

Solitary Bone Cyst: A Case Report and Review of Literature

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Abstract

Solitary bone cyst (SBC) is a rare disorder of the jaw bones, as well as other skeletal bones, particularly the long bones. It usually occurs in the metaphyseal region of long bones comprising only around 2% of all bone cysts affecting this area. Solitary bone cyst is an asymptomatic, slow growing, usually nonexpansile lesion commonly diagnosed incidentally during routine radiographic examination of the jaw bones. Its etiology is not clear and trauma has not been definitely determined to be the cause. It occurs mainly in children and young adults, and the body of the mandible is the most common site. On the basis of the literature available, opinions concerning the etiology, pathogenesis, and treatment of this disorder have been presented. A case of incidentally diagnosed solitary bone cyst of the mandible in a 22 years old female patient is presented. The clinical, radiographic and histopathologic features of this cyst have been demonstrated.

Keywords: Solitary bone cyst, trauma, mandible, differential diagnosis.

INTRODUCTION

Solitary bone cyst (SBC) lesions were first recognized by Virchow in 1876. Jaffe and Lichenstein provided a discussion of the topic in 1942. In dentistry, Blum reported the first three cases in 1932. Solitary bone cyst of the jawbone is relatively rare, but it has frequently been reported in the dental literature and has become familiar to dentists but its pathogenesis is still not clearly understood.¹

Solitary bone cysts have been reported in the literature under a variety of names: Simple bone cyst, Hemorrhagic bone cyst, Progressive bone cavity and Unicameral bone cyst. The multitude of the names applied to this lesion attests to the lack of understanding of the true etiology and pathogenesis.²

CASE HISTORY

A 22-year-old female patient reported to the department of Oral Medicine and Radiology with a chief complaint of pain and swelling in the lower left posterior region since 1 month. The pain was continuous, dull aching and nonradiating in nature which aggravated on mastication with no relevant relieving factors. The swelling was initially small and has gradually reached the present size. Patient also gave history of extraction of 36 one year back which was uneventful.

On extraoral examination no evidence of facial swelling was present and the lymph nodes were not palpable.

Intra-orally, swelling was present in the buccal region which extended horizontally from the distal aspect of 34 to the distal aspect of 36 region into the vestibule. The patient was unaware of the swelling. The swelling was approximately 1 × 0.5 cm in

size, oval in shape, bony hard in consistency, nontender with normal overlying mucosa. The teeth 34 and 35 were vital, 37 was carious and tender on percussion (Fig. 1).

Correlating with the history and clinical examination a provisional diagnosis of periapical infection with 37 and residual cyst in 36 region was given.

Intraoral periapical (IOPA) radiograph revealed a hazy, ill-defined radiolucency with 35 as the epicenter. As the entire extent of the lesion could not be covered the patient was further advised lateral oblique, panoramic radiograph and occlusal radiographs.

Lateral oblique view and panoramic radiograph revealed an oval, partly well-defined unilocular radiolucency above the mandibular canal extending from the distal aspect of 34, to the mesial of 36 region with corticated borders. There was no evidence of tooth displacement and resorption. Ill-defined periapical radiolucency was seen in the periapical area of 37 (Fig. 2).

Occlusal radiograph revealed expansion of buccal and lingual cortex with a multilocular radiolucency consisting of ill defined septa (Fig. 3).

On the basis of clinical and radiological features, the entities in the last of differential diagnosis included Ameloblastoma, Odontogenic keratocyst, Central giant cell granuloma, Anuerysmal bone cyst, Periapical cementoosseus dysplasia—early stage and Solitary bone cyst.

On surgical exploration, the lesion was found to be an empty cavity, with no evidence of epithelial lining and containing very little amount of fluid mixed with blood. Curettage of the cavity was performed (Fig. 4).



Fig. 1: Intraoral swelling present in the premolar region



Fig. 3: Occlusal radiograph showing multilocular radiolucency with ill-defined septa

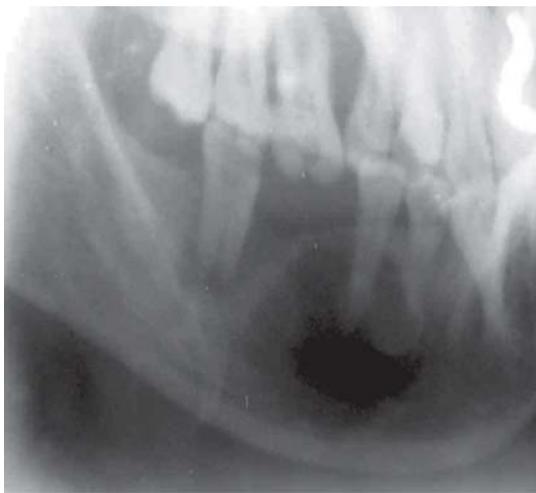


Fig. 2: Lateral oblique view of the mandible showing unilocular radiolucency



Fig. 4: Surgical exploration showing empty cavity

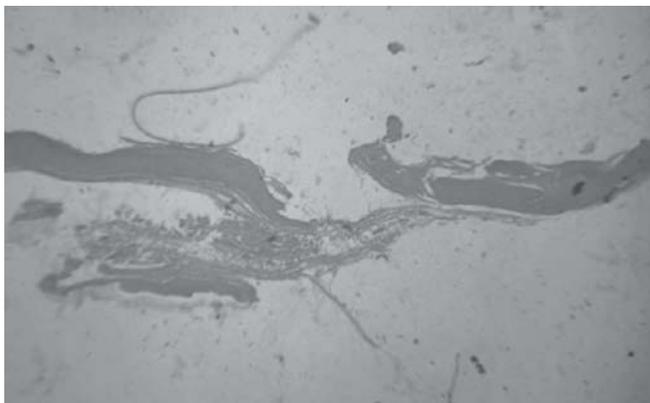


Fig. 5: Photomicrograph of histologic picture (Hematoxylin-Eosin stain. Original magnification X 10)

