



A METHODOLOGICAL APPROACH FOR RESTORATION OF LOST VERTICAL DIMENSION BY ADVOCATING HOBBO'S TWIN STAGE TECHNIQUE – A CASE REPORT

Dental Science

Soumadip Niyogi* MDS *Corresponding Author

Manas Konar MDS

Jayanta Bhattacharyya MDS; Principal, H.O.D, Department Of Prosthodontics And Crown & Bridge, Guru Nanak Institute Of Dental Sciences & Research, Kolkata – 700114

Samiran Das MDS; Professor, Department Of Prosthodontics And Crown & Bridge, Guru Nanak Institute Of Dental Sciences & Research, Kolkata – 700114

ABSTRACT

STATEMENT OF PROBLEM: Restoration of occlusal harmony in patients with worn dentition and reduced vertical dimension is a demanding situation as every case is unique in itself. There is great apprehension involved in clinicians due to widely divergent views regarding the choice of an appropriate occlusal scheme. Rehabilitating the lost vertical dimension in a graduated and structured fashion will not only bring back the harmony of the stomatognathic system but also plod the adverse diversifications on the muscles and orthopedic instability of the temporomandibular joints.

PURPOSE: To restore the vertical dimension by adapting a less cumbersome and precise technique that uplifts both functionality and esthetics.

MATERIAL AND METHODS: The case report humbly represents the rehabilitation of a 47 year old female patient with severe worn out dentition. Assessment of lost vertical clinically and adjudging the space to be distributed among both the arches through the metal fused to porcelain restorations, by advocating Hobo's Twin stage technique to achieve disclusion and a canine guided occlusal scheme.

RESULTS: A stable occlusion was achieved, with the desired amounts of disclusion of more than 1mm on protrusive and nonworking sides, and about 0.5mm on working sides during eccentric movements with a pleasing esthetics, with more than 9 months follow up deciphering uneventful occurrences.

CONCLUSION: The technique adapted requires very less complicated armamentarium, calculated condylar guidances, methodical method of achieving anterior guidance with sequential technique gives a very predictable outcome.

KEYWORDS

Hobo's Twin Stage; Cusp Shape Factor; Condylar Guidance, Vertical Dimension Of Occlusion.

INTRODUCTION

Rehabilitation of an annihilated dentition is one of the most challenging aspect facing a clinician. The catch in these situations lies on the fact, of determination and diligent execution for the development of sufficient restorative space and at the same time fulfill esthetic and functional harmonization for long term success. Tooth wear is inevitable and may be caused by attrition or erosive process, but surpassing of physiologic bracing between alveolar growth and tooth eruption¹ and repetitive contracted length of the elevator muscles eventually leads to loss of vertical dimension of occlusion (VDO). This case report highlights the use of Hobo's twin stage procedure for a patient with severe tooth wear with a methodical approach of developing the posterior tooth morphology followed by subsequent anterior morphology build up and guidance to achieve a standard amount of disclusion and esthetic upliftment.

CASE OUTLINE

A 47 year old female patient reported to the department of Prosthodontics and Crown & Bridge, with the chief complaint of difficulty in chewing, sensitivity to cold foods and unaesthetic appearance. Thorough corroboration of history included patient's diet, eating habits and any associated gastric disorders which yielded noncontributory, though the patient provided a remote predilection of her towards aerated drinks. Facial asymmetry was not evident and intra oral examination revealed grossly attrited teeth in both the arches with spacing and flattening of incisal edges with stable periodontium as depicted in [Figure 1], evaluation of the TMJs was unremarkable, with normal jaw opening and range of motion. No joint sounds, signs or symptoms of vulnerability were evident. Load testing was performed utilizing bimanual manipulation which resulted in no reported tenderness or discomfort. Approximately 4mm loss of VDO was established and the amount to be increased was judged through the "Closest speaking space" and measurements made from the marginal gingiva of anterior teeth in both the arches. After explaining the procedure and obtaining patient's consent, a full mouth reconstruction with Hobo's twin stage technique was formulated.

