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Case Report

Overdentures with Attachments: Case Reports

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Abstract

Aim: The aim of the study is to have a removable prosthesis with enhanced retention, stability, and support and to be aligned with the principles of preventive prosthodontics.

Background: Loss of teeth in the mandibular arch leads to increased resorption of the alveolar bone, resulting in instability of the mandibular denture. The principles of preventive prosthodontics enable us to preserve the remaining natural teeth and use them as abutments for added retention, improved proprioception, and masticatory efficiency.

Case 1 Description: The patient presented with a maxillary completely edentulous arch and mandibular arch with 33, 35, 36, 43, and 45 present. The patient was evaluated clinically and radiographically, and a diagnostic jaw relation was recorded. The treatment plan was a maxillary complete denture and mandibular tooth-supported overdenture. The abutment teeth were prepared to receive a bar attachment on 35, 33, 43, and 45 and dome-shaped preparation to receive telescopic metal copings for 36. Final impressions were made using additional silicone impression material for the maxillary and mandibular arch. Following the fabrication of the attachments, the jaw relation was recorded. Teeth arrangement was assessed, and dentures were processed.

Case 2 Description: Patients have consented for the utilization of their records and photographs to be used for presentations or publications with their identity concealed.

Conclusion: The patient was successfully rehabilitated with a maxillary conventional complete denture and tooth-supported overdentures with Hader bar attachment and stud attachments with the aim to improve the stability of the mandibular dentures.

Clinical significance: This technique of attachment overdentures enhances stability and retention along with even stress distribution, subsequently benefiting the patient psychologically and physiologically.

Key words: Overdentures, Bar attachment, Stud attachment, Tooth supported overdenture, Preventive prosthodontics, Residual ridge preservation, Masticatory efficiency

INTRODUCTION

Tooth-supported overdentures represent a significant advancement in prosthetic dentistry, offering a balanced solution for patients with partial tooth loss who are not ideal candidates for conventional complete dentures or implant-supported prostheses. Unlike traditional removable dentures, which rely solely on the alveolar ridge for support, tooth-supported overdentures utilize remaining natural teeth or roots as abutments, enhancing retention, stability, and function. This treatment approach not only improves masticatory efficiency and patient satisfaction but also helps preserve residual alveolar bone by distributing occlusal forces through periodontal ligament stimulation.

The incorporation of the attachment system further augments the prosthesis' performance, providing superior mechanical retention compared to individual stud attachments.

In addition, tooth-supported overdentures offer a cost-effective alternative to implant-retained prostheses, making them a viable option in cases where financial constraints or anatomical limitations preclude implant placement. Despite their benefits, the long-term success of tooth-supported overdentures depends on careful patient selection, meticulous treatment planning, and consistent maintenance to prevent complications such as caries, periodontal disease, or prosthetic wear.

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This case reports describes tooth-supported overdenture with DMLS Hader bar metal superstructure attached to the lower denture with an indirect technique and stud attachments.

CASE 1 DESCRIPTION

A 70-year-old male patient reported to the Department of Prosthodontics with the chief complaint of multiple missing teeth, inability to chew, and an unesthetic look.

The patient gave a history of diabetes and was under medication for 5 years. Past dental history revealed that the patient had undergone extraction of his upper posterior teeth 6–7 years back and upper anterior teeth 3 years back.

Extraoral examination revealed an ovoid facial form and a convex facial profile [Figure 1]. Clinical examination revealed that the teeth present were 33, 35, 36, 43, and 45 [Figure 2]. A U-shaped maxillary and mandibular arch with well-rounded ridges was noted. An orthopantomogram (OPG) along with the intraoral periapical (IOPA) radiographs was used to assess the endodontic and periodontal prognosis of the teeth.

