



A CASE REPORT OF ANEURYSMAL BONE CYST PROXIMAL TIBIA TREATED WITH INTRA- LESIONAL CURETTAGE AND BONE GRAFT CEMENT

Orthopedics

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ABSTRACT

Aneurysmal bone cyst, abbreviated ABC, is an osteolytic bone neoplasm characterized by several sponge-like blood or serum filled, generally non-endothelialized spaces of various diameters.[1].The term is a misnomer, as the lesion is neither an aneurysm nor a cyst.[1]. Aneurysmal bone cysts (ABCs) are benign bone lesions arising predominantly in the pediatric population more often in females (2:1), usually before the age of 20 years, and most commonly in long bones metaphysis origin that can cause local pain, swelling, and pathologic fracture. Primary lesions, which constitute roughly two thirds of all ABCs, are thought to be neoplastic in nature due to translocation t(16;17)(q22;p13) leading to juxtaposition of promoter region CDH11 on 16q22, with one third of ABCs arising secondary to other tumors. Diagnosis is made with various imaging modalities, which exhibit characteristic features such as “fluid-fluid levels,” Currently, the standard of care and most widely employed treatment is intralesional curettage and bone grafting .

KEYWORDS

Aneurysmal Bone Cyst, Benign Bone Tumor, proximal tibia ,Curettage, Bone Graft Cement (PMMA).

MATERIALS AND METHODS :

A 15 year old female patient juveria Fatima presented to owaisi hospital in ortho department with complains of pain ,swelling, fever over proximal aspect of right leg since 3 months of admission .patient had associated history of cough with sputum, weight loss ,anorexia bone pain during night time which is relieved by taking medication .no history of trauma ,congenital disorder .past history of painful lymphnode enlargement over sub mandibular region left side size of 30mm ×15 mm noted in 2015 year .FNAC was done reported koch's etiology and excised in local hospital.patient was taken ATT since 2015 stopped after 6months of treatment .patient was advised regular follow up . thereafter no symptoms and signs noted . On physical examination patient had tenderness ,swelling over proximal aspect right leg , no signs of redness, non erythematous, no sinus, with warmth temperature , non fluctuant ,immobile ,firm in consistency with range of movement around right knee joint is 30°-90°,with no neurological deficit .On Radiological examination shows large osteolytic lesion with multilocular lesion noted proximal tibia right side. Magnetic resonance imaging (MRI) was performed, which revealed a multilocular lesion with fluid levels confirming its vascular nature(Fig 1). The cyst was found to be extending into the epiphysis, crossing the open physis (Fig. 2). Biopsy of the lesion showed multiple blood-filled sinusoidal spaces separated by fibrous and osseous septa of varying thicknesses lined with fibroblastic cells, spindle cells, multinucleated giant cells and strands of mature osteoid, which was suggestive of an aneurysmal bone cyst. There were no features that were suggestive of malignancy. The patient was scheduled for intralesional excision, curettage and cement (PMMA)grafting. Histologically, areas typical of an ABC were identified, along with some broad areas of fibroblastic proliferation, hemosiderin-laden macrophages, and osteoid proliferation (suggestive of fracture healing). Features like a thin fibrous wall lined with flat to slightly plump layers of mesothelial-like cells were not seen, thereby excluding the possibility of a simple bone cyst. There was no evidence of malignancy in any of the sections examined. Hence the diagnosis of primary ABC was established. The patient was assigned to regular clinicoradiological follow-up in order to check for any shortening, angular deformity or recurrence, as well as to monitor the extent of healing and physal growth.

DISCUSSION

ABCs are commonly seen during childhood and young adulthood with a median age of 13 years, and 90 % of lesions are found prior to age 30

[5]. Females are slightly more affected with an estimated M:F sex ratio of 1:1.16 [5]. ABCs have a predilection for the metaphysis of long bones including the femur (Fig. 1), tibia/fibula, and upper extremity (Fig. 2). However, ABCs can present in the spine (16%), pelvis sacrum (12%), femur,13% ,clavicle&ribs 5%, foot 3%,lower leg 24% and upper extremity 21%, rendering this a disease that can afflict the entire skeleton (Fig. 3). ABCs are generally solitary and are currently thought to arise either as a primary neoplasm (translocation driven) or secondary lesions arising adjacent to osteoblastomas, chondroblastomas, or giant cell tumors, among others [6, 7]. An aneurysmal bone cyst can arise from a pre-existing chondroblastoma, a chondromyxoid fibroma, an osteoblastoma, a giant cell tumor, or fibrous dysplasia. A giant cell tumor is the most common cause, occurring in 19% to 39% of cases.

Pathological study: Histologically, they are classified in two variants.The classic or standard form 95% has blood filled clefts among bony trabeculae .osteoid tissue is found in stromal matrix. Other is solid form5% shows fibroplastic proliferation osteoid production and degenerated calcifying fibromyxoid elements.

