

## CONSERVATIVE SURGERY FOR THE MANAGEMENT OF A MANDIBULAR SIMPLE BONE: A CASE REPORT

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### ABSTRACT

Simple Bone Cyst is an intraosseous cyst with no epithelial lining. It usually occurs during the second decade of life. Commonly, the SBC is asymptomatic and discovered incidentally during a radiological examination. The X-ray exam shows a radiolucent, with a well-defined margin and without cortical expansion. Surgical limited exploration is the treatment of choice for this lesion, especially in young patients. The diagnosis is confirmed by the presence of a cavity empty or filled with a sero-hematic liquid. We report the case of a 14-years-old teenager who presented an asymptomatic radiolucent unilocular image apical to mandibular right canine, first premolar and second premolar, discovered incidentally and managed by minimal explorative surgery. Twenty months of follow-up control shows a complete cure of the cyst.

**Keywords:** conservative surgery, mandible, simple bone cyst, traumatic bone cyst.

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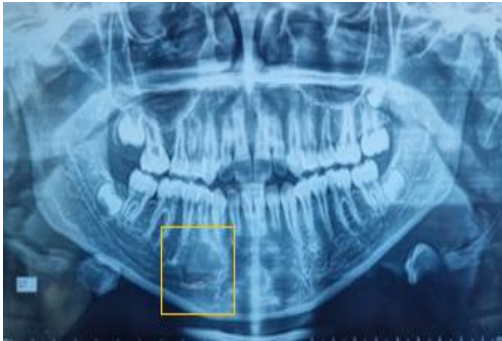
### INTRODUCTION

Simple Bone Cyst (SBC), also called traumatic, solitary, idiopathic, hemorrhagic, extravasation, or unicameral bone cavity, is an intraosseous cyst of unknown etiology, that is devoid of the epithelial lining. It can be empty or filled with serosanguineous fluid [1, 2]. The SBC is seen more in the second decade of life. This lesion is generally asymptomatic. However, some authors have reported symptoms such as pain, tooth sensitivity and possible paresthesia associated with displacement of the inferior dental canal [3]. The radiographic aspect is a radiolucent unilocular image, larger examples may be multilocular, situated in the mandible bone without cortical expansion [2]. The most recommended treatment for these lesions is surgery followed by curettage of the bony walls. Surgical exploration permits diagnosis confirmation of SBC and can also be considered as therapeutic because it makes the walls of the cavity bleeding. Indeed, the induction of bleeding in the cavity allows the formation of a clot which permits bone

regeneration [3-5]. The present case aims to illustrate the management of a mandibular simple bone cyst by a conservative surgery (surgical bone access only).

### CASE REPORT

A 14-years-old girl was referred by another clinician to the dental department of pediatric dentistry, for the management of a radiolucent mandibular image found incidentally during a routine examination. There was no associated causal factor or history of trauma in the region. The patient has no systemic disease or any known drug allergy. Panoramic X-ray revealed an asymptomatic, radiolucent, unilocular image in the periapical area of the mandibular right canine, first premolar and second premolar, measuring 20 mm in diameter, without resorption or displacement. (**Figure 1**)



**Figure 1:** Panoramic radiography: Unilocular radiolucent apical image, measuring 20 mm in diameter, located in the apical region from the mandibular right canine to the second premolar.

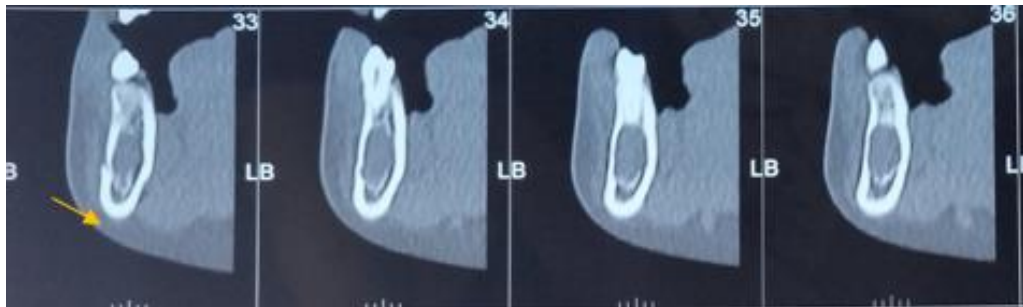
Extra oral examination revealed a symmetrical face and lymph nodes examination was normal. Furthermore, intraoral examination shows normal mucosa in the affected region, without bone

expansion. **(Figure 2)** The response to the pulp sensibility test was normal in the 43, 44 and 45 teeth.



