

A Rare Presentation of Aneurysmal Bone Cyst - Calcaneum

N K Mohammad Salil¹, S Anoop¹, M Raffic¹

Abstract

Introduction: Aneurysmal bone cysts are a benign non-neoplastic reactive bone lesion filled with multiple blood-filled cavities, can be locally destructive to normal bone, and may extend to soft tissue. It is usually seen in the second decade. The exact etiology is unknown. Typically metaphyseal, the most common site is femur and tibia. It is the only bone lesion that derives its name from its X-ray appearance rather than its histology. It is rarely seen in bones of feet. It is usually seen in the second decade. Aneurysmal bone cysts were first described by Jaffe and Litchensen in 1942. The exact etiology is unknown. One of the most widely accepted ideas was that aneurysmal bone cyst was a consequence of increased venous pressure and subsequent dilatation and rupture of local vascular network. However, studies by Panoutsakopoulos et al. and Olivia et al. uncovered the clonal neoplastic nature of aneurysmal bone cysts. Here, we report a case of aneurysmal bone cyst of calcaneum which is one the rarest site.

Case Report: A 22-year-old male presented with a history of trivial fall from step and sustained injury to the right heel. On examination, he had swelling around the ankle and foot with tenderness. Swelling was soft in consistency and tender. The patient was evaluated radiologically and diagnosed as pathological fracture of calcaneum. Curettage biopsy and bone grafting were done. The patient was pain free and was bearing weight fully on the operated limb, 6 weeks postoperatively.

Conclusion: Aneurysmal bone cyst of calcaneum although seen rarely, should be considered as one of the differential diagnoses in the cystic lesions in calcaneum. Curettage and bone grafting have stood the test of time as standard treatment.

Keywords: Aneurysmal bone cyst, bone grafting, benign bone lesions, calcaneus, curettage.

Introduction

Aneurysmal bone cyst is an osteolytic bone neoplasm characterized by several sponge-like bloods or serum filled, generally non-endothelized spaces of various diameters [1]. It is rarely seen in bones of feet. Controversy exists regarding optional treatment. Regardless of techniques reported the recurrent rates ranges from 5 to >40% [2, 3, 4, 5, 6, 7, 8]. At present, curettage and bone grafting or insertion of polymethyl methacrylate are the principal techniques [2, 3, 4, 5, 6, 7, 8, 9], but in the past, radiation has been used [10]. In several other trials,

sclerosing substances, bone substitutes, and other agents seemed to be less effective than conventional curettage. Primary etiology probably is arteriovenous fistula within the bone [11].

Case Report

A 22-year-old male presented with a history of trivial fall from step. He complained of pain and swelling. On examination, he had swelling over the medial aspect of the right ankle and foot (Fig. 1). Skin over the swelling was stretched, and it was soft in consistency and tender. No relevant history and family history in view of bone cyst and malignancy. No evidence of any risk factors. Radiograph of the right ankle revealed an eccentric, expansile, and cystic lesion of the calcaneum with thin septae traversing the cystic cavity giving it a blown out or soap bubble appearance. There was a cortical breach suggesting fracture (Fig. 2). In our case, we avoided



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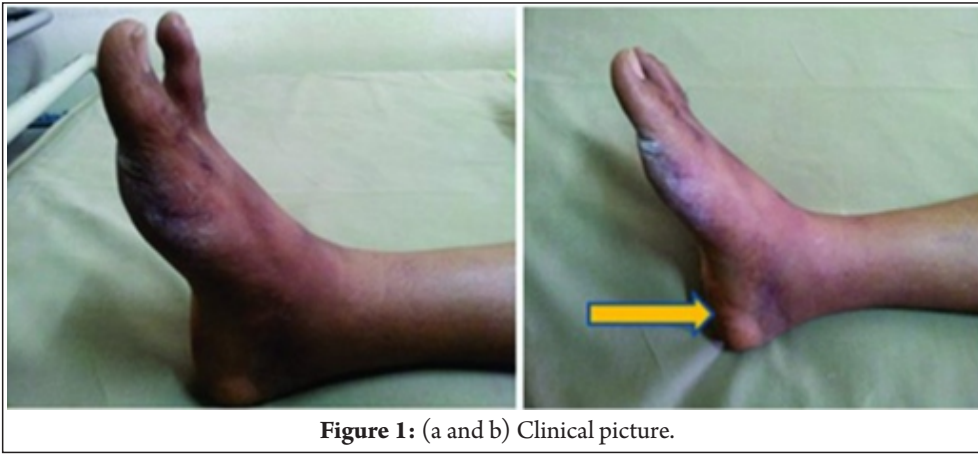


Figure 1: (a and b) Clinical picture.

