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Case Report

Manuscript Title: “Excision of an Extensive Cemento-Ossifying Fibroma in the Right Mandible: Case Report”

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ABSTRACT

Cemento-ossifying fibroma is a benign fibro-osseous lesion of odontogenic mesenchymal origin, most commonly affecting the mandible. It is typically

characterized by slow growth, cortical expansion, and well-defined radiographic features. This case report describes the diagnosis and surgical management of a cemento-ossifying fibroma involving the right mandible of a 55-year-old female patient who presented with facial asymmetry without associated pain. Radiographic and tomographic examinations revealed a well-circumscribed expansile lesion involving the mandibular body, ramus, and angle. Surgical treatment consisted of complete excision of the lesion followed by mandibular stabilization using a 2.4-mm reconstruction plate system and adjunctive xenogeneic bone grafting. Histopathological analysis confirmed the diagnosis of cemento-ossifying fibroma. At the 8-month postoperative follow-up, satisfactory bone neoformation, stable fixation, and favorable functional and aesthetic outcomes were observed. This case highlights the importance of accurate diagnosis, appropriate surgical planning, and long-term follow-up in the management of extensive mandibular cemento-ossifying fibromas.

Keywords: Cemento-ossifying fibroma; Mandible; Fibro-osseous lesions; Oral surgery; Case report.

Statement of Clinical Significance

This case report highlights the diagnosis and surgical management of an extensive cemento-ossifying fibroma of the mandible, emphasizing clinical decision-making and reconstructive strategies applicable to advanced fibro-osseous lesions.

INTRODUCTION

Cemento-ossifying fibroma (COF) is a benign fibro-osseous lesion derived from odontogenic mesenchyme, characterized by the presence of cellular fibrous tissue containing mineralized material resembling bone and/or cementum^{1,2}.

It shows a predilection for female patients and fair-skinned individuals, with a higher incidence during the third and fourth decades of life². The mandible particularly the premolar and molar regions is the most frequently affected anatomical site¹.

Clinically, these lesions present as a slow-growing, expansile enlargement of the affected bone, which may result in facial asymmetry; however, they are typically asymptomatic³⁻⁵. Radiographically, COF appears as a well-defined lesion with variable internal density depending on the degree of mineralization (radiolucent, mixed, or radiopaque), usually exhibiting a corticated margin and bone expansion without invasion of adjacent structures⁶.

Treatment generally consists of complete surgical removal by enucleation or curettage. Larger or more extensive lesions may require marginal or segmental resection, with possible bone reconstruction². Postoperative radiographic follow-up is recommended to monitor for recurrence, which is uncommon when complete excision is achieved⁶.

