Full mouth rehabilitation of the patient with severely worn dentition - A clinical report

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ABSTRACT

Full mouth rehabilitation is challenging in preventive and restorative dentistry. Full mouth rehabilitation seeks to convert all unfavorable forces on teeth which invariably lead to periodontal conditions, into favorable forces which permit normal function and therefore induce healthy condition. Thus it entails the performance of all the procedures necessary to produce a healthy, esthetic, well functioning, self maintaining masticatory function. This paper discusses the phases of prosthodontic rehabilitation, from diagnosis to final treatment, of a 55 year old bruxer with severely worn dentition.

Key Words: Tooth wear, Vertical dimension of occlusion, Full mouth rehabilitation, bilateral balanced occlusion.

INTRODUCTION

The gradual wear of the occlusal surfaces of teeth is a normal process during the lifetime of a patient. However, excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function, and esthetic disfigurement [1]. Management of tooth wear and attrition is an interesting subject in preventive and restorative dentistry [2]. The occlusion vertical dimension (OVD), the interocclusal rest space (IRS), and centric relation (CR) records are critical for successful treatment. In order to achieve a predictable and desirable prognosis, a systematic approach may be helpful [3]. This current article presents the treatment procedure of a patient with generalized attrition in a simple and systematic manner to improve the function as well as aesthetics.

CASE REPORT

A 55 year old man referred to the Department of Prosthodontics of Govt. dental college and hospital, Patiala for treatment of his worn teeth. The patient’s chief complaint was chewing deficiency and speech problems. The medical history was noncontributory, extraoral examination revealed no facial asymmetry or muscle tenderness. The mandibular movements were normal. Intraoral examination revealed overclosure, severely worned mandibular dentition with missing 45, 46 and 47 and partially edentulous maxilla with only 13 present.(Fig. 1).
Several treatment options are available for a patient with restricted restorative space; (a) increasing the VDO; (b) surgical crown-lengthening procedures and intentional root canal therapy of mandibular anterior teeth; (c) surgical reduction of tuberosity bone in the maxilla.

After proper intraoral examination and radiographic investigation, treatment was planned to fabricate upper complete denture. Extraction of 34 was done due to poor periodontal status and PFM crowns wrt 37, 36 and fixed dental prosthesis wrt 35, 34, 33 and 44, 45,46,47,48 with 35, 33 and 44, 47, 48 as abutments respectively. Composite built was planned wrt 32, 31,41,42,43. Prior to construction of the denture, it was desirable to complete all rehabilitation procedures in the opposing dental arch. Maxillary and mandibular impressions were made with irreversible hydrocolloid and study models were poured with dental stone for the purpose of diagnosis and treatment planning. A face bow transfer was done and maxillary cast was mounted on a semi-adjustable articulator. Tentative jaw relation was made and diagnostic mounting was done to check the inter-arch distance. The curves of Spee and Wilson as well as the orientation of the occlusal plane were determined using a Broadrick occlusal plane analyzer (Fig 2). Silicon putty index was made over the modified diagnostic cast which served as a guide for the tooth preparation in the lower arch.

