

Full Mouth Rehabilitation of A Patient With Worn-Down Teeth : A Case Report

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Abstract:

These days dental practitioners face a change in the patterns of dental disease in adults with many patients interested in keeping their teeth for longer and have got awareness towards oral health. The severe wear of anterior teeth results in the loss of anterior guidance. Anterior guidance protects the posterior teeth from wear during excursive movement. The collapse of posterior teeth results in the loss of normal occlusal plane and the reduction of the vertical dimension.

We report description of a case relating to 45 –years old female patient, who had wear of dentition leading to the reduction in vertical dimension. Once the compatibility of the new vertical dimension had been confirmed, the permanent reconstruction was initiated. The satisfactory clinical result was achieved by restoring the vertical dimension with an improvement in aesthetics and function. In light of recent research findings the functionally oriented treatment planning has become acceptable. These treatment efforts and resources are directed principally to retain the 'strategic' part of the dentition for a longer period of time.

Keywords:Worn down dentition, Vertical Dimension of Occlusion, Centric Relation, Mutually Protected Occlusion,

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Introduction

The gradual wear of the occlusal surfaces of the teeth is a normal process during the lifetime of an individual. However, excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function and aesthetic disfigurement.¹Turner and Missirlan¹ classified patients with occlusal wear as follows:

- a. Excessive occlusal wear with loss of vertical dimension but with space available to restore the vertical height.
- b. Excessive occlusal wear without loss of vertical dimension but space available.
- c. Excessive wear without loss of occlusal vertical dimension but with limited space.

The severe occlusal wear can be attributed to;

- i. Congenital abnormalities (where tooth structure is weak), attrition, abrasion, erosion and parafunctional habit.
- ii. Aggravating factors that exemplify the problem include; loss of posterior support, the tooth wear from opposing restorative material and stress.¹

Full mouth rehabilitation is re-establishing a state of functional efficiency in which the teeth with their periodontal structures, the muscles of mastication, and the temporomandibular joint mechanisms all function together in synchronous harmony.²The indications of which are fractured teeth, worn down teeth, missing or decayed teeth and faulty dentition leading to temporomandibular disorders which can be treated by proper reconstruction, restoration, and

maintenance of the health of the entire oral mechanism.

The aim of this writing is to give descriptions of the presentation and prosthodontics management of a patient presenting severe tooth-wear.

Case Report

A 45 year old female patient reported with a complaint of unacceptable appearance of her teeth and inability to chew food efficiently. Clinical examination revealed that she had generalized attrition of her teeth leading to reduced vertical dimension (Figure 1). The patient had missing maxillary left first molar replaced with a fixed dental prosthesis and missing right lower first molar teeth (Figure 2). Also the maxillary and mandibular anterior teeth had sharp enamel edges and wear due to the loss of posterior support (Figures 1-4). The patient had no history of temporomandibular disorders and soreness of the masticatory muscles. On guiding the patient to centric relation (CR) using bimanual technique a discrepancy between the retruded contact position (RCP) and maximum intercuspal position (MIP) was found.^{1,3,4}



Figure 1: Pre-operative Intra-oral view.



Figure 2: Pre-operative Intra-oral view of maxillary arch.



Figure 3: Preoperative intra-oral view of mandibular arch.

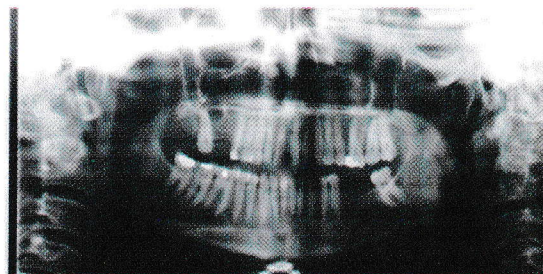


Figure 4: Pre-operative OPG.

Normally, the physiologic tooth wear could be compensated by the tooth eruption, but if the rates of tooth wear exceeded the rate of eruption then tooth wear becomes obvious resulting in jaw over closure. The patient's food was tough, fibrous and had liking for wheat, sweets and acidic fruits as all these factors led to accelerated tooth wear.

On evaluating the phonetics of the patient the distance between the incisal edge of the mandibular incisors and lingual surface of the maxillary incisors is increased and led to the pronunciation of /s/ sound to /f/. Normally, this space is about 1 mm, and makes normal /s/ sound.

The extra-oral examination of the patient done by measuring the interocclusal rest space between nose tip and chin tip was 5 mm. This was greater than the normal value of 2 - 4 mm.

The possible causes of patient's worn dentition might be due to posterior interferences, parafunction, eating habit or dental ignorance. Articulated study casts and diagnostic wax-up was carried out to view the final outcome, for planning the provisional restorations to accommodate the temporomandibular tissues to the new prosthesis. The clinical evaluation revealed that there was reduced Vertical Dimension of Occlusion (VDO), henceforth the full mouth reconstruction with increased VDO was planned.

