



Case Report

Harmony in attachment: A case report of tooth-supported overdenture using locator attachment

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ARTICLE INFO

Article history:

Received 01-12-2023

Accepted 14-12-2023

Available online 16-01-2024

Keywords:

Overdenture

Extra coronal attachment

Preservation

Stability

ABSTRACT

The over-denture is a frequently employed treatment for elderly patients who have two or more remaining teeth in the arch. The presence of these remaining teeth contributes to the preservation of the alveolar ridge, provides sensory feedback, and enhances the stability and retention of the denture. This is in contrast to conventional complete dentures, where stability and retention are typically improved by utilizing coping or attachments over the remaining portions of the teeth. The incorporation of these remaining teeth significantly enhances the overall stability and retention of the denture. This case report presents prosthetic rehabilitation of a partially dentulous mandibular arch with a tooth supported overdenture with extra coronal attachments aimed to attain normal structure and functionality.

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1. Introduction

Preventive prosthodontics underscores the significance of procedures aimed at delaying or preventing potential prosthodontic issues, with overdentures serving as a crucial component in this preventive treatment approach. In the course of transitioning to complete dentures, patients typically experience a series of events, including the loss of discrete tooth proprioception, gradual deterioration of alveolar bone, the shift of all occlusal forces from the teeth to the oral mucosa, and, notably, a decline in the patient's self-confidence, which can be particularly disheartening.¹

Overdentures are recommended for patients who have a limited number of remaining retainable teeth in an arch. They are particularly preferred for cases involving malrelated ridges, individuals requiring a single denture, and those with challenging conditions such as unfavorable tongue positions, problematic muscle attachments, and a high palatal vault, which can make achieving stability and

retention of the prosthesis difficult.² However, overdentures are contraindicated in patients with questionable oral hygiene, systemic complications, and insufficient interarch distance. Careful consideration of these factors is essential in determining the suitability of overdentures for each individual patient.^{3,4}

An overdenture is undeniably a superior option when compared to a removable complete denture prosthesis, which comes with inherent limitations. Overdentures represent one of the most pragmatic approaches in preventive dentistry. In a study conducted over four years by Renner et al., it was observed that 50% of the roots utilized as overdenture abutments remained stable and immobile. This underscores the efficacy and durability of overdentures as a viable and beneficial preventive measure in dental care.⁵

2. Case Report

A 56-year-old male patient reported to the department of prosthodontics and crown & bridge complaining of dislodged fixed prosthesis with respect to mandibular arch.

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He also complained of pain in front region of lower jaw. The pain was intermittent and dull in nature. Intraoral examination revealed faulty fixed prosthesis. It spanned across the whole mandibular arch and was tender on percussion (Figure 1). Radiographic investigations were done which revealed presence of complete arch fixed cantilever prosthesis on eight abutment teeth in mandibular arch as shown in Figure 2.



Figure 1: Intraoral preoperative view of maxillary and mandibular arches



Figure 2: Radiographic investigations

Favourable treatment options were assorted which comprised of fabrication of conventional complete denture or implant supported overdenture or a more conservative approach which was a tooth supported overdenture. The patient declined the idea of extracting the remaining teeth, therefore considering awareness of the patient, fabrication of mandibular tooth supported overdenture with extra coronal attachments was planned.

The treatment plan was as follows:

1. Removal of faulty prosthesis with mandibular arch
2. Extraction of abutment teeth with poor prognosis
3. Fabrication of Interim removable prosthesis
4. Fabrication of tooth supported overdenture with extra coronal attachments.

2.1. Treatment procedures

2.1.1. Removal of faulty prosthesis with mandibular arch

The preexisting faulty prosthesis from 37 to 48 was removed using a mechanical crown remover (GDC Automatic Crown Remover) Figure 3. On removal of prosthesis, 31 and 45 abutment teeth were removed along with the prosthesis. The sockets of 31 and 45 were debrided and irrigated with betadine solution. The abutment teeth present intraorally after the removal of prosthesis were 32, 33, 42, 43, 44 and 48 (Figure 4).



Figure 3: Crown remover (GDC automatic crown Remover)



Figure 4: Intraoral view after removal of faulty prosthesis

2.2. Extraction of abutment teeth with poor prognosis

After the clinical and radiographic examination of remaining mandibular teeth, diagnostic impression were made and cast was fabricated followed by extraction of unfavourable teeth i.e. 32, 42, 44 was advised to the patient.

2.3. Fabrication of Interim removable prosthesis

Patient was recalled after 1 week of post extraction and border moulding was done along with secondary impression

of mandibular arch. Bite registration records were made using Alu wax. The maxillary and mandibular casts were articulated followed by teeth arrangement. The removable prosthesis was processed and finished after a satisfactory trial of try in denture, curing, processing and finishing of dentures was done. Interim Removable partial denture was inserted and post insertion instructions were given to the patient.

2.4. Fabrication of tooth supported overdenture with extra coronal attachments

Vertical dimension was assessed after the interim prosthesis was given to the patient. The diagnostic articulation helped in assessing the available inter-arch space and was found to be adequate. Proposed abutment teeth 33 and 43 were prepared on the diagnostic cast, and the ability to accommodate abutment copings and custom ball attachments was assessed. Then it was decided to fabricate a mandibular overdenture with locator attachments (Figure 5). The treatment plan was presented to the patient and his consent was obtained.

