

Multifocal Localization of Giant Cell Reparative Granuloma around the Knee

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Abstract: Giant-cell reparative granuloma is a rare benign intraosseous lesion with characteristically associated subperiosteal hemorrhage. There is always a diagnostic dilemma, due to overlapping of clinical, radiological and histological features with other Giant-cell rich osteolytic lesions. These lesions are commonly described in the small tubular bones of hand and feet, but their existence in axial skeleton and long bones cannot be ruled out. We report a rare case of Giant-cell reparative granuloma in 18 years old female with lesions around the knee joint. Patient had metachronous appearance of multicentric giant-cell reparative granuloma in proximal fibula and distal femur within a period of 5 years and was managed surgically. Lesion healed well with no recurrences noted at 7 years following last surgery. Giant-cell reparative granuloma presents with a wide range of morphologic presentations with overlapping of clinical, radiological and histological features, adding to a difficult diagnosis. A high index of clinical suspicion and good communication with pathologist is essential for adequate diagnosis and working out treatment.

I. Introduction

Giant-cell reparative granuloma is a rare benign intraosseous lesion with characteristically associated subperiosteal hemorrhage, first reported by Jaffe¹. The nature of lesion is truly controversial and unknown, as literature supports that it could be reactive lesion, a developmental anomaly or a benign neoplasm. These lesions are commonly described in the small tubular bones of hand and feet, although earlier they were believed to be limited to jaws². There were few reports of Giant cell reparative granuloma in long bones^{3,4}. Robinson et al⁵ in 1989 reported a case of multicentric Giant-cell reparative granuloma in foot. There is always a diagnostic dilemma, due to overlapping of clinical, radiological and histological features with other Giant-cell rich osteolytic lesions.

We report a rare case of Giant-cell reparative granuloma in 18 years old female with lesions around the knee joint (distal femur and proximal fibula). We find it as a first description of Giant-cell reparative granuloma as metachronous, multicentric lesion of long bone in English literature.

II. Case Report

A 18 years old female presented in outpatient department with pain and swelling in left upper half of leg since 3 weeks following twisting injury to knee while playing. She gave history of gradually increasing painful mass in lateral aspect of left knee over a period of 3 weeks. She had similar episode of pain and swelling in left knee 1.5 years back which subsided with rest and medication for 2 weeks. Physical examination revealed localized tenderness and mass in posterolateral aspect of upper 1/4th leg measuring about 7x4 cms in size. Mass was well defined, smooth-surfaced, hard in consistency. Range of motion of knee was terminally restricted due to pain. No signs of joint effusion in knee and inguinal lymph nodes of ipsilateral limb were neither enlarged nor tender on palpation.

Antero-posterior and lateral radiographs of left knee showed cystic expansile swelling with thinning of cortex in head of fibula with associated pathological fracture (Figure 1). A radiological diagnosis of Giant cell tumor in proximal end of fibula with pathological fracture was made. Consent was taken from patient before stating the treatment. Routine blood investigations showed no abnormalities. The patient subsequently underwent excisional biopsy of the lesion. Surgical specimen consisted of soft brownish tissue. Tumor samples were sent at two different laboratories as per hospital protocol. One of the laboratories gave histological diagnosis of fibrous dysplasia while the other reported scattered osteoclast-like multinucleated giant cells in a stroma of spindle-shaped fibroblasts, histiocytes and inflammatory cells (Figure 2). Areas of hemorrhage and osteoid formation were also evident. These reports made us to review the slides again, and after a mutual discussion between us and the pathologists, diagnosis of Giant-cell reparative granuloma was made. Following surgery, patient improved with good range of motion of knee and was painless. Patient was asymptomatic at 2 years follow up when she was last seen at that time.

After 5 years of primary surgery, patient again presented with 2 months history of discomfort in left knee. Pain was aggravated on activities of daily living like squatting, climbing, walking and relieved by rest.

Plain radiographs of the knee were taken in view of recurrence, but surprisingly they showed another lesion in lateral condyle of femur measuring about 4x3cms. MRI showed well defined lesion in posterior aspect of lateral condyle of femur abutting the cortex, associated with cortical breach (Figure 3). Apart from routine blood investigations, serum calcium, phosphorus, and alkaline phosphatase and parathormone levels were done, which were within normal limits. Biopsy of the lesion was taken and the microscopic appearances were similar to the previous lesion, as reported from two different laboratories (Figure 4). Upon confirmation of the diagnosis as Giant-cell reparative granuloma, the lesion was treated with extended curettage with use of high speed burr and phenol, and filling of the defect with polymethyl methacrylate cement. The lesion eventually healed well and patient was followed regularly. Last follow up examination at 7 years after second surgery showed good knee function and laboratory studies were within normal limits. Radiograph showed good consolidation of lesion with no recurrences (Figure 5).