Diagnostic impressions were made with irreversible hydrocolloid, Alginate (Tulip Alginate, Cavex Holland BV, The Netherlands) and casts were poured using type III dental stone (Kalabhai, Mumbai, India). In order to provide splints, the centric relation was recorded at increased VDO with the aid of Lucia Jig and polyvinylsiloxane occlusal registration material (Virtual CAD Bite Registration; Ivoclar-Vivadent, Liechtenstein). The new VDO was set by 5 mm increase in the incisal guidance pin of the articulator. The interocclusal record was made using a face-bow (Hanau Spring Bow, Whip Mix Corp., Louisville, USA) and the record was obtained with polyvinylsiloxane occlusal registration material. The diagnostic casts were mounted on a semi-adjustable articulator (Hanau Wide View II Articulator; Whip Mix Corp., Louisville, USA) and the diagnostic wax up was done in this new increased VDO.

The occlusal splint was fabricated in such a way to increase the VDO by 5 mm and offering bilateral contacts of all posterior teeth in centric relation and guides of the anterior teeth in excursive movement. The anterior guidance disoccluded the posterior teeth in all eccentric movements except in centric relation. The adaptation of patient to the increased VDO was evaluated on a one month trial period during which no muscle tenderness and TMJ discomfort was found. This method of increasing VDO with the splint was used to determine desirable VDO of the fixed interim prostheses.

Auto-polymerizing acrylic resin (Tooth Moulding Powder; DPI, India) provisional crowns were fabricated from the matrix obtained from the

diagnostic wax-up. The provisional restorations (Figure 5) were cemented with a temporary cement (RelyX Temp; 3M ESPE, USA), and the patient's adaptation was monitored. For the next three months, interim restorations were adjusted, and used as a guide for the definitive oral rehabilitation. During this period, the patient's condition and functions, such as muscle tenderness and discomfort of TMJ, muscles of mastication, the range of the mandibular movements, swallowing and speech, were evaluated. The patient's tolerance to the new mandibular position with the restored VDO was confirmed by improvement in mastication, speech and facial aesthetics.

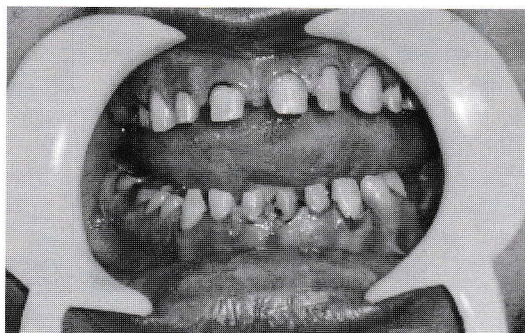


Figure 5: Tooth preparation for provisional crowns.

After the evaluation period, minor alterations in the teeth were done and definitive impressions were made with polyvinylsiloxane impression material (Aquadil Putty; Aquasil LV; Dentsply, PA, U.S.A). Bite registration was done using provisional crown and occlusal registration material (Virtual CAD Bite Registration; Ivoclar Vivadent, Liechtenstein) to confirm the final occlusal pattern and vertical dimension. The wax patterns were prepared, invested and casting was done. The metal copings were retrieved from the investment, trimmed; sand-blasted and fit of the metal copings were tried in the mouth (Figure 6). A bite registration was done (Figure 7) with provisional crown and metal copings half and half using wax bite registration material (Aluwax, Aluwax Dental Products, MI, USA).

The patient's anterior guidance was used in the production of definite restoration and hence the

amount of occlusal adjustment on the lingual surface of maxillary anterior teeth was minimal. Mutually Protected Occlusion was preferred in the designing of the prostheses. The porcelain fused to metal restorations were made using customized anterior guide table.

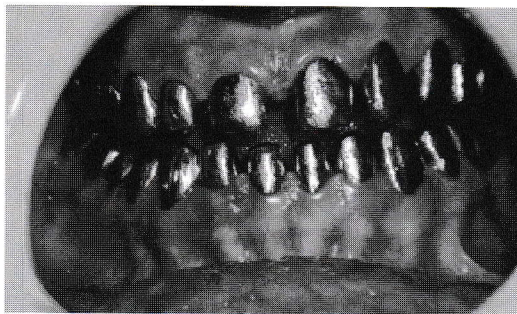


Figure 6: Metal trial.

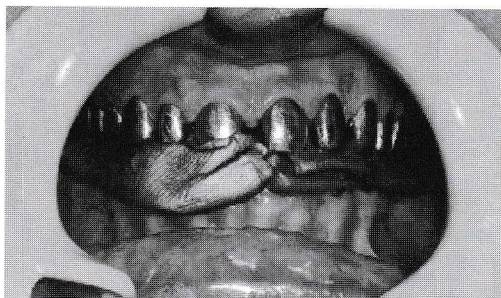


Figure 7: Metal trial with bite registration.

The final restorations (Figure 8) were initially cemented with a non- eugenol temporary cement (RelyX Temp NE; 3M ESPE, USA). The patient's acceptance and adaptation were monitored for 4 weeks and later cemented with glass ionomer cement (GC America, USA). The post-treatment smiling pose of the patient is shown in Figure 9.

Discussion

Tooth surface loss may be purely physiological or pathological [5, 6]. The physiological mode of tooth loss occurs as a consequence of ageing. But it could cater a problem affecting the function and aesthetics with or without causing pain.

