

# A Case Report: Aneurysmal Bone Cyst Of Proximal Femur With Subtrochanteric Femur Fracture In A Child

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## Abstract

Aneurysmal bone cysts are blood-filled lesions of the bone that are benign, expansile, aggressive, and locally damaging. They have an atypical presentation and an unknown etiology. We present the case of a 17-year-old male youngster who appeared with a history of trauma that resulted in a pathological left femur fracture. A subtrochanteric fracture complicated a slowly forming aneurysmal bone cyst in the proximal femur. Excision of the tumor with curettage and open reduction with internal fixation with a titanium elastic nail were successful treatments, and the empty space was replaced with bone graft from the left iliac crest. The gold standard for diagnosis is a biopsy. Bone grafting should be used in conjunction with fracture fixation to achieve bony union.

**Key words** - Aneurysmal bone cyst, proximal femur, titanium elastic nail

## INTRODUCTION

Aneurysmal bone cyst (ABC) is a rare, benign, and eccentric and expansile skeletal tumour with multiloculated blood filled cystic lesion that occurs in the first two decades of life. It is commonly located in the metaphyseal end of long bones.<sup>[1]</sup> Most common bone to be affected is the proximal part of femur.<sup>[2]</sup> It causes extensive weakening of the bony structure and impinging on the surrounding tissues. Histologically it is classified as Conventional / vascular type (that is rapidly growing extensive lesion), solid type, and a mixed type.<sup>[3]</sup> Because of the substantial bone damage and high risk of local relapse, pathological fractures caused by benign bone tumours are difficult to cure. We report a rare case of aneurysmal bone cyst of proximal femur complicated by subtrochanteric fracture. The following treatment modalities are used for ABC such as curettage with or without bone grafting, arterial embolization, adjuvant radiotherapy, demineralized bone, sclerosing agents, matrix applications, and segmental or en bloc resections.<sup>[1]</sup>

## CASE REPORT

A 17 year old male child came to an orthopedic emergency with complaints of pain, swelling over left thigh and inability to bear weight over left leg since 1 day. Patient was apparently alright 1 day back when he had a history of trauma sustaining injury to his left thigh in Chamur on 23/1/2021 around 6pm. Patient then developed pain and swelling over left thigh which was gradually progressive and was not able to bear weight over left leg. He was taken to a private based hospital in Chamur for primary management. Patient has come to AVBRH for definitive management. There was no history of loss of consciousness, ENT bleed, vomiting, seizures, and history of weight loss or loss of appetite. Patient had been diagnosed with proximal femur fracture left side for which he was managed with fixed traction 8 years back. Examination revealed diffuse swelling present over left hip and proximal thigh and left lower limb was externally rotated. Radiograph of left femur was done and there was sub trochanteric fracture with eccentric lytic lesion which showed soap bubble appearance at proximal metaphysis of femur. To aid in diagnosis, enhancing contrast study of MRI Bilateral hip with Pelvis was done.

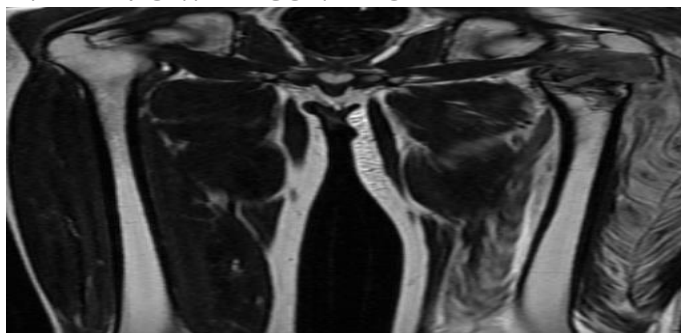
## PRE- OPERATIVE X RAY

**Fig 1**

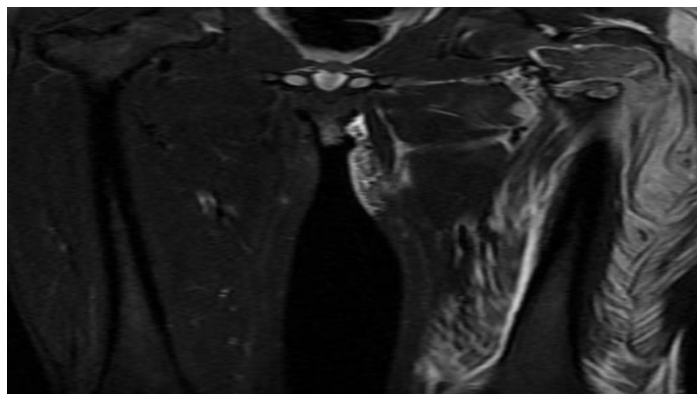


**Fig 1** - Pre operative X-ray of left hip with thigh shows lytic lesion and multiple lobulated cavities with medial and lateral cortical break of intertrochanteric area of femur extending into subtrochanteric area of shaft femur

