

## Full Mouth Rehabilitation Using Hobos Twin Stage Procedure- A Case Report

M.Sadish<sup>1</sup>, P.Prasanna kumar<sup>2</sup>

<sup>1</sup>(Department of prosthodontics, sri vengateswara dental college, India)

<sup>2</sup>(Department of conservative dentistry, sri vengateswara dental College, India)

Corresponding Author: M.Sadish

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**Abstract:** Face is the most exposed part of the human body, and the mouth being a prominent feature, the teeth are cynosure to all eyes. In the last century, some of the patients with collapsed bite were condemned to total extraction of teeth for conventional complete dentures because the success of rehabilitation procedures were dubious. In the current millennium, the dental technology, advanced equipments and materials, have simplified the task of restoring and rehabilitating the diseased mouth. This has enabled the prosthodontists to preserve teeth and associated structures. Optimum oral health should be the prime objective of all rehabilitation procedures, because the ultimate goal will always be to restore the oral health and preserve the stomatognathic system. This case report describes a patient with severe attrition and collapsed bite treated with "Hobo's twin-stage Technique" after establishing a functional and esthetic vertical dimension and occlusal plane.

**Keywords:** Collapsed Bite, Full Mouth Rehabilitation, Vertical Dimension of Occlusion, Hobo's twin-stage procedure

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### Abbreviation:

VDO- vertical dimension of occlusion

TMJ-Temperomandibular joint

PFM-Porcelain fused metal

### I. Introduction

The ability to change lives through comprehensive care is truly a wonderful part of prosthodontists. But along with the advantage to the patient, there is a challenge to the prosthodontists to understand and address the chief concerns and desires of the patient, as well as to understand all the medical and dental implications related to treatment. Patients affected by severe dental attrition often present with an extremely mutilated dentition. The vertical dimension may have decreased and supraeruption may have occurred. If attrition and abrasion is not intercepted at an early stage, full mouth rehabilitation may be required.

Rehabilitation of patients with collapsed bite is becoming crucial, both from a restorative and preventive point of view. Comprehensive treatment plan along with assessment of vertical dimension at rest and occlusion are an essential part of full mouth rehabilitation. The main objective of full mouth rehabilitation is reconstruction, restoration and maintenance of the stomatognathic system

Increasing the vertical dimension of occlusion (VDO) is often held to be a hazardous procedure in prosthetic treatment. However the recent concept of rehabilitating the teeth began with the idea of bite raising to rectify the collapsed bite due to excessive wear and supraeruption. A moderate increase in the vertical dimension of occlusion(VDO) does not seem to be a hazardous procedure, provided the occlusal stability is well established. It is not always possible to restore a worn occlusion without some increase in vertical dimension of occlusion(VDO). Hence the vertical dimension is raised to provide room for the restorative material.

In the present case, the bite was collapsed due to loss of numerous posterior teeth and attrition of lower anterior teeth, together with loss of vertical dimension of occlusion(VDO). The task of rehabilitating this patient includes the restoration of missing and attrited teeth by increasing the vertical dimension. Here in this case report, full mouth rehabilitation of mutilated dentition was attempted successfully with increased vertical dimension of occlusion using Hobo's twin-stage procedure.

## **II. Case Report**

### **General and dental history**

A 36 year old female patient was reported to our department of prosthodontics and implantology with a chief complaint of difficulty in eating due to loss of teeth and poor facial appearance by the worn out teeth. Her expectation was to have masticatory function and esthetics should be enhanced. Clinical and radiological examination revealed generalised severe attrition and cervical abrasion.

Attrition was more severe in the lower anteriors[1] and it is almost close to the pulp (**Fig-1**); posterior teeth are supraerupted (**Fig-2**) and it is very close to the opposing ridge thereby limiting the interarch distance (Turner and Missirlian classification-I)[2]. Temporomandibular joint (TMJ) function was normal with no clicking or tenderness. Study cast was obtained and mounted on semi adjustable articulator using centric occlusal record and face-bow transfer. As observed from diagnostic mounting, there was insufficient interarch space and insufficient clinical crown height for lower anteriors.