Figure 1: Pre-operative extraoral

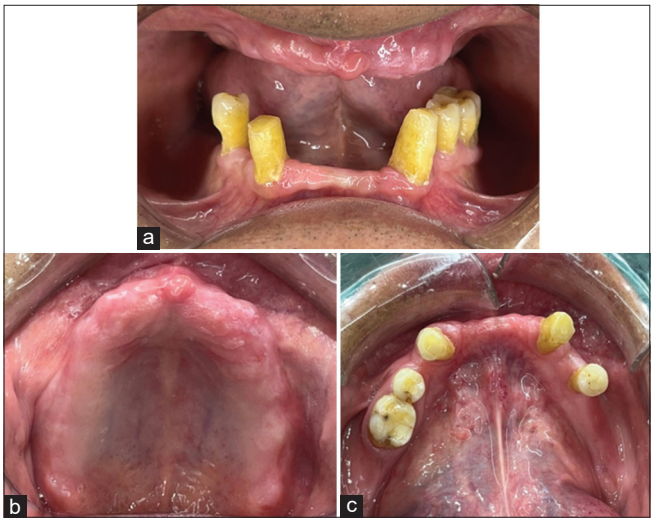

Figure 2: (a-c) Pre-operative intraoral

Oral prophylaxis was carried out. A diagnostic irreversible hydrocolloid impression was made; then, a diagnostic jaw relation was recorded and transferred on a semiadjustable Hanau Wide Vue 183 series articulator using self-centering spring bow. The interarch space available was assessed to be 46 mm with a class I ridge relationship.

The various treatment options presented to the patient were the following:

Maxillary Arch

- Conventional complete denture
- Implant-supported overdenture
- Fixed implant prosthesis.

Mandibular Arch

- Extraction of remaining natural teeth and complete dentures
- Tooth-supported overdenture
- Extraction of remaining natural teeth and implant-supported overdenture
- Extraction of remaining natural teeth and fixed implant prosthesis.

Taking the adequate interarch space, good periodontal prognosis of 33, 35, 36, 43, and 45, U-shaped mandibular arch, well-formed ridges, and affordability for the patient into consideration, it was planned to do a conventional complete denture for the edentulous maxillary arch and a tooth-supported overdenture with the Hader bar attachment on 35, 33, 43, and 45 and telescopic metal copings on 36 for the mandibular arch.

Figure 3: Diagnostic mounting

Clinical Procedure

- Intentional root canal treatment was carried out on the abutments 33, 35, 36, 43, and 45.
- Tooth preparation was done with 33, 35, 36, 43, and 45 with a chamfer margin [Figure 4]
- Adequate tooth reduction was assessed using the diagnostic jaw relation for adequate space for the arrangement of teeth and optimal crown-to-root ratio
- Chemical retraction was carried out using the Astringent retraction paste, and an impression was made using addition silicone putty and light body [Figure 5]
- The master cast was poured into a die stone
- The master case was scanned with laboratory scanner and the design was prepared in the Exocad software [Figure 6]

