ANTERIOR OPEN BITE AS A COMPLICATION OF THE TREATMENT OF BRUXISM WITH ANTERIOR BITE PLANE: A CASE REPORT

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ABSTRACT

Bruxism is one of the major dental diseases indicating that up to 20% of the population have signs of significant wear on their teeth. The etiology and pathophysiology of this disorder are still unclear. Anterior bite plane has been shown to be beneficial in the management of the signs and symptoms associated with bruxism, including nocturnal headaches in certain patient populations. The clinical report of a 55-year-old female patient who has been using an anterior bite plane for 2 years for the treatment of bruxism describes how spontaneously anterior open bite occurred in this patient after the application of anterior bite plane for the treatment of bruxism.

Key words: Bruxism, Open Bite, Splint

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INTRODUCTION

Bruxism is a parafunctional activity observed both in adolescent and adult populations. The mean prevalence is about 20% and is decreasing with age. Women appear to clench more frequently than men. The term bruxism refers to nonfunctional grinding of the lower teeth against the upper teeth. If uncontrolled, it generally leads to severe abrasive wear of the occlusal surfaces or hypermobility of the teeth and may also contribute to adaptive changes in the temporomandibular joints, resulting in flattening of the condyles and gradual loss of convexity of the eminentiae. Symptoms of bruxism include dull headaches, sore and tired facial muscles, earaches, sensitive teeth, and locking, popping, and clicking of the jaw. Bruxism is associated with muscle spasm, split teeth, and fractured fillings. The cause of bruxism is not completely clear. This can be accomplished in two ways: Directly by equilibration, occlusal restorations, or orthodontics, and indirectly by occlusal splints. The beneficial effect of acrylic occlusal splints or night guards is the result of occlusal correction in the appliances themselves and the stabilizing effect they have on the teeth. The elimination of signs of bruxism will occur with virtually any technique that eliminates occlusal interferences, either on the teeth themselves or on an appliance that fits over the teeth. A common fallacy regarding occlusal splints is that the relief of symptoms is the result of the increased vertical dimension. There are several different kinds of splints that can be used for bruxism therapy. Some splints are worn on the upper teeth, while others are worn on the lower teeth. There are also partial coverage and full coverage splints. While partial coverage splints are worn over only the back or front teeth, splints that provide full coverage are worn over all of the teeth. This allows the specialist who is overseeing the splint therapy to have more control over the creation of the new bite, and lessens the risk that the teeth or jaw could shift over time. Finally, there are directive and permissive splints. While directive splints hold the jaw in a fixed position, permissive splints allow it to find its own position and move more smoothly and naturally. Permissive splints are more modern alternatives that many patients find less restrictive and easier to wear on a daily basis. Permissive splints are designed to unlock the occlusion to remove the deviating tooth inclines from the contact. Any splint design is permissive if it unlocks occlusal incline contacts and provides a smooth gliding surface that permits uninhibited muscle positioning of the mandible. Permissive splints can be made for either anterior or posterior teeth, or for upper or lower teeth. A properly made centric relation occlusal splint is a permissive splint. If centric relation can clearly be verified, on occlusal splint, then it can be fabricated with multiple, equal-intensity occlusal contacts of the cusp tips on the opposing arch against the occlusal surface of the splint. Directive splints are designed to position the mandible in a specific relationship to the maxilla. The anterior bite plane is a hard acrylic appliance worn over the maxillary teeth providing contact with only the mandibular anterior teeth. It is primarily intended to disengage the posterior teeth, and thus eliminate their influence in the function or dysfunction of the masticatory system. Anterior bite planes can be fabricated either directly in the mouth or in directly on mounted diagnostic casts. Although direct fabrication has the advantage of requiring less time to make the appliances, it is not an acceptable method if the appliance is to be converted to a full occlusal splint. It is, however, a practical procedure to use overnight as a muscle deprogrammer or to determine whether condyle-disk alignment can be maintained during function. This clinical report describes spontaneous anterior open bite occurred in this patient after the application of the anterior bite plane for the treatment of bruxism.

