A SYSTEMATIC APPROACH TO FULL-MOUTH REHABILITATION OF A PATIENT WITH SEVERELY WORN DENTITION - A CLINICAL REPORT.

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Abstract: Esthetic and functional restoration of the severely worn dentition represents a significant clinical challenge to a Prosthodontist. The stable occlusal vertical dimension, TMJ comfort, muscular comfort, speech, long term occlusal stability are the prerequisite for restoring the severely worn dentition. One of the most demanding aspects of such cases involves the development of adequate restorative space, esthetic, occlusal and functional parameters, essential for long-term success. 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 function. This clinical report describes a sequential step by step procedure done for the patient having severely worn dentition.

Keywords: esthetics, full mouth rehabilitation, function, occlusal wear, vertical dimension.

INTRODUCTION
Restoration of the severely worn dentition is one of the most challenging procedures in dentistry. For successfully restoring and maintaining the teeth, one must first assess the exact reason which has led to destruction. Tooth wear can result from abrasion, attrition, and erosion. [1-3] Evaluation and diagnosis should account for the patient’s diet, history of eating, gastric disorders, along with the present state of the occlusion. Behavioral factors that may contribute to parafunctional habits and/or nocturnal bruxism are also important to understand and manage in order to successfully restore and maintain a healthier dentition. [4] Emphasis must be placed on the evaluation of occlusal prematurities preventing condylar seating into the centric relation position. [5] Severe tooth wear leads to alteration in vertical dimension of occlusion (VDO). In many cases the VDO is maintained by the tooth eruption and alveolar bone growth. As teeth are worn out, the alveolar bone undergoes an adaptive process and compensates for the loss of tooth structure to
maintain the VDO. In most cases, clinicians look to alter vertical dimension for one or all of the following reasons: to gain space for the restoration of the teeth; to improve aesthetics; or to correct occlusal relationships. Therefore, VDO should be changed carefully. Increasing the VDO in bruxers puts a severe overload on the teeth and often results in the destruction of the restorations or of the teeth themselves.\[5-6\] Once a complete understanding of the etiology of the dentition’s present state is appreciated, a treatment plan can be formulated, taking into account the number of teeth to be treated, condylar position, space availability, the vertical dimension of occlusion (VDO), and the choice of restorative material.\[7\] The following case presentation demonstrates a restoration of severely worn dentition by altering the VDO with metal ceramic crowns and bridges.

**CASE REPORT**
A 52-year-old female reported to the Department of Prosthodontics with a chief complaint of difficulty in chewing food and sensitivity to hot and cold food items. The patient gave no significant medical history and did not report any signs of temporomandibular joint disorder or myofascial pain dysfunction. The patient gave a history that included clenching, grinding, and gastric regurgitation. A discrepancy between centric occlusion and maximum intercuspal position was found when she was guided to a centric relation position with the bimanual technique. Extraoral examination revealed no facial asymmetry or muscle tenderness. The mandibular range of motion was within normal limits. Intraoral examination revealed grossly attrited dentition in both maxillary and mandibular arches [Figures 1A]. There was missing mandibular 36 and 46 with spacing between maxillary and mandibular anterior tooth. The patient had a bilateral class I molar relation and a canine-guided occlusion. A comprehensive examination was conducted, inclusive of a full-mouth radiographic series, caries detection, and periodontal probing. She was having fair periodontal status. Approximately 2 mm of loss in VDO was established and an increase of 2 mm of vertical dimension was planned.

**PROCEDURE**
1) Impressions for study casts were then made, along with a centric relation occlusal record with raised vertical dimension of 2mm utilizing the Lucia Jig and Aluwax and a facebow transfer was done [Figure 2A].\[8-9\]
2) The fabrication of a full-mouth diagnostic waxup, which would be completed with the understanding that the 36 and 46 were to be replaced and the heights of the teeth to be waxed up with desired raised vertical dimension. Occlusal plane was analysed by Broadrick’s Flag [Figure 3C]. Anterior guidance was established following the posterior disocclusion of posterior teeth.
Canine guided occlusion was kept in the wax up.

3) Tolerance of changes to vertical dimension of occlusion is usually confirmed with the clinical evaluation of the patient having a diagnostic splint.\cite{10} The patient was given a hard acrylic splint at a particular desired height of raised vertical dimension of 2 mm for 1 month to condition the oral musculature [Figure 3A]. This splint was given in mandibular arch and was permissive in nature.

4) Provisional restorations were placed after trial period of removable occlusal overlay splint for one month. 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. Canine guided occlusion was kept in provisional restoration as per the wax up. 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 disocclusion on excursive movement were established. [Figure 3 B]

5) After the 1 month trial period of provisionals, final tooth preparations were done, and definitive impressions were made with polyvinylsiloxane impression material of each arch [Figure 4]. Occlusal registration bite was taken at appropriate vertical dimension.
Esthetics, phonetics, canine guided occlusion, protrusive and lateral disocclusion of posterior teeth were verified in bisque trial of Porcelain fused to metal restorations. Stable holding centric contacts and light anterior contacts were maintained. Interferences in the excursions were removed. Finally it was cemented with resin modified glass ionomer cement [Figure 5].

**DISCUSSION**

In full mouth rehabilitation, severe wear cases present many challenges to the prosthodontist, including gaining the space to create restorations to satisfy the patient's aesthetic desires, while also achieving occlusal and function that are essential for long-term success. A variety of techniques may be used in simultaneous constructions to obtain complete arch dies and mounted casts. These techniques assist in concomitant laboratory construction of the units. When all of the prepared teeth are on a single articulator, there is flexibility in developing the occlusal plane, occlusal theme, embrasures, crown contour, and esthetics. The chairside disadvantages include unpredictable patient visits, full arch anesthesia (if required), full arch chairside treatment restorations, and possible loss of the vertical dimension of occlusion. Other disadvantages are the need for accurate cross-arch multiple tooth impressions and/or the need for transfer techniques to fabricate full arch working casts. An alternative approach to the full-mouth simultaneous reconstruction is to complete one quadrant before beginning another. The advantages of this approach are that it is primarily chairside and includes preparation and final impressions of select teeth, maintenance of vertical dimension, and shorter predictable appointments. The disadvantages of the quadrant reconstruction include restrictions for achieving ideal occlusion when altering the vertical dimension, occlusal plane, and embrasure development. The existing opposing dentition limits the reconstruction of an isolated quadrant. Esthetic consistency can be compromised because the porcelain restorations are made in stages. In this case both upper and lower arch were simultaneously reconstructed. The lost vertical dimension was regained by 2 mm, keeping the condyles in centric relation position. The maintenance of severe wear cases can be ensured by the development of proper anterior guidance that allows for posterior disocclusion within the patient’s envelope of function. Cuspid protected occlusions and disocclusions were natural adaptations which were used for preventing destructive occlusions. Added to the aesthetics and comfort, the other important factor which has to be taken into consideration is disocclusion of teeth during excursions, which would preserve the integrity of entire stomatognathic system, thus resulting in a long lasting, functional restoration. Accurate evaluation during provisionalization ensures minimal adjustments in the definitive restorations and a greater long-term predictability of the case.
CONCLUSION

Full mouth rehabilitation is a treatment modality which not only focuses on the esthetics and functional aspect of the dentition but also improves upon the health of the whole stomatognathic system. A detailed diagnosis and treatment planning is necessary to achieve predictable success.

REFERENCES


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