Review Article

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Rehabilitation of Partially Edentulous Mouth with Maxillary Cast Partial Denture and Mandibular Overdenture: A Case Report

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Abstract

Retaining natural teeth as abutments for dentures can significantly reduce progress of residual ridge resorption. The stress concentration can be shared between the denture baring areas and the abutments. Overdentures can decrease the impact of residual ridge resorption; provide sensory feedback, loss of occlusal stability, loss of esthetics in addition to compromised mastication. In order to reduce residual ridge resorption and to increase retention and stability, overdenture as a treatment modality has been successful. When edentulous areas too extensive or too numerous for fixed prosthesis and need for cross arch stabilization cast partial denture is preferred. Insertions as well as taking away of the denture and regular oral hygiene are simple to perform. Present paper depicts the rehabilitation of partially edentulous mouth with maxillary cast partial denture and mandibular tooth supported overdenture.

Keywords: Overdenture; Residual Ridge Resorption; Cast Partial Denture; Cross Arch Stabilization; Stability.

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Introduction

Edentulousness is the state in which loss of teeth causes adverse aesthetic and biomechanical squeal. Even though complete edentulism has decreased, the number of partially edentulous individuals has enhanced, possibly because of the worldwide ageing population in addition to oral health-related prevention policies. For the rehabilitation of the partially edentulous state to restore the missing teeth various type of prosthetic alternatives are available including removable partial denture (RPD), tooth supported fixed partial denture, implant supported partial denture, flexible denture. How well these prostheses restores and maintain the functions of natural teeth depends on a large extent on the numbers and location of the missing teeth. Cast partial denture provides better results in terms of retention, stability, masticatory efficiency, comfort and periodontal health of abutment.

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

The choice of treatment plan depends on the surrounding teeth, tissues, the patient's need and financial status. This paper explains the case report of a cast partial denture designed for Kennedy's class II modification I in maxillary arch without compromising the principles of RPD designing and tooth supported overdenture in mandibular arch.

Case report

A 65-year-old male patient reported to the department of prosthodontics, Al-Badar Rural Dental college and hospital, Gulbarga, with a chief complaint of missing tooth and difficulty in having food. Patient gave a medical history of hypertensive since 5 years. He is currently on oral antihypertensive. The patient gave a dental history of undergoing extraction around 2 months back.

A preliminary examination revealed that the patient had missing 14, 15, 16, 18, 23, 24, 25, 26, 27, 28, 31, 32, 33, 37, 38, 41, 42, 43, 44, 47 and 48. There were furcation involvement with respect to 36 and 46. There was midline diastema between 11 and 21 (Fig. 1). There was a bony spicule with respect to 28 and 33. Also there was cervical abrasion with respect to 22. Oral hygiene was fair. Diagnostic impression was made using irreversible hydrocolloid impression and an inter-occlusal bite registration was taken. The impressions were poured and diagnostic models were mounted on a semi adjustable articulator. A diagnostic surveying of the model was done. A complete radiographic survey was carried out to correlate with the clinical findings. The OPG revealed horizontal bone loss and furcation involvement was seen in 36 and 46. During the definite intra-oral examination the potential abutments were evaluated clinically to determine their periodontal condition, pockets, mobility, caries, old restoration, vitality, abrasion, and supra-eruption.

Treatment plan

It was decided to extract both mandibular first molars due to advanced periodontitis followed by a thorough oral prophylaxis. Composite restoration was done with respect to 22. Alveoloplasty was advised with respect to 28 and 33 regions. It was decided to prosthetically rehabilitate this patient with a tooth supported overdenture for the mandibular arch and cast partial denture for the maxillary arch. Intentional RCTs were performed on 34, 35 and 45 (Figs.1 and 2). After intension RCTs with respect to 34, 35 and 45, they were prepared with tapered round end diamond point with chamfer finish line made subgingivally. Teeth were prepared in a dome shaped contour and hemi spherically rounded in all dimensions with approximately 3-4 mm projecting just above the gingival (Fig. 3). After the mouth preparation in mandibular arch gingival retraction was done and a final impression was made with addition silicone using putty wash technique. The master model was prepared from the impression for fabrication of the copings (Fig. 4). Once the copings were evaluated for fit, the copings were luted using glass ionomer cement and border moulding and wash impression was made using green stick impression compound and light bodied additional silicone impression material (Fig. 5) and the master model was made.