Intentional root canal therapy and cast post and core was planned for all six lower anteriors since the pulp horns are closer and the patients complaints of sensitivity. Vertical dimension of occlusion(VDO) has been reestablished using acrylic removable partial denture replacing 14,15,16 ,24,25,26,36,46 and 47 and the patient is advised to wear for two weeks[1,3]. The patient didn't complain of any discomfort at the newly established vertical dimension.

Tooth preparation was done on first and fourth (**Fig-3**) quadrant and acrylic provisionals(DPI tooth moulding powder) have been given with the reestablished vertical dimension maintained based on bioaesthetic concept. Then second and third quadrant prepared (**Fig-3**) and provisional crowns have been given at the newly established vertical dimension[4,5]. Post space preparation was done on lower anteriors and post space impression was made using indirect technique.

Cast post and core was fabricated (**Fig-4**) and cemented in the patient's mouth. Acrylic provisionals have been fabricated for lowers anteriors and cemented (Freegenol,GC,India). Once the provisional restorations were equilibrated and aesthetics, phonetics were deemed satisfactory, then the occlusal bite record was made for maxillary and mandibular arches after removing acrylic provisionals.

Gingival retraction was done using retraction cord (Sure cord-braided) and final impression was made using putty wash technique(Exaflex, GC,India). Master cast was made and die preparation was done for Hobo's twin-stage procedure with separate anterior and posterior segments. Face-bow transfer and centric relation records were made and master cast was articulated in the semi adjustable articulator(Hanua - H2).

### **Hobo's twin-stage procedure**

In the twin-stage procedure a standard cusp angle is created on a restoration and the incisal path (anterior guidance) for obtaining the standard amount of disocclusion is then computed based on the mathematical model of mandibular movements. Thus, by using the standard cusp angle as the main determinant, it is possible to establish the standard amount of disocclusion. The anterior guidance created in this manner may control the condylar path, since the condylar path is influenced by the anterior guidance.[6,8-10]

To create a standard cusp angle on the restoration, an articulator is mandatory. For the twin-stage procedure, an articulator is used as a tool for the fabrication of the restorations. It is important to use the articulator not for reproduction but for the simulation of mandibular movement to produce certain conditions. The adjustment values of the articulator used to create the standard cusp angle is called "condition-1". The adjustment values used to create anterior guidance was called "condition-2". These articulator adjustment values were determined by Hobo by computation.[8-10]

The anterior segment of the maxillary arch is removed for wax pattern fabrication. This will avoid any interferences by the anterior segment during waxing up and helps to evaluate adequate clearance for metal ceramic copings during articulator movements. Wax pattern was done for metal ceramic copings for all segments except the anterior segment. After completion of wax pattern for the remaining segments, the anterior segment was repositioned in the cast and wax pattern completed for the anterior segment. The wax pattern was casted and metal ceramic copings made(Fig-5). Metal ceramic coping was fitted in the cast and later on tried in the patient's mouth and adjusted as needed.

Definite restorations with porcelain fused metal (PFM) crowns(Vita) exhibiting a vital and natural appearance with proper contour, shade, and optimal incisal translucency were fabricated with Hobo's twin-stage procedure. The articulator was programmed to different conditions of the twin-stage procedure and definite metal ceramic restorations are fabricated in condition-1 (Fig-6) (Table-1) and condition-2 (Fig-7) of Hobo's technique. Extracoronally semiprecision attachment (Rhein-83) retained removable partial denture was fabricated. The processed metal ceramic restoration is cemented in the patients mouth using type-I GIC(Gc,India) (Fig-8) and the semiprecision attachment retained removable partial denture with nylon sleeve was inserted.

