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Case Report

Rehabilitation of Mutilated Dentition-Two Aspect of Cases

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Abstract

Reorganization of an occlusion in a mutilated dentition is the most challenging task faced by the prosthodontists. Various factors such as, vertical dimension of occlusion, acquired defects, centric relation, occlusal contact pattern, aesthetics and phonetics need to be considered simultaneously for the rehabilitation. We hereby, are comparing entirely two different cases, one with maintained vertical dimension of occlusion and another with loss of vertical dimension of occlusion being treated in a simple and systematic manner to improve the function as well as aesthetics.

Keywords: *Vertical Dimension; Centric Relation; Attrition; Full Mouth Rehabilitation*

Introduction

The word rehabilitate implies 'To restore to good condition or to restore to former privilege'. The term full mouth rehabilitation is used to indicate extensive and intensive restorative procedures in which the occlusal plane is modified in many aspects in order to accomplish equilibration. Full mouth rehabilitation however continues to be one of the biggest challenge to any clinician in restorative dentistry. It requires efficient diagnosis and elaborate treatment planning to develop ordered occlusal contacts and harmonious articulation in order to maintain stomatognathic function, health and esthetics which leads to patient's comfort and satisfaction [1].

Full mouth rehabilitation should establish a state of functional as well as biological efficiency where teeth and temporomandibular joint mechanism all function together in synchronous harmony. It seeks to convert all unfavourable forces on teeth which invariably lead to periodontal conditions into favourable forces which permit normal function and therefore induce healthy condition. It implies the normal restoration of impaired occlusion, enhancement of esthetics, preservation of remaining teeth and maintenance of healthy periodontium [1,3].

Particular approach followed for a patient must result in healthy maintainability of teeth and their respective supporting structures in harmony with the muscles, bones, joints, ligaments of mouth and jaws.

Full mouth rehabilitation is to restore impaired occlusal function, maintain healthy periodontium, eliminate pain and discomfort of teeth and surrounding structures. It correlates centric occlusion with the unstrained centric relation. It retains the vertical dimensions, establishes smooth guiding tooth inclines, reduce the steepness of inclines of guiding tooth surfaces to so that the occlusal stresses are

more favourably applied to supporting structures. It also obtains the maximum distribution of occlusal stress in centric relation by decreasing the size of occlusal contact surfaces.

Various classification have been proposed to classify patients requiring full moth rehabilitation. Most widely adopted classification is the one given by Turner and Missirlian [2]. According to them, the patients with occlusal wear can be broadly classified as follows:

Category 1: Excessive wear with loss of vertical dimension of occlusion- The patient closest speaking space is more than 1 mm and the interocclusal space is more than 4 mm and has some loss of facial contour and drooping of the corners of the mouth. All teeth of one arch must be prepared in a single sitting once the final decision is made. This makes the increase in VDO less abrupt and allows better control of esthetics.

Category 2: Excessive wear without loss of VDO but with space available -Patients typically have a long history of gradual wear caused by bruxism, oral habits, or environmental factors but the occlusal vertical dimension (OVD) is maintained by continuous eruption. It might be difficult to achieve retention and resistance form because of shorter crown length and gingivoplasty may be needed. Enameloplasty of opposing posterior teeth may provide some space for the restorative material.

Category 3: Excessive wear without loss of VDO but with limited space- There is excessive wear of anterior teeth over a long period, and there is minimal wear of the posterior teeth. Centric relation and centric occlusion are coincidental with a closest speaking space of 1 mm and an interocclusal distance of 2–3 mm. In such cases, vertical space must be obtained for restorative materials. This can be accomplished by orthodontic movement, restorative repositioning, surgical repositioning of segments, and programmed OVD modification.

This article hereby discusses the rehabilitation of patients presenting with excessive wear with loss of vertical dimension of occlusion and patients with excessive wear without loss of vertical dimension of occlusion with sufficient space available for restoration.

Case Report I

A 55-year-old male patient reported to the Department of Prosthodontics, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India with chief complaint of difficulty in chewing due to excessive tooth wear and discoloured teeth. The patient gave a history of gradual wearing of teeth with time (Figure 1 Frontal view).

