

**Functional and aesthetic full mouth rehabilitation of a severely worn-out dentition - A clinical report**

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**Abstract:** Prosthodontic rehabilitation of a severely worn-out dentition aims to restore the form, function and aesthetics of the patient. Efficient diagnosis and elaborated treatment planning is required to achieve proper occlusal contacts in harmony with a healthy stomatognathic system. Severe wearing of the teeth results in loss of anterior guidance, collapse of posterior teeth, loss of occlusal plane with reduction in vertical dimension. The objective of full mouth rehabilitation is to convert all unfavorable forces into favorable forces and thereby maintain a health condition with proper function. This clinical report presents a stepwise successful approach for full mouth rehabilitation of a fully worn-out dentition.

**Keywords:** Full mouth rehabilitation, Attrition, Vertical dimension of occlusion, Aesthetics.

**Introduction**

Occlusal wear is most commonly seen due to attrition which can occur in association with congenital anomalies like amelogenesis imperfecta, dentinogenesis imperfecta, enamel and dentin dysplasias or due to parafunctional habits. Extensive occlusal wear results in decreased vertical dimension of occlusion.<sup>1</sup> The etiology of non-carious worn dentition can be multifactorial and may be a combination of attrition, abrasion and erosion. Restoration of a worn-out dentition may be challenging especially when there is a lack of restorative space available.<sup>2</sup> Well defined wear facets and shiny surfaces are characteristic features of attrition caused by tooth-to-tooth friction without any intervening substance. Such wear facets are seen on the functional surfaces with a deep vertical overlap. It results in pulpal pathologies, impaired occlusal function and dental and facial

aesthetic problems like loss of lower facial height, drooping of the corners of the mouth and facial wrinkles.<sup>3,4</sup>

Management of worn dentition is often challenging and a careful and planned treatment approach is needed to attain long term clinical success of the prosthesis. Articulated study casts and diagnostic wax up has to be done and the assessment of vertical dimension plays a crucial role in comprehensive treatment planning. Assessment of vertical dimension of occlusion should be done prior to the initiation of treatment and a trial period with an interim prosthesis is desirable.<sup>5</sup> Tolerance to the changes in vertical dimension has to be evaluated by using a diagnostic splint or provisional restoration.<sup>6</sup>

This clinical report presents a case of an aesthetic and functional full mouth rehabilitation of a patient with a severely worn-out dentition after evaluating the adaptation to a removable occlusal overlay splint.

### **Case report**

A 51-year-old female patient reported to the department of Prosthodontics with the chief complaint of sensitivity while eating hot and cold food. The patient had no relevant medical history and had a betel quid chewing habit for the past 15 years. On intraoral examination generalized attrition with respect to maxillary and mandibular teeth with loss of vertical dimension was seen. The patient presented with a healthy periodontium with good bone support. The interocclusal rest space was measured between the tip of the nose and chin. Phonetic evaluation was also done to assess the freeway space. On examination a freeway space of 7mm was found and hence an increase in vertical dimension of 4mm was planned. Drooping of the corners of the mouth and wrinkles were observed. The possible causes of attrition like parafunction, eating habits and dental ignorance were explained to the patient. The mandibular anterior

