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Case Report

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En bloc resection of aneurysmal bone cyst at proximal fibula in skeletally immature individual presented with neuropraxia: a case report

Aakash Bansal*, R. P. Meena, Umesh K. Meena, Prince Singh

Department of Orthopaedics, Government Medical College, Kota, Rajasthan, India

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***Correspondence:**
Dr. Aakash Bansal,
E-mail: aakashbansal.ac@gmail.com

ABSTRACT

Aneurysmal bone cysts (ABCs) are usually benign but locally destructive, blood-filled reactive lesion of the bone. Although a wider age group may be affected, usually they are seen in patients less than 20 years of age, with a more female preponderance. Most common sites include metaphysis of femur, proximal leg bone and then humerus. Aneurysmal bone cyst of proximal end of fibula is a rare and uncommon. Here, we report a case of 17-year-old female with classic histologic, clinical, and radiographic findings that was treated by en bloc resection.

Keywords: Aneurysmal bone cyst, Blood, Enbloc excision

INTRODUCTION

An aneurysmal bone cyst (ABC) is a benign bone lesion that typically develops in the metaphyseal region of long bones and within the vertebral bodies.[1] Histologically, aneurysmal bone cysts are characterized by blood-filled cavities divided by connective tissue septa, which contain fibroblasts, osteoclast-type giant cells, and areas of reactive woven bone.[2] The most common sites for aneurysmal bone cysts include the distal femur, proximal tibia, proximal humerus, and the spine, with a marked preference for the metaphyseal regions of long bones. ABCs represent less than 6% of all bone tumors and are approximately four times less common than osteosarcomas.[3] The exact cause of aneurysmal bone cysts remains unclear, although several theories suggest that they may arise due to local disturbances in blood circulation, leading to elevated venous pressure and subsequent hemorrhage. On radiographs, these lesions typically appear as expansile and lytic. Magnetic resonance imaging (MRI) and computed tomography (CT) imaging often reveal a heterogeneous mass composed of fluid-filled cystic spaces surrounded by a thin bony shell.[4] Complete surgical excision remains the standard treatment for aneurysmal bone cysts and has demonstrated favorable outcomes.

CASE REPORT

A 17-year-old female, with a six-month old history of accident managed with slab elsewhere was referred to our institution at Government Medical College (GMC), Kota as non-resolving painful swelling. On examination there was swelling over the proximal left leg with foot drop on the same side.

On taking history, patient had pain which was gradual in onset, dull in character which was aggravated with knee movements from past 5 months. 2 months after the onset of symptoms, patient gradually developed weakness in the left foot which progressed as the swelling increased. But she ignored and didn't visited the hospital before having an accident. There was very mild local rise of temperature and without any other signs of inflammation like erythema, induration.

Clinical findings

On inspectory examination there was a diffuse swelling over left proximal leg lateral aspect with presence of overlying shiny skin. There was weakness in dorsiflexors of left foot with power grade 2 with hypoesthesia over the anterolateral aspect of left lower leg and dorsum of foot with normal deep tendon reflexes.

Diagnostic assessment

Routine blood investigations and chest X-ray were sent, which comes out to be in normal limits. Plain radiograph of the knee joint with leg in anterio-posterior and lateral view revealed an expansile lytic lesion that elevates the periosteum at proximal fibula, limited by a thin shell of cortical bone (Figure 1). MRI of left knee joint with leg showed that there is a heterogenous enhancing expansile lesion in proximal epimetaphysial region of fibula with blood fluid levels.

Figure 1: Pre-operative X-ray of left knee with leg AP and lateral view.

Differential diagnosis (if any)

We thought there is a possibility of giant cell tumor (GCT) due to age group presentation of patient as it is more common in skeletally immature individual. Other differential diagnosis of aneurysmal bone cyst includes osteoblastoma, chondroblastoma, chondromyxoid fibroma, nonossifying fibroma (NOF), and fibrous dysplasia (FD), for confirmation, a needle biopsy was done which revealed aneuysmal bone cyst (ABC). Disease nature along with the progression with treatment plan and prognosis was explained to the patient and consent were taken for undergoing operative procedure.

Therapeutic intervention

Patient was put in supine position in OT and after proper painting and draping, enbloc resection was done which included resection of proximal end of fibula with 2.5 cm of normal diaphysis and a muscle cuff in all dimensions via posteriolateral approach (Figure 2). The tumor was resected as a whole and the peroneal nerve and motor branches were preserved (Figure 3).

