

Management of long partially edentulous space in mandibular arch with attachment retained removable partial denture.

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Abstract: Long span partially edentulous areas require prosthetic rehabilitation. Planning the right prosthesis is important for obtaining proper esthetics, phonetics, ease of hygiene maintenance, distribution of occlusal forces on underlying or adjacent supporting areas within physiologic limits besides satisfying all biomechanical principles of designed prosthesis. One of the viable options having all the above mentioned advantages in a single prosthesis designed for long span edentulous area is attachment retained removable partial denture. Such prosthesis is more or less equivalent to the fixed prosthesis for the patient in terms of support, stability, and retention; moreover they are very convenient for hygiene maintenance by the wearer and helps in preservation of the remaining dentition under occlusal forces by uniform distribution among alveolar bone in edentulous area and abutment teeth. This article presents rehabilitation of such long-span edentulous cases with attachment-retained removable prosthesis.

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I. Introduction:

Rehabilitation options for the long span partially edentulous patient with multiple missing teeth include conventional cast partial denture, removable partial denture with attachment, fixed partial denture, or implant-retained prosthesis. Clinical decision-making is critical in deciding the most suitable treatment option for a particular patient.¹ The implants are not an option for each situation because of anatomic limitations and cost factor.² The conventional tooth supported fixed partial dentures require multiple teeth involvement to satisfy Ante's law and even hygiene maintenance below pontics are a major concern in them.³ Conventional cast partial dentures are technique sensitive as well as retention is not up to the expectations of the patient in most of the times. Even, display of metal parts makes patients for not choosing them.⁴ Precision attachment system provides esthetics, resiliency and easy replacement of worn out attachment.^{5,6}

II. Case report:

A 55-year-old male patient reported to army dental centre for replacement of his missing lower back teeth. Clinical examination [Figure 1] revealed missing 35-37 and 45-47, root canal treated 34 and mesially tilted 38, 48 and patient wanted a fixed replacement only. Dental Implant was the first option suggested to the patient; however, cost was the limiting factor here. A tooth supported conventional fixed partial denture using third molar on distal and canine and first premolar on mesial side as abutments was a possibility but was not suggested because of its disadvantages like involvement of many natural teeth, increased load on abutment teeth and difficulty in hygiene maintenance below pontics and between abutment teeth leading to unfavorable long-term prognosis. As an alternative, a bar-clip retained removable partial denture was suggested to the patient. Diagnostic impressions of the maxillary and mandibular arches were made using irreversible hydrocolloid (Zelgan, Dentsply, India) and were poured using model plaster for treatment planning and patient education. 34, 44 were prepared for PFM with porcelain buccal facing only fused to metal retainers and 38, 48 for full metal retained and a putty, light body impression, was made and poured in die stone (Ultrarock, Kalabhai Karson, India). A blue inlay wax pattern was fabricated on 34, 38, 44, 48 and a pre-fabricated plastic bar (CIKA precision, USA) was attached within wax patterns to connect terminal abutments in both quadrants. These patterns were casted using Ni-Cr alloy (Auriloy N.P. Aurium, USA). The metal framework was finished and evaluated in the patient's mouth. Ceramic (Vita VMK Master, Vita Zahnfabrik, Germany) built up was done only for buccal facings over 34 and 44. The finished prosthesis was evaluated in the patient's mouth for fit and occlusion [Figure 2] and then cemented over prepared abutments using glass ionomer cement (GC Luting and lining cement, GC Corporation, Japan). A putty- light body impression was made and poured in die stone (Ultrarock, Kalabhai

Karson, India). Centric records were made and using them articulation was done. Spacer was given in area of clip attachment and a pattern resin framework was fabricated for edentulous areas bilaterally connected together with lingual bar (minor connector) and later casted using Ni-Cr alloy (Auriloy N.P. Aurium, USA). Teeth arrangement was done (group function occlusal scheme) on this finished metal frame and later it was acrylised in heat cure resin after wax trial. Clip with metal housing was put in place intraorally [Figure 3] and adequate space was created in removable partial denture for complete seating. Now, chemical cure acrylic resin was used to fix metal housing on inner surface of the denture. Final check for fit and occlusion was done [Figure 4,5] and patient was educated for removal and insertion as well as for hygiene maintenance. Final prosthesis [Figure 6,7]