### **III. Discussion**

Function and health can be restored for worn out dentition using the Hobo's 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 chair side 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. Previously, the condylar path was the principle focus of attention for gnathologists as it did not change during adulthood and the determination of anterior guidance remained the sole discretion of the prosthodontist[4]. Thus, anterior guidance and the condylar path were considered independent factors. Dawson stated that the condylar path was not a determination of anterior guidance, and that it did not matter whether the anterior path was flat, curved.[4]

### **IV. Conclusion**

Tooth surface loss has been classified into erosion, attrition, abrasion and abfraction. Tooth wear has a multifactorial cause and may be generalized throughout the dentition, but is often localized to incisors and canines. The distribution of wear in the dentition is not even, as is evidenced by the difference between anterior and posterior teeth. Inadequate or unstable posterior support has been identified as a factor in severe anterior attrition and decreased VDO[4]. Posterior occlusal prematurities too, may cause increased function on anterior teeth, resulting in increased wear. Clinical judgment plays a major role in the assessment of this important component in rehabilitation. A variety of techniques, such as phonetics, interocclusal distance, swallowing and patient preferences, have been proposed to determine measurements for the correct VDO.

Here in this case report a moderate increase in vertical dimension of occlusion was achieved and the collapsed bite is successfully corrected. Full mouth rehabilitation was done with satisfactory esthetics and her oral function was reestablished using Hobo's twin-stage procedure. Bilateral balanced occlusion is achieved in condition-I of twin-stage procedure and canine guided occlusion is given to the patient to avoid any unwanted damage to the other teeth.

The principles and concepts involved in oral rehabilitation using the Hobo's twin-stage procedure have been discussed. The amount of disocclusion of teeth is significantly controlled by the condylar and incisal guidance and disregards the role of measured condylar guidance. The average calibrations of condylar, lateral and incisal guidance and cusp angle provide an easy approach of management with lesser skills needed.

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### **Legends for figures**

- Fig-1 Preoperative frontal photograph
- Fig-2 Preoperative left and right lateral photograph
- Fig-3 Vertical dimension reestablished using provisionals
- Fig-4 Cast post and core on lower anteriors.
- Fig-5 Metal ceramic coping-occlusal view
- Fig-6 uniform cuspal contact in condition-1
- Fig-7 Canine guided disocclusion
- Fig-8 Postoperative intraoral photograph



**Fig-1** Preoperative frontal photograph



**Fig-2** Preoperative left and right lateral photograph



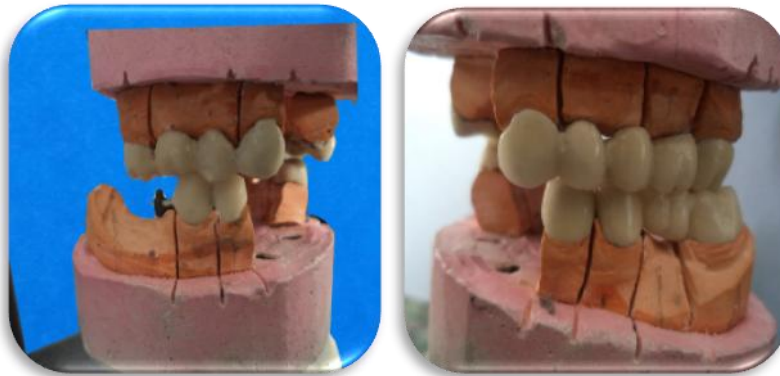
**Fig-3** vertical dimension reestablished using provisionals



**Fig-4** Cast post and core on lower anteriors



**Fig-5** Metal ceramic coping-occlusal view



**Fig-6** uniform cuspal contact in condition-1



**Fig-7** Canine guided disocclusion



**Fig-8** Postoperative intraoral photograph

	Sagittal condylar guidance (in degrees)	Lateral condylar guidance(in degrees)	Anterior guidance (in degrees)	
			sagittal	lateral
*CONDITION 1	25	15	25	10
*CONDITION 2	40	15	45	25

**Table-1** ARTICULATOR ADJUSTMENT VALUES FOR TWIN-STAGE PROCEDURE[8,9]

\* Condition-1:The adjustment values of the articulator used to create the standard cusp angle

\*Condition-2: The adjustment values used to create anterior guidance.

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