



## FULL-MOUTH REHABILITATION OF A PATIENT WITH SEVERE ATTRITION USING THE HOBO TWIN-STAGE PROCEDURE – A CASE REPORT

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**ABSTRACT** The gradual wear of the occlusal surfaces of teeth is a customary process during the lifetime of a patient. However, excessive occlusal wear can result in pulpal injury, occlusal disharmony, impaired function and aesthetic deformity. In many cases, the Vertical dimension of occlusion (VDO) is maintained by tooth eruption and alveolar bone growth. Loss of anterior guidance can result from severe wear of anterior teeth, which protects the posterior teeth during excursive movement. The collapse of posterior teeth also results in the loss of normal occlusal plane and the reduction of the vertical dimension. 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. This clinical report highlights the use of the Hobo twin-stage procedure for rehabilitation of a patient with severe tooth wear, resulting in reduced VDO.

**KEYWORDS :** Occlusal Wear, Pulpal Injury, Reduced Vertical Dimension, Rehabilitation

### INTRODUCTION:

The goal of dentistry is to increase the life span of the functioning dentition. In striving to achieve its goal, dentistry uses its knowledge, skill and all the resources at its command in both maintenance work and rehabilitation. Thus, the continuing prophylactic program of childhood, including the regulation of the teeth for good occlusion, and the rehabilitation of the neglected adult mouth have one and the same goal. The techniques of these two areas in dentistry obviously differ, but they should be viewed as integral parts of an over-all dental program.

### Case History:

A 54 year old male 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.

A discrepancy between centric occlusion (CO) and maximum intercuspal position (MIP) was found when he was guided to a centric relation position with the bimanual technique. Extraoral examination depicted no facial asymmetry or muscle tenderness.

The mandibular range of motion was within normal limits. Intraoral examination established grossly attrited dentition in both maxillary and mandibular arches (Figure 1 and 2). Both the arches were fully dentate with spacing between maxillary and mandibular anterior teeth. The patient had a bilateral class I molar relation and a canine-guided occlusion.

Approximately 3 mm of loss in vertical dimension was established (figure 3). Full mouth reconstruction with the Hobo twin-stage technique was planned to reconstruct the attrited dentition in functional harmony to the stomatognathic system while providing a canine-guided dis-occlusion during eccentric movements.

An increase of 3 mm of vertical dimension was also planned. The amount of bite rise to be achieved was also evaluated using the "Closest S-speaking space" or freeway space.



**Figure 1** pre-operative-occlusal view



**Figure 2** pre-operative-lateral view



**Figure 3** OPG Showing loss of vertical dimension

### Procedure:

1. Impressions of both arches were made with reversible hydrocolloid material and diagnostic casts were obtained (Figure 4).
2. Facebow transfer of the maxillary cast was done and mounted on a semi adjustable articulator in MIP (figure 5).



**Figure 4** hydrocolloid impressions **Figure 5** facebow record

3. Wax up was done for fabrication of bite raising appliance and was fabricated in heat cure acrylic resin (figure 6).

4. An occlusal splint was provided to the patient as part of reversible interventional modalities to evaluate adaptation of the patient to altered VDO. The patient was kept in a diagnostic and observational period of 6 weeks before the definitive restorative phase of rehabilitation was started. (Figure7)



**Figure 7** Occlusal splint

5. A diagnostic wax-up of the full-mouth restoration was carried out at the increased vertical dimension. To produce standard effective cusp angles, the condylar and the incisal guidance were set to Condition 1 (table 1). At this position, the diagnostic wax-up for posteriors was balanced in protrusive excursion and lateral excursions (figure 8).

7. The wax-up for anterior segment of the cast was then done and the condylar guidance and incisal guidance were set again (Condition 2) and the wax-up was completed so as to generate posterior disocclusion (figure9).

