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Case Report

Prosthodontic approach for restoration of extremely worn dentition: A case report

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Abstract

This clinical report illustrates the oral rehabilitation of a 48 year old female patient with severely worn teeth with accompanying loss of vertical dimension of occlusion. The aim of treatment was to restore aesthetics and improve masticatory function and it was achieved by placing a tooth supported overdenture with custom made precision attachment from mandibular right and left first premolars, single crowns in relation to maxillary centrals, laterals, canines and right and left first premolars, metal-ceramic three unit fixed partial dentures for the missing maxillary and mandibular right and left first molars. Metal occlusal surfaces were preferred for strength and durability and keeping the cost factor in mind as per the patient's request. This treatment option has been suggested to be efficient and cost effective,with the final outcome pleasing to the patient.

Keywords: Vertical dimension of occlusion, Tooth wear, Metal frame work, Interocclusal distance

1. Introduction

Tooth wear is commonly found in every dentition and may have physiologic or pathologic causes. The gradual wear of the occulsal surfaces of teeth is a normal process during the life time of patient. However excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function, and esthetic disfigurement. The rate of wear may be greater depending on factors such as age, gender occlusal conditions, parafunction, gastrointestinal disturbances, and excessive intake of citrus fruits or beverages with a low pH, environmental and salivary factors[1]. A differential diagnosis is not always possible because there may be a combination of these processes occurring [2, 3]. Situations in which the tooth wear is excessive require evaluation of the vertical dimension of occlusion (VDO). Loss of VDO caused by physiologic tooth wear is usually compensated by continuous tooth eruption and alveolar bone growth[4]. The determination of VDO can be achieved by several methods such as phonetics, interocclusal distance, swallowing & patient preferences[5-8]. Despite these techniques, there is no absolute method to determine an acceptable VDO. Clinicians may decide to increase VDO based on the amount of interocclusal space required to restore the dentition to proper esthetics, form, and function. If an increase is indicated and performed, it should be followed for several months[9]. A carefully monitored trial period with removable occlusal splints, followed by fixed provisional restorations should be performed whenever clinical evaluation demonstrates the necessity to restore VDO[10-12].

This clinical report describes the use of tooth supported over denture in relation to lower anterior with custom made precision attachment and single crowns in relation to upper anterior region and FPD in relation to upper and lower posterior teeth. This treatment option is suggested to be efficient and cost effective, with the final outcome pleasing to the patient.

2. Clinical report

A 48 year old female patient was referred to the department of prosthodontics, Nitte University. She was complaining of severely worn dentition and was unable to chew food; hence she desired to have her teeth restored for improved esthetics and function. Detailed medical and dental histories were recorded, and a complete series of radiographs was made. The patient gave a medical history of gastric regurgitation. Intra oral examination revealed severe tooth wear extending to the cervical level of the teeth in some areas, with missing mandibular incisors, right and left first molars and maxillary right and left first molars, prefabricated post and cores in relation to maxillary central incisors with wearing of the core structure and facial appearance of over closure (Figure 1). Treatment options were presented to the patient. Complete mouth rehabilitation with endodontic therapy of worn teeth, custom-cast post and core in relation to maxillary lateral incisors and canines, due to the amount of tooth wear all teeth were to be restored with metal ceramic crowns in relation to maxillary anteriors and right and left premolars and metal-ceramic three unit fixed partial dentures for the missing maxillary and mandibular first molars for the patients masticatory function, tooth supported over denture with custom made precision attachment for mandibular anteriors.

Facial measurements were taken to confirm the loss of VDO. For the patient in this clinical report, the inter occlusal space measured was 6mm hence the worn teeth were restored in such a way as to increase the actual VDO by 3mm and thereby leaving 3mm of inter occlusal space. On the basis of the newly established VDO, an occlusal splint was given as transitional VDO devices for approximately 6 weeks. Tolerance to changes to vertical dimension of occlusion is usually confirmed with the clinical evaluation of the patient having a diagnostic splint

or provisional prosthesis[13]. For most patients moderate alterations to the VDO may be well tolerated, which has been confirmed in long term observations[14]. Preliminary impressions were made. The diagnostic casts were mounted on a semi-adjustable articulator using an interocclusal relation record with a bite registration material at the presumed final OVD and an average mounting technique. Diagnostic teeth arrangements were made to establish the new VDO and the plane of occlusion on the basis of anatomic landmarks and averaged values[7]. Tooth preparations done for overdenture copings in relation to mandibular canines and first premolars (Figure 2a, 2b). Cast partial overdenture with custom made precision attachment was fabricated. The frameworks were evaluated for fit, retention, and stability (Figure 3) and maxillomandibular relationship record was made with the frameworks in position.