In maxillary arch 17, 13 and 22 was selected as abutment for the cast partial denture. Surveying of the diagnostic cast was done. Rest seat were prepared with respect to 13 and 17. Guide plane were prepared with respect to 13, 17 and 22. Final impression was made using heavy body and light body addition silicone impression material (Fig. 5) and master cast was poured (Fig. 6). Cast duplication was done using agar hydrocolloid material (Fig. 7). Refractory cast was made using investment material (Fig. 8). Cast partial design was made and wax pattern was made on the refractory cast (Fig. 9). Spruing of pattern was done (Fig. 10). Investment was poured using casting ring and casting of frame work was carried out. Co-cr alloy was used for casting. The framework was trimmed and polished and adjusted over the master cast (Fig. 11). After evaluating the fit of the framework in the mouth (Fig. 12) jaw relation was recorded (Fig. 14) using wax rim and were mounted on an articulator. After teeth arrangement and wax up try-in was done to check (Fig. 15) and verify the established maxillomadibular relationship and for proper esthetics, function and phonetics. After verification denture was processed. The completed prosthesis were evaluated for function, esthetics and phonetics (Fig. 16).


Fig. 1 and Fig. 2: Intraoral pictures of maxillary and mandibular arch

Fig. 3: Tooth prepared for copings

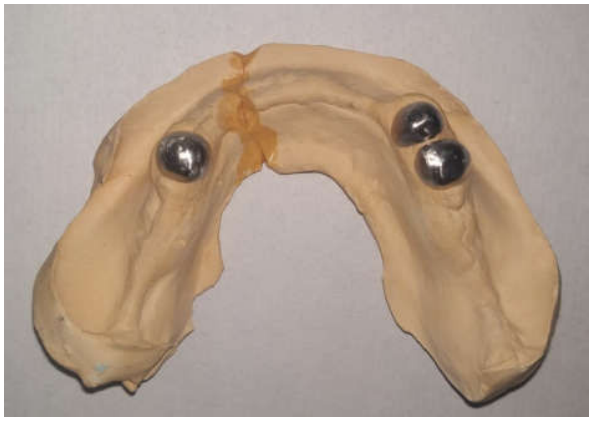

Fig. 4: Fabrication of copings

Fig. 6: Master cast with tissue stop

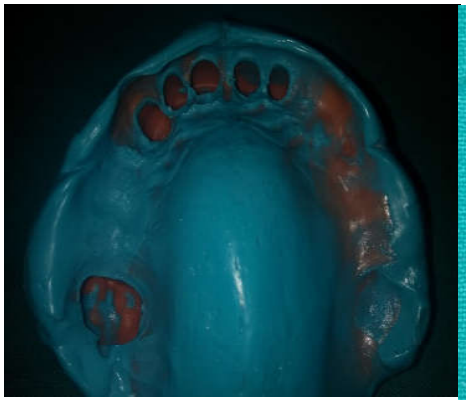


Fig. 5: Final impression of maxillary and mandibular arch

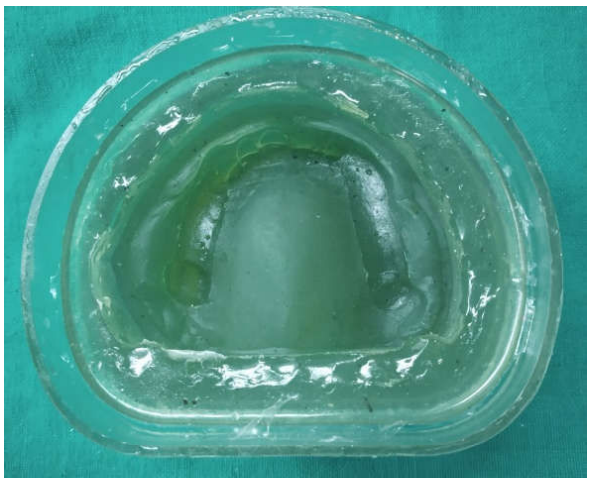

Fig. 7: Agar Agar duplication

Fig. 8: Refractory cast

Fig. 9: Wax pattern

Fig. 10: Spruing

Fig. 11: Framework

Fig. 12: Framework try in (A) Occlusal view (B) Left lateral (C) Right lateral (D) Front view

Fig. 13: Copings cemented

Fig. 15: Try-in

Fig. 14: Jaw relation

Fig. 16: Final prosthesis

Fig. 17: Before

Fig. 18: After

Discussion

A maxillary cast partial denture and mandibular over denture was chosen for this patient because of its good retentive and stabilizing properties, better distribution of stress and proprioception provided by remaining teeth. Other treatment options include extraction of remaining teeth, followed by a conventional complete denture. This is not selected because extraction would have decreased the available support and proprioception provide by the teeth and their periodontal ligaments. Implant supported prosthesis was not opted for as the patient was medically compromised and also because of the cost involved in the procedure.

Conclusion

The restoration of the partially edentulous exhibits a challenging decision making in planning the treatment without compromising the patient's needs. The technique followed in the treatment of this patient is a simple but yet effective treatment plan for providing an optimum treatment for an individual.

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