

Replacing Maxillary Posterior Teeth by Cast Partial Denture and Mandibular Arch by Tooth Supported Overdenture: A Case Report

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Abstract:- In situations where a fixed prosthesis is not recommended, a conventional removable partial denture is a therapy alternative. In contrast to conventional removable partial denture, cast partial denture has several designs with RPI and Clasp assembly. On the other part, the overdenture is advisable to those older individuals who have few teeth left and want to retain teeth due to its firmness. The dentures are more stable when roots are maintained beneath the denture base. Moreover, denture retention is improved by using metal copings on the remaining teeth. This clinical report details the technique that fabricates cast partial denture holding the posterior molars of maxillary arch with a tooth supported overdenture with post preparation with 33 and 43.

Keywords:- Cast Partial Denture, Esthetics, Post Preparation, Tooth Supported Overdenture.

I. INTRODUCTION

The prosthodontic treatment plan for both functional and aesthetics purpose, should be maintained during the rehabilitation of the patient.^[1] In many clinical situations, conventional removable partial prosthesis such as cast partial denture and tooth supported overdenture offers a good treatment alternative to fixed prosthesis. In case of a cast partial denture a lingual rest with an I bar offers assistance for the prosthesis. An I bar adapted on the facial surface of the abutment yields a visually pleasing outcome rather than a clasp assembly.^[1] Generally abutments for two or more retained teeth that have been repaired or changed coronally are commonly endodontically prepared and utilised as abutments for an overdenture. An overdenture is a dental prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and/or dental implants.^[2] In overdenture therapy, dental implants, tooth roots, or retained teeth are covered by a full, removable denture. For more than a century, practitioners have effectively used residual roots or preexisting tooth structures to support full denture treatment^[3, 4]. A diseased periodontal ligament causes time dependent drop in residual ridge dimensions, whereas a healthy periodontal ligament preserves the morphology of the alveolar ridge^[5]. Combining both treatment modalities the aim of this clinical report is to distribute stress concentration between retained abutments and the soft tissues supporting

the denture for the mandibular arch with an aesthetic cast partial denture reconstruction for maxillary arch^[6,7].

This clinical report describes the method of replacing maxillary posterior teeth (Kennedy's Class I with no modifications) with cast partial denture and mandibular arch by tooth supported overdenture.

II. CASE REPORT

A 54-years old male patient with missing maxillary molars and with mandibular residual two canines 33 and 43 reported to the Department of Prosthodontics, for prosthetic rehabilitation (Fig. 1). Patient's chief complaint was about multiple missing teeth in upper and lower jaws. On intra oral clinical examination it was found that the patient had posterior missing teeth with respect to 16,17,26,27 with two retained canines in the mandible. The patient had a past dental history of extraction of multiple teeth. All possible treatment modalities for prosthetic rehabilitation were presented to the patient, where cast partial denture and tooth supported overdenture were taken into considerations. The unaesthetic acrylic RPD and high cost implants were the criterias which lead the patient to choose the cast partial denture and tooth supported overdenture. The treatment plan was to fabricate a CPD with aesthetic outcome along with conserving the two mandibular teeth 33 and 43 for short metal copings, to fabricate tooth supported overdenture. The treatment was started with the informed consent of the patient and with an orthopantomograph.

Diagnostic casts were made through primary impression technique and a tentative jaw relation was recorded to establish a guide for the final treatment modality. According to the Kennedy's Classification the missing teeth of maxillary arch came under Kennedy's Class I with no modifications. Custom trays were fabricated and border moulding was done. A pickup impression was made for the maxillary arch with Polyvinyl siloxane impression material (regular body consistency) and cast was poured with type IV dental stone (Figure2). Simultaneously in the mandibular arch the canines 33 and 43 were intentionally endodontically treated and post preparation was done (Figure 4). After the master cast retrieval, framework was digitally designed with antero-posterior palatal strap with RPI concept for the maxillary arch (Figure3). The cast framework was finished and polished and checked for the fit on the cast and intraorally in the patient. In

the mandibular arch the post impressions were made through indirect technique and were casted. Short metal copings were checked intraorally and the posts were cemented followed by an IOPA w.r.t 33 and 43. (Figure 4). It was then followed by border moulding with master cast preparation for jaw relation. The casted framework of CPD was adjusted for the proper fit on the patients maxillary arch (Figure5). Jaw relation was recorded w.r.t maxillary and mandibular arch (Figure6). Teeth arrangement was done followed by try in the patient (Figure 7). The finished acrylic dentures were inserted and occlusal corrections were carried out in the patients mouth (Figure8,9). On recall the patient expressed great satisfaction functionally and aesthetically with the dentures (Figure10).

