

## Therapeutic outcome of various treatment modalities for the management of 34 cases of mandibular unicystic ameloblastoma

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### ABSTRACT

**Background & Objectives:** Unicystic ameloblastoma is a challenge, as conservative modalities have high recurrence chances whereas radical modalities have high morbidity for defects and deformity. Enucleation with peripheral ostectomy and Carnoy's solution is an intermediate treatment with less risk of recurrence and good outcome. The objectives of the study was to determine the therapeutic outcome for various treatment modalities for the management of mandibular unicystic ameloblastoma. **Materials & Methods:** Retrospective analysis of 34 cases from 2005 to 2014 was done and were analysed in terms of demographic profiles, treatment modalities and its efficacy (recurrence) in 6 years' follow up time. **Results:** The total number of patients was 34. The age ranged from 12 years to 28 years with a mean age of 18.82 years. Gender distribution was 21 males (61.8%) and 13 females (38.2%). The location found was 26 (76.5%) cases in posterior mandibular region and 8 (23.5%) cases in the anterior mandibular region. Size of the lesions was small in 10 (29.4%) cases, medium in 18 (52.9%) cases and large in 6 (17.6%) cases. Perforation of buccal or lingual cortex was present in 6 (17.6%) and no perforation in 28 (82.4%). Treatment modalities done was marsupialisation in 6 (17.6%) cases, enucleation with peripheral ostectomy with caroney solution in 22 (64.7%) cases and resection with safe margin in 6 (17.6%) cases. Recurrence occurred in 8 (23.5%) cases and no recurrence in 26 (76.5%) cases. **Conclusion:** Enucleation with peripheral ostectomy and Carnoy's solution is one of the good treatment modality for unicystic ameloblastoma of the mandible whereas complete resection of the mandible with safe margin has low risk of recurrence in long term follow up.

**Key words:** Ameloblastoma; Carnoy's solution; Curettage; Enucleation; Mandibular resection.

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### INTRODUCTION

Ameloblastoma is a benign aggressive odontogenic tumor of epithelial origin.<sup>1</sup> WHO and the International Agency for Research on Cancer, has classified ameloblastoma into Solid/multicystic, Extraosseous/peripheral, Desmoplastic ameloblastoma and Unicystic types.<sup>2</sup>

Unicystic ameloblastoma is the second most common type accounting for 10 to 46% of intraosseous ameloblastoma.<sup>3</sup> This type tends to

occur in younger population (average 21 years) with growth pattern of 6% and is associated with impacted tooth and dentigerous cyst; with most common location being the ramus/ molar region of the mandible.<sup>4</sup>

Clinically they present as local swelling, occasional pain with signs of lip numbness. Roentographically they may vary from well-defined unilocular to multilocular radiolucency with 40 to 70% root resorption.

Three mechanisms have been proposed for the pathogenesis: i) arising from reduced enamel epithelium, ii) arising from dentigerous or other odontogenic cysts and iii) solid ameloblastoma undergoing cystic degeneration of ameloblastic islands.<sup>5</sup>

Histopathologically three different types of unicystic ameloblastoma has been reported. i)The luminal type is lined by a variable often non-descript epithelium; ii)the intraluminal type shows intraluminal plexiform proliferation of epithelium; whereas iii)intramural type shows invasion of epithelium into the cyst wall in either follicular or plexiform patterns.<sup>6</sup> The proliferative potential of this type lies between the odontogenic keratocyst and solid ameloblastoma.<sup>7</sup>

Various treatment modalities include marsupialization, enucleation with Carnoy's solution, enucleation with peripheral ostectomy and resection (marginal or segmental).<sup>8,9</sup>

Marsupialization and simple enucleation have shown higher recurrence rate as the pathological tissue is left behind. Resection with safe margin (1 to 1.5cm radiographic margin) is a good treatment modality but is associated with various complications such as severe deformity and dysfunction. So to avoid the complications of resection and to reduce the high risk of recurrence with simple enucleation, enucleation has been combined with peripheral ostectomy and with chemical cauterisation which proved to have good therapeutic efficacy and outcome. In peripheral ostectomy, after the enucleation, a small amount of bone is trimmed off the cavity with a large round bur using a coolant.<sup>10</sup> This is followed by chemical cauterization with Carnoy's solution (absolute alcohol 6 mL, chloroform 3 mL, glacial acetic acid 1 mL, ferric chloride 0.1 gm/mL) for about three minutes using cotton applicators, which gave a good prognosis.<sup>11,12</sup>

The aim of our study was to determine the therapeutic outcome for various treatment modalities in the management of mandibular unicystic ameloblastoma.