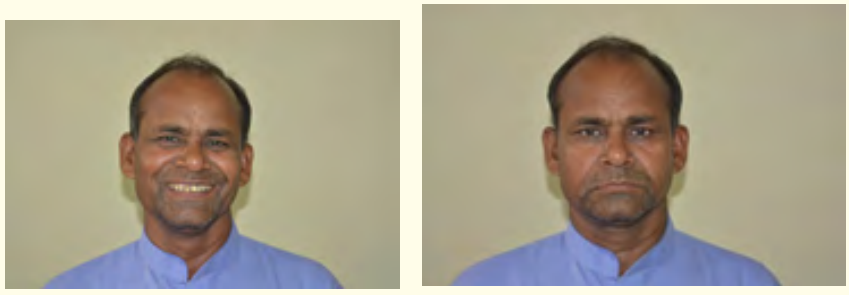

Figure 1: *Frontal view.*

On examination, there was generalized attrition, poor aesthetics, sensitivity of teeth, chewing difficulties and loss of tooth substance due to chipping and wearing. Both the arches were fully dentate. The patient had a bilateral class I molar relation. Approximately 5 mm of loss was established in VDO (Figure 2, severly worn teeth with loss in vertical dimension).

Figure 2: *Severely worn teeth with loss in vertical dimension.*

In order to properly diagnose the case, a comprehensive examination was conducted, inclusive of a full mouth radiographic series, caries detection and periodontal probing.

Evaluation of TMJ revealed normal jaw opening and range of motions. No abnormal sound, signs or symptoms of instability were evident.

The case was eventually diagnosed as ''Mutilated dentition with reduced vertical dimensions due to severe attrition". Diagnostic impressions were made by using irreversible hydrocolloid impression material.

Soft occlusal splint of approximately 3mm thickness was fabricated for maxillary arch and patient is advised to wear it continuously for 3 months. This period was required to adapt the patient to restore the lost vertical dimension and check his tolerance.

After 3 months, patient reported with relief and then an anterior deprogramming jig was fabricated by manipulating modeling compound Type II at the temperature of 60°C on the mandibular anterior teeth. Anterior deprogrammer helps to harmonize the anterior guidance for best possible esthetics, function and comfort (Figure 3, anterior deprogrammer and posterior interocclusal record). Centric relation was recorded by using polyether bite registration material. Facebow transfer was also done for the patient and then transferred same to the articulator (Figure 4, facebow record).

Figure 3: *Anterior deprogrammer and posterior interocclusal record.*

Figure 4: *Facebow record.*

Using facebow record maxillary cast is articulated on Whipmix semi adjustable articulator. Mandibular cast was mounted with the help of anterior deprogramming jig and centric relation bite records.

The plane was determined by the Broadrick's occlusal plane analyzer (Figure 5, custom made broadrick's plane). It is a useful tool as it identifies the most likely position of the centre of curve of spee. Its purpose is to permit reconstruction of the curve of spee in harmony with the incisal and condylar guidance [6].

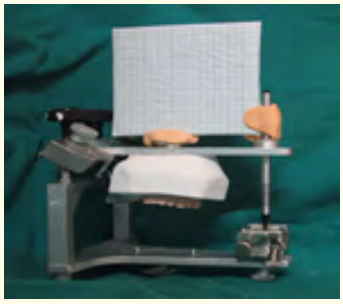

Figure 5: *Custom made broadrick's plane.*

Wax up was done for maxillary and mandibular teeth with inlay wax in the recorded centric relation.

Minimal occlusal reduction is indicated for patients who are scheduled for rehabilitation at an altered VDO. Preparation of maxillary right and left posterior teeth was performed using the index to confirm clearance. With the index in place, posterior bites were taken. The index was then removed and the anterior teeth were prepared utilizing posterior bite records. Preparing the anterior and posterior tooth in such a way maintains the centric relation and vertical dimension position. A full arch elastomeric impressions were made and provisionalization was done in three sections, two posterior sections from molar to first premolar, and an anterior section from canine to canine.

On the next visit, tooth preparation and provisionalization was done in the similar way as done before. Maxillary provisional restorations were removed and anterior bite records which were made previously were inserted and mandibular posterior tooth preparation

was done. Then, posterior bite records were taken and anterior teeth were prepared utilizing the posterior records to check clearance. A final elastomeric impression was made and mandibular provisional restorations were fabricated in three sections (Figure 6, Final temporization).

Figure 6: *Final temporization, quadrant wise.*

On the follow-up visits patient, the provisional restorations were subsequently equilibrated to establish maximum intercuspation in centric relation with canine guidance and also with anterior guidance. Once the provisional restorations were equilibrated and the esthetics and phonetics were found satisfactory, patient will undergo final restorations.

Case Report II

A 24-year-old female patient reported to the Department of Prosthodontics, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India with chief complaint of grossly decayed permanent teeth, pain, difficulty in chewing and unesthetic appearance (Figure 7). The patient gave a similar history of decay and subsequent loss of deciduous teeth. Patient reported to our department with endontically treated maxillary and mandibular teeth. On examination, there was generalized carious teeth, poor aesthetics, sensitivity of teeth, chewing difficulties and loss of tooth substance. Both the arches were fully dentate, with spacing between maxillary and mandibular anterior teeth. The patient had a bilateral class I molar relation and a canine-guided occlusion. There had been no loss of vertical dimension of occlusion.

