



GIANT CELL TUMOR WITH SECONDARY ANEURYSMAL BONE CYST OF CALCANEUM: AN EXCEEDINGLY RARE CASE REPORT

Pathology

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ABSTRACT

Introduction - Giant cell tumor (GCT) of bone is generally a benign tumor composed of mono-nuclear stromal cells and characteristic multinucleated giant cells. It usually develops in long bones of the lower extremity especially around the knee, but can occur in unusual locations. Aneurysmal bone cyst (ABC) is a benign cystic lesion of bone that is composed of blood-filled spaces separated by connective tissue.

Aims & Objectives - To study tumors of calcaneum with osteoclast like giant cells with differential diagnosis including benign and malignant lesion.

Result - Histopathological features are suggestive of giant cell tumor with aneurysmal bone cyst like changes of calcaneum along with clinical and radiological findings.

Conclusion - GCT with secondary ABC is a rare presentation though it can be diagnosed by its characteristic microscopic findings.

KEYWORDS

Giant cell tumor, Aneurysmal bone cyst, Histopathology, Calcaneum.

INTRODUCTION

Giant cell tumour (GCT) is a benign, locally aggressive neoplasm which is composed of sheets of neoplastic ovoid mononuclear cells interspersed with uniformly distributed large, osteoclast like giant cells. [1,3] It usually develops in long bones of the lower extremity especially around the knee [3,4], but can occur in unusual locations like the bones of hands and feet [3], with a prevalence of <2% [5]. Multicentric GCT has been located in <1% of cases [5]. It represents 4 to 5% of all primary bone tumor. Majority of cases present with 20-25 years of age. [3].

Aneurysmal bone cyst is a benign cystic lesion of bone that is composed of blood-filled spaces separated by connective tissue. It may be primary or secondary. A secondary develops most commonly with giant cell tumor of bone and when it happens diagnosis is usually based on histopathology. Early diagnosis will help in successful treatment with less radical operative procedure. [1,2]

CASE REPORT

A 17 year old male patient was admitted in orthopaedic ward with complain of pain and swelling over right calcaneum since 1 month. **On examination**, swelling over right calcaneum was noted which was measuring approx. 3 x 3 cm size, soft to firm in consistency with normal overlying skin which was painful. **On radiological Findings** approx 3.5 X 3.2 cm sized well-defined lytic geographic lesion noted with soap bubble appearance in calcaneum. So suggestive of ?Benign bone tumor ??Giant Cell tumor of calcaneum or Aneurysmal bone cyst of calcaneum. Biopsy was taken and sent for histopathology.

MATERIAL & METHODS

Tissue was fixed in 10% formalin for 12-24 hour, subsequent dehydration, clearing, wax embedding, sectioning and staining with Hematoxyline & Eosin was carried out.

RESULT

Histopathologically, it showed solid sheets contained evenly distributed multinucleated osteoclastic giant cells with intervening area showed oval to plump tumour cells having fine dispersed chromatin and scanty eosinophilic cytoplasm. Also there were areas of haemorrhagic cyst formation and occasionally cyst lined by fibroblast and fibrous tissue mimicking aneurysmal cyst like changes. So, diagnosis given was **GIANT CELL TUMOR WITH SECONDARY ANEURYSMAL BONE CYST**. (Fig : 1,2,3,4)

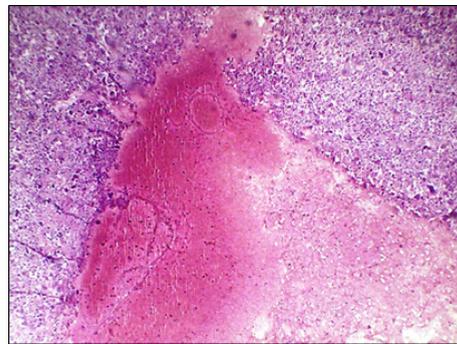


Fig 1 (4X) (H&E Stain) : Haemorrhagic Cystic Area.

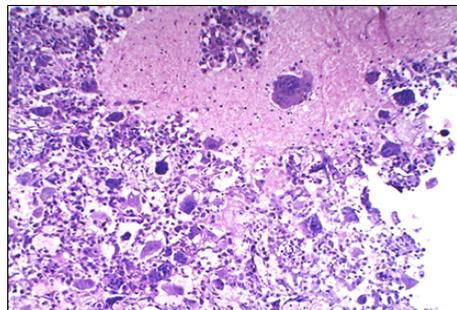


Fig 2 (10X) (H&E Stain) : Solid Sheets showing evenly distributed Multinucleated Osteoclast like Giant cells with haemorrhagic area.