Condition	Condylar path			Anterior guide table	
	Sagittal condylar path inclination	Bennett angle	Sagittal inclination	Labial wing angle	
Condition 1 Without anterior teeth	25	15	25	10	
Condition 2 With anterior teeth	40	15	45	20	



**Figure 8** diagnostic wax-up of posterior teeth according to condition 1



**Figure 9** wax-up for anterior teeth done using condition 2

8. The teeth were prepared and Stage I temporary restoration were fabricated chairside quadrant by quadrant during several appointments to minimize patient discomfort.

9. The patient's VDO was maintained by using unprepared second molar teeth as occlusal vertical stops which will be prepared later. The second molars were prepared and Stage II temporaries were fabricated using the index of the diagnostic wax-up and cemented with ZnO non-eugenol cement and left for 2 weeks.



**Figure 11** post and core done for upper anterior teeth and temporization done quadrant wise using zoe cement.

10. Once the patient was adapted to this position, a final full-arch impression for maxillary and mandibular teeth was made using polyether (pentamix) impression material and casts were poured in die stone (figure 12).

11. This cast was mounted on a H2 articulator using the facebow transfer. The mandibular cast was mounted in CR using interocclusal record. (figure 13,14)

12. To transfer the vertical dimension and centric relation, temporaries were removed from both maxillary and mandibular left posterior region while the temporaries of right and anterior maxillary and mandibular region acted as a stop. Likewise, the temporaries were removed from right maxillary and mandibular region while the temporaries were present in left and anterior region of both arches, interocclusal record was placed between the right maxillary and mandibular prepared teeth, and the same procedure was followed in the anterior region. The three segmental interocclusal records thus obtained were used to mount the mandibular cast.



**Figure 12** full arch polyether impressions

**Figure 13** Facebow



**Figure 14** interocclusal record with right upper and lower posterior temporaries present and left posterior temporaries removed

13. The wax pattern was fabricated for posterior segment following Conditions 1 and for anterior segment following condition 2.

14. Definite restorations with PFM crowns exhibiting a vital and natural appearance with proper contour and shade were fabricated. (figure 15, 16)



**Figure 15** coping trial and finished pfm crowns for posterior teeth



**Figure 16** shade selection

15. Permanent cementation was done with GIC type I luting cement. (figure 17)

16. Oral hygiene instructions were given and follow up was carried out at regular intervals. (figure 18)



**Figure 17** luting of crowns using type 1 gic and mutually protected occlusion established



**Figure 18** happy patient after 6 months follow-up

#### DISCUSSION:

Function and health can be restored for worn-out dentition using the Hobo twin-stage procedure. There has been conflicting opinion whether to work simultaneously or to work on different segments of the arch individually. The proponents of the later theory state that work can be completed more quickly and easily and with much more comfort for the patient. The total chairside and laboratory time for rehabilitation is significantly reduced. The disadvantage includes restrictions for achieving ideal occlusion when altering the vertical dimension, occlusal plane and embrasure development.

#### CONCLUSION:

Full Mouth Rehabilitation implies the restoration of missing teeth or impaired occlusion, preservation of remaining teeth and maintenance of healthy periodontium. Occlusion has been the controversial subject of dentistry since ages occlusion is the common meeting ground of dentistry. Technique and philosophy are independent of each other but a good technique does not necessarily justify the philosophy, nor should a philosophy be discarded or discredited because of poor technique. To decide the most appropriate treatment plan for a patient of full mouth rehabilitation, clinician requires understading of the patient's stomatognathic system presenting his present oral condition simulating jaw movements in a three dimensional space as closely as possible.

Full mouth rehabilitation often require multi-disciplinary approach which include team of oral diagnostician, periodontist, endodontist, oral surgeon & prosthodontist to achieve a long term successful reconstruction.

#### Key Message:

This clinical report highlights the use of the Hobo twin-stage procedure for rehabilitation of a patient with severe tooth wear, resulting in reduced VDO. It was planned to reconstruct the attrited dentition in functional harmony to the stomatognathic system while providing a posterior disocclusion during eccentric movements.

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