At second visit on primary cast wax spacer (Maarc, Shiva Products, Thane;India) was adapted and on that custom tray was fabricated. On this custom tray border molding was done followed by making of the wash impression. The master cast was obtained. Record base and wax rim was fabricated on the maxillary final cast. A face bow transfer was done and maxillary cast was mounted on a semi-adjustable articulator, the modified mandibular cast was mounted using a centric interocclusal bite record. Diagnostic wax up was done on the modified mandibular cast and maxillary teeth arrangement was done against the diagnostic wax up. Bilateral balanced occlusion was achieved during the teeth arrangement. Fig 3
After a diagnostic wax up, a new cast was made (with duplication of diagnostic wax up) and on this cast the vacuum-formed clear template (Biostar) with 0.02 inch thick was adapted. The template was cut at the level of gingival margin around the entire cast to facilitate removal. The patient was given the provisional denture and vacuum formed clear template for 2 months to check the proposed vertical dimension. During this period, the patient’s condition and functions such as muscle tenderness, discomfort of TMJ, mastication, range of the mandibular movements, swallowing, and speech were evaluated. After a detailed assessment the final restorations were fabricated. During preparation the tooth pulp of teeth 33 and 43 were exposed and revealed that the clinical crown lengths of teeth 33 were not sufficient for fixed restorations. Hence elective endodontics of 33 and 43 was performed followed by crown lengthening of 33. According to the wax up index and ideal occlusal plane, custom cast dowel cores for the teeth 33 were fabricated and cemented. After completion of teeth preparations, the final impressions were made with 2step impression technique (Putty and light body impression materials) in a custom tray. The casts were mounted on the articulator using interocclusal registrations recording CR by guiding the mandible via bimanual manipulation. A full contour wax up was accomplished for the PFM restoration and bilateral balanced occlusion was the scheme of occlusion given to the patient. Fig 4, 5, and 6.
The metal ceramic crown was provisionally cemented using temporary cement for two weeks and oral hygiene instructions were given. After 2 weeks, the temporary cement was changed to GIC and the patient was placed on a 6 months recall. The 1 year evaluation of the esthetics and function of the restorations showed no evidence of temporomandibular joint problems, fractures in the teeth, or PFM restorations.

**DISCUSSION**

Full mouth rehabilitation cases are one of the most difficult cases to manage in dental practice. This is because such cases involve not only replacement of the lost tooth structure but also restoring the lost vertical dimensions. Assessment of the vertical dimension is important for the management and careful comprehensive treatment plan [5]. Vertical dimension is not lost in all cases with generalized wear [6]. In most instances, any reduction in the heights of natural teeth is compensated for by the stimulated growth of alveolar bone and tissue and the continual eruption of the teeth [7]. In the present case there was excessive wear of anterior and posterior teeth. The vertical dimension was evaluated to be decreased and it was increased in the patient by giving an occlusal splint for a period of two months.

In the present case the plane was determined using Broadrick’s occlusal plane analyzer. It was developed by Dr. Lawson Broadrick in 1963 as an instrument to provide a guide to the most suitable position and orientation of the posterior occlusal plane [8]. The Broadrick flag is a useful tool in prosthodontic and restorative dentistry, as it identifies the most likely position of the center of the curve of Spee. Its purpose is to permit reconstruction of the curve of Spee in harmony with the
incisal and condylar guidance. The relevance of recording and maintaining this curve is to minimize posterior protrusive interferences, which in turn prevents abnormal activity of mandibular elevators like temporalis and masseter.

Successful complete denture used by patients depends on many variables, but three factors stand out in terms of functional success: retention, stability and support. Of the three, it is generally agreed that stability is the most important factor which depends mainly on occlusion. Occlusion that is not balanced in centric and excursive movements will create instability of the prosthesis, which leads to the loss of retention and psychology of the patient. In addition, when dentate arch opposes an edentulous arch, the edentulous arch is usually adversely affected because of the force generated.

Heat polymerized dentures are the dominant material for the fabrication of denture bases. These heat polymerized denture base resins present acceptable physical, biologic and esthetic characteristics at moderate expense, [9]. However, denture base resins in single complete dentures have been frequently found to fracture under excess masticatory forces. Metal bases have been proved to be a valuable alternative for denture bases opposing natural dentition to strengthen bases and to prevent them from fracture. Hence in this case metal reinforcement was given in the maxillary denture.

CONCLUSION

Several decisions must be made concerning the complex area of occlusion, before starting occlusal rehabilitation. The clinician must be aware that not all the patients can be successfully treated with a single preconceived treatment philosophy. Satisfactorily restoring a patient to a state of physiologic health is a challenge that requires the clinician not only to be an acute diagnostician but also a master of a wide range of treatment modalities. In this clinical report, raising vertical dimension of occlusion using removable maxillary denture and fixed restoration in the mandibular arch based on accurate diagnosis showed successful full mouth rehabilitation for severely worn down dentition.

REFERENCES