The maxillary and mandibular teeth were prepared, impressions were made and provisional restorations were fabricated on the semi adjustable articulator in centric relation and were cemented with zinc oxide non-eugenol provisional cement. Phonetics and esthetics were evaluated at this time. After two weeks the patient was called back the provisional restorations were removed, final preparations were completed and definitive impressions was made using polyvinyl siloxane impression material; and casts were poured in type IV die stone, which was later secured to a die lock tray (Figure 4a, 4b). A face bow registration was made and the casts were articulated on a semiadjustable articulator that was adjusted according to the records obtained. Wax build up was completed (Figure 5a, 5b) and occlusion in centric relation, posterior disclusion and balanced occlusion in protrusive movement was established. All the wax patterns were cast and the metal try in was done and adjusted as needed for proximal contact and occlusion. Definitive restorations with porcelain fused to metal crowns were fabricated. Following the normal clinical sequence, the accuracy of the marginal fitting and esthetic appearance of the crowns were verified. After occlusal and proximal contacts had been adjusted, the restorations was cemented with type I glass inomer cement.

The patient was monitored at 3-month intervals for 12 months. The restorations remained intact, with no discoloration (Figure 6). The patient exhibited a satisfactory function and esthetics.

Figure 1: Facial view of the patient presenting severely worn maxillary and mandibular dentition and loss of VDO.

Figure 2a: Tooth preparations done for overdenture copings

Figure 2b: Copings cemented

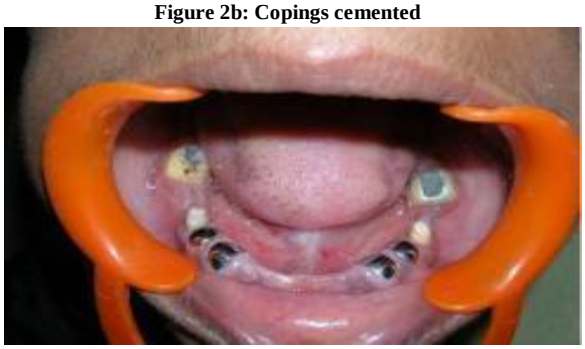

Figure 3: Metal framework try in

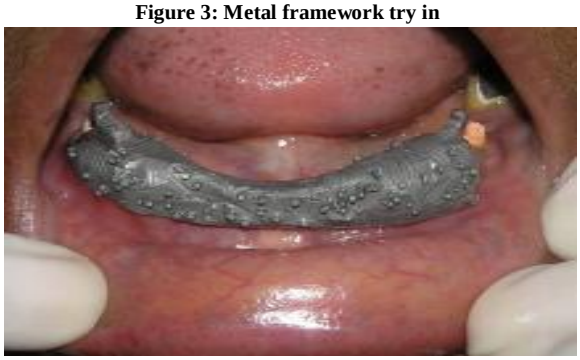

Figure 4a and 4b: Maxillary and mandibular casts secured to a die lock tray

Figures 5a and 5b: Occlusal view of the maxillary and mandibular wax up

Figure 6: Facial view of the restored teeth

3. Discussion

Tooth wear represents a frequent pathology with multifactorial origins. Behavioral changes, unbalanced diet, various medical conditions and medications inducing acid regurgitation or influencing saliva composition and flow rate, trigger tooth erosion. Awake and sleep bruxism, which are widespread nowadays with functional disorders, induce attrition. It has become increasingly important to diagnose early signs of tooth wear so that proper preventive, and if needed, restorative measures are taken. Once a complete understanding of the etiology of the dentition's present state is appreciated, a treatment plan can be formulated, taking into account the number of teeth to be treated, condylar position, space availability, the vertical dimension of occlusion (VDO), and the choice of restorative material[1].

Most common problem to be faced in the reconstruction of a severely worn dentition is the lack of restorative space in which there will be a need in the alteration of the VDO, Understanding what determines the VDO and what the effects of altering it have on the temporomandibular joint (TMJ), muscle comfort, bite force, speech, and long term occlusal stability are prerequisites to restoring the worn dentition. Assessment of the vertical dimension is important for the management, and careful comprehensive treatment plan is required for each individual case. There is evidence from long term studies, the patient adapts to such an increase and that the new VDO is stable[15]. The preservation of tooth structure is also of great concern. In cases of gastric erosion, it is of real importance to prevent further exposure of the eroded teeth to the damaging gastric contents[16]. The treatment used in this case is a relatively conservative and cost-effective solution that allowed an esthetic and functional rehabilitation. Metal-ceramic restorations and a removable cast partial denture with attachments were fabricated for mandibular anterior edentulous area. Attachments were given to improve denture retention and patient comfort; several disadvantages are associated with overlay RPDs such as complaints related to compromised esthetics when the dentures are removed, and oral comfort. Overlay treatment may be related to caries and progression of periodontal disease adjacent to the abutments even if preventive measures are introduced however, these problems are mainly a result of poor oral hygiene.

4. Conclusion

The best treatment for any wear depends on its early recognition, but this is an ideal that is difficult to achieve. Severe wear cases present many challenges to the restorative dentist, including gaining the space to create restorations to satisfy the patient's aesthetic desires, while also fulfilling occlusal and functional parameters that are essential for long-term success. It is important to distinguish between physiologic and pathologic tooth wear and to determine when and how to intervene.

Success in maintaining severe wear cases depends on the development of proper anterior guidance to allow for posterior disclusion within the patient's envelope of function. In this clinical report, a satisfactory clinical result was obtained by restoring the VDO, with improved function and esthetics.

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