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Case Report

A One Year Follow-Up of a Full Mouth Rehablitation for Severly Attrited Dentition

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Abstract: A 53 year old male patient came to the comprehensive care clinic with the chief complaint of worn out teeth. On examination generalized attrition, extrinsic staining, spacing between anterior teeth, decreased vertical dimensions of occlusion with loss of anterior guidance were seen. The patient was presented with the diagnostic mock up to restore the lost anterior guidance. On his acceptance, occlusal rehabilitation with full mouth porcelain fused to metal crowns and custom post and core for maxillary anteriors were done. Mutually protected occlusion with canine guidance was achieved for the patient. During follow-up appointments the patient was comfortable with his newly restored occlusion. A positive psycho-social changes were conveyed by patient's family and colleagues.
Keywords: full mouth rehabilitation, PFM, attrition, vertical dimension

INTRODUCTION

The gradual wear of the occlusal surfaces of teeth is a normal process during a lifetime of a patient. However, excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function, and esthetic disfigurement [1]. Therefore, it is important to identify the factors that contribute to excessive wear and to evaluate alteration of the vertical dimension of occlusion (VDO) caused by the worn dentition [2]. The treatment plan can be formulated, taking into account the number of teeth to be treated, condylar position, the VDO and the choice of restorative material [3]. While the severe wear of anterior teeth facilitates the loss of anterior guidance, which protects the posterior teeth from wear during excursive movement [4].

Restoration of the severely worn dentition is one of the most challenging procedures in dentistry. Evaluation and diagnosis should account for the patient's diet, history of eating and/or gastric disorders, along with the present state of the occlusion [3].

The full mouth rehabilitation (FMR) implies the involvement of all diagnostic, therapeutic, and restorative procedures at our command for the treatment and prevention of dental disease. In the narrower, more recently acquired sense, the term refers to the extensive and intensive restorative procedures in which the occlusal plane is modified in many aspects to accomplish equilibration [5]. These modifications are motivated by various factors: improvement in esthetics and restoration of occlusal function [6].

Successfully treating patients requires a combination of many aspects of dental treatment such as patient education, sound diagnosis, periodontal therapy, operative skills, occlusal considerations, endodontic treatment and achieving harmony between the TMJ and occlusion [6]. It also covered maintenance of the health of the entire oral mechanism [3, 7].

Pankey Mann Schuler's philosophy advocates that condylar guidance does not dictate anterior guidance. Thus it believes in harmonization of the anterior guidance for best possible esthetics, function and comfort and the determination of an occlusal plane based on anterior guidance [3, 6, 7].

For many years, Porcelain fused to metal (PFM) restorations have represented the most widely used restorative technique for teeth, this popularity may have attributed to the clinical longevity and accepted esthetics [8]. The aim of this case report was to show the sequence of FMR of a 50 year patient complained of severe attrition of anteriors maxillary teeth with generalized attrition of the remaining teeth.

CASE REPORT

A 50 year old male patient presented to the comprehensive care clinic (CCC), College of Dentistry, Jazan University. His complaint of aesthetic discontent due to the size, shape and shade of his existing natural dentition (especially maxillary anterior teeth) make him socially depressed. A multidisciplinary team including,

prosthodontist, psychologist, preventive dentist, periodontist, endodontist and dental ceramist were consulted. The patient was medically fit, with past dental history with bruxism. The extra-oral examination showed short lower 1/3 of the face with poor support of the upper lip (Figure -8, c). The intraoral examination showed chronic generalized gingivitis, attrition of all teeth, but server in maxillary centrals and laterals teeth (anteriors) . This attrition resulted in loss of vertical dimensions and incisal guidance. All teeth were presents expect 28,38,47,48, with over eruption of tooth # 18 was obvious (Figure -1, b &c). Class I molar relationship and canine guidance occlusion in both sides were registered. A diastema and high frenum attachment between maxillary central incisors was obvious (Figure -1, a). The panoramic radiographic interpretation showed mild bone loss, normal anatomy of glenoid fossa. The position of the condyle on both sides were normal (Figure -1, f).

Fig-1: Pre-operative intra-oral (A - frontal, B – maxillary, C – mandibular, D – right lateral, E- left lateral and F - Panoramic X – ray)

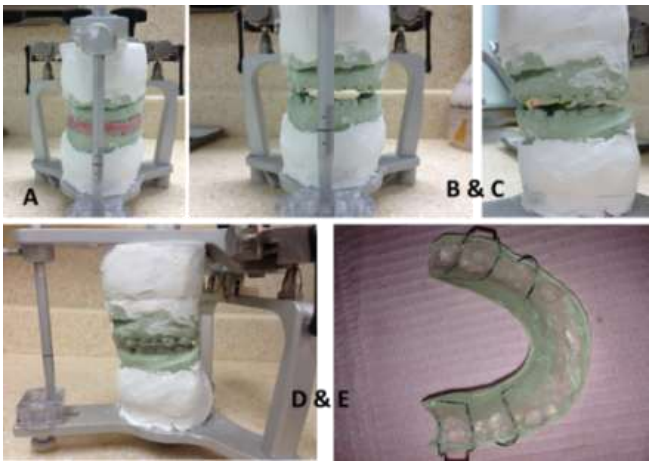

Fig-2: Different views of the mounting of maxillary and mandibular casts using interocclusal record –A –C, construction of hard acrylic rising bite appliance (D-E)

