Radical management of solid ameloblastoma of the mandible: Report of a case with 5-year follow-up

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Abstract

Introduction
Ameloblastoma is a true neoplasm of odontogenic epithelial origin. This pathology can be classified into 4 groups: unicystic, solid or multicystic, peripheral, and malignant. Solid ameloblastomas of the mandible are the most common of them, and represent a challenging group of tumours to treat; in addition the follicular histopathological subtype has a high likelihood of recurrence. Thus, the challenges in the management of this tumour are to provide complete excision in addition to reconstruct the bony defect, in order to provide the patient with reasonable cosmetic and functional outcome. With this in mind, this paper aimed to describe the management of a solid multilocular ameloblastoma of follicular subtype in a 39-year-old female.

Case report
The authors report a case of a solid multilocular ameloblastoma of follicular subtype in a 39-year-old female who was successfully treated by partial resection of the mandible with immediate reconstruction using an iliac crest, as a donor site. After 15 months, the patient was rehabilitated using titanium implant dentistry, and has been followed up for 5 years without signs or symptoms of recurrence.

Conclusion
Correct surgical planning is the key for successful management of solid ameloblastoma with multicellular features, which is best treated using radical resection with immediate reconstruction, which ensures complete tumour excision, prevents recurrence, and enables fast and safe dental rehabilitation. Biomedical prototypes should be used since they provide acceptable precision and are useful for surgical planning.

Introduction
Ameloblastoma is a histologically benign but is a locally invasive tumour arising from odontogenic epithelium, which accounts for 1% of all oral tumours. Clinically, ameloblastomas can be classified into 4 groups: unicystic, solid or multicystic, peripheral, and malignant. Therefore, in its histopathologic appearance and complex biologic behaviour, ameloblastoma bears some resemblance to basal cell carcinoma of the skin, and continues to be a subject of intense interest and some controversy.

Ameloblastoma is a unique jawbone tumour found exclusively in the maxillofacial region. It appears more frequently in the mandible, particularly in the angle and ramus, although it can occur in any mandibular region. In a review of literature, Reichart et al. found the solid variant to be the most common, being 92% of all ameloblastomas. In addition, solid ameloblastomas of the mandible represent a challenging group of tumours to treat, in terms of achieving adequate excision and restoring oral function. Various treatment methods for ameloblastomas have been suggested, including enucleation, marginal resection and aggressive resection, such as partial or total resection.

For many patients, full functional restoration following resection of the mandible depends on the ability of the bony reconstruction to heal primarily and support endosseous implants. In spite of significant advances in bone-grafting techniques, non-vascularized bone grafting for mandibular reconstruction for some surgeons.

This paper aims to report a case of a solid mandibular ameloblastoma in a 39-year-old subject who was successfully treated using partial resection of the mandible with immediate non-vascularized bone grafting for reconstruction of the mandibular defect.

Case report
A 39-year-old female was referred to the Oral Medicine & Surgery Department, Londrina Dental School (Londrina State University, Brazil) by her orthodontist, because of a radiographic image suggestive of bone lesion at the right mandibular angle.

Upon physical examination, there was no paraesthesia of the right side of the face. There was no associated pain, difficulty in opening the mouth, chewing or articulating. The patient’s medical history and review of systems were unremarkable. There was no enlarged lymph node over the neck region. Intraorally, all the present dentition was vital and continues to be a subject of intense interest and some controversy.

A panoramic radiography was viewed, which demonstrated a radiolucent, multicellular lesion around the right angle and ascending ramus of the mandible (Figure 1). A computed tomography (CT) scan showed the extension of the lesion that involved the mandible (Figure 2). Incisional biopsy of the oral cavity mass was carried out

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under local anaesthesia. The specimen revealed characteristics of a solid multilocular ameloblastoma, follicular subtype. In light of this histopathological feature, the treatment planning was partial resection of the mandible. For the surgical planning, biomedical prototypes were used (Figure 3). Under general anaesthesia, through transcervical approach, a partial resection of the mandible was performed with clear margin of approximately 1.0 cm at each side of the tumour.

