Esthetic rehabilitation of severely worn dentition: a functional and prospective approach
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Abstract
Restoration of extremely worn dentition presents a substantial challenge to the dentist. Careful evaluation of the etiology, history and factors relative to the occlusal vertical dimension are essential to appropriate treatment planning. Various treatment modalities are successful in the treatment of patients with worn dentition. This case report presents the prosthodontic management of a 61 year old male patient with a severely worn dentition and decreased occlusal vertical dimension.

Key Words: Worn dentition; occlusal vertical dimension; occlusal splint; provisional restorations; attrition

Introduction
Most dentists agree that minimal and gradual attrition of the occlusal surfaces of the teeth is a normal process during the lifetime of a patient. According to Seisler, gradual tooth wear is compensated by continuous eruption of the teeth, which maintains occlusal vertical dimension (OVD). However, occlusal wear may occur more rapidly than continuous eruption depending on the etiology of the wear. The excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function and aesthetic disfigurement. Patients with excessive wear often require extensive restorative treatment. The existing OVD has to be assessed. Sometimes the vertical dimension has to be restored or increased. The contributing factors for excessive wear of teeth have to be evaluated and should be addressed.

This case report presents the prosthodontic management of a 61 year old male patient with a severely worn dentition and decreased occlusal vertical dimension.

Case report
A 61 year old male patient reported to the department of Prosthodontics with a chief complaint of severely worn upper and lower teeth, and difficulty in chewing food. A review of the patient’s medical history revealed that he had undergone angioplasty 5 years back. The extra-oral examination revealed no signs of cervical lymphadenopathy. The patient had no muscle tenderness or facial asymmetry. Mandibular range of motion was within normal limits.

Intra-oral examination revealed maxillary and mandibular arch were completely dentate. The periodontal status was deemed to be satisfactory. There was generalized severe attrition of maxillary and mandibular teeth present, which resulted in anterior deep bite. According to Turner and Missirlian’s classification, this is Class I situation 3 (Category I - excessive wear of teeth with loss of occlusal vertical dimension) [Figure 1, 2, 3]. The excessive wear of maxillary and mandibular teeth demonstrates a closest speaking space of 5mm, an interocclusal distance of 7mm. It may be concluded that this patient had lost some OVD concomitant with tooth wear. Radiographically the trabecular bone pattern was normal.

The oral and written presentation of the treatment plan was presented to the patient. The type of restorations, restorative materials, aesthetic expectations, complications, limitations and oral hygiene requirements were discussed. After endodontic consultation, elective root canal therapy was carried out for maxillary and mandibular anterior teeth followed by composite core build up.

Two sets of study casts were made using irreversible hydrocolloid and type IV dental stone for the records and treatment planning. Maxillary cast was mounted on to the semi adjustable articulator using a Hanu arbitrary face-bow record. The mandibular cast was articulated using a wax occlusal centric relation record. A maxillary occlusal overlay splint was fabricated at an increased OVD of 5mm using self-curing acrylic resin (DPI, India) to evaluate the patient’s tolerance at 5mm increased OVD [Figure 4]. The patient was instructed to wear the splint for 8 weeks. Recall visits were carried out and there were no signs and symptoms of muscle soreness or TMJ pain was observed.
The diagnostic tooth preparation and diagnostic wax patterns were completed on the other set of mounted casts at a 5 mm increased OVD. A custom incisal guide table was prepared using pattern resin. The diagnostic patterns were used to determine necessary tooth reduction, adequacy of tooth preparation and fabrication of acrylic provisionals. The mandibular and maxillary teeth were prepared simultaneously for metal ceramic restoration and full-cast restorations. This allowed for provisional restoration of all teeth at a 5mm increased OVD with stable occlusion. Heat cured acrylic provisionals were fabricated and cemented using temporary cement [Figure5, 6].

The patient functioned on the provisional restoration for 12 weeks, to further assess the adaptation of the proposed occlusal vertical dimension. After 12 weeks of comfortable functioning with the provisional restorations, the tooth preparations were refined for final impression to fabricate permanent restorations. Mandibular and maxillary full arch impressions were made using individualized custom trays using polyvinyl siloxane in heavy-body and light-body consistency, after gingival retraction in both arches. The maxillary cast was mounted on semi adjustable articulator with the help of face bow record and mandibular cast articulated to maxillary cast by using the obtained occlusal registration record. The metal frameworks were tried intraorally for adequate position, tightness of the proximal contacts, acceptable marginal adaptation, stability and internal adaptation. Metal ceramic restorations and cast restorations were fabricated and tried in mandibular and maxillary arch subsequently and evaluated for marginal adaptation, proximal contacts, and occlusion. The shape and contour of the anterior crowns were modified to the patient’s satisfaction. The final restorations were cemented using glass ionomer cement. Oral hygiene instructions were explained to the patient. Subsequent recall intervals were followed to evaluate the proper functioning of final restorations.

Discussion

Every patient has unique treatment requirements. Proper diagnosis and treatment plan are important aspects of full mouth rehabilitation; however the only reliable method to confirm the diagnosis and determine a physiologic OVD is with trial restorations. Periodic observation is to be done to evaluate the patient for comfort and function at the increased OVD. Caution must be exercised not to make firm diagnosis based solely on patient’s acceptance of a removable trial restoration, because the removable restoration may have been removed during the periods of stress and fatigue or soreness associated with excessive OVD. When the patient is comfortable with removable restoration for a reasonable time, the teeth have to be prepared and provisional fixed restorations are to be placed and these should withstand the occlusal function for several weeks. These restorations allow for a more critical appraisal of patient’s comfort, aesthetics, and hygiene. (7-9)

Conclusion

Most patients with severe wear of teeth can be managed by restoring the occlusion and OVD. If the OVD has to be increased, it has to be done cautiously. The amount of vertical height to be increased is best judged by placing removable splint and fixed provisional restorations. The final restorations should closely duplicate the OVD, function, and aesthetics that have been developed in fixed provisional restorations.

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