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**AMELOBLASTOMA OF THE MANDIBLE: A CASE REPORT OF
 DIAGNOSTIC DISCORDANCE ACROSS SEQUENTIAL PATHOLOGICAL
 EVALUATIONS**

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ABSTRACT

Background: Ameloblastoma is a benign epithelial odontogenic tumor with a high recurrence tendency, predominantly found in the mandible. Follicular ameloblastoma is the most common histopathological subtype of the ameloblastoma. Its complex histopathology can complicate diagnosis, particularly when limited biopsy sampling fails to represent the entire tumor. **Objectives:** This case report aims to highlight the importance of comprehensive histopathological evaluation of the resected specimen in establishing a definitive diagnosis of ameloblastoma. **Case:** A 35-year-old female presented with a painless, progressively enlarging right mandibular mass. Incisional biopsy indicated ossifying fibroma, while CT scan revealed a destructive, expansile lesion measuring 3.1x3.3 x 5.23 cm inconsistent with a fibro-osseous lesion. Specimen review subsequently suggested mixed-type ameloblastoma. This case highlights the importance of comprehensive histopathological evaluation of the complete resected specimen, as limited biopsy sampling may not capture the predominant architectural pattern in histologically heterogeneous tumors such as ameloblastoma. Segmental resection with iliac crest bone graft reconstruction was selected to ensure adequate tumor removal and restore mandibular continuity. **Managing Cases:** Given this diagnostic complexity, segmental mandibulectomy with immediate iliac crest bone graft reconstruction and plate fixation was performed. Histopathological examination of the definitive resected specimen ultimately confirmed follicular-type ameloblastoma, with no evidence of malignancy. **Conclusion:** This case demonstrates that histopathological heterogeneity of ameloblastoma may lead to diagnostic discordance. Segmental mandibulectomy with immediate reconstruction served as both the definitive diagnostic and therapeutic solution for extensive mandibular involvement.

Keywords: Ameloblastoma, follicular-type, Mandible, Reconstruction, Segmental resection

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INTRODUCTION

Ameloblastoma is a true odontogenic neoplasm with locally invasive characteristics, commonly found in the jaw. Although ameloblastoma is a benign lesion, it has a high tendency to recur after inadequate

excision.¹ Epidemiologic studies have demonstrated geographic variation in the incidence, demographic distribution, and clinicopathologic characteristics of ameloblastoma.

Histopathologically, conventional ameloblastoma is further subclassified into several subtypes including follicular, plexiform, acanthomatous, granular cell, basaloid, and desmoplastic. When more than one histopathological pattern is identified within a single specimen, the case is classified as mixed-type ameloblastoma. A study of the Indonesian population found that mixed-type ameloblastoma is the most predominant subtype (57.6%), followed by follicular (16.2%) and plexiform (9.9%) subtypes, respectively.² A study conducted within the Airlangga University hospital network similarly reported follicular type as the most common single histological subtype among non-mixed cases.³

Treatment of ameloblastoma may vary from a simple enucleation to segmental or en-block resection of the tumor with reconstruction. To prevent recurrence, the surgical margins should be at least 1–2 cm of radiologically normal margins.⁴ The histopathological complexity of ameloblastoma poses significant diagnostic challenges, as its varied patterns may overlap with other odontogenic and non-odontogenic lesions. Delayed or inaccurate diagnosis may lead to inadequate treatment, increasing the risk of recurrence and potential malignant transformation into ameloblastic carcinoma.⁵

The mandible is the most frequently affected site, accounting for approximately 75–80% of all cases, with several studies reporting a slight female predominance.^{1,2} Based on the latest World Health Organization (WHO) clinical classification, ameloblastoma is classified into five groups: unicystic, conventional (formerly referred to as solid/multicystic), peripheral, adenoid, and metastasizing ameloblastoma.⁶ Due to its potential for extensive bone involvement, accurate assessment of tumor extent is essential for treatment planning.

Therefore, accurate diagnosis requires careful correlation of clinical, radiological, and histopathological findings. This case report aims to highlight the importance of integrated clinical, radiological, and histopathological evaluation in achieving an accurate diagnosis of ameloblastoma, and to discuss the surgical management and reconstruction approach in extensive mandibular involvement.