CASE REPORT

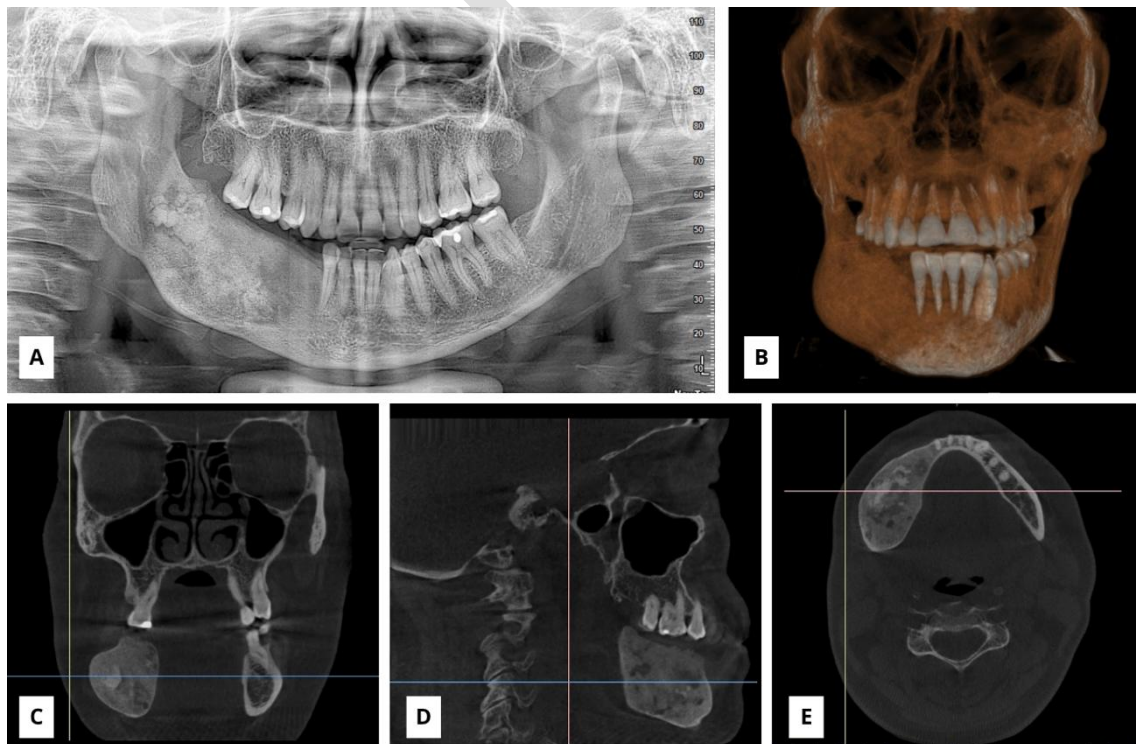
A 55-year-old Caucasian female patient denied the presence of systemic diseases as well as the continuous use of medications. She sought dental care with the chief complaint of facial asymmetry on the right side, without pain or other associated symptoms.

Radiographic examination (Figure 1)

Figure 1. Preoperative imaging examinations. Panoramic radiograph (A); three-dimensional computed tomography reconstruction (B); coronal (C), sagittal (D), and axial (E) sections.

revealed an increase in bone volume involving the angle, ramus, and body of the right mandible, with cortical expansion and alteration of the mandibular contour, associated with the absence of the right mandibular posterior teeth. Three-dimensional reconstruction of the computed tomography scan (Figure 1-B) confirmed the unilateral increase in bone volume. Coronal, sagittal, and axial sections (Figures 1-C, D, and E) demonstrated cortical thickening in the affected region and hyperdense content within the lesion.

FIGURE 1. Preoperative imaging examinations. Panoramic radiograph (A); three-dimensional tomographic reconstruction (B); coronal (C), sagittal (D), and axial (E) sections.

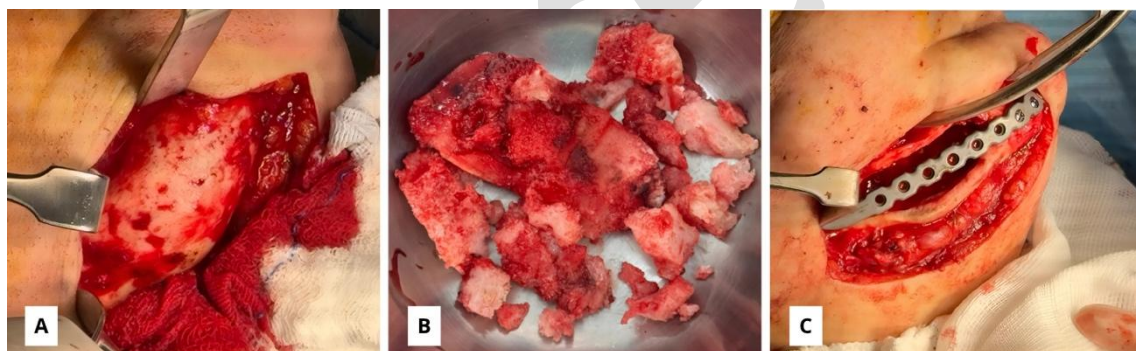


Source: Author.

