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CASE STUDY

OCCLUSAL SPLINT THERAPY IN TMJ DISORDER

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ABSTRACT

Interocclusal appliances, or more commonly termed as bite splints, have been advocated for the control and treatment of conditions such as bruxism (bruxomania), trauma from occlusion and temporomandibular joint disorders. Many different types of splint designs have been advocated, each aimed at eliminating a specific etiologic factor. The selection of the appliance design should be based on sound therapeutic goals. A well designed interocclusal appliance may help reduce nocturnal bruxism, clenching and decrease the pain in orofacial region via a physical action or a placebo effect. This article describes the fabrication of an occlusal splint for a 60 year old female patient with a history of bruxism and clenching that resulted in much loss of tooth structure through attrition, a reduced masticatory efficiency and associated pain in the orofacial region.

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INTRODUCTION

An occlusal splint is a removable appliance, usually made of hard acrylic that fits over the occlusal and incisal surfaces of the teeth in one arch, creating precise occlusal contact with the teeth in the opposing arch (Okeson, 1985). The occlusal splint offers a conservative and reversible therapy and is recommended for the management of TMJ disorders, bruxism and occlusal trauma (Ramfjord *et al*., 1983). This article describes the fabrication of a maxillary occlusal splint as a conservative approach in a patient with a history of bruxism and clenching.

Case Report

A female patient aged 60 years reported to the Department of Prosthodontics, Govt. Dental College and Hospital, Amritsar with the chief complaint of inability to eat, pain on chewing and frequent headaches since four years. The patient had been diagnosed and treated for bruxism two years previously with an anterior partial coverage interocclusal appliance but the therapy was reported as unsuccessful. The patient was apparently aware of the grinding and the clenching habits. Clinical examination revealed clicking in the left TMJ on opening and mild tenderness to palpation in the masseter region on the left side. There was no discomfort to resistance on opening or protrusion but a slight difficulty was noticeable during the right excursive movement. Radiographic analysis did not suggest any contributory pathology. Intraoral examination revealed marked attrition of all the teeth (Fig. 1) with contacts in the maximum intercuspation present on both the posterior as well as the anterior teeth. Non-working contacts on the left side were demonstrated during right lateral excursion. Based on the history and the findings of the clinical examination, a provisional diagnosis of left disc disorder and myalgia secondary to bruxism was made. Full mouth fixed rehabilitation was planned and explained to the patient but due to financial constraints, the patient was only willing for a cost effective alternative. Therefore, in addition to palliative therapy for relief of pain, a maxillary occlusal splint was included in the treatment plan to improve the occlusal stability, eliminate non-working contacts and to prevent the direct trauma associated with clenching and bruxism. A maxillary appliance was preferred over a mandibular one because of the increased stability offered by the maxillary appliance (Nelson, 1995).

Steps in Fabrication of the Occlusal Splint

Making Impressions and Mounting Procedure

1. Maxillary and mandibular impressions were made in irreversible hydrocolloid and poured in dental stone. The cast was carefully inspected to make sure that it was free of voids or bubbles that could affect the final fit of the splint.

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Fig.1. Intraoral photograph showing marked attrition of teeth

Fig.2. Waxed-up splint

Fig.3. The finished and polished heat-cure acrylic splint

Fig.4. The maxillary splint in place. The guiding ramps are evident

2. The maxillary cast was mounted on an articulator using a face-bow transfer procedure. Whip-Mix semi adjustable articulator was used for this purpose along with the Quick-Mount face-bow for orienting the maxillary cast.
3. A centric relation record was used to mount the mandibular cast on the articulator.
4. Right and left lateral interocclusal records were used to adjust the condylar guidance on the articulator.

Cast Preparation

5. All the undercut areas, lingual surfaces and the interproximal areas were blocked out with plaster up to the adjacent marginal ridges to allow a path of insertion of the splint. Block out on the buccal surface was limited to only very deep embrasures because most of the splint retention comes from the buccal surface. A circumferential clasp was given bilaterally on the first molars for added retention.
6. The splint outline was drawn on the cast. On the facial surface, the margin was marked to cover one half of the crown of the posterior teeth and the incisal half of the crown on the anterior teeth. On the lingual side, 6-8 mm of the palatal tissue was covered.

Splint Wax-up

7. The vertical dimension was adjusted on the articulator to allow 2 mm of space between the closest occluding cusps (opposing second molars) to allow an adequate thickness to the waxed splint (Taubert, 1995).
8. Base plate wax was shaped into a horse shoe adapted on the maxillary cast to the outlines previously marked. The buccal surface was waxed about 2 mm thick.
9. The occlusal surface of the wax was adjusted to provide contact with all opposing teeth. The excess wax was trimmed off and finished to a smooth, flat surface (Fig. 2).
10. To allow for posterior disclusion during eccentric excursions, guiding ramps (Taubert, 1995) were formed on both sides in the cuspid region. The articulator was moved in lateral and protrusive movements to determine where the lower cuspids guided over the wax. The ramp was finished as a smooth and gradual slope and extended to the occlusal-buccal line angle.

Processing, Finishing and Delivery of the Splint

11. Heat-cured, clear acrylic was used to process the splint following flasking and boil out in the usual manner.
12. The processed splint was trimmed to remove all flash, bubbles or irregularities. The buccal surface was trimmed to a thickness of 1mm and scalloped around the posterior teeth distal to the cuspids.
13. The occlusal-lingual line angle of the splint was rounded.
14. Chair side adjustments were made to provide stable, even occlusal contacts with the help of articulating paper and posterior disclusion was evaluated in the patient's mouth.
15. The splint was finished (Fig. 3) after necessary adjustments and delivered to the patient (Fig. 4).

The patient was instructed to wear the splint at all times except during meals and oral hygiene procedures and placed on regular recall to evaluate the effectiveness of the splint therapy

Conclusion

The occlusal splint offers an economical and conservative therapy for patients with bruxism and occlusal trauma as compared to the more invasive and more expensive restorations that are often done as part of occlusal rehabilitation procedures. The patient has been benefited by this simple treatment approach and reported a decrease in orofacial pain as well as more comfortable chewing after one month of appliance usage. A regular recall protocol has been instituted for the patient to evaluate.

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