



OVERLAY REMOVABLE PARTIAL DENTURE FOR POST MANDIBULECTOMY REHABILITATION: A CASE REPORT

Rehabilitation Science

Dr. Jeldi. Kusuma*	Post Graduate Student, Dept Of Prosthodontics, Crown And Bridge, Maulana Azad Institute Of Dental Sciences, New Delhi *Corresponding Author
Dr. Rekha Gupta	Professor SAG And Head Of The Department Of Prosthodontics, Crown And Bridge, Maulana Azad Institute Of Dental Sciences, New Delhi.
Dr. Shubhra Gill	Professor SAG, Dept Of Prosthodontics, Crown And Bridge, Maulana Azad Institute Of Dental Sciences, New Delhi.
Dr. Vasudaa Anandan Thandri	Post Graduate Student, Dept Of Prosthodontics, Crown And Bridge, Maulana Azad Institute Of Dental Sciences, New Delhi.

ABSTRACT

Mandibulectomy is a surgical procedure often indicated in the management of benign and malignant tumours of the jaw. Post-surgical rehabilitation poses significant challenges due to anatomical disruption, functional limitations, and compromised retention. This case report describes the prosthodontic rehabilitation of a segmental mandibulectomy defect due to ameloblastoma. The patient presented with severe mandibular ridge resorption, facial asymmetry, and only two remaining posterior teeth. Given the compromised anatomy and inability to place implants, an overlay removable partial denture (ORPD) was planned. The prosthesis was designed to restore occlusal vertical dimension, improve mastication, and enhance aesthetics. Post-insertion, the patient showed good adaptation and functional improvement. This case highlights the effectiveness of ORPD as a conservative, cost-effective alternative for rehabilitation in patients with segmental mandibular defects.

KEYWORDS

Mandibulectomy, Overlay removable partial denture, Prosthodontic rehabilitation

INTRODUCTION

Mandibulectomy refers to the surgical removal of a portion or the entire mandible along with associated soft tissues. It is commonly performed to treat benign or malignant lesions of odontogenic or non-odontogenic origin¹. Ameloblastoma, a locally aggressive tumour, accounts for 13–58% of odontogenic tumours and is five times more common in the mandible, especially the molar-ramus region, with up to 50% recurrence². Oral cavity squamous cell carcinoma (OSCC) is the leading malignant cause, affecting ~300,000 people annually, with mandibular involvement in 12–56% of cases. Other indications include osteomyelitis, osteoradionecrosis, medication-related osteonecrosis, odontogenic infections, and trauma. Mandibulectomy is classified into total and partial types. Partial mandibulectomy may be segmental, involving discontinuity of the bone, or marginal, where continuity is preserved. Regardless of the type, mandibular resection often results in functional, aesthetic, and psychological deficits. Common issues include mandibular deviation, difficulty in mastication, impaired speech and swallowing, drooling, and facial asymmetry, all of which negatively affect the patient's quality of life¹. Prosthodontic rehabilitation aims to restore lost function and aesthetics. While implant-supported prostheses offer superior outcomes, their use is often limited due to insufficient bone, systemic contraindications, financial barriers, or healing complications³. Overlay removable partial dentures (ORPDs) serve as a conservative and cost-effective alternative. As per M.M. DeVan's philosophy, ORPDs utilise the remaining teeth to provide retention, maintain proprioception, distribute occlusal forces, and enhance function⁴. Hence, overlay dentures represent a practical solution in patients with mandibular defects where other treatments are not feasible³.

CASE PRESENTATION :

A 37-year-old male patient reported to the Department of Maxillofacial Prosthodontics at MAIDS, New Delhi, with the chief complaint of wanting to replace missing lower front teeth. The patient had previously undergone a segmental mandibulectomy due to an ameloblastoma, which extended from the left second molar to the right first molar region.

