

RE-ORIENTATION OF TEMPOROMANDIBULAR JOINT BY RESTORING THE VERTICAL DIMENSION OF OCCLUSION IN THE SEVERELY WORN DENTITION-A CASE REPORT

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INTRODUCTION :

Reconstruction of a severely worn dentition has been a challenge to a dentist's skills and capabilities. It demands rehabilitation within the physiological and functional harmony of the stomatognathic system.

The severely worn dentition, because of trauma, caries, attrition, abrasion, erosion or parafunctional habit, is associated with loss of vertical dimension of occlusion resulting in an unesthetic appearance, loss of muscle tonus, overclosure, and mastication and phonetic being adversely affected. It requires skill of an expert to regain a sound function of masticatory apparatus by occlusion rehabilitation.

A minimal amount of tooth wear on the occlusal, incisal and proximal areas is normal. Incisal and occlusal wear is a relatively slow process for most patient¹. Attrition has been postulated to be "physiologically normal and necessary for function"². Xhonga³ found the rate of normal attrition for nonbruxers to be 35 to 65 μ m in 6 months.

CASE REPORT

A 62 year old female patient was reported to VSOG Dental Clinic, Kathmandu Model Hospital in December 2000 with the complaints of severely worn dentition, TMJ pain, clicking, headache and tinnitus. On examination, the existing teeth were attrited, tenderness and clicking at TMJ, collapsed corners of lips, reduced vertical dimension of

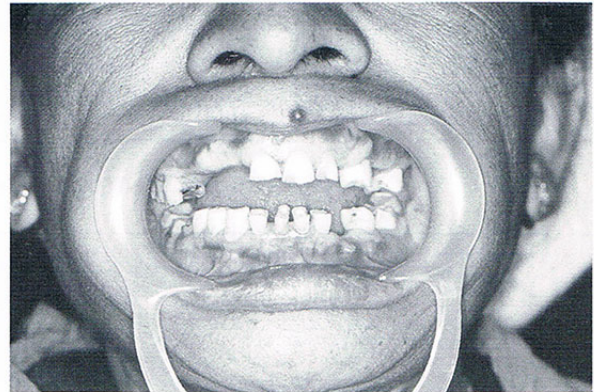


Fig. 1: Preoperative intra oral view

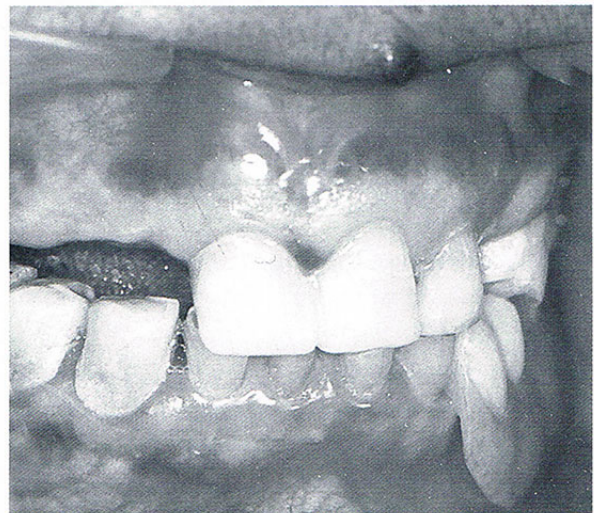


Fig. 2: Postoperative intra oral view

occlusion, increased freeway space and overclosure were noted, due to which the patient was not comfortable during functions like – chewing, swallowing, talking and esthetically as well as psychologically. It was tried to improve her certain conditions by putting her in muscle relaxant. Patient was not actually comfortable with it. So it was

decided to give her a treatment partial denture, “bite-raising appliance” making use of freeway space and increasing the muscle length thereby re-orienting the TMJ.