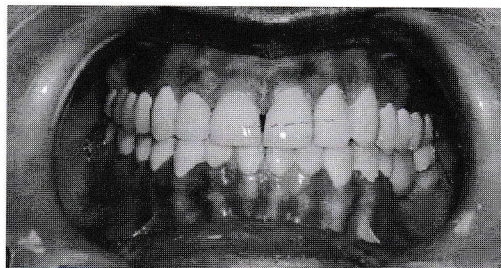


Figure 8: Final restorations in mouth.



Figure 9: Post-treatment smiling view.

In other instances non-carious factors may lead to tooth surface loss and is termed as pathological. The pathological tooth surface wear could occur because of abrasion, attrition, erosion and abfraction.^{7,8}

Normally, the anterior teeth protect the posterior teeth, and the phenomenon is called as Anterior Guidance. The excessive wear of anterior teeth facilitates the loss of anterior guidance, and the collapse of posterior teeth resulting in the loss of normal occlusal plane and the reduction of the vertical dimension. Therefore, it is important to identify the factors that contribute to excessive wear and to evaluate the alteration of the VDO caused by the worn dentition. The alveolar bone undergoes an adaptive process and compensates for the worn teeth and to maintain the VDO. The evaluation of the alveolar bone before increasing the vertical dimension is mandatory. The dense sclerotic bone with numerous exostoses does not have the same capacity to remodel as alveolar bone with normal trabeculae.

The changes in VDO are normally estimated from the visual examination to oral examination along with or without symptoms. Tolerance to changes in VDO is usually confirmed clinically, on evaluation of the patient with a diagnostic splint or provisional prosthesis. In practice, we come across patients with unique problems and need treatment modifications. Proper history taking, complete examination followed by proper diagnosis and treatment plan are important for a successful rehabilitation.⁹

In general, the loss of tooth structure does not always indicate the loss of VDO. Therefore, it is mandatory to evaluate whether the proposed alteration in OVD is restoratively acceptable. The need to increase vertical dimension at occlusion becomes necessary for patients in whom interocclusal space problems or aesthetic considerations are especially critical. In such a scenario, the need to increase the VDO becomes inevitable.

Conclusion:

Diagnosis and proper treatment plan is mandatory before starting of any clinical procedure. This could

be achieved only by a clinical examination, radiographic assessment and diagnostic wax up. In accordance with these principles the establishment of the VDO should be conservative and be carried out with careful approach. In this case report, the visualization of the desired results was done well in advance which guaranteed the outstanding prosthodontic outcomes.

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Book Review:

Editor Note: Books, videos, CD-ROMs and any other item covering the science, art, technology and humanity related to the practice of prosthodontics must be submitted in duplicate for publication (of their review by experts) in the Journal of the Pakistan Prosthodontics Association (JPPA). They, along-with a formal request for publication of review should be sent to:

Dr. Fazal Ghani, Editor-in-Chief, Journal of the Pakistan Prosthodontics Association, Department of Prosthodontics, Khyber College of Dentistry, University Campus, Peshawar 2510 (Pakistan). Email: fazalg55@hotmail.com

Review of Three Prosthodontics Books:

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Abstract:

We present review of three prosthodontics titles including "Removable Partial Dentures", "Fixed Partial Dentures" and "Complete Dentures" all authored by Dr. Lovely M, Associate Professor & Head of Department of Prosthodontics at the Sri Mookambika Institute of Dental Sciences, Tamil Nadu, India. In the review of each title, aspects making the titles useful have been highlighted as well as critical constructive appraisal has been made for consideration in future editions of these titles.

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Review of Removable partial Dentures.

Author: Lovely M. Pages 340. ISBN 81-8061-577-4. Published by Jitendar P. Vij Of Jaypee Brothers Medical Publishers (P) Ltd, EMCA House, 23/23B Ansari Road, Daryaganj, New Delhi 110 002 (India). www.jaypeesbrothers.com

Reviewed by: Amna Mansur, Fazal Ghani

This book, authored by Lovely M, Associate Professor & Head of Department of Prosthodontics at the Sri Mookambika Institute of Dental Sciences, Tamil Nadu, India, is the first of the three book series available in the market since 2005. The objective of this book has been to make undergraduate students prepare for exams adequately and to better reproduce it. This objective is well reflected in the foreword written by Dr. George Paulose.

The book comprises of Essays, Short notes and an Updated Index at the end. It comprehensively covers the subject matter of removable partial dentures. The material is logically divided into diagnosis and planning, clinical procedures and laboratory procedures. The question and answer format makes the book easy to understand the basic principles of removable partial denture. The language of the book is simple yet does not compromise on effectively conveying the content. Topics like principles of RPD designs, components of RPD, mouth preparations, surveyors, jaw relations, laboratory procedures, failures of RPD, obturators and post-insertion protocols have been explicitly discussed and explained.

A major concern regarding the book is that it lacks in adequate diagrams and references. Adding these would have created an immediate visual impact and better capture of the concepts. Use of references in the end of every topic would have helped establish the authenticity of the information shared. Use of tables for discussing comparisons between different