The surgical procedure was performed at the Santa Casa de Misericórdia de Agudos Hospital setting under general anesthesia with nasotracheal intubation. A submandibular (Risdon) approach was used to provide wide exposure of the affected area (Figure 2-A). After identification of the anatomical limits and the lesion, complete excision was carried out, yielding multiple bone fragments (Figure 2-B).

Considering the extent of the affected area and the potential residual structural fragility, placement of a 2.4-mm fixation system reconstruction plate was chosen, secured with three screws on each side of the bone defect (Figure 2-C). Subsequently, particulate xenogeneic bone graft material was placed around the plate to assist bone regeneration and improve reconstruction adaptation. Finally, layered closure was performed using 4-0 Vicryl for the muscle layer and 4-0 Nylon for the skin layer, with simple interrupted sutures.

FIGURE 2. Intraoperative steps: complete exposure of the lesion (A); removal and harvesting of the fragments (B); and placement of a 2.4-mm reconstruction plate system (C).

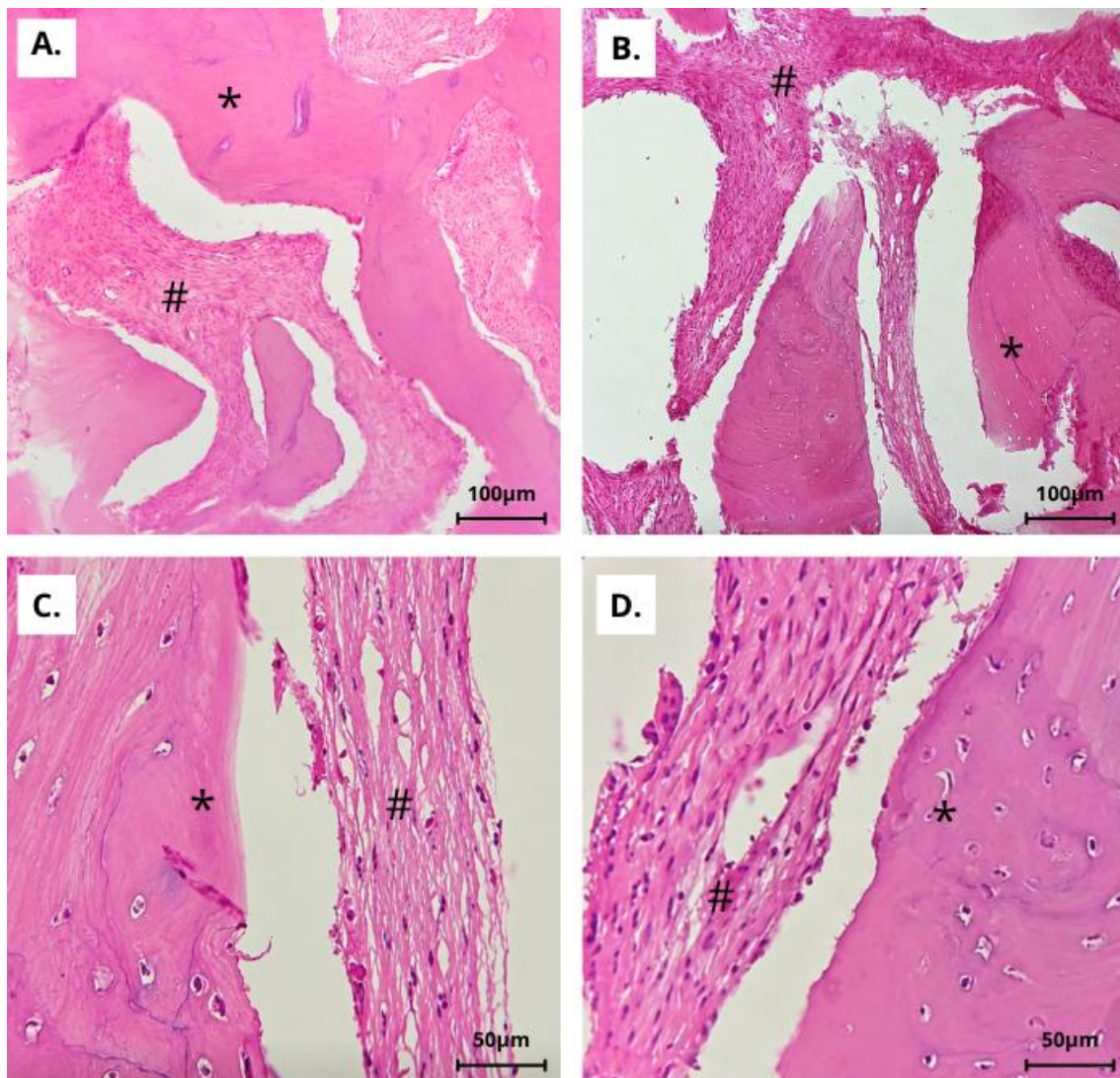


Source: Author.

The tissue fragments obtained during surgery were submitted for histopathological examination. Following fixation in 10% buffered formalin, the bone specimens were decalcified in a 7% nitric acid solution for 30 minutes and subsequently rinsed in running water to remove residual decalcifying agent. The samples were then processed according to standard histological protocols, including dehydration in ascending ethanol concentrations, clearing in xylene, and paraffin embedding, as described by Bancroft and Gamble (2020)⁷.

Serial sections (6 μ m thick) were obtained using a rotary microtome, mounted on glass slides, and stained with hematoxylin and eosin (H&E). After staining, the sections were dehydrated, cleared, and coverslipped with a synthetic mounting medium. The slides were examined under light microscopy to assess the histomorphological features of the alveolar bone and adjacent tissues.

Histopathological analysis revealed trabecular osteoid tissue with intertrabecular spaces filled by fibroadipose tissue and areas of fibrous thickening. These findings were consistent with the diagnosis of COF (Figure 3 A **FIGURE 3.** Histological images of bone tissue fragments. (A and B) Low magnification (100×; 10× objective). (C and D) High magnification (400×; 40× objective). The histological sections reveal trabecular osteoid tissue (*) with intertrabecular spaces filled by fibro-adipose tissue (#) exhibiting fibrous septa. Additionally, the presence of blood vessels within the soft tissue component can be observed, along with a prominent fibroblastic network.



