

**Surgical management of Ameloblastoma - A Prospective Study**

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**Abstract**

**Purpose:** Ameloblastoma is a histological benign epithelial but locally invasive odontogenic tumour, grows slowly and persistently with a marked tendency for recurrence. The purpose of this study is to present 6 cases of mandibular ameloblastoma with the emphasis on gender, age, tumor localization, size, histological variants, primary treatment, recurrence and follow up review.

**Study design:** A prospective study of mandibular ameloblastoma is presented. All patients were treated by surgical excision of tumour mass. 3 cases were immediately reconstructed using reconstruction plate.

**Result:** A 3 yrs follow up showed no evidence of recurrence.

**Conclusion:** we concluded that a radical surgical protocol is a very good option to prevent relapse of the tumour on a long-term basis.

**Keyword:** Odontogenic tumour, mandibular ameloblastoma, radical surgical resection.

**Introduction**

Melo blastoma is the most common odontogenic neoplasm affecting the jaws. Ameloblastoma is a histologically benign, locally aggressive tumor of epithelial origin that arise from the enamel organ, remnants of dental lamina, the lining of an odontogenic cyst, or possibly from the basal epithelial cells of the oral mucosa. It accounts for 1% of all oral tumors<sup>1</sup> and for 9% to 11% of all odontogenic tumors<sup>2</sup>. In 20% of all cases the tumor can be found in the upper jaw, predominantly in the canine or molar region. Within the mandible (accounts for 80% of all Ameloblastomas),

70% are located in the molar region or the ascending ramus, 20% in the premolar region, and 10% in the anterior part<sup>3</sup>. According to several studies Ameloblastomas occur with equal frequency in both sexes<sup>4</sup>. However, some Nigerian and Indian study showed a male preponderance with a male: female ratio of 1.7:1<sup>5</sup>. The age range is usually between the first and the seventh decade of life with a mean in the fourth decade. Clinically, Ameloblastomas can be classified into 4 groups: Unicystic, solid or multi cystic, peripheral, and malignant. Ameloblastoma is slow growing, but is often aggressive and destructive, with the capacity to attain great size, erode bone and invade adjacent structures, recurrence is common if removed with inadequate surgical margins.

Modes of treatment include the range from conservative to radical. The conservative approach included enucleation, curettage, and cryosurgery. The radical treatment involves marginal resection, segmental resection, or composite resection.

### **Materials and methods**

All cases of ameloblastoma from department of oral and maxillofacial surgery, Pacific dental college and hospital, Udaipur, Rajasthan, India were reviewed. Histopathology report obtained from department of oral pathology. The demographic features were obtained, the clinical features, radiographic details, histologic variants recorded. All the ameloblastoma cases treated surgically. Patients were reviewed 3 yr post-operatively for follow-up.

### **Results**

All 6 cases of ameloblastoma were located in mandible. Out of that 3 were located in body region, 1 case was located in ramus, 2 cases were located in body to condyle region. 2 cases were recurrent ameloblastoma – previously enucleation done in another center.

5 cases had multilocular radiolucency and 1 case had unilocular radiolucency involving two impacted supernumerary tooth. (Table 1)

Histopathologic ally 2 cases were diagnosed as follicular type of ameloblastoma and 4 cases were diagnosed as plexiform type of ameloblastoma. All cases were surgically treated as a segmental resection with or without disarticulation. Reconstruction was done with reconstruction plate in 3 cases. Following two year follow up, there was no recurrence found.

### **Discussion**

Ameloblastoma is the most common odontogenic neoplasm affecting the jaws. It is an aggressive benign tumor of epithelial origin that may arise from the enamel organ, remnants of dental lamina, the lining of an odontogenic cyst, or possibly from the basal epithelial cells of the oral mucosa. It often present as a slow-growing, painless swelling causing expansion of the cortical bone, perforation of the lingual and/or buccal plates, and infiltration of soft tissue. They are therefore, found almost exclusively in the mandible and maxilla but they can be found in the gingiva and buccal mucosa on some occasions<sup>6</sup>. Radiologically, they are osteolytic, being usually radiolucent and frequently multilocular with well-defined sclerotic margins which may appear scalloped or expand the cortical plate, tooth roots may be resorbed.

According to several studies Ameloblastomas occurs with equal frequency in men and women<sup>7</sup>, however a Nigerian<sup>5</sup> and an Indian<sup>8</sup> showed a male preponderance. The age distribution is usually from the first to the seventh decade of life with the mean age in the fourth decade. Approximately 80% of the tumours are found in the mandible<sup>9</sup>. The maxilla is infrequently affected. It occurs in the posterior maxilla in 98% of cases and 2% in anterior region. There is early spread to sinus,

pterygomaxillary fissure, infratemporal fossa and nasal cavity. There may be intracranial or orbital invasion. In present study all cases were found in mandible, with high predilection of female.

The molar/ramus area is the most frequent involved in Japanese<sup>10</sup> and whites<sup>11</sup> more than 70% of the Ameloblastomas involve this region. In blacks Ameloblastomas occur more frequently in the anterior region of the jaws<sup>11</sup> and reports from Nigeria show that the lesions are frequently gigantic<sup>12</sup>.

Three type of ameloblastoma are distinguished based on their gross appearance: the Unicystic, the multi cystic and the solid type. Unicystic ameloblastoma is essentially a local, cyst-like lesion.