III. DISCUSSION

Conventional CPD and tooth supported overdentures with short metal copings has been routinely followed for the restoration of partially and completely edentulous situations. In the present case report, a conventional upper CPD and lower tooth supported overdenture was planned after assessing the vertical dimension in the patient. Tooth supported overdentures offers a lot of benefits to the patient

as it prevents extraction of the terminal dentition. Studies have been shown that a well planned tooth supported overdenture results in overall improvement of patient’s oral health and satisfaction.^[8]The canines being the longest root were chosen for post preparation which adds upto the retention of the prosthesis. The teeth being periodontically healthy and with a thick biofilm helps to hold the periodontium firmly. The criteria for the tooth supported overdenture includes single rooted tooth having sufficient supragingival tooth structure which generally acts as a ferrule after post preparation for the metal copings. The overdenture helps to preserve the proprioception within the periodontal ligament, which helps in regulating the biting force over the denture.^[9] Removable partial dentures such as cast partial dentures are treatment of choice when a fixed prosthesis is not feasible and indicated. A cast partial denture with RPI concept provides better aesthetic appearance than the denture with conventional clasp assembly.^[10,11] The strength of the antero-posterior palatal strap major connector design lies in the fact that the anterior and posterior components are joined together by longitudinal connectors on either side, which forms a square or rectangular framework. Each component braces the others against possible torque and flexure.^[12]

