

Goal and Diagnosis of Full Mouth Rehabilitation

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ABSTRACT

Full mouth rehabilitation entails the performance of all the procedures necessary to produce healthy, aesthetics, and well functioning, and self-maintaining masticatory mechanism. This article is aimed to understand the physiology and mechanics of occlusion while maintaining the full mouth rehabilitation.

Keywords: Diagnostic wax up, full mouth rehabilitation, morphology, occlusion.

INTRODUCTION

Function and health can be restored to badly deteriorated, diseased mouths by utilizing modern techniques of oral rehabilitation. Recent advances in dental technology, materials and equipment however, have simplified the task of rebuilding, restoring, and rehabilitating diseased mouths. This has enabled dentists to preserve many teeth which would have been sacrificed. Achieving success in full mouth rehabilitation requires a multidisciplinary approach. The ultimate goal of any dental treatment is to provide optimum oral health.

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”.

The modification of plane is characterized by full coverage, multiple crowns, multiple splinting of teeth, modification of arch form by labial or lingual positioning of crowns and various procedures for ‘repositioning’ the mandible. It implies the restoration of impaired occlusion, enhancement of esthetics, preservation of the remaining teeth and maintenance of a healthy periodontium.

Treatment plan must result in healthy maintainability of the teeth and their respective supporting structures in harmony with the muscles, bones, joints and ligaments of the mouth and jaws.

All current experimentation and research in various branches of dentistry is inspired by a common purpose that is to develop the most effective program of oral health service for curing as well as preventing disease. However, the road leading to this is long and thorny, filled with a history of trial, error and adjustments. Many investigators and clinicians have developed procedures based on multitude of theoretic considerations. The final judge in the validity of some of these theories is the clinical experience. Full mouth rehabilitation entails the performance of all the procedures necessary to produce a healthy, esthetic, well functioning, self-maintaining masticatory mechanism.

REASONS FOR FULL MOUTH REHABILITATION

Occlusal wear is most often attributed to attrition. Attrition is defined as ‘the wearing away of one tooth surface by another tooth surface’.

The causes for worn dentition are -

Congenital abnormalities- Amelogenesis imperfecta and Dentinogenesis imperfecta

- **Amelogenesis imperfecta**

It is a hereditary defect of the enamel occurring in a ratio of 1:14000 in general population. It is classified into 3 types- hypoplastic, hypomaturation and hypocalcified. These result in early loss of enamel and rapid attrition of tooth structure. In hypoplastic type, enamel thickness is reduced. In hypomaturation enamel is of normal thickness but soft and tends to fracture from dentin. In hypocalcified type enamel is of normal thickness but extremely friable and soon lost after tooth eruption.

- **Dentinogenesis imperfecta**

It is also called as 'hereditary opalescent dentin'. It is a dominant autosomal trait with a high degree of penetrance and occurs in a ratio of 1:8000 people. It may be associated with osteogenesis imperfecta. The dentin-enamel attachment is weak with normal enamel which shears away leaving soft dentin. This gives a characteristic amber colored translucency to the dentin which is subject to rapid dentin attrition.

Para functional occlusal habit- Chronic bruxism leads to excessive wear. This habit is usually associated with emotional stress and may be triggered by occlusal interferences. Counseling to break habit, occlusal splint, occlusal adjustment and restorative procedures are used to treat it.

Abrasion- Excessive wearing away of tooth tissue by external agents can mutilate the dentition

Erosion- Chemical action leads to worn cupped-out appearance of incisal edges and lingual surfaces. Citrus juices, cola drinks, carbonic acid beverages, vinegar, pickles, hydrochloric acid for achlorhydra, regurgitation of stomach foods and chronic vomiting in anorexia nervosa cause erosion.

Loss of posterior support- Loss of posterior support is probably the most common cause of decreased occlusal vertical dimension. Posterior collapse that results from missing, tipped, rotated, broken down teeth, malposition and occlusal interference exerts undue force on anterior teeth resulting in teeth mobility and excessive wear of clinical crown.

