

Multifocal Traumatic Bone Cyst of the Mandible: A Case Report

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Abstract

Traumatic bone cysts (TBCs) are uncommon pseudocystic lesions of the jaws, typically unilocular and most frequently observed in adolescents. Multifocal forms occurring in adults are distinctly rare and may closely resemble fibro-osseous or odontogenic lesions, thereby creating substantial diagnostic challenges. We report the case of a 34-year-old adult with a medical history significant for radiotherapy and chemotherapy for a Hodgkin lymphoma of the scapula, in whom a multifocal and multilocular mandibular radiolucency was incidentally discovered. The patient was asymptomatic, the teeth in the affected area were vital, and no traumatic history was reported. Imaging demonstrated a well-defined multilocular radiolucency with marked interradicular scalloping and an unusual perforation of the lingual cortical plate. Aspiration produced a sero-hemorrhagic fluid. The initial surgical exploration suggested a fibro-osseous process because of peripheral reactive bone, and histopathologic evaluation misleadingly favored an ossifying fibroma, prompting further biochemical assessment. Persistent diagnostic uncertainty led to a second exploration, which revealed an entirely empty cavity lacking any epithelial lining, thereby establishing the diagnosis of a traumatic bone cyst. A gentle curettage was performed to induce intra-cavitary bleeding and facilitate clot formation. Follow-up imaging showed progressive and satisfactory bone regeneration. This case illustrates how atypical multilocular TBCs in adults can mimic other pathologies and emphasizes the importance of correlating clinical, radiologic, and intraoperative findings.

Keywords: Traumatic bone cyst; Mandible; Multilocular radiolucency; Pseudocyst; Case report.

Introduction

Traumatic bone cysts (TBCs) were first described by Lucas and Blum in 1929 (1). They are uncommon intraosseous lesions of the jaws and are classically classified as pseudocysts because they lack an epithelial lining (2). Although cases have been reported across a wide age range, they are most frequently identified during the second and third decades of life (3). with a recognized predilection for the posterior mandible in adolescents and young adults (4). Sex distribution remains unclear: some studies report no significant difference, whereas others suggest a slight male predominance (5,6).

The etiology of TBCs is still debated. The most widely accepted hypothesis implicates a traumatic event followed by an intraosseous hemorrhage that fails to organize, eventually resulting in a fluid-filled or empty bone cavity (7). Other theories include local disturbances in bone development or metabolism,

degenerative changes, and abnormalities in calcium homeostasis (8). Radiographically, TBCs typically manifest as well-defined unilocular radiolucencies, often discovered incidentally. Multilocular appearances are less common. Intraoperatively, the lesion characteristically reveals an empty cavity, occasionally containing a small amount of serous or sero-hemorrhagic fluid (9). While most patients remain asymptomatic, some may present with pain, swelling, sensitivity of adjacent teeth, or—more rarely—root resorption, delayed tooth eruption, paresthesia, cortical expansion, or even pathologic mandibular fracture (10). Despite these generally recognizable features, multilocular presentations may pose a significant diagnostic challenge, particularly in adults, where the differential diagnosis is considerably broader and includes odontogenic cysts, fibro-osseous lesions, giant cell-rich lesions, and other conditions with potentially aggressive behavior (11).

The present case contributes to the limited literature describing a multilocular TBC in an adult patient, further complicated by discordant intraoperative and histopathologic findings. The case was surgically managed in our unit and highlights the importance of clinico-radiologic–operative correlation in establishing a definitive diagnosis.

Patient and Observation

Patient Information

A 34-year-old female patient with a medical history significant for chemotherapy (2014) and radiotherapy (2015–2017) for Hodgkin lymphoma of the scapular region was referred following the incidental discovery of a mandibular multilocular radiolucency on a panoramic radiograph. The patient reported no pain, swelling, dental symptoms, or history of maxillofacial trauma. No relevant family or psychosocial history was noted.

Clinical Findings

Extraoral and intraoral examinations revealed no facial asymmetry, no cervicofacial lymphadenopathy, no swelling, no mucosal abnormalities, and no sensory disturbances. There was no buccal or lingual cortical expansion on palpation. Periodontal tissues were unremarkable. Dental caries were present, vitality testing confirmed normal responses for all teeth associated with the lesion (Figure 1).



Figure 1: Intraoral clinical photographs.