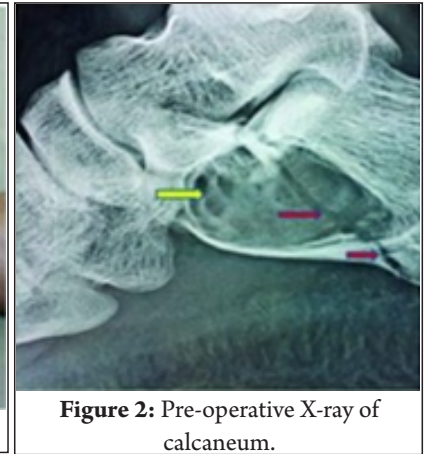


Figure 2: Pre-operative X-ray of calcaneum.

computed tomography (CT)/magnetic resonance imaging (MRI) due to the expense and we proceeded with biopsy and histopathological examinations, which is more informative. The patient underwent two-staged procedure, first for biopsy followed by the second procedure after confirmation by histopathological examination. Under strict aseptic precautions, biopsy was done under anesthesia. The specimen was sent for histopathological examination, and it was diagnosed by pathologist as aneurysmal bone cyst. A differential diagnosis of aneurysmal bone cyst or giant cell tumor with pathological fracture was made. Under spinal anesthesia and strict aseptic precautions, the lesion was curetted and the cavity was filled with iliac bone grafts (Fig. 3, 4). The curetted specimen was sent again for histopathological examination and the diagnosis was confirmed (Fig. 5). The wound was closed, dressed, and below knee posterior plaster slab was applied. Postoperatively, a non-weight-bearing crutch walking was allowed for 6 weeks followed by partial weight-bearing for further 4 weeks. Follow-up was done on the 3rd and 6th month of post-operative (Fig. 6, 7). The patient returned to his activities at the end of 6 months and we are still continuing the follow-up because the recurrence usually happens within 1 year.

Discussion

An aneurysmal bone cyst of calcaneum is a rare entity. Females are affected more often than males in the ratio of 1.04:1 [12]. The frequency of occurrence of aneurysmal bone cyst in various bones is as follows: [13, 14].

- Long bones: 50–60%, typically of the metaphysis
- Lower limb: 40%
- Tibia and fibula: 24%.
- Femur: 13%.
- Upper limb: 20%
- Spine and sacrum: 20–30%
- Foot: 3%.

Aneurysmal bone cyst of calcaneum comprises only about 1.6% of the total aneurysmal bone cysts reported over the body [15]. The various cystic lesions that can affect calcaneum include non-neoplastic cysts, benign or malignant neoplastic lesions ranging from simple bone cyst, aneurysmal bone cyst, chondroblastoma, giant cell tumor, and osteosarcoma, especially telangiectatic variety. Although often primary, up to the third of ABCs is secondary to an underlying lesion (e.g., chondroblastoma, fibrous dysplasia, giant cell tumor, and osteosarcoma) [16]. Although radiographs are commonly employed to diagnose aneurysmal bone cysts, CT scans and MRI have a role in diagnosis. CT helps in diagnosing whether it is a

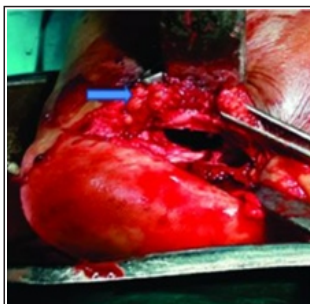


Figure 3: Intraoperative picture.



Figure 4: Post-operative X-ray.

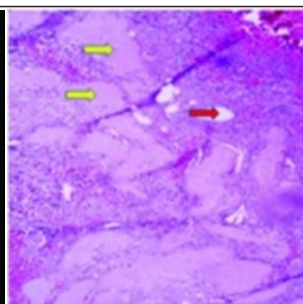


Figure 5: Histopathological picture.



Figure 6: Follow-up at 3 months.