Figure 7: *Pre-operative records of the patient showing multiple endodontically treated maxillary and mandibular teeth.*

Full mouth radiographic evaluation was done to reach proper diagnosis. Multiple endodontically treated maxillary and mandibular teeth can be appreciated in the mull mouth radiograph. TMJ evaluation showed normal jaw opening and normal range of motion. No abnormal sounds and mandibluar deviation can be noticed. Diagnostic impressions were made with alginate.

Facebow and interocclusal record were taken and articulation of maxillary and mandibular cast was done on a semi adjustable articulator. It had been found that there was no loss on vertical dimension of occlusion.

There was severe tooth structure loss both with maxillary and mandibular anterior teeth, hence post and core where performed to build up the tooth structure (Figure 8). As there is no loss of vertical dimension at occlusion, tooth preparations were in a proper sequence. Right side tooth preparation was done first taking left side occlusion as guidance for clearance. Index was made on the right side after completion of tooth preparation which acted as a guide for tooth preparation on left side. Final elastomeric impressions were made of both the arches. Provisional restorations were placed on the prepared teeth.

Figure 8: *Fibre post and composite core buildup of maxillary and mandibular anterior teeth.*

On the next visit, provisional restorations were removed and metal try-in was done to check for the proper fit and verification of occlusal clearance (Figure 9). Once metal try-in was done, it was sent to laboratory for fabrication of final prosthesis.

Figure 9: *Metal try-in of the maxillary and mandibular dentition.*

On the third visit, cementation of the final prosthesis was done and occlusion was checked for any high points (Figure 10).

Figure 10: *Post treatment records showing various full mouth prosthetic rehabilitation of the patient.*

On the follow-up visits patient was checked for occlusal harmony, esthetics and phonetics.

Discussion

Occlusal rehabilitation deals with the restoration of functional integrity of dental arches. The primary objective of full mouth rehabilitation is preservation of health, restoring function, achieving esthetics and most importantly providing comfort to the patient [5]. Other important factor which has to be taken into consideration is disocclusion of teeth during excrusive movements which would preserve the integrity of entire stomatognathic system, resulting in a long lasting, functional restoration.

As per literature the condylar and anterior guidance are considered to be the primary determinants of the occlusal rehabilitation. The technique which has been used for the rehabilitation of severely worn dentition describes the use of Broadrick's plane analyzer which helps in establishment of acceptable occlusal plane by marking the position of curve of spee [6]. The relevance of recording and maintaining the curve is to minimize posterior protrusive interferences, which in turn prevents abnormal activity of mandibular elevators like temporalis and masseter.

Group function occlusion refers to a group of teeth rather than assigning the force on one particular teeth. Lateral forces is distributed to all working side teeth in order to prevent the overloading of the canine. This helped in distribution of forces over number of teeth thus protecting the canines [10,14].

The maintainence of the severely worn out dentition can only be ensured by the development of poor anterior guidance that allows proper posterior disocclusion within the patient's envelope of function. Provisionalization in such cases ensures the minimal adjustments in the definitive restorations and hence provides the greater long term predictability of the case. Hence, by discussing the case reports, assessment of vertical dimension and centric relation is important for the management and effective treatment planning. Vertical dimension is not lost in all the cases. Many a times, it has been compensated by stimulated growth of alveolar bone and tissue and continual eruption of teeth but sometimes loss in vertical dimension is too high to be compensated. It increases the work of the clinician to come up with precise treatment plan, establishing the proper occlusal plane and rehabilitating according the patients need.

Two cases were taken one presenting with loss in vertical dimension and other with maintained vertical dimension. In the former case, increasing the vertical dimension and maintaining the centric relation is a challenge both for the clinician as well as to the patient.

The main purpose is to restore function, esthetics and form of the mutilated dentition. As far, patient's response in both the cases is good towards the treatment. So, every case should be thoroughly evaluated and planned accordingly. Follow-up of the patients should be done at regular intervals and discrepancies if present should be removed.

Conclusion

Severely worn cases present many challenges to the clinician, including gaining the space to create restorations to satisfy the patients esthetic desires along with fulfilling occlusal and functional parameters that are essential for long term success. It is always difficult to treat a patient with reduced vertical dimension at occlusion. It needs more precise technique, more resources and time both of the patient and the clinician.

The occlusal rehabilitation procedure requires proper clinician patient relationship as it is a long-term procedure that needs full co-operation from the patient. All the cases are different from others. Therefore, a clinician should come up with a proper technique after a comprehensive diagnosis of patient's clinical condition and prospective consideration of his or her oral health, comfort, function and esthetic requirements.

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