GOAL OF FULL MOUTH REHABILITATION

The modern practice of renewing and reorganizing the teeth by prostheses began with the idea of "raising the bite" to rectify closure resulting from excessive wear of the occlusal surfaces. Later, such closure was associated with hearing loss, noted by Costen. To accomplish this, these teeth were rebuilt to harmonize with the movements of the joints in order to protect them from further injury. With our present understanding of traumatic occlusion and its deleterious effect upon the supporting structures, the procedure known as "bite raising" has shifted in emphasis and broadened in scope and is now designated by a term that describes it accurately. Full mouth reconstruction, as of now includes therapy which will, by improving the relationship of the teeth, improve the condition and health of the supporting structures. It should be kept in mind that although the operations of all mouth rehabilitation procedures are performed on tooth units, they have one basic objective: the equalization of the forces directed against the supporting structures. Any disharmony at the occlusal or incisal aspects of a tooth will direct forces against these malaligned surfaces and thus subject the supporting structure to traumatic injuries. Similarly, any impairment of buccal or lingual harmony will be reflected in injury to the gingival tissue and subsequently to the deeper tissues involved in supporting the tooth. The proximal contact anatomy is also vital in maintaining the health of the underlying soft tissue. Poor contact relationships encourage food impaction with resultant periodontal tissue loss.

DIAGNOSIS

In prosthetic treatment the dentist must have a practical and scientific approach to the problem. Diagnosis of the disease is a prerequisite before planning any treatment. Hence knowledge of all branches of dentistry is required.

The problems can be easily solved with a programmed approach

The first appointment is the listening time. The patient's problems, his point of view, long term expectations and opinion on esthetics should be judged. Impressions for study casts, radiographs, bite records and face bow records are to be taken. Clinical examination of the mouth and the articulation should be checked. The diagnosis and tentative treatment plan is made.

At the second appointment, individual tooth is meticulously examined and evaluated to determine whether they should be extracted or can be restored. Determination is made whether the remaining teeth would best be served by fixed or removable prosthesis.

Diagnostic wax-up

Before diagnostic wax-up, the occlusal discrepancies in centric and eccentric occlusion should be eliminated. Diagnostic preparation of gypsum stone teeth that will require prospective crowns is carried out. This will reveal any resistance or retention form problems caused by short axial walls. Thus planning of subgingival margins or surgical crown lengthening required can be done. Then wax is used to appropriately shape all crowns and final prosthesis is planned. This diagnostic wax-up can be used to prepare an elastomeric putty mould and used for temporization or sectioned through long axis of tooth to act as reduction guide intra-orally.

However, today advancements in endodontic and periodontic skills provide healthier abutments making fixed treatment possible. Fixed prosthesis in anterior poor ridge condition can be made esthetic by ridge augmentation. Implants can make the use of fixed partial dentures where removable prosthesis was the only treatment option available earlier.

The advent of implant prosthesis has increased the option of choice between fixed and removable. Evaluation of implant site is done with clinical and radiographic examination for the quality and quantity of available bone. Treatment planning aspects of implant placement must be done with a consideration for restoration. Distal extension cases and long edentulous span restorations which needed removable prosthesis can be fixed with implants.

Completely edentulous patients can also be rehabilitated using fixed metal ceramic rehabilitation on multiple implants. Hybrid prosthesis which combines the principles of conventional fixed prosthesis to which resin is added to mimic soft tissue esthetics can also be used.

After considering all the treatment options available, decision regarding the treatment plan which will best suit that particular patient is to be followed is finalized.

Prosthetic Phase

Prosthetic full mouth rehabilitation is divided into

- Immediate treatment
- Definitive treatment

Immediate Treatment

In some cases like amelogenesis imperfecta in a child, postponing treatment until adulthood may cause adverse psychological effect and impair correct relationship between maxillary and mandibular teeth. Preformed nickel-chromium crowns are placed on first permanent molars and second deciduous molars to stabilize occlusion and prevent attrition. Vertical dimension is not altered. As anterior teeth and premolars erupt, polycarbonate resin crowns are given. Second molar is fitted with nickel crown to preserve vitality. After all permanent teeth are erupted, these restorations serve as transitional treatment until adulthood.

Definitive Treatment

Once all teeth have erupted and adulthood is reached, the size of pulp horns decreases compared to newly erupted teeth. A definitive treatment can then be planned.

Using the Functional Model

The articulator is always locked in the centric relation position that allows absolutely no lateral movement when the functional model is in use. Since the pathways of lower teeth are recorded three dimensionally in the solid core, moving the articulator laterally produces an error.

The technician has the following three options for using the functional model –

- 1) Wax the restorations directly under the functional model.
- 2) Wax against the anatomic model and then refine the occlusal inclines and check for interferences against the functional core.
- 3) Complete the castings against the anatomic models and then adjust the metal or porcelain surface against the functional model.