The treatment was initiated with periodontal therapy and oral hygiene instruction. The vertical dimension was measured at rest and at occlusion position using a ruler. There was a loss of vertical dimension, which should be compensated by increasing the vertical dimension by 1.5 mm posteriorly, which results in 3 mm in anteriorly. At the same appointment, maxillary and mandibular alginate impressions were made for diagnostic casts. Those casts were mounted on semi-adjustable Whip-Mix articulator (Waterpik Technologies, Fort Collins, Co, USA) after face bow (Hanau Spring bow) transfer and bite registration/ through centric and protrusive interocclusal record (Take 1, Kerr, Romulus, MI, USA). (Figure -2, a-c). A hard acrylic removal raising appliance was constructed on maxillary cast to increase the vertical dimension (Figure 2, d & e). During the try-in and delivery of the bite rising appliance, the premature contacts were identified and selective grinding was done intraorally with articulating paper 8 microns in thickness. A diagnostic wax-up patterns were made on the casts in harmony with centric occlusion, protrusive and extrusive movements from other maxillary and mandibular casts (Figure 3, a-d) using Inlay wax (Harvard, Germany). Then, rubber base indexes were prepared from the diagnostic wax-up casts, which would be utilized later in the fabrication of provisional restorations.

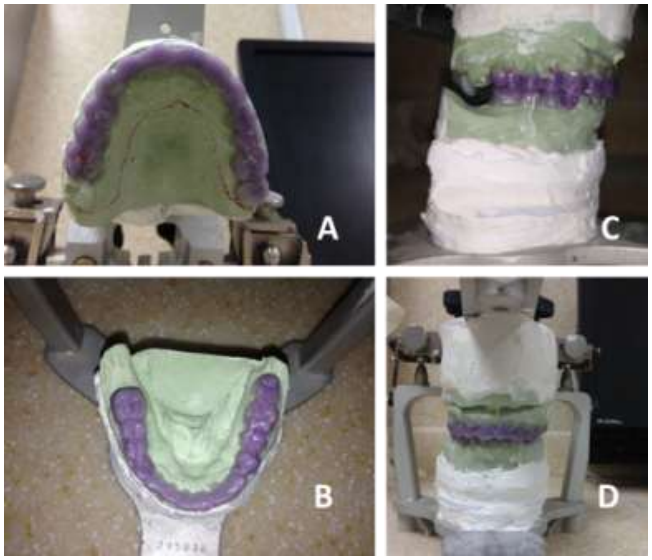

Fig-3: Maxillary and mandibular diagnostic wax-up (A –D)

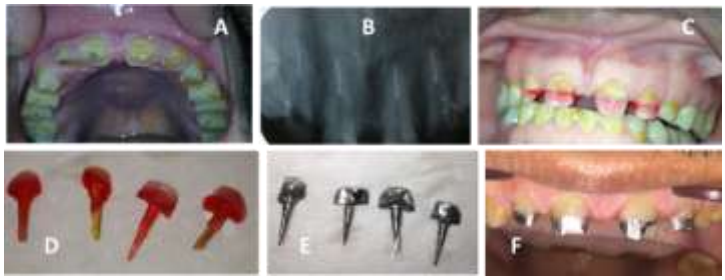

Fig-4: Root canal treatments -A, custom made post and core, build-up, casting and cementation B-F

After three months follow-up, there was considerable improvement in the vertical dimension with slight stiffness in the TMJ in the early morning. After the disappear of stiffness of TMJ, root canal treatment of tooth number 12,11,21,22 were done, followed by custom made post and core buildup using resin posts and core (Durally, Reliance, dental Manufacturing Company, Italy). The post and core were casted with nickel chromium casting alloy (Wiron 99, Bego, Germany), then polished and cemented in the canal with conventional cement (Figure 4, a-f).

Fig-5: Maxillary and mandibular teeth preparations (A-C), maxillary and mandibular final impressions (D-E) and bite registration and face bow transfer (F-G)

Fig-6: Maxillary and mandibular metal try-in (A-c), all build-up PFM separated crowns (D-E)

All maxillary and mandibular teeth were prepared to receive a separated porcelain fused to metal crowns (Figure -5, a-c). After that, maxillary and mandibular final impressions were taken with addition Silicon (Virtual Ivoclar Vivadent, Lichtenstein) using double mixing techniques (Figure -5, d & e).