Radiographic evaluation using panoramic imaging showed a multilocular radiolucent lesion in the posterior mandible with marked interradicular scalloping (Figure 2). Cone-beam computed tomography (CBCT) revealed multilocular cavitations extending between the roots, associated with thinning and focal perforation of the lingual cortical plate (Figure 3), while the contralateral side was unaffected (Figure 4).



Figure 2: Initial panoramic radiograph showing a multilocular radiolucent lesion of the mandible.

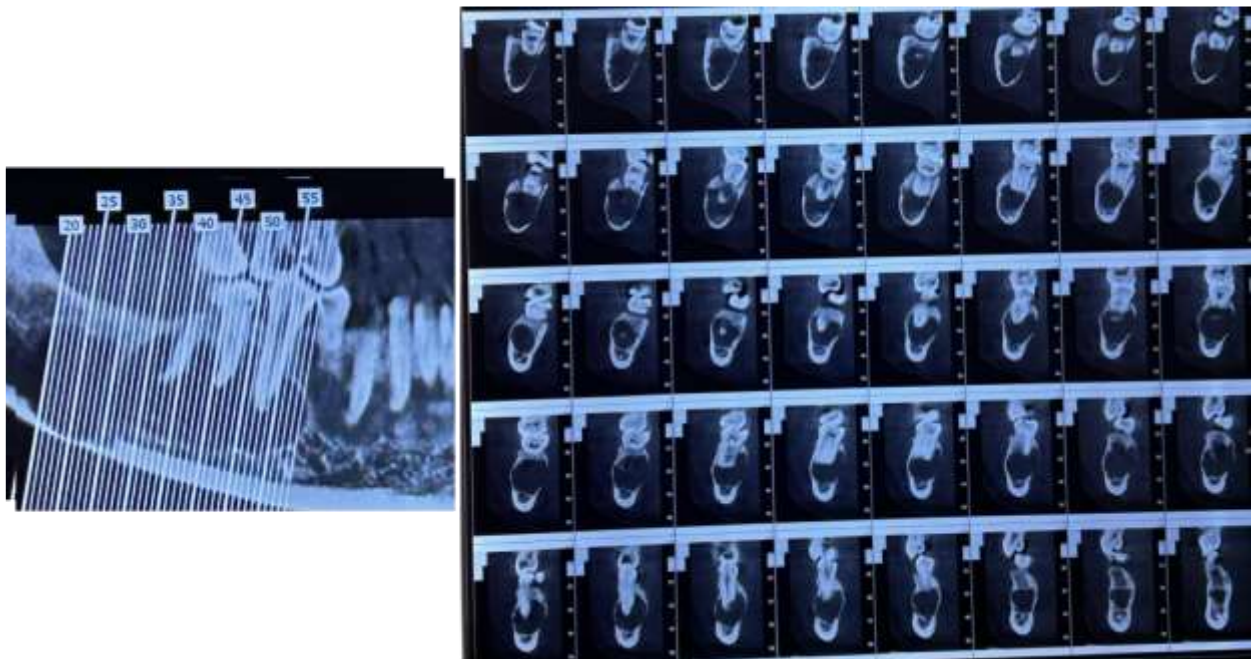


Figure 3: CBCT images of the right mandibular body demonstrating multilocular cavitations and cortical involvement.

