

# Mutilated Occlusion Fixed-Removable Approach- A Case Report

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## ABSTRACT

Partial or complete edentulism has multiple implications in relation to function, esthetics and future rehabilitative treatment. This case report illustrates the management of a patient with extreme consequences of partial edentulism in the maxillary arch and total edentulism in the mandibular arch. The main clinical findings were unopposed remaining teeth, over eruption of the remaining teeth, loss of vertical dimension of occlusion, and significant disfigurement of the occlusal plane. Following the diagnostic procedure, a well-coordinated prosthodontic treatment involving liaison with other dental disciplines as indicated. The management involved an innovative combination of fixed and removable prostheses in conjunction with intentional root canal therapy of the remaining natural teeth. Series of provisional prostheses were applied to facilitate the transition to the final treatment.

**Key-words:** Edentulism, Fixed and Removable prosthesis, Provisional Restoration, Vertical dimension

## INTRODUCTION

The gradual wear of the occlusal surfaces of teeth is a normal process during the lifetime of a patient. However, excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function, and esthetic disfigurement <sup>[1]</sup>. One must gain insight into how the teeth arrived at this state of destruction. Tooth wear can result from abrasion, attrition and erosion <sup>[2-6]</sup>.

In many cases, the vertical dimension of occlusion (VDO) is maintained by tooth eruption and alveolar bone growth. As teeth are worn, the alveolar bone undergoes an adaptive process and compensates for the loss of tooth structure to maintain the VDO. Therefore, VDO should be conservative and should not be changed without careful approach <sup>[7,8]</sup>. Especially, increasing the VDO in bruxers puts a severe overload on the teeth and often results in the destruction of the restorations or teeth themselves <sup>[7]</sup>.

Management of worn dentition using fixed or removable prostheses is complex and among the most difficult cases to restore. Assessment of the vertical dimension is important for the management, and careful comprehensive treatment plan is required for each individual case. Articulated study casts and diagnostic wax-up can provide important information that 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 or provisional prosthesis <sup>[9]</sup>.

This clinical report describes the treatment of a patient who was clinically monitored to evaluate the adaptation to the combination of fixed and removable treatment, he was evaluated during a 1 month trial period with the provisional restorations in the maxillary arch opposed to a conventional complete denture and then followed with final restorations in Porcelain fused to metal <sup>[10,11]</sup>.

## CASE REPORT

A 77-year-old man was referred to the Department of Prosthodontics, D. Y. Patil School of Dentistry Nerul, Navi Mumbai, India for the treatment of his severely worn dentition. His chief complaint was that he could not eat anything because he had very few teeth left in his

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mouth. The patient had no relevant medical history. Intraoral examination revealed presence of few teeth in the maxillary arch and completely edentulous mandibular arch. The teeth presented in the maxillary arch were left and right incisors and the right first molar (Fig. 1). The anterior teeth had sharp enamel edges, dentinal craters, and attritional wear due to the loss of posterior support. All the mandibular teeth were missing (Fig. 2). The facial type of patient was square and his lip



**Fig. 1:** Maxillary intraoral view



**Fig. 2:** Mandibular intraoral view

To determine whether VDO had been altered, the following aspects were investigated [1,8,12]

1. **Loss of posterior support-** Mandibular posterior teeth were missing; posterior collapse resulted in excessive wear and fracture of anterior teeth.
2. **History of wear-** Physiologic wear can be compensated by tooth eruption in general, but the accelerated wear may exceed the rate of eruption. The patient liked vegetables and acidic fruits. His favorite food was tough and fibrous.
3. **Phonetic evaluation-** If the distance between the incisal edge of the mandibular incisors and lingual surface of the maxillary incisors is about 1 mm, it makes normal /s/ sound. The patient's increased space altered /s/ sound to /ʃ/.
4. **Interocclusal rest space-** The patient's interocclusal rest space that was measured between nose tip and chin tip was 5–6 mm that was greater than the normal value, 2–4 mm.
5. **Facial appearance-** Wrinkles and drooping commissures around mouth were observed. The possible causes of patient's worn dentition that might include parafunction, eating habit, and dental ignorance was explained to the

seemed to be under strong tension. The patient did not have temporomandibular disorder history and soreness of the mastication muscles, but the discrepancy between centric occlusion (CO) and maximum intercuspal position (MIP) was found, when he was guided to CR with bimanual technique. The trans-cranial view was taken to determine whether a temporomandibular problem exists. The right mandibular condyle was flatter than the left one, but any specific disorder was not found.

patient and the options of treatment plan comprising of

restoring mandibular edentulous arch with implants or removable conventional complete denture, maxillary arch rehabilitation with a combination of the fixed and removable prosthesis was suggested to the patient as the first line of treatment. The fixed component in the maxillary arch would be fabricated with metal ceramic restoration with or without crown lengthening procedure.