For this purpose, primary impression of both arches were made with irreversible hydrocolloid material. Diagnostic casts were prepared after pouring the impressions. Custom trays were fabricated and dual impressions were made. Master casts were prepared after pouring the final (dual) impression. Then temporary denture bases with occlusion rims were fabricated and jaw relations were recorded making use of excess freeway space, which

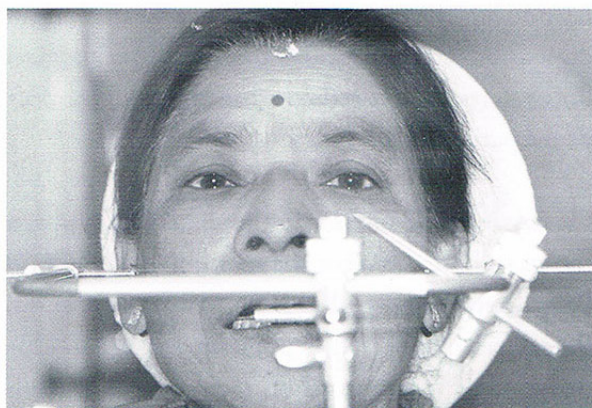


Fig. 3: Face bow record

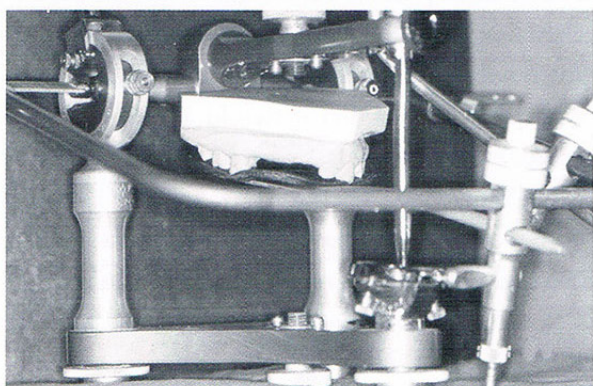


Fig. 4: Face bow record transferred into semi-adjustable articulator (Dentatus)

was around 8mm. Face bow record was made. Face bow record and jaw relation record were then transferred to semi-adjustable articulator (Dentatus)⁴. Waxed-up treatment partial dentures



Fig. 5: Wax up treatment partial denture

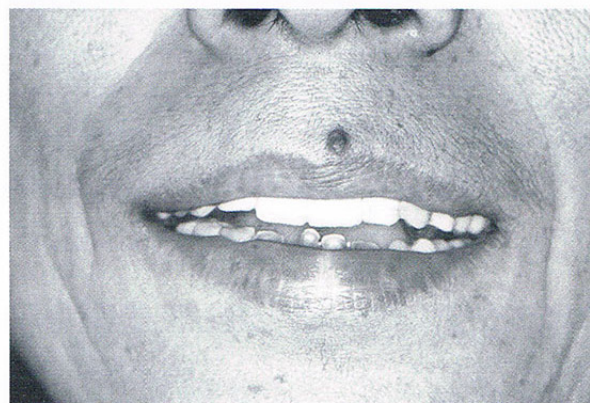


Fig. 6: Treatment partial denture in patient's mouth

with temporary denture base were invested. After wax elimination, processing, deflasking, finishing were carried out. The treatment partial dentures were then laboratory remounted and clinical remounted. Necessary occlusion correction, trimming and adjustments were done. Patient was given post insertion instructions and recalled after 24 hours for check up. After 24 hours of recall visit necessary adjustments in the denture base extensions and occlusion corrections were made. Patient was recalled every month for 3 months. During first 3 weeks, patients was given muscle relaxant as she complained of pain associated with muscles of mastication when excess freeway was utilized by “bite-raising appliance”^{5,6}. After 3 months decreased in freeway space was observed. Necessary tooth preparation was done to receive cast partial denture⁷. Master cast was duplicated in order to prepare refractory cast. Wax pattern was prepared, investing,

casting, finishing, and polishing were carried out. New face bow record and jaw relation were recorded. Then it was transferred into semi-adjustable articulator (Dentatus). Teeth arrangement and try-in was done. It was then inserted and patient was given post insertion instruction. Patient was

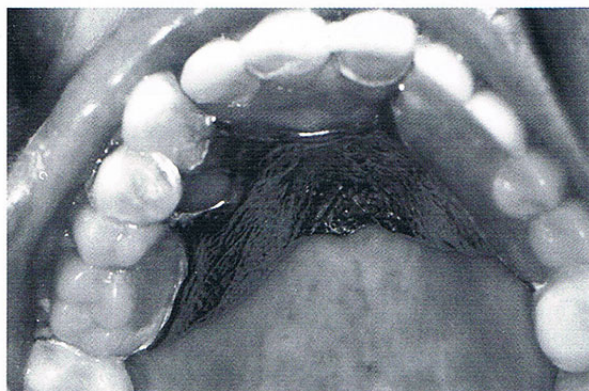


Fig. 7: Cast partial denture intra oral view



Fig. 8: Post operative extra oral view

recalled after 24 hours for necessary occlusal equilibration⁸. Patient was recalled every month for 7 months.