**Figure 2:** Clinical examination showing normal mucosa in the affected region without bone expansion.

The Dentascan examination confirmed the presence of a well-defined radiolucent unilocular lesion, with preservation of the root apices of the teeth and the cortical bone. Image is far from mental foramen. **(Figure 3)**



**Figure 3:** Dentascan examination: Coronal reconstruction showing a well-defined unilocular radiolucent lesion, with preservation of the inner and outer corticals. Image is far from mental foramen.

Based on the clinical and radiological findings, the potential diagnoses considered were an orthokeratinized odontogenic cyst, an aneurysmal bone cyst, a simple bone cyst, and a unicystic ameloblastoma.

We opted for surgical management of the lesion. We realized inferior alveolar nerve block with para-apical anesthesia then, intrasulcular incision from 44 to 46 and vertical releasing incision were made. The detachment of the mucoperiosteal flap was realized. After trepanation of the external cortical, we discovered a cavity with no epithelial lining, filled with a sero-hematic liquid, thereby confirming the diagnosis of a simple bone cyst **(Figure 4)**.

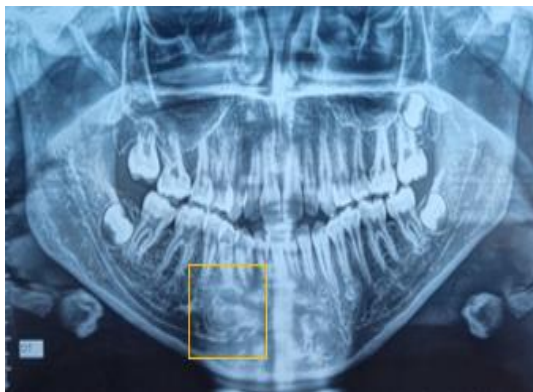


**Figure 4:** Surgical exploration of the lesion. The presence of an empty cavity was noted and confirmed the diagnosis of SBC

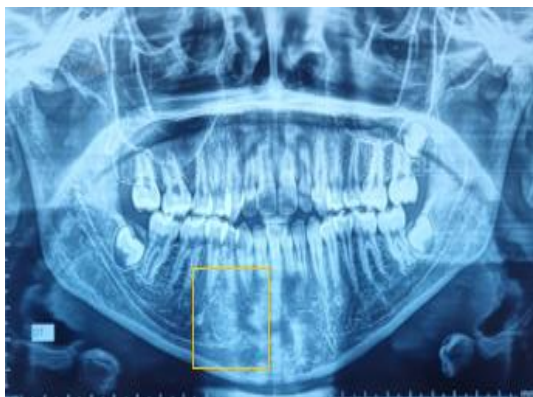
The cavity was rinsed with physiological serum and the mucoperiosteal flap was repositioned and sutured. Postoperative prescription included antibiotic and analgic with a mouth rinse.

The patient was advised to apply a cold compress to prevent swelling and to maintain good oral hygiene using a soft toothbrush.

The patient was seen after 10 days for sutures removal. Clinical and radiological follow-up at 9 months (**Figure 5**) and 20 months (**Figure 6**) shows a complete repair of the lesion.



**Figure 5:** Panoramic X-ray control 9 months after surgery showing bone formation



**Figure 6:** Panoramic X-ray follow-up at 20 months showing complete repair of the lesion

## DISCUSSION

Simple bone cyst is not a common lesion. It is generally detected in patients in the second and third decades of life [6-8]; it has a male predilection with a sex ratio of 1.6/1, but some authors suggested equal sex distribution [5-7]. SBCs occur commonly in the metaphyseal region of long bones in the maxillofacial region. SBCs are essentially restricted to the mandible, particularly in the body and symphyseal area and occasionally in the ramus and condylar area. In the body of the mandible, the second premolar is the most common location [7- 9].

