



## CASE REPORT

## Revitalizing Heavily Worn Teeth: A Detailed Case Report of Full Mouth Rehabilitation

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## ABSTRACT

The management of tooth wear, especially attrition, is becoming a subject of increasing interest in the prosthodontic literature, both from a preventive and a restorative point of view. Dealing with patients who have worn dentition is intricate and challenging. Precise clinical and radiographic assessments, along with a diagnostic wax-up and OVD determination, are pivotal in managing this condition. A crucial element involves establishing the occlusal vertical dimension (OVD) using a systematic method, resulting in a reliable treatment outlook. In this case report attrited teeth were restored with metal-ceramic restorations and a removable partial denture was fabricated for maxillary and mandibular edentulous areas. An occlusal splint was used to protect the restorations. The treatment protocol yielded a pleasing aesthetic and functional outcome. This result can encourage clinicians to seek accurate diagnosis and treatment planning to treat such patients.

**Keywords:** Full mouth rehabilitation; Occlusal vertical dimension; Prosthetic dentistry; Prosthodontics; Tooth wear; Worn dentition

### 1 INTRODUCTION

Full mouth rehabilitation presents itself as a complex treatment approach aimed at enhancing the patient's appearance while rectifying issues related to the alignment of the bite. Core principles integral to successful full mouth rehabilitation encompass the centric relation, vertical dimension, speech functionality, and muscular balance. The overarching objective of dentistry parallels that of medicine, aspiring to extend the functional longevity of a person's dentition, similar to how medicine aims to prolong an individual's overall functionality.<sup>(1)</sup> This necessitates a meticulous examination of each facet in relation to the natural dentition and its interaction within the stomatognathic system. A full mouth rehabilitation aims to achieve functional comfort in addition to producing a visually beautiful smile.<sup>(2)</sup>

Notably, dental attrition, a common occurrence observed during routine clinical evaluations, often transpires unnoticed by patients due to its stress-induced and unconscious nature. Patients usually become aware of the situation after

they have experienced a significant loss of tooth structure.<sup>(3)</sup> Addressing this phenomenon requires the simultaneous consideration of several factors, encompassing the occlusal vertical dimension, centric relation, phonetics, aesthetics, and occlusal pattern. This complexity is further compounded by missing teeth, tooth sensitivity, pre-existing dental restorations, instances of pulpal exposure, over-erupted teeth, and temporomandibular joint (TMJ) discomfort.<sup>(4)</sup>

This specific case report herein outlines a clinical instance of dental wear managed through a prosthetic intervention. This approach embodies a comprehensive perspective on the patient's overall dental health and functional restoration, encapsulating the intricate balance between aesthetics and functionality.

### 2 CASE REPORT

- A male patient, aged 61, presented himself to the Department of Prosthodontics, Coorg Institute of Dental Sciences, Virajpete, Karnataka with a primary complaint of difficulty in chewing from both sides of

the jaw, and generalized teeth sensitivity.

- The patient was in good general health, and the dental and medical history revealed no contraindications to receive dental treatment.
- Clinical and radiographic examinations revealed generalized severe tooth surface loss with missing 13,14,16,24,36, and 37.
- No signs and symptoms of TMD were present and no history of parafunctional habits noted.

### 2.1 Diagnostic procedures

- The differential diagnosis included partially edentulous maxillary and mandibular arch with mechanical teeth attrition. The patient had acceptable oral hygiene. A clinical assessment was made of the vertical dimension. Physiologic rest position was determined by facial measurements and confirmed by phonetics.<sup>(3,4)</sup> The interocclusal distance was judged to be approximately 5 mm, and the vertical dimension of occlusion could be restored by increasing it by approximately 2 mm.
- Irreversible hydrocolloid was used to create primary impressions and casts poured with type III dental stone.
- Bite registration was recorded using an anterior deprogrammer made of acrylic and baseplate wax in the posterior region supported by the acrylic baseplate and bimanual manipulation technique was used to guide the mandible into centric relation (CR). A tiny quantity of zinc oxide eugenol paste was applied to the wax over each indentation location, and the mandible was kept in CR until the paste solidified, to verify the record.
- Using an arbitrary facebow and centric record (Hanau™ Springbow; Whip Mix), the casts were mounted on a semi-adjustable articulator (Hanau™ Wide-Vue; Whip Mix). A 2 mm opening was achieved by adjusting the incisal pin. Occlusal splint, primary wax-up, and interim prostheses were fabricated at this new VDO.
- Patient was instructed to use the occlusal splint for a period of 6 weeks. The patient was accustomed with this new VDO without any signs and/or symptoms.
- Protrusive records were used to set the articulator's condylar guidance. The orientation of occlusal plane, curve of Spee and Wilson were determined using a Broadrick occlusal plane analyser.
- The patient was categorized as class IV according to the classification system for partial edentulism developed by the American College of Prosthodontists.

### 2.2 Pre-Prosthetic procedures

- According to the patient's dental history, regular dental checkups and procedures included extraction of 15 and

41, oral prophylaxis, Root canal treatment in relation to 11,12,21,22,23,25,31,32,33,34,42 and 43, post and core in relation to 11,12,21,22,23,31,32,42 and 43.