## MATERIALS AND METHODS

### Materials

The retrospective analysis was done by Department of oral and maxillofacial surgery at UCMS, Bhairahawa, Nepal.

### Sample selection

**Inclusion criteria:** Patients diagnosed as unicystic ameloblastoma histopathologically by incisional or

excisional biopsy.

**Exclusion criteria:** Patients exempted from surgery due to lack of fitness

### Treatment modality algorithm:

The treatment modalities chosen was as per the radiographic size of the lesion.

⇒ Small (2x2 cm) were operated with enucleation with caroney solution and peripheral ostectomy.

⇒ Medium (2x2- 4x4) size of ameloblastoma were treated with enucleation with peripheral ostectomy and Carnoy's solution, if no perforation of the buccal and lingual cortex was found; resection was done for the cases with perforation

⇒ Large (> 4x4cm) size was treated with resection with safe margin for perforation and marsupialisation followed by enucleation for non-perforated cases

### Data collection and analysis

Patients with unicystic ameloblastoma diagnosed histopathologically by incisional or excisional biopsy were collected and analysed. Evaluation was done by taking a brief history and clinical examination and panoramic view of the patients' jaw along with standard photograph. Informed consent was taken from the patient explaining the procedure in detail. Patients were operated with different treatment modalities depending upon the treatment protocol under LA or GA.

Descriptive variables was collected and transferred to statistical package for the social sciences (SPSS) version 20.0.0 computer software and analyzed accordingly. Age, gender and location, size of the lesion, perforation, treatment modalities and recurrence were presented in the form of percentage and bar diagrams.

## RESULTS

The total number of patients was 34. The age ranged from 12 years to 28 years with a mean age of 18.82 years. Gender distribution was 21 males (61.8%) and 13 females (38.2%) .

The location found was 26 (76.5%) cases in distal mandibular region and 8 (23.5%) cases in the proximal mandibular region. Size of the lesions was small in 10 (29.4%) cases, medium in 18 (52.9%) cases and large in 6 (17.6%) cases

Perforation of buccal or lingual cortex was present in 6 (17.6%) and no perforation in 28 (82.4%)

Treatment modalities done was marsupialisation in 6 (17.6%) cases, enucleation with peripheral ostectomy and Carnoy's solution in 22 (64.7%) cases and resection with safe margin in 6 (17.6%)

Table 1: Treatment modalities

Treatment modalities	Frequency	%
Marsupialization	6	17.6
Enucleation peripheral osteotomy and Carnoy's sol	22	64.7
Resection	6	17.6
Total	34	100

cases. (Table 1) Recurrence occurred in 8 (23.5%) cases and no recurrence in 26 (76.5%) cases. Preoperative and post operative photographs are shown in figure 1.

### DISCUSSION

Akerman et al<sup>6</sup> found the ratio of male to female to be 1.3:1. As per our experience, the result was 21 males and 13 females with a ratio of 1.6:1, which shows a close variability.

The mean age reported by Akerman et al<sup>6</sup> was 23.8 years whereas our figures show 18.2 years which reveals that unicystic ameloblastoma occurs in the younger population.

The distribution of the lesion in our study was 76% in the distal region (angle and ramus) and 24% in the proximal region (parasymphysis and body region). Olaintan et al<sup>13</sup> reported UA affecting the symphysis with extension to the canine region (23.8%); affecting the premolar and molar region (28.6%); affecting the premolar, molar and the angle of the mandible (23.8%); affecting the angle and the ascending ramus (9.5%); and associated with all involvement posteriorly (14.3%). Both the studies show that distal part of mandible was more prevalent with the pathology.

