

# A Full Mouth Rehabilitation of a Patient with Uneven Occlusal Plane and Severe Attrition: A Clinical Report

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## Abstract

In clinical practice we usually come across cases with severe tooth wear which requires a full mouth rehabilitation. And management of patients with worn-out dentition was always a tough and complex procedure. For a predictable and favourable treatment outcome a systemic multidisciplinary approach was required. This case report describes the interdisciplinary approach in the treatment of a patient with severe attrition and loss of vertical dimension. After performing endodontic treatment for required teeth, a bite raising transitional prosthesis was given for increasing the VD to acquire essential interocclusal space for post and core buildups and full coverage restorations. After that the porcelain fused to metal permanent restoration was fabricated and scrutinized for stable contact in centric and eccentric relation.

**Keywords:** Attrited teeth, full-mouth rehabilitation, Occlusal splint, vertical dimension of occlusion.

## Introduction

When we get a patient with mutilated dentition we as dentist are very happy thinking about it financial aspect only. But to manage these patients of mutilated dentition by restorative dentistry is a tough job. And the dentist need to be trained in different aspect and concept of full mouth rehabilitation. So these patients need a full mouth rehabilitation with a systemic multidisciplinary approach<sup>1</sup>. Severe attrition of the teeth leads to loss of anterior guidance, and overall vertical dimension. To restore the same aesthetically is a challenging job for a novice dentist. So for prosthetic rehabilitation of these patients a multidisciplinary treatment planning is required to restore occlusal vertical dimension (VD) and interocclusal rest space.<sup>2</sup> As an adaptive process in the

alveolar bone continues to compensate for the loss of tooth structure due to attrition so an increase in vertical dimension should be done systematically after careful assessment by an occlusal splint.<sup>3,4</sup>

**Tuner<sup>5</sup> et al gave a classification of severe wear patients into three categories:**

- Category 1: Excessive wear with loss of occlusal vertical dimension
- Category 2: Excessive wear without loss of occlusal vertical dimension but with space available.
- Category 3: Excessive wear without loss of occlusal vertical dimension but with limited space

This case report describes in detailed full mouth rehabilitation of a patient with a multidisciplinary approach in which an endodontist, a prosthodontist, a periodontist, worked together for occlusal rehabilitation of mutilated dentition with loss of vertical dimension. The patient was having wear without loss of vertical dimension but with limited interocclusal space(category 3). As these category patients are most difficult to rehabilitate as the adaptive process has maintained the vertical dimension and to accommodate the restorative materials interdisciplinary approach is required.

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Increasing the vertical dimension within the permissible limit is very important and systemic procedure has to follow. The procedure is sequential use of occlusal splint and provisional restoration to slowly increase the tolerance of patients to increase in vertical dimension.

**Case Report:** A 58-year-old male patient reported to the department of prosthodontic Institute of Dental Sciences, SOA Deemed to be University with a chief complaint of difficulty in chewing and speech problems. The patient gave a history of paan chewing for the last 25 years. The medical history of the patients was non-contributory to the contraindication of dental treatment. On intraoral & radiographical examination, it was found that there was severe tooth loss in the anterior and posterior region in the maxillary and mandibular arch. (Figure 1a). The esthetic concern of the patient was short teeth, lack of display of teeth during rest or smile. And darkened appearance of teeth was due to exposed dentine and bad habits. Due to bruxism an uneven occlusal plane was observed. And to the surprise of all there was no sign or symptom of temporomandibular joint pain or

dysfunction. On periodontal examination there were no signs of pocket and status was fair.

**Diagnostic procedure:** Diagnostic cast revealed reduced clinical crown due to severe attrition. On intraoral examination the discrepancy was found between centric occlusion and maximum intercuspal position. Interocclusal vertical dimension was assessed by measuring the distance between the chin and the nose, the vertical dimension at rest was found to be 58 mm and at occlusion was 52 mm (Figure 1b). Features of collapsed vertical dimension was observed on facial examination. Pseudo mandibular prognathism with a reverse smile line was observed. Radiographic examination revealed partial obliteration of pulp chamber in 31,32,33,34,41,42,43,44. No evidence of any periapical pathology was observed in any teeth. A treatment plan was developed for full-mouth rehabilitation. The objective was to restore the masticatory function and esthetical appearance of the patient. This was done by raising vertical dimension, in the first phase by stabilizing occlusal splint, followed by provisional restoration.



