

Case Report: Nepal

Ganglion cyst of the Hoffa's fat Pad: Rare case report with MRI features

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Abstract:

Ganglion is defined as cystic lesion composed of myxoid matrix, having jelly-like consistency, and is lined by pseudomembrane. Ganglion cyst arising from the Hoffa's fat pad (infrapatellar fat pad) is rare conditions and only few cases have been reported in the literature. MRI is the most sensitive and specific method for diagnosing ganglion cyst. Hereby, we reported a rare case of ganglion cyst arising from the Hoffa's fat pad in a 15 year old male patient, diagnosed on magnetic resonance imaging followed by surgical excision.

Keywords: Ganglion Cyst, Infrapatellar fat pad, Hoffa's fat pad, Magnetic resonance imaging

Introduction:

Albert Hoffa in 1904 was first to describe Hoffa's disease as the clinical condition characterized by anterior knee joint pain secondary to inflammation and/or impingement of Hoffa's fat pad (1,2,3). The Hoffa's fat pad, also known as infrapatellar fat pad is intracapsular extrasynovial structure located posterior to the patellar ligament and adjoining capsule separating them from the synovium. Ganglion is defined as cystic lesion composed of myxoid matrix, having jelly-like consistency, and is lined by pseudomembrane. Popliteal cysts are the most frequently occurring cysts around the knee joint; less common are meniscal and rare are ganglion cysts [4,5]. Ganglion around the knee joints are usually found within the joint, in juxtaposition to the joint or in the soft tissues (within muscles, tendons, nerves or fat pad) around the knee. Most of the ganglions are found incidentally on magnetic resonance imaging (MRI) or arthroscopy, are of little clinical significance, and usually are asymptomatic.

Case report:

We reported the case of a 15 year old male presented with pain in the right knee on the anterior aspect for four months. There was past history of minor trauma to the same knee. Clinical examination revealed a palpable cystic mass in the right Hoffa's fat pad. There was no limitation of knee range of motion apart from a minor lack of flexion and no knee effusion. On palpation, there was tenderness over the swelling. Apley's and McMurray's tests were negative. Plain radiograph showed few foci of calcifications in the right Hoffa's fat pad.

MRI examination was performed in sagittal, axial and coronal planes by taking T1-weighted, proton density (PD) and T2-weighted sequences with fat saturation. MRI revealed a well-defined mild heterogeneously enhancing cystic lesion of size 3.2x2.7 cm in the right Hoffa's fat pad appearing low signal intensity on T1-weighted images and intermediate to high signal intensity on T2-weighted, PD and fat saturation images. Few foci of

hypointense areas seen, suggesting calcifications. Morphology and signal intensity of menisci, anterior cruciate ligament (ACL), posterior cruciate ligament (PCL), and the rest of the capsuloligamentous components were normal. No intra-articular fluid was shown. Diagnosis of ganglion cyst was made followed by surgical excision revealing a cystic lesion inside the infrapatellar fat pad with a firm

attachment to the capsule. The cyst was soft and rubbery with clear jelly-like content. Histopathological examination revealed a cyst with fibrous capsule, myxoid areas and fatty cells adjacent to the fibrous capsule, confirming the diagnosis of ganglionic cyst. The postoperative period was uneventful and patient was doing well on follow-up after four weeks.

Figure 1: Plain radiograph of right knee joint showing few calcific foci in infrapatellar fossa.



Figure 2a and 2b: T1-weighted axial (Figure 2a) and sagittal (Figure 2b) MR images of right knee showing a well-defined hypointense lesion in the right Hoffa's fat pad.



Figure 3: T2-weighted sagittal MR image of right knee showing a well-defined lesion appearing intermediate to high signal intensity in the right Hoffa's fat pad.



Discussion:

Ganglion cysts may be seen in all joints with variable frequency depending on the location, but it is rare in the knee joint [4,7]. Around the knee joint, it is usually found near lateral meniscus, anterior cruciate ligament (ACL) or posterior cruciate ligament (PCL); they rarely arise from Hoffa's fat pad and only few cases have been reported in the literature [4,8]. Intra-articular ganglion cyst in the knee has been reported to be nearly 0.2-1% on MRI and 0.6% on arthroscopy [9]. The differential diagnosis of swelling in the infrapatellar fat pad region includes lipoma, synovial cyst, meniscal cyst or parameniscal cyst, ganglion, synovial myxoma, pigmented villonodular synovitis, synovial hemangioma, aneurysm, synovial sarcoma and synovial chondromatosis [10].

The etiology of ganglion cysts is unclear; however Hoffa had described its pathogenesis due to inflammation followed by hypertrophy. Recently it has been found that hypertrophy of fat pad is caused by impingement of the fat pad between patella and femoral condyle during extension [1]. According to some researchers, as Hoffa's fat pad has two clefts lined by synovium, ganglion cyst may arise from this synovial lining [11,12]. Repetitive microtrauma leads to alteration in the metabolism of cells leading to release of vasoactive substances that sensitizes the synovium and fat tissue, causing necrosis of adipocytes [1]. Fibrocartilagenous metaplasia of Hoffa's fat pad was considered as the end stage of Hoffa's disease by some researchers [13,14].

Usually they are asymptomatic and symptoms may correlate with size and the location within the knee joint [10]. Knee pain, clicks, stiffness, incomplete extension of the knee and pain at the extremes of

motion are common symptoms. Sometimes a palpable mass and bone erosion can be seen. Plain radiograph helps in excluding pathologies such as a loose body or other bone abnormalities. Ultrasound (USG), computed tomography (CT) scan and arthrography are not very helpful examinations; however MRI is the most sensitive, specific, accurate and noninvasive method for depicting and characterizing the cystic masses [6]. The characteristