Case Report

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Dentistry Section

Full Mouth Rehabilitation of a Patient with Extracoronal Attachments and Telescopic Prosthesis - A Case Report

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ABSTRACT

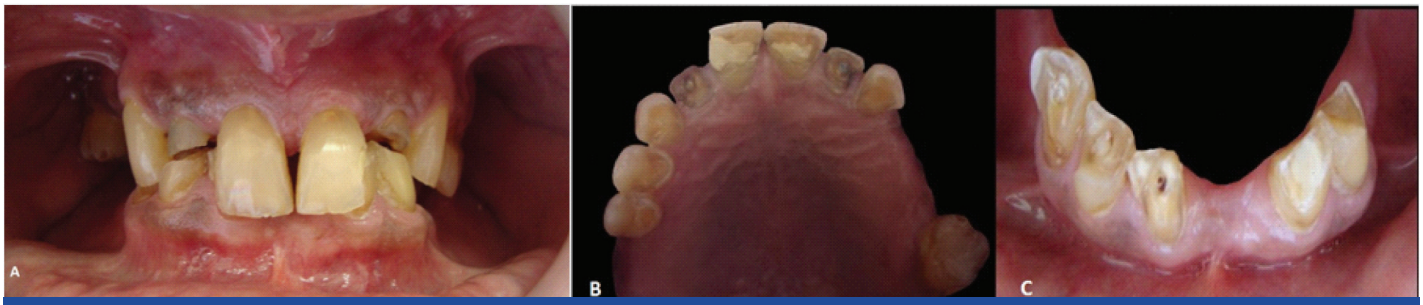
The management of tooth wear is complex and challenging as it involves multidisciplinary approach. Proper diagnosis and elaborative treatment protocol is necessary to obtain successful and predictable outcome. The objective of full mouth rehabilitation includes identification of the cause, prevention and preservation of the remaining tooth structure. This case report presents the management of the remaining teeth by endodontic and periodontic intervention which was followed by porcelain fused to metal fixed prosthesis, telescopic denture for the upper missing teeth and extra-coronal attachments for the lower missing teeth. Segmental arch technique was utilized for the rehabilitation where anterior teeth were restored first followed by the posterior teeth. Patient had a satisfactory functional and aesthetic results.

Keywords: Broadrick occlusal plane analyzer, Extracoronal attachment, Full mouth rehabilitation, Semi-precision attachment, Telescopic denture

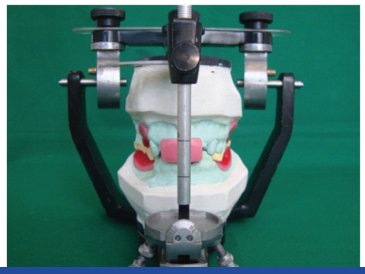
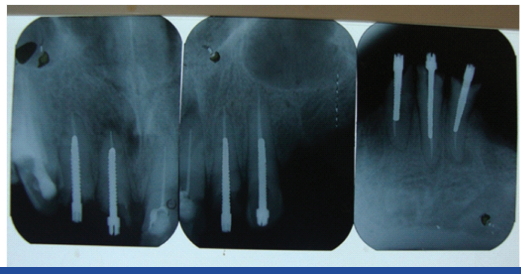
CASE REPORT

A 62-year-old male patient reported to the Department of Prosthodontics with chief complaint of unaesthetic appearance and sensitivity of the teeth. Clinical intraoral examination revealed several broken and missing teeth [Table/Fig-1a]. Maxillary palatal [Table/Fig-1b] and Mandibular occlusal aspects [Table/Fig-1c] of the teeth showed severe attrition with decreased vertical dimension which led to deep bite. Patient had no signs of exudate or fistula formation and no symptoms of TMJ dysfunction. Panaromic view [Table/Fig-2] showed missing posterior teeth in the region 14, 15, 16, 26, 27, 31, 34, 35, 36, 37, 41, 45, 46, 47 and moderate bone resorption in the maxillary and mandibular posterior region. Few endodontically treated teeth were noted in relation to 12, 33, 42, 43, 44. Most teeth had pulp chambers nearer to the occlusal surface with inadequate crown length; so intentional Endodontic therapy (lateral condensation obturation technique) was planned for the remaining teeth followed by post and core restoration. Implant supported prosthesis was suggested for the posterior maxillary and mandibular arches but was refused by the patient due to invasive procedure. Due to advanced attrition, the treatment plan involved full coverage restoration of the remaining teeth for long term predictability with extra coronal attachments for mandibular posterior partial edentulous arch and cast partial denture with telescopic crown for maxillary posterior edentulous arch for additional retention.After obtaining informed consent bilateral manipulative technique (Dawson technique) was performed on a patient to close the mandible in centric relation. Vertical dimension (VD) was determined for the patient with the help of aesthetic, phonetic, anatomical landmarks and facial measurements. It was decided to increase the VD by 4.0 mm. Casts were mounted onto the semi adjustable articulator (Hanau wide vue, USA) with the help of lucia jig and inter occlusal records in centric relation and at increased VD [Table/Fig-3]. Provisional removable partial denture at increased vertical dimension was delivered to the patient for two months to evaluate adaptation or any changes related to TMJ. During this period diagnostic wax up was done for anteriors at increased VD to establish occlusion. Occlusal stability and TMJ function was checked at the same time. Endodontic treatment was carried out in relation to 11, 13, 17, 21, 22, 23, 24, 25, 32 followed by post space preparation in relation to 12, 13, 21, 22, 42, 43, 44.

