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Case Report

Implant-supported mandibular overdenture with locator attachments: A functional and aesthetic solution

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Abstract

Implant-supported overdentures provide a noticeable improvement over conventional dentures by offering a more secure fit, greater comfort, better appearance and a positive impact on a patient's confidence and well-being. This article shares an easy, chairside technique for attaching lower dentures to implants using stud attachments, making the process more convenient for both the clinician and the patient.

Keywords: Implant supported overdenture, Attachment, Stud attachment, Crown height space

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1. Introduction

Traditional complete dentures have long been the primary solution for managing edentulous patients. However, many individuals experience issues such as poor retention, limited stability during functional movements, and overall discomfort—especially in the lower jaw. These limitations can negatively influence chewing efficiency, speech clarity, facial appearance, and overall quality of life. Implant-supported overdentures offer a reliable alternative that overcomes many of these shortcomings. By securing the prosthesis to dental implants, they provide significantly improved retention and stability, minimize prosthetic movement, and enhance patient satisfaction and confidence.[1–3] In addition, they contribute to preserving alveolar bone, support facial contours, and improve aesthetics, all of which play a vital role in maintaining psychological well-being.[4–5] This article outlines a straightforward and effective chairside procedure for attaching mandibular overdentures to implant-supported stud attachments. The technique is designed to be minimally invasive, efficient in a clinical setting, and predictable in outcome—providing increased comfort and satisfaction in mastication for the patient.[6]

2. Case Report

A 60-year-old well-built male patient reported to the Department of Prosthodontics with the chief complaint of difficulty in chewing food due to missing teeth in the lower arch for the past three years. The patient had been wearing a mandibular complete denture during this period; however, the prosthesis had undergone significant occlusal wear, leading to compromised masticatory function. In the maxillary arch, a fixed prosthesis was present from teeth 16 to 25, which was functionally and esthetically acceptable to the patient.

Intraoral examination revealed a completely edentulous mandibular arch with a moderately resorbed residual ridge. **(Figure 1**) The maxillary fixed prosthesis was intact and did not require replacement. A comprehensive case history was recorded, and based on clinical findings and radiographic evaluation, including cone-beam computed tomography (CBCT), the patient was diagnosed with a completely edentulous mandible. Treatment planning involved the placement of two dental implants in the mandibular inter-foraminal region to retain an overdenture using locator attachments. The implant sites and dimensions were determined with the help of CBCT, and two implants were placed in regions of tooth #43 and #33; Implant size: 4.0 mm × 10 mm, and D: 3.0 mm × 11.5 mm respectively. **(Figure 2)**

The implants were placed in the canine regions, between the two mental foramina. Flap closure was done using simple interrupted sutures. The patient was recalled after a healing period of three months for the prosthetic phase.

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Figure 1: Pre-treatment (A) Extra-oral Photograph; (B) Intra oral view of maxillary; and (C) Mandibular edentulous arch

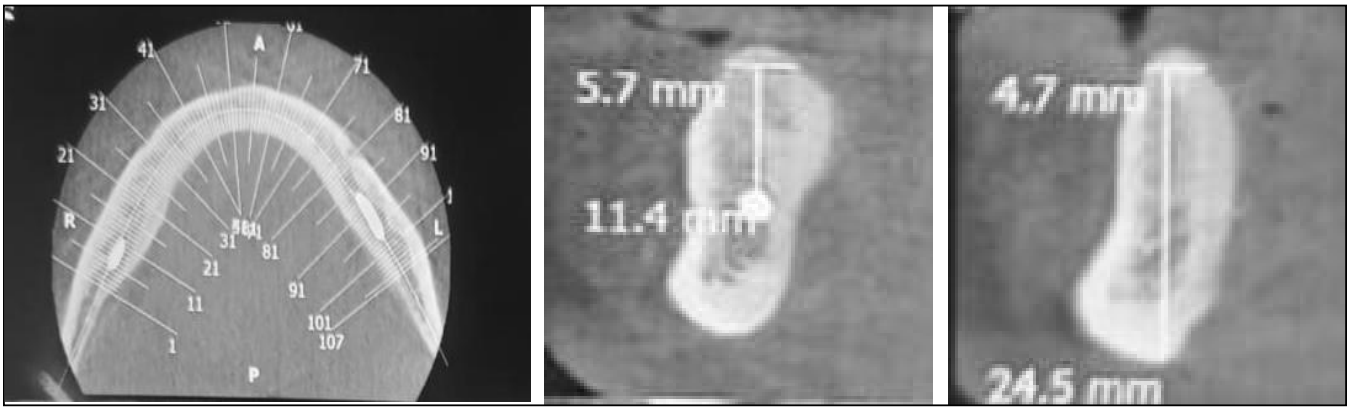

Figure 2: CBCT images depicting alveolar width around tooth #33 and #43

At the three-month recall, preliminary impressions were made. A special tray was fabricated on the primary maxillary cast following necessary block-out procedures. Border molding was performed using low-fusing impression compound, and final impressions were made using zinc oxide eugenol (ZOE) paste. Maxillomandibular relationship was recorded, including centric relation and facebow transfer, and the casts were mounted on a semi-adjustable articulator (Hanau Wide Vue). Acrylic resin teeth were arranged and evaluated intraorally during the try-in appointment for esthetics, phonetics, and occlusion. After processing and finishing of the denture, locator abutments were placed on the implants. The cuff height of the abutments was selected to match the soft tissue thickness, ensuring that only the male seating area was exposed above the mucosa.

