# Case Report

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# Radical resection of giant ameloblastoma mandible with free fibula reconstruction: a case report and review of literature

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#### **ABSTRACT**

The ameloblastoma is a rare odontogenic tumor of the oral cavity. It is slow growing, locally invasive benign tumor affecting mandible more than maxilla mostly in age group 30-60 years. It grows in bone and soft tissue causing facial disfigurement. Treatment is surgical taking wide margins. This case report describes the treatment of a 30-year-old female having right side jaw swelling since two years, fine needle aspiration cytology was suggestive of ameloblastoma. Right hemi mandibulectomy was done by head and neck surgery team and reconstruction was done by plastic surgery team using free fibula flap. The free fibula osteocutaneous flap is the most versatile and reliable option for microsurgical reconstruction of large mandibular defects.

Keywords: Free fibula osteocutaneous flap, Giant ameloblastoma, Hemi mandibulectomy, Radical resection

# INTRODUCTION

Ameloblastoma is a rare, slowly growing, locally invasive odontogenic tumor of epithelial origin that involves the mandible in 80% of cases and occurs mostly in individuals aged 30-60 years old. In 1885 Malassez introduced the term adamantinoma to denote the odontogenic tumors, Ivey and Churchill changed the name in 1930 to Ameloblastoma. Ameloblastoma accounts for 60.3% of all odontogenic tumors in Indian population with a slight male preponderance. They are classified into unicystic, multicystic (solid), peripheral and desmoplastic types. Ameloblastoma in the mandible can progress to large size and cause facial asymmetry, displacement of teeth, malocclusion, and pathologic fractures.

Many conservative surgical treatments, such as enucleation, cauterization, and curettage have been suggested, owing to the high risk of recurrence, radical

surgical treatment with a wide margin remains the choice of treatment for many surgeons.<sup>1,2</sup>

Large defects in the mandible due to radical tumor resection lead to functional loss like mastication and swallowing. Therefore, mandibular reconstruction is important to restore these functions and to provide satisfactory aesthetic outcomes.<sup>3</sup>

The free fibula osteocutaneous flap fulfills these requirements by providing high cortical bone content in large quantity which can be shaped easily to adapt to remaining mandible and implant-based prosthetic restoration can also be done.

# **CASE REPORT**

Authors present a case of 30-year-old female having right side jaw swelling since 2 years. It was insidious in onset and gradually progressive, was associated with pain, difficulty in mastication and malocclusion. The swelling was 8 cm  $\times$  7 cm extending from below the pinna and crossing angle of mandible, firm, tender, non-fluctuant with overlying skin free (Figure 1). On intra oral examination it extended from Rt lower central incisor to Right retromolar trigone (Figure 2). There were no neck nodes and rest of the Head and neck examination was normal. Contrast enhanced CT scan was suggestive of a large 8 cm  $\times$  6 cm expansile lesion involving right mandible body and ramus with dislodged teeth seen within the lesion with extension intraorally and laterally into infratemporal fossa indenting Rt lateral pterygoid muscle (Figure 3). Fine needle aspiration cytology of swelling was done which was reported as ameloblastoma.



Figure 1: Preoperative picture showing the tumor.



Figure 2: Preoperative picture showing Intra oral extent of the tumor.

Neck skin crease incision was made two finger breadth below the mandible, sub platsymal flap was elevated and swelling was identified. Right hemimandibulectomy was done as 2 cm margins were not compromised (Figure 4). The resultant defect was reconstructed with free fibular osteocutaneous flap harvested from right leg (Figure 5).

The maximum possible length of fibula bone was harvested, leaving 5-7 cm of bone distally and proximally. Three osteotomies were done in the fibula,

which was attached to a premolded mandibular reconstruction plate (Figure 6) and was fixed to remaining mandible with the help of mini plates. A skin paddle was used to cover any adjacent intra-oral defect. Arterial anastomosis was made with facial artery and venous anastomosis was made with facial vein. Post-operative biopsy came out to be follicular variant of ameloblastoma, with free margins. Patient had a favorable aesthetic and functional outcome in the post-operative 6 month follow up period, with no major early or delayed complications (Figure 7).