CASE REPORT

A 55-year-old retired female patient came to our clinic with complaints of bruxism, and anterior open bite. Mandibular movement was normal during opening (44 mm) and right and left lateral excursions (8 mm). No pain was felt. The occlusal examination disclosed a complete natural dentition. Moderate tooth wear was apparent on the anterior teeth. The other occlusal findings were within normal limits. There were no other significant findings in either the history or the clinical examination. Examination showed no pain or tenderness in either joint. Observation and palpation revealed normal movement of the condyle during opening. The transcranial radiograph and panoramic radiograph depicted the subarticular surfaces as normal. The patient was treated with anterior splint for two years (Figures 1, 2 and 3). Her anterior teeth were not in contact position and there was an anterior open bite when she was referred to our dental clinic (Figures 4, 5 and 6). The patient was suffering from the spacing between the anterior teeth. There was a speech difficulty.
Figure 1. Anterior bite plane in occlusion

Figure 2. Anterior bite plane in the mouth

Figure 3. Anterior bite plane

Figure 4. Anterior open bite

Figure 5. Open mouth position

Figure 6. Front view of the patient
The impressions were made from maxillary and mandibular arches, and casts were prepared and mounted in centric relation. A vertical pin was set so that there would be approximately 1mm of space between the teeth that contact first. Acrylic resin was adapted to the palate and maxillary occlusal surfaces and the articulator was closed onto the vertical space established by the incisal pin. Then the model was taken out and the resin was removed from the maxillary cast and polished (Figure 7). Occlusal adjustment was made in the mouth, and the following day the patient was checked for the splint adaptation and evaluated so as to see if any problems occurred (Figures 8, 9). The patient was recalled to the clinic one week after the review and was checked for any complications. The recalls were scheduled at 1 month, 3 months, 6 months after splint delivery.

**DISCUSSION**

Many types of occlusal splints have been advocated (Figures 10, 11). They may be full or partial occlusal coverage, maxillary or mandibular, repositioning or stabilising, and made from a variety of different materials. An occlusal splint is a removable appliance covering some or all of the occlusal surfaces of the teeth in either the maxillary or mandibular arches. The ideal occlusal splint is made from laboratory-processed acrylic resin, which should cover the occlusal surfaces of all the teeth in one arch. It should provide even simultaneous contacts on closure on the retruded axis with all opposing teeth and anterior guidance causing immediate disclusion of the posterior teeth and splint surface outside intercuspal position. Occlusal splints should be worn according to the dentist’s recommendation for considerable periods of time to be effective. If a splint does not cover all the occlusal surface in an arch, unopposed teeth will continue to erupt creating an iatrogenic malocclusion. This applies to both anterior and posterior partial coverage splints, and their use cannot, therefore, be recommended.

Our patient has used an anterior bite plane for two years, and consequently the anterior open bite has developed. An anterior splint would permit the posterior teeth to erupt so that when the splint was removed, the anterior teeth would be apart and anterior guidance would have been lost. The same findings were observed in this patient. The anterior bite plane caused abnormal space between maxillary and mandibular anterior teeth. The posterior teeth may have been prolonged or the anterior teeth may have been buried. We do not know this exactly
The Treatment of Bruxism

All centric relation contacts are even and on flat surfaces. Centric relation contacts provide even chewing forces on the teeth. Centric relation splints are fabricated for patients with centric relation contacts.

Owing to these advantages, a centric relation splint was fabricated for this patient. Occlusal splints are typically made of a heat-cured acrylic resin. Soft acrylic or light cured composite, or vinyl splints may be made more quickly and cheaply, but are not as durable, and are more commonly made for short-term use. Soft splints are also used for children, because normal growth changes the fit of hard splints. A heat-cured acrylic resin was preferred to make the splint. To protect the tooth and restoration surfaces, and to manage mandibular (jaw) dysfunction, we suggested the patient wear the splint all night.

To close the anterior open bite was possible through an anterior fixed restoration and orthognathic surgery that will have impact on the posterior maxilla, which allows the mandible to autorotate, thereby decreasing the anterior facial height. However, we choose splint therapy because of bruxism and follow-up the anterior teeth extrusion by non-contact anterior splint. We observed that the space decreased; and we continued to follow-up.

Conclusion

Anterior bite plane provides occlusal contacts only on the anterior teeth. Parafunctional activity associated with unfavorable posterior tooth contacts can be treated with it but only for short periods. There can be some major complications when an anterior bite plane or any splint is used to cover only a portion of one arch. The unopposed posterior teeth have the potential to supererupt. If the appliance is worn continuously for several weeks or months, there is a great likelihood that the unopposed mandibular posterior teeth will supererupt. When this occurs and the splint is removed, the anterior teeth will no longer contact and the result will be an anterior open-bite. Anterior bite planes should not be left worn for extended periods.

References