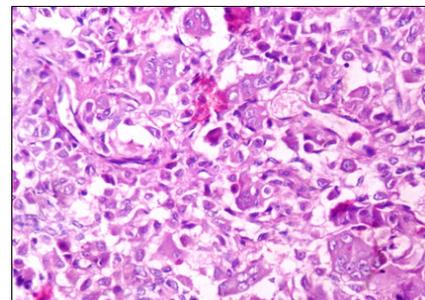


Fig 3 (40X) (H&E Stain) : Evenly Distributed Giant Cells with intervening area of oval to plump tumor cells.

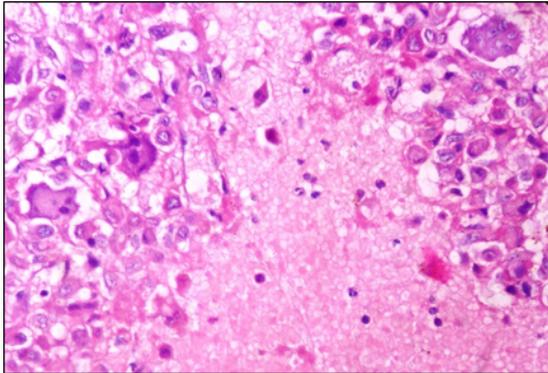


Fig 4 (40X)(H&E Stain) : Multinucleated Osteoclast like giant cells with Haemorrhagic Cyst.

DISCUSSION

Giant cell tumor of bone was first described by Cooper in 1818[7]. Giant cell tumor is so named because the histopathology is dominated by multinucleated osteoclast type giant cells, giving rise to synonym OSTEOCLASTOMA. GCT are large, red brown masses that frequently undergo cystic degeneration. There are 40 to 60 % chances of recurrence and upto 4 % metastasize to lungs.[2].

There is one case report of GCT of Calcaneum by Dhaval Gotecha[5]. In a study by Muhammad Saeed Minhas 3 (1.2%) cases reported in calcaneum out of 240 cases [6]. Suggesting Calcaneum, a very rare site for GCT.

Aneurysmal bone cyst is seen usually in patients between 10 and 20 year of age and more common in vertebrae and flat bones. It is characterized by multiloculated blood-filled cystic spaces. It can be seen as primary as well as secondary to primary bone tumor especially giant cell tumor & chondroblastoma. ABC consists of blood-filled cystic spaces separated by thin, tan-white septa which are composed of plump uniform fibroblasts, multinucleated osteoclast like giant cells. Approximately one third cases contain calcified matrix called 'blue bone'[2]

Pathogenesis of Giant cell tumor characterised by presence of Neoplastic cells which are osteoblast precursors but they represent only a minority of the tumour cells. The bulk of tumor consist of non-neoplastic osteoclasts & their precursors. The neoplastic cells express high levels of RANKL, which promotes proliferation of osteoclasts precursors. However the feedback between osteoblasts and osteoclasts is absent which results in localized but highly destructive resorption of bone matrix by reactive osteoclasts.[2] In Aneurysmal bone cyst there is Rearrangement of ch 17p13 resulting in fusion of the coding region of usp6 to the promoters of genes that are highly expressed in osteoblasts, leading to usp6 overexpression which regulate activity of the transcription factor NFkB leading to cystic resorption of bone. But secondary ABCs appear to be triggered by epigenetic mechanisms.[2]

Differential Diagnosis of Giant cell tumor with aneurysmal bone cyst like changes includes Chondroblastoma, Aneurysmal bone cyst, Giant cell rich osteosarcoma, Osteoid osteoma, Osteoblastoma. In Giant Cell Tumor giant cell and stromal cells are distributed uniformly. While in others foci containing numerous giant cells alternate with large areas completely lacking this. In addition in Osteosarcoma there is osteoid production.

CONCLUSION

Giant Cell Tumor with secondary Aneurysmal Bone Cyst like changes of Calcaneum is a very rare presentation, though it can be diagnosed by its characteristic histopathological findings. It can be presented with pain, can be asymptomatic or can be diagnosed accidentally on radiograph. It has tendency for local recurrence and malignant transformation. So, histological features will help in early diagnosis and treatment with less radical operative procedure.

References

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