Figure 1a, 1b:

**Treatment Procedure:** The patient was explained about the entire treatment procedure. The photographs and diagnostic casts were prepared for records. In the following visit, the treatment was explained in detail, it started with root canal therapy of all teeth, then an occlusal splint of hard acrylic has to be worn by the patient for one month, followed by periodontal treatment of crown

lengthening of twelve teeth and at the end, prosthetic rehabilitation was to be done with porcelain fused to metal crowns. Before definitive treatment diagnostic cast was obtained and articulated in semi-adjustable articulator in centric relation. The mandible was guided to the centric position by bimanual palpation and the bite registration was done by bite registration material with

the help of acrylic anterior deprogramming device. the curve of Spee, Wilson & orientation occlusal plane was determined by the Broadrick occlusal plane analyzer. On the articulator the incisal pin was raised by 3 mm and diagnostic wax-up was done in the new vertical dimension of occlusion. (Figure 2).



Figure 2

The first phase of treatment root canal therapy was performed on all the remaining teeth and completed in a phased manner. The occlusal deprogrammer splint with a height of 3 mm was given to the patient for one month (Figure 3a). The splint was designed to offer bilateral contact in posterior in centric relation. And the anterior guidance disoccluded the posterior teeth in all eccentric movement.

The adaptation of the patient to a new vertical dimension was evaluated after one month. The patient reported no muscle tenderness or TMJ discomfort. The surgical phase of crown lengthening was performed using electrocautery to expose the tooth margin of all the anterior teeth. Post and core build-up of the fifteen teeth were done with Coltene Paracore core build-up material & tapered fiber post. Tooth preparation of all the maxillary and mandibular teeth are done in a phased manner (Figure 3b). The diagnostic wax-up was used as a stent for the fabrication of autopolymerizing resin provisional crowns. The provisional were fixed with temporary cement and patient adaptation was monitored. (Figure 3c).



Figure 3a, 3b, 3c

For one more month the interim restoration was adjusted and monitored for any discomfort and muscle tenderness. The mandibular movements, speech, and swallowing was evaluated and adjustment were done to achieve comfort for the patients. And this occlusion was used as a guide for definitive oral rehabilitation. The final preparation was done and the final impression was made with polyvinyl siloxane impression material. Bite registration was done in centric relation using the incisal guidance established with provisional

prosthesis. (Figure 4a). The definitive anterior guidance was replicated using the customized anterior guide table. Wax patterns were fabricated in the articulator at the predetermined vertical dimension. The metal crowns fabricated were evaluated radiographically and intraorally for fit, retention and stability (figure 4b). The metal-ceramic was fabricated with equal intensity centric contact in posterior teeth and group function in the anterior region to dis-occlude the posteriors in eccentric movements. Final occlusal adjustment was

done intraorally in the bisque trail. The metal-ceramic crowns were cemented with type I glass ionomer cement.(Figure 4c) and hard acrylic resin occlusal splint was fabricated and given to a patient for use during the

night time to prevent occlusal wear due to bruxism. Oral hygiene instruction was given to the patient. On periodic evaluation the patient reported the prosthesis to be comfortable in function (Figure 5).



Figure 4a, b, c



Figure 5.

### Discussion

Occlusal rehabilitation of a functionally weakened dentition requires an interdisciplinary treatment approach. We have to restore the esthetic & functional aspect of the patient and our end goal should be a healthy functional masticating apparatus<sup>6</sup>. Tooth wear has many

cause<sup>7</sup>, and it may be generalized in many patients. Tooth wear distribution was found to be uneven about anterior versus posterior. This was due to posterior occlusal prematurities and bruxism that leads to loss of vertical dimension<sup>8</sup> Clinical controlled trials of restorative and prosthodontic approaches are limited in quantity and quality<sup>9</sup>. So the clinical judgment of the prosthodontist plays an important role in the rehabilitation of the patient. Phonetics, swallowing and patient preference plays a major role. The loss of interocclusal space can be compensated by the following means<sup>10</sup>.

