



Full Mouth Rehabilitation Using Hobo Twin-Stage Technique- A Clinical Report

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(Received: 07 January 2024

Revised: 12 February 2024

Accepted: 06 March 2024)

KEYWORDS

full mouth
rehabilitation,
attrition, Hobo Twin
Stage.

ABSTRACT:

The goal of full mouth rehabilitation is the restoration of the decrepit dentition by establishing new occlusal arrangement at the correct vertical dimension in order to improve function and appearance, while maintaining the health and harmony of the entire stomatognathic system of the patient. This clinical report highlights a case with severe attrition and compromised aesthetics with Hobo Twin Stage technique.

1. Introduction

Tooth wear is the result of abrasion, attrition and erosion while abfraction might potentiate wear by abrasion or erosion.^[1] Excessive wear of the occlusal surface of teeth leads to the decreased vertical dimension of occlusion results in compromised aesthetics and function. The role of restorative dentistry in dental care is to maintain and preserve the natural dentitions as long as possible to support function. The objective of 'full mouth rehabilitation' is the restoration of the decrepit dentition by establishing new occlusal arrangement at the correct vertical dimension to improve function and appearance, while maintaining the health and harmony of the entire stomatognathic system. The indications for full mouth rehabilitation include the restoration of multiple teeth which are broken, worn, missing or decayed, discoloured dentition, developmental defects and worn out dentition.^[2,3]

Concepts in full-mouth rehabilitation have been ever-changing and evolving. To frame a tailored set of rules for a patient is very problematic. The knowledge and skill of the clinician in diagnosing the case and

developing a prototype for the individual is most important.^[4,8] Molar disocclusion is determined by a cusp-shape factor and an angle of hinge rotation. Condylar path, incisal path and cusp angle determines the amount of disocclusion. Hobo and Takayama stated that, "the condylar path shown to have deviation within the individual and its influence on disocclusion is minimal".^[5,6] The twin stage technique by Hobo and Takayama develops anterior guidance to create a predetermined, harmonious disocclusion with the condylar path. Condition 1 incorporate a cusp shape factor while condition 2 is used for the angle of hinge rotation.^[7]

2. Clinical report

A 56-year-old male patient reported to the Department of Prosthodontics with a chief complaint of difficulty in chewing, generalized sensitivity and having aesthetic problems. Extraoral examination revealed that the patient had no facial asymmetry, or muscle tenderness. The mandibular range of motion was within normal limits. The Temporomandibular joint and the muscles of mastication were asymptomatic. Intraoral



examination revealed generalized attrition, decreased vertical dimension, sharp incisal edges, severe tooth surface loss and uneven occlusal surfaces. Discrepancy between centric relation and maximum intercuspation was also noted. Endodontic treatment was advised in relation to tooth number 11,12, 13, 14,15, 21, 22, 23, 24, 25, 32,33,34,35, 42,43,44,45,46. (Figure 1,2,3). The vertical dimension was determined by Niswonger's Thomason's technique: vertical dimension at occlusion was 50mm and vertical dimension at rest was 57 mm, freeway space of 7mm approximately.



Image 1: Pre-operative occlusal view of the maxillary arch



Image 2: Preoperative occlusal view of the mandibular arch



Image 3: Preoperative intra-oral view of the occlusion

After obtaining written informed consent from the patient, diagnostic impressions were made using alginate hydrocolloid (Tropicalgin, Zhermark, Rovigo, Italy). Face bow records made and the casts were mounted on a Hanau H2 semi adjustable articulator. An anterior deprogramming jig was made and centric relation was recorded by using polyvinyl siloxane bite registration material. The vertical dimension was increased by 3 mm. A heat cure acrylic occlusal splint of 3 mm was fabricated, which was to be used by the patient. The splint maintained uniform tooth contact in centric relation and disocclusion of posterior teeth in an eccentric movement. The patient was examined every two weeks for two months and the adaptation of the muscles and of the temporomandibular joints was observed.

A diagnostic wax up was done at a 3mm increased vertical dimension of occlusion. Poly vinyl siloxane putty index was then made. The wax up helped in assessing the outcome of the final prosthesis and it also helped in fabricating the provisional restorations.

