

Radiographic Evaluation of a Large Multilocular Ameloblastoma of the Mandible in a 22-Year-Old Patient Managed by the Dredging Method: A Case Report

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ABSTRACT Ameloblastoma is a rare benign odontogenic tumor with a high risk of local recurrence if inadequately treated. Radical resection reduces recurrence rates but can result in significant functional and aesthetic deficits. The dredging method is a conservative surgical approach that aims to eradicate tumor tissue while promoting bone regeneration. A 22-year-old male presented with a two-year history of recurrent, painless swelling on the left side of the face. Orthopantomogram and CBCT revealed a large multilocular radiolucent lesion involving the left mandibular ramus, angle, and body, associated with an unerupted third molar. Histopathology confirmed unicystic ameloblastoma, mural type. The patient underwent enucleation, decompression, and two dredging procedures at three-month intervals. Follow-up at five months demonstrated significant bone remodeling, absence of facial asymmetry, and no evidence of recurrence. The dredging method offers an effective, conservative option for managing large ameloblastomas in young patients, preserving jaw continuity and function while encouraging bone regeneration. Long-term follow-up is essential to monitor for recurrence.

KEY WORDS: Ameloblastoma, Bone regeneration, Conservative surgery, Dredging method, Mandible.

I. INTRODUCTION

Ameloblastoma is an uncommon benign tumor of odontogenic epithelial origin, more frequently affecting the mandible than the maxilla. Although it is locally invasive, malignant transformation or metastasis is rare. Ameloblastomas account for approximately 1% of all oral tumors and about 18% of odontogenic tumors, with 81% occurring in the mandible, and 19% in the maxilla [1]. The growth and malignant conversion of odontogenic epithelium into ameloblastoma is influenced by a variety of chemicals and gene dysregulations connected to the sonic hedgehog, WNT/-catenin, and mitogen-activated protein kinase (MAPK) signaling pathways [2]. Through a radiographic exam, an ameloblastoma is observed as a single or multiple radiolucent lesion. It has clearly defined edges and may or may not exhibit sclerotic margins. It has

often been reported in association with retained teeth. Radiographic investigations of multicystic ameloblastoma typically reveal them to be radiolucent and multilocular tumors. They are compared to "honeycombs" or even "soap bubbles" in the literature [3].

Surgical resection is the primary treatment, ranging from radical segmental resection to conservative approaches such as enucleation, curettage, and cryosurgery. Radical resection reduces recurrence but may result in functional and aesthetic deficits. Conservative methods preserve more tissue but carry a higher recurrence risk. The "dredging method" is a conservative technique involving repeated enucleation and removal of scar tissue

to eradicate tumor remnants while promoting bone regeneration [4]. This report describes the successful management of a large multilocular ameloblastoma of the mandible in a young adult using the dredging method.

II. CASE REPORT

Patient Presentation

A 22-year-old male presented with a recurrent, diffuse swelling on the left side of the face for two years. The swelling was painless and not associated with trismus, chewing difficulty or speech impairment. Intraoral examination revealed swelling and mobility of the left mandibular second molar teeth with pus discharge from the distal gingival margin. The remainder of the oral mucosa appeared normal. No cervical lymphadenopathy was detected, and systemic examination was unremarkable.

Investigations

Orthopantomogram (OPG) revealed a large unicystic, multilocular radiolucency extending from the left mandibular ramus to the second molar region, involving ramus, angle, and body, and associated with an unerupted third molar as shown in Figure 1. Cone-beam computed tomography (CBCT) confirmed the lesion’s involvement of the ramus, coronoid process, and condyle with buccolingual expansion, cortical thinning and inferior border attenuation as shown in Figure 2. An incisional biopsy performed under local anesthesia revealed a unicystic ameloblastoma, mural type.

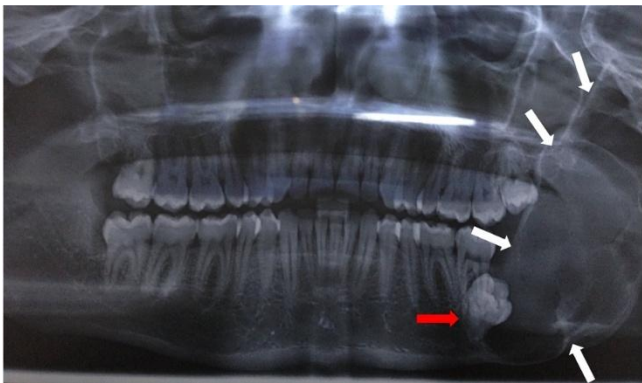


Figure 1: OPG shows a large multilocular radiolucency arising from the left side of the mandible indicated with white arrow and impacted 3rd molar indicated with red arrow.

Treatment Stage

Under general anesthesia, enucleation and deflation were performed. The anterior ramus cortex was removed by osteotomy, and the lesion, along with the unerupted third molar and first and second molars, was removed as shown

in Figure 3. A first dredging procedure was performed to remove scar tissue and ensure



Figure 2: CBCT showed unicystic appearance of mandible ramus, coronoid process, and condyle with expanding buccal

clearance of any residual tumor. The wound was sutured using 4–0 resorbable sutures, and the cavity was packed with medicated gauze. Fenestration was carried out. Postoperatively, the patient received cefixime (12-hourly for 7 days), metronidazole 400 mg (8-hourly for 5 days), ibuprofen 400 mg (12-hourly for 5 days), and gastric protection. Four days later, the gauze was removed, and the cavity irrigated with saline.