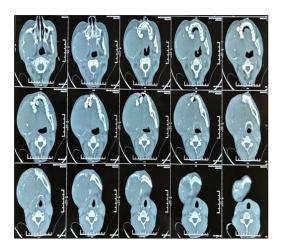


Figure 3: Contrast enhanced CT scan showing the lesion in right mandible.

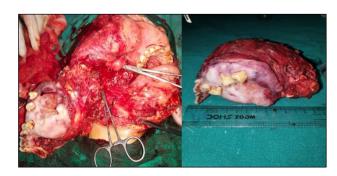


Figure 4: Right hemi mandibulectomy and resected specimen.



Figure 5: Preoperative mapping of perforators.



Figure 6: Osteotomized fibula with premolded mandibular reconstruction plate and skin paddle.



Figure 7: Postoperative pictures showing accepted osteocutaneous free fibula flap.

## **DISCUSSION**

Ameloblastomas are benign, locally invasive odontogenic neoplasms of epithelial origin, which are derived from the tooth-forming apparatus. It was assumed that ameloblastomas are derived from ameloblasts. This assumption has now almost certainly been confirmed in studies that have shown that the cells of origin are epithelial cells that express amelogenin.<sup>4</sup>

Long-standing huge ameloblastoma can be extensive and extremely destructive, imposing a serious reduction in the quality of life of patients.

Surgery is the standard treatment for ameloblastomas. Several treatment modalities have been tried which include Curettage, Enucleation, Chemical/Electro Cauterization, En bloc excision, Radical resection and Radiotherapy/Chemotherapy. Sehdev et al in 1974 analysed 72 patients with ameloblastoma of mandible and they concluded that the conservative approach (curettage) led to 90% recurrence of mandibular ameloblastoma.<sup>5</sup>

The "radical" surgical option is the current standard of care for ameloblastoma and wide local excision with 1-2 cm bone margins and immediate bone reconstruction to

help with speech and swallowing. The bony margin is defined as the distance away from the radiographic margin predicted to be disease free and ontologically safe to perform osteotomies.

In the past, mandibular defects presented a major challenge because of the limited reconstruction options with a pedicled flap. However, current advances in microvascular surgeries have allowed for composite soft and bony facial reconstruction. Fibula, scapula, and iliac crest flaps are commonly used as donor sites to reconstruct composite mandibular defects after surgery.<sup>6</sup>

A vascularized osteocutaneous free fibula flap for mandibular reconstruction has several advantages over other free flaps: more bone length, relatively easy graft dissection and contouring, long pedicles with, a two-team approach, minimal donor-site morbidity, and bicortical bone stock for dental implantation.

Few reports are available in the literature regarding recurrence of ameloblastoma in the grafted bone, therefore long-term follow up is recommended for more than 10 years at regular intervals after appropriate surgical operation. Patient should be on clinical and radiological follow up for at least a decade irrespective of the treatment done.

## **CONCLUSION**

Mandibular ameloblastoma should be treated with segmental mandibulectomy with a surgical margin of 2 cm from its radiographic margin to reduce the risk of recurrence. Mandibular defects larger than 4 cm should be immediately reconstructed with a free fibula osteocutaneous flap to restore mandibular function and to cover any adjacent soft tissue defect

In authors experience, the free fibula osteocutaneous flap is the most versatile and reliable option for microsurgical reconstruction of large mandibular defects. It provides a large quantity of bone, which can be shaped easily to adapt to the remaining mandible passively. The bone height is suitable for an implant-based prosthetic restoration. Preoperative mapping of the cutaneous perforators improves the versatility of the flap design and decreases the donor site morbidity. Postsurgical followup should be done at least annually, as there is a lifelong risk of recurrence.

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