

Case report:

Giant Cell Tumor Masquerading as Lateral Meniscus Injury: A Case Report

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Abstract:

Giant cell tumor (GCT) is a benign bone tumor with aggressive characteristics and capacity to metastasize. They are more common in the third decade of life and demonstrate a preference for being located in the epiphyseal region of long bones. They have a high local recurrence rate, which depends on the type of treatment and initial tumor presentation. Early detection of GCT is possible with proper clinical assessment and radiograph. However, due to its rarity, physicians may have neglected the possibility of bone tumor as one of the differential diagnosis for cases referred as “soft tissue injury”. We report a case of a 22-year-old lady who presented with seven-month-history of right knee pain, lateral joint line tenderness and positive McMurray test and initially treated as right lateral meniscus injury. However, the knee pain worsened over time and became persistent despite starting on physiotherapy and home-based-exercises. Upon subsequent visit two months later, she presented with tender bony swelling over the lateral tibial plateau and radiological examination revealed a lytic lesion over her proximal right tibia. Magnetic resonance imaging and histopathology testing confirmed the diagnosis of Giant cell tumor. This case report aims to increase the awareness of possible bone tumors in soft tissue injury cases and highlight the importance of detailed reassessment and reviewing diagnosis during each follow up.

Keywords: Giant cell tumor, meniscus.

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Introduction

Giant cell tumor (GCT), also known as osteoclastoma, is a benign neoplasm that accounts for 5% of primary bone tumors. It commonly occurs among females between the age of 20 to 40.¹ It demonstrates a preference for being located in the epiphyseal region of long bones, especially distal femur, proximal tibia, proximal humerus and distal radius. Despite of its benign characteristics, the World Health Organization (WHO) classified GCTs as “an aggressive, potentially malignant lesion” as it is locally aggressive and destructive in nature.² The local recurrence rate ranges between 20% to 50% while about 10% of the

cases can transform into malignant tumor.^{3,4} Early detection of GCT is possible with proper clinical assessment and radiograph. However, due to its rarity, physicians are more likely to neglect the possibility of bone tumor as one of the differential diagnosis for cases referred as “soft tissue injury.” Many times, physicians do not repeat radiographs on a previously normal x-ray findings and we hope this case report would trigger higher index of suspicion on possibility of bone tumors which may be detected on repeated radiographs. Our case report highlights an interesting case of GCT mimicking a lateral meniscus injury and the importance of recognizing this rare tumor.

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Case Report

A 22-year-old lady who is previously well but sedentary presented to the Sports Medicine Clinic with a seven-month history of right knee pain. The pain started insidiously from September 2017 after a hiking activity but she denied any fall or direct trauma to the knee. The pain was sharp in nature and localized around the anterior aspect of her right knee. She first presented to the emergency department in January 2018 due to worsening of the pain. Knee X-ray was normal. She was discharged with the diagnosis of soft tissue injury, and referral was subsequently made to our Sports Medicine Clinic for further management.

Initial assessment at the Sports Medicine Clinic in April 2018 revealed that the pain was localized around the anterolateral aspect of the right knee with lateral joint line tenderness and positive McMurray test. There was no bony tenderness at the tibial plateau or femoral condyle. A diagnosis of lateral meniscus injury was made and patient was started on rehabilitation exercises such as quadriceps strengthening and proprioception. She was due to be re-reviewed in two months.

During subsequent visit to the clinic, she reported that the pain progressively worsened in severity and became persistent especially at night. She also started to notice swelling over her right knee. She complained of loss of appetite since May 2018 but no weight loss, night sweats or fever. Physical examination revealed tender bony swelling over the lateral tibial plateau. X-ray of the right knee showed an expansile lytic lesion over the lateral tibial plateau extending to the articular surface (Figure 1). Chest X-ray was also done and appeared normal. Patient was then referred to a tertiary hospital for further investigation and management. MRI revealed 4cm x 5cm x 6cm multiloculated lytic mass on lateral aspect of right proximal tibia (Figure 2 and 3). Subsequently, core needle biopsy was done and confirmed the presence of giant cells. Whole body bone scan showed localized lesion without distant bone metastasis. With clinical diagnosis and biopsy of giant cell tumor, the patient was planned for adjuvant radiotherapy and surgical resection with curettage later.



Figure 1: X-Ray of right knee (AP view) shows lytic lesion extending to the articular surface, with thinning of the overlying cortices and thin internal septation within.