CASE

A 35-year-old female who presented with an eight-month history of a painless, progressively enlarging right mandibular mass, first noticed in September 2025. Extraoral examination revealed no obvious facial asymmetry. A diffuse swelling was palpable in the right mandibular region, firm to cystic in consistency and painless on palpation. The overlying skin was of normal color and temperature. The patient reported that the mass had been gradually enlarging with no history of preceding trauma or dental pain. Altered sensation over the right mandibular region was noted, consistent with hypoesthesia of the inferior alveolar nerve distribution. Intraoral examination revealed a well-defined mass extending from tooth 33 to 46, measuring 2×10 cm, with intact overlying mucosa and no ulceration. Preoperative chest X-ray revealed no significant abnormalities.



Figure 1: Extraoral examination of the patient showing no obvious facial asymmetry in frontal, submental, and bilateral lateral views.



Figure 2: Intraoral examination revealing a well-defined mass extending from tooth 33 to 46 with firm to cystic consistency and intact overlying mucosa.

Panoramic radiograph revealed a well-defined multilocular radiolucent lesion with radiopaque borders extending from tooth 47 to tooth 33, involving the right mandible. The lesion demonstrated expansion into the mandibular canal, with thinning of the mandibular cortex. Root resorption was noted on teeth 47, 46, 45, 44, 42, 41, 31, 32, and 33.



Figure 3: Panoramic radiograph demonstrating a well-defined multilocular radiolucent lesion with radiopaque borders extending from tooth 47 to 33, with expansion into the mandibular canal, cortical thinning, and root resorption of adjacent teeth.

Fine-needle aspiration biopsy (FNAB) was performed on the right mandibular mass, yielding clear fluid. Microscopic examination revealed hypocellular smears with amorphous basophilic matrix admixed with cystic macrophages, lymphocytes, and neutrophils, along with small clusters of cuboidal epithelial cells exhibiting round nuclei and fine chromatin. No malignant cells were identified. The cytological findings were consistent with a benign cystic lesion, and histopathological confirmation was recommended. Incisional biopsy was subsequently performed, and histopathological examination suggested ossifying fibroma.

The patient underwent computed tomography (CT) scan, which provides detailed three-dimensional analysis of the lesion extent, cortical and medullary bone involvement, and soft tissue extension, offering superior diagnostic information compared with conventional radiographs such as orthopantomogram (OPG). CT scan examination revealed a well-defined expansile radiolucency involving the right mandible with a soap bubble-like appearance, measuring approximately $3.1 \times 3.3 \times 5.23$ cm (axial/coronal/sagittal), extending from the mentum to the corpus and angulus of the right mandible.

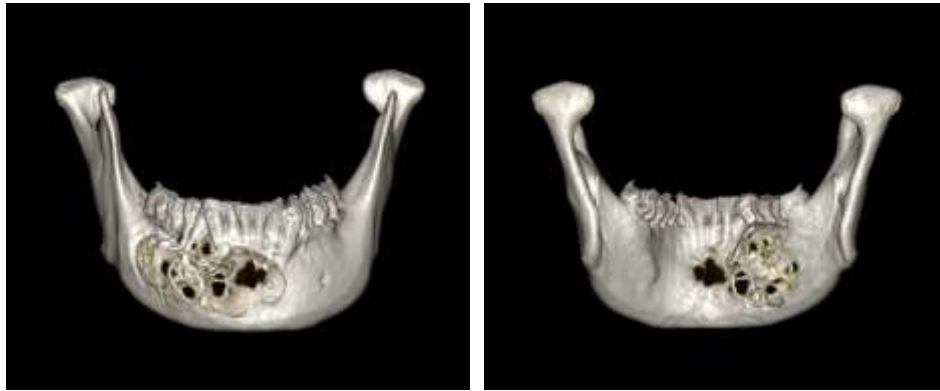


Figure 4: Three-dimensional CT scan showing extensive bony destruction of the right mandible from the mentum to the angulus with multilocular expansion and cortical thinning.

Given the discordance between the incisional biopsy findings and the destructive, expansile radiographic appearance on CT scan, a histopathological review of the same specimen was performed, which identified mixed-type ameloblastoma comprising follicular, cystic, and plexiform components. Based on the compelling radiological and revised histopathological findings, a provisional diagnosis of conventional ameloblastoma was established. Given the extensive involvement of the right mandible from the mentum to the angulus, radical surgical intervention was indicated.

CASE MANAGEMENT

Preoperative preparation included dental model casting, fabrication of a surgical wafer, ramus fixator, surgical stent, and reconstruction plate. Preoperative arch bar placement was performed to maintain occlusal stability during the surgical procedure. The patient underwent segmental mandibulectomy of the right mandible under general anesthesia with ASA physical status I. Intraoperatively, the mental nerve was identified and preserved bilaterally, along with the right facial artery. Osteotomy was performed at the predetermined resection margins, and the tumor-bearing segment of the mandible was removed en bloc. Following resection, reconstruction was performed using an iliac crest bone graft harvested in a joint operation with the orthopedic surgery team, stabilized with a 2.7 reconstruction plate system, fixed with three 16 mm screws on the left side and three 12 mm screws on the right side. A radon drain was placed prior to layered extraoral closure.

