RESEARCH PAPER

Rehabilitation Of A Partially Edentulous Maxillary Arch Using Cast Partial Denture And Completely Edentulous Mandibular Arch Using Implant-Supported Overdenture With Locator Attachment: A Clinical Case Report

Dr. Sonam Agrawal[1], Dr. Bhairavi Patwardhan[2], Dr. Sonia Sharma[3], Dr. Prasad Najpande[4], Dr. Atharv Rokade[5], Dr. Anuj Agrawal[6]

[1]Associate Professor, Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital, Nagpur
[2]PG Student, Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital, Nagpur
[3]Associate Professor, Triveni Institute Of Dental Sciences and Hospital and Research Center, Bilaspur
[4]PG Student, Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital, Nagpur
[5]PG Student, Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital, Nagpur
[6]PG Student, Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital, Nagpur

ABSTRACT

Complete mandibular edentulism significantly affects mastication, phonetics, esthetics, and quality of life.[1] Implant-supported overdentures are considered a predictable and effective treatment option for improving retention and stability in edentulous patients.[2] Locator attachment systems are widely used because of their low profile, dual retention mechanism, and ease of maintenance.[3] This clinical report describes the prosthodontic rehabilitation of a patient with a partially edentulous maxillary arch and completely edentulous mandibular arch using a mandibular implant-supported overdenture retained with locator attachments. The treatment involved diagnostic evaluation, implant placement, definitive impression procedures, framework fabrication, jaw relation records, and final prosthesis delivery. The definitive prosthesis demonstrated satisfactory retention, stability, function, and esthetics.

Keywords: Implant-supported overdenture, locator attachment, mandibular edentulism, overdenture prosthesis, implant prosthodontics.

How to cite this article: Agrawal S, Patwardhan B, Sharma S, Najpande P, Rokade A, Agrawal A. Rehabilitation Of A Partially Edentulous Maxillary Arch Using Cast Partial Denture And Completely Edentulous Mandibular Arch Using Implant-Supported Overdenture With Locator Attachment: A Clinical Case Report. Int J Drug Deliv Technol. 2026;16(52s): 500-506. DOI: 10.25258/ijddt.16.52s.64

Source of support: Nil.

Conflict of interest: None

Introduction

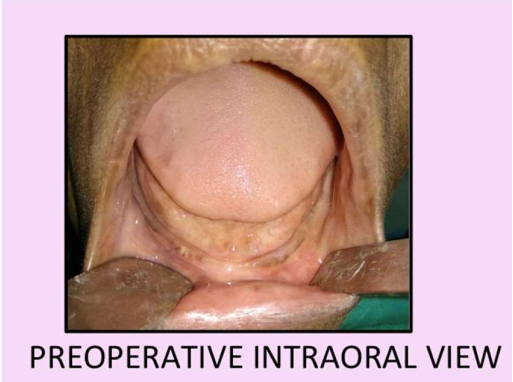
Edentulism is associated with impaired oral function, reduced masticatory efficiency, compromised facial appearance, and psychological distress.[1] Conventional mandibular complete dentures frequently present inadequate retention and stability because of progressive residual ridge resorption.[4] Implant-supported overdentures have shown superior patient satisfaction, retention, and functional efficiency when compared with conventional complete dentures.[2]

The McGill recommends a two-implant mandibular overdenture as the minimum standard of care for edentulous mandibles.[5] Various attachment systems are available for overdentures, including bar, ball, magnet, and locator attachments.[6] Locator attachments are commonly preferred because of their low vertical height, self-aligning design, resilient movement, and ease of replacement.[3]

This clinical report presents the rehabilitation of a partially edentulous maxillary arch and completely edentulous mandibular arch using a locator-retained implant-supported overdenture.

