

CASE REPORT

TRAUMATIC BONE CYST OF MANDIBLE – A CASE REPORT

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Abstract: Traumatic bone cyst is an uncommon pseudocyst that is a non-epithelial lined cavity of the bones. In the maxillofacial region it is usually present in the mandible and are quite often encountered upon by chance due to their asymptomatic nature. Here we present a typical case of unilateral traumatic bone cyst of the mandible and a brief review about the pathology.

Key Words: Hemorrhagic bone cyst, Idiopathic bone cyst, Solitary bone cyst, Simple bone cyst, Unicameral bone cyst.

Introduction:

The traumatic bone cyst was first described by Lucas in 1929.¹ The most common locations are long bones (90%) with a predominance in the metaphyseal region of the proximal ends of the humeral (65%) and femoral (25%) shafts. Traumatic bone cysts of the jaw bones appears to be far less frequent (10%). The body of the mandible is usually affected (75%) in the premolar and molar regions, with a possible posterior extension.² A variety of other terms have been used by different authors to describe the traumatic bone cyst. These include solitary bone cyst³, simple bone cyst⁴, hemorrhagic

bone cyst⁵, progressive bone cyst⁶, idiopathic bone cyst⁷, and unicameral bone cyst⁸. We report a typical case of traumatic bone cyst.

Case Report:

A 13 year old female patient visited our institute seeking orthodontic treatment. On pre-operative radiograph the orthopentamogram (OPG) showed a radiolucency in left mandible and the patient was referred to Dept. of Oral and Maxillofacial Surgery. Clinically no swelling was appreciable extraorally or intraorally. No draining sinus or fistula was present. There were no associated complaints from the patient. Patient

did not reveal any history of trauma in the region.



Fig.1: OPG shows unilocular radiolucency in left mandible



Fig. 2: CBCT Shows lesion extending lingually

But radiographic findings showed a well corticated unilocular radiolucency with scalloped border extending anteroposteriorly from 2nd premolar to 1st molar on left side of mandible (Figure 1) CBCT showed the extent of lesion up to the lingual cortical border (Figure 2) Pulp vitality test showed delayed response in 2nd premolar and 1st

molar. However there was no clinical caries. From the clinical and radiological presentation a provisional diagnosis of radicular cyst or odontogenic keratocyst was proposed. The patient was taken up for excisional biopsy. Since the lesion was closely related to apices of 2nd premolar and 1st molar and exploration of the same was anticipated root canal treatment in both teeth were done pre-operatively.



Fig.3: Surgical removal of lesion



Postoperative OPG shows marked bone formation

Intraoral triangular mucoperiosteal flap was raised with anterior releasing incision near canine and

the area was exposed. Mental nerve was identified and protected. A perforation was present in the bone which was enlarged by removing thin bony margins with the help of a sharp mucoperiosteal elevator. The bony window was then enlarged with bur and engine under saline irrigation. Upon exposure the bony cavity was found to be empty except some amount of blood. There was no cystic lining (Figure 3) This suggested of a traumatic bone cyst. Apicoectomy was then done in both teeth and the area was closed. Post-operative follow up OPG at 6 months of our patient shows marked bone formation. (Figure 4)

Discussion

Howe in his review of literature found that male to female predilection is 3:2. It usually comes to notice in the 2nd decade with posterior mandible the most common site. Usually it is symptomless and comes to attention on accidental finding.⁹The lesion is radiolucent, generally

well-circumscribed, and occasionally presenting some thinning and scalloping of the cortex. The bone surrounding the lesion may takes on the appearance of cortical bone or in some cases, sclerotic bone. The lesion envelops the roots of the erupted teeth 'scalloping' between teeth however scalloping may also occur in areas remote from the teeth.⁹

Rushton gave his criteria for diagnosis as traumatic bone cyst: (1) The cyst should be single, have no epithelial lining, and show no evidence of acute or prolonged infection, (2) The cyst should contain principally fluid and not soft tissue, (3) Its walls should be of bone which is hard though possibly thin in parts (4) The pathological and chemical findings do not exclude the diagnosis of solitary bone cyst.³ In our case lesion had all of these features.

Howe's review showed conflicting view on the lining as well as the contents of this lesion. Majority of

authors found no visible lining while few stated that a thin membrane is present which is too thin to enucleate. Similarly contents of the lesion include completely empty, blood, blood clot or a serosanguinous fluid.⁹ In our case the lesion consisted of a blood tinged serosanguinous fluid with no lining surrounding the cavity.