and premolars were severely attrited up to the gingival level and root canal treatment was advised for mandibular anterior, premolars first molars, maxillary anterior and premolars. The patient's casts were mounted in a semi adjustable articulator (Hanau™ modular articulator; Whip Mix Corp, Louisville, USA) using a face bow record. The new VDO was set at 3mm increase in the incisal pin of the articulator and a hard acrylic splint was designed so that it guides the anterior teeth in excursive movements and offer bilateral occlusal contacts in centric relation. The patient was asked to wear the splint for at least 6-8 hours per day for 14 days after which the patient's adaptation to the new increased vertical dimension was evaluated. No temporomandibular discomfort or muscle tenderness was reported by the patient. Further the vertical dimension was increased to 1mm more and the patient was instructed to wear the new splint for 7 days. The adaptation of the patient to the new VDO was assessed and was found to be satisfactory. The same splint was then divided into three parts: anterior canine to canine, right and left 1<sup>st</sup> premolar to 2<sup>nd</sup> molar. With the anterior splint in position composite buildup was done on the posterior teeth to establish the desired vertical dimension. Preparation of all the teeth were done along with post and core for mandibular anterior and premolars. Right and left sectional putty bites were made keeping the hard splint on opposite side. Similarly anterior sectional bite was made by keeping the posterior hard splints on both the sides. Provisional restorations were given in three sections, anterior, right and left posteriors separately. The patient was under provisional restoration for 1 month during which no stomatognathic discomfort was reported. The definitive impression was made using polyvinyl siloxane impression material. Bite registration was taken using provisional crowns and

occlusal registration material. E- max crowns were planned for anteriors and metal ceramic crowns for posteriors with a mutually protected occlusion. After metal try in and bisque try in the final crowns were cemented. The patient was instructed to wear night guards and to quit the habit.

### Discussion

The primary requirement of full mouth rehabilitation is a healthy temporomandibular joint, non-interfering posteriors in harmony with anterior guidance.<sup>9</sup> All these factors are correlated and any disharmony between them can affect the balance of the stomatognathic system. Attrition of the teeth can occur due to various factors many of which remains unidentified. Turner and Missirlian in 1984, classified the severely worn dentition by the amount of lost vertical dimension of occlusion and available restorative space.<sup>1</sup> Niswonger, cited by Tallgren suggested that the distribution of wear in dentition is uneven in anterior and posterior teeth and posterior occlusal prematurity may cause increased anterior function leading to severe attrition.<sup>1,3</sup> The etiology of the wear should be found out for predictable outcome of the treatment procedure. Physiological wear can be compensated by continued eruption of the teeth but many times the accelerated wear may exceed the process of eruption resulting in loss of VDO.

Four options are available for the rehabilitation of severely attrited dentition.

- 1) Pin retained full gold restoration
- 2) Increasing the vertical dimension of occlusion
- 3) Crown lengthening procedures
- 4) Endodontic intervention followed by definitive crowns.<sup>4</sup>

The wearing period of occlusal splint and provisional restoration varies in literature. The trial period of splints varies from 3 weeks to 5 months and intensive fixed

provisional from 1-6 months.<sup>1,5,6,7,8</sup> Here the patient was carefully monitored for 3 weeks and was found to be comfortable and adapted to the new vertical dimension of occlusion. Based on the patient's adaptability and condition the interim period can be adjusted and modified. What is most important in the long-term clinical success is the periodic recall and monitoring. Any signs of recurrent wear should be identified and immediate intervention has to be done.<sup>10</sup>

### Figures



Figure 1: Preoperative view



Figure 2: Intraoral view



Figure 3: Maxillary arch



Figure 4: Mandibular arch



Figure 5: Hard acrylic diagnostic splint



Figure 6: Composite build up done to the

established vertical height



Figure 7: Right sectional putty bite



Figure 8: Left sectional putty bite



Figure 9: Anterior sectional bite made with both posterior sectional bites in position



Figure 10: Sectional putty bites



Figure 11: Provisionalisation



Figure 12: Final cemented maxillary crowns



Figure 13: Final cemented mandibular crowns



Figure 14: Post operative view

### Conclusion

Minimal and gradual physiological attrition of teeth is a normal process but excessive occlusal wear can result in abnormal function and aesthetics. Abnormal occlusion is often overlooked by the patient due to ignorance or neglect and often results in the need for extensive prosthetic intervention. The treatment should aim to establish stable contacts on all teeth with equal forces in centric relation and eccentric jaw movements. Hence a

reliable and predictable treatment approach should be chosen for long term clinical success of the prosthesis.

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