Following surgical healing, the patient presented with facial asymmetry and masticatory difficulties due to the absence of teeth (Fig.1a). Intraoral examination revealed a fully dentulous maxillary arch and a severely resorbed, partially edentulous mandibular arch, with only teeth 46 and 47 remaining (Fig.1b,1c). The mucosa at the surgical site had healed, exhibiting scar contracture. The remaining mandibular teeth were found to be lingually rotated.

conventional denture was considered inadequate. Furthermore, the remaining teeth, though vital, could not be utilised for other treatment modalities. Therefore, a decision was made to retain the existing teeth and fabricate an **overlay removable partial denture (ORPD)** to restore occlusal vertical dimension (OVD), improve mastication, and enhance facial aesthetics.



Fig 1a-: Extraoral picture showing lower third facial asymmetry; 1b,c- maxillary dentulous arch and mandibular severely resorbed ridge with lingually rotated 46,47 teeth; 1d-Definitive impression made with irreversible hydrocolloid; 1e,f -occlusal wax up with raised VD; 1g- retentive clasps added on remaining teeth; 1h-, i-: Final prosthesis

Clinical Procedure:

- **Preliminary Impression:** Taken with irreversible hydrocolloid (Algitex, Dental Products of India, Mumbai).
- **Custom Tray Fabrication:** Using cold-cure acrylic resin (DPI Cold Cure, Dental Products of India, Mumbai).
- **Definitive Impression:** Captured using the all green-stick technique to register the functional sulcus, followed by a wash impression with alginate for fine detail of the ridge and teeth. (Fig 1d)
- **Occlusion Rims:** Constructed using baseplate wax (Hindustan Modelling Wax No. 2, Hyderabad) and adjusted to increase the OVD by 2.0 mm to accommodate prosthetic material.
- **Jaw Relations:** Recorded and transferred to a semi-adjustable articulator (Hanau WIDE VUE, Whip Mix, USA) with the maxillary cast mounted via face-bow transfer and the mandibular cast in centric relation.

Due to the severity of ridge resorption and compromised retention, a

- **Trial Denture:** Included replacement of missing teeth and occlusal wax build-up (Fig. 1e,f) on remaining mandibular teeth to re-establish vertical dimension. The trial was evaluated intraorally for esthetics, phonetics, and occlusion.
- **Retention:** Wires engaging the undercuts of remaining teeth were incorporated into the framework for added retention. (Fig. 1g)
- **Final Prosthesis Fabrication:** Tooth-colored heat-polymerized acrylic resin (DPI Heat Cure, Dental Products of India, Mumbai) was used in the tooth region, with conventional acrylic covering the rest of the prosthesis (Fig. 6). Minimal lingual extensions were designed for better retention and comfort.

Outcome And Follow-up:

Upon insertion, the prosthesis was carefully adjusted for optimal fit and comfort (Fig. 1h, i). The patient was educated on hygiene maintenance and denture care. The overlay denture effectively compensated for the lost alveolar bone height, utilising available undercuts to enhance retention and support.

At follow-up, the patient demonstrated notable improvement in speech, masticatory function, and overall satisfaction. Partial restoration of facial symmetry was observed, and the patient adapted well to the prosthesis, with satisfactory soft tissue response.

DISCUSSION

Segmental mandibulectomy often leads to functional and aesthetic impairments due to discontinuity of the mandible, loss of alveolar ridge, soft tissue scarring, and deviation of the residual segment⁵. Prosthodontic rehabilitation in such cases is challenging, particularly when there is limited bone support, few remaining teeth, and financial or medical constraints that preclude reconstructive surgery or implant placement⁶.

In this case, the patient had only teeth 46 and 47 remaining in a severely resorbed mandibular arch following mandibulectomy for ameloblastoma. These teeth were vital but not suitable for conventional restorative approaches such as crowns, posts, or overdentures. Given the poor ridge morphology, a conventional removable partial denture would have lacked adequate retention and stability⁷.

An overlay removable partial denture (ORPD) was chosen as a conservative and reversible option. ORPDs are especially beneficial when vertical dimension has been lost, as they allow buildup over existing teeth without requiring significant tooth preparation. In this patient, 2 mm of occlusal vertical dimension was restored using occlusal wax-up. The use of tooth-colored heat-cure acrylic on occlusal surfaces ensured a more natural appearance, while normal acrylic provided base strength. Wires were incorporated to engage undercuts of the remaining teeth, enhancing prosthesis retention without damaging them⁸. The minimal lingual extensions helped reduce discomfort and improve tongue space, which is critical in patients with post-surgical soft tissue limitations. The final prosthesis significantly improved mastication, phonetics, and facial symmetry, and the patient adapted well functionally and psychologically. This case highlights the value of ORPDs in restoring oral function and aesthetics in post-mandibulectomy patients. They offer a cost-effective, non-invasive solution in situations where implants or surgical reconstruction are not feasible, and they can be customised to the patient's anatomical and functional needs⁹.

CONCLUSION:

This case underscores the value of **overlay dentures** in rehabilitating patients who have undergone extensive mandibular resections where surgical reconstruction or implant placement is not feasible. ORPDs provide a **non-invasive, reversible, and cost-effective** solution for restoring oral function and aesthetics in compromised ridges, especially when vital teeth cannot support other prosthodontic options.

REFERENCES:

1. Goudarzi, S., Cinquini, C., Izzetti, R., Nisi, M., Priami, M., Brevi, B. C., Bruschini, L., Lorenzetti, F., Santarelli, S., & Barone, A. (2024). Oral rehabilitation following surgical treatment of mandibular ameloblastoma: Case report and comprehensive literature review. *Oral*, 5(3), 57. <https://doi.org/10.3390/oral5030057>
2. Ogane, S., Fujii, A., Suzuki, T., Hashimoto, K., Hashimoto, S., Takano, M., Katakura, A., & Nomura, T. (2023). Ameloblastic carcinoma of the mandible: A case report. *Maxillofacial Plastic and Reconstructive Surgery*, 45(17). <https://doi.org/10.1186/s40902-023-00380-y>
3. Alarcón-Sánchez, M. A., Becerra-Ruiz, J. S., Yessayan, L., Mosaddad, S. A., & Heboyan, A. (2023). Implant-supported prosthetic rehabilitation after ameloblastoma treatment: A systematic review. *BMC Oral Health*, 23(1013). <https://doi.org/10.1186/>

4. DeVan, M. M. (1952). The nature of the partial denture foundation: Suggestions for its preservation. *Journal of Prosthetic Dentistry*, 2(2), 210–218. [https://doi.org/10.1016/00223913\(52\)900744](https://doi.org/10.1016/00223913(52)900744)
5. Goudarzi, S., Cinquini, C., Izzetti, R., Nisi, M., Priami, M., Brevi, B. C., Bruschini, L., Lorenzetti, F., Santarelli, S., & Barone, A. (2024). Oral rehabilitation following surgical treatment of mandibular ameloblastoma: Case report and comprehensive literature review. *Oral*, 5(3), 57. <https://doi.org/10.3390/oral5030057>
6. Kadavakolanu, V. (2014). Prosthodontic rehabilitation of mandibulectomy. *SlideShare Presentation*. <https://www.slideshare.net/slideshow/prosthodontic-rehabilitation-of-mandibulectomy/50116206>
7. Ogane, S., Fujii, A., Suzuki, T., Hashimoto, K., Hashimoto, S., Takano, M., Katakura, A., & Nomura, T. (2023). Ameloblastic carcinoma of the mandible: A case report. *Maxillofacial Plastic and Reconstructive Surgery*, 45(17). <https://doi.org/10.1186/s40902-023-00380-y>
8. Belkhode, V. M., Nimmonkar, S. V., Agarwal, A., Godbole, S., & Sathe, S. (2019). Prosthodontic rehabilitation of a patient with mandibular resection using overlay prosthesis: A case report. *Journal of Clinical and Diagnostic Research*, 13(6), ZD01–ZD03. <https://doi.org/10.7860/JCDR/2019/39527.12592>
9. Aruna, U., & Thulasigam, C. (2012). Prosthodontic management of segmental mandibulectomy patient with guidance appliance and an overlay denture. *Journal of Indian Prosthodontic Society*, 12(4), 252–257. <https://doi.org/10.1007/s13191-012-0208-8>