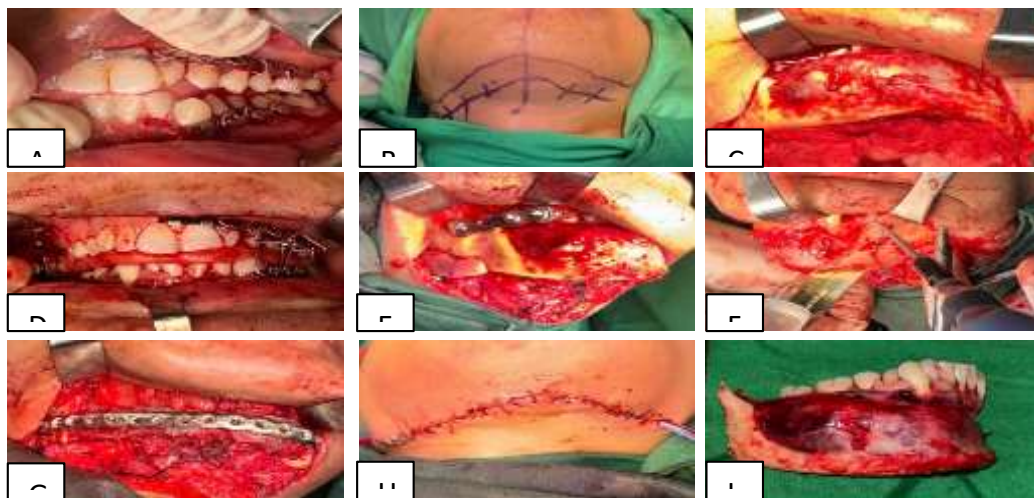


Figure 5: Intraoperative photographs. (A) Arch bar placement for occlusal stabilization prior to resection. (B) Surgical marking at the iliac crest donor site. (C) Exposure of the tumor mass following extraoral incision. (D) Surgical wafer placement to maintain occlusal relationship. (E) Ramus fixator and surgical stent placement for mandibular stabilization. (F) Osteotomy at the mandibular resection margins. (G) Reconstruction plate fixation with iliac crest bone graft in situ. (H) Radon drain placement and subcutaneous suturing following closure. (I) Surgical specimen following segmental mandibulectomy demonstrating the resected tumor mass.

Following the surgery, the resected tissue was submitted for definitive microscopic evaluation. The resected specimen was processed into six tissue blocks with a total weight of 39 grams. Histopathological examination confirmed follicular-type ameloblastoma, characterized by islands of odontogenic epithelium within mature collagenous connective tissue stroma, with peripheral palisading of ameloblast-like cells and central stellate reticulum-like areas. No features of malignant transformation were identified.

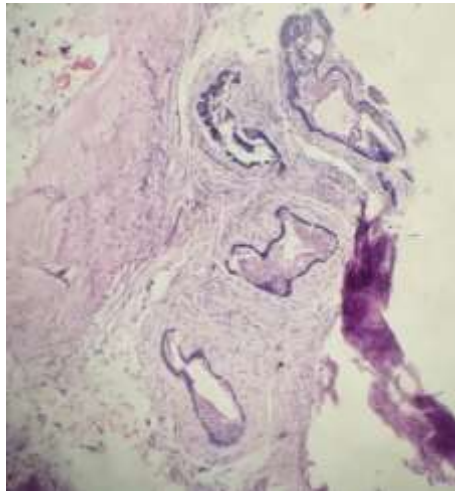


Figure 6: Histopathological examination (hematoxylin and eosin stain) showing follicular-type ameloblastoma.

At one-week postoperative follow-up, extraoral examination revealed well-healed surgical incisions with no edema, erythema, fistula, wound dehiscence, or plate exposure, though slight mandibular asymmetry was noted. Intraoral examination showed well-healed sutures with no fistula, dehiscence, bone or graft exposure, and the reconstruction plate was palpably intact and stable. The patient reported no pain (pain score 0) and demonstrated good oral intake. No early signs of recurrence were noted at this stage. The diagnostic journey and surgical management of this case raise important considerations regarding the evaluation and treatment of follicular ameloblastoma, as discussed below.

DISCUSSION

Radiographic evaluation, particularly CT scan, also plays a crucial role in assessing the extent of bony involvement and guiding surgical planning. In this case, CT scan revealed a multilocular radiolucent lesion with a soap bubble appearance, extending from the mentum to the angulus of the mandible, allowing adequate delineation of tumor margins prior to resection. This finding represents the classic radiographic presentation of ameloblastoma, in which the lesion appears as a radiolucent area with multiple internal septations creating a bubble-like pattern.⁷ While several jaw lesions, including odontogenic keratocyst, dentigerous cyst, AOT, and CGCG, can present with overlapping features, the extensive size and root resorption observed were more characteristic of ameloblastoma.⁸ Although radiographic findings provide important information regarding lesion characteristics and surgical planning, definitive diagnosis of ameloblastoma relies on histopathological evaluation.

This case illustrates diagnostic discordance across sequential evaluations, from fine-needle aspiration cytology suggesting a benign cystic lesion, to incisional biopsy indicating ossifying fibroma, and a subsequent specimen review suggesting mixed-type ameloblastoma, all of which contrasted with the radiographic findings described above. This discordance reflects the known limitation of FNAB and incisional biopsy in adequately representing the histological architecture of the tumor due to their small sample size.^{9,10} Given this diagnostic uncertainty, definitive surgical resection served both a therapeutic and diagnostic purpose, allowing comprehensive histopathological evaluation of the complete tumor specimen. Histopathological examination of the resected specimen, processed into six tissue blocks totaling 39 grams, confirmed follicular-type ameloblastoma. This case underscores that adequate tissue sampling is a critical determinant of diagnostic accuracy, particularly in tumors with recognized histological heterogeneity such as ameloblastoma.

Given the extensive bony involvement and the recurrent nature of ameloblastoma, segmental resection was performed as the definitive surgical approach. Conservative treatments such as enucleation and curettage are associated with significantly higher recurrence rates, whereas radical resection with adequate bone margins offers superior long-term tumor control, despite requiring more extensive reconstruction.¹¹ Histopathological examination of the resected specimen confirmed tumor-free medial and lateral resection margins (0.7 cm and 0.2 cm, respectively), consistent with adequate surgical clearance. Following segmental resection, an iliac crest bone graft was used to perform reconstruction. This bone was selected mainly for its abundant cancellous bone volume, structural rigidity, and reliability in restoring mandibular continuity.¹² Non-vascularized iliac crest grafts have been reported as highly successful for mandibular continuity reconstruction and are considered a first-line option for defects under 9 cm.¹³ Stabilization using a titanium reconstruction plate provided additional structural support pending future prosthetic rehabilitation.

A pooled recurrence rate of 8% was reported following radical treatment of conventional ameloblastoma, compared to 41% with conservative management.¹¹ Similarly, Almeida et al. demonstrated that conservative treatment of primary multicystic ameloblastoma carried a 3.15-fold greater relative risk of recurrence compared to radical treatment.¹⁴ Recurrence rate is influenced not only by the surgical approach but also by multiple factors, including tumor type, histological variant, surgical expertise, and instrumentation. Additional factors such as patient age, tumor location, size, and the extent of bony involvement further contribute to overall prognosis.⁷ Collectively, these variables result in a wide range of reported recurrence rates, from approximately 10% with adequate radical treatment to as high as 55–90% following conservative management, underscoring the long-term clinical complexity of ameloblastoma management.⁵ Although uncommon, malignant transformation into ameloblastic carcinoma remains a recognized risk, particularly in long-standing, recurrent, or inadequately treated lesions. This possibility further reinforces the need for complete surgical excision and long-term postoperative surveillance, given the potential for malignant progression and its associated impact on survival outcomes.¹⁵

CONCLUSION

This case underscores that when biopsy findings are inconsistent with the clinical and radiological behavior of a jaw lesion, further pathological review and comprehensive clinicoradiological-pathological correlation are essential before definitive management. In this case, incisional biopsy findings did not fully represent the histological architecture of the tumor, and comprehensive histopathological evaluation of the complete resected specimen was ultimately required to establish a definitive diagnosis of follicular-type ameloblastoma. Segmental resection, combined with immediate reconstruction using an iliac crest bone graft and reconstruction plate fixation, achieved tumor-free medial and lateral resection margins (0.7 cm and 0.2 cm, respectively) and restored mandibular continuity. Long-term postoperative follow-up is recommended to monitor for recurrence, given the recognized recurrence potential of ameloblastoma.

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