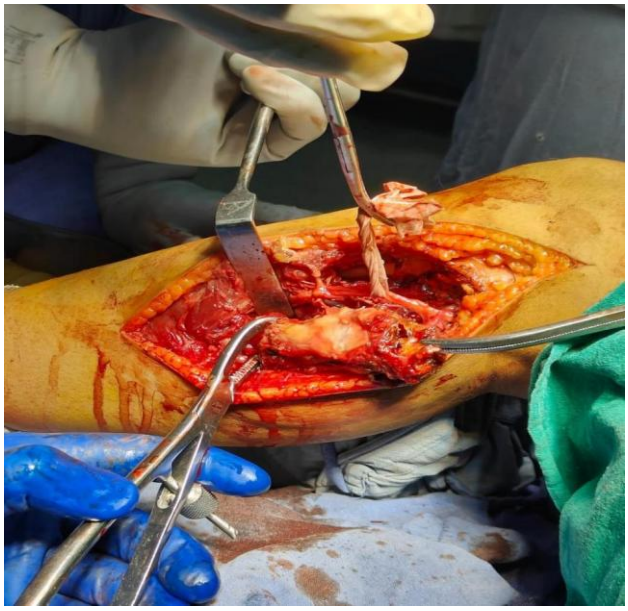

Figure 2: Intraoperative photo showing ABC with common peroneal nerve.

Figure 3: Sample send for histopathological examination.

We reconstructed the lateral collateral ligament and biceps femoris tendon carefully on the lateral tibial condyle by nonabsorbable sutures (ethibond) in 30^0 knee flexion to prevent any future instability. Biopsy report shows that multiple cavernous cystic cavities of variable size blood filled, and usually separated by thick fibro-collagenous septae suggestive of ABC of proximal end of fibula. Post-operative (AP and lateral) X-rays showing enbloc excision of ABC from proximal fibula (Figures 4 and 5).

Figure 4: Post operative (AP and lateral) radiographs showing en-bloc excision of ABC from proximal end of fibula.

Figure 5: Postop showing dorsiflexion of foot.

Follow up and outcomes

Postoperatively, patient had a complain of slight bloodish discharge from the incision site for which we have sent culture and it came out sterile and then the wound become dry after 2-3 dressings on alternate day. We immobilized the patient by GT slab for 6 weeks for the healing of lateral stabilizers. After 6 weeks the patient was allowed knee range of motion exercises. Partial weight bearing was started 3 weeks post-surgery and full weight bearing after 8 weeks. The patient was followed up every 3 months thereafter and on each follow up knee stability was examined by varus-valgus stress X-ray at 30-35 degree of flexion and clinical examination. Physical and radiological examination revealed no knee instability and no sign of any recurrence or local complication. The preoperative peroneal nerve palsy recovered fully within 6 months after resection and the patient regained dorsiflexion and touch sensation. Patient was followed up for 12 months and now currently there is no evidence of local site recurrence and she is in a good physical state doing routine work normally.

DISCUSSION

In 1942 Jaffe and Lichenstein described ABC is a bony tumor which is osteolytic described by generally non-endothelialized spaces of various diameters, several sponge-like blood or serum filled.[5] More than 95% cases of ABC are reported earlier the age of thirty, although it is a rare occurrence at the age of 17 as we reported here.[6] ABC usually located at the metaphysis region of long bones mostly distal femur, proximal leg bone, humerus or in vertebral bodies and is eccentrically and expansile. Differential diagnosis of aneurysmal bone cyst comprises GCT, osteoblastoma, chondroblastoma, chondromyxoid fibroma nonossifying fibroma (NOF) and fibrous dysplasia (FD). Aneurysmal bone cyst is usually distinguished with Unicameral bone cyst by MRI where presence of a intralesional septations and double density fluid level usually suggests an ABC. The incidence of Aneurysmal bone cyst in proximal end of fibula is very low, treatment options are also limited.[7] Routine treatment procedure for Aneurysmal bone cyst is curettage and bone grafting, but since here the lesion involves the proximal end of fibula completely en-bloc excision is preferred. The etiology of aneurysmal bone cyst still remains unknown. Biesecker et al states that because ABC's are usually accompanied by associated lesions and these associated lesions are rarely accompanied by ABC's, it is probable that ABC's are secondary to the associated lesions of bone therefore, the inaugural of the genesis of ABC's most likely which is an antecedent and primary lesion of bone. The next step in the pathophysiological development of an ABC is the production of an abnormal vascular component by the precursor lesion of bone an arteriovenous fistula. While the tumor can be antagonistic in growth and is benign and can be successfully treated with surgical excision. Few also explained enbloc excision with allograft reconstruction for bony stability.

CONCLUSION

Based on the literature till now, ABC at proximal end of fibula is rare and here we report a rare case of ABC at proximal end of fibula which was quite effectively managed with enbloc excision.

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