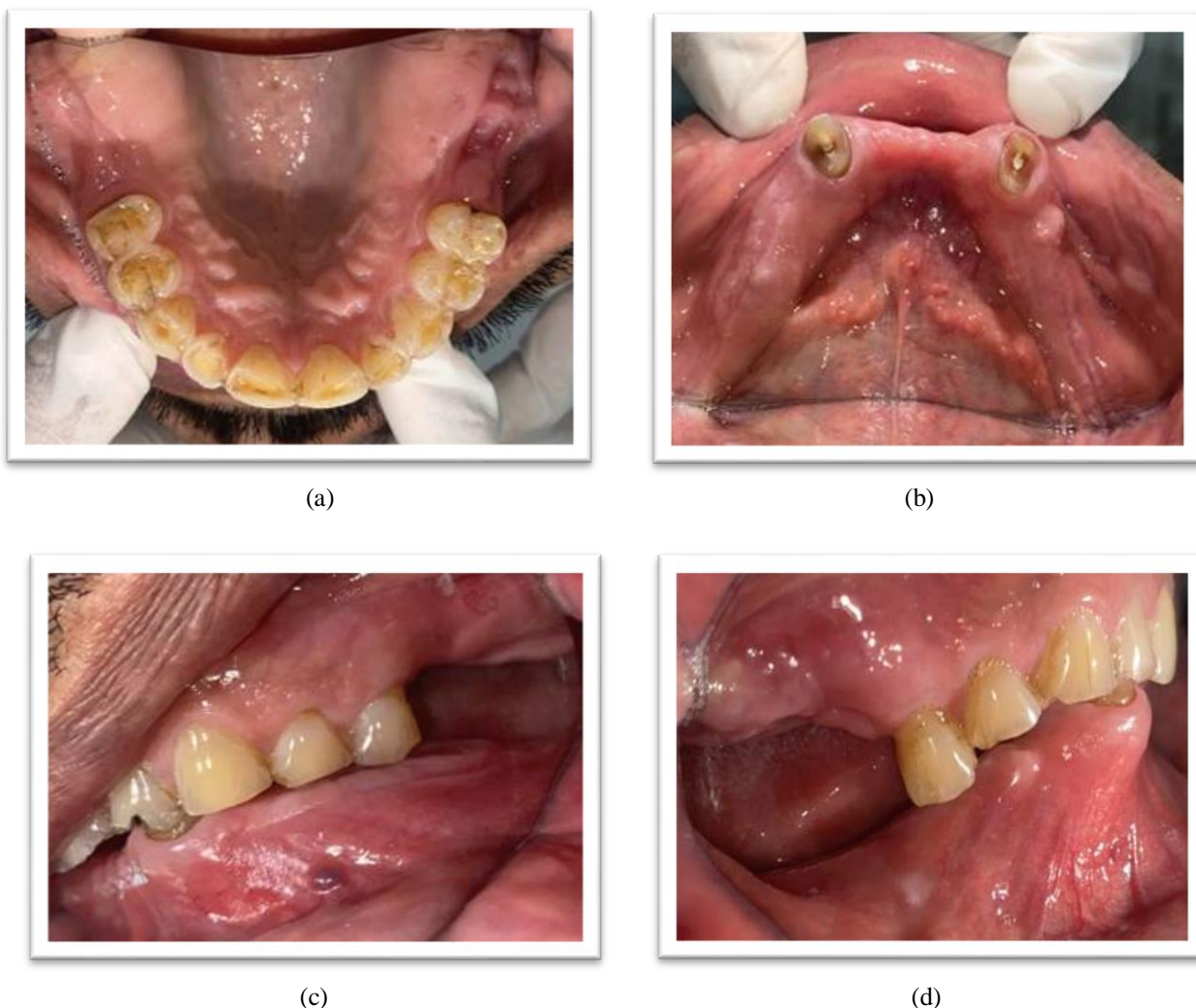


Fig 1: Intraoral Views (a) Occlusal View of Maxillary Arch (b) Occlusal View of Mandibular Arch (c) Right Lateral View (d) Left Lateral View

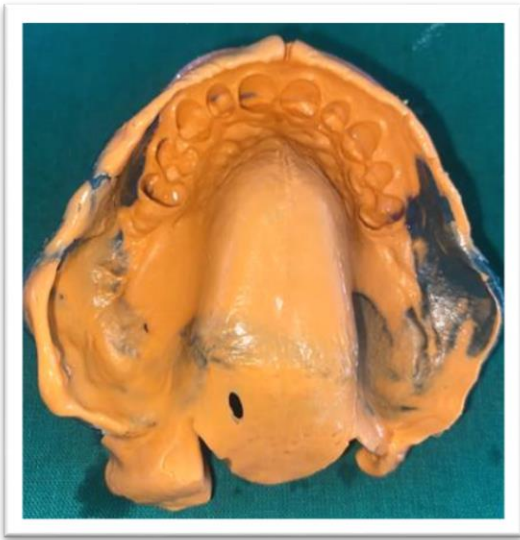


Fig 2: Border-Moulding With Pickup Impression

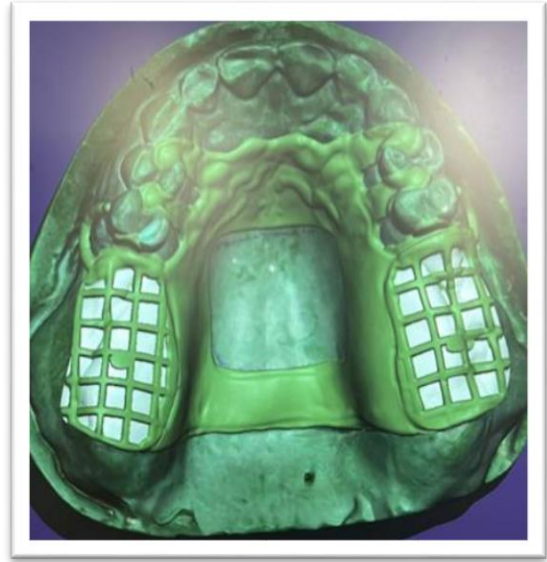


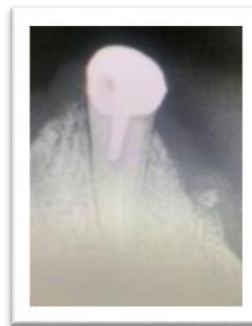
Fig 3: CAD/CAM Designing of the Framework



(a)



(b)



(c)



(d)

Fig 4: IOPA of Post Preparation (a) & (b) Pre Op Views (c) & (d) Post Op Views



Fig 5: Fit of Framework on the Maxillary Arch



Fig 6: Jaw Relation at Centric Relation



Fig 7: Try-in of the Patient



Fig 8: Denture Insertion after



Fig 9: Framework Fit on Maxillary Arch



Fig 10: Post Op Extra Oral View

IV. CONCLUSION

Conventional acrylic removable partial denture has limitations due to its esthetic problems and implant retained fixed partial denture has limitations due to its financial aspect. In situations where a balance has to be achieved between aesthetics and treatment cost, the cast partial dentures and tooth supported overdentures can be a good alternative treatment choice for the patient. This combined treatment results in bio-mechanical, functional and aesthetical advantages to the patient.

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