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Aneurysmal bone cyst of the calcaneum in a 6 years old child – treated with curettage and use of allograft: A case report

Sampat Dumbre Patil[1], Wavre Shankar Dnyanoba[1], Keswani Harish[1], Vaishali Sampat DumbrePatil[1], Harshe Amol[1]

Abstract:

Introduction: *Aneurysmal bone cyst is a rare, benign, expansile tumour-like lesion of unknown origin, commonly noted in the age group of 10-30 years. Though it can occur in any bone, more than 50% incidence is noted in the metaphysis or metadiaphysis of long bones, especially around the knee. Aneurysmal bone cyst is less common in the bones of the foot. In foot, it is common in metatarsals while calcaneum is affected very rarely. We present a case of aneurysmal bone cyst of calcaneum in a 6 year old child which was occupying near complete calcaneum. We treated the case with curettage and allograft was used to fill the defect. The diagnosis was confirmed on histopathology. Eight years follow up of the case showed good consolidation of the lesion and no evidence of local recurrence or growth disturbances. To our knowledge, very few cases of aneurysmal bone cyst in calcaneum have been reported in the literature in paediatric age group.*

The purpose of presenting this case is to share our experience of successful outcome of curettage and bone grafting with allograft in a case of huge aneurysmal bone cyst in calcaneum in a 6 year old child. Level of Clinical Evidence: Level V.

Key Words: *Aneurysmal bone cyst, allograft, curettage and bone grafting, calcaneum.*

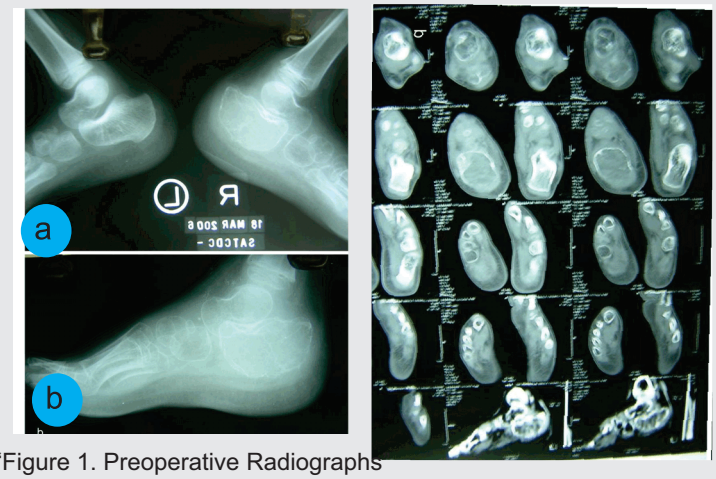
Introduction

"Aneurysmal bone cyst (ABC)" is a rare, benign, expansile and locally destructive lesion of unknown etiology. It is more common in the metaphyses of long bones, especially around the knee, and in the vertebral column [1]. Only in 3% cases, foot is affected, calcaneum being affected rarely. It is commonly noted in age group of 10-30 years [2]. Males are affected slightly more than females (1.3:1) [3]. We present a case of ABC in calcaneum in a 6 year old child treated with curettage and bone grafting with allograft. The cyst healed completely and there are no recurrence or growth disturbances in last 8 years.

Case Report

In March 2006, a six years old boy reported to us with pain in right heel since one month. There was no history of fall, trauma or fever. The pain went on increasing and the child started walking on the toes. He was not able to put weight on the heel.

On clinical examination, there was no erythema or swelling around ankle or heel. There was tenderness on deep palpation on the calcaneum. Anteroposterior and lateral radiographs of affected ankle showed evidence of a large, well defined, expansile osteolytic lesion in the calcaneum "(Figure 1a and b)".



"Figure 1. Preoperative Radiographs
Radiographs of both ankles (a) and right ankle lateral (b) showing an osteolytic lesion in the right calcaneum. Osteolytic lesion was occupying nearly complete calcaneum with thin intact cortex.

"Figure 2. Computed Tomographic Images"
a and b - Computed Tomographic (CT Scan) images of right calcaneum showing evidence of a large lytic, expansile lesion with cortical thinning and narrow zone of transition.

[1]Dept. of Orthopaedics,
Noble Hospital, Hadapsar, Pune- 411013
Maharashtra, India.
Address of Correspondence
Dr Sampat S Dumbre Patil
Director and Head, Orthopaedic Department,
Noble Hospital,
Hadapsar, Pune- 411013
Maharashtra, India.
Email : sampatdumbre@gmail.com

There was no evidence of fracture. Routine blood investigations were carried out which were normal. Computed Tomography (CT scan) examination of the affected ankle was done which showed evidence of a large lytic, expansile lesion with cortical thinning and narrow zone of transition "(Figure 2 a and b)". Other bones of the foot and ankle were normal. Radiologically, we thought of differential diagnosis of aneurysmal bone cyst or

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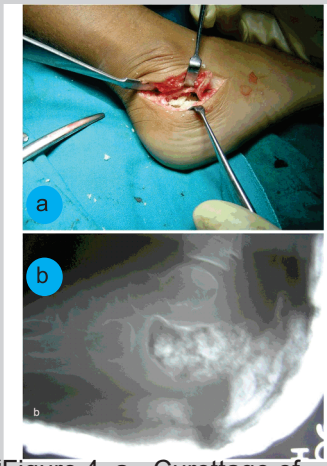
"Figure 3. Intraoperative Pictures of Cyst cavity in the calcaneum filled with bloody fluid and Femoral head allograft, used to fill the cavity.



