of infrequent pain at the temporomandibular joint with a clicking sound for 4-5 months. By thorough examination and history of the "patient," the diagnosis of the bruxism was made, and the patient was planned for treatment with the help of a permissive occlusal splint. The permissive occlusal splint was prepared on the models and given to the patient for daily use (Figures. 2 and 3).

Fig 2 and 3: Maxillary and mandibular models prepared for the construction of the occlusal splints.

All the instructions for using the occlusal splints were given to the "patient", and a follow-up of the patient was done after three months and patient showed improvements in the symptoms, and the attrition of the teeth was also stopped (Figure 4).

Fig 4: Placement of the occlusal splint in the patient mouth.

3. DISCUSSION

Marie Pietkiewicz, in 1907 introduced the term "la bruxomanie". It was then implemented as "bruxism" to designate gnashing and grinding of the teeth lacking a functional purpose. Glossary of Prosthodontic Terms called bruxism is an oral habit of parafunctional grinding and clenching of teeth.[4] Bruxism aetiology is multifactorial and still needs to be completely understood. It can involve local, systemic or psychological factors related to sleep disorders.[2] Previously, peripheral factors such as occlusal discrepancies and deviations in orofacial anatomy have been measured as the main causative factors for bruxism. Nowadays, these factors play a minor role, if any. Recently, the focus has been on central psychosocial factors like stress and certain personality characteristics. Further, it has been shown that bruxism is part of a sleep arousal response.[5] The diagnosis of sleep bruxism consists of clinical signs and symptoms such as tooth wear, pain in the facial muscles, headaches reported or observed by polysomnographic changes (in cases of nocturnal bruxism). [2] Various treatment modalities have been proposed like pharmacological, psychological, and dental. Pharmacological management includes benzodiazepines, beta-blockers, anticonvulsants, dopamine agents, muscular relaxants, antidepressants, and others. To eliminate symptoms, local injections of botulinum toxin can be administered for patients with severe bruxism. But, its effectiveness and pharmacological safety have yet to be discovered. Psychological management involves a behaviour therapist, like sleep hygiene, relaxation to control stress, psychotherapy, hypnosis, and biofeedback. Dental management of bruxism includes tooth surface restoration, occlusion adjustment, and orthodontic treatment.[5] Occlusal splint therapy is commonly used for the diagnosis of bruxism, with many types of appliances currently available for neuromuscular stabilization. These devices are also called flat plane, myo-relaxation splints or inter-occlusal splints. It was used to stabilize the TMJ and protect the teeth, relax the masseter and temporalis muscles, increase inter-vertebral and inter-discal space, allow the balance of bite forces, and decrease bruxism activity.[6] Occlusal therapy is the art and science of establishing neurovascular harmony in the masticatory system by forming mechanical lockage for the parafunctional forces with the help of removable appliances.[3] Previous studies have shown many signs and symptoms treated with occlusal splints. Our case report showed that the patient presented a decrease in or elimination of the signs and symptoms related to bruxism after three months of occlusal splint usage. One of the most frequent clinical signs was the temporomandibular joint clicking sound click which occurs mainly during the early phase of mouth opening. In our case, there was a marked decrease of the joint noises using the occlusal splint, considering that this sign disappeared.[6] The various types of occlusal splints available are permissive, non-permissive, hydrostatic and silicon splints. Splints distribute the forces across the masticatory system. Thus decreasing the episodes of bruxism and its effects. [3] An occlusal splint can overcome wear and tear due to cases of bruxism[7]. In situations of sleep bruxism, an occlusal splint is recommended as the first line of treatment to prevent noise bruxism and tooth wear[8]. Achmad H[9], in their literature review, suggested the symptoms of bruxism can be considerably reduced when an occlusal splint is used as a therapy. De Oliveira L et al.[10] evaluated the possible association between bruxism and temporomandibular disorders. Children diagnosed with Sleep Bruxism have a 2.97 times greater probability of presenting temporomandibular disorders. Andre BF et al. [11] proposed treating bruxism in children using jaw plates made entirely of silicone with a fully covered occlusal surface. He confirmed that the absence of nocturnal bruxism reports after two months indicates a reduction in the severity of nocturnal bruxism and improvement in the reporting of discomfort in facial muscles and headaches[11]. However, when managing bruxism in children, it is important to remember that they are still growing and developing their maxillary structures. Thus any interventions should be carried out carefully.[12] Chisini L et al.[13] advise psychological therapy, physical therapy, and occlusal plates; however, it is vital to have extensive control and periodic controls if this treatment is used. Gholampour S[14] analyzed occlusal splint therapy in patients with bruxism; the maxilla, mandible, and teeth of 37 patients and 36 control subjects were generated as three-dimensional models using in-vivo image data. They concluded that the splint functions as a stress reliever and dissipates the extra stresses produced and the TMJ deformation and deviations brought on by bruxism. On the contrary, Riley P et al. [15], in their systematic review, evaluated the clinical effectiveness of oral splints for patients with a temporomandibular disorder or bruxism for the primary outcomes: pain (TMD) and bruxism. They concluded that the low certainty evidence identified did not show that splints lessened the pain in TMD, and there isn't enough data to say whether splints for bruxism patients lessen tooth wear. Similarly, another systematic review by Hardy RS and Bonsor SJ [16] on the efficacy of occlusal splints in the treatment of bruxism concluded that there was insufficient evidence to recommend occlusal splint therapy over no treatment or other treatment modalities. Alternative treatment options, Shim YJ et al. [17] evaluated the effects of botulinum toxin type A for managing sleep bruxism in a randomized, placebo-controlled trial. They concluded that a single botulinum toxin type A injection cannot reduce the genesis of sleep bruxism; however, lowering the masseter muscle's activity may be a useful therapeutic strategy for sleep bruxism. Tavares-Silva C[18]

recommended homoeopathic remedies with sedative and anxiolytic effects, such as Melissa Officinal is, which has been shown to reduce bruxism in children. The exact mechanism of action of occlusal splints has yet to be completely discovered. Some theories were put forward to explain its mechanism like: as alteration or improvement of the occlusal condition, alteration or raising in the vertical dimension, change in peripheral (motor or afferent) impulses to the central nervous system, alteration of the TMJ condylar position, placebo effects and increase in the cognitive awareness.[6] The occlusal splints also function for the providing diagnostic information in various ways. The dental practitioner can determine potential neutral zone impingements, the envelope of function, anterior guide requirements, and parafunctional habits and can also obtain information about the vertical dimension of the patients wearing occlusal splints.[3]

4. CONCLUSION

Bruxism is commonly seen oral parafunctional habit having adverse effects on dentition. Early diagnosis and management can decrease the symptoms and prevent psychological trauma to the patient. Our case report showed the patient's successful management using occlusal splints. Therefore, studies should be done on occlusal splints, including many patients with bruxism.

5. AUTHORS CONTRIBUTION STATEMENT

Dr Mesfer Ibrahim Abdullah Alsheri and Dr Shumua Mahmoud Abdullah Shami conceptualized and gathered the data with regard to this case report. Dr Arwa Jabar I. Mohana gave the necessary inputs and managed the literary searches. Dr Esraa Eissa Ibrahim Abujamilah and Dr Fahad Ali Abduallah Alshehri provided valuable inputs on the manuscript. Fareedi Mukram Ali curated the data and provided valuable inputs towards the design of the manuscript. All authors discussed and contributed to the final version of the manuscript.

6. CONFLICT OF INTEREST

Conflict of interest declared none.

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