Various treatment modalities are mentioned in the literature. We used marsupialization for the large lesions, enucleation with Carnoy's solution for medium and large lesions and resection for the lesions with cortical perforation. Decompression and dredging treatment modalities have also been discussed in the literature.<sup>14, 15</sup>

Lau and Samman et al<sup>8</sup> found the recurrence rates for unicystic ameloblastomas to be 3.6% after resection; 30.5% after enucleation alone; 16% after enucleation followed by application of Carnoy's solution; and 18% after marsupialization. Our recurrence rate was 23.5%

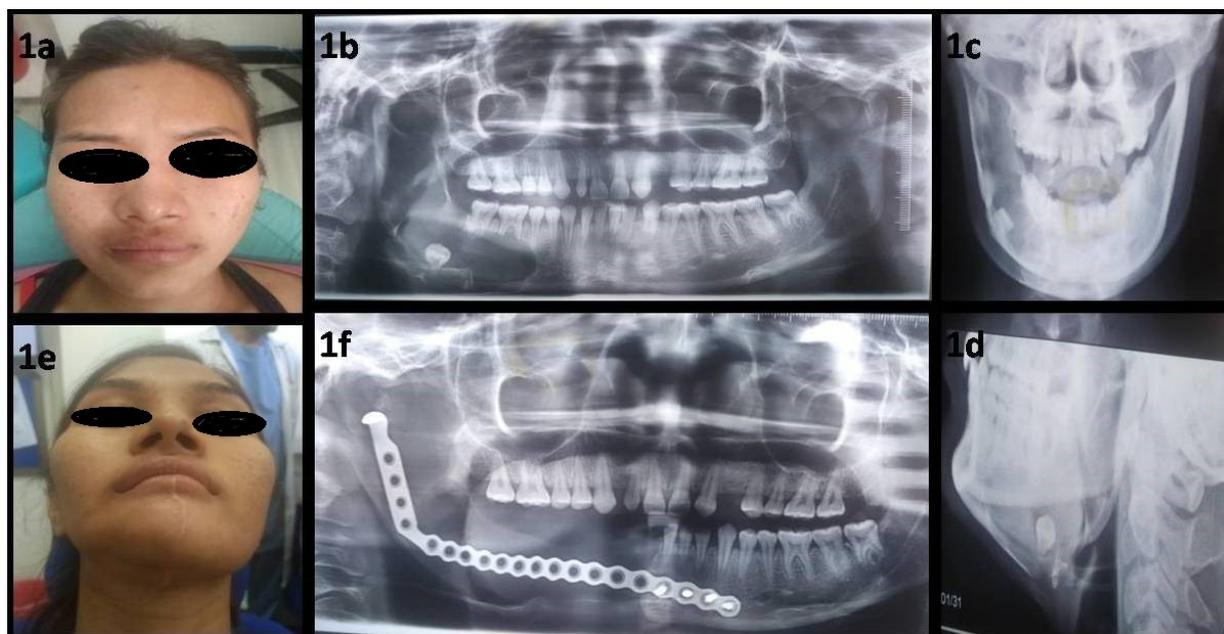


Fig 1a: Preoperative photograph.

Fig 1b: OPG showing a large multilocular radiolucency associated with impacted mandibular 3<sup>rd</sup> molar.

Fig 1c: PA view showing the same multilocular radiolucency on right mandibular region.

Fig 1d: Lateral oblique view showing the same multilocular radiolucency on right mandibular region with impacted 3<sup>rd</sup> molar.

Fig 1e: Post operative photograph with sutures in place.

Fig 1f: Post operative OPG showing the excision of the lesion with the placement of arch bars.

after overall treatment modalities. Further, recurrence rate after marsupialization for large defect was 60% whereas after enucleation and peripheral ostectomy for small defect was 10% and for medium defects was 41%. We found no recurrence after complete resection with safe margin. The variance in the recurrence rate may be due to the prudent decision making in the differential treatment modalities.

### CONCLUSION

Enucleation with peripheral ostectomy and Carnoy's solution is one of the good treatment modality for small and medium unicystic ameloblastoma of the mandible which is more of a conservative approach, however complete resection of the mandible with safe margin is more beneficial to the patient and less cumbersome to the operator due to low risk of recurrence in long term follow up.

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### Conflict of Interest Statement:

None Declared

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