III. Discussion

The pathogenesis of Giant-cell reparative granuloma still remains controversial and unknown⁶. Literature supports that it could be reactive lesion, a developmental anomaly or a benign neoplasm. There is some belief that, these lesions may be related to traumatic bone cysts and genetic etiology has been hypothesized. Majority of these lesions occur in jaws, temporal bone and short tubular bones of hand and feet, but there occurrence in axial skeleton and long bones cannot be ruled out. Multicentric presentations of these lesions have been reported before⁵, but metachronous, multifocal localization in long bone has not been described before.

Other Giant cell rich lesions like brown tumors of hyperparathyroidism, giant-cell tumor, aneurysmal bone cyst, fibrous dysplasia must be kept in differentials while dealing with a case of Giant-cell reparative granuloma. Hyperthyroidism can be difficult to distinguish both radiographically and histologically, but absence of abnormal blood and renal profile and generalized rarefaction can support diagnosis. It's very unusual for Giant-cell reparative granuloma to disrupt the cortex and extend into soft tissues as can be seen in giant cell tumor lesion^{5,7}, exceptionally in our case, there is an associated cortical breach. Aneurysmal bone cyst is rather similar to these lesions but, they typically occurs before skeletal maturity and composed of large blood filled vascular channels^{4,7}. However, a large proportion of giant cell tumor lesion with associated pathological fracture may show similar histological features as giant-cell reparative granuloma, so a careful clinical follow up is required in such cases⁸. Recently, research is going into the genetic analysis of karyotype of such lesions, which may simplify the approach to diagnosis in near future.

In present scenario, diagnosis of Giant-cell reparative granuloma can only be made by careful histological examination with a high degree of clinical suspicion. Collagenized, fibrous connective tissue with osteoid formation, stromal hemorrhage, and zonal clustering of giant cells are essential for diagnosis. However, the two most consistent features were hemosiderin deposits and osteoid islands⁹. But, still we cannot clearly demarcate between these lesions and giant cell tumors. Although, these lesions do not carry a potential risk of malignancy but cases of recurrences have been reported⁹. Giant-cell reparative granuloma in axial skeleton has better biological behavior compared to their occurrence in small tubular bones of hand and feet⁴.

Giant-cell reparative granuloma has a wide range of morphologic presentations with overlapping of clinical, radiological and histological features, making conclusive diagnosis, a difficulty. A high index of clinical suspicion and good communication with pathologist is essential for adequate diagnosis and working out treatment.

Conflict of interest Authors report no conflict of interest, financial or otherwise, concerning the material or methods used in this study or the findings specified in this paper.

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Ethical standard This study was approved by ethical committee and was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Captions and Legends



Figure 1: Antero-posterior and lateral radiographs of left knee showing cystic expansile swelling in head of fibula with associated pathological fracture.

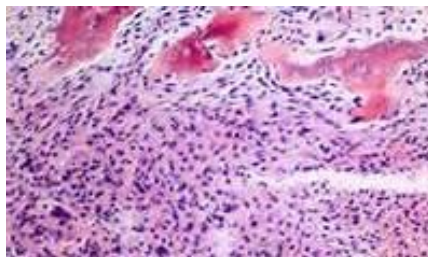


Figure 2: Histo-pathological image showing Giant cell reparative granuloma.

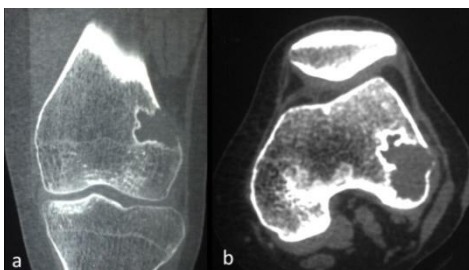


Figure 3: MRI showing well defined lesion in posterior aspect of lateral condyle of distal femur abutting the cortex.

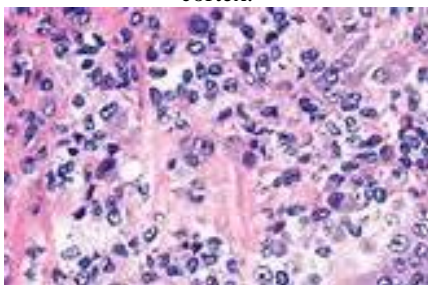


Figure 4: Histopathological photomicrograph confirming diagnosis of Giant cell reparative granuloma.



Figure 5: Radiographs of knee at 7 years following surgery showing good consolidation of the lesion in distal femur and the excised head of fibula with no recurrences.

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