A Hobo's twin stage technique for full mouth reconstruction, with the occlusal scheme as canine guided disocclusion was selected for this case. A cast with a removable anterior and posterior segment is required. The first stage involved removing the anterior section of the cast and adjusting the condylar and incisal guidance of the articulator to conform with Hobo's condition 1, which ensures standard effective cusp angles. Occlusal morphology of the posterior teeth was established without the anterior segment. The occlusal morphology of the posterior teeth was built up so that the maxillary and mandibular cusps came into contact during eccentric movement and balanced occlusion developed in protrusive and lateral excursions. In second stage, the anterior segment of the cast was reassembled, the condylar guidance and incisal guidance were set again (condition 2) and the wax-up was completed, so as to generate posterior disocclusion. (Table 1) (Fig 4 and 5)





Image 4: Condition 1



Image 5: Condition 2

Table – 1 - Values in degrees of condition 1 and 2 according to the Hobo twin- stage technique.

	Horizontal condylar guidance	Lateral condylar guidance	Anterior guidance	Lateral condylar guidance
Condition 1	25	15	25	10
Condition 2	40	15	45	20

Minimal occlusal reduction is indicated for patients who are scheduled for rehabilitation at an altered vertical dimension of occlusion. Teeth preparations for full coverage porcelain fused to metal restorations were completed for the entire dentition. Acrylic resin provisional restorations were fabricated using an indirect technique and was luted with provisional luting cement (Freegenol Temporary Pack; GC Corp., Tokyo, Japan) and kept for two months. Aesthetics and phonetics were evaluated during this period. Full-arch impressions were made by using poly vinyl siloxane impression material (Reprosil; Dentsply, USA). The maxillary cast was mounted with the face bow record and centric relation was recorded with the help of Lucia jig with the anterior provisional in place. After verification of posterior disocclusion in protrusive and laterotrusive movements the wax patterns were sent for the fabrication of porcelain fused to metal restoration. Finally, the porcelain fused to metal restorations were cemented in place using glass ionomer cement after correction of occlusal prematurities. (Figure 6,7,8,9)



Image 6: Canine guided disclusion of the right lateral side



Image 7: Canine guided disclusion of the left lateral



Image 8: Post-operative intra-oral view in occlusion



Image 9: Postoperative extra-oral view

3. Discussion

Restructuring of an occlusion in a decrepit dentition is the utmost challenging task. Full mouth rehabilitation is the most common treatment procedure in treatment of severely worn-out dentitions, developmental anomalies, acquired defects and ill fitting, long span fixed partial dentures. Various factors such as vertical dimension of occlusion, centric relation, occlusal contact pattern, aesthetics and phonetics need to be considered simultaneously for both anterior and posterior teeth during full mouth rehabilitations.^[2,3,4]

Full-mouth rehabilitation starts with evaluation of aesthetics i.e. evaluating incisal edges, teeth shapes and sizes, occlusal plane, ideal occlusal vertical dimension and to establish an ideal occlusal plane. Full-mouth wax-ups are made by the technician and mock-up reproducing the wax-ups are transferred in mouth by the clinicians. Then restoration of vertical dimension of occlusion is done by phonetics and swallowing followed by establishment of the anterior guidance.^[5,6]

There are various occlusal philosophies in literature like the Gnathological concept, Pankey-Mann-Schuler rehabilitation principles, Hobo and Takayama philosophy, occlusal philosophies with reduced periodontal support for remaining teeth by Youdelis, Nyman and Lindhe, Wiskott and Belsers simplified occlusal scheme which reduces the overall number of occlusal contacts. It is upon the clinician to follow any philosophy to improve function while maintaining the health and harmony of the stomatognathic system of the patient.^[9] Thimmappa M et al in their systematic review concluded that no philosophies are universally

applicable. Pankey Mann Schuyler philosophy was most commonly used followed by Hobo Twin stage philosophy.^[10]

The recent advances of digital technology are progressively changing restorative dentistry. The improvements in CAD/CAM devices and dental materials, it is possible to carry out a treatment plan for full mouth rehabilitations with fully digital approaches and noninvasive concepts. The chipping rates and technical complications associated with bilayered ceramics reported with porcelain fused to metal or with porcelain-fused-to-zirconia fixed dental prostheses can be reduced with monolithic zirconia.^[11,12] The advent of minimally invasive approach and adhesive dentistry, full-mouth rehabilitation of a severe wear can now be managed with v-shaped veneers, tabletops, overlays and laminate veneers thus preserving remaining tooth structure.^[13,14]

4. Conclusion

A proper diagnosis and treatment plan customised for the patients is most important in management of severe wear cases while maintaining the health and harmony of the entire stomatognathic system of the patient. Occlusal scheme developed on a properly fabricated and accepted provisional restoration will save much time of the clinician during fabrication and adjustments of the definitive restorations. Regular recall visits will also guide the clinician for any problem that may arise in future.

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