

Full Mouth Rehabilitation: A Case Report

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ABSTRACT

Background: Wearing out of natural enamel is a common phenomenon in the dentulous population, although it is seen in aged people but has become common among relatively young patients. One of the most demanding aspects of such cases involves the development of sufficient restorative space, while simultaneously fulfilling aesthetic, occlusal and functional parameters essential to long term success when evaluating and diagnosing a patient with severely worn dentition, emphasis must be placed on the occlusal prematurities preventing condylar seating into the centric relation position. The requirement for increasing vertical dimension will be confirmed, and tissue tolerance for change in vertical dimension will be determined by giving occlusal splints or provisional prosthesis.

Keywords: Prosthodontics, rehabilitation, dentistry.

INTRODUCTION

Wearing out of natural enamel is a common phenomenon in the dentulous population, although it is seen in aged people but has become common among relatively young patients. The etiology is variable and depends on many factors like food habits, bruxism, attrition, erosion, abrasion. The resultant generalized attrition of teeth leading to loss of vertical dimension could be because of one or combination of factors¹. The vertical dimension of occlusion of an individual always remains constant and any alteration in vertical dimension will interfere in the normal masticatory system and physiology of temporomandibular joint^{2,3}. Although many studies have proven that some patients can adapt to such changes. Restoration of the esthetics and masticatory function of severely worn dentition represents a significant clinical challenge to dentist. One of the most demanding aspects of such cases involves the development of sufficient restorative space, while simultaneously fulfilling aesthetic,

occlusal and functional parameters essential to long term success when evaluating and diagnosing a patient with severely worn dentition, emphasis must be placed on the occlusal prematurities preventing condylar seating into the centric relation position. Success in maintaining severe wear cases depends on the development of proper anterior guidance to allow for posterior disocclusion within the patient's envelope of function⁴.

The first step in restoring the worn dentition will be assessment of VDO, any pulpal pathology, occlusal disharmony, functional impairment, and aesthetic requirement of the patient. After careful evaluation of these factors a comprehensive treatment plan should be decided for that particular patient. Articulated study casts and diagnostic wax up will provide information which is helpful in evaluating treatment options. The requirement for increasing vertical dimension will be confirmed, and tissue tolerance for change in

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vertical dimension will be determined by giving occlusal splints or provisional prosthesis⁵.

CASE REPORT

A 73 years old male patient came to the department of prosthodontics with the chief complaint of worn out dentition and unsatisfactory esthetics. A complete medical and dental history of the patient was taken. Thorough extraoral and intraoral examination was done. Extraoral examination revealed no facial asymmetry or muscle tenderness. Intraoral examination revealed generalized attrition and abrasion with loss of vertical dimension. The pulp chambers of lower anterior teeth were exposed due to severe attrition, and the lower anteriors were completely overlapped by the upper anteriors. So there was a loss of vertical dimension with anterior deep bite. Radiographs (figure 1) and diagnostic impressions were made. Patient gave a history of dental extraction with reference to 46. Root stumps with reference to 36, 37, 47 were present. Faulty prosthesis was present with reference to 27, 35, 45. (figure 2a, 2b) Evaluating the speech and phonetics of the patient, the freeway space was evaluated. The treatment plan was raising the vertical dimension by 3mm followed by full mouth rehabilitation including the placement of implants i.r.t. 36 and 46. The complete treatment plan was explained to the patient. Extraction of root stumps i.r.t. 36, 37, 47 and removal of faulty prosthesis i.r.t. 27, 35, 45 was done. The aim of the treatment plan was to improve esthetics and restore occlusion so as to achieve optimum oral health for the patient.



Fig 1: pre-operative OPG.

1) The diagnostic casts were mounted on a semi adjustable articulator (Hanau H2 articulator) using face bow record (figure 3) to determine the correct

occlusal plane followed by recording of centric relation.(figure 4)

2) Implant surgery was planned i.r.t. 36 and 46 with implants of diameter 3.75*11.5mm (ARDS, ISRAEL) and 4.2*11.5mm (ARDS, ISRAEL) respectively.