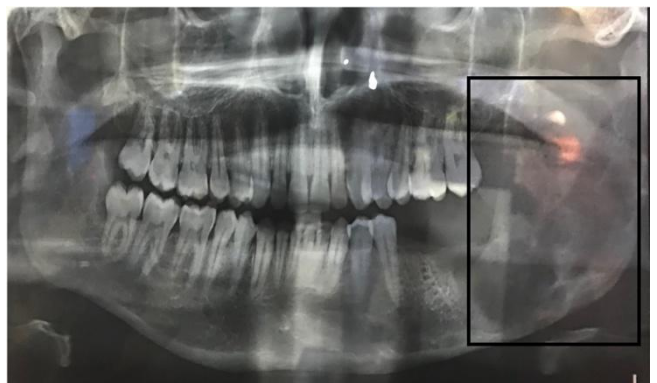


Figure 3: Dredging was performed followed by the extraction of 1st, 2nd and 3rd molar

At three months, OPG demonstrated new bone formation and reduced lesion size. A second dredging procedure was performed to remove remaining scar tissue and ensure clearance of any residual tumor. At 5-month follow-up, the patient exhibited no facial asymmetry, no trismus, and normal sensory function. Radiographs showed marked bone remodeling as shown in Figure 4.

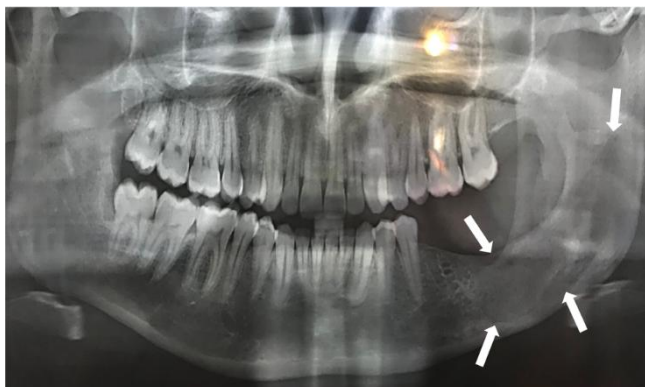


Figure 4: OPG showed a high rate of bone remodelling on the surgical site

III. DISCUSSION

Ameloblastoma is a benign tumour with a strong propensity to recur locally. These lesions may originate from basal cells of the oral mucosa, dental lamina remnants, a growing enamel organ, the epithelial lining of an existing odontogenic cyst, or dental lamina remains. Unilocular ameloblastoma (UA), which makes up around 6% of all ameloblastomas, is an uncommon variant of the condition. Around 50% of cases occur in the second decade of life, with it often affecting younger age groups. The mandible contains more than 90% of them. Between 50 to 80 percent of cases, an impacted 3rd molar is present, most frequently involving the mandibular third molar [5]. A treatment procedure known as a "dredging method" was disclosed in this study and was first mentioned by Kawamura et al. in 1991. According to their procedure, enucleation is repeated five to six times with an interval of two to three months following deflation and enucleation or only enucleation, until no tumor cell nest is found in the pathological results of scar tissues that have been moved by two successive dredging. A targeted marginal resection is added in cases of honeycomb-patterned ameloblastoma. Also, several clinical investigations revealed that "the dredging approach" for treating mandibular ameloblastoma results in a low risk of recurrence and few complications, with no dysfunction or deformity. The dredge technique surgery, described by Kawamura et al., necessitates (1) the observation of adequate new bone growth and (2) the absence of tumor cell nest in the scar tissues removed by two successive dredgings [6]. Another study has reported the complete removal of the ameloblastoma by two successive dredging method [7]. In the current study the tumor with involvement of the ramus, angle, and body of the left lower second molar tooth and an unerupted third molar was detected on an orthopantomogram (OPG). On radiographs, the lesion appears as a multilocular radiolucency that is well-corticated. When the loculi are tiny, the multilocular form

is frequently characterised as having a "honeycomb" or "soap bubble" appearance (when the loculi are large). The tumor had a strong propensity to significantly damage bone, with cortical growth and root resorption. This case of ameloblastoma most likely involved the unerupted third molar teeth. Even though extensive marginal bone involvement called for surgical resection of the mandible, we chose the dredging technique because of the patient's age and the patient's importance to society in terms of aesthetics. Unexpectedly, following two consecutive dredgings separated by a 5-month period, we observed considerable bone growth.

Consequently, our treatment method for a mural kind of unicystic ameloblastoma involved removing scar and new bone until there was no longer any sign of tumor cells in the scar tissue. Yet, a protracted follow-up with a "wait and see" approach was required. When recurrence is discovered following the two-stage surgery, the recurring tumor may be amenable to marginal resection removal. In the present case, the patient's young age and aesthetic considerations favored a conservative approach. The dredging method achieved functional and structural preservation, with significant bone regeneration observed within five months. Short-term outcomes were favorable, but long-term follow-up is essential, as recurrences can occur years after treatment.

The dredging technique can be a good substitute for radical resection in the treatment of large ameloblastomas, as this case illustrates, especially in young patients where maintaining both function and appearance is crucial. The radiographic evidence of progressive bone regeneration after conservative care is documented in this study, providing useful clinical data that might guide decision-making in future cases of it. It emphasizes how crucial customized treatment planning is, achieving a balance between oncologic safety and quality-of-life factors. The current research may also persuade medical professionals to include the dredging method to their arsenal of treatments for ameloblastomas.

IV. CONCLUSION

The dredging method is a viable conservative alternative for treating large ameloblastomas, particularly in young patients where preservation of jaw continuity and aesthetics is a priority. Close long-term monitoring is crucial to detect potential recurrence.

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