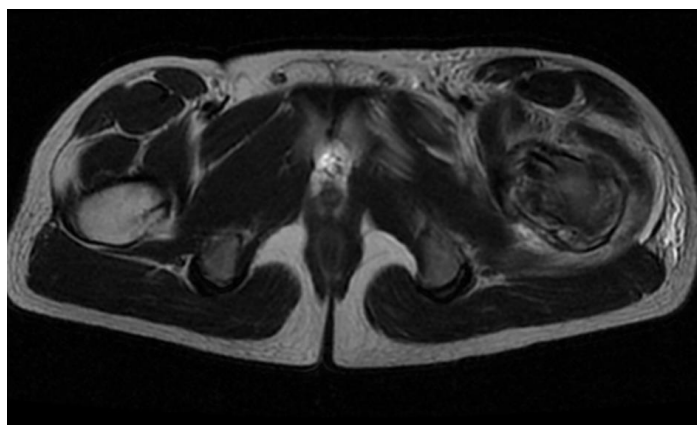
## MRI BILATERAL HIP AND PELVIS WITH CONTRAST



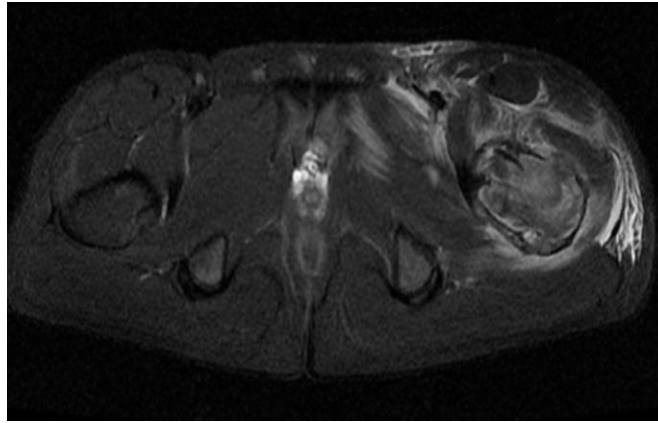
**Fig 2**



**Fig 3**



**Fig 4**



**Fig 5**

Fig 2, 3 shows an expansile irregular heterogeneous lesion in the metaphysis of femur extending into the head and neck of femur causing multiple cortical break in the intertrochanteric and subtrochanteric area of femur along with myofascial edema in the adjacent soft tissue area leading to pathological fracture.

Fig 4, 5 shows lesion along the entire length of neck of femur involving the intertrochanteric area and cortical discontinuity in anterior and posterior aspect of head and neck of femur

### **SURGICAL MANAGEMENT**

Under spinal anesthesia the patient was taken in a supine position well prepared and all aseptic measures taken. Tumor mass extending from subtrochanteric region where there was fracture up to approximately 8 cm proximally upto greater trochanter and medially upto medial cortex which was curetted out completely, blood clots were present in the lesion. In the proximal end bone was laterally broken at places. Medially the cortex was broken. Under imaging, the fracture was fixed with two 4.5 mm titanium elastic nails. Retrograde entry was made at lower end femur medially and laterally which was followed by bone grafting.

### **POST OPERATIVE X-RAY**



**Fig-6**



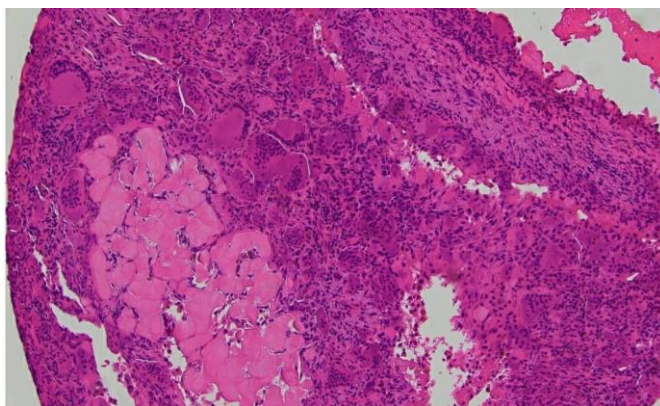
**Fig-7**

Fig 6 and 7 shows subtrochanteric fracture femur with Titanium elastic Nail in situ with evidence of bone graft at fracture site.