In the majority of cases, there are no symptoms and the lesion is only discovered incidentally in a radiographic examination [4]. Clinical signs like swelling, pain and in some cases, labial paresthesia have also been reported. Related teeth are usually vital [5, 7, 8, 10].

The exact etiology is unclear. Numerous synonyms of SBC found in the literature showing its different etiopathogenesis (Simple bone cyst, traumatic, solitary, idiopathic, hemorrhagic, extravasation, or unicameral bone cavity) [1, 2, 6, 11]. Many hypotheses were advanced: the most accepted is trauma leading to intramedullary hemorrhage. Iatrogenic trauma caused by orthodontic treatment or tooth extraction has been suggested as a triggering factor [7, 8, 11].

Radiographically, SBC shares similarities with other common jaw lesions, leading to difficulties in diagnosis [7]. The other potential diagnoses to consider when encountering such a lesion include orthokeratinized odontogenic cyst, aneurysmal bone cyst, and unicystic ameloblastoma. Due to the absence of pathognomonic radiographic signs and symptoms, SBC is frequently misdiagnosed as an odontogenic cyst [12]. Panoramic radiography mainly shows a unilocular radiolucent image with an irregular and definite edge [7, 10, 11, 13]. It may be multilocular in large lesions and evoke other potentially more aggressive lesions, like ameloblastoma or keratocyst [10, 11, 13]. More accurate evaluation requires dental scan examination, which shows more details and anatomical relation with other structures [10].

The diagnosis of SBC is primarily based on clinical evaluation. It is made when an empty or filled cavity containing serous or sanguineous fluid [13] is observed, surrounded by a hard bony wall, without an epithelial lining, and with no signs of acute or chronic infection. The walls of the cavity may or may not be lined with a thin band of vascular fibrous connective tissue [7, 9, 13]. It is important to note that there are no specific biological tests or histopathological examinations available to confirm the diagnosis of SBC, highlighting the reliance on clinical assessment.

The cavity content may vary according to its location and stage of evolution. SBSs found in the mandible body are usually empty. The cystic contents seem to change according to SBC development, from blood to serosanguinous, serous fluid to an empty cavity, which seems to be the final stage in its evolution [7, 9- 11].

Currently, the appropriate treatment of SBC is still unclear. Treatment options include: surgical exploration, curettage, enucleation, embolization, bloc resection or observation. More recently, percutaneous steroids and autogenous bone marrow



injection have been described [10, 11]. Nowadays, the treatment of choice is the surgical approach [4, 9]. The treatment is mainly focused on establishing bleeding in the lesioned cavity as it promotes the formation of a blood clot, necessary for osteogenesis. This is done by raising a flap and drilling the outer bony wall [4, 7, 11]. Surgery with curettage of the lesion walls is preconized by some authors who observed a higher rate of persistence after treatment by surgical access only compared to curettage, but this is especially valid for multiple SBCs [4].

Borgonovo et al. [12] suggested that pediatric surgery should be minimally invasive, with careful clinical and radiographic evaluation before starting surgery.

It has been found that healing and filling of the cavity by bone occur generally within 6 to 12 months. Healing or recidivism can be confirmed after 3 years of treatment [11]. Spontaneous healing of untreated SBCs may occur; however, it's not suggested to establish periodic follow-up of suspected simple bone cysts without surgical intervention because, with no treatment, the cyst may continue to enlarge until having a pathological fracture of the affected bone [2, 4, 5, 9, 10].

Also, regular follow-up after surgical intervention is recommended to verify the reduction of the cavity by new bone formation [4]. The prognosis is usually good [10]. One-quarter of solitary SBCs recur. Cases of multiple lesions have a higher recurrence rate [13].

If conventional treatment fails, after confirmation that the lesion doesn't contain neoplastic cells, the surgeon may use additional procedures. After additional curettage, the cavity can be filled with autogenous material (blood or bone chips) or with allogenic material (lyophilized bone chips, hydroxyapatite, or gel foam) [10, 11].

## CONCLUSION

Simple bone cysts are commonly discovered incidentally by a radiological examination. Surgical intervention is the gold-standard treatment for SBC, it allows diagnosis confirmation and promotes bone regeneration. Control visits are necessary to check bone formation and to confirm the absence of recurrence.

**No Competing Interest to Declare.**

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