Immediately following the resection, a 2.4 Reconstruction Plate was adjusted and fixed with three screws at each side of the defect. An autogenous bone graft was obtained from the iliac crest, which was used for reconstruction of the mandibular defect (Figure 4). After 15 months, the patient was rehabilitated using titanium implant dentistry (Figure 5). The patient has been followed up for 5 years and has remained clinically and radiographically disease-free (Figure 6).

Discussion

Ameloblastomas comprise 39.6% of all odontogenic tumors, accounting for 1% of all oral tumours. This pathology were first described by Cusack in 1827 and detailed by Broca in 1868. The World Health Organization (WHO) classifies ameloblastomas as benign odontogenic tumours formed by odontogenic epithelium with fibrous mature stroma, but without odontogenic ectomesenchyme. It is a unique jawbone tumour found exclusively in the maxillofacial region, which appears more frequently in the mandible (80% of all cases), particularly in the angle and ramus, as found by the authors of this case report.

This pathology can be clinically classified into 4 groups: unicystic, solid or multicystic, peripheral, and malignant. Malignant ameloblastomas are extremely rare; representing far less than 1% of all ameloblastomas. The WHO has recognized 2 subtypes of this disease, metastasizing ameloblastoma and ameloblastic carcinoma. Metastatic ameloblastomas are rare and have a high tendency to metastasize (especially to the lungs and cervical lymph nodes), despite benign histology of the primary and secondary lesions. Ameloblastic carcinoma shows common histologic characteristics of carcinoma.

Although a benign histologic pattern, ameloblastoma is locally aggressive and has a high tendency to recur. For these reasons, the treatment of ameloblastoma is controversial. Additionally, there is discussion in the literature concerning different treatment approaches for solid ameloblastomas. Therefore, Carlson and Marx carried out an extensive literature review, and concluded that radical resection is the only form of treatment for ameloblastomas with predictable results, which are in accordance with other authors.

Solid ameloblastomas are the most common of all ameloblastomas, characterized by a slow but infiltrative growth pattern and locally aggressive, occurring mainly on the posterior mandible of young adults. Microscopically,
subtype has a relatively high likelihood of recurrence, requiring more radical treatment.\textsuperscript{15} Radiographically, these lesions are uni- or multilocular osteolytic lesions. Therefore, Fregnani et al.\textsuperscript{3} found solid cases with multilocular radiographic image, presented a significantly higher incidence of recurrences, which is in accordance with other studies.\textsuperscript{16,17} With this in mind, the authors of this case report performed partial resection of the mandible in order to decrease the recurrence rate of this pathology. Conservative treatment results in an acceptably low risk of recurrence.\textsuperscript{3,15}

The mandible holds an important place in function and aesthetics of human facial structure. Loss of mandibular continuity, whether caused by tumour resection, produces significant functional disability and cosmetic deformity.\textsuperscript{18} Therefore, it is possible to provide significant functional restoration for most patients suffering from mandibular defects using bone grafting. In spite of significant advances in bone-grafting techniques, non-vascularized bone grafting of the mandible, remains the preferred method for mandibular reconstruction for some surgeons.\textsuperscript{7,8,9} However, non-vascularized bone grafting should be restricted to defects less than 5-6 cm in length.\textsuperscript{7,19} Non-vascularized bone grafting from iliac crest are ideal for defects involving the mandibular angle or anterior mandible in dentate patients because they provide adequate bone height and the natural shape of the iliac crest often facilitates its placement.\textsuperscript{20} Additionally, biomedical prototypes should be used since they provide acceptable precision and are useful for surgical planning.\textsuperscript{6,21}

**Conclusion**

In summary, correct surgical planning is the key for successful management of solid ameloblastoma with multilocular features, which is best treated using radical resection with immediate reconstruction. Thus, it ensures complete tumor excision, prevents recurrence, and enables fast and safe dental rehabilitation, as found by the authors of this case report.

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**Figure 5:** After 15 months, the patient was rehabilitated with titanium implants dentistry.

**Figure 6:** After 5 years, the patient presented with good functional stability of the occlusion, and without signs or symptoms of recurrence.

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**References**


