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CASE REPORT

SCULPTING THE AESTHETICS AND OCCLUSION: A CASE REPORT

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ABSTRACT

The management of tooth wear is complex and challenging. Moreover, aesthetic and functional restoration in such patients entails the performance of all procedures necessary to produce healthy, aesthetics, well functioning and self maintaining masticatory mechanism. The following case report provides a description of a patients' oral rehabilitation with metal ceramic restorations to increase vertical dimension. Patient not only had satisfactory functional and aesthetic results but also showed positive psychological impact and hence improved the quality of life.

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INTRODUCTION

Restoration of occlusion and aesthetics in patients with multiple missing teeth and severely worn out dentition is a challenging situation as every case is unique in itself. Restoration and reconstruction in such cases requires maintenance of the health of the entire stomatognathic system. It involves re-establishment of a state of functional as well as biological efficiency where teeth and their periodontal structures, the muscles of mastication, and the temporomandibular joint mechanisms all function together in synchronous harmony (Tiwari *et al.,* 2014). The following clinical report presents a successful multidisciplinary approach to a full mouth rehabilitation of a patient whose dentition has been aesthetically and functionally compromised with age.

CASE REPORT

A 76 year old male patient reported to our department of Prosthodontics at D.A.V. Dental College Yamuna Nagar with chief complaint of multiple missing teeth and wanted replacement for the same. On diagnosis it was seen that his remaining teeth i.e. 11, 14, 15, 16, 17, 21, 24, 25, 26 33, 34, 43 were discoloured, attrited and abraded. Also loss of vertical dimension was observed. (Fig.1) Supplemental diagnostic aids like OPG and IOPA revealed that these teeth had good alveolar bone support.

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After diagnosis, it was planned to provide the patient with full mouth rehabilitation with increased vertical dimension that consisted of maxillary fixed partial denture and mandibular tooth supported overdenture using hader bar attachment with respect to 33 and 43. Treatment plan included elective endodontic treatment of 11, 14, 15, 21, 24, 25, 33, 34, and 43. The patient was given a detailed explanation regarding his present state, procedures and alternative treatment plan and finally an informed consent was obtained from patient. Diagnostic impressions using irreversible hydrocolloid impression material were made and poured in type III dental stone to obtain diagnostic casts. Next, we did diagnostic mounting of maxillary casts on Hanau semi-adjustable articulator using facebow transfer. (Fig.2a) Interocclusal record in centre position was recorded by using vinyl polysiloxane (putty consistency) between maxillary teeth and mandibular partial denture with occlusal rim. Following this, occlusal plane analysis was done which is the most important step so as to avoid temporomandibular joint pain and disorder. This was done using a custom made plane analyzer jig made of brass that consisted of horizontal reference platform that is parallel to Frankfort horizontal plane. It is supported by three pillars that can be raised up and down according to the requirement (Fig.2b). Jig was placed on lower member of articulator and was raised till incisal edges of maxillary casts touched the horizontal table. 6 to 10 degree angulation of occlusal plane referenced from horizontal level was measured by protractor was easily waxed with curve of Spee to artistically create a soft smile line. Here, we had 8 degree angulation for curve of spee (Fig.3).

Fig. 1. Pre-rehabilitative extra-oral and intra-oral view

Fig.2a. Facebow transfer

Fig. 2b. Maxillary cast mounted on semi-adjustable articulator followed by plane analysis on customized jig

This was followed by maxillary teeth preparation in order to receive metal ceramic fixed partial denture with respect to 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, and 25. Mandibular teeth were prepared in a dome shaped contour and hemispherically rounded in all directions with respect to 33 and 43 for hader bar and clip attachment and 34 was prepared to receive a metal coping. Next, the final impression was made in vinyl polysiloxane impression material.(Fig.5a) Thereafter, maxillary provisional restorations were fabricated and cemented (Fig.5b).

Fig. 3. Diagnostic wax up of the maxillary cast done with 8 degrees angulation from the customized plane analyzer

Fig. 4. Tooth preparation done in maxilla and mandibular teeth

Wax pattern was prepared on 33 and 43 for metal coping with prefabricated plastic retainer bar. It was then invested, casted, finished, polished and verified for fit by placing on the cast.

Fig. 5a.

Fig. 56.

Fig. 5c

Fig.5a) Final putty wash impression; 5b) Temporization of the maxillary prepared teeth; 5c) Cementation of the metal bar and premolar metal coping.

Then the milled Nickel chromium hader bar with respect to 33 and 43 and premolar coping with respect to 34 was cemented. (Fig.5c) This was followed by mandibular border moulding using polyvinylsiloxane (putty consistency) and secondary impression using light body was made with the help of heat mouldable trays (Libral) (Fig.6).