The multi cystic and solid type may grow to huge proportion and possibly infiltrate surrounding tissues. Histologically, ameloblastoma consists of either anastomosing epithelial strands and field or discrete epithelial islands. The former is called the plexiform type, the latter the follicular type. Three histologic variants of Unicystic ameloblastoma are described in the literature, in first type, luminal ameloblastoma, the tumor is confined to the luminal surface of the cyst. In the second type, intraluminal ameloblastoma, tumor nodules project from the cystic lining into the lumen of the cyst. In the third type, mural ameloblastoma, the fibrous wall of the cyst is infiltrated with tumor nodules. The third type is considered the most aggressive of the 3 variants, with a recurrence rate as high as 35.7% reported in the literature.

Treatment modalities for ameloblastoma are many and varied; they may be divided into conservative and radical therapies. This study suggests that the prognosis for ameloblastoma is more dependent on the method of surgical treatment rather than the histologic type of the tumor. Segment or composite resection produces good

results, especially when carried out as a primary treatment. Once the tumor infiltrates the surrounding soft tissue, the rate of recurrence increases. This is mainly because of the difficulty in identifying the tumor boundary.

Radical surgery, the treatment recommended for conventional (multi cystic) Ameloblastomas involves resection of the diseased section of the jaw and inclusion of about 1 or 2 cm of apparently uninvolved bone. In conventional Ameloblastomas that has spread up to lower border of the mandible, resection of the tumour with the investing dentoalveolar bone and a margin of 1 cm of apparently healthy bone and preservation of the lower border, has been suggested by some authors<sup>5</sup>. Williams suggests that the treatment of choice for multi cystic ameloblastoma is resection with 2 cm margin of normal bone and adequate margin of soft tissue as confirmed by frozen section when involvement of soft tissue has occurred.

Ueno et al, using conservative surgery, showed a recurrence rate significantly higher in the follicular type (56.8%) than in the plexiform type (32.4%). According to Hong et al, there is a significant correlation between recurrence, treatment method and histopathological type. Mark wardt and Pfeifer et al reviewed risk factors for complications after the bridging of mandibular defect using reconstruction plate. Complications were oral and extraoral plate exposure, the looseness of screws with or without displacement and plate fractures.

The effectiveness of the surgical procedure is dependent on accessibility of the tumour, the skill of the operator and completeness of removal of the disease. When used alone curettage can be effective in the treatment of some Unicystic lesions. Sedhev et al reported that curettage is followed by local recurrence in 90% of mandibular and maxillary ameloblastomas<sup>13</sup>. Adekeya and Lavery did a

study of 21 recurrences that included 19 mandibular and 2 maxillary tumours. The primary operation included enucleation in 5 patients, curettage in 8 patients, en block resection in 3 patient and mandibulectomy or maxillectomy in 5 patients. Recurrences were treated with radical surgery. Based on their data they were strongly in favour of radical surgery for both primary or recurrent tumour<sup>14</sup>. In present study all case were treated surgically with segmental resection with or without disarticulation, because of infiltration into soft tissue so immediate reconstruction was done with reconstruction plate and the patient to be taken up for reconstruction at

later date. Till three year follow up there is on sign of recurrence.

**Conclusion**

Ameloblastoma is a slow growing tumour. It has a high rate of local recurrence if it is not adequately removed. Radical surgical resection should be the first choice of treatment in Ameloblastomas. Especially in cases of large, expansive tumour, a radical surgical protocol is a very good option to prevent relapse of the tumour on a long-term basis. Based on their data we were strongly in favour of radical surgery for both primary or recurrent tumour.

Table 1: Tumor site, diagnosis, clinical finding, radiologic finding and treatment Summary.

No.	Age	Sex	Tumor Localization	Clinical Symptom	Radiologic Finding	Histopathology	Surgical Treatment	Surgical Reconstruction	Recurrence
1	38	F	Mandibular Body Ameloblastoma Region: 48 - 35	Painless Swelling	Multilocular	Plexiform	Segmental Resection Region: 48 – 36 Size: 14 X 10 Cm	Reconstruction Plate	Nil
2	25	F	Mandible Region: Left Ramus Involving Angle, Coronoid Process	Painless Swelling	Multilocular	Follicular	Segmental Resection with Disarticulation Region: 36 – Ascending Ramus Size: 4 X 2 Cm	No	Nil
3	31	M	Mandibular Body Ameloblastoma Region: 32 - 37	Painful Swelling	Unilocular	Plexiform	Segmental Resection Region: 31 – 38 Size: 12.4 X 8 Cm	Reconstruction Plate	Nil
4	80	F	Mandibular Ameloblastoma Region: Left Body, Ramus, Condyle, Coronoid Process	Painless Swelling	Multilocular	Plexiform	Segmental Resection with Disarticulation Size: 25 X 26.5 Cm	No	Nil
5	40	F	Recurrent Mandibular Body Ameloblastoma Region: 48 - 36	Recurrent Painless Swelling	Multilocular	Plexiform	Segmental Resection Region: 48 – 38 Size: 11 X 4 Cm	Reconstruction Plate	Nil
6	38	M	Recurrent Mandibular Ameloblastoma Region: Left Body 35, Ramus, Coronoid Process and Condyle.	Recurrent Painless Swelling	Multilocular	Follicular	Segmental Resection with Disarticulation Region: 33 – Ramus, Condyle, Coronoid Process Size: 12 X 8 Cm	No	Nil

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