Sectional Occlusal Splint in Mouth Rehabilitation – An Update and Case Report.

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Abstract

Severely worn dentition adversely affects function, aesthetics or longevity of dentition. The etiological factors of tooth wear are abrasion, attrition and erosion. The present case report determined the etiology and correct sequence of treatment outline. Patient was completely dentate except the mandibular left first molar. Authors recommended the use of acrylic sectional occlusal splint in full mouth rehabilitation. Sectional occlusal splint used as a vertical stop to guide the teeth preparations and planning provisional restorations at the established vertical dimension of occlusion. This helped preparatory work both on teeth in the articulator and oral cavity. Recordings and restorations were made with latest economical material and technology. Organized approach, managing these patients certainly leads an expected and promising prognosis.

Key words: Severely worn dentition, sectional occlusal splint, provisional restorations.

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Introduction

Non-carious tooth surface loss is a normal physiological process occurring throughout the life whereas accelerated tooth wear can become a problem affecting function, aesthetics or longevity of dentition. Oral rehabilitation has been defined as restoration of the form and function of the masticatory apparatus to as near normal as possible.[1] Full-mouth rehabilitation is called reconstruction or rejuvenation of the individual of each tooth in a mouth.[2] The term occlusal rehabilitation has been defined as the restoration of the functional integrity of the dental arches by the use of inlays, crowns, bridges and partial dentures including implant prostheses.[2] Therefore, occlusal rehabilitation involves restoring the dentate or a partially dentate mouth. The conjecture literature of the sectional occlusal splint is sparse. Few references were listed.[3,4] The previous studies of McCollum, Christensen and Pankey-Mann-Schuyler have been heightened over the years by the practicing gnathologists.[2]

This case report describes the application of sectional occlusal splint in mouth rehabilitation on the articulator as well as in the oral cavity. It can be used to maintain the established vertical dimension of occlusion as a vertical stop to guide the teeth preparations and provisional restorations.

Case Report

A 35 years old middle class male patient reported to the Department of Prosthodontics, Daswani Dental College, Kota Rajasthan with the complaint of generalized tooth hypersensitivity, difficulty in chewing and pain in masticatory muscles. Patient was consuming excessive alcohol. He did not have any compromising medical condition. He had the addiction of bad habits of beetle nuts, tobacco and pan chewing. Personal history revealed that patient was also under considerable psychological stress due to financial constraints.

Clinically, vertical dimension of occlusion (VDO) as measured using the method of physiologic rest position, a difference of 5-6mm was recorded between the rest vertical dimension (RVD) and the occlusal vertical dimension (OVD). This was further assessed by phonetic and aesthetic method. Patient was completely dentate except for mandibular left first molar. He has extracted two third molars. Rest of the two last molars was congenitally absent. Generalized, occlusal wear facets were present. Maxillary central incisors were previously restored following endodontic treatment with acrylic jacket crown (Figure 1). Occlusion revealed occlusal interferences in protrusive and balancing movements. Patient complained of masticatory muscle tenderness on palpation while TMJ was asymptomatic.

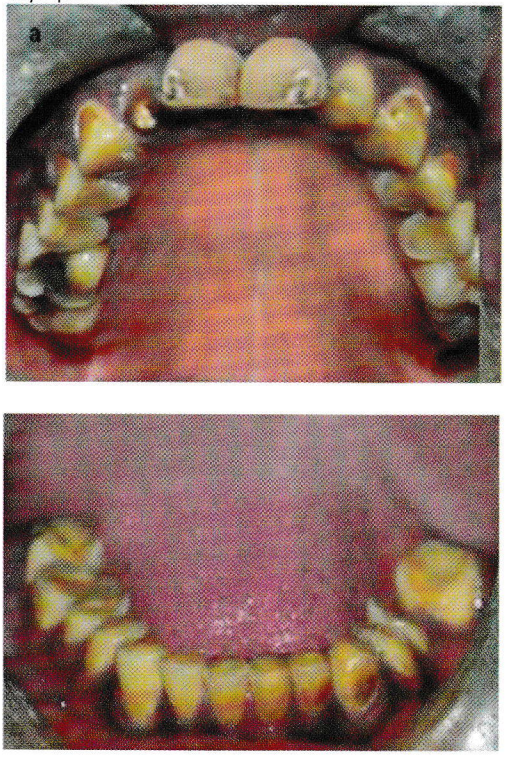

Figure 1: Occlusal view-severely worn dentition in the maxillary and mandibular arches.

The Orthopantomograph revealed generalized loss of enamel and dentin with close to pulp in relation to most of the teeth. Peri-apical radiographs showed that present teeth did not show any pulp exposure. Blood hemogram, complete urine examination, blood sugar and thyroid function test were also investigated. These were all in normal range. Load testing was done to assess centric position. Class I occlusion with severely worn complete dentition was noticed.