Fig. 6. Border moulding using putty followed by secondary impression with light body

Once the metal trial was done, centric record was made again using polyvinyl siloxane (putty consistency) as interocclusal record between maxillary metal trial and mandibular occlusal rim. (Fig.7) This was followed by maxillary bisquetrial and mandibular denture teeth trial to ensure patient's comfort, esthetics and occlusion.

Fig.7. Interocclusal record

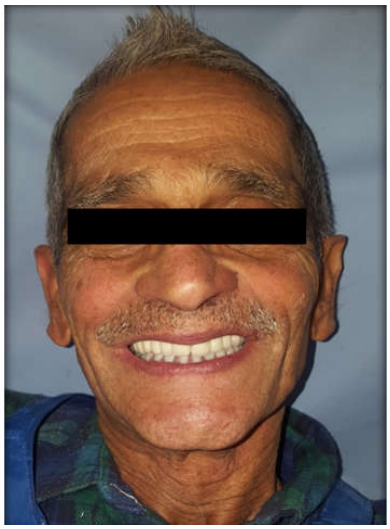

Fig. 8. Post-Rehabilitative extra-oral view

After minor adjustments in bisque trial, metal ceramic crowns were glazed and polished and cemented in place. The retention clips were placed under intaglio surface of denture. The mandibular surface prosthesis was processed and finished and inserted in patient's mouth. Aesthetics, occlusion and denture borders were verified in patient's mouth (Fig. 8). Patient was given instructions regarding maintenance of proper oral hygiene and recalled for evaluation at an interval of a month for three months. At recall visits, patient was very happy with improved aesthetic and function by oral rehabilitation. On oral examination, soft tissues were healthy and restorations in satisfactory function without any complications.

DISCUSSION

Rehabilitation of patients with tooth wear and tooth loss is challenging in preventive and restorative dentistry and often requires correct assessment of occlusal vertical dimension, interocclusal rest space and centric relation records (Jain *et al.,* 2013). Bone loss of alveolar process after tooth extraction is inevitable and occurs with great individual variation, difficult to predict at the time of extraction. The simplest way to prevent bone loss is to avoid extraction of all the teeth and to keep a few teeth for tooth/root supported overdenture. This gives great psychological comfort to the patient as there is no period of edentulousness as well as patient receives stabilized, retentive, aesthetically pleasing prosthesis (Jonkman *et al.,* 1995). Moreover, by retaining natural teeth for an overdenture, some of the sensory inputs from periodontal mechanoreceptors are preserved which are more precise than that obtained from oral mucosa. These periodontal receptors actively influence muscles of mastication and the cyclic temporomandibular movements by their proprioceptive mechanism (Thayer, 1980). Several studies have shown that anterior teeth exhibit more sensitivity and discrimination of forces than posterior teeth. In overdentures, retaining of mandibular canines reduces loss of alveolar bone by 8 times (Crum and Rooney, 1978). In 1962, it was found by Kruger and Michael that canine had more neurons than any other teeth and is the most important proprioceptive organ. Thereby, in the given case, mandibular canines were used for overdenture support (Kruger *et al.,* 1962). Overdenture attachments can be classified as rigid or resilient. As the periodontal support of the remaining teeth is mostly compromised, resilient attachment is used more often for overdenture therapy.

Moreover, it provides a splinting action between overdenture teeth and divides the functional load between the retained teeth and edentulous ridge (Preiskel, 1985). In the present case report, it was planned to provide a bar retained overdenture which provides better support and stability as it reduces torqueing of the remaining tooth structure because crown root ratio is decreased and splinting of teeth is done. As the bar is closer to the alveolar ridge, forces of mastication exert much less leverage to the abutment teeth. In addition to this, bar joint provides slight vertical and rotational movement of the denture as well as stress breaker action because of the resiliency provided by the plastic sleeve. Furthermore, abutments are less susceptible to caries due to cast dome coping coverage of the remaining tooth structure (Brewer and Morrow, 1980; Heartwell and Salisbury, 1965; Thayer and Caputo, 1979). In the patient, occlusal plane was analyzed using custom made plane analyzer jig which was designed to better assess the maxillary occlusal cants, asymmetries and occlusal discrepancies when referenced to the horizontal ground when

the patient's head is correctly oriented looking at a level horizontal position. It assists both the dentist and laboratory technichian to better communicate a more representative occlusal plane orientation for occlusal waxing and smile design. It is a simple and inexpensive technique to use. Moreover, it allows for a more proportional distribution and crown length ratio between the upper and lower posterior crowns and prevents the need to excessively reduce the maxillary posterior occlusal during crown preparation (Chan, 2006; Braly, 1966). Hence, full mouth rehabilitation requires unusual knowledge, judgement and dexterity to convert all the unfavourable forces on the teeth into favourable forces to permit normal function especially in older patients (Goldman, 1952).

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