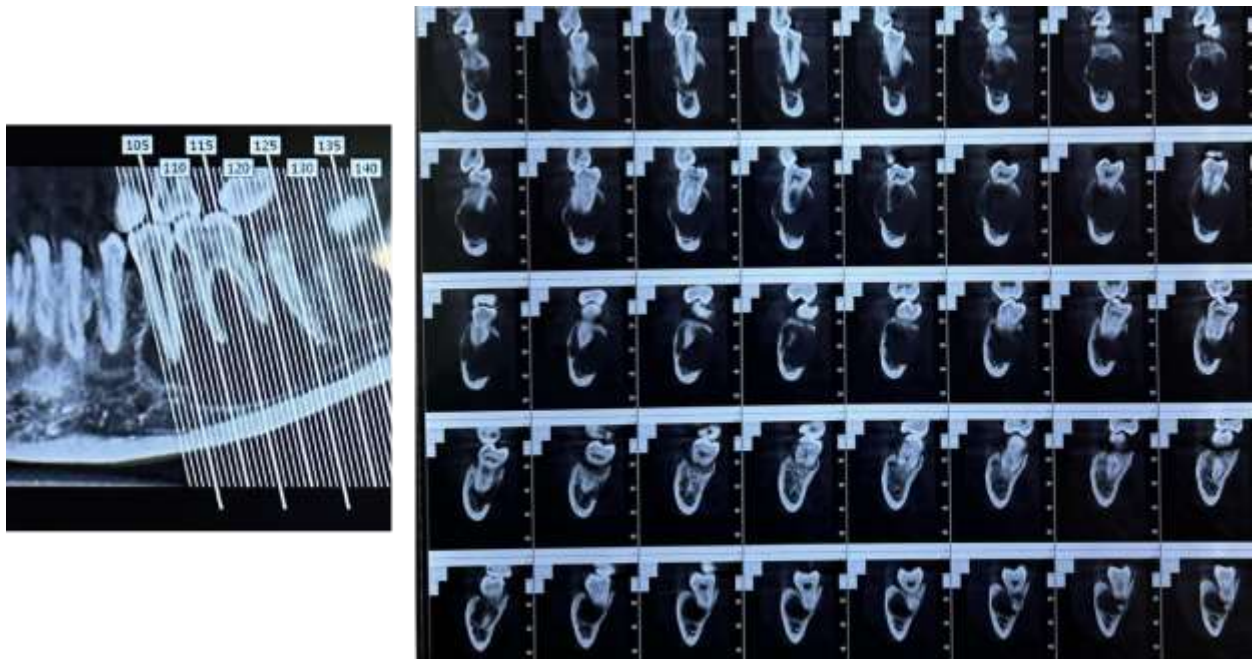


Figure 4: CBCT images of the left mandibular side showing absence of lesion extension.

Diagnostic aspiration yielded a sero-hemorrhagic fluid (Figure 5).



Figure 5: Aspiration of the mandibular lesion yielding sero-hemorrhagic fluid.

Diagnostic Assessment

The unusual multilocular morphology of the lesion in an adult patient significantly broadened the differential diagnosis. Initial surgical exploration revealed peripheral reactive bone, raising suspicion of a fibro-osseous lesion (Figure 6). Histopathological examination showed trabecular-like calcified osteoid structures bordered by osteoblastic rimming, misleadingly suggestive of an ossifying fibroma (Figure 7).



Figure 6: First surgical exploration showing reactive peripheral bone tissue.

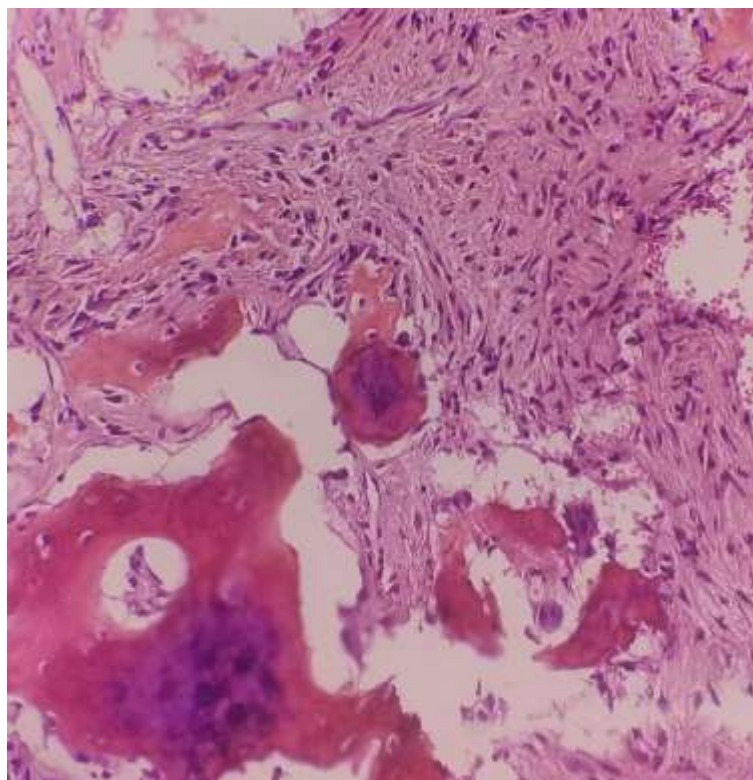


Figure 7: Histopathological examination showing fibro-osseous features suggestive of ossifying fibroma.

Given this discordance, biochemical investigations were performed. A slightly elevated parathyroid hormone (PTH) level was identified (79.20 pg/ml) and attributed to vitamin D deficiency (<8.10 ng/ml), thereby excluding a brown tumor.