Case Report

A female patient reported to the Department of Prosthodontics with a chief complaint of difficulty in mastication and poor denture stability.[1] Clinical examination revealed partial edentulism in the maxillary arch and complete edentulism in the mandibular arch. Diagnostic evaluation and treatment planning were performed prior to prosthetic rehabilitation.[7]



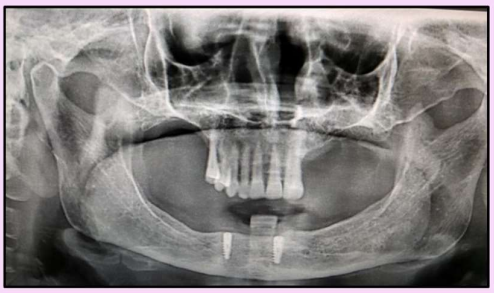
PREOPERATIVE INTRAORAL VIEW

Preoperative intraoral examination and radiographic assessment were completed to evaluate the available bone and prosthetic space.[7]

A surgical guide was fabricated to facilitate accurate implant placement.[8]

SURGICAL GUIDE

Postoperative orthopantomographic evaluation confirmed satisfactory implant positioning.



POST OPERATIVE OPG

Preliminary impressions were made using impression material to obtain diagnostic casts.[9] Primary casts were poured, and custom trays were fabricated for definitive impression procedures.[9]

PRELIMINARY IMPRESSION

PRIMARY CAST AND SPECIAL TRAY FABRICATION

Final impressions were made using polyvinyl siloxane impression material because of its excellent dimensional stability and accuracy.[10] Master casts were subsequently obtained for prosthesis fabrication.

FINAL IMPRESSION USING POLYVINYL SILOXANE IMPRESSION MATERIAL AND MASTER CAST

The maxillary arch was restored with crowns incorporating rest seats to improve support and prosthesis stability.[11]

CROWN CEMENTATION WITH REST SEAT

Metal framework fabrication and trial procedures were completed to evaluate passive fit and adaptation intraorally.[12]

METAL FRAMEWORK

Facebow transfer was recorded and the maxillary arch to the articulator and facilitate harmonious occlusion.[13]

FACEBOW TRANSFER

Jaw relation records were obtained, and teeth arrangement was completed according to esthetic and functional requirements.[14]

Intraoral try-in procedures were performed to evaluate occlusion, phonetics, vertical dimension, and esthetics before final processing.[14]

TRY IN INTRAORAL VIEW

The definitive prosthesis was processed, finished, and polished according to conventional laboratory protocols.[15]

FINISHED PROSTHESIS POLISHED SURFACE

Locator attachment male and female components were incorporated into the mandibular overdenture to improve retention and stability.[3]

MALE AND FEMALE COMPONENTS OF THE LOCATOR ATTACHMENT

The locator system provides resilient retention and allows ease of insertion and removal for the patient.[6]

Postoperative intraoral evaluation demonstrated satisfactory retention, stability, esthetics, and patient comfort.

POSTOPERATIVE INTRAORAL VIEW

Oral hygiene instructions and maintenance protocols were explained to the patient to ensure long-term success of the prosthesis.[16]

Discussion

Mandibular implant-supported overdentures are considered a predictable treatment modality for edentulous patients with compromised denture retention.[2] Implant overdentures significantly improve masticatory performance, oral comfort, and

patient satisfaction when compared with conventional complete dentures.[17] The improvement in retention and stability provided by implants also contributes to enhanced chewing efficiency, improved speech, and greater psychological confidence in edentulous patients.[17]

Conventional mandibular complete dentures often present clinical challenges because of continuous residual ridge resorption and reduced denture-bearing area.[4] Progressive bone loss compromises denture stability and support, resulting in discomfort and functional limitations for the patient.[4] Implant-supported overdentures help reduce these limitations by providing additional support and retention through osseointegrated implants.[2]

Locator attachment systems have gained popularity because of their low profile design and dual retention mechanism.[3] They are particularly useful in patients with limited interarch space because they require less vertical height than bar attachment systems.[18] The resilient nature of locator attachments also helps distribute occlusal stresses more evenly to the implants and supporting tissues.[19] Their self-aligning feature facilitates easy insertion and removal of the prosthesis, especially in elderly patients with compromised dexterity.[3] In addition, locator attachments are associated with simplified maintenance procedures because worn nylon inserts can be replaced easily during recall appointments.[6]

