

Full Mouth Esthetic and Functional Rehabilitation of a Middle Aged Man using Hobo's twin stage procedure- A Case Report

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ABSTRACT

Background: Full mouth rehabilitation is a multidisciplinary treatment modality and is one of the most challenging in the field of dentistry. It demands a skillful correlation of mechanical principles, biological factors and aesthetic requirements in the treatment procedure. This case report discusses full mouth aesthetics and functional rehabilitation of a middle aged patient with severe generalized tooth wear which has led to sensitivity to hot and cold food, reduced vertical dimension of occlusion/ decreased lower facial height and an unaesthetic appearance. Hobo's twin stage technique was used in this particular case report because of its indications and its procedural simplicity for both clinician and patient. The treatment goal to provide proper restorative treatment, that would restore the worn out tooth surfaces, enhance mastication, improve the esthetic appearance and maintain a stable occlusion in long term was achieved in this particular case. With advances in esthetic dental materials and improved clinical techniques, it is now possible to produce a long-lasting, functionally and esthetically better outcome, to the satisfaction of both the clinician and the patient.

Keywords: Full mouth rehabilitation; Aesthetics; Tooth wear; Vertical dimension of Occlusion; Hobo's twin stage.

INTRODUCTION

With advancing age tooth wear is a common phenomenon, usually seen in aged people. However, in the present day's stress full life, the occurrence of tooth wear in young and middle aged people is not uncommon. A new dimension in esthetic and functional rehabilitation for patients with severely worn out dentition has opened up in restorative dentistry, with advances in esthetic dental materials and improved clinical techniques.

It is now possible, to produce a long-lasting, functionally and esthetically better outcome, to the satisfaction of both the clinician and the patient. This case report describes the use of the Hobo twin-stage procedure for full mouth rehabilitation of a

middle aged patient with generalized tooth wear which has led to sensitivity to hot and cold food, reduced vertical dimension of occlusion and an unaesthetic appearance.

Hobo's twin stage indications and its procedural simplicity for both clinician and patient was the reason for selecting this technique in this particular case.

CASE REPORT

A 48 year old healthy male patient reported to the department of prosthodontics, Army college of dental sciences, Secunderabad with a chief complaint of generalized sensitivity to hot and cold food and beverages and difficulty in chewing food.

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Fig 1: a) Pre-Operative intraoral pics. b) 3mm thick heat cured occlusal splint. c) Facebow (Hanau Springbow) record. d) Diagnostic mock wax up (Condition 1) e) Diagnostic mock wax up (Condition 2).



Fig 2: a) Full mouth teeth preparation. b) Provisional restorations were made with auto-polymerizing acrylic resin, and esthetics and occlusion were evaluated. c) Inter-occlusal record- To transfer the exact vertical dimension and centric relation. d) Anterior metal try-in. e) All excursion movements performed to see posterior disocclusion.



Fig 3: Post-operative situation with raised lost vertical dimension and definitive prosthesis.

Table 1: Anticulator adjustment values for the twin-stage procedure (deg).

Condition	Condylar path		Anterior guide table	
	Sagittal condylar path inclination	Bennett angle	Sagittal inclination	Lateral wing angle
Condition 1: without anterior teeth	25	15	25	10
Condition 2: with anterior teeth	40	15	45	20

Clinical findings

Extraoral findings- Patient has no extraoral facial deformity, no muscle tenderness, no TMJ pain and no deviation while opening and closing. **Intraoral findings:** Patient has a class 1 molar relation on right side and class II molar relation on left side with class II div 2 anterior relations (upper incisors retroclined). Occlusal findings- Generalized attrition was present with respect to maxillary and mandibular posteriors, and mandibular anteriors. In maxillary anteriors attrition was present at the cingulum, except in lateral incisors which were spared because of proclination. Reduced vertical

dimension (Figure 1a) - freeway space was 5-6 mm (VDR-VDO) Vertical Dimension of rest- Vertical Dimension of Occlusion.

