

# CLINICAL REPORT

## Alternative Prosthodontic Management Of Segmental Mandibulectomy- A Case Report

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### ABSTRACT

Ameloblastoma is a benign tumor of odontogenic epithelial origin commonly affecting the mandible than the maxilla. The ameloblastoma is a rare metastatic neoplasm with lesions causing abnormalities of face and jaw. Abnormal cell growth would affect the surrounding bony structures which could be managed only by surgical excision. Mandibulectomy of various levels could be done depending on the extent of the lesion. Surgical excision of mandible can be done with or without preservation of the basal cortical bone. Prosthodontic management of mandibulectomy patients with alternate options than conventional dentures have not been reported. Here, we report a case of 37 year old male patient with segmental mandibulectomy managed with a hollow cast partial denture.

**Keywords:** Ameloblastoma, segmental mandibulectomy, Hollow denture.

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### INTRODUCTION

Ameloblastoma is a benign tumor of odontoblastic origin, mainly affecting the mandible more than the maxilla. Ameloblastomas are generally associated with unerupted teeth causing painful swelling and facial asymmetries. They extend till the ascending ramus of mandible or upto the tuberosity in maxilla.

They can be managed by surgical excision with common chances of recurrences. Ameloblastoma in mandible can be surgically managed by excision of part of the mandible involved and surrounding bony structures<sup>[1]</sup>. Depending on the extent of the lesion, mandibulectomy can be Marginal (involving the

marginal bone alone), Segmental (involving segment of the mandible with preserved basal cortical bone), and complete excision of the mandible either in one quadrant or extending till the midline. Cantor and Curtis in 1971<sup>[2]</sup> proposed a classification of edentulous patients with resected mandibles based on the amount of bone preserved after surgical excision and Firtnell and Curtis gave classification of removable partial denture design for mandible resected patients<sup>[3]</sup>.

### Case Report

A 37 year old male patient, reported to Department of prosthodontics, SRM dental college,

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Ramapuram, Chennai, Tamilnadu, India with a chief complaint of missing teeth in lower front and right back tooth region for past six months. Past dental history revealed that patient has undergone surgical excision of the mandible (segmental) with preservation of basal cortical bone in right mandibular region, six months back due to ameloblastoma and has been partially edentulous since then. On clinical examination, edentulism was seen in right mandibular region with preserved basal mandibular bone and no evident asymmetry of face and deviation of the mandible. [Fig 1]



Figure 1. Intra oral view

The present case according to Cantor and Curtis classification is type I, with preservation of mandibular continuity and is Kennedy's class 1V classification of partially edentulous condition as the defect crosses the midline.

### Prosthodontic Rehabilitation

In patients with mandibulectomy conventional management is done with removable partial denture. In this case report, as there is continuity of the mandibular basal cortical bone, cast partial denture has been constructed with an alteration of hollow denture fabrication to reduce the overall weight of the prosthesis so as to lessen the load transfer over the resected region.

Diagnostic Impression [Fig2] were made for maxilla and mandible with alginate and casts were made with type III dental stone. Diagnostic cast was surveyed for conventional removable partial denture design and was tripod. The design included embrasure clasp in 36,37, I bar in 33(RPI),cingulum rest in 33 and simple circlet clasp design in 47.Lingual bar was chosen as major connector with lattice type as minor connector.



Figure 2. Diagnostic impression and cast

Mouth preparation was done based on the design. Sufficient reduction was done in rest seat areas and guiding planes were prepared in 33 and 47. Elastomeric final impression was made with addition silicone and master cast was obtained using Type IV Gypsum (Die stone- Ultra Rock) [Fig 3].



Figure 3. Final impression

Wax block-out was done and duplication of master cast with reversible hydrocolloid (Agar) was carried out. Refractory cast was obtained and wax pattern was fabricated, invested and casted and the framework was finished and polished. Try-in of metal framework was done [Fig 4].



Figure 4. Metal framework try in

Teeth arrangement was done on trial bases prepared over the metal framework and wax-trial carried out. The master cast with tried in acrylic teeth was duplicated with irreversible hydrocolloid impression material (alginate) and cast was obtained. A template was fabricated with the duplicated master cast to determine the height and width of space available for placing the hollow material [Fig 5].



Figure 5. Duplicated cast with template

Master cast with complete wax up of teeth was initially flaked and dewaxed as conventional procedures of processing. After dewaxing, base of another counter flask was used to flask the master cast to obtain shim denture base. It was again dewaxed and packed with heat cure acrylic (Polymethyl methacrylate-DPI ) to obtain the shim denture base, which was then retrieved and finished [Fig 6].



Figure 6. Shim denture base

The shim of the acrylic denture base was placed in the master cast, and the available space was determined using the template to place the Thermocols (hollow material). Small striations were made in the shim denture base and thermocols were stabilized with cyanoacrylates [Fig 7].



Figure 7. Thermocol placed

Finished and polished denture was delivered to the patient after evaluation of fit, comfort and esthetics [Fig 8]. Post insertion review was done and the patient was satisfied with the function and esthetics of the denture.



Figure 8. Denture Placed

## DISCUSSION

Cysts or tumors can be managed by surgery, chemotherapy or radiotherapy depending on the extent of the lesion which will eventually determine the extent of rehabilitation needed for specific patients<sup>[4]</sup>. Various authors have described about prosthodontic management of resected edentulous patients. Normal occlusion as present earlier cannot be achieved even though mandibular continuity is not altered. Teeth are placed in lingual relationship<sup>[4,5,6]</sup>.

This article reports a case where the mandible has been segmentally removed with preservation of basal bone (Cantor and Curtis Type I) and the edentulous space extends beyond the midline (Kennedy's classification class IV). There was no evident mandibular deviation as there was not much of soft tissue loss and adequate intercuspation with opposing natural teeth was present<sup>[7,8]</sup>.

Implant supported fixed prosthesis or cast partial denture are the two treatment modalities for mandibulectomy patients. Implant supported prosthesis could not be advised due to inadequate bone support and financial constraints<sup>[9]</sup>.

Type I mandibulectomy patients could be managed with cast partial denture as there is not much of anatomic and functional suppression. The prosthesis design should basically follow the principles of broad stress distribution, optimization of the prosthesis and cross arch stabilization. This design supports the resected region and maintains the proportion of the missing segment thereby rehabilitating the anatomic form and function. <sup>[10]</sup>. Hollow dentures are preferred in severely resorbed ridges to minimize the occlusal load over the ridges that could accelerate ridge resorption. Hollow space is created within the dentures which could reduce the overall weight of the prosthesis thereby decreasing the occlusal load. The hollow space could be created using putty, salt, sugar, thermocols and cotton. The use of hollow materials in fabrication of dentures reduce the weight of the

prosthesis and they are usually indicated in severely resorbed ridges. <sup>[11]</sup> The denture provided support to collapsed lips and cheeks, restored function with ease and enhanced esthetics. The patient was well satisfied with the lightness of the denture.

### CONCLUSION

The case report describes simple and effective prosthodontic management of patients with type I mandibular resection for treatment of ameloblastomas. This can be an alternative for conventional removable prosthesis enhancing patient satisfaction and comfort. This alternative method of fabricating hollow denture reduces the amount of load transferred with an added advantage of light weight prosthesis over the surgically resected region. This design has improved the patient compliance and satisfaction in terms of function by restoring the facial form.

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