The standard of care for ABCs is curettage with or without bone-graft depending on the resultant void. Despite best efforts at curettage, clinical series have shown highly variable recurrence rates, with some series showing rates as high as 59 % [29]. High speed burr After intralesional resection of an ABC lesion, a high-speed burr can be used to augment curettage by mechanical disruption of the lesion to the level of the circumscribing bone. Argon beam coagulation, Directing argon beam therapy at an ABC lesion following curettage has been shown to reduce recurrence rates. Phenol, also known as carbolic acid used after curettage reduce recurrence rate. Cryosurgery entails the use of liquid or aerosolized nitrogen to generate freezing temperatures that have a cytotoxic effect on the ABC lesion following curettage. Cement ,Similarly, polymethylmethacrylate (PMMA) cement in pediatric benign bone lesions can provide immediate stabilization for the resultant cavity, and it can act as a recurrence reducing adjuvant through its exothermic effect as the cement hardens [43]. PMMA is biologically inert without the potential for osseous incorporation, has no growth potential, can lead to stress shielding, thereby increasing the risk of future pathologic fracture, and as a foreign body, may act as a nidus for infection. Adjuvant radiation therapy is associated with excellent control of ABCs, ranging from 83 to 100 % local control [22, 24, 26, 29, 45]. However, complications from radiotherapy include chronic effects that can impair function and secondary malignancies.

RESULTS:

Direct extension of metaphyseal lesions across a viable physis is a rare phenomenon, as it acts as a relative but not complete barrier to tumor extension. with high rates of recurrence rendering its treatment uniquely challenging. The receptor-activator of nuclear kappa B ligand (RANKL) signaling pathway is an important mediator in bone homeostasis by promoting osteoclast activation, and hence bone resorption and remodeling. RANKL expression is seen in a variety of benign and malignant bone neoplasms, and there is growing evidence that ABCs have higher than normal levels of RANKL expression [60]. Denosumab is a human monoclonal antibody that directly inhibits RANKL signaling approved under several indications: to treat osteoporosis.

CONCLUSION:

Aneurysmal bone cysts are aggressive benign lesions. The standard of treatment remains curettage and grafting to fill the bone void, but the adjuvant or alternative treatment methods to reduce recurrence are numerous. Most commonly, orthopedic oncologists use curettage, a high-speed burr and local adjuvants that are available in their institution to remove the tumor prior to reconstruction. As more institutions have argon beams available, this seems to be an increasingly adopted technique given its ease of operation and limited side effect profile. ABCs in anatomic locations where surgery would cause significant morbidity are most often treated with embolization or radiotherapy and with increasing frequency, medical management with denosumab.

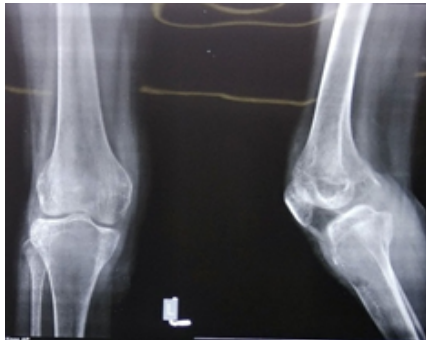


Figure 1: Pre operative radio graphic image right Proximal Tibia shows large osteolytic lesion extending into Epiphysis.

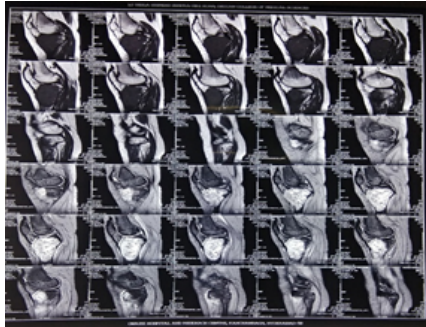


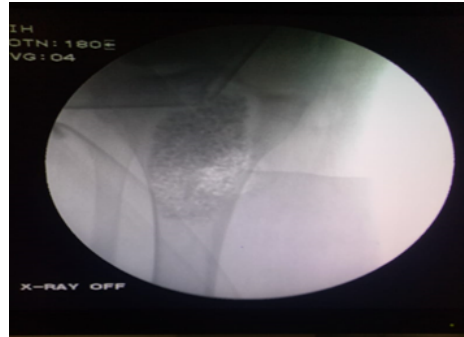
Fig 2 : MR imaging Arrow shows the proximal tibia shows high signal intensity in the proximal tibia, size (60×55mm).



Figure 3: Intra op image shows intra-lesional curettage and wide margin (en bloc) excision in proximal tibia.



Figure 4: Bone cavity is filling with bone graft cement (PMMA).

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