Persistent diagnostic uncertainty led to a second surgical exploration, which revealed an empty bone cavity devoid of epithelial lining (Figure 8), a decisive finding consistent with a traumatic bone cyst.



Figure 8: Second surgical exploration revealing an empty bone cavity consistent with traumatic bone cyst.

Diagnosis

Final diagnosis: Traumatic bone cyst (TBC).

Therapeutic Interventions

Surgical management consisted of gentle curettage of the cavity walls to induce intra-cavitary bleeding and promote the formation of a stable blood clot, serving as a scaffold for natural bone regeneration. No bone grafts or additional biomaterials were used.

Follow-up and Outcomes

The postoperative course was initially uneventful. Radiographic follow-up demonstrated progressive bone regeneration, with early ossification observed at 2 months (*Figure 9A*), further consolidation at 12 months (*Figure 9B*). After the 12-month follow-up, the patient developed a serous cellulitis related to pulpal necrosis of tooth 36. Pulpal necrosis was also diagnosed on tooth 43. Both teeth were managed conservatively with endodontic treatment, leading to complete resolution of the infectious episode without impact on bone healing, and near-complete bone healing at 17 months (*Figure 9C*).

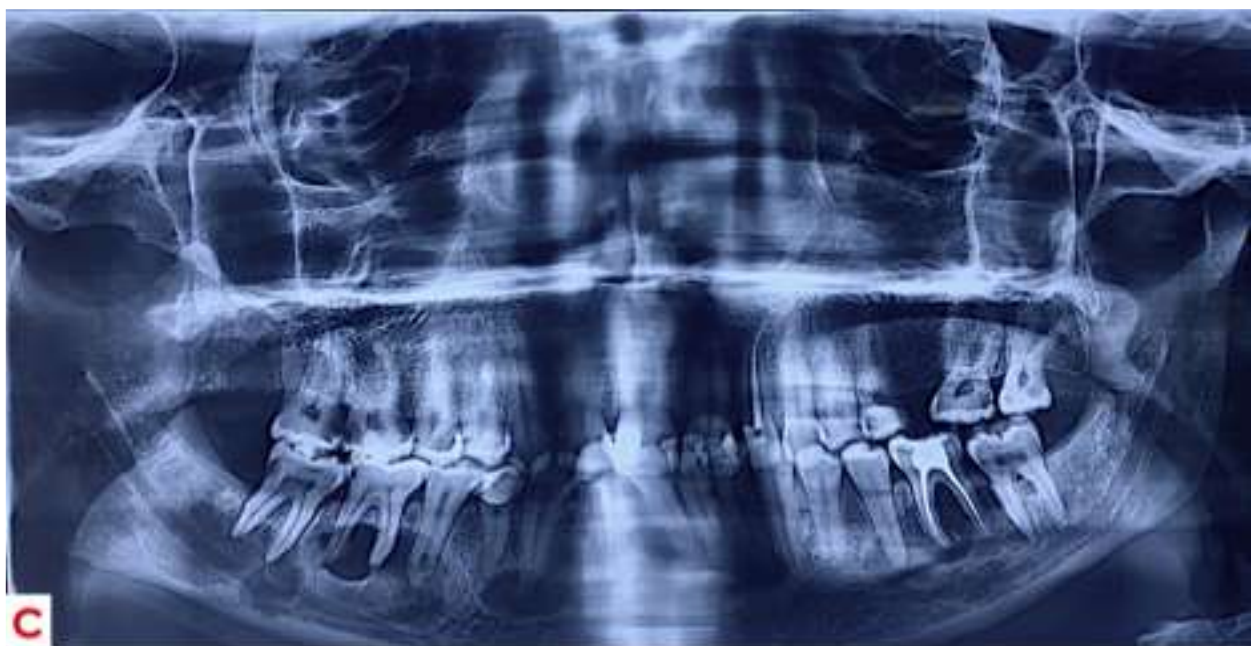
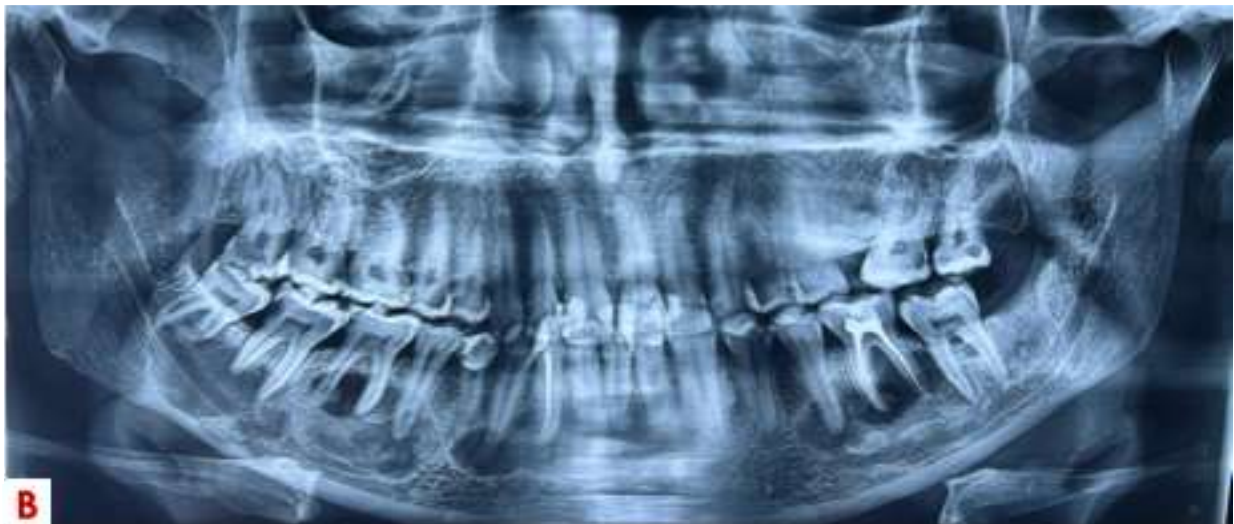
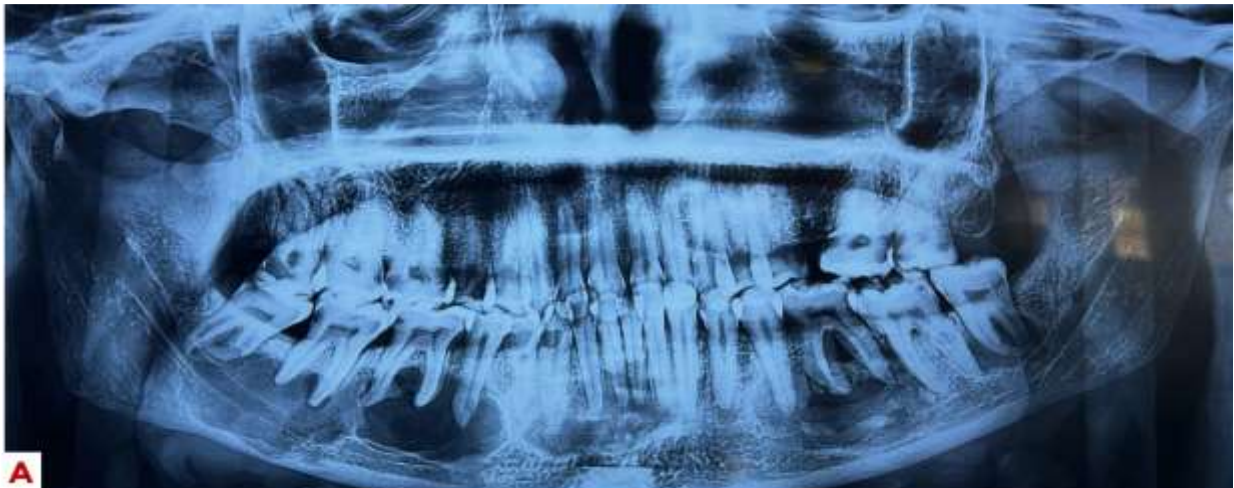


Figure 9: Follow-up panoramic radiographs showing progressive bone regeneration at 2 months (A), 12 months (B), and 17 months (C).

Patient Perspective

The patient expressed relief after learning that the lesion was benign and required only conservative surgical treatment. She appreciated the clarity of the explanations provided and was satisfied with the clinical outcome.

Informed Consent

Written informed consent was obtained from the patient for publication of this case report and the accompanying images. All identifying information has been removed to ensure patient anonymity.

