Case Report

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Esthetic Rehabilitation with a Cast Partial Denture

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ABSTRACT
Removable partial denture is a treatment option where fixed prosthesis is not indicated. Due to its esthetic problems in the anterior region various modifications have been designed for its fabrication. This article describes an esthetic alternative using a round rest distal depression clasp for maxillary anterior teeth abutment while restoring the missing teeth with a cast partial denture.

Key words: Cast partial denture; Esthetics; Maxillary anterior teeth; Round rest distal depression clasp

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INTRODUCTION

The treatment plan during prosthodontic rehabilitation should fulfill both esthetic and function. It is very unrealistic to assume that because acceptable masticatory capability has been achieved, patients will tolerate a poor appearance of the prosthesis.[1] Recently, implants have gained the attention over removable prosthesis as a treatment option in partially edentulous conditions. However sometimes financial, anatomic, psychological, or medical considerations of the patients still require the dentist to treat them with removable prosthesis. Conventional partial dentures with unsightly display of the metal clasps have always been the psychological burden to the patient, which they have rejected many a time. This has led the clinicians to design a Removable Partial Denture (RPD) that can alleviate such problems. Various designs have been proposed by different authors, which basically aim at alteration of the visible display of metal clasp by:

1. Eliminating it e.g. rotational path/ dual path design
2. Hiding it by utilizing lingual and proximal undercuts
3. Making it less conspicuous: using acetal resin, flexible thermoplastic materials
4. Using different attachment systems.[2-8]

A round-rest, distal depression clasp (RRDD Clasp) has been suggested by Tran et al as an esthetic alternative to a conventional clasp for maxillary anterior teeth serving as abutments for a removable partial denture.[1] A lingual round rest provides support for the prosthesis, and a mesiolingual reciprocating plate is present. A split minor connector engages a distal depression for retention. The facial surface of the abutment displays no metal and provides an esthetic result.

This clinical report describe a method of eliminating the display of metal on the labial surface of maxillary anterior teeth used as abutments for a removable partial denture by using a round-rest, distal depression clasp.

CASE REPORT

A 22-year old male patient with a missing maxillary left canine, first and second premolars came to the department of prosthodontics, for the prosthetic rehabilitation (Fig. 1 and 2). He had the history of extraction of teeth along with enucleation of the cystic lesion in that region. He was presented with all possible treatment modalities for prosthetic rehabilitation. He did not want implant-supported restorations due to financial constraints. He was not willing to have a conventional RPD with visible display of clasps due to esthetic concern. So, he was

Fig. 1. Pre-treatment photograph

Fig. 2. Pretreatment intraoral radiograph of the abutment teeth

Fig. 3: Finished RPD with RRDD clasp assembly

presented with different esthetic modifications of the RPD designs, and he chose the RRDD clasp. With the informed consent of the patient, the treatment was started.

Diagnostic casts were made from primary impressions of the maxillary and mandibular arches. Maxillary cast was surveyed and RPD was designed with a broad palatal major connector, RRDD clasp on left lateral incisor, and occlusal rests and conventional cast circumferential clasps

Fig. 4a: Post-treatment photograph (Frontal view)

Fig. 4b: Post-treatment photograph (Occlusal view)

Fig .4c: Post-treatment photograph (Side view)

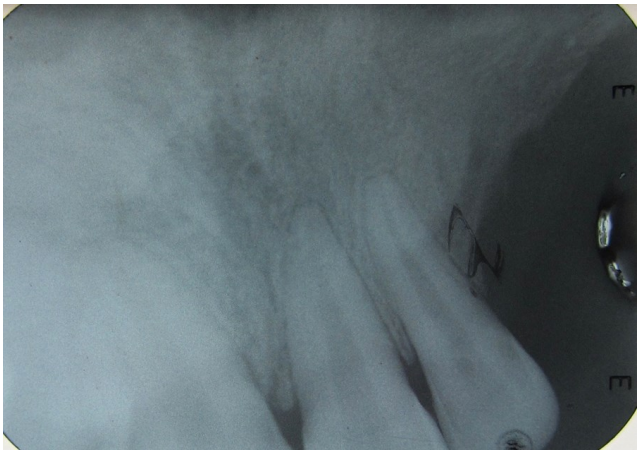

Fig. 5: Post treatment radiographs- one year follow up

on the first molar adjacent to edentulous space, and second premolar and first molar on the contralateral side.

