

Oral Rehabilitation with Mandibular Cast Partial Overdenture Opposing Maxillary Cast Complete Denture - A Case Report.

Tajmulla Ahmed¹, Asaad Javaid Mirza²

Abstract

The basic principles of any prosthetic design include preservation of the remaining tissues along with retention, stability, support, and aesthetics. Partial Overdenture is a logical method in preventive prosthodontics that emphasizes on the importance of any rehabilitative procedure to delay or eliminate the future prosthodontic problems. This clinical report describes "conventional" prosthodontic management of a diffuse hyperplastic goitrous patient who presented with complete maxillary and partially edentulous mandibular arch with several periodontally compromised teeth. The rehabilitation of this patient was done with conventional cast complete denture in maxillary arch and a teeth-tissue supported cast partial overdenture in mandibular arch. This prosthodontic treatment spectrum renders the patient, the satisfaction of preserving their own natural teeth as well as a definitive prosthesis even in an extremely critical clinical condition.

Keywords: Prosthodontics, overdenture, prostheses.

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Introduction

Rehabilitation of a partially edentulous patient is determined to a greater extent by the number, position and salvagability of the existing teeth as well as, the expectations and demands of the patient from the prosthesis. Sometimes, conventional complete denture therapy results in inadequate denture retention, stability & patient satisfaction. The patient's confidence & comfort in such cases would be compromised. However, the overdentures could overcome the shortcomings of conventional complete dentures. Problems like loose dentures, loss of proprioception & bone resorption can be re-

solved with overdentures & hence it is the last line of defence that successfully keeps patients from becoming edentulous¹.

Studies indicate that there is inevitable resorption of residual ridge, following the loss of teeth. Ridges treated with overdentures showed significantly less vertical alveolar bone resorption than ridges with conventional complete maxillary and mandibular dentures². The rate of resorption depends on three factors; the character of bone, health of the individual and the amount and type of forces on the bone. Ten years of clinical investigation showed that weak teeth used as support for denture prosthesis not only remained in position but a few have regained a healthier status³. Neil's Brill (1955) classified the dentures supported by the existing natural teeth that had characteristics of both a removable partial denture and a complete denture, which he termed as "Hybrid Prosthesis"⁴.

The purpose of this manuscript is to present a case report of a diffuse hyperplastic goitrous patient presenting with upper complete and lower partially

¹Department of Prosthodontics Dental Sciences

²Department of Restorative Dental Sciences
College of Dentistry Alzulfi, Almajmaah University
Saudi Arabia

Correspondence: Dr. Tajmulla Ahmed
Lecturer, Department of Prosthodontics
Dental Sciences
College of Dentistry Alzulfi,
Almajmaah University Saudi Arabia
Cell: 00966556019342
Email:a.tajammul@gmail.com

edentulous condition, rehabilitated with conventional cast complete denture in maxillary arch and a teeth-tissue supported cast partial overdenture in mandibular arch.

Case report

A 50-year-old female patient reported with a chief complaint of mobile teeth, with difficulties in chewing food and insisted for the replacement of her missing teeth. History and general examination revealed diffuse hyperplastic goitrous enlargement in the front neck region since 14 years. However, this finding had no effect on the existing dental condition and did not modify the treatment plan. Intraoral examination revealed a completely edentulous maxillary arch that was moderately resorbed, due to excessive masticatory forces from long standing natural teeth in the opposing arch. In mandibular arch the retained teeth were in critical condition with mobility ranging from Grade-I to Grade-III. Teeth number 38 and 48 were Grade-I mobile, 36, 33, 43 and 44 were Grade-II mobile and 37, 32 and 47 were Grade-III mobile Fig.1.

Based on the diagnosis of the existing dental condition, a cast partial overdenture was planned in the mandibular arch. The abutment teeth for overdentures may require periodontal therapy, endodontic therapy, reduction of clinical crowns, and placement of copings and/or attachments. A complete denture opposing a dentate arch and use of a metal base is needed to prevent fracture of denture bases from occlusal forces⁵. Hence in the maxillary arch a cast complete denture was planned instead of a conventional complete denture.

In the mandibular arch, all Grade-III mobile teeth were extracted because of poor prognosis. The prognosis of Grade II mobile teeth could be enhanced by decreasing the crown root ratio, hence endodontic treatment was carried out on them and crowns were amputated 3 mm above the gingival level. Periodontal conditioning with curettage and root planning were also completed. Patient was kept under observation for 2 to 3 weeks. Mobility of teeth was reduced and teeth became firm. Grade I

mobile teeth were retained as such after periodontal conditioning.

Development of caries on overdenture abutment is a significant problem. However, copings on overdenture abutment teeth help to prevent secondary caries formation on them. Appointment was scheduled for post space and coping preparation on endodontically treated teeth, and preparation of rest seats and elimination of undercuts on 38 and 48 to facilitate path of insertion & removal of the prosthesis Fig.2. Post space impression was made with indirect technique using light body polyvinylsiloxane (Reprosil B no: 070702) and cast was poured using die stone (Denflo, Prevest denpro ltd, B no: 71203). Wax patterns of the copings with posts were fabricated using Type-II inlay wax, (Renfert, USA. B. No. 6820001) sprues attached and invested. Castings of copings with posts were tried for marginal accuracy Fig.2. Final cementation of copings with posts was done with Zinc-phosphate cement⁶ (Harvard B.No.1900604 & 1900605). Border molding of the maxillary and mandibular arches were carried out on the same appointment, final impressions were made and master casts were poured using dental stone.