Discussion

TBC is an uncommon, nonepithelial lined, intraosseous bone cavity of the jaws(4). They lack an epithelial lining and thus are not true cysts (1). Other nominations include hemorrhagic bone cyst, extravasation cyst, simple bone cyst, primary bone cyst, solitary bone cyst, unicameral bone cyst and idiopathic cyst (12). Traumatic bone cyst is currently the most commonly used name (13). A recent review reported that one of every four cases showed a previous traumatic event, hence the name (14). Although, our patient did not report any previous traumatic event, she received radiation treatment in 2015 for Hodgkin's lymphoma.

Clinically, TBC is an asymptomatic expansion and the soft tissues are unaffected, without any increased mobility of the teeth or changes in their color(4). Moreover, there was no increased mobility of the teeth or changes in their color.

During routine radiographic examination, lesions appear unilocular, radiolucent, well defined, and with no cortical or tooth abnormalities (15). Some "scalloping" can be seen with cystic involvement of the interdental space as in our case (16). The presence of multiple cysts is rare. So far, thirty four cases have been reported in literature with only five cases being detected after the third decade of life (4). Differential diagnoses include keratocystic odontogenic tumors and radicular cysts, aneurysmatic bone cysts, osseous dysplasia, granulomas, dentigerous cysts, osteoprotic defects, ameloblastomas and vascular malformations. Our patient had a mandibular radiolucent lesion that intra-operatively was filled with sero-hematic fluid. No septae or any other lesions were found inside the cavity. Pathologically, the cavity had no epithelium lining and stroma was fibrous. The twelve-month follow was unremarkable, confirming the diagnosis of TBC.

Surgical treatment is a cornerstone in TBC management. Firstly, an aspiration prior to the surgical investigation of the lesion is advised so as not to cause any significant haemorrhage(8). Evacuation of the cystic contents followed by curettage of the cavity to stimulate bleeding in the cavity (17). After proper suturing, blood clot formation induces bone healing through an enzymatic cascade (18). Packing the cavity might promote healing to 12 up to 17 months (19,20), and reduce recurrence risk (21). Other viable treatment options include gel foam and platelet-rich plasma union, intralesional infusions of blood, permeable hydroxyapatite, and bone pieces graft (8). Few case reports show spontaneous resorption (22). The lack of lining epithelium is the hallmark of TBCs. Other findings include: serum material and blood remnants, howship lacunae, fibrovascular connective tissue, cholesterol clefts, fibrin, calcifications and foreign body giant cells(4).

Conclusion

This case illustrates an uncommon multilocular presentation of a traumatic bone cyst in an adult patient,

highlighting the diagnostic challenges created by atypical radiologic features and misleading preliminary intraoperative and histopathologic findings. The key lesson is that the definitive diagnosis still relies on the intraoperative observation of an empty cavity without epithelial lining, despite potentially confusing imaging or biopsy results. Simple curettage to induce bleeding remains an effective and predictable therapeutic approach, leading to progressive bone regeneration.

Figures

Figure 1: Clinical intraoral photographs.

Figure 1A: Frontal intraoral view showing poor dental condition with no detectable buccal expansion.

Figure 1B: Mandibular occlusal view showing intact mucosa and absence of swelling.

Figure 2: Initial panoramic radiograph showing a multilocular radiolucent lesion of the right posterior mandible with pronounced interradicular scalloping.

Figure 3: CBCT of the right mandibular body.

Figure 3A: Sagittal slices demonstrating multilocular cavitations with root scalloping.

Figure 3B: Axial views showing cortical thinning and lingual cortical perforation.

Figure 4: CBCT of the left mandibular side (for comparison).

Figure 4A–B: Multiplanar reconstructions showing no lesion extension to the left mandibular body.

Figure 5: Aspiration of the lesion yielding sero-hemorrhagic fluid.

Figure 6: First surgical exploration.

Figure 6A: Intraoperative view showing reactive peripheral bone suggestive of a fibro-osseous lesion.

Figure 6B: Cured bone fragments obtained for histopathological analysis.

Figure 7: Histopathological examination showing trabecular-like calcified osteoid bordered by osteoblastic rimming, initially suggestive of ossifying fibroma.

Figure 8: Second surgical exploration revealing an empty bone cavity with intact osseous walls, confirming the diagnosis of traumatic bone cyst.

Figure 9: Follow-up panoramic radiographs.

Figure 9A: Two-month radiograph showing early bone regeneration.

Figure 9B: Twelve-month radiograph showing progressive ossification.

Figure 9C: Seventeen-month radiograph showing near-complete bone healing.

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