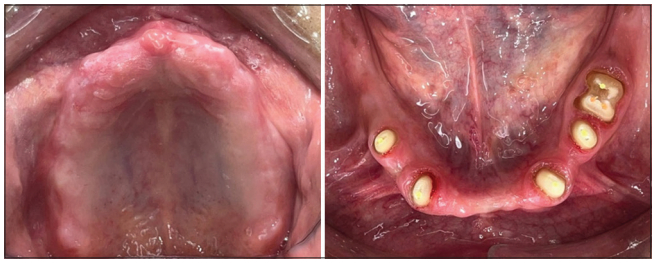

Figure 4: Maxillary arch and tooth preparation with 33, 34, 36, 43, and 44

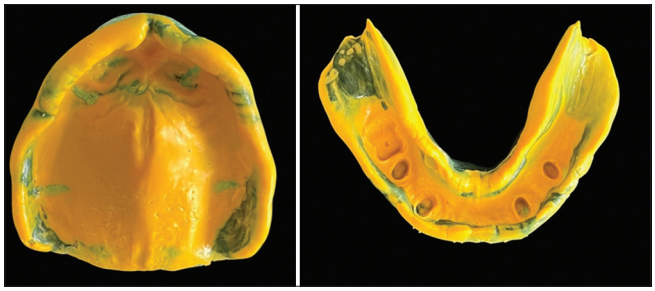

Figure 5: Final impression

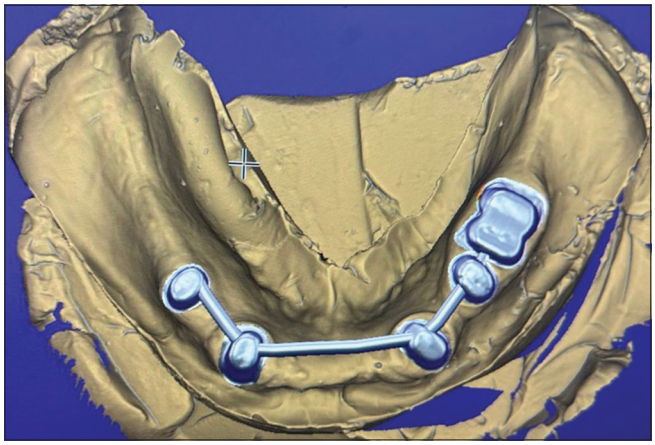

Figure 6: Design prepared in the Exocad software

- A facebow record was made. The jaw relation was recorded and transferred to the Hanau semiadjustable articulator [Figure 3]. Teeth arrangement and trial of the denture were done to assess the fit and esthetics [Figures 8 and 9]
- The bar attachment on the cast was blocked out and the plastic sleeve along with the metal housing

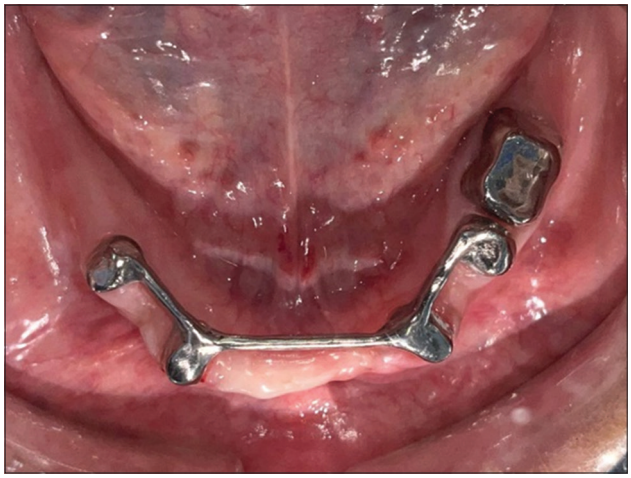

Figure 7: Co-Cr bar intraorally

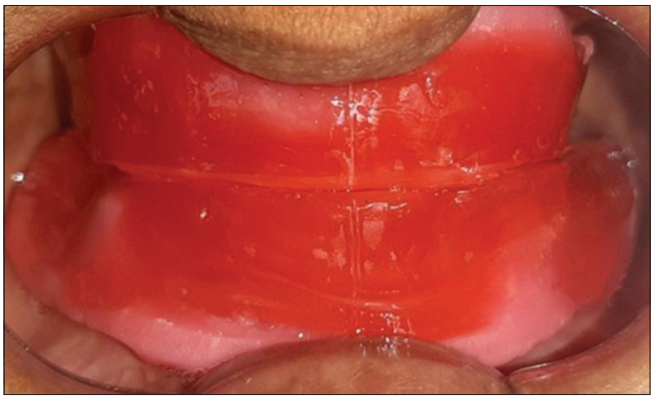

Figure 8: Maxillomandibular relation

Figure 9: Facebow record

was secured in the desired location. The acrylization process was carried out, and the maxillary and mandibular dentures were retrieved, finished, and polished [Figures 10 and 11]. The bar attachment along with metal copings was cemented using glass ionomer cement [Figure 7].

- The mandibular denture was snapped into position with the aid of the retentive clips placed in the metal housings. The metal housing allows labiolingual movement of the clips during placement and removal of the prosthesis as well as secures the clip in position. The maxillary and mandibular dentures were assessed for retention, stability, support, comfort, and esthetics
- The patient was instructed to follow-up the next day and the following week for any adjustments. A 3-month follow-up was advocated [Figure 12]
- The patient was prescribed fluoride mouthwash and a Proxa brush to clean the undersurface of the bar.

Figure 10: Denture intraorally

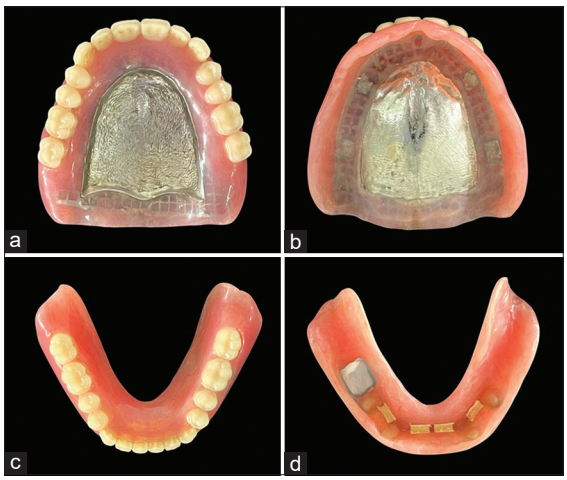

Figure 11: (a-d) Occlusal and polished surface of the denture

Figure 12: Pre-operative and post-operative extraoral

CASE 2 DESCRIPTION

A 61-year-old male patient reported at the Department of Prosthodontics with a chief complaint of multiple missing teeth, inability to chew.