Treatment procedure

1. On day one- After complete examination, impression of both arches was made with irreversible hydrocolloid and a cast was obtained. A removable appliance for correction of upper retroclined anteriors was given for 2 months and a 3mm thick heat cured occlusal splint (Figure 1b) was given with respect to the lower arch to prevent further attrition and to evaluate the adaptation to the increased VDO. Patient was examined after every 15 days for the next 2 months. Meanwhile, the patient also underwent root canal treatment of lower anteriors.
2. At two months- After orthodontic correction of upper incisors, a new diagnostic impression was made with irreversible hydrocolloid and a cast obtained. Maxillary cast was mounted onto a semi-adjustable articulator (Hanau Wide-View, USA) with the help of a Facebow (Hanau Springbow) (Figure 1c) record and mandibular cast mounted using inter-occlusal record in centric relation.
3. Diagnostic mock wax up was carried out according to twin-stage procedure. The posterior teeth mock waxup was done without the anterior segment of mandibular cast (Figure 1d) to produce standard effective cusp angle values for which condylar guidance and incisal guidance were set to Condition 1 (Table 1). Next, anterior mock waxup was done with the condylar and incisal guidance of articulator set according to Condition 2 (Table 1) and the wax-up was completed so as to generate posterior disocclusion (Figure 1e).
4. Two putty indexes was made from the diagnostic mock wax up; one to act as index for uniform tooth preparation and second for indirect temporization.
5. Maxillary and mandibular posterior tooth preparation was done in a single visit and patient was recalled next day for anterior teeth preparation (Figure 2a). Provisional restorations were made from the diagnostic wax-up template with auto-polymerizing acrylic resin, and esthetics and occlusion were evaluated. Provisional restorations were then cemented with zinc oxide non-eugenol (Rely XTM, 3M ESPE, Germany) provisional cement (Figure 2b)..
6. Patient was kept on 2 weeks follow up, to ensure esthetics, mastication and adaptation to raised VDO.
7. Once the patient was adapted to this position, a final impression was made of both arches using poly vinyl siloxane impression material and casts were poured in die stone (type IV). The cast was mounted on a Hanau articulator using the facebow transfer.
8. To transfer the exact vertical dimension and centric relation, posterior temporary crowns on the right were removed; inter-occlusal recording material was placed between the prepared tooth and patient asked to bite. The existing temporaries on posterior teeth on the other side and the anterior temporary crowns act as stop. The procedure was repeated by removing temporary crowns on the left side. Now the temporary crowns on anterior teeth were removed when the temporaries on posterior teeth on both sides stayed in place. An anterior inter-occlusal record was made. The three segmental inter-occlusal records so obtained were used to mount the lower cast (Figure 2c)..
9. Once the mandibular cast was mounted on the semi adjustable articulator, the posterior wax patterns were fabricated and casted, followed by anterior wax patterns, following Conditions 1 and 2. Metal ceramic restoration restoration with natural appearance in terms of shade and contour were designed first for posteriors and were cemented with temporary cement for 1 week. Meanwhile anterior metal try-in was done (Figure 2d) and anterior Metal ceramic cowns were temporarily cemented. All excursion movements performed to see posterior disocclusion (Figure 2e).
10. After 1 week, when the patient showed satisfaction and comfortable with the

restoration, permanent cementation (Figure 3) was done for both posteriors and anteriors using GIC type 1 luting cement (GC GoldLabel, GC Corp., Tokyo). Oral hygiene instructions were given.

DISCUSSION

The treatment goal was to provide proper restorative treatment, that would restore the worn out tooth surfaces, enhance mastication, improve the esthetic appearance and maintain a stable occlusion in long term. D'Amico stated that to prevent destructive occlusion, cuspid protected occlusion and disocclusion were necessary and natural adaptations [1]. In 1957 Stuart and Stallard proposed the scheme of mutually protected occlusion, which has been widely accepted [2]. According to Pankeymann-Schuyler (PMS) theory anterior guidance is first established followed by restoration of posterior teeth. Previously, the condylar path was the principle focus of attention for gnathologists. Hobo and Takayama studied the influence ratio of the condylar path, incisal path, and the cusp angle to the amount of disocclusion in the second molar region when the condyle moved 3 mm from the centric was 1:2:2, 1:3:3 and 1:4:4 during protrusive movement; working side and non-working side movement respectively. They concluded that cusp angle was the most reliable and was used as a new determinant of occlusion [3]. Twin-stage procedure proposed by Hobo and Takayama was adopted for wax build-up because

studies have proved that it is possible to accurately control the amount of disocclusion on the restoration without measuring the condylar path. Twin-stage procedure helps in achieving a standard disocclusion of 1 mm on protrusion, 1 mm on nonworking side, and 0.5 mm on working side in eccentric movements at 3-mm protrusion from centric relation. The returning condyle path always passed above the eccentric condyle path in sagittal plane. This procedure also aimed in achieving disocclusion in both eccentric path and returning path [4].

CONFLICT OF INTEREST

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

REFERENCES

1. Damico A. Function occlusion of natural teeth in man. *J Prosthet Dent* 1961;11:899-915.
2. Stuart CE. Good occlusion for natural teeth. *J Prosthet Dent* 1964;14:716-24.
3. Hobo S, Takayama H. Twin stage procedure. Part 1: A new method to reproduce precise eccentric occlusion relations. *Int Periodont Rest Dent* 1997;17:113-23.
4. Hobo S, Takayama H. Twin stage procedure, Part 2: A clinical evaluation test. *Int Periodont Rest Dent* 1997;17:457-63.