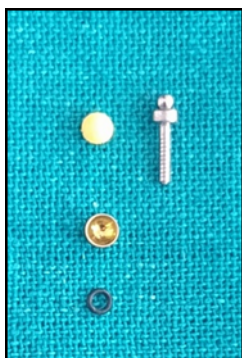


Figure 5: Locator attachment

2.5. Elective endodontic treatment of favourable abutment teeth

The patient also complained of pain in front and right back tooth region of mandibular arch. On intraoral examination it was deduced that 33, 43 and 48 were found to be tender on percussion. The radiographic investigations were suggestive of periapical abscess with 33, apical periodontitis with 43 and 48. The patient was advised to undergo root canal treatment with 33, 43 and 48 which was aimed to achieve favourable abutment teeth for the definitive prosthesis (Figures 6, 7 and 8).

Elective endodontics was carried out with respect 43 and 33 and they were prepared in a dome-shaped contour and hemi spherically rounded in all dimensions with approximately 3– 4 mm projecting just coronal to the gingiva (Figure 9).



Figure 6: Pre (a) & post (b) Operative radiographs of 38



Figure 7: Pre (a) & post (b) operative radiographs of 43



Figure 8: Pre (a) & post (b) operative radiographs of 33



Figure 9: Preparation of abutment teeth

A primary impression of the lower arch was made with alginate and a special tray was fabricated on the primary cast after block out (Figure 10). Using conventional techniques border moulding was done and secondary impression was made with light viscosity rubber base material (Aquasil TM, DECA Regular Set, Dentsply) (Figure 11). Record rims were fabricated to record the maxilla-mandibular relationships. The established record was transferred to a semi adjustable articulator and arrangement of teeth was done and a try-in was accomplished. After a satisfactory try-in, the waxed-up denture was processed using heat cure acrylic.



Figure 10: Custom tray

An adequate post space preparation was done on previously treated mandibular canines. The attachments were inserted into root canal of each canine and after evaluation of proper fit they were cemented by glass ionomer cement as shown in Figure 12. The intaglio surface was marked bilaterally in the area of ball attachment in canines and was relieved to incorporate the female component (Nylon housing). The female component was attached to the denture after picking them up from the respective male components (Figure 13). Excess resin from area was trimmed, finished and polished. The final denture



Figure 11: Final impression

(Figure 14) was delivered to the patient and post insertion instructions were given. This was followed by periodic recall.



Figure 12: Occlusal view after placement of ball attachment



Figure 13: Pickup of Nylon housing using self-cure acrylic

3. Discussion

Different kinds of attachments are accessible and have found extensive application in removable partial/complete denture prostheses, segmented fixed prostheses, and



Figure 14: Final denture

implant-supported prostheses. However, there is not a one-size-fits-all attachment suitable for every case. Therefore, it is imperative to carefully choose the right attachment for each unique situation.⁶ Through a thorough analysis of study models and radiographs, clinicians can make crucial assessments, each of which plays a role in determining the final attachment selection. This option is a practical alternative for patients retaining some teeth who are unwilling to undergo the surgical procedures associated with implant placement.⁷

An overdenture contributes to minimizing the shrinkage of the surrounding bone, alleviating pressure on the alveolar ridge, and preserving proprioception.⁸ In a study conducted by Rissin et al. in 1978, a comparison of masticatory performance among individuals with natural dentition, complete dentures, and overdentures was carried out. The findings revealed that patients with overdentures exhibited a chewing efficiency that was one-third higher compared to those with complete dentures.⁹

Overdenture attachments are categorized as either studs, linking the prosthesis to individual teeth, or bars, connecting the prosthesis to splinted abutment teeth. These attachments are further distinguished as either rigid or resilient. Considering that edentulous ridges and remaining roots are frequently compromised, prostheses relying on resilient attachments demonstrate better ability to redirect occlusal forces away from weakened abutment teeth.⁴

4. Conclusion

The prominence of a tooth-supported overdenture as a treatment modality lies in its integration of core concepts

from preventive prosthodontics. It's essential not to overlook the fundamentals; instead, revitalize and integrate them consistently into our clinical practice.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Brewer AA, Morrow RM. Overdentures Made Easy. St. Louis: The C. V. Mosby Co; 1980.
2. Preiskel HW. Overdentures Made Easy: A guide to Implant and root supported prostheses. London, UK: Quintessence Publishing Co; 1996.
3. Rahn A, Heartwell C. Textbook of Complete Dentures. 5th ed. Philadelphia: WB Saunders Co; 1993.
4. Almuhaiza M. Fracture resistance of three different post and core systems on endodontically treated teeth: an in vitro study. *J Int Oral Health*. 2016;8(6):679.
5. Renner RP, Gomes BC, Shakun ML, Baer PN, Davis RK, Camp P. Four-year longitudinal study of the periodontal health status of overdenture patients. *J Prosthet Dent*. 1984;51(5):593–8.
6. Miller PA. Complete dentures supported by natural teeth. *Tex Dent J*. 1965;83:4–8.
7. Thayer HH. Overdentures and the periodontium. *Dent Clin North Am*. 1980;24(2):369–77.
8. Preiskel HW. Precision Attachments in Prosthodontics: Overdentures and Telescopic Prostheses. vol. Vol 2. 2nd ed. Chicago, IL: Quintessence Publishing Co; 1985.
9. Morrow RM, Feldmann EE, Rudd KD, Trovillion HM. Tooth-supported complete dentures: An approach to preventive prosthodontics. *J Prosthet Dent*. 1969;21(5):513–22.

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Cite this article: Kumar V, Jain L, Deole K. Harmony in attachment: A case report of tooth-supported overdenture using locator attachment. *Int J Oral Health Dent* 2023;9(4):315-319.