"Figure 4. a - Curettage of cavity was done and filled with crushed femoral head allograft.
b - Post operative radiograph showing allograft filling the calcaneal cavity.

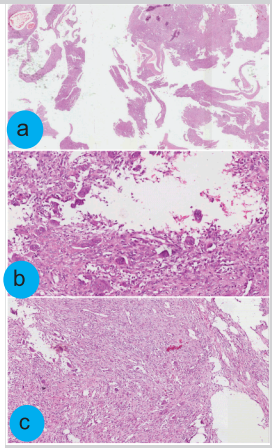
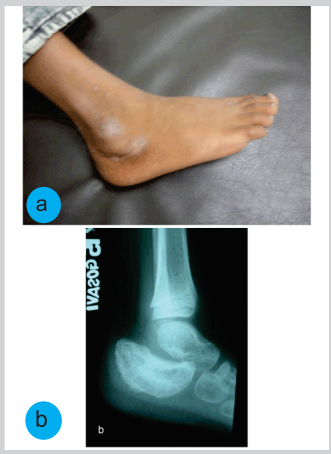


Figure 5.a to c - Photomicrographs showing a lesion composed of spindloid cells and fibroblasts arranged in an interwoven pattern forming cavernous spaces containing blood. Diffusely scattered many multinucleated giant cells are noted.



"Figure 6. a and b - At two years follow up, clinical photograph(a) and radiolograph(b) of right calcaneum showing complete healing of lesion.

unicameral bone cyst and decided to confirm it by biopsy. The cyst was so huge that there was only a thin rim of intact calcaneum. There was possibility of fracture on weight bearing; hence we decided to go for curettage, biopsy and bone grafting.

Allograft was preferred to autograft to avoid donor site morbidity in a 6 year child as large amount of graft was needed to reconstruct the cavity.

Method

Patient was given general anaesthesia. A thigh touniquet was applied. Painting and draping of right lower limb was done in left lateral position. An incision measuring 5 cm in length was taken centering sinus tarsi. It started 1cm below and behind fibula curving anteriorly towards base of fourth metatarsal. Sharp dissection was done to reach the bone. Peroneal tendons were retracted superiorly. Lateral wall of calcaneum was exposed and it was found to be intact. Thin lateral wall of calcaneum was cut with 15 no blade. On opening the wall, complete calcaneum was found to be filled with bloody fluid "(Figure 3a)". This fluid was collected and sent for histopathological examination. Thorough wash was given with normal saline. Gentle curettage of the walls of calcaneum was done and sent for histopathological examination. Cancellous allograft of femoral head "(Figure 3b)" was cut into pieces and used to fill the defect completely "(Figure 4a)". No drain was kept.

Incision was closed in layers.

Histopathological Examination:

Histopathological examination "(Figure 5a to c)" revealed a lesion composed of spindloid cells and fibroblasts arranged in an interwoven pattern forming cavernous spaces containing blood. Diffusely scattered many multinucleated giant cells were also noted. The cavernous channels lacked the elastic and muscle cell layers in the walls. Focal bony lamellae were noted. There was no evidence of any malignant cells.

Post operative Care:

Below knee slab was applied for 4 weeks. Child was kept non weight bearing for 6 weeks. He was advised follow up in the outpatient department. Serial radiographs were taken at the interval of one month "(Figure 4b)".

Results

We have followed the case for last 8 years which shows good consolidation of the lesion and no evidence of local recurrence "(Figure 6a and b)". Child is walking full weight bearing without any functional disability and there are no growth disturbances.

Discussion

Various treatment modalities for ABC are described in the literature. Curettage with or without bone grafting is the most widely used treatment [4,5,6]. Few other recommended treatment modalities include - selective arterial embolization [7] ,radiation therapy [4,8,5,6] calcitonin injection[4] and cryotherapy [1]. The use of osteoinductive material such as demineralized bone and autogenous bone marrow [4] with minimally invasive technique has also been introduced with good results. In the treatment of ABCs an overall cure rate of 90-95% [9] is reported. But it is also known for recurrence. Recurrence of

59% is noted in intralesional excision [10] while 0% in cases with resection [11]. Recurrence is noted within the first year after surgery. Most of the episodes occur within 2 years12, 13, 14; hence, patients should be monitored for 5 years. To note the growth affection, children should be monitored till the age of maturity. We have treated ABC in a 6 years old child. It was a huge expansile lesion occupying near complete calcaneum. There was a possibility of fracture in calcaneum; hence we decided to treat him with intralesional curettage, biopsy and bone grafting. As large amount of bone graft was required, we used allograft to fill the cavity. Satisfactory consolidation of the lesion was noted. We have a follow up of 8 years without recurrence and and growth affection. In conclusion, intralesional curettage and bone grafting using allograft resulted in good healing of ABC in calcaneum of a 6 years child. Recurrence or growth affection was not noted on long term follow up of 8 years.

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