Block-out spacers were adapted around the locator abutments, and metal housings with black processing male inserts were positioned. The intaglio surface of the denture was relieved to ensure passive fit without any rocking. The housings were picked up chairside using autopolymerizing acrylic resin, and excess resin was trimmed and polished. The black processing inserts were replaced with blue nylon retentive inserts for final delivery. **(Figure 3)**

The prosthesis was delivered with excellent fit, retention, and stability. **(Figure 4)** The patient expressed satisfaction with the functional and esthetic outcome. Follow-up was scheduled to monitor implant and prosthesis performance.

3. Discussion

Mandibular complete dentures often present clinical challenges due to insufficient retention, instability during function, and progressive residual ridge resorption. These factors compromise prosthesis performance and patient comfort. Implant-supported overdentures have emerged as a standard treatment modality, offering significantly improved retention, stability, masticatory efficiency, and patient satisfaction compared to conventional complete dentures.[7]

In this case, a two-implant-supported mandibular overdenture retained with Locator attachments was selected, guided by anatomical limitations, prosthetic requirements, and patient expectations. The selection of only two implants in the anterior mandible, placed at positions B and D (canine regions), aligns with the McGill Consensus (2002) and York Consensus (2009) statements. These consensus guidelines recommend the two-implant overdenture as the minimum standard of care for edentulous mandibles, given its favorable clinical success, cost-effectiveness, and reduced morbidity.[1,2]

The interforaminal region, specifically positions B and D (corresponding to 33 and 43), was chosen for implant placement due to the presence of sufficient bone volume, favorable cortical support, and safe distance from the mental foramina. Placement in this region ensures optimal biomechanical support, wide anterior-posterior spread, and reduces the risk of neurovascular complications.[3] Furthermore, the B and D sites provide symmetric distribution of masticatory forces and improve the prosthesis's rotational stability.