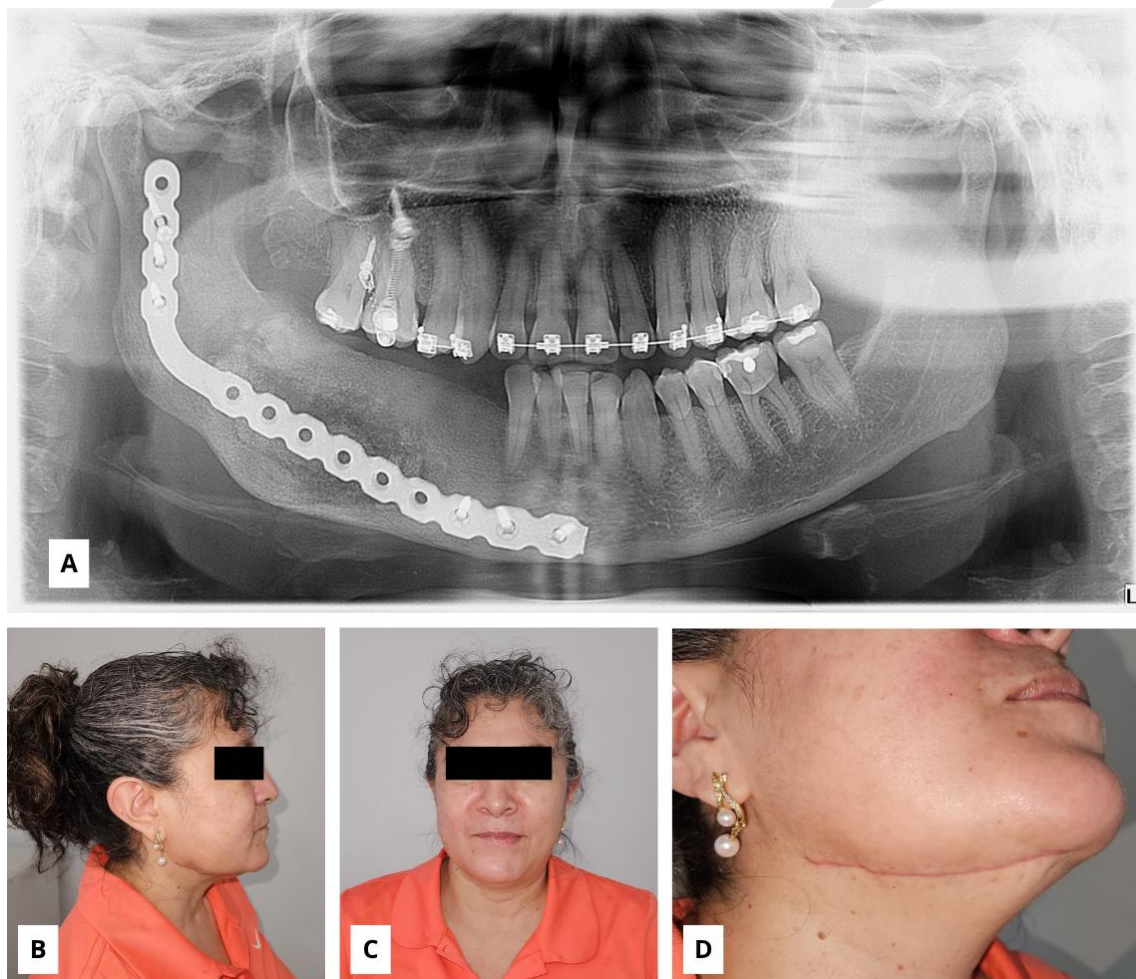
Source: Author.

Postoperatively, medication was prescribed and postoperative instructions were provided regarding local hygiene, a soft diet, and relative rest. The patient

progressed without complications, showing good healing and absence of infectious signs or suture dehiscence.

After 8 months, the patient returned for postoperative follow-up. Radiographic examination (Figure 4 - A) demonstrated bone neoformation compatible with the postoperative period and good adaptation of the reconstruction plate. Physical examination (Figure 4 - B, C and D) revealed satisfactory facial symmetry, good mandibular contour, and stable occlusion, indicating a favorable functional outcome.

FIGURE 4. Eight-month postoperative follow-up. Final panoramic radiograph (A); facial appearance in lateral (B), frontal (C), and inferior views (D).



Source: Author.

The lesion was successfully removed, restoring form, function, and aesthetics, and providing a favorable prognosis. It is anticipated that, in the future, the area will allow prosthetic rehabilitation with dental implants, ensuring complete functional and aesthetic recovery.

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DISCUSSION

Cemento-ossifying fibroma (COF), also referred to as ossifying fibroma (OF), is a benign fibro-osseous neoplasm originating from the periodontal ligament and occurring exclusively in the craniofacial bones, predominantly in the mandible and maxilla¹. It is characterized by the replacement of normal bone with fibrous tissue containing variable amounts of mineralized material resembling bone, cementum, or both². These histopathological features were consistent with the present case, in which trabecular osteoid tissue associated with fibroadipose stroma was observed.