Master casts were then duplicated to obtain refractory casts on which metal wax patterns for metal frame-work of maxillary cast complete denture and mandibular cast partial overdenture were fabricated, sprues attached and invested (Bellavest, Germany. B. No. 06902, 06905, 09902). The mandibular cast frame-work was checked for intimacy on cemented metal copings and for retention of clasps on 38 and 48. Maxillary cast frame-work was also tried to check for adaptation and stability.

Maxillary and mandibular temporary denture bases on metal frameworks were fabricated and occlusal rims were constructed on them. Using face-bow (Teledyne Water Pik, Fort Collins, Colorado, USA) transfer and centric records maxillary and mandibular casts were mounted on a semi-adjustable articulator (Hanau Wide Vue, No. 183, Teledyne Water Pik, Fort Collins, Colorado, USA). Artificial teeth were arranged in balanced articula-

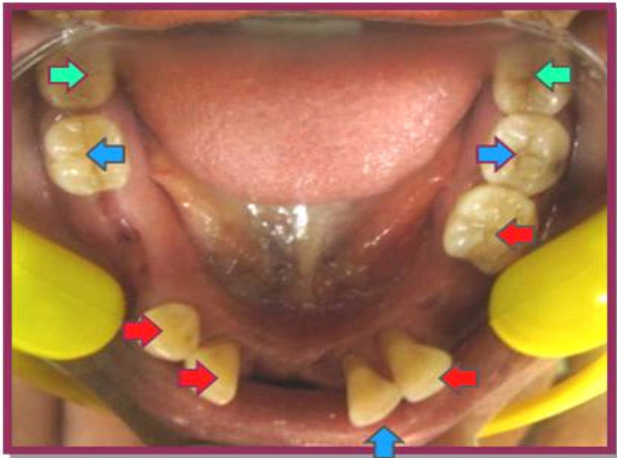


Fig.1: Pre-treatment mandibular retained teeth condition. Teeth number 38 and 48 were Grade-I mobile, 36, 33, 43 and 44 were Grade-II mobile and 37, 32 and 47 were Grade-III mobile.



Fig.2: Post space preparations of root canal treated teeth and cementation of post with metallic copings on respective abutments.



Fig.3: Final insertion of dual prosthesis with patient's confident and radial smile.



Fig.4: Final insertion of dual prosthesis with patient's confident and radial smile

The dentures were processed with heat cure acrylic resin (DPI Heat cure resin. Dental Products of India, B. No. 1151). Finishing and polishing was done Fig.3. Maxillary cast complete denture and mandibular cast partial overdentures were inserted in the patient's mouth. The border extensions of the prostheses, function, aesthetics, and occlusion with the prostheses on patient were evaluated. Necessary adjustments were completed. The final prosthesis demonstrated satisfactory retention, stability, support and patient satisfaction Fig.4.

Instructions regarding maintenance of oral hygiene and prostheses were given. Patient was recalled for routine check-up after three months and six months durations to evaluate abutment teeth condition as well as general and oral health. No signs of secondary caries in abutment teeth and other relevant signs or symptoms observed. Patient was completely satisfied with the prostheses.

tion ion. Trail prostheses were tried on patient for function and aesthetics. Centric occlusion and eccentric contact relationship assessed, minor interferences were rectified and corrected.

Discussion

The advantages of preserving the natural teeth are, (i) preservation of alveolar bone, (ii) preservation of proprioception, (iii) improved retention (iv) improved support, and above all (v) less psychological trauma of losing natural teeth for patients. Moreover patient insisted to preserve her natural teeth.

Teeth-tissue supported overdentures rely on the remaining natural teeth for support of the prosthesis. The location and distribution of these natural teeth are highly variable and they are often compromised because of bone loss associated with periodontal disease. There can also be problems arising from dental caries in retained abutment teeth, and technical problems associated with denture fabrication⁷. However, proper oral hygiene maintenance and use of fluoride mouth rinses will preclude the chances of gingivitis and dental caries on abutment teeth underlying overdentures. In this case the design of cast partial overdenture resembles the design of mandibular partial overdenture supported by implants and posterior natural abutment teeth⁸. But the differences exist in exclusion of attachments and the support for overdenture, which was from underlying natural teeth instead of implants. On the whole there was a definite reduction in the total cost of treatment as implants and precision attachments were not incorporated. There was also an added advantage of preserving patient's own natural teeth and potential benefits of reduced ridge resorption with enhanced retention, stability and support for the prosthesis. Louis and associates reported that patients can masticate food more efficiently with overdentures than with complete dentures which justify the increased cost and time involved in their construction^{9,10}. Moreover prosthesis retained by prefabricated intra-radicular retainers offer greater flexibility with regard to extension of base of pros-

thesis and the coverage of alveolar ridge in areas of missing teeth¹¹. However, in the present case, clasps engaging the abutment teeth offer additional prosthetic retention.

Conclusion

The preservation of tissues is a trust that cannot be ignored. The application of the basic concepts and proper treatment planning will help to keep this trust in the hands of the dental profession. Hence, it is essential to perform the most meticulous and intelligent prosthodontic care of the patient within our capabilities.

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