The patient gave a history of angioplasty and had been on aspirin medication for 4 years. Past dental history revealed that the patient had undergone the extraction of his upper posterior teeth 6–7 years back.

Extraoral examination revealed an ovoid facial form and a convex facial profile [Figure 13]. Clinical examination revealed that the teeth present were 33, 34, 43, and 45 [Figure 14]. A square-shaped mandibular arch with well-rounded ridges was noted. An OPG along with the

Figure 13: Pre-operative extraoral

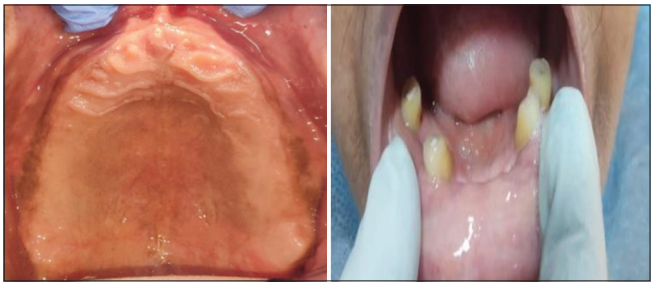

Figure 14: Pre-operative intraoral

IOPA radiographs was used to assess the endodontic and periodontal prognosis of the teeth.

Oral prophylaxis was carried out. A diagnostic irreversible hydrocolloid impression was made; then, a diagnostic jaw relation was recorded and transferred on a semiadjustable Hanau Wide Vue 183 series articulator using self-centering spring bow. The interarch space available was assessed to be 41 mm with class I ridge relationship.

The various treatment options presented to the patient were the following:

Maxillary Arch

- Conventional complete denture
- Implant-supported overdenture
- Fixed implant prosthesis.

Mandibular Arch

- Extraction of remaining natural teeth and complete dentures
- Tooth-supported overdenture
- Extraction of remaining natural teeth and implant-supported overdenture
- Extraction of remaining natural teeth and fixed implant prosthesis.

Taking the adequate interarch space, good periodontal prognosis of 33, 34, 43, and 45, U-shaped mandibular arch, well-formed ridges, and affordability for the patient into consideration, it was planned to do a conventional complete denture for the edentulous maxillary arch and a tooth-supported overdenture with the ball attachment on 33, 34, and metal coping on 43 and 45.

Clinical Procedure

- Intentional root canal treatment was carried out on the abutments 33, 34, 43, and 45
- Tooth preparations were carried out on mandibular teeth after the endodontic treatment of the same
- Postspace preparation was done and teeth were prepared to achieve a favorable crown-root ratio
- Peeso Reamers and Gates Glidden drills were used for preparing the postspace by removing gutta-percha leaving one-fourth of the material in the apex. This facilitates the placement of copings within the canal space
- Then postspace impression was obtained with light body, and lower pickup impression was obtained using putty and light body
- Cobalt chromium copings were fabricated and evaluated for the fit and were inserted individually into each canal for evaluating the fit and their parallelism. After the trial fit, copings were cemented in the prepared root canal space with glass ionomer cement. The primary impressions were obtained with irreversible hydrocolloid material, and custom trays were fabricated using auto-polymerizing resin with double spacer
- Border molding was done using tracing sticks, and final impressions were obtained using polyvinyl siloxane light body [Figure 16]
- For the mandibular arch, during the secondary impression procedure, temporary silicone stoppers were attached to the male component and picked up along with the impression
- Maxillomandibular relations were recorded [Figure 15], and teeth arrangement was done in a conventional manner, and dentures were processed [Figures 17 and 18]
- Temporary silicone stoppers on the tissue side of the dentures were replaced by metal housing and O-ring