Several attachment systems have been described for mandibular overdentures, including bar attachments, ball attachments, magnets, and locator systems.[6] Bar attachment systems provide excellent retention and splinting of implants but require increased interarch space and involve more complex laboratory procedures.[6] Ball attachments are relatively simple and economical; however, they may demonstrate increased wear over time.[19] Locator attachments provide a balance between retention, resiliency, ease of maintenance, and patient comfort, making them a widely accepted attachment option in clinical practice.[3]

Proper diagnosis and treatment planning play a crucial role in the long-term success of implant-supported overdentures.[7] Radiographic evaluation and surgical guide fabrication aid in accurate implant positioning and help achieve favorable prosthetic outcomes.[8] Accurate implant angulation is important for improving attachment function, reducing wear, and minimizing stresses transmitted to the supporting structures.[7]

Accurate impression procedures are essential for achieving passive fit and long-term success of implant prostheses.[20] Polyvinyl siloxane impression material was used in the present case because of its dimensional accuracy and elastic recovery.[10] Accurate transfer of intraoral implant positions to the master cast is critical for fabrication of a well-fitting prosthesis and attachment assembly.[20] Errors during impression making or cast fabrication may lead to prosthesis misfit, attachment wear, and biomechanical complications.[20]

The use of facebow transfer and proper jaw relation records contributed to accurate articulation and establishment of harmonious occlusion in the present case.[13] Balanced occlusion is important in overdenture prostheses because it helps reduce destabilizing forces during function and improves prosthesis stability.[14] Proper occlusal planning also minimizes excessive stress on implants and supporting tissues, thereby contributing to long-term prosthetic success.[13]

The maxillary arch in the present case was rehabilitated with crowns incorporating rest seats to improve support and prosthesis stability.[11] The combination of fixed and removable prosthodontic treatment provided favorable distribution of occlusal forces and improved overall oral rehabilitation.[12] Such multidisciplinary rehabilitation approaches are often required in partially edentulous patients with complex prosthetic needs.[7]

Maintenance and periodic recall are essential components of implant overdenture therapy.[16] Patients must be educated regarding oral hygiene procedures, denture hygiene, and attachment maintenance to minimize peri-implant complications and prosthetic failures.[16] Regular follow-up appointments allow evaluation of attachment wear, tissue response, occlusion, and implant health.[16] Early management of maintenance issues contributes significantly to the longevity and success of implant-supported overdentures.[16]

The combination of fixed prosthetic rehabilitation in the maxillary arch and implant-supported overdenture in the mandibular arch provided improved retention, stability, esthetics, and functional efficiency for the patient.[2] The treatment approach described in the present report successfully restored oral function and improved patient comfort and satisfaction[17]

Conclusion

Implant-supported overdentures retained with locator attachments provide a reliable and predictable treatment option for completely edentulous mandibular arches.[2] Locator attachments offer improved retention, stability, ease of maintenance, and enhanced patient comfort when compared with conventional complete dentures.[3] The low-profile design and resilient mechanism of locator attachments make them particularly

advantageous in patients with limited restorative space and compromised denture retention.[18]

Successful rehabilitation of partially and completely edentulous arches requires careful diagnosis, comprehensive treatment planning, accurate impression procedures, and precise prosthetic execution.[7] In the present case, the combination of fixed prosthetic rehabilitation in the maxillary arch and implant-supported overdenture in the mandibular arch resulted in improved masticatory efficiency, phonetics, esthetics, and overall patient satisfaction.[2] Accurate implant placement, definitive impression procedures, proper jaw relation records, and balanced occlusion contributed significantly to the functional and esthetic success of the prosthesis.[13]