MAKING ADJUSTMENTS AGAINST THE FUNCTIONAL MODEL

When the restorations or the wax up are on the upper model, there should be no crack between the 'key teeth' and the lower functional stone core. This crack is an indication of an occlusal interference which is removed by marking with silk articulating ribbon and selective spot grinding. Infraocclusion can be noted by checking whether the die can be moved up and down when the restoration is in place.

Group function is obtained by adjusting the working inclines, that is, the lingual incline of the upper buccal cusp should be in contact with the core. Balancing inclines should be relieved. The length of the stroke contact on the working incline should be shortened progressively from front to back by relieving the pattern from the buccal edge toward the centric stop.

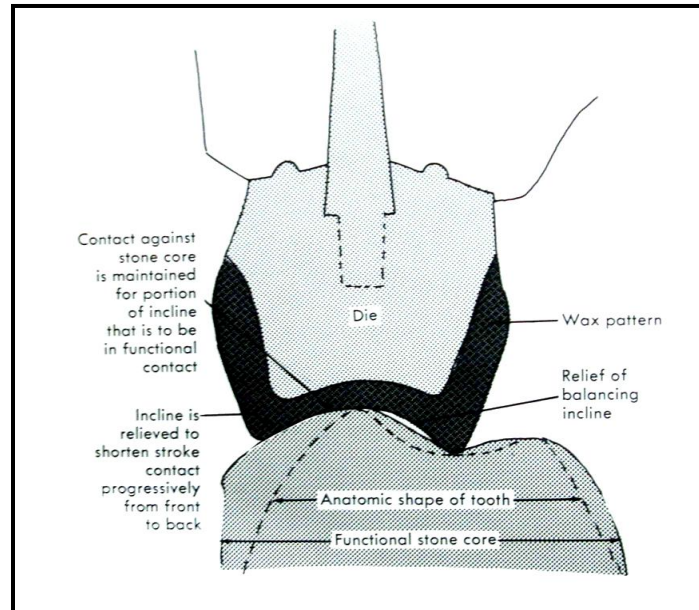


Fig-1: Adjustment for group function occlusion using functional core functional core

Disclusion of posterior teeth in canine guided occlusion for lateral movements is obtained by taking the inclines out of contact with the functional core and leaving only selected centric contacts.

Balancing inclines should be out of contact.

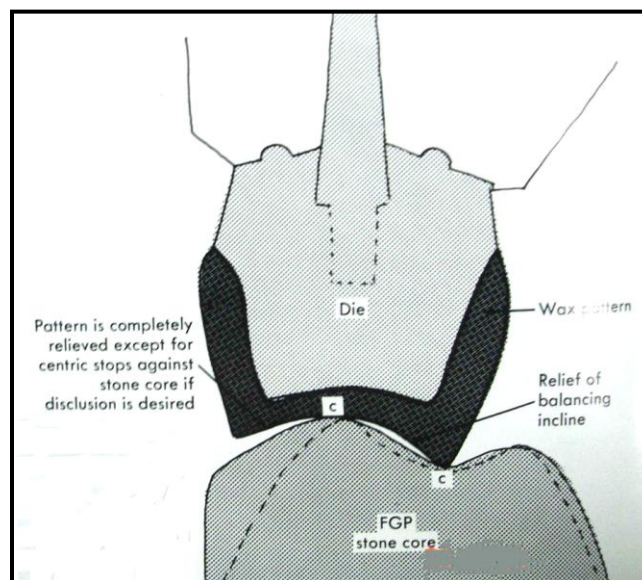


Fig-2: Adjustment for canine protected occlusion using functional core functional core



CONCLUSION

Failure in full mouth rehabilitation case may be dependent on technical and biophysical factors. Technical failures may be loss of restorations and retainers or fracture of metal or porcelain components. Caries, fracture of abutments, periodontal disease and extractions are classified as biological failures.

Health of periodontium is influenced by the oral hygiene practice of the patient, crown position and margin, contour and occlusion of the restoration. Hygiene instructions combined with repeated prophylaxis every six months prove successful in maintaining oral health. Adequate plaque control program to prevent secondary caries is essential.

Provided the recall schedules and oral hygiene maintenance is properly done and restorations are meticulously fabricated considering mechanical and biological factors, full mouth rehabilitation can provide a long term success.

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