Figure 7: Follow-up at 6 months. Yellow arrow it shows graft incorporating with the host bone. Red arrow it shows healed fracture line.

primary or secondary. If it is a secondary aneurysmal bone cyst, then CT scan will help us to identify the primary pathology. MRI might show the fluid levels because of blood. When biopsy is performed, the entire sample must be sent for histopathological examination because the primary diagnosis might be missed if we send limited samples, especially in case of secondary aneurysmal bone cyst. Other modalities of treatment employed are liquid nitrogen, phenol instillation [1], and filling the defect with bone graft or polymethyl methacrylate cement (PMMA). Advantages of bone

grafting are readily available in the host; it is more biological compared to PMMA cement; complications like infection which possibly could have occurred while using PMMA cement can be avoided. Here, we treated with curettage and bone grafting because of the readily availability and its biological. Surgical curettage is sufficient to treat most ABCs of the feet, including the calcaneum [17]. Recurrence usually happens within the 1st year after surgery and almost all episodes occur within 2 years. Therefore, a patient of aneurysmal bone cyst needs to be observed for at least this period of time to exclude any recurrence.

Conclusion

Any patient presenting with unilateral heel pain should be subjected to at least radiological examination during their first visit, instead of labeling them as plantar fasciitis. The cause for heel pain could be a benign lesion or a malignant lesion as mentioned above. Management protocol varies from lesion to lesion. Further, early diagnosis can lead to early treatment, and hence, subsequent complications of late treatment can be avoided, especially in aggressive bone tumors.

References

1. Roberto M. Imaging in Treatment Planning for Sinonasal Disease. Verlag, Berlin: Springer; 2005. p. 114.
2. Kuna S, Gudena R. Soap bubble in the calcaneus. CMAJ 2011;183:1171.
3. Vergel De Dios AM, Bond JR, Shives TC, McLeod RA, Unni KK. Aneurysmal bone cyst. A clinicopathologic study of 238 cases. Cancer 1992;69:2921-31.
4. Ozaki T, Hillman A, Linder N. Aneurysmal bone cysts in children. J Cancer Res Clin Oncol 1996;122:767-9.
5. Bollini G, Jouve JL, Cottalorda J, Petit P, Paniel M, Jacquemier M. Aneurysmal bone cyst in children: Analysis of twenty seven patients. J Pediatr Orthop 1998;B7:274-85.
6. Campanacci M, Cervellati C, Donati U, Bertoni F. Aneurysmal bone cyst (a study of 127 cases, 72 with longterm follow up). Ital J Orthop Traumatol 1976;2:341-53.
7. Dormans JP, Hanna BG, Johnston D. Surgical treatment and recurrence rate of aneurysmal bone cysts in children. Clin Orthop Traumatol 1976;2:341-3.
8. Hay MC, Paterson D, Taylor TK: Aneurysmal bone cyst of the spine. J Bone Joint Surg 1978;60B:406-11.
9. Campanacci M, Capanna R, Picci P. Unicameral and aneurysmal bone cysts. Clin Orthop Relat Res 1986;204:25-36.
10. Feigenberg SJ, Marcus RB Jr, Zlotecki RA, Scarborough MT, Berrey BH, Enneking WF, et al. Megavoltage radiotherapy for aneurysmal bone cysts. Int J Radiat Oncol Biol Phys 2001;49:1243-7.
11. Hefti F. Pediatric Orthopedics in Practice. Berlin: Springer; 2007. p. 151-5.
12. Campanacci M, editor. Aneurysmal bone cyst. Bone and Soft Tissue Tumours. 2nd ed. New York, NY: Springer Verlag; 1999. p. 812-40.
13. Babazadeh S, Broadhead ML, Schlicht SM, Powell GJ, Tymms GM. Pathologic fracture of a calcaneal aneurysmal bone cyst. J Foot Ankle Surg 2011;50:727-32.
14. Blake MA. Imaging in Oncology. Boston, MA: Springer; 2008.
15. Meyers SP. MRI of Bone and Soft Tissue Tumours and

Tumour Like Lesions, Differential Diagnosis and Atlas. Stuttgart, Germany: Thieme Publishing Group; 2008.

16. Kransdorf MJ, Sweet DE. Aneurysmal bone cyst: Concept, controversy, clinical presentation, and imaging. *AJR Am J*

Roentgenol 1995;164:573-80.

17. Chowdhry M, Chandrasekar CR, Mohammed R, Grimer RJ. Curettage of aneurysmal bone cysts of the feet. *Foot Ankle Int* 2010;31:131-5.

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