### 2.3 Prosthetic procedures

- Following pre-prosthetic treatment procedures, re-evaluation was done using radiographic and clinical observations.
- Tooth preparation included equi-gingival shoulder finish lines to receive porcelain fused to metal restorations.
- Preparation of mandibular anteriors followed by temporization and cementation.
- Preparation of maxillary anteriors followed by temporization and cementation.
- Preparation of mandibular posteriors followed by temporization.
- Preparation of maxillary posteriors by functionally generated pathway technique followed by temporization.
- Temporary crowns were fabricated from the putty index made on the primary wax-up.
- After 4 weeks, patient comfort and function were re-evaluated and final cementation of fabricated PFM crowns and FPDs in maxillary and mandibular arches was done.
- For fabrication of RPD, an impression of the maxilla and mandible was made in a custom acrylic tray after border molding.
- Then the acrylic teeth (Ruthinium AcryRock Dental Teeth Set) were arranged in occlusion, and Group-function articulation was adjusted. The RPD was completed; occlusal contacts were adjusted, and the RPD was delivered.
- A vacuum formed soft splint of 1mm thick was provided to the patient for use at night to prevent parafunctional occlusal wear.
- Follow up visits at regular time intervals was performed.



Fig. 1: Pre-treatment radiographs and intraoral pictures

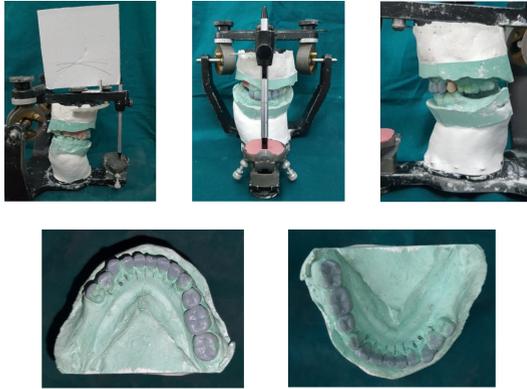


Fig. 2: Diagnostic mounting, Broadrick's occlusal plane analyser, waxup



Fig. 3: Post space preparation and cast post cementation



Fig. 4: Temporization



Fig. 5: Fabricated final restorations



Fig. 6: Final cementation and RPD insertion



Fig. 7: Pre- Treatment intraoral picture



Fig. 8: Post- Treatment intraoral picture

### 3 DISCUSSION

Rebuilding extensively worn dentition poses a major challenge for dentists, demanding skill and expertise. Complete oral rehabilitation relies on three key principles: a consistent rest position for the lower jaw, recognition of variable occlusion dimensions, and dynamic centric occlusion.<sup>(5)</sup> The goal is to shift detrimental tooth forces causing pathologies into forces which are favourable for normal function and oral health.<sup>(1)</sup> Clinical studies consistently show stable vertical occlusion dimensions despite rapid wear; wear of occlusal surfaces is compensated by elongation of the alveolar process.<sup>(6)</sup>

Full mouth rehabilitation hinges on healthy temporomandibular joints, interference-free posterior teeth, and balanced anterior guidance. Disharmony among these elements negatively affects the stomatognathic system. There are several approaches to occlusal rehabilitation, with the principles of Hobo and Pankey Mann Schuyler prevalent. The latter offers a practical, systematic, patient-friendly approach.<sup>(7)</sup>

Occlusal plane analysis was introduced by Pankey and Mann, simplified by the use of a customized Broadrick occlusal plane analyzer, ensuring tooth morphology align-

ment with the curve of Spee, crucial for posterior restorations. Prioritizing anterior guidance establishes functional and aesthetically pleasing anterior restorations crucial for full mouth rehabilitation after centric relation.<sup>(8)</sup>

Anterior guidance allows for easier posterior disclusion during jaw movements. Posterior teeth replacement necessitates addressing disclusion of posterior teeth, choosing an occlusal scheme and establishing the occlusal plane. Well-defined occlusal planes allow teeth disclusion during lateral mandibular movements. Restoring the vertical occlusion dimension requires precise execution at centric relation for patient comfort and neuromuscular harmony.<sup>(9)</sup>

Occlusal rehabilitation is a transformative, philosophy-informed procedure, demanding dentist expertise. The Pankey-Mann-Schuyler technique, noted for flexibility, offers advantages such as freedom from centric requirements, individual tooth treatment, and harmonious occlusal contours. Unlike Hobo's approach, it doesn't require specific instruments.<sup>(10)</sup>

#### 4 CONCLUSION

Effective full mouth rehabilitation relies on adopting a multidisciplinary treatment strategy and maintaining ongoing interaction with patients, ensuring their comprehension of the condition and active involvement in its management. In cases of teeth that are extremely worn, it is vital to create anterior guidance in alignment with natural jaw movements, while ensuring disclusion of all posterior teeth during any unconventional jaw motion. Precise diagnosis and comprehensive treatment planning are imperative for achieving consistent positive outcomes. Full mouth rehabilitation aims to restore healthy, normal masticatory function. Patients value streamlined procedures that accelerate their journey towards improved oral health, functional efficiency, comfort,

and aesthetics.

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