

Marginal Mandibulectomy Defect Rehabilitated with Cast Partial Denture: A Case Report

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ABSTRACT

The primary prosthetic objectives for marginal mandibulectomy defects are to restore mastication, speech and appearance by replacement of teeth. With marginal resection of mandible followed by reconstruction with submental flap, the major prosthesis concern is related to soft tissue potential for support due to loss of vertical ridge height, loss of vestibular depth, mobility and displaceability of the flap that frequently unseats the prosthesis. This article describes prosthetic rehabilitation with a cast partial denture for missing teeth and restoring function for a patient who had undergone wide lesion excision of verrucous carcinoma with marginal mandibulectomy.

Key words: Cast partial denture; Mandibular defect; Marginal mandibulectomy; Prosthetic rehabilitation.

INTRODUCTION

Marginal mandibulectomy involves resection of alveolar process, body of mandible and overlying soft tissues with preservation of mandibular continuity at the inferior border.¹ Tumor that necessitates marginal resection of mandible is frequently located in gingival tissues and floor of the mouth. Soft tissues like local flap and pedicle flap are frequently used for surgical reconstruction and are often sutured to movable tissues like labial mucosa, buccal mucosa and tongue which tends to unseat the prosthesis.²

Marginal mandibulectomy also presents challenge to rehabilitation because of loss

of vertical ridge height and vestibular depth, limiting extension of prosthesis flanges for maximum support, stability and retention. The presence of remaining teeth following mandibular resection may be an important factor for determining prognosis of rehabilitative therapy since presence of large number of teeth increases the ability to design a prosthesis with maximum retention, stability and support³.

This article describes prosthetic rehabilitation of a patient with a cast partial denture for missing teeth who had undergone wide lesion excision of verrucous carcinoma and marginal mandibulectomy surgically reconstructed with submental flap.

CASE REPORT

A 45-year-old male patient was referred to Department of Prosthodontics, BPKIHS, Dharan for replacement of missing mandibular teeth. Medical and dental history revealed that he was diagnosed with verrucous carcinoma of lower left gingivobuccal sulcus and had

Conflict of Interest: None

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undergone wide lesion excision with marginal mandibulectomy and bilateral selective neck dissection (I – IV) followed by surgical reconstruction with submental flap about seven months before.

Extraoral examination revealed decreased lower lip support in left corner of the mouth. Intraoral examination showed complete dentulous maxillary arch, Kennedy class IV partial edentulous situation in the mandibular arch with missing teeth 36-43. A freely movable flap was attached from lower anterior and left posterior vestibular region to floor of the mouth obliterating normal vestibular anatomy and decreasing vertical ridge height. The vertical dimension of occlusion was maintained by remaining natural teeth. Panoramic radiograph revealed marginal resection of mandible (Class I of Cantor and Curtis)⁴ extending from right canine to left first molar region.

A cast partial denture with optimum design consideration was planned for rehabilitation of form and function of the patient. Because of freely displaceable flap, it was first decided to fabricate a temporary acrylic removable partial denture to predict the prognosis of the future definitive prosthesis.

FABRICATION OF TEMPORARY ACRYLIC PARTIAL DENTURE

Primary impressions were made with irreversible hydrocolloid and diagnostic casts were poured in type III dental stone (Fig 1). An acrylic denture base with wax occlusal rim was made for bite registration followed by articulation in an articulator, teeth setting and try in. The waxed denture was processed in heat

cure resin with two arrow pin head clasps for retention, finished, polished and delivered to the patient (Fig 2). The acrylic partial denture was observed for one month for prognosis after which cast partial denture was finally planned.

DESIGN OF CAST PARTIAL DENTURE

After surveying diagnostic cast, simple circlet clasp as direct retainer with mesial occlusal rest seat was designed on 44, 47 and 37, proximal guide planes on mesial aspect of 44 and 37, meshwork type minor connector on edentulous area and a lingual plate as major connector.

After mouth preparation, final impression was made using putty and light body addition silicone (Fig 3). Master cast was poured in type IV dental stone followed by fabrication of wax pattern based on proposed design. Try in of metal framework was done to verify the fit followed by fabrication of wax occlusal rim for vertical dimension and bite registration (Fig 4 and 5).