3) Meanwhile the patient had been undergoing endodontic treatment for all the teeth. Post and core was done i.r.t. 14, 24, 25, 31, 32, 33, 41, 42, 43, 44, 45.

4) Anterior jig of 3mm was made which acted as a guide for the posterior tooth preparation. The occlusion was evaluated and the amount of vertical preparation of teeth was determined with proposed change in vertical height in mind.

5) Next, mock preparation of all the maxillary and mandibular teeth was done followed by a diagnostic wax-up. (figure 5)

Preparation and restoration of the teeth

6) First, crown preparations of maxillary and mandibular posterior teeth were performed i.r.t. 14,15,16,17,24,25,26,27 34,35,44,45 using acrylic anterior jig and centric relation was recorded. (figure 6a, 6b)

7) The provisional bridge was constructed with methyl methacrylate resin with increased vertical height as determined by acrylic anterior jig. The provisional bridge was cemented using Non eugenol temporary cement (Rely X TM Temp NE, 3M ESPE,USA).

8) Patient was recalled once in 10 days and observed for any muscle tenderness, discomfort in TMJ and any change in the function of mastication, speech, swallowing. Any adjustment needed for the betterment of mastication and facial aesthetics were carried out. The provisional bridge was maintained for 6 weeks and patient's tolerance for new mandibular position and increase in VDO was confirmed.

9) Final preparations were performed and definitive impressions were made with condensation silicon putty and light body impression material. Facebow transfer was done to adjust the plane of occlusion and centric relation was recorded.

10) Porcelain fused to metal restorations were made i.r.t 14,15,24,25,34,35,44,45 and Metal try-in was done. All metal crowns were made for 16, 17, 26, 27. Final restorations were cemented using glass ionomer cement.

11) After establishing the posterior stop, crown preparations were done for 11, 12, 13, 21, 22, 23, 31, 32, 33, 41, 42, 43. Final impression was taken in the similar manner. Provisional restorations were cemented. Metal try-in was done followed by cementation with glass ionomer cement. (figure 6a, 6b)

12) After 4 months the prosthetic phase (stage II surgery) was initiated after evaluating the osseointegration of implants i.r.t.36 and 46. The implants were uncovered with small crestral incision and healing abutments were placed. Patient was recalled after 10 days. Impression copings were attached and final impression was made using closed tray technique. Metal try-in was done. Abutments were screwed using torque ratchet (35 N torque) and final restorations were cemented in the similar manner. (figure 7a, 7b)

13) Figure 8 and 9 shows post operative intraoral and extraoral photograph of the patient. Oral hygiene instructions were given and the patient was asked to report after 1 week for review. Postoperative OPG was taken. (figure 10)

Recall visits were scheduled after one month, three months, followed by every six months. During each visit, the oral hygiene maintenance, periodontal health status and fit of the prostheses were assessed. The patient was satisfied with the aesthetics, function and comfort.



Fig 10: post operative OPG.



Fig 2a: Intraoral pre-operative.



Fig 2b: Extraoral pre-operative.



Fig 3: Face bow transfer.



Fig 4: mounted cast at centric relation.



Fig 5: Diagnostic wax up.



Fig 6a: Crown preparation with post and core cementation maxillary arch.



Fig 6b: Crown preparation with post and core cementation mandibular arch.



Fig 7a: Final cementation of prosthesis maxillary arch.



Fig 7b: Final cementation of prosthesis mandibular arch.



Fig 8: post-operative intraoral view.

