Case Report

Metadiaphyseal presentation of giant cell tumor in adolescent femur: A case report

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Abstract

Background: Giant Cell Tumor (GCT) of bone is typically seen in long tubular bones in skeletally mature individuals at the epiphyseal. location. The peak incidence is in the 3rd to 4th decade of life. Occurrence in children and adolescents is rare, especially prior to physical closure. We report a case of distal femoral Giant Cell Tumor (GCT) at metaphseo diaphysis site in a 13-year-old boy in the femur with an open physis. We managed this lesion successfully with curettage and bone grafting.

Key words: Gaint Cell Tumor(GCT); Meta-diaphyseal

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1. Case Presentation

A 13-year-old boy presented to our outpatient department with pain and swelling in the right thigh for 2 months. There was no history of trauma or fever.

On examination, there was tenderness over the distal third of the thigh, knee range of motion was preserved, and neurovascular status was normal. Radiographs revealed a lytic lesion in the meta-diaphyseal region of the distal femur, measuring approximately 12 × 5 × 3 cm (Fig 1). ACT-guided biopsy showed multinucleate giant cells confirming the diagnosis of giant cell tumor. (Fig 2)

The patient was taken up for surgery. A thorough intraregional curettage was performed, (Fig 3) The defect was reconstructed using autologous iliac crest bone graft along with hydroxyapatite bone graft substitute. (Fig 4) No adjuvant radiotherapy or chemotherapy was given. The post-operative radiographs Fig 5 showed complete filling of the defect. The postoperative period was uneventful. Patient was managed non weight bearing for six seeks and partial weight bearing up to three months after surgery. The patient was followed up at 3, 6, and 9 months, with clinical and radiological evaluation. The follow up radiographs showed gradual integration of the bone graft with replacement of bone substitutes with native bone. At one year of follow up, the bone appearance returned to normal with no sign of recurrence. (Fig 6, 7 and 8 after 6 Weeks ,3 months. 9 months after surgery).

Fig (1): Lytic lesion

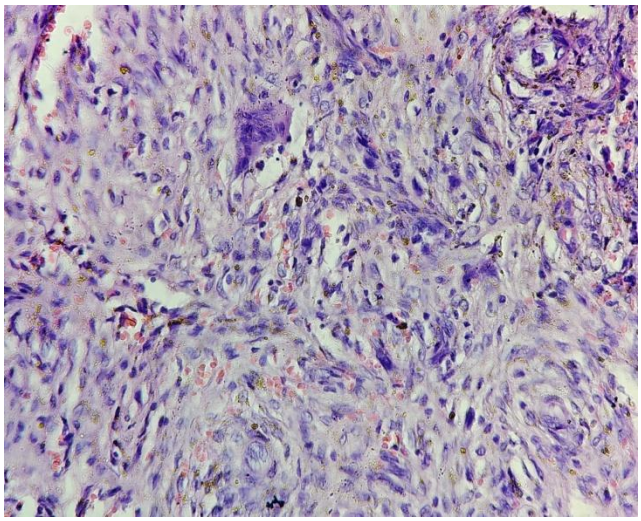

Fig (2): Multinucleate giant cells

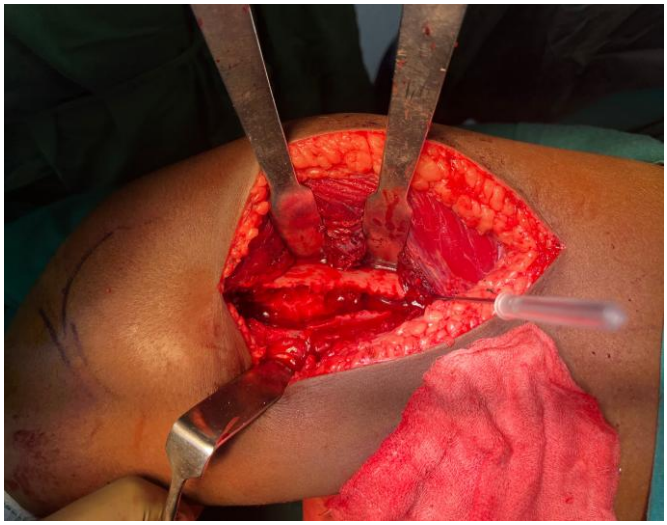

Fig (3): Intraregional curettage

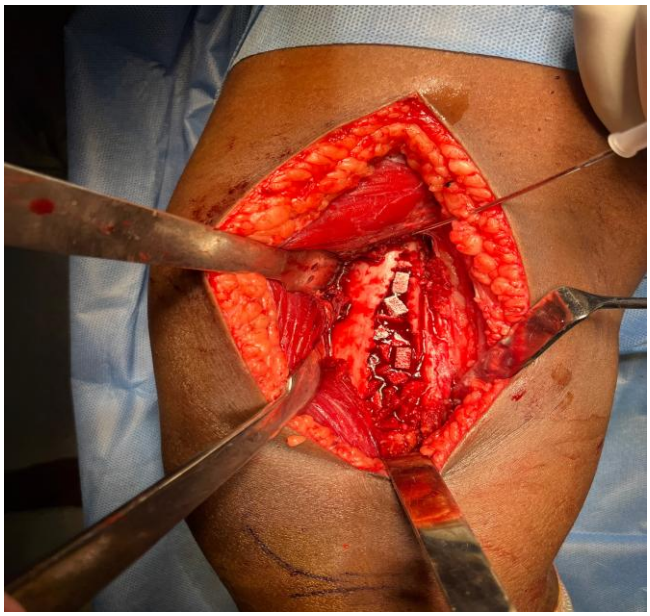

Fig (4): Hydroxyapatite bone graft

Fig (5): Hydroxyapatite bone graft

Fig (6): 6 Weeks Post op X-ray

Fig (7): 3 months' post op X-ray

Fig (8): 9 months' post op X-ray

2. Discussion

Primary bone tumors in children are commonly benign lesions with osteochondroma, simple bone cysts, aneurysmal bone cysts. osteoid osteoma, fibrous dysplasia, non-ossi-

fying fibroma. should be considered for differential diagnosis. (Esra Akyüz Özkan). Giant cell tumors are not commonly considered for differential diagnosis in children with an open physis.

A comprehensive review of pediatric bone lesions by Sebastian Breden in 2024 reported 420 children with primary bone lesions with the majority being benign bone lesions. (80%). They reported only 6 GCTs in children with only 2 in the femur among 335 benign bone lesions (0.6%).

GCTs are more common in Epimetaphyseal region of bone in adults. Puri et al showed similar incidence in children with the open physis not acting as a barrier to the tutor. Recently M Wülling et al reported metaphaseal only location of GCT in children under the age of 18. Though they reported 18 patients, only five were with open physis. Our patient presented with an even rare Metadiaphyseal location of GCT which has hitherto not been reported.

Management typically involves curettage with bone grafting or bone substitutes, sometimes with adjuvants. Wide resection is reserved for aggressive or recurrent cases. Our patient underwent, curettage with bone grafting with bone substitutes as the lesion was large.

Recurrence rate has been reported by both Puri eat al and M Wülling, 20 and 80% respectively. Our patient had excellent functional and radiological outcomes without recurrence at 1 year.

This case highlights the importance of considering GCT even in patients with an open physis. The case report also highlights the unusual metaphaseo diaphyseal location of GCT within the long bone of femur.

3. Conclusion

GCT of the distal femur in children is rare. Thorough curettage with bone grafting can provide satisfactory results with good healing and low recurrence in properly selected cases. Upto our knowledge this is first reported case of Metadiaphyseal GCT in Adolescent femur.

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