According to her, she was totally comfortable during insertion and removal of prosthesis, chewing, phonation, esthetic as well as swallowing. She complained of no TMJ pain, clicking, headache or tinnitus. Patient satisfaction was rated high. Prosthesis constructed in this manner indicated success in function, esthetic, phonation and tissue tolerance with minimal need of adjustment.

DISCUSSION :

The presence of caries, restoration, attrition, trauma or a combination of these conditions can cause teeth to have little intact coronal tooth structure remaining, resulting in loss of vertical dimension of occlusion. Many clinical studies indicate that, vertical dimension of occlusion is maintained even with rapid abrasive wear. As the occlusal surface wears, alveolar process elongate as compensatory mechanism by progressive remodeling of the alveolar bone⁹. As a result there is no loss of vertical dimension unless tooth loss occurs. However, in some situations occlusal wear is so rapid in onset that the compensatory mechanism fail therefore we have no logical alternative but to increase the vertical dimension within the functional and physiological limits to restore the esthetic, function and comfort of the patient.

Occlusal splint "bite-raising appliance" is used as a means to raise the vertical dimension of occlusion. Basic function of a splint is to prevent alteration, thus referred as muscle deprogrammer and it helps the condyle in returning to their centric relation position⁵.

One of the important consideration in full mouth rehabilitation is the selection of the articulator, to which one can stick till end. The main requirement of an articulator is that it should accept face bow record, especially in cases where vertical dimension would be altered. The face bow transfer allows a more accurate arc of closure of the articulator when interocclusal record is removed and the articulator is closed. When given a choice between a semi-adjustable and a fully-adjustable articulator, a semi-adjustable articulator can be successfully used for occlusal rehabilitation. A semi-adjustable incisal guide table, removable mounting rings, horizontal condyle lock path that are adjustable from 0-60 degree, a progressive side shift path at least 15 degrees and an inter-condyle width of approximately 110 mm, fulfils the requirement for full mouth

rehabilitation⁹. It has an additional advantage that condylar pathways are limited to straight line during protrusive movements, this gives a built-in safety for necessary disclusion of posterior teeth during eccentric movement. Another important consideration is customizing for the progressive side shift. In a semi-adjustable articulator the lateral condylar guidance adjusted to 15 degrees automatically eliminate all the balancing side contacts during lateral movements.

Correct orientation of occlusal plane with compensating curves incorporate poses problems in rehabilitating mutilated dentition. It is therefore essential that an anterior occlusal plane be established at the temporization stage. Speaking line, smile line and lower lip line may be assessed for optimum visibility of upper and lower anteriors. In addition, labio-lingual and superio-inferior positioning may be checked using labio dental sounds (f&v) and Silverman's closet speaking space. Once the anterior occlusal plane has been established, then it may be extended posteriorly incorporating antero-posterior and mediolateral compensating curves.

For occlusal rehabilitation a number of occlusal schemes have been enumerated in the literature. The Gnathological, Pankeyman-Schulyer and concept of balance occlusion etc. All these schemes are in agreement with axial loading of the teeth both in intercuspal position and centric relation position, however they differ in relationship of intercuspal position to centric relation. According to Gnathological concept, centric relation and intercuspal position should coincide while Pankeyman-Schulyer theory states that there should be an area of function between both the positions. They have been propagating the use of canine guidance, bilateral balance and group function during excursive movements. Canine guidance is superior to the other because it is easier to establish and anatomically acceptable. Moreover, canine has a long root surrounded by dense compact bone and

least muscular activity is recorded when canines are in function. Here in this case, group function occlusion i.e. multiple contact between maxillary and mandibular teeth on working side during eccentric movements because canines were weak or they could not bear the horizontal masticatory forces.

CONCLUSION :

The clinical report describes the full mouth occlusal rehabilitation of a patient with severely worn dentition and reduced vertical dimension. The nonsurgical treatment was pioneered by Farrar and involves corrective occlusion prosthesis designed to recapture the disk in its correct anatomic relationship to the condyle, followed by appropriate adjustments in the prosthesis and occlusion to maintain this relationship. Rehabilitation of such a condition is possible after thorough diagnosis and treatment planning. Success of such treatment depend upon the cooperation of the patient and post insertion instructions being followed by the patient. "Success comes to those who seek for it, not for those who wait for it."

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