III. Discussion:

The use of precision attachments is uncommon because of lack in their awareness among the dental professionals and less availability of these attachments in market. Many authors have described tissue bars attached to teeth adjacent to the edentulous span and having the pontic section attach onto the tissue bar with a clip.^{5,6} Precision attachment system provides esthetics, resiliency and easy replacement of worn out attachment. Partial dentures with these attachments have the advantage of being more stable and retentive than partial dentures without attachments. A removable prosthesis with attachment is an efficient and cost-effective treatment option for long span partially edentulous ridge. There are several advantages to such prosthesis. Firstly, splinting of the terminal abutments provide stability if they are periodontally compromised or else full coverage crown provides external strength for these abutments if they are restored or root canal treated.⁷ Secondly, prosthesis gets vertical support during occlusal load through occlusal rests and direct rest on rigid bar resulting in lesser trauma to the underlying mucosa in edentulous area.^{5,7} Thirdly, as the prosthesis is very stable during all oral functions so patient remain comfortable and get big psychological satisfaction. Their spectrum of food items in diet increases so does their health.⁸ Fourthly, patient can remove the prosthesis and can clean so hygiene maintenance is not an issue as it is with tooth supported fixed prosthesis. There is minimal soft tissue coverage by the superstructure promotes mucosal health.⁷ Lastly, there are no clasps as in cast partial denture so there is no unaesthetic display of metal components. The possible disadvantages include the disintegration of cement and dislodgement of crown due to repeated removal and insertion; wear off for the clip with time and additional laboratory efforts. The replaceable housings can be removed and reinserted to provide easy serviceability of the attachment system.⁵ The laboratory procedures involved in fabricating this type of prosthesis do not differ much from the conventional laboratory techniques.

IV. Conclusion

The aim of the prosthetic rehabilitation is to preserve the remaining structure. The attachment based removable partial dentures are satisfying all biomechanical principles as well as they provide results up to the expectation level of the patient without doing much harm to the remaining intraoral structures. Although there are many advantages to this prosthesis, proper execution of all the clinical and laboratory procedures requires knowledge of important laboratory techniques and clinical skills.

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Case Photographs

Figure 1: Pre-Operative Intraoral View



Figure 2: Crown-Bar Assembly Cemented On Terminal Abutments



Figure 3: Final Prosthesis In-Situ



Figure 4: Removable Prosthesis In Occlusion (Right)



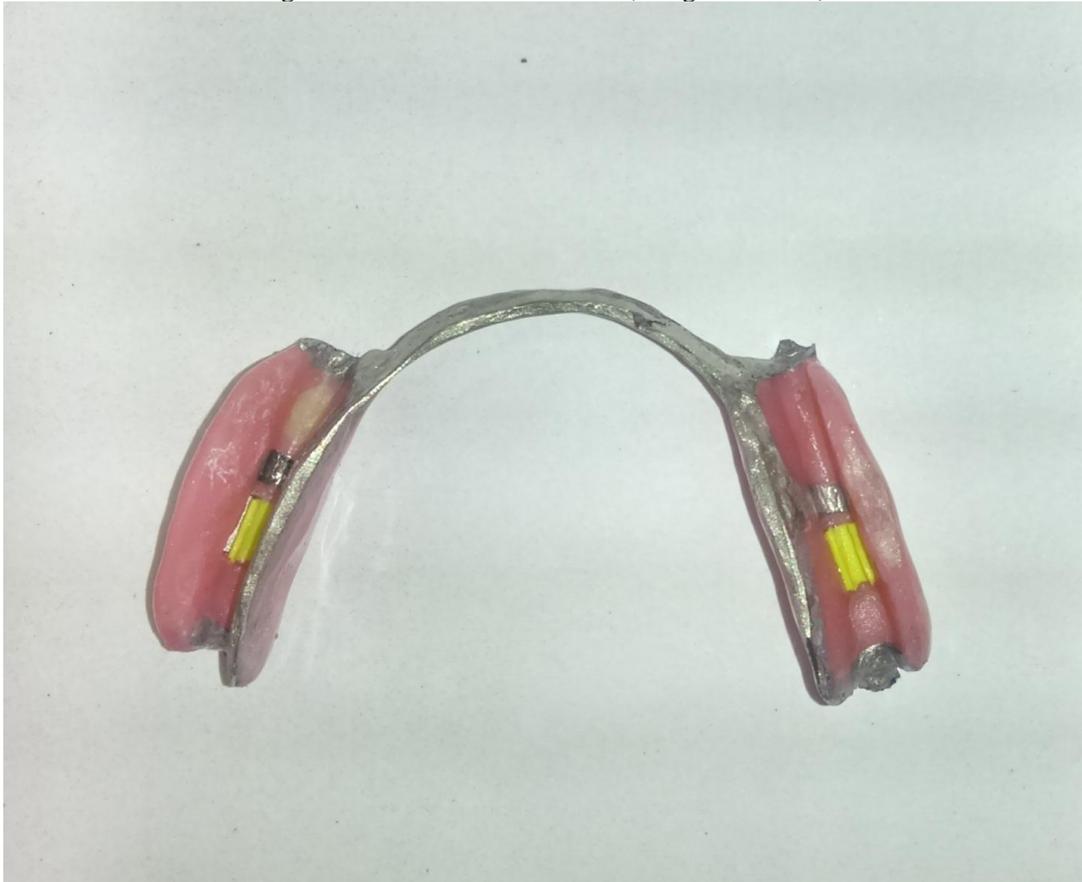
Figure 5: Removable Prosthesis In Occlusion (Left)



Figure 6: Removable Prosthesis (Occlusal Surface)



Figure 7: Removable Prosthesis (Intaglio Surface)



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