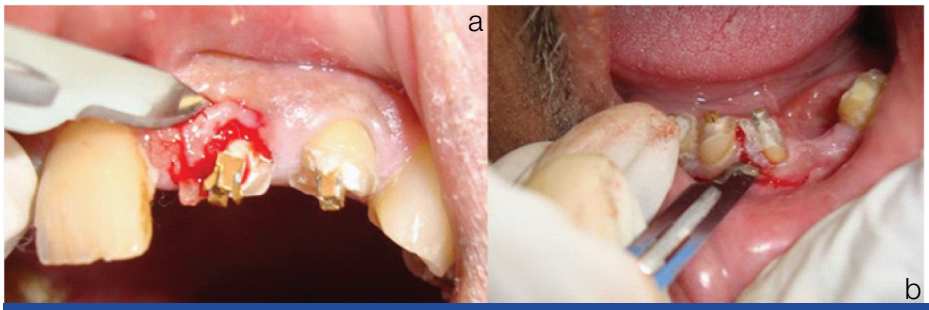
Prefabricated gold posts [Table/Fig-4] were cemented with GIC luting cement (GC Fuji 1) and core build up done with composite resin (Primedent, Chicago).Clinical crown lengthening [Table/Fig-5a,b] was performed in maxillary and mandibular arches based on the thickness of soft tissue layer, proximity of the osseous contour and esthetic zone. The maxillary and mandibular anterior teeth were prepared [Table/Fig-6]. Provisional FPD was cemented by indirect method [Table/Fig-7] with the help of putty silicone index from the diagnostic wax up. Anterior guidance was determined by adjusting the provisional restoration in the patient's mouth by locating all excursive pathways form centric relation to an edge to edge relationship in both protrusive and lateral jaw position. Each upper and lower incisal edge was located and labial contour was finalized, then an impression of the corrected provisional FPD's were made after their acceptability had been confirmed. The casts were prepared and mounted on an articulator with the help of facebow



[Table/Fig-1]: 1a)Preoperative frontal view 1b) Maxillary palatal view 1c) Mandibular occlusal view

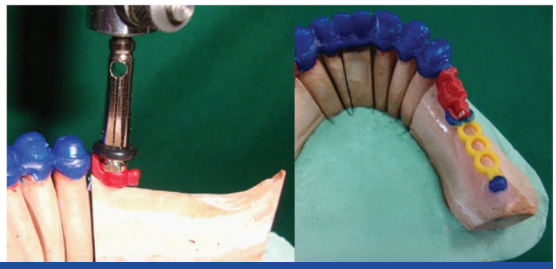




[Table/Fig-2]: Preoperative panaromic view **[Table/Fig-3]:** Casts mounted in centric relation with anterior deprogrammer (Lucia jig) **[Table/Fig-4]:** Intra-oral periapical radiographs showing posts cemented in root canal treated teeth

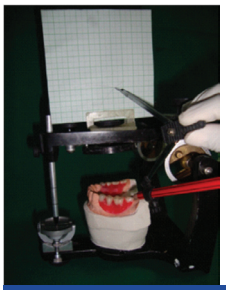


[Table/Fig-5a,b]: Crown lengthening procedure for upper and lower arch **[Table/Fig-6]:** Maxillary and mandibular anterior teeth preparation

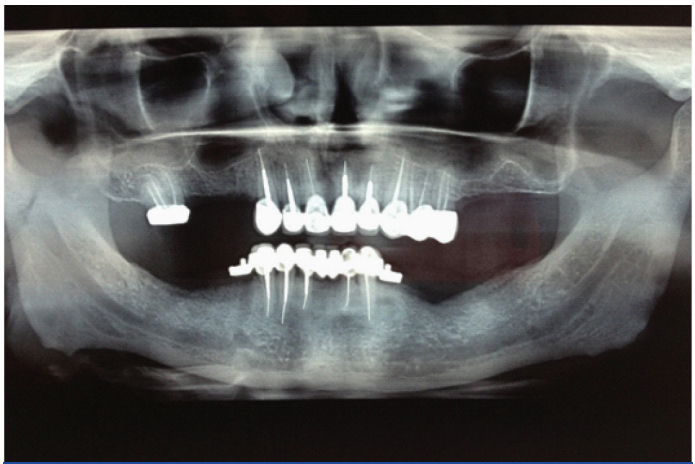




[Table/Fig-7]: Provisional restoration **[Table/Fig-8]:** Custom made incisal guide table **[Table/Fig-9]:** Rhein 83 OT Attachment placed using parallelometer mandrel




[Table/Fig-10]: Occlusal plane determined using Broadrick plane analyser **[Table/Fig-11a,b]:** Maxillary telescopic denture and mandibular denture with semi-precision attachment **[Table/Fig-12]:** Intra-oral postoperative view



