CASE REPORT

Traumatic bone cyst of the jaws: An idiopathic entity

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Abstract

The synonym for traumatic bone cyst (TBC) is solitary bone cyst, idiopathic bone cyst and is characterized as the presence of infectious bony cavity filled with fluid and little quantities of tissue with no lining of epithelium. Typically these lesions show no symptoms and are detected coincidently while performing routine radiographic investigation for another purpose for which the patient reported. Usually, these cavities are found to be empty but occasionally may contain serosanguinous fluid, clots, erythrocytes, fibrin, and giant cells. Of the jaw bones, this cyst is preferentially found more in the mandible than in maxilla. In this report, we present a case of asymptomatic TBC in the anterior mandible.

Keywords
- Idiopathic bone cyst
- mandible
- maxilla
- traumatic bone cyst

Introduction

Traumatic bone cyst (TBC) shows its non-neoplastic behavior and is defined by WHO as “an intraosseous cyst with fragile connective tissue lining without any epithelium.”[1] Its synonyms are solitary bone cyst, simple bone cyst, hemorrhagic cyst, idiopathic bone cavity, and unicameral bone cyst. In 1929, Lucas and Blum described TBC as “a benign, bony pseudo cystic cavity either is fluid filled or unfilled and has been described as a separate disease entity.”[2] Mostly it has been diagnosed incidentally in orthopantomogram and the age predilection teens or early adult age with body of the mandible (75%) being more affected than the maxilla.[3] Usually, it is asymptomatic, but the pain is found in 10-30% of the patients and other infrequent symptoms include tooth sensitivity, paresthesia, fistulas, delayed eruption of permanent teeth, displacement of the inferior dental canal, and pathologic fracture of the mandible.[3-10] According to WHO Classification of Head and Neck Tumours, 2005 TBC is classified as a nonneoplastic osseous lesion being not showing any epithelial lining, which distinguishes it from the true cysts.[11] Radiographically, it reveals as a well-circumscribed, unilocular radiolucency with a characteristic garlanded pattern in the apical region of the adjacent teeth.

Case Report

A female patient age 17 years reported to the outpatient department with a chief complaint of forwardly placed upper anterior teeth and wanted the correction for the same with unremarkable medical history and it presented normal oral structures except Ellis Class I fracture on right maxillary anterior in relation to 11, around 10 years back on clinical examination and for orthodontic documentation panoramic radiograph was taken and during the examination of radiograph, presence of a radiolucent area in the anterior mandible was found [Figures 1 and 2]. During clinical examination, the patient stated unawareness of the lesion due to its asymptomatic behavior and it did not showed any swelling or other significant sign. Radiographically, the lesion presented as a well-defined unilocular radiolucent area in the periapical region extending from 33 to 43 surrounded by sclerotic border measuring about 6 cm × 2 cm in size approximately roughly oval in shape [Figure 3]. The lesion produced no root resorption or loss of lamina dura, and pulp vitality test was performed for the tooth concerned with the lesion as she gave a history of trauma around 10 years back and was found the mandibular anterior teeth to be nonvital [Figure 4].

The differential diagnosis included keratocystic odontogenic tumor, ameloblastoma, and TBC. A surgical procedure, i.e., biopsy was done under local anesthesia and after raising a mucoperiosteal flap of the concerned region under saline irrigation, a bony window was created below the roots of 31, 41 to expose the lesion [Figure 5].

On exposing the bone cavity, it was found that there is clearly visible completely unfilled tissue or fluid cavity with intact bony
walls without any lining of epithelium. Material was collected for histopathological examination and bleeding induced inside the cavity showed the lack of a capsule or membrane. The material was collected and histopathologically, revealed the presence of the normal cortical bone consisting of concentric lamella with osteocytes and osteons with osteoblastic rimming and no cystic lining was evident in the tissue section. On correlating the radiographic, histopathological and operative findings, the diagnosis of this case was given as TBC.

Discussion

TBC is known by various names due to absence etiology and pathogenesis and has been acknowledged by various names such as hemorrhagic bone cyst, simple bone cyst, solitary bone cyst, extravasation cyst, idiopathic bone cyst, and primary bone cyst.[12,13] Trauma is found to be the most common origin in the formation of TBC. Mandible, symphysis region being the most common than maxilla and in 1965, Howe reported that till now 17-70% cases reported with the presence of a history of trauma.[3,12] According to Howe, the most widely known concept behind this is involvement of microtrauma lead to precipitate intramedullary hemorrhage which shows osteoclastic activity and elimination of trabeculae within the cancellous bone compartment, yet a failure of the hematoma to undergo organization and tissue replacement.[5] Pommer thought that trauma is the origin of intraosseous hematoma formation and destruction of adjacent bone takes place due to the enzymatic...
activity leading to liquefaction of blood clot. According to Blum and Thoma mostly previously history of trauma may give rise to TBCs. Tomography. Thoma recommended that trauma initiates a subperiosteal hematoea causing a compromised blood supply, leading to osteoclastic bone resorption of that area. Apart from trauma other theories given by Olech et al. explaining pathogenesis include:
- Infection of bone marrow
- Loss of blood supply to hemangioma or lymphoma
- Cystic degeneration of existing bone tumor
- Changes and reduction in the osteogenic activity
- Faulty calcium metabolism as a result of systemic disease (parathyroid diseases)
- Ischemic necrosis of the fatty bone marrow
- Low-grade chronic infection
- Imbalance between the osteoclastic and osteoblastic activity due to trauma
- Developmental defect
- Failure of mesenchymal tissue to form bone and cartilage, and instead becomes immature as multiple bursa-like synovial cavities.

In this case, the patient herself gave a history of trauma, so it is suspected to be the etiology of TBC. It is usually observed in young adults with no gender predilection and clinically, periodontium is healthy without any increase in mobility of the teeth and discoloration. The teeth are rarely sensitive to percussion. There is no given history of pain or paresthesia. In its early phases no bone expansion has been noticed but in the later phase observable bony expansion in around 18-50% of patients. This case is also seen in a young female patient with healthy soft tissues, but the vitality of the patient was lost in the concerning region.

Usually, almost every lesions or disease shows any sign and symptoms on the basis of which we diagnosed the concerned disease, but TBC seems to be asymptomatic detected coincidentally on a radiograph, performed for completely different disease, but TBC seems to be asymptomatic detected coincidentally on routine radiographic examination. The radiographic, histopathological, and operative findings of this case were correlated with all school of thoughts of TBC except gender which was considered to be controversial some authors believed its predilection in men, and some said that it is equally present. Finally, the rapid bone regeneration following the surgical procedure is typical for TBCs.

**Conclusion**

On the basis of a review of literature and clinical follow-up of a patient with a radiolucent lesion diagnosed as a TBC, we conclude that the mainly TBC occurs due to trauma and is well thought to be a pseudocyst due to the complete absence of epithelial lining. On correlating clinical, radiographic imaging, surgical, and histological findings the final diagnosis of this case was made as TBC. A review of literature showed excellent prognosis of TBCs of the mandible as recurrence rate is very less and is not associated with any other pathology. An asymptomatic bony swelling of the mandible in a young patient with or without a history of trauma should raise the suspicion of a TBC so that prompt intervention can be made.

**References**