- Occlusal adjustment
- Elective endodontics treatment of attrited tooth and core build-up of the same.
- Increasing the vertical dimension by giving occlusal splint, provisional restoration.
- Crown- lengthening procedure; surgical exposure of adequate tooth structure to help in esthetics and retention.
- Orthodontic movement to create interocclusal space.

In the present case,multi-visit endodontics was preferred over a single visit as it has a proven record of

better healing and less post-operative complication.<sup>11</sup> In this present case lack of restorative space was a huge challenge, so the vertical dimension was increased for optimal functional and esthetic<sup>12</sup> The phase of occlusal splint allows time for neuromuscular adjustment to increased vertical dimension and helps to determine patient's compatibility to the new position<sup>13</sup> The minimum recommended period for adaptation to this increased vertical dimension has been determined to be 6–8 weeks.<sup>14</sup> Prefabricated posts were given for anterior teeth as these are simple to use and require less chair side time<sup>15</sup>. Thin tapered treaded posts were used in the present case, as these prevented excessive dentin removal. Threaded post provides the highest resistance to rotational forces and produce uniform stress distribution along the post length. Crown lengthening allowed apical migration of attached gingiva in natural tooth structure so proper core build-up could be done.. So in this case interdisciplinary approach played an important role in enhancing the esthetics, function and to re-establish the lost occlusal function of the patient.

### Conclusion

Full-mouth rehabilitation of a bruxer is complex and difficult, and it requires the proper application of interdisciplinary concepts to achieve functional and esthetic success.

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### References

1. Harpenau LA, Noble WH, Kao RT. Diagnosis and management of dental wear. *J Calif Dent Assoc.* 2011;39(4):225–231.
2. Jaikumar RA, Madhulika N, Kumar RP, Vijayalakshmi K. Prosthetic rehabilitation in a partially edentulous patient with lost vertical dimension: A case report. *J Indian Acad Dent Spec Res* 2014; 1:70-3.
3. Dawson PE, *Functional Occlusion: From TMJ to Smile Design*, Elsevier, New York, NY, USA, 1st edition, 2008
4. Jahangiri L, Jang S. Onlay partial denture technique for assessment of adequate occlusal vertical dimension: a clinical report. *J Prosthet Dent.* 2002;87(1):1–4.
5. Turner KA, Missirlian DM. Restoration of the extremely worn dentition. *J Prosthet Dent.* 1984;52(4):467-74.
6. Slavicek G, Makarevich A, Makarevich I, Bulatova K. Concepts, aims, and drawbacks in interdisciplinary dentistry: Results of an international questionnaire. *J Interdiscip Dent* 2013; 3:91-102.
7. Bartlett DW, Shah P: A critical review of non-carious cervical (wear) lesions and the role of abfraction, erosion and abrasion. *J Dent Res* 2006; 85:306–312.
8. Brown KE. Reconstruction considerations for severe dental attrition. *J Prosthet Dent* 1980; 44: 384-8.
9. Moslehifard E, Nikzad S, Geraminpanah F, Mahboub F. Full-mouth rehabilitation of a patient with severely worn dentition and uneven occlusal plane: a clinical report. *J Prosthodont.* 2012;21(1):56–64.
10. Schwendicke F, Göstemeyer G. Single-visit or multiple-visit root canal treatment: Systematic review, meta-analysis and trial sequential analysis. *BMJ Open* 2017;7
11. Gopi CN, Venkat R. An appraisal on increasing the occlusal vertical dimension in full occlusal rehabilitation and its outcome. *J Indian Prosthodont Soc* 2011; 11:77-81.
12. Sato S, Hotta TH, Pedrazzi V. Removable occlusal overlay splint in the management of tooth wear: a clinical report. *J Prosthet Dent.* 2000; 83:392–395.
13. Terry DA, Swift EJ. Post and cores: Past to present. *Int Dent SA* 2010; 12:20-8.
14. Standlee JP, Caputo AA, Collard EW, Pollack MH. Analysis of stress distribution by endodontic posts. *Oral Surg Oral Med Oral Pathol* 1972; 33:952-60.
15. Johansson A, Johansson AK, Omar R, Carlsson GE. Rehabilitation of the worn dentition. *J Oral Rehabil* 2008; 35: 54866.