[Table/Fig-13]: Post operative panaromic view.

and centric bite record. The anterior guidance as determined and tested, can be duplicated by use of the customized anterior guide table. On semi-adjustable articulator, mechanical incisal guide was flattened to 0. Unset creamy resin was placed on an incisal table and the rod was moved laterally in both directions, stopping exactly at the point of alignment of the labial surfaces of the upper and lower cuspids and moved into edge to edge relationships in all intermediate protrusive lateral excursions. Thus the guide table will record the path of the incisal edges of mandibular teeth over the lingual surfaces of the maxillary anterior teeth. This process also permits verification by the dentist that the technician has followed all details.The acrylic was allowed to harden [Table/Fig-8]. Master die model was mounted with the same centric skill record that was used to mount provisional restorations. Thus it relates perfectly to the custom anterior guide. Spherical castable (Rhein 83 OT Unilateral) attachments were attached on both the sides distal to the distal abutments using parallelometer mandrel [Table/Fig-9]. Castable housing was placed over the OT unilateral attachment. Yellow coloured connector was joined to housing on both the sides. Wax coping with OT unilateral attachments and housing joined to the connectors were invested, casted together for more preciseness. Final porcelain fused to metal anterior restorations was cemented with glass ionomer luting cement. Posterior teeth were prepared

and working casts were mounted on to the semi adjustable articulator using face bow transfer and centric record. To determine the occlusal plane, broadrick's occlusal plane analyzer method was used. The maxillary model was removed and aside for later use. The pencil was inserted into one end of the caliper and set at a radius of 4 inches. Anterior survey line was drawn on the flag by placing the needle on the cuspid between the cusp tip and distoincisal line angle. Condylar survey line was drawn on the flag by placing the needle near the center of the ball which simultaneously intersects the anterior survey line. The point where two lines intersect is called survey centre. The line was scribed on the model by placing the caliper needle at the survey center. The line represented the height of buccal cusp tip. Mandibular posterior teeth were arranged and the cusp tips were adjusted according to this line [Table/Fig-10]. Porcelain fused to metal was fabricated and cemented in relation to 24 and 25. Metal coping was cemented in relation to 17 for construction of maxillary telescopic cast partial denture based on the lower posterior teeth trial in the patient's mouth. Rest seats were prepared on 13, 24, 25. After mouth preparation, maxillary elastomeric impression was made. Finally the maxillary and mandibular dentures were processed, trimmed and finished [Table/Fig-11a,b]. Patient's mouth was checked for verification of mutually protected occlusion and maximum interocclusion in centric relation [Table/Fig-12].

DISCUSSION

Tooth surface loss (TSL) is a multifactorial process which involves the destruction of enamel and dentin with progressive deterioration of functional quality of affected individuals. Attrition, abrasion, erosion and abfraction are the aetiological factors which lead to tooth wear [1]. Severe attrition results in loss of occlusal vertical dimension, impaired masticatory function and unaesthetic appearance. Generalized tooth wear can be managed by full mouth rehabilitation [2]. The vertical dimension has to be measured before the start and it showed 4 mm with the help of esthetic, phonetic, anatomical landmarks and facial measurements. The anterior deprogrammer can be adjusted to 4 mm increase in height.At centric relation position 4 mm increase was done in a single visit. Once the deprogrammer is placed, the patient will be manipulated by dawsons technique in centric relation position. At that position normally an occlusal splint is fabricated which provides centric contacts both anteriorly and posteriorly. Nearly every week the occlusal contacts should be evaluated to see whether the centric relation contacts are stable. If a temporary teeth or RPD is given the same contacts have to be established in the CR position. A change in centric relation position can lead to problems related to TMJ [3].

Mutually protected occlusion was given in this case as anterior teeth were periodontally sound. Anterior teeth protect posterior teeth in all excursions and consequently posterior teeth disocclude anterior teeth in intercuspal position when axially loaded or in contact [4]. Group function occlusion should be utilized when anterior teeth are periodontally compromised or canines are missing [5,6].

Since 1970's telescopic crowns have been successfully and widely used on natural teeth to support denture. Telescopic cast partial denture was given for maxillary posterior arch as it provides additional retention, support, axial loading and denture's conduction towards supporting tissues as compared to conventional cast partial denture [7-13].

Extracoronal attachments were used to provide more even pressure on remaining natural teeth, balanced support with low maintenance and exceptional patient comfort [14]. In the present case appliance does not get easily dislodged during function as each attachment has double seatings in a metal housing to provide excellent retention. These are colour coded for different levels of retention and are easier to remove and insert. The patient was recalled after 1, 3, 6 and 12 months. The restorations [Table/Fig-13] exhibited no signs of deterioration with the final outcome pleasing to the patient.

The clinical report describes the method and sequential approach for full mouth rehabilitation in separate series of appointments by segmental arch technique.

CONCLUSION

Full mouth rehabilitation through proper methods and materials, increases the life span of the functioning dental health and make the dentition to accept occlusal forces with minimal damage, at the same time to function efficiently.

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