



Case Report

Localised tenosynovial giant cell tumour of the infrapatellar fat pad mimicking an intra-articular loose body – A case report

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ABSTRACT

Tenosynovial giant cell tumour is a benign lesion which presence in the infrapatellar fat pad is uncommon. Herein, we report a unique case of a young female patient who presented with a loose body sensation at the knee. Surgery revealed a localized swelling in the infrapatellar fat pad which was treated with an open excisional biopsy of the mass. Diagnosis of giant cell tumour is confirmed by histopathological examination.

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1. Introduction

Tenosynovial giant cell tumour is a locally aggressive neoplasm originating from the synovium of fibrous tissue surrounding the joints, tendon sheaths, mucosal bursa, and tendons. It is rare in the knee joint.¹ It is commoner among women with an age-range presentation of 30 to 50 years old.^{2,3} Giant cell tumours of the knee can be localized or diffuse. The diffuse form, also known as pigmented villonodular synovitis (PVNS), is three times more common than the localised form which also known as giant cell tumour of tendon sheath (GCT-TS).⁴ In most patients with the diffuse form or PVNS, the diagnosis is straight-forward given the suggestive clinical picture of pain, repeated hemarthrosis, stiffness, formation of bone cysts, and cortical erosion.⁴ Unlike its counterpart, the presenting symptoms for GCT-TS can be non-specific, therefore often caused challenges in the diagnosis. In this case report, we present a rare case of GCT-TS with symptomatic loose body sensation

at the knee.

2. Case Report

This report discusses a case of a 27-year-old lady who presented with a loose-body sensation over the lateral aspect of her knee one year post primary ACL reconstructive surgery. She initially sustained a traumatic mid-shaft femur fracture and concomitant ACL injury, of which femoral nailing and later, an elective ACL reconstruction was performed. A year post-operatively, she complained of having a mobile fragment over the lateral knee joint especially during terminal extension, with no symptoms of locking or instability. She denied any preceding new trauma. Local examination failed to detect presence of any swelling. Blood investigations and radiograph of the right knee were unremarkable. Her magnetic resonance imaging done a year ago showed only ACL injury without any other notable lesion, and it is not repeated during this incident due to anticipated interference from the presence of adjacent femur implant. Initial arthroscopic examination revealed an anterolateral capsular defect with

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intra-articular herniation of which anterolateral capsular repair was performed. However, her symptoms of a recalcitrant loose body sensation persisted immediately post-operatively. Sports ultrasound examination (Figure 1) revealed the presence of a hypoechoic, non-vascularised oval lesion originating from the lateral joint space, which appears to be subluxated over the lateral femoral condyle during terminal extension. A provisional diagnosis of an intra-articular loose body was postulated. She subsequently underwent a marginal excision of the lesion via open surgery which appeared to be a cyst originating from the infrapatellar fat pad (Figure 2). On the second postoperative day, patient resumed full weight bearing and was discharge. Subsequently, the histopathological examination revealed a well-circumscribed, lobulated benign tumour consisting of various amount of mononuclear stromal cells mixed with osteoclast-like giant cells with no nuclear atypia or significant mitosis (Figure 3). A diagnosis of benign localized tenosynovial giant cell tumour of the infrapatellar fat pad was established. She was asymptomatic at twelve months post-operatively with no local tumour recurrence.

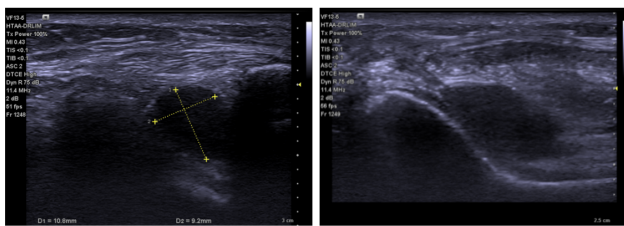


Fig. 1: Ultrasonography imaging of lateral knee showing an intra-articular hypoechoic lesion measuring 10.8mm x 9.2mm originating from the lateral joint space, which appears to glide over the lateral femoral condyle upon terminal knee extension

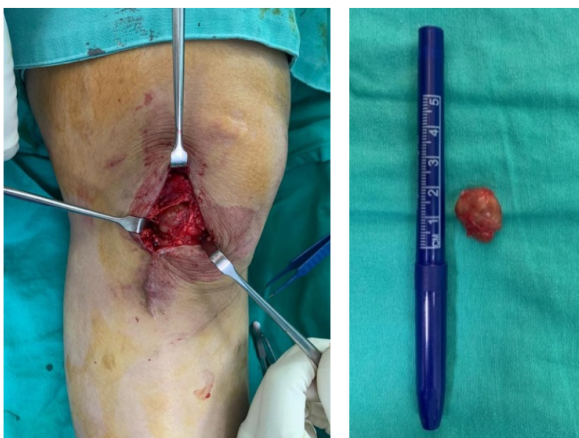


Fig. 2: Excisional biopsy of the lateral knee showing a piece of lobulated yellow-grayish tissue measuring 17 x 16 x 8mm located within the infrapatellar fat pad

