Cast Partial Denture in Maxillary Anterior Region with Severe Bone Loss: A Case Report

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ABSTRACT

Nowadays implant-supported prosthesis is very popular due to various advantages. But every patient is not suitable for implant-supported prosthesis due to physical, medical, financial and psychological condition of the patient. In case of severe bone loss and uncontrolled systemic problems, implant-supported prosthesis is not indicated. In this case report, treatment planning and steps of cast partial denture are discussed.

KEYWORDS: Removable Partial Denture, Cast Partial Denture, Anterior bone loss, CPD

INTRODUCTION

According to Glossary of prosthodontics term esthetics can be defined as “pertaining to the study of beauty’ and the sense of beautiful.” Esthetics plays a major role in the rehabilitation of complete and partially edentulous patients. So during planning to rehabilitate a partially edentulous patient with a prosthesis, esthetics, as well as function, is to be restored close to natural. This will enhance patient’s self-confidence.1

In distal extension cases, there are only two options: implant-supported fixed prosthesis and removable dental prosthesis. Every patient does not accept implant-supported fixed prosthesis due to high cost, surgical interventions and time factor. In case of uncontrolled systemic problems and severe bone loss, implant-supported prosthesis is also contraindicated. In these situations, cast partial denture is good treatment options for the patient with partially edentulous arches.2

In this article, discussed the steps of rehabilitation of patient having partially edentulous arch and severe bone loss in a maxillary anterior region with cast partial denture.

CASE REPORT

A 36-year-old male patient was reported to the Department of Prosthodontics, of Career Post Graduate Institute Of Dental Sciences & Hospital Lucknow, with the chief complaint of difficulty in eating and bad appearance in relation to the upper front region.

He had no relevant medical history and his occupation was a farmer. The primary cause of upper anterior teeth loss was accidental trauma. Intraoral examination revealed missing 11, 12, 13, 14, and 21 with severe bone loss in relation to the premaxillary region (Figure 1,2). Grossly decayed teeth were 25, 26, and 27. On the basis of patient’s current condition; two treatment options could be given to the patient. One implant-supported fixed dental prosthesis and second is cast partial denture (removable dental prosthesis). Implant-supported fixed dental prosthesis is also contraindicated.

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dental prosthesis was discarded as there was a severe bone loss in premaxilla region and patient was not ready for ridge augmentation surgery. Finally, it was decided to deliver CAD-CAM cast partial denture in relation to 11, 12, 13, 21 with root canal treatment and individual crown in relation to 25, 26, 17. After discussing the treatment plan, expenditure, time, Informed consent was taken with the patient and his family members.

**Treatment Steps:**

**Surveying and Designing:** Diagnostic impression was taken with alginate impression material, and the cast was poured with type III gypsum product. Surveying of diagnostic with cast partial denture designing was done with proper color coding. Survey tilt of 5 degree and tripoding done to relocate the cast in the same position. A maxillary removable partial denture (RPD) was designed with a closed horseshoe shape major connector, occlusal rests and cast circumferential embrasure clasps on 15, 16, 24, 26. Mouth preparation is done according to design and tilt of the cast partial denture framework.

**Mouth Preparation:** The patient was referred to the department of periodontics for scaling and root planning. The patient was further referred to the department of endodontics for root canal treatment of 25, 26, and 27. RPI clasp on the maxillary left lateral incisor and accessory cingulum rest on right canine. Root canal treated teeth 15, 16, 25, 26 were prepared to receive metal crowns with rest seats for embrasure clasps. Rest seats were carved out on wax patterns of 15, 16, 25, 26 (at the distal side of 15, 25 and mesial side of 16 and 26). After casting metal crowns with rest seats, were finally cemented with glass ionomer cement. Guide planes were made on 14 and 22. A check impression was made with alginate and cast was made with dental stone (type III). Final surveying of check cast was done to evaluate the mouth preparation according to designing. Check Cast was placed on surveyor according to tripoding. A custom tray with the wax spacer and tissue stop was made on check cast so that proper extension of the labial vestibule was recorded. Border molding was done on the labial vestibule area with green stick compound on a special tray. After removal of the spacer, the final impression was taken with the help of addition silicon on the custom tray. The impression was poured with type III gypsum product.

**Duplication of the master cast:** Following steps were done:

- Die hardener was applied on master cast before duplication.
- Blocking out of all undercut areas with block out wax was done.
- Spacer was applied on ridge area of master cast for acrylic flow below minor connector.
- Master cast was placed on the agar duplicating flask and molten agar was flowed. After complete setting of agar, master cast was retrieved. In the mould space, refractory material was filled and refractory cast was retrieved.

- With the help of pattern waxes, pattern was made for cast partial denture framework according to design.
- Casting was done and CPD framework was retrieved.
- Framework try-in and jaw relation was done with facebow. In framework try-in, all extensions and rest was evaluated so that it does not affect the occlusion. Minor correction, adjustment and polishing done. (Fig. 2 & Fig 3)

**DISCUSSION**

Restoration of Kennedy’s class IV situation is very difficult in a long span edentulous situation with the severe bone loss in the labial vestibule area.
In this case report, implant-supported prosthesis was discarded due to the severe bone loss in the labial vestibule area. If we choose an implant for such situation, bone grafting has to be done and left for 3-4 month. So in this case, due to high cost and multiple surgical interventions, the patient was not ready for implant-supported prosthesis. Cast partial denture was chosen as it not only restores anterior esthetics, phonetics but also the function.

While restoring the teeth with removable partial dentures, sometimes anterior teeth must be used for support. The use of I bars instead of circumferential clasp may somehow make restoration less conspicuous, however slight display will be unavoidable while smiling or speaking especially in those with high smile line. In this case report, anterior display of RPI clasp was very minimal, and acceptable to the patient. As there was a long edentulous area so RPI clasp was must for anterior retention, stability and support of the prosthesis. In this situation, the maxillary labial flange of cast partial denture was fabricated over anterior bone loss for better aesthetic results.

In an anterior bone defects with multiple missing teeth, a cast partial denture would be better choice. This type of the CPD has rotational path of placement, and rigid metal framework in place of clasp arms cannot be adjusted. In Kennedy class I and class II with anterior modification, this type of rigid design are generally not given as it would cause harmful forces on abutment teeth. A twin-flex clasp can be given to prevent abutment teeth from harmful torquing forces, and have better esthetic results. The flexible twin-flex clasp is soldered into a channel which is cast in the major connector. However, a CPD with twin-flex clasp fabrication for such situation is technique sensitive and required a good lab support.\(^5\)\(^7\)

Some clinicians have also adopted camouflaging the clasp arms with tooth-colored micro filled resins through the etched metal retentive mechanism. However, this also doesn’t provide total elimination of clasp display facially and is temporary.\(^6\)\(^8\)

CONCLUSION

A cast partial denture is good treatment of choice for anterior bone defects and, when patient is not ready for extensive surgical ridge augmentation. It is not only restores esthetics of patient but also function and self confidence. For fabrication of such type of prosthesis, a trained clinician and good lab support is mandatory. The supporting teeth with excessive mobility are not recommended for the CPD abutment. Patients having high caries index, are not appropriate for the RPI clasp.

REFERENCES


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