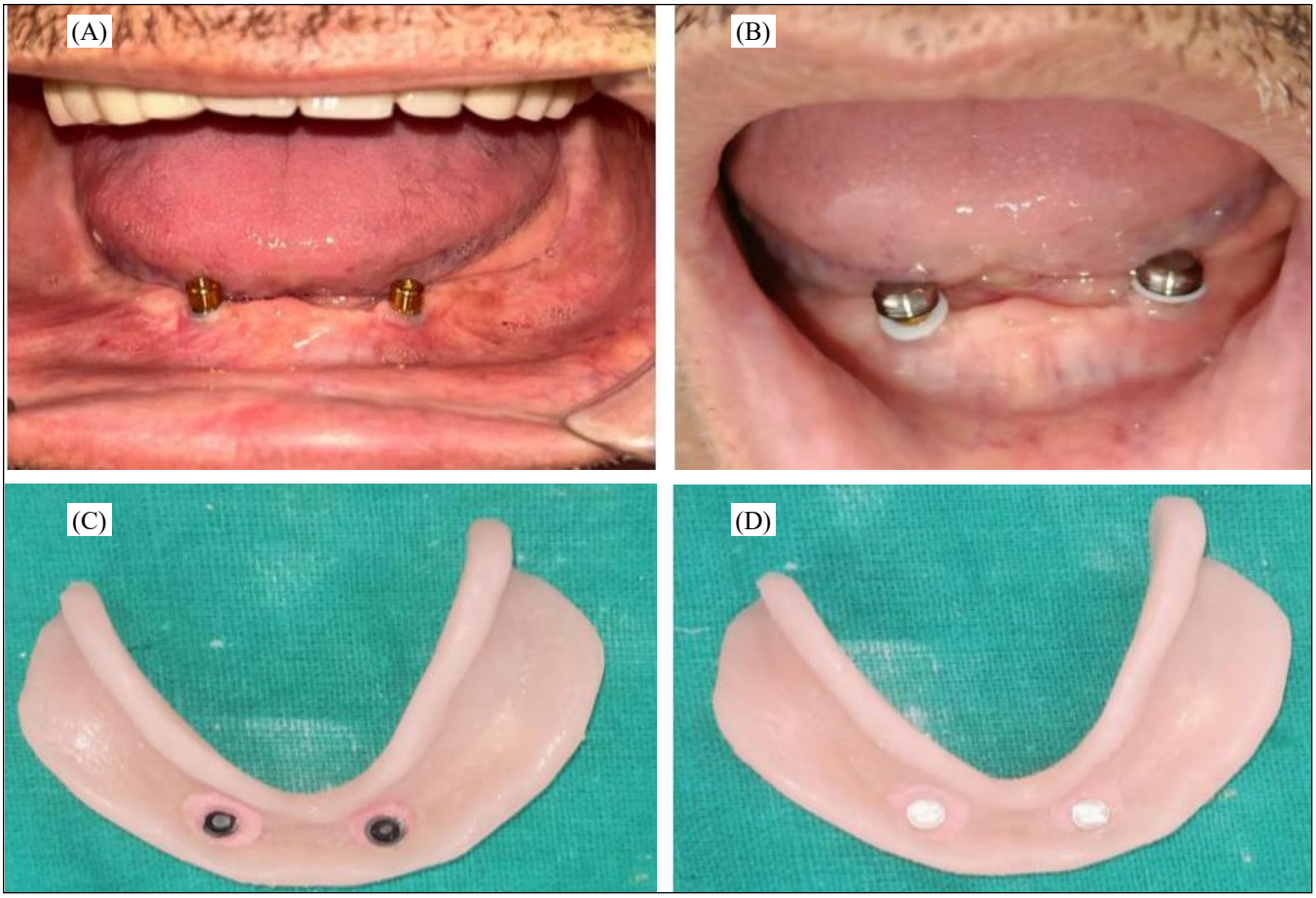

Figure 3: Case photos (A) Port abutments placed over the fixtures; (B) Block out spacer; (C) Pick up of metal housing using auto polymerizing resin; (D) Black processing ring removed

The choice of Locator attachments (also referred to as port abutments) was made after evaluating prosthetic space and anatomical constraints. One of the major considerations was the crown height space (CHS)—the vertical distance from the alveolar crest to the opposing dentition. CHS is a critical parameter in overdenture treatment planning, as it directly influences the selection of attachment systems, prosthesis design, and long-term mechanical success. An ideal CHS for Locator attachments ranges from 8 to 14 mm. In this patient, the CHS was measured at 14 mm, making Locator attachments a suitable choice. Had the CHS exceeded 15 mm, bar attachments may have introduced challenges such as overcontouring, weakened denture bases, or increased leverage on implants.

Locator attachments are low-profile, self-aligning stud attachments offering dual retention (internal and external frictional engagement) and permitting angulation correction up to 20°. These features are particularly beneficial in edentulous patients with moderately resorbed ridges, allowing for improved path of insertion, reduced chair-side time, and better prosthesis hygiene maintenance. In contrast, bar attachments are bulkier, require parallel implant placement and additional vertical space, and can complicate hygiene due to plaque accumulation beneath the bar. Ball attachments, while simpler, tend to wear faster and require more frequent maintenance.[5]

Additionally, Locator-retained overdentures are associated with fewer mechanical complications, better distribution of functional loads, and reduced crestal bone stress due to their forgiving design.[5] The chairside pickup technique using autopolymerizing acrylic resin also simplifies the workflow and minimizes the number of appointments required, which is advantageous for elderly or systemically compromised patients.

In this patient, blue nylon inserts were used to achieve moderate retention while ensuring easy removability. These inserts can be replaced with different retention strengths (e.g., pink for light, clear for heavy retention), depending on patient preference and function over time. This modularity and ease of maintenance further justify the preference for Locator systems.

From a biomechanical perspective, Locator attachments offer reduced lateral force transmission compared to bar systems, potentially lowering the risk of implant overload and peri-implant bone loss.[5] Moreover, studies consistently report higher patient satisfaction scores for Locator-retained overdentures due to improvements in speech, comfort, prosthesis handling, and psychological acceptance.[8]

In conclusion, the use of Locator attachments at B and D positions in the interforaminal region provided a minimally invasive, functionally effective, and patient-friendly solution for mandibular edentulism. The outcome demonstrated significant improvement in prosthesis stability, masticatory efficiency, and patient satisfaction.

Figure 4: Post insertion, intra-oral photograph of implant-supported mandibular

4. Conclusion

The strategic placement of two implants at positions B and D in the anterior mandible, combined with the use of Locator attachments, provided a minimally invasive, functionally reliable, and patient-friendly solution for the rehabilitation of a completely edentulous mandible. This treatment plan is supported by the McGill and York consensus statements, which recommend the two-implant overdenture as the minimum standard of care for edentulous mandibles.[1,2] The interforaminal region offered favorable bone quality, allowing for optimal implant placement with reduced risk to vital anatomical structures.[3] The Locator attachment system was particularly advantageous in this case due to its compatibility with limited crown height space, simplified chairside pickup, and superior ease of maintenance. From both a prosthodontic and biomechanical standpoint, this approach resulted in improved prosthesis retention, stability, masticatory function, and patient satisfaction, while reducing lateral forces on implants and minimizing peri-implant stress.[5,7,8] The positive clinical outcome observed further supports the efficacy and practicality of Locator-retained mandibular overdentures in similar clinical scenarios.[6]

Declaration of Patient Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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None.

Conflict of Interest

None.

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