Hence the final treatment plan for the patient was to fabricate a combination of fixed and removable prosthesis in the maxillary arch and the fabrication of a conventional complete denture in the mandibular arch. Also the patient was advised intentional root canals in the maxillary central and lateral incisors on both sides and maxillary first molar on the right side. As there was clinical evaluation of reduced VDO, full mouth rehabilitation with increasing VDO was planned.

The patient's casts were mounted on a semi-adjustable articulator (Addler CE) using a face-bow record and an interocclusal record that was made with the aid of a Lucia jig and polyvinylsiloxane occlusal registration material (Alu wax). The new VDO was set by 3 mm increase in the incisal guidance pin of the articulator (Fig.

3) because the patient's interocclusal rest space was 1–3 mm larger in the premolar area than normal distance, the increase were determined 3 mm in the anterior teeth and 1–2 mm in the posterior teeth. The splint was incorporated in the complete denture for the mandibular arch designed so to offer bilateral contacts of all posterior teeth in centric relation and guides of the anterior teeth in excursive movement (Fig. 4).



**Fig. 3:** Increased VDO

The adaptation of patient to the increased VDO was evaluated during 1-month trial period. No muscle tenderness and temporomandibular discomfort were found. The method of increasing VDO with the splint in a complete denture was used to determine desirable VDO of the fixed interim prostheses for the maxillary arch. After taking CR record using Lucia jig and wax-rim, diagnostic wax-up was performed. Autopolymerizing acrylic resin (PROTEMP) provisional crowns were fabricated using a putty matrix (Aquasil, Dentsply) that was produced from the diagnostic wax-up, and mandibular provisional CD and maxillary provisional RPD was made to fit provisional crowns. The provisional fixed restorations were cemented with temporary cement (Templute), and the patient's adaptation was monitored. For 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, discomfort of TMJ, mastication, range of the mandibular movements, swallowing, and speech, were evaluated. Improvement in mastication, speech, and facial esthetics confirmed the patient's tolerance to the new mandibular position with the restored VDO. The anterior guidance and posterior disclusion on excursive movement were established.

The anterior guidance disoccluded the posterior teeth in all jaw positions except centric relation. Occlusal overlay splint in the form of lower cd having monoplane occlusion opposing a removable partial denture in the maxillary posterior region was delivered and monitored for 1 month to evaluate patient's adaptation to the new VDO.



**Fig. 4:** Splint at increased VDO

Adjusted occlusion was transferred to customized anterior guide table, which was made with acrylic resin (Pattern resin; GC Corp, Tokyo, Japan). Final preparation was performed, and definitive impressions were made with additional siloxane impression material (Aquasil, Dentsply) (Fig. 5). Bite registration was taken using provisional crown and occlusal registration material (Alu wax) by half and half. Porcelain fused to metal restorations were made using customized anterior guide table and cemented with resin modified glass ionomer cement (FujiCEM; GC America, Alsip, USA). Because the patient's anterior guidance table was used in the production of definitive restoration, the amount of occlusal adjustment on the lingual surface of maxillary anterior teeth was minimal. Individual tray with additional silicone impression material (Aquasil, Dentsply) was used for the impression of maxillary posterior RPD and mandibular complete denture. Coping trial for the maxillary anterior fixed prosthesis was taken (Fig. 6). The prostheses were designed using mutually protected occlusion (Fig. 7 and Fig. 8). The anterior teeth protected the posterior teeth from excursive force and wear, and posterior teeth supported the bite force. Oral hygiene instruction and regular check-up were administered.



Fig. 5: Final impression



Fig. 6: Metal coping trial



Fig. 7: Maxillary final prosthesis



Fig. 8: Mandibular final prosthesis

## DISCUSSION

Mouth rehabilitation has been definitely come of age. There are newer techniques now that are being developed and widely used in full mouth rehabilitation. Various digitalized technologies make the process faster, such as digitalized impressions and smile designing software. The importance of restoring a mutilated dentition is being more understood by the patients. Most philosophies and associated techniques for full mouth rehabilitation share similar characteristics: (1) They are based on the specific philosophy of occlusion according to the author, and (2) They are individualistic and work around the condition of the patient making them flexible for each.

## CONCLUSIONS

The management of the present case reflects the importance of judicious use of prosthodontic principles and strategic planning in addition to multidisciplinary team work. Despite the significant disfigurement of the occlusal plane, optimal and esthetically pleasant

occlusion was achievable by restoring the lost VDO in conjunction with intentional root canal therapy. The multiple provisional prostheses enhanced the predictability and patient adaptation to the definitive prostheses.

Newer digital technologies such as intraoral scanners and digital printing of the prosthesis will enable the dentist to deliver the prosthesis to the patient faster and with much better results.

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**Research concept-** Dr. Nami Sheth

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