DISCUSSION

Creating the perfect smile along with health is a challenging procedure that requires a multidisciplinary approach, and meticulous treatment planning. Emphasis was given on occlusal adjustments in both temporary and final restoration, since occlusal rehabilitation is the key



Fig 9: Post-operative extraoral view.

to long-term success of the restorations and the oral health.⁶ Full mouth rehabilitation cases are one of the most difficult cases to manage in dental practice. This is because such cases involve not only replacement of the lost tooth structure but also restoring the lost vertical dimensions. Assessment of the vertical dimension is important for the management and careful comprehensive treatment plan.⁷ Vertical dimension is not lost in all cases with generalized wear.⁸ In most instances, any reduction in the height of natural teeth is compensated by the stimulated growth of alveolar bone and tissue and the continual eruption of the teeth. In the literature wearing time of overlay splint or provisional crowns varies. The time period for provisional prosthesis which will be reversible and conservative is between 1 to 5 months, and that of intensive fixed provisional prosthesis is 2 to 6 months^{4,9,10,11,12}. There are several reported procedures for determination of the VDO, and one commonly employed method is measurement of the freeway space when the mandible is at rest. The increase of vertical dimension was determined by patient's physiologic factor like interocclusal rest space and speech.

In the present case there was excessive wear of anterior and posterior teeth. Vertical dimension was raised upto 3mm by using provisional crown and bridge in auto polymerizing resin for 6 weeks so that patient stomatognathic system gets adjusted to the new vertical dimension.

The patient's acceptance of aesthetics & comfort were evaluated over a period of time and adjusted to the desired level. During this period patient adaptation to the new crowns was good and no discomfort, or muscle fatigue was reported.

Niswonger¹³ reported that the freeway space was 4/32" (3 mm) in 87% of patients; the remaining 13% varied from 1/32" to 11/32". Niswonger concluded that as the teeth slowly wear down, adaptation of body makes necessary changes in bone and tissue to maintain the space. According to a systematic review investigating the implications of increasing the VDO, a permanent increase in the vertical dimension from 1 to 5 mm is a safe and reliable procedure, and the associated signs and symptoms are self-limiting with a tendency to resolve within 2 weeks.¹⁴

The main objectives while restoring anterior teeth were achieving adequate esthetics, proper phonetics and non-interference in the posterior teeth so as to achieve posterior disclusion. Anterior guidance is the dynamic relationship of the lower anterior teeth against the upper anterior teeth through all ranges of function. Anterior guidance plays a very important role in full mouth rehabilitation following centric relation.^{15, 16} The anterior guidance forms the anterior control to provide posterior disclusion. The job of anterior guidance is to protect the posterior teeth from lateral or protrusive stresses. To correctly obtain this it is necessary to perform a facebow transfer so as to relate the anterior guidance with the opening and closing axis. Obtaining the correct plane of occlusion while restoring posterior teeth holds prime importance. The patient had severely worn down anteriors and wear facets on the canine. Hence group function occlusion was followed to avoid functional overload on canines, which can be detrimental to the overall oral health of the patient. Group function refers to the distribution of lateral forces to a group of teeth rather than assigning all forces to one particular tooth. Lateral pressure is distributed to all working side teeth in order to prevent overloading of the canine. This helped in distribution of forced over more number of teeth thus protecting the canines.

This case report describes a full-mouth rehabilitation in a restricted interocclusal space

with severely worn teeth resulting in loss of vertical dimension. We used provisional restorations to temporarily increase the VDO and observe the patient's adaptation. This approach provided a safe and conservative route to meet the patient's requirement. During the one-year follow up, there were no clinical complications or symptoms, or signs of temporomandibular disorder. We successfully met the treatment goals of rehabilitation of masticatory function and improved smiling appearance.

CONCLUSION

Planning and executing the restorative rehabilitation of a decimated occlusion is probably one of the most intellectually and technically demanding tasks faced by a prosthodontist. Several decisions have to be made concerning the complex area of occlusion, before starting occlusal rehabilitation and for this various factors, general and specific recommendations and selection of the case in particular must be analyzed in detail. The clinician must be aware of the requirements that a physiologic restoration be made that is not only aesthetic and functional but that also remains in harmony with the entire gnathostomatic system. One should also remember that not all patients can be successfully treated with a single preconceived treatment philosophy. Satisfactorily restoring a patient to a state of physiologic health is a challenge that requires proper diagnosis and adequate knowledge of a wide range of treatment modalities.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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