Waldron reported a case in which owing to a diagnostic error, a portion of mandible containing a haemorrhagic cyst was excised in toto. The pathological findings showed: (a.) the inner surface of the cystic cavity was lined with a cellular oedematous granulation tissue containing many erythrocytes and haemosiderin pigment, (b) The surface of the bone facing the cystic cavity showed irregular notching resorption. Osteoclasts were occasionally seen in these Howship's lacunae, (c) In some areas osteoblasts were present along the inner surface with a minimal formation of osteoid tissue. Greatly enlarged Haversian

canals were present within the substance of the cortical plate. These cavities were filled with a loose connective tissue and contained dilated vessels and numerous osteoclasts. These showed evidence of active undermining resorption. (e) Active periosteal bone formation was present on the outer surface of the overlying bone.¹⁰

Etiopathogenesis of this lesion is still unclear and debatable. Among the many theories, 3 predominate: (1) an abnormality of osseous growth, (2) a degenerating tumoral process, (3) a particular factor triggering hemorrhagic trauma. Abnormality of bone growth theory proposes that traumatic bone cyst may represent an "out of control" remodeling osseous area. An abnormality in cellular differentiation during ossification and growth related to local environmental factors induces mechanical constraints during osteogenesis and angiogenesis. Tumor degeneration theory

proposes that the liquefaction in the middle part of a central giant cell granuloma may lead to traumatic bone cyst formation. The third, traumatism is the most widely accepted hypothesis, based on the occurrence of an intramedullary hemorrhage followed by a hematoma after trauma insufficient to fracture a healthy bone. The pressure from the hematoma causes venous stasis that leads to an area of bone marrow necrosis and osteoclastic resorption. However a positive history of trauma is present in only half of the cases.²

Toller through his experiment showed that the hydrostatic intracystic pressure was exceptionally low, and comparable with capillary pressure, unlike other cysts of the jaws and the osmotic tension of the cyst fluid was greater than that of the patient's blood, and this must constitute a small but definite expansile pressure.¹¹

Various treatment options have been proposed for the management

of traumatic bone cyst. Surgical approach has a diagnostic importance. Opening into such a cavity and making it bleed is sufficient to lead to rapid healing of the bony cavity, and so, after exploration of the space, primary closure is to be carried out, and the further healing of the lesion observed. Thoma filled with the entire cavity with Gelfoam, saturated with thrombin (100 units per ml.) and penicillin and found excellent results.¹² Traumatic bone cysts can also regress spontaneously and patient can be kept on a regular follow up without any treatment.¹³

Recurrence rate differs in literature. Swei et al. reviewed the literature and found that the overall recurrence rate was 26%. The recurrence rate in this study was higher than rates reported previously. Hence it is recommend that postoperative examination be continued until complete healing is confirmed radiographically, particularly in cases with multiple

lesions or those associated with cemento-osseous dysplasia.⁴ We recommend a long term follow up for such a case; which should be at least 3 years.⁴

References:

1. Blum T: Do all cysts in the jaws originate from the dental system? J Am Dent Assoc 1929; 16:647-61.
2. Harnet JC, Lombardi T, Klewansky P, Rieger J, Tempe MH, Clavert JM: Solitary Bone Cyst of the Jaws: A Review of the Etiopathogenic Hypotheses. J Oral Maxillofac Surg 2008; 66:2345-.8.
3. Rushton MA. Solitary bone cysts in the mandible. Br Dent J. 1946 ;81(2):37-49.
4. Swei Y, Taguchi A, Tanimoto K: Simple bone cyst of the jaws: evaluation of treatment outcome by review of 132 cases. J Oral Maxillofac Surg. 2007 ; 65(5):918-23.
5. Oda Y, Kagami H, Tohnai I, Ueda M. Asynchronously occurring bilateral mandibular hemorrhagic bone cysts in a patient with idiopathic thrombocytopenic purpura. J Oral Maxillofac Surg 2002;60:95-9.
6. Robinson M, Canter S, Shuken R: Multiple progressive bone cysts of the mandible and maxilla. Oral Surg Oral Med Oral Pathol. 1967 23:483-6.
7. Jones A, Baughman R: Multiple idiopathic mandibular bone cysts in a patient with osteogenesis imperfect. Oral Surg Oral Med Oral Pathol 1993;75:333-7.
8. Jaffe H, Lichtenstein L: Solitary unicameral bone cyst *with emphasis on the roentgen picture: the pathological appearance and pathogenesis.* Arch Surg 1942;44:1004-25.
9. Howe GL. 'Haemorrhagic cysts' of the mandible I. Br J Oral Surg. 1965; 3(1):55-76.
10. Waldron CA. Solitary (hemorrhagic) cyst of the mandible. Oral Surg Oral Med Oral Pathol. 1954 ;7(1):88-95.
11. Toller PA. Radioactive isotope and other investigations in a case of haemorrhagic cyst of the mandible. Br J Oral Surg.1964;2(2):86-93.
12. Thoma KH. The treatment of extravasation cysts with the use of gelfoam. Oral Surg Oral Med Oral Pathol. 1955;8(9):950-4.
13. Szerlip L. Traumatic bone cysts. Resolution without surgery. Oral Surg Oral Med Oral Pathol. 1966;21(2):201-4.

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