Treatment Outline:

The goal of occlusal therapy was to achieve Type I condition of Dawson.[2] The reported patient was the case of full mouth rehabilitation at the newly established vertical dimension. Treatment outline was included as buildup of diagnostic and working cast. Centric relation (CR) record was made after anterior deprogramming exercises. [5] Occlusal splint therapy was planned at normal freeway space of 3 mm for the masticatory muscles pain for one month. The patient was responding favorably to the splint. Mock preparation and diagnostic wax up was done with the application of customized Broadrick occlusal plane analyzer (BOPA).[6] and a sectional occlusal splint as shown in Figure 2 was recommended.

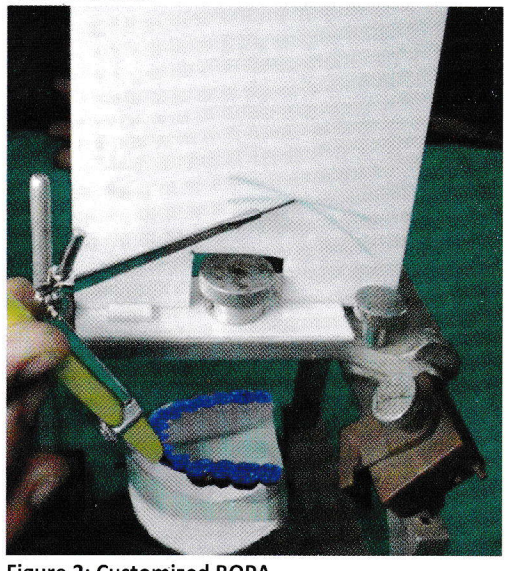

Figure 2: Customized BOPA.

Fabrication of Sectional Occlusal Splint

Acrylic sectional occlusal splint was fabricated using Arcon type whip mix articulator. The self-curing acrylic resin mix in the dough stage was used to construct the splint at the established OVD in between the maxillary and mandibular second molars on either side, separately (Figure 3). Working casts were mounted with face bow records. Customized BOPA assembly was set for the articulator to determine the Curve of Spee (anterior- posterior curve) for black carbon pencil mark of sectional splints and mock preparations. Full mouth wax patterns were prepared and silicone indexes (Figure 4) were made to prepare the provisional restorations (Figure 5).

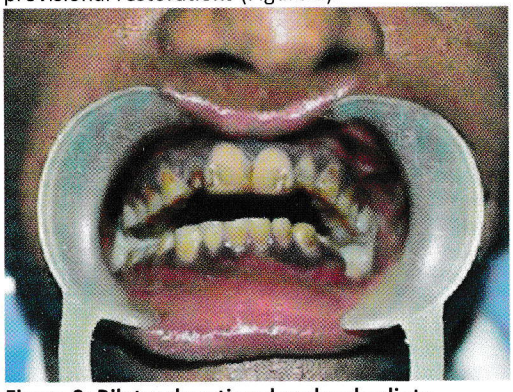

Figure 3: Bilateral sectional occlusal splints- positioned on the second molars, at the 3 mm inter occlusal gap

Bilaterally, the sectional occlusal splints were placed on second molars in mouth (Figure 4). Teeth preparations were done leaving out the second molars. The teeth preparations were phased on the patient as were preplanned as on the articulator. Once the provisional restorations of acrylic were in place as planned on the OVD established, the sectional occlusal splints were removed and teeth preparations on the second molars were completed. Provisional restorations were placed full arch and luted with temporary cement (Figure 5). Patient was monitored periodically for one month.

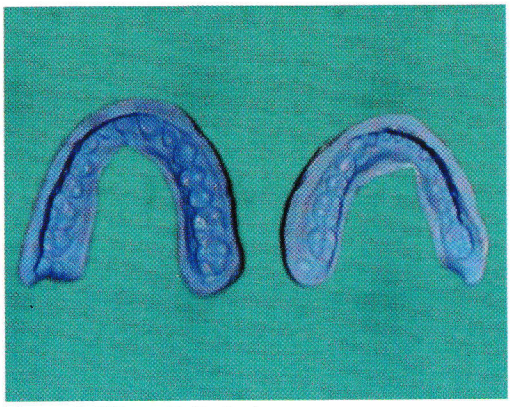

Figure 4: Silicon Putty index

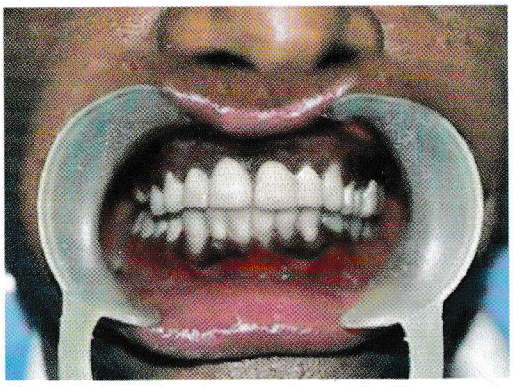

Figure 5: Provisional restorations- Maxillary & Mandibular arches.

