

Aneurysmal Bone Cyst (of the Jaw Bones)

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Overview

Aneurysmal bone cyst is a benign / non-malignant tumor-like lesion. It is an intra-osseous vascular lesion composed of multi-lobulated blood-filled cystic spaces. This lesion is classified as a benign osteoclastic giant-cell-rich tumor on the 2020 WHO Classification of Bone Tumors (*Restrepo et al., 2022*). Similar lesions include central and peripheral giant-cell granuloma, cherubism, and simple bone cysts.

Etiology

The etiology of aneurysmal bone cysts is currently unknown, although they appear to be due to vascular malformations in the bone. Initially, it was thought that it develops due to an underlying vascular event, increased venous blood flow, or a reaction to prior trauma. (*Nasri & Reith, 2023*)

Current thinking suggests that vascular malformations lead to increased pressure and expansion in the bone itself, causing erosion and resorption of the involved bone.

Clinical Presentation

Patients with ABCs typically present with a rapidly developing swelling or a palpable mass. It is often painful, which may be associated with the pathological

fractures the lesion can cause. Some forms of focal neurological symptoms (e.g., paresthesias, numbness) can accompany the pain.

The clinical presentation can vary enormously (even in the exact location) as they can have different rates of expansion/growth ranging from months to years. This further contributes to the differences seen in imaging these lesions (*Restrepo et al., 2022*).

Depending on the craniofacial bone from which it arises, they may present with various other symptoms like decreased hearing, worsening headaches, and visual disturbances (*Rehman et al., 2021*)

Demographic

Aneurysmal bone cysts have a propensity for children and young individuals and are more commonly diagnosed in people in the second decade of life. It does not show a specific preference for any gender.

Of all the lesion cases/incidences, only 2% occur in the maxillofacial skeleton, with a 3:1 mandible/maxilla ratio of occurrence. The lesions affect the mandible's molar and ramus regions more frequently than other parts of the jaw.

Biopsy / Histology / Radiographs

Biopsies are necessary to confirm a diagnosis. They can either be -

- a) Core needle biopsy: A small sample is taken using a small needle. It is then examined under a microscope.
- b) Open biopsy: A large sample is taken via incision in an operating room.

Aneurysmal bone cysts are not a “true” cyst. There is a distinct lack of an epithelial lining. They are composed of blood and hemosiderin-filled cavities enclosed in a shell of reactive bone. The cavities contain osteoclasts (multi-nucleated giant cells), hemosiderin (iron from hemoglobin), and extravasated RBCs (blood cells outside of blood vessels).

Radiographically, it presents as either unilocular or multilocular radiolucency, usually in the posterior of the mandible. A thin “eggshell” sclerotic border of the internal cystic compartments is visible.

Differential Diagnosis

The expansile and radiolucent features of aneurysmal bone cysts are also seen in other common bone lesions. These include -

1. Chondroblastoma
2. Fibrous Dysplasia
3. Giant Cell Tumor
4. Osteoblastoma
5. Osteosarcoma (Nasri & Reith, 2023)

Treatment

There is no “ONE” definitive treatment modality in managing Aneurysmal bone cysts. The approach to management depends on various factors. These include the age of the patient, location, extent, and size of the lesion. Some of the treatment options include-

- a) Simple curettage supplemented with Cryosurgery
- b) En Bloc resection
- c) Radiation therapy (*Stevens & Stevens, 2023*)

Surgical treatment is the most common alternative; it is associated with high morbidity rates postop aesthetic and functional alterations. (*Álvarez-Martínez et al., 2019*)

Prognosis

ABC's overall prognosis is generally good. As with any treatment, the goal is to slow down the progression of the disease, relieve symptoms, and potentially prevent pathologic fracture. (*Nasri & Reith, 2023*)

Recurrence rates range from 20% to 30% and are commonly seen within the first year after surgery (*Yahaya et al., 2023*). It is usually associated with insufficient excision or curettage of the lesion, especially when the soft tissue is invaded /involved. Complete excision of aneurysmal bone cysts prevents or significantly reduces the chances of recurrence.

Professional Relevance

The associated clinical presentation of a rapidly developing, painful swelling in itself will always be of concern to any DHCP. The lesion's internal osteolytic (destructive process) activity can weaken the craniofacial bones to pathologic fracture. It can also lead to numbness/paresthesia of the area. The expansile nature of the lesion can lead to facial asymmetry. In cases affecting the temporomandibular joint and/or mandibular

condyle, it can affect the opening and closing of the mouth, lead to trismus, and even affect the patient's occlusion.

Citations

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