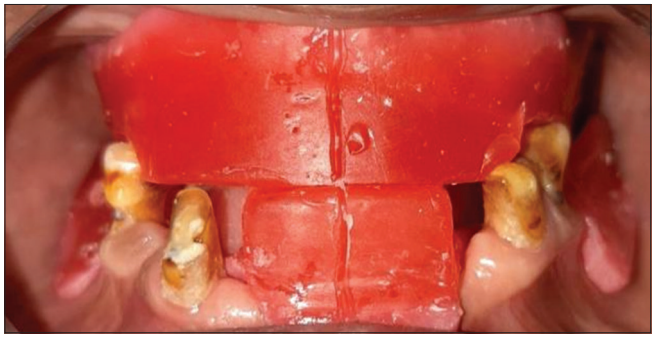

Figure 15: Diagnostic jaw relation

Figure 16: Final impression

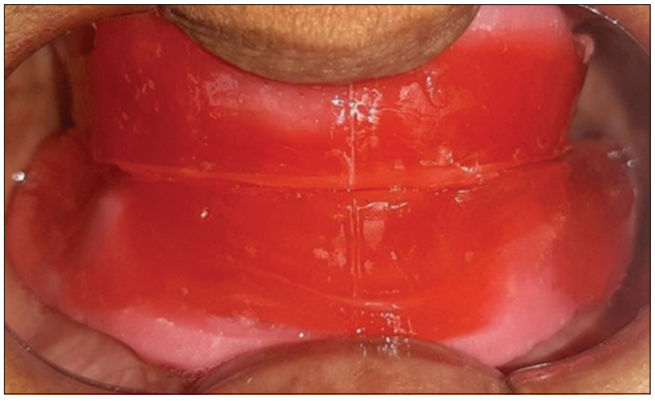

Figure 17: Jaw relation

[Figure 19]. Dentures were delivered after necessary adjustments [Figure 20]. Post-insertion follow-ups were done on the 1st day, 1 week, and 1 month. After that, a 6-month follow-up and 1-year follow-up were done [Figure 21].

DISCUSSION

Following the extraction of teeth, the maxillary and mandibular bones are subjected to lifelong catabolic remodeling. The amount of bone loss to the resorptive process has been estimated at 21% by 3 months, 36% after 6 months, and 44% after 1 year.[1]

Figure 18: Try-in

Figure 19: Black processing caps placed on the ball attachments

Figure 20: Insertion of the final prosthesis

It is a clinically proven fact that the bone loss is four times faster in the anterior mandible than in the anterior maxilla. Many denture wearers have difficulty in wearing and eating with mandibular complete dentures due to loss of retention and stability of the denture. The presence of the tongue moves the denture while mastication. The obvious way to prevent this is by saving the natural teeth. The treatment option of saving the remaining natural teeth and constructing an overdenture has the advantages of enhanced stability retention and positive support of the denture as well as psychological benefit to the patient over the conventional complete denture.[2,3]

Franco has classified overdentures as non-coping, with copings, and with attachments. Adequate interarch is a prerequisite in planning an overdenture with attachments. Overdentures with attachments distribute the occlusal forces evenly between the abutments and the remaining edentulous ridges, thereby resulting in superior retention.[4] Overdenture attachments are classified as extraradicular attachments and intraradicular attachments. In extraradicular attachments, studs which connect the prosthesis to individual tooth or bar attachments which splint the remaining abutments to distribute the forces.

Tooth-supported overdentures with attachments offer a valuable treatment option for patients with compromised dentition, providing improved retention, stability, and preservation of alveolar bone.[5-7] Stud attachments, while simple and easy to use, may offer less retention, particularly in situations where maximum overdenture stability is required. Stud attachments are beset with the disadvantage of not providing a splinting effect, potentially leading to increased stress on individual implants and the surrounding bone, especially under lateral or oblique loading.

Figure 21: Pre-operative and post-operative extraoral

The bar and clip system involves connecting remaining abutment teeth with a rigid bar, onto which the denture is retained using a clip mechanism. This configuration has been shown to improve both the functional and psychological outcomes for patients. The bar and clip system involves connecting remaining abutment teeth with a rigid bar, onto which the denture is retained using a clip mechanism. This configuration has been shown to improve both the functional and psychological outcomes for patients.