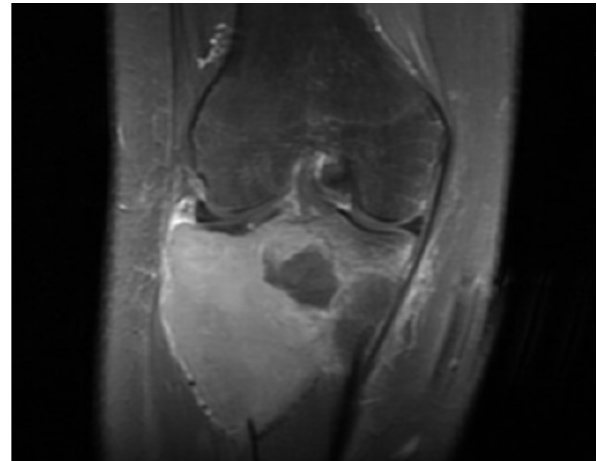


Figure 2: MRI of right knee (T2-weighted, coronal view) shows heterogenous enhancing lesion at epiphysis of the lateral aspect of right proximal tibia.

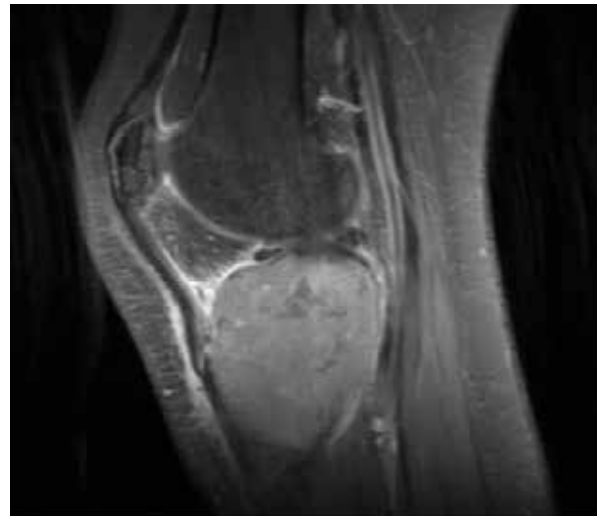


Figure 3: MRI of right knee (T2-weighted, sagittal view)

Discussion

Giant cell tumor is locally aggressive and destructive with a capacity to metastasize. Although rarely fatal, it is associated with a significant disturbance of local bony architecture especially when extending into the intra-articular space.³ Therefore, early recognition and treatment is crucial.

There are several key points in clinical assessment that help to point towards a potential sinister condition such as bone tumor than a simple muscle or ligamentous injury. A history of long-standing pain which starts insidiously, worsens at night and responds poorly to simple analgesia and rehabilitation warrants for further investigation.⁵ The pain, however, may sometimes be masked by the prolonged use of strong analgesia. The presence of swelling, which progressively increases in size and localized over bony structure rather than diffuse over a joint, should also warrant an attention. Some patients may present with fracture following a low impact trauma or non-traumatic events. Since soft tissue extension is common in GCT, patient may initially present and gets treated as soft tissue injury as in this case. However, soft tissue injury is more prevalent in the young, active population with a clear history of injury, as opposed to a sedentary person with no prior trauma.

Upon physical examination, swelling may not be apparent in some cases until advanced stage. Palpation of a tender bony mass helps to suggest a possible bony lesion rather than a soft tissue injury. In this case, patient initially had tenderness localized only over the lateral joint line with no bony tenderness. In the second visit, the lateral joint line was still tender but maximum tenderness migrated to the lateral tibial plateau. Therefore, adequate attention should be paid to proper palpation during a joint examination as it could

determine the diagnosis.

Radiographically, GCT typically involves the metaphysis and epiphyses and extends to the subarticular border. The lesion usually has geographic margins and is eccentrically situated with bony expansion, cortical thinning and erosion.⁶ Pathological fracture may be seen in approximately 20% of the cases.⁷ MRI and CT are crucial for staging and therefore surgical planning. MRI is useful in determining extraosseous extent, articular surface involvement and intramedullary lesion while CT is better in demonstrating subtle cortical destruction and determination of tumor recurrence.^{8,9}

The treatment of GCT is essentially surgical removal with bone grafting. In benign GCT, the treatment of choice is usually curettage or wide local excision. Next, hydrogen peroxide or liquid nitrogen is applied to remove the remaining tumor cells and the cavity is filled with bone cement. As for malignant tumors, the management includes curettage and adjuvant therapies such as phenol cauterization, usage of intralesional chemotherapeutic agents such as Adriamycin or methotrexate, radiotherapy and cryotherapy to reduce recurrence. If there are presence of massive recurrences and uncontrolled malignant transformation, resection or amputation of the part of the bone affected would be indicated.^{10,11}

Conclusion

Despite the fact that majority of musculoskeletal injury cases with normal X-rays referred from the emergency department to the Sports Medicine Clinic are soft tissue injuries, it is also important have a list of differential diagnosis, including rare diseases such as bone tumor. Proper clinical assessment at each visit is essential to avoid misdiagnosis and allows for early referral for surgical intervention.

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