The removed pieces of bone with minimal amount of soft tissue and fluid were sent for histopathological study.

Histopathology report showed bits of tissues, containing thin trabeculae of bone lined by a thin strand of fibrous

connective tissue. Some multinucleated giant cells are also noted, at places on the surface of the trabeculae. No evidence of epithelial lining was seen (Fig. 5).

Thus, on the basis of clinical, radiological and histopathological findings, a final diagnosis of Solitary bone cyst was made.

DISCUSSION

Solitary bone cyst has been classified by the World Health Organization as a nonneoplastic lesion related to bone. It is defined as “an intraosseous cyst having a tenuous lining of connective tissue with no epithelium”.³

Solitary bone cyst in the jaws may affect patients between the ages of 2 and 75 years, but 56 to 70% of the cases present in the second decade of life and only 15% of the patients are more than 40 years old.⁴ Men are affected more than women (M:F-3:2), but one series reported that they were more common in women in the older age group.⁵

In the maxillofacial region, most solitary bone cysts occur in the molar region of the mandible, with estimates varying from

68 to 100%.⁶ Most of the others occurred in the maxilla, with only a single case in the zygoma.⁷ Although these cysts are generally asymptomatic, one study reported symptoms in 30% of the patients.⁶ The commonest symptom was pain, but sensitivity of the teeth, or tenderness have been reported in 12 to 14% of patients.⁴

The etiology of solitary bone cyst is unknown and many hypotheses have been proposed. The most widely accepted explanation, though far from being based on evidence, is that trauma is followed by intramedullary hemorrhage that fails to organize leaving an empty cavity proposed by Olech et al.⁸

In published cases, the figures for a history of trauma vary widely from 12 to 81% and the nature of injury is rarely defined.⁴⁻⁶

Other theories for the pathogenesis included—(1) infection of bone marrow; (2) loss of blood supply to a hemangioma or lymphoma; (3) cystic degeneration of existing bone tumor; (4) changes and reduction in the osteogenic activity; (5) faulty calcium metabolism as a result of systemic disease, such as parathyroid diseases; (6) ischemic necrosis of the fatty bone marrow; (7) low grade chronic infection; (8) imbalance between the osteoclastic and osteoblastic activity due to trauma; (9) developmental defect; (10) failure of mesenchymal tissue to form bone and cartilage, and instead becomes immature as multiple bursa-like synovial cavities.⁹

On radiological examination, between 61 and 79% of solitary bone cysts are radiolucent. However, 21% have radiopaque foci, and 7% may show cloudiness. The border, although irregular, can vary from well-defined to a complete absence of cortical outline. Scalloping or interdigitation between the roots of teeth was a common feature in 44 to 68% of the cases.¹⁰

Loss of lamina dura is predominantly in patients over 30 years of age and there is minimal involvement in younger people.⁵ Displacement of teeth and root resorption are rare although in one series they were reported in 9 and 22% of the cases, respectively.⁶

The definite diagnosis of traumatic cyst is invariably achieved at surgery when an empty bone cavity without epithelial lining is observed, leaving very little except normal bone and occasional fibrous tissue curetted from the cavity wall for the histopathologist. Sometimes, the cavity contains a straw-colored fluid of bright blood.²

Most of the histologic findings reveal fibrous connective tissue and normal bone. There is never any evidence of an epithelial lining. The lesion may exhibit areas of vascularity, fibrin, erythrocytes and occasional giant cells adjacent to the bone surface. The widely recommended treatment for SBC is surgical exploration followed by curettage of the bony walls. The surgical exploration serves as both a diagnostic maneuver

and as definitive therapy by producing bleeding in the cavity. Hemorrhage in the cavity forms a clot which is eventually replaced by bone. It is believed that in some cases there may be a spontaneous resolution.²

The clinical data in our case is basically in agreement with previous literature. The patient was young. The lesion was asymptomatic and was discovered accidentally on routine radiographic examination. The radiographic, histopathological and operative findings of this case correlate with the available literature.

CONCLUSION

Perhaps, the most universal agreement on Solitary bone cyst is that; its etiology and pathogenesis have not yet been clearly understood. Trauma can be an important factor in the development of solitary bone cyst although questions regarding mode, intensity, frequency and pathogenesis must be answered before reaching any final conclusions. Clear, complete and detailed reporting of cases is the only way in which material can be collected for analysis of these problems. In our case, "iatrogenic" trauma appears to be the principal etiologic factor; however, unequivocal proof is lacking.

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