The primary benefit of this system is the enhanced retention and stability it provides. By splinting the abutment teeth with a bar, occlusal forces are more evenly distributed, reducing the risk of individual tooth overload and subsequent mobility or loss. The clip ensures that the denture remains securely in place during function, minimizing movement and improving chewing efficiency. This is particularly beneficial for patients with reduced residual ridge height, where conventional dentures may lack adequate support and stability. The rigid connection provided by the bar distributes occlusal forces more evenly across the abutment teeth and the supporting soft tissues, improving denture function and patient comfort.

Retaining natural teeth as abutments for overdentures helps to preserve the alveolar ridge by maintaining proprioception and stimulating bone remodeling.[6,8] This is crucial in minimizing residual ridge resorption, a common consequence of tooth loss that can compromise denture stability and facial esthetics over time.[9]

The presence of natural teeth, even reduced to roots or copings, provides sensory feedback to the patient through periodontal proprioception. This proprioceptive input enhances the patient's awareness of their jaw position and function, leading to better control of the denture and improved masticatory efficiency.[5,6] Maintaining natural teeth, even beneath a denture, can have positive psychological effects on patients. It can improve self-esteem, reduce the feeling of edentulism, and enhance overall quality of life.

One of the major concerns for attachments supported overdenture is meticulous oral hygiene which is pertinent in order to prevent caries and periodontal diseases.[10,11] The attachments in this study maintained no contact with the underlying tissue. Any contact between the bar and the mucosa causes compression leading to hyperplasia. The patient was educated to perform a proper oral hygiene regimen including the use of proxy brush to clean the undersurface of the bar.[12] Fracture of the denture is a concern in cases of attachment prosthesis but this can be taken care off by incorporating metal mesh or metal plate into the denture. Another disadvantage of using attachment prosthesis is the bulk of the denture as well as loss of retention of the retentive clip, culminating in replacement of the clip in bar attachments.

CONCLUSION

Mandibular tooth or implant-supported overdentures are a viable treatment option to preserve the remaining alveolar bone and maintain the proprioception, masticatory efficiency, and psychological benefit to the patient.

CLINICAL SIGNIFICANCE

Various attachment systems are available and are considered a boon to prosthodontics with improved retention and stability of dentures. A detailed examination of the patient and proper selection of attachment according to the case dictate the success of tooth-supported overdentures.

REFERENCES

1. Carlsson GE, Persson G. Morphologic changes of the mandible after extraction and wearing of dentures. A longitudinal, clinical, and x-ray cephalometric study covering 5 years. Odontol Revy 1967;18:27-54.
2. Morrow RM, Feldmann EE, Rudd KD, Trovillion HM. Tooth-supported complete dentures: An approach to preventive prosthodontics. J Prosthet Dent 1969;21:513-22.
3. Dodge CA. Prevention of complete denture problems by use of "overdentures". J Prosth Dent 1973;30:403-11.
4. Thayer HH. Overdentures and the periodontium. Dent Clin North Am 1980;24:369-77.
5. Bista S, Sapkota B. Bar retained tooth supported overdenture: A case report. J Nepalese Prosthodont Soc 2022;5:84-92.
6. Daviasigamani S, Chidambaranathan AS, Balasubramanium M. Coping and bar retained tooth supported over denture a viable option to preserve the proprioception and residual bone case report. JIDAM 2020;7:157-62.
7. Elabdouli R, El Assraoui K, Rimaoui S, Bellemkhannate S. Mandibular tooth supported overdenture: Case report. Open Access Libr J 2024;11:1-10.
8. Singh S, Rathee M, Ghalaut P, Malik S, Wakure P. Tooth supported overdenture retained with ball attachments and custom-made coping: A case report. J Indones Dent Association 2022;5:45-8.
9. Samra RK, Bhide SV, Goyal C, Kaur T. Tooth supported overdenture: A concept overshadowed but not yet forgotten. J Oral Res Rev 2015;7:16-21.
10. Brill N, Schu¨beler S, Tryde G. Aspects of occlusal sense in natural and artificial teeth. J Prosthet Dent 1962;12:123-8.
11. Manly RS, Braley LC. Masticatory performance and efficiency. J Dent Res 1950;29:448-62.
12. Kapur KK, Soman SD. Masticatory performance and efficiency in denture wearers. J Prosthet Dent 1964;14:687-94.

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