## HISTOPATHOLOGY

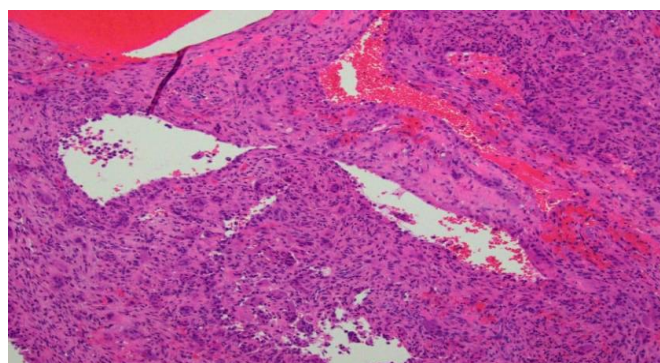
The curetted specimen was sent for histopathology reporting which was suggestive of hemorrhagic and cystic exudate of Aneurysmal Bone Cyst.

**Fig-8**



**Fig 8** shows solid area of cyst wall with increase in giant cell number. No atypia and mitosis seen.

**Fig-9**



**Fig 9** shows H & E stained slide with blood filled cystic spaces suggestive of aneurysmal bone cyst.

## DISCUSSION

Aneurysmal bone cyst is a locally destructive and aggressive lytic bone lesion. It has hemorrhagic cavities lined by histiocytes and fibroblasts<sup>[4]</sup>. Hemosiderin-laden macrophages, chronic inflammatory cells, and multinucleated giant cells are also seen.<sup>[5]</sup> The incidence is 8% and mostly seen in the first two decades of life. It affects long tubular bones such as femur, humerus, tibia and vertebrae. There are two types of ABCs primary and secondary. Primary ABCs are the lytic lesions which arise de novo and secondary are the lesions which arise due to some predisposing conditions like non-ossifying fibroma, osteoblastoma, osteosarcoma, chondrosarcoma, simple bone cyst, metastatic carcinoma, fibrous dysplasia, and chondromyxoid fibroma. The current case shows features of primary ABC and X-Ray shows an eccentric, lytic lesion which is expansive in nature, and seen at the metaphyseal end of the femur. The natural history of aneurysmal bone cyst has evolved through four radiological stages which are initial, active, stabilization and healing. In the initial phase, the lesion is characterized by a well-defined area of osteolytic with discrete elevation of the periosteum which is followed by a growth phase, which consists of rapidly growing lesion with progressive destruction of bone.<sup>[2]</sup> The growth phase is followed by a period of stabilization, during which the bony shell matures and takes on the characteristic soap bubble appearance. Finally there is healing step that causes lesion to calcify and ossify, transforming into dense bone mass. The current case was in the growth phase when the patient arrived at the orthopedic emergency as there was soap bubble appearance on x ray. Treatment was done successfully with excision of tumour with curettage and open reduction with internal fixation with titanium elastic nail after which void space was filled by bone graft from the left iliac crest.

## CONCLUSION

Aneurysmal bone cysts are quite uncommon. When a clinician is faced with a lytic bone lesion, however, the condition must be kept in mind. The gold standard for diagnosis is a biopsy. Bone grafting should be used in conjunction with fracture fixation to achieve bony union.

## REFERENCES

1. Welk A, Noman W K. Aneurysmal Bone Cyst Presenting as a Pathologic Fracture in a 12-Year-Old Football Player. 2021;.
2. Sajjanshetty ., Timothy J. Proximal femur pathological fracture secondary to aneurysmal bone cyst in a child. 2019;.

3. Purohit S, S Raja B. A Case Report of Aneurysmal Bone Cyst with Pathologic Fracture of Proximal Femur Managed with Enbloc Excision and Autologous Non-vascularized Fibular Graft. 2019;.
4. Jongpil E, Youngmin Y. A case report of aneurysmal bone cyst of the thoracic spine treated by serial anterior and posterior fusion. 2019;.
5. Kransdorf1'2 M, E. Sweet D. Aneurysmal Bone Cyst: Concept, Controversy, Clinical Presentation, and Imaging. 1995;.