Diagnostic models were obtained through impressions of both the arches with irreversible hydrocolloid. Maxillary cast was mounted on a semi adjustable articulator (Hanau Wide Vue) with a face bow tran

sfer and the mandibular casts subsequently mounted with interocclusal records interposed between the posterior teeth and an anterior deprogrammer to facilitate the closure in centric [Figure 2]. A maxillary stabilization splint was fabricated to evaluate and acclimatize the patient to the desired, altered VDO and periodic recalls were initiated to observe any muscular disharmony for 6 weeks before the final restorative procedure was commenced [Figure 3]. A diagnostic wax up was carried out at an increased vertical dimension of the posterior teeth without the anterior segment, wax up was done to produce balanced contacts in excursive movements, and anterior segment was reassembled to produce a wax up that provided disclusion, according to Condition 1 and Condition 2 (condylar and incisal guidance values set on the articulator) [Figure 4]. Tooth preparation was carried out in a segmental fashion and stage I provisionals were fabricated to reduce patient discomfort, thereafter from the index of the diagnostic wax up the stage II provisionals were fabricated and luted [Figure 5]. The patient was recalled after 3 weeks. After the patient's none hindered adaptation and harmonizing periodontal health a full arch final impression was made with polyvinyl siloxane [Figure 6] and definitive casts obtained were mounted with a face bow record. To transfer the altered VDO and centric, the provisionals of the right posterior quadrant were removed (upper and lower) and Interocclusal registration material was squashed in, while the other posterior and anterior quadrant provisionals provided the desired stop [Figure 7]. Eventually 3 such records obtained were used to mount the mandibular cast precisely. The wax patterns were fabricated according to [Condition 1 & 2], casting done and metal copings were tried in for margin, fit and accuracy [Figures 8a, 8b]. When deemed satisfactory veneering of porcelain done and a bisque trial [Figure 9] was performed to achieve the desired results. Final restorations were luted, [Figure 10] proper hygiene instructions given and followed up for 9 months with periodic recalls [Figures 12 a-b].

DISCUSSION

Management of reduced VDO aims not to increase it, but to restore the amount lost. The condylar path was the principle focus as it did not change during aging and thus making the anterior guidance and condylar path independent factors. However Dawson mentioned that it was not the sole determinant of incisal guidance, as the condyle moving down the unchanged condylar path permitted the lower

anteriorly to follow myriad path variations without interferences.² So it is desirable to set the condylar guide so that during movement it moves outward along the horizontal axis. As the etiology of the wear is multifactorial and often a dilemma subdues in determining the exact cause, the alteration of VDO is justified by using a splint or overlay prosthesis for gradual deprogramming of the joints. The key to posterior disclusion is the angle of hinge rotation, but it is entirely not liable as findings of clinical investigation suggests that the amount of actual disclusion in non-working and protrusive movements are not in unison,³ thus the unaccounted part is contributed to cusp shape factor.⁴ Condylar path, anterior guidance and cusp factor all contribute to a functional harmonization and thus as depicted in this case the stringent clinical methodology followed to achieve posterior disclusion, thus preventing harmful lateral forces as seen in [Figures 11 a-c]. The increase of VDO was determined by patient's physiologic factors and maintained through an overlay splint in graduated fashion justifies that for each millimeter the condyle is seated vertically the masseter muscle length is reduced almost 1 mm. It is, therefore, feasible that if the condyle is seated as the anterior vertical dimension is increased, there will be minimal contraction and anticipation of relapse, thus optimal occlusion according to the needs of the patient should be attained in rehabilitation procedures.

CONCLUSION

The averaged mathematical calibrations of values writes off the role of measured condylar guidance and provides a hassle free yet precise method for rehabilitation of worn out dentition. . An inclusive and practical approach is directed towards restoration and maintenance of the health of the stomatognathic system through Hobo's Twin stage technique.

FIGURES



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figures 8a and b

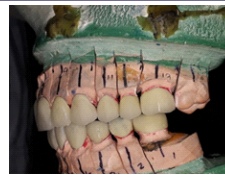


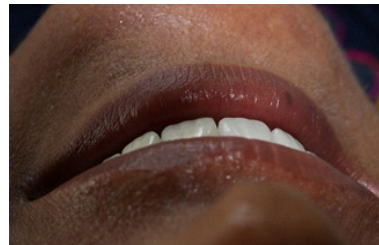
Figure 9



Figure 10



Figures 11a, b and c



Figures 12a and b

FIGURE LEGENDS

- Figure 1: Preoperative intra oral view.
- Figure 2: Anterior deprogramming and recording of centric.
- Figure 3: Maxillary occlusal stabilization splint.
- Figure 4: Diagnostic wax up according to condition 1 & 2.
- Figure 5: Provisional restorations.
- Figure 6: Final impressions.
- Figure 7: Transfer of increased vertical and centric.
- Figures 8a, 8b: Metal trial
- Figure 9: Bisque trial
- Figure 10: Postoperative intra oral occlusal and frontal view.
- Figures 11a-c: Protrusive and lateral excursions producing desired amount of disclusion through canine guided scheme.
- Figures 12 a-b: Extra and intra oral frontal view 9 months follow up.

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