The use of polyvinyl siloxane impression material and locator attachment components helped achieve satisfactory prosthesis fit, retention, and long-term functional stability.[10 3] In addition, regular follow-up and maintenance protocols remain essential for preserving peri-implant health and ensuring the longevity of the overdenture prosthesis.[16] Periodic recall visits also aid in evaluating attachment wear, occlusal discrepancies, oral hygiene status, and overall prosthesis performance.[16] Proper patient education regarding denture hygiene and implant maintenance plays a critical role in minimizing biological and mechanical complications associated with implant overdentures.[16]

Within the limitations of this clinical report, mandibular implant-supported overdentures retained with locator attachments is considered an effective treatment modality for restoring oral function, improving prosthesis stability, and enhancing the overall quality of life in edentulous patients.[17] The treatment approach described in the present report successfully combined functional rehabilitation with improved esthetics and patient comfort, thereby demonstrating the clinical effectiveness of locator-retained mandibular overdentures.

References

1. Zarb GA, Bolender CL, Eckert SE. Prosthodontic Treatment for Edentulous Patients. 12th ed. Mosby; 2004.
2. Feine JS, Carlsson GE, Awad MA, et al. The McGill consensus statement on overdentures. Int J Prosthodont. 2002;15(4):413-414.
3. Kleis WK, Kämmerer PW, Hartmann S, et al. A comparison of three different attachment systems for mandibular two-implant overdentures. Clin Implant Dent Relat Res. 2010;12(3):209-218.
4. Atwood DA. Reduction of residual ridges: a major oral disease entity. J Prosthet Dent. 1971;26(3):266-279.
5. Thomason JM, Feine J, Exley C, et al. Mandibular two implant-supported overdentures as the first choice standard of care for edentulous patients. Br Dent J. 2009;207(4):185-186.
6. Cune M, van Kampen F, van der Bilt A, Bosman F. Patient satisfaction with implant-retained mandibular overdentures. Int J Prosthodont. 2005;18(2):99-105.
7. Misch CE. Contemporary Implant Dentistry. 3rd ed. Mosby; 2008.
8. Vercruyssen M, Laleman I, Jacobs R, Quirynen M. Computer-supported implant planning and guided surgery. Clin Oral Implants Res. 2015;26(Suppl 11):69-76.
9. Shillingburg HT, Hobo S, Whitsett LD. Fundamentals of Fixed Prosthodontics. 4th ed. Quintessence Publishing; 2012.
10. Donovan TE, Chee WW. A review of contemporary impression materials and techniques. Dent Clin North Am. 2004;48(2):445-470.
11. Stewart KL, Rudd KD, Kuebker WA. Clinical Removable Partial Prosthodontics. 2nd ed. Ishiyaku EuroAmerica; 1983.
12. Carr AB, Brown DT. McCracken's Removable Partial Prosthodontics. 12th ed. Elsevier; 2011.
13. Winkler S. Essentials of Complete Denture Prosthodontics. 2nd ed. Ishiyaku EuroAmerica; 2000.
14. Heartwell CM, Rahn AO. Syllabus of Complete Dentures. 4th ed. Lea & Febiger; 1986.
15. Anusavice KJ. Phillips' Science of Dental Materials. 11th ed. Elsevier; 2003.
16. Goodacre CJ, Bernal G, Rungcharassaeng K, Kan JYK. Clinical complications with implants and implant prostheses. J Prosthet Dent. 2003;90(2):121-132.
17. Burns DR. Mandibular implant overdenture treatment: consensus and controversy. J Prosthodont. 2000;9(1):37-46.
18. Alsabeeha NHM, Payne AGT, De Silva RK, Thomson WM. Mandibular single-

implant overdentures. Clin Oral Implants Res. 2009;20(4):356-365.

19. Tokuhisa M, Matsushita Y, Koyano K. In vitro study of a mandibular implant overdenture retained with ball, magnet, or bar attachments. J Prosthet Dent. 2003;89(4):361-368.

20. Assunção WG, Delben JA, Tabata LF, Barão VAR. Comparison between complete denture and implant-retained overdenture. J Oral Rehabil. 2010;37(1):72-84.