Clinically, COF typically presents as a slow-growing and painless lesion, often leading to facial asymmetry, tooth displacement, and occlusal alterations^{3,4}. In the present case, the patient reported facial asymmetry without associated pain, which aligns with the classical presentation described in the literature. The radiographic findings of a well-defined lesion with cortical expansion and hyperdense internal content further support the typical imaging characteristics of COF.

Although histologically benign, COF may cause significant morbidity due to progressive bone expansion and cortical thinning^{3,8}. In this case, the lesion involved the mandibular body, angle, and ramus, resulting in considerable bone enlargement and alteration of mandibular contour. This extent of involvement justified a more comprehensive surgical approach.

Epidemiologically, COF shows a predilection for females and more frequently affects the mandible, particularly in the premolar and molar regions^{3,4}. The present case is consistent with these findings, as it involved a female patient with a mandibular lesion. However, the patient's age (55 years) is higher than the mean age reported in some studies^{9,10}, suggesting that although more common in younger individuals, COF may also occur in older patients.

Regarding treatment, conservative approaches such as enucleation and curettage are often recommended for small, well-circumscribed lesions³. However, larger or more extensive lesions may require more aggressive surgical management to ensure complete removal and reduce the risk of recurrence². In the present case, given the lesion's size and extension, complete excision associated with reconstruction using a fixation plate and xenogeneic bone graft was performed. This approach is consistent with the recommendations of Miloro et al.² for expansile lesions requiring structural support.

The use of a reconstruction plate in this case was essential to maintain mandibular continuity and prevent pathological fracture, considering the residual bone fragility after lesion removal. Additionally, the placement of xenogeneic graft material aimed to promote bone regeneration and improve structural stability, facilitating future prosthetic rehabilitation.

The prognosis of COF is generally favorable when complete surgical removal is achieved². In the present case, the patient demonstrated satisfactory postoperative evolution, with no complications and evidence of bone

neoformation after 8 months, as well as restoration of facial symmetry and functional stability. These outcomes are in agreement with previous reports indicating low recurrence rates and good long-term prognosis⁶.

In summary, this case reinforces the classical clinical, radiographic, and histopathological features of cemento-ossifying fibroma, while highlighting the importance of individualized surgical planning based on lesion extent. The favorable postoperative outcome further supports the effectiveness of complete excision associated with appropriate reconstruction in the management of extensive mandibular lesions.

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CONCLUSION

This case report reinforces the benign behavior of cemento-ossifying fibroma and highlights the importance of accurate diagnosis and appropriate surgical planning, particularly in extensive mandibular lesions. Complete surgical excision associated with adequate reconstruction can result in favorable functional and aesthetic outcomes, with a low risk of recurrence when long-term follow-up is ensured.

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AUTHORS' CONTRIBUTIONS

João Guilherme Zanutto Martins: participation in the surgical procedure, manuscript writing, and submission of the article.

Raphael De Marco: participation in the surgical procedure and manuscript writing.

Letícia Liana Chihara: participation in the surgical procedure and manuscript writing.

Eduardo Sant'Ana: participation in the surgical procedure, manuscript writing, and supervision of the study.

CONFLICT OF INTEREST STATEMENT

Funding: The authors declare that no financial support was received for this study.

Competing interests: The authors declare that there are no conflicts of interest related to this study.

Ethics approval: Ethical approval was not required for this case report, as the treatment was performed in private clinical practice in accordance with ethical standards.

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Figure 2. Intraoperative stages: complete exposure of the lesion (A); removal and collection of fragments (B); and placement of a 2.4-mm reconstruction plate fixation system (C).

Figure 3. Histological images of bone tissue fragments. (A and B) Low magnification (100×; 10× objective). (C and D) High magnification (400×; 40× objective). The histological sections reveal trabecular osteoid tissue (*) with intertrabecular spaces filled by fibro-adipose tissue (#) exhibiting fibrous septa. Additionally, the presence of blood vessels within the soft tissue component can be observed, along with a prominent fibroblastic network.

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