Also bite registration was done using pink base plate wax and face bow transferred (Figure 5, f & g). From the rubber base indices which were prior prepared from the diagnostic wax-up models, the provisional crowns were constructed (Success SD, Promedica Neumunster, Germany) and then cemented with temporary cementation (Temp-Bond NT, Italy). The final impressions were poured and dies were made. Wax-up, coping and metal casting were carried out as per the manufacturer's instruction and routine laboratory procedure. The metal copping tried-in, in the patient mouth (Figure – 6, a-c), and shade selection (2M2 - 3D master, shade guide) was done for porcelain build-up (Figure -6, d & e).

Fig-7: Post-operative view of cemented all PFM crowns (A-C), right and left canine guidance (D-E), Post-operative panoramic view G

Fig-8: Pre and post-operative view of the patients, teeth and PFM crowns (A-B),lateral views before and after full mouth rehabilitation (C-D), anterior views at rest closing and smiling showing lip support (F-G)

At the subsequent appointment porcelain try-in and occlusion adjustment during centric and eccentric movements (Figure -7, a -c). The occlusion was adjusted at canine guidance in both sides (Figure - 7, d-e), before glazing and cementation with modified glass ionomer cements Relaxy (3M ESPE, Germany) (Figure - 7).A new alginate impressions were taken for relaxation soft splint 2mm thickness, which was constructed and given to the patient to be used for a month.

The patient was recalled after 3,6,9 and 12 months for maintenance phase. He was free of any pain or discomfort. During follow up visits a marked improvement in the facial appearance, aesthetic, speech, social life is observed. Also positive psycho-social changes were conveyed by patient's family and colleagues as shown in pre and post views (Figure -8 a-f).

DISCUSSION AND CLINICAL SIGNIFICANT

Amongst the indications of the full mouth rehabilitation of the entire dentition are restoring the worn teeth, creating esthetic of the lower 1/3 of the face, to prevent the TMJ disorders. Assessment of the vertical dimension is important factor for the comprehensive treatment plan for each individual case. Articulated study casts and diagnostic wax-up can provide important information to dentist and patient. This is helpful for the evaluation of treatment options. Tolerance of changes to vertical dimension of occlusion is usually confirmed with the clinical evaluation of the patient having a diagnostic splint [9]. This is what we started our treatment for the patient.

In our case we restored our root canal treated maxillary anterior teeth with custom made post and core then PFM crowns.

This is in agreement with Preethi and Kala, those restored anterior teeth with same type of restorations and concluded, none of the restorations of cast posts and cores exhibited any signs of fracture of the root on clinical and radiographic examinations at the various time intervals during one year follow-up, thus, the success rate was 100% [10].

In prosthetic full mouth oral rehabilitation in adult patients, the treatment plan should consist of interdisciplinary evaluating the entire face and lip movement in relation to the teeth. This leads to achieving excellent results in facial, dentolabial, phonetic, dental, and gingival parameters. This what we followed in treatment of case since we end by rebuild up of the lower third of the face [11, 12].

A systemicapproach for FMR was described by Mattoo *et al*, [13] which consists of, in the diagnostic phase we determined the tolerance towards increase in occlusal vertical dimensions by using splint and psychological evaluation of patient's mental attitude and need for education and motivation. In the preparatory Phase, oral hygiene maintenance program with fluoride application and endodontic treatments for maxillary central and lateral teeth and other treatments of existing teeth. While in the restorative Phase, a full mouth PFM crowns were constructed and cemented. In the maintenance face, evaluation of all crowns during different periods with periodontal and endodontic treatment. In addition to that, the psychological improvement in the patient was recorded. This what exactly we followed in the treatment of our case [13].

Before commencing any appliance therapy for restoring the loosed vertical dimension, the dentist should be confident that the patient will benefit from the therapeutic approach. However, much controversy exists over the exact mechanism by which occlusal appliances reduce symptoms. The all conclusions are that they decrease parafunctional activity of the muscles [14].

PFM crowns are still the choice for anterior as well as posterior teeth for their strength and esthetic reasons in the presence of limited economic status for the patients [15].

The clinical significant of the this case is the optimal and esthetically pleasant occlusion was achievable by restoring the lost vertical dimension with PFM crowns. Also the developed occlusion was coincided with the existing canine guidance. Although positive psycho-social changes were conveyed by patient's family and colleagues as shown in pre and post views

CONCLUSIONS

Understanding the patient main complain, with proper diagnosis followed by an accurate and organized treatment planning with a multidisciplinary team resulted in excellent esthetic and improvements in patient psycho-social life.In this clinical case report for severely worn down dentition, restoring the lost vertical dimension of occlusion using hard bite raising appliance then successful full mouth rehabilitation with PFM individuals crowns were cemented. So we restored the tooth to its natural form, function and esthetics with maintaining the physiologic integrity in harmonious relationship with hard or soft tissues of the oral cavity. This resulted in an excellent restoration and maintenance of the oral health of the entire dentition.

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