For permanent restorations, all ceramic restorations (IPS e.max Ivoclar-Vivadent, Schaan, Leichstentein)) were planned for the upper and lower anteriors in the form of two-two units. PFM restorations were decided (IPS d.sign 84 Ivoclar-Vivadent) for the posteriors in the form of two- two units except for left sided lower mandibular molar region, a three unit fixed dental prosthesis (Figure 6 & 7).

Patient was provided soft splint and instructed to wear it at night for two months to protect the permanent restorations from parafunctional wear. Patient was also made aware and to avoid bruxing and chewing and biting hard foods.

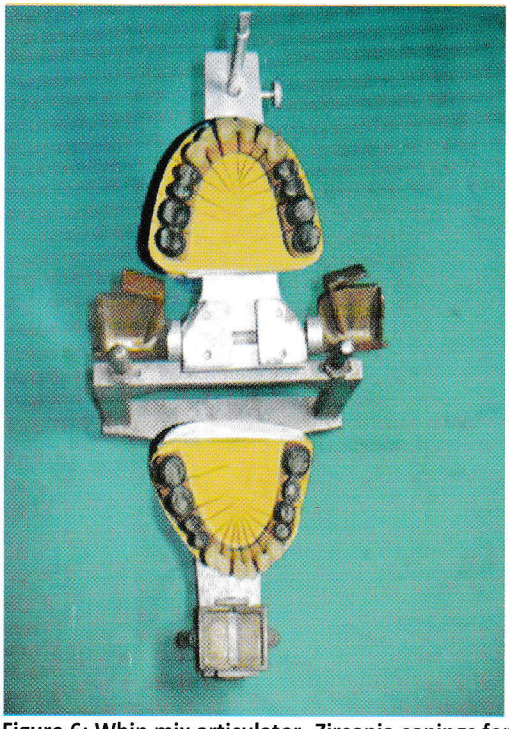

Figure 6: Whip mix articulator- Zirconia copings for anterior teeth and metal copings for posteriors

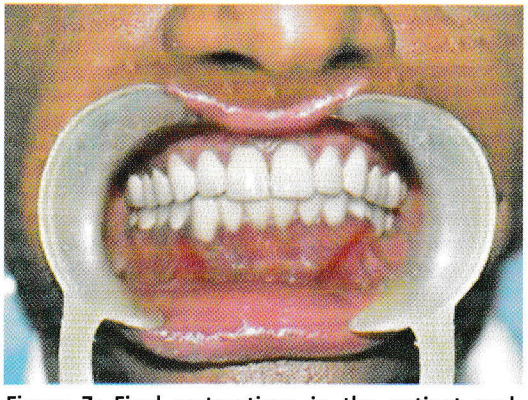

Figure 7: Final restorations in the patient oral cavity

Discussion

A systematic approach for managing tooth wear could lead to a predictable and favorable prognosis towards full mouth rehabilitation situation. Occlusal splint was used initially to maintain comfortable neuromusculature and to relieve all occlusal interferences at established VDO. Any disagreement between the teeth and joint made the neuromusculature to initiate a series of negative reflex actions which interfered with normal functional mandibular movements. This is a strong cause for painful masticatory musculature at decreased VDO.[2, 5] The advocated sectional occlusal splints were made in the diagnostic mounting served as the guide to maintain the planned vertical dimension during teeth preparations and provisional restorations.

Conclusion

Tooth attrition and erosion are modern day problems for dentistry. A concern is taken in diagnosing the cause before treating the effect. Sectional occlusal splint guide in teeth preparations and provisional restorations. Patient is educated and warned regarding the chewing and biting hard and parafunctional movements.

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References

1. The Glossary of Prosthodontic Terms. 8th edition. J Prosthet Dent 2005; 94:53.
2. Dawson PE. Functional Occlusion from TMJ to smile design. Mosby; 2007.
3. Capp NJ. Tooth surface loss: Occlusion and splint therapy. Br Dent J 1999; 186:217-222.
4. Nelson SJ. Principles of stabilization bite splint therapy. Dent Clin N Am 1995; 39:403-421.
5. Beohar G, Shrivastava S, Agarwal S, Katare U. A concise overview of various options of TMJ deprogrammers: Part II.Arch of Dent Sci, Vol.2; Issue 4: 8-11.
6. Bedia SV, Dange SP, Khalikar AN. Determination of the occlusal plane using a custom-made occlusal plane analyzer: A clinical report J Prosthet Dent 2007; 98:348-352.