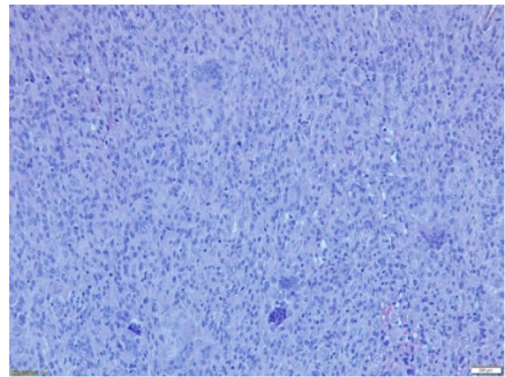


Fig. 3: Histopathological section of specimen showing well-circumscribed and lobulated benign tumour composed of varying amount of mononuclear stromal cells admixed with osteoclast-like giant cells. No nuclear atypia or significant mitosis seen. There is no evidence of malignancy. (H&E 200x magnification)

3. Discussion

The reported tenosynovial giant cell tumour in the knee involved areas including the anterior cruciate ligament, posterior cruciate ligament, medial plicae and fat pad, etc.⁵ The presence of GCT-TS in Hoffa's fat pad is unusual,⁶ but they had been described several times in the literature.

The etiology of GCT-TS is unknown.² Trauma was not associated in many of the cases reported.^{1,4–6} Booth M et al⁵ recently reported a similar case of giant cell tumour of the knee post anterior cruciate ligament reconstruction. However, they detected an intrasynovial swelling which stalk off from the graft site. In contrast, the tumour of our reported case was found in the infrapatellar Hoffa's fat pad, at the intraarticular extrasynovial compartment. The association between GCT-TS and ACL reconstruction is yet to be established.

Localized tenosynovial giant cell tumour of the knee can have non-specific signs and symptoms which often lead to delay in diagnosis and appropriate management. The more common presentation include painless or painful palpable swelling, locking of the knee joint, and restriction of movement.⁶ Our patient complained of foreign body sensation at the knee without symptoms of locking nor any range of motion limitation. This may be due to a smaller tumour size that was not significant enough to cause any mechanical block. A swelling may not be palpable from physical examination.

A preoperative clinical diagnosis of meniscus injury was made on 30% of localized form of GCT cases.⁴ Therefore sometimes, surgeons may proceed with diagnostic arthroscopy without MRI scanning. Arthroscopy is useful to rule out other causes of knee swelling and pain such as meniscal tear, cruciate ligament tear, osteochondral defect, etc. However, GCT-TS in the infrapatellar fat pad can be missed if not diligently explored during arthroscopy.

Imaging studies play a vital role in the diagnosis of GCT-TS. Plain radiography is often normal but may occasionally show areas of soft tissue opacities that replace the Hoffa fat pad lucency.¹ In chronic cases, bone erosions by the soft tissue mass can be observed.⁶ Ultrasonography shows a circumscribed, hypoechoic lesion inside the knee joint. Dynamic ultrasound could appreciate the relation of the swelling at different range of knee movement. Additionally, in some cases, ultrasound guided fine needle biopsy of the lesion is performed prior to definitive surgical intervention.^{1,7}

Magnetic resonance imaging (MRI) is the investigation of choice for the diagnosis of GCT-TS. It is highly sensitive. The typical appearance on MRI is an oval, solitary mass with lobulated contours and well-defined margin. It is slightly hyperintense on T1-weighted images relative to skeletal muscle, whereas on T2-weighted images it shows heterogeneous signal intensity due to the of hemosiderin pigment content in the lesion.^{1,7} Differentials on MRI should consider benign soft tissue neoplasms including lipoma, haemangioma, ganglion cyst, osteochondroma, synovial chondromatosis, or malignant tumours such as synovial sarcoma.^{6,7}

The diagnosis of tenosynovial giant cell tumour is confirmed on a histopathological basis, which shows multinucleated giant cells in a collagenous stroma containing round or polygonal mononuclear cells. Hemosiderin deposits are often.^{1,6}

Standard management of GCT-TS is surgical excision via open or arthroscopic approach. Arthroscopic excision is associated with reduced morbidity, joint stiffness, postoperative pain, and infections.⁸ Although better functional outcome may be achieved via arthroscopic excision, it comes with a cost of higher recurrence risk.⁸ Fragmented intralesional tumour evacuation via the use of arthroscopic shaver may cast doubt in tumour surgery principles due to potential persistence of residual tissue.⁶ With a good marginal excision, the reported recurrence rates of GCT-TS is 10 to 20 percent^{5,7} in contrast to the diffuse form with recurrence rate between 14 to 40 percent.⁸ Although local recurrences are less common for GCT-TS, open excision instead of arthroscopic is recommended to keep the recurrence risk as low as possible. Recently, microscopic excision has been prescribed to prevent recurrence.² Prakash et al. published a prospective study in which he suggested the use of radiotherapy after surgery in order to limit recurrence rate. His results showed only a 4% recurrence rate.⁹

4. Conclusion

Although rare, GCT-TS of the infrapatellar fat pad may be a potential cause of symptomatic loose body in the absence of overt trauma. Due to its non-specific presentation, it often leads to a wrong diagnosis. MRI is highly advocated to increase diagnosis accuracy. Ultrasonography is useful for dynamic assessment and for guiding needle biopsy.

Marginal excision is sufficient for the management although a risk of recurrence needed to be emphasized.

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None.

6. Conflict of Interest

The authors declare no conflicts of interest.


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