Accordingly, the mouth preparation was started. A round cingulum rest was prepared with a round bur to a depth of 0.75 mm. The reciprocating plane on the mesiolingual surface of the incisor was prepared with a thin parallel chamfer tip carbide bur. The extension of the reciprocating plane was stopped just short of the mesial proximal contact. The guiding plane was prepared on the distolingual surface of the tooth from the distolingual line angle and was stopped just short of the distal proximal contact area. A distal depression, 0.5 mm deep was prepared with a No. 4 round bur 1mm above the gingival margin, and 1 mm lingual to the proximal contact in the middle of the guide plane. Occlusal rest sets were prepared on teeth number 3, 4 and 14.

After completion of the mouth preparation, a polyvvinylsiloxane putty wash impression (Aquasil soft putty, Dentsply DeTray GmbH, Germany, Kanstanz: Reprosil, DentsplyCaulk, USA, DE) was made for the maxillary arch. A definitive cast was obtained and surveyed. Wax pattern was fabricated on the refractory cast. The minor connector and mesiolingual plate of the RRDD were 3 mm wide mesiodistally and 0.5 mm thick occlusogingivally, respectively, to provide adequate rigidity. Distal to the minor connector, 1.5 mm split was made. A smaller minor connector, 2 mm wide tapering to 1mm, engaged the distal depression. The length of this minor connector was about 10 mm to provide adequate flexibility.

A cast chrome RPD framework was fabricated (Remanium GM3 80, Dentaurum, Germany). The framework was evaluated intraorally and was adjusted wherever needed. Maxillomandibular relation was established; acrylic teeth were arranged, and try in was done. Being satisfied with the esthetic and functional requirements, the denture was processed in heat cure acrylic resin. Prior to denture base processing, a rubber-separating medium was used generously on the minor connector flexible arm so that it could flex without binding from the processed acrylic resin denture base. After finishing and polishing (Fig. 3), the denture was inserted and post insertion instructions were given (Fig.4). Patient was recalled after one year for radiographic examination of the lateral incisor abutment tooth, which revealed no adverse effect on the alveolar bone (Fig. 5). Patient was very much satisfied with the esthetic and functional requirements of the denture.

DISCUSSION

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 but still slight display will be unavoidable while smiling or speaking especially in those with high smile line. Although intracoronal and extracoronal precision attachment may be used, this may require technique sensitive procedures that may increase the likelihood of increasing clinical and laboratory errors.[9]

A conventional cast partial denture which has rotational path of insertion may be used in those esthetically demanding areas but the disadvantage of this is that the rigid anterior retentive portion of the framework used in place of clasp arms cannot be adjusted.[10]

In Kennedy class I and class II with anterior modification, this type of design is generally not given as these type of design would create unfavorable torquing action on the abutments.[11] To avoid such unfavorable forces, proximal spring clasp can be used which consists of flexible wire clasp soldered into a channel which is cast in the major connector. As this is flexible it doesn't generate musch torque when the distal extension denture base is pressed. But the disadvantage of this technique is that it demands tedious lab procedures and is technique sensitive. There should be a greater distance between the retentive component of the clasp and the artificial tooth and the clasp is difficult to repair if broken. Some clinicians have also adopted comaouflaging the clasp arms with tooth colored microfilled resins through the etched metal retentive mechanism.[4] However this also doesn't provide total elimination of clasp display facially.

The RRDD clasp assembly is technically demanding for both the clinician as well as the lab technician. A thorough understanding of the clasp functions and a good mouth preparation are mandatory on the clinician's part, while a meticulous work is required by the lab technician.

An abutment tooth with excessive mobility is not recommended for the RRDD clasp. Conditions such as significant eccentric and centric occlusal contacts on cingulum of the tooth, patients having high caries index, are not appropriate for this clasp. The RRDD clasp does not achieve 180 degree

encirclement of the abutment; therefore, it is not recommended for the terminal abutment of a distal extension RPD. Lateral incisor is generally not used as a primary abutment tooth.

The RRDD is an alternative to the rotational path design, with the advantage of adjustable retention if needed. The RRDD clasp assembly design for maxillary incisors and canines satisfies the esthetic and functional requirements of an RPD. Here the distal proximal depression was used for the retention and mesial proximal plate for reciprocation. The clasp arm was made adjustable for minor adjustments in retention, if required. The assessment of the pre-treatment radiograph and the post-treatment radiographs of the mesial abutment after one year revealed no bone loss around the abutment tooth with satisfactory result.

CONCLUSION

Sometimes conventional removable partial denture has some limitations due to esthetic problems. The current scenario presented aims towards restoration of function and phonetics taking along the esthetic consideration. Simple design modification such as Round rest distal depression (RRDD) clasp can be used with favorable outcome in cases where display of clasp in the esthetic zone has to be eliminated.

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