Teeth arrangement was done after articulation in an articulator (Fig 6) followed by try in of waxed trial denture (Fig 7) which was then processed in heat cure resin, finished, polished and delivered to the patient (Fig 8 and 9). Figure 10 shows the panoramic radiograph revealing marginal mandibulectomy. The intraoral photograph before and after insertion of prosthesis is shown in Fig 11.

Post insertion instruction regarding oral hygiene and denture maintenance were given to the patient and evaluation was done after 24 hours for presence of tissue trauma and occlusal errors and minor adjustment were made accordingly.



Figure 1: Diagnostic Cast



Figure 2: Temporary acrylic partial denture with retentive aid

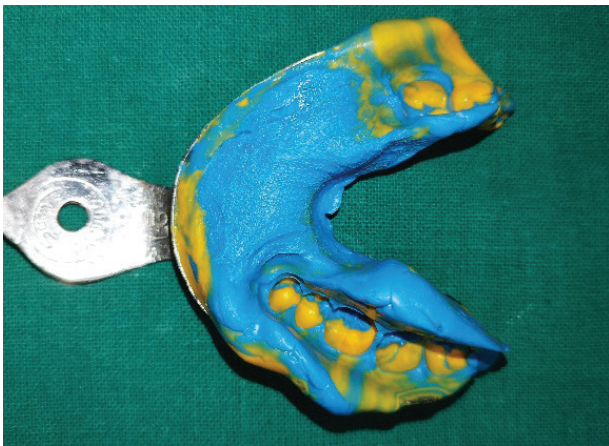


Figure 3: Final Impression



Figure 4: Metal framework with occlusal rim



Figure 5: Bite Registration



Figure 6: Teeth arrangement



Figure 7: Try in



Figure 8: Definitive Cast Partial Denture



Figure 9: Insertion of CPD

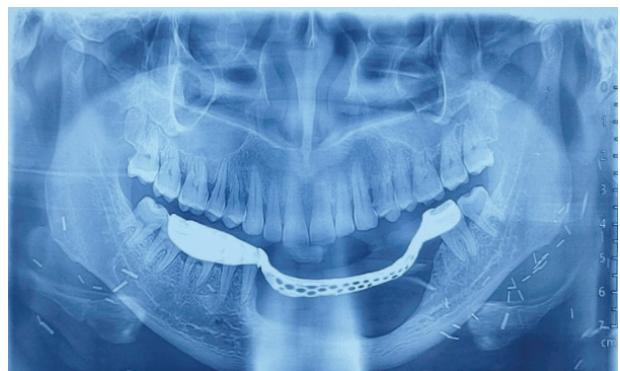


Figure 10: Panoramic radiograph



Figure 11: Before and after insertion of prosthesis (Intraoral view)

DISCUSSION

One of challenging aspects of prosthetic rehabilitation is to deal with patients who have undergone surgical resection of part of the mandible.³ Problem associated with rehabilitation of patients without loss of mandibular continuity are comparatively

less than those with discontinuity defects.⁵ In marginal mandibulectomy, the major concern for prosthesis is related to unusual soft tissue configuration, lack of attached mucosa, obliteration of vestibule and compromised bony support.⁶ After adequate osseocutaneous free flap reconstruction, rehabilitation with

conventional removable prosthesis has been successful.⁷ For anterior marginal mandibulectomy defect, residual mandible may be adequate for consideration of endosseous implant supported/retained, fixed or removable prosthesis.⁸

The acrylic removable prosthesis initially delivered in this case was observed to be displaced by underlying freely moveable flap which might be due to lack of rigid direct and indirect retainers. However, such problems were not encountered with cast partial prosthesis.

The design of cast partial denture should follow the basic parameters related to support, stability, retention, reciprocation, and major and minor connectors for optimum prognosis.² Long mesial rests should be designed on second molars for indirect retention and proximal plates and distal aspect of minor connectors should be relieved to allow mild movement of anterior region.⁹ The maintenance of health of remaining natural teeth is of critical importance for the success of the prosthesis since they provide support and retain the prosthesis in place.^{3,10}

CONCLUSION

Prosthetic rehabilitation of the mandibulectomy patient can make enormous impact on their quality of life. Rehabilitation of such patient should always consider the restoration of form and function. Asymmetric display of teeth and slight occlusal plane discrepancy might be evident due to lip contracture after surgery that might allow only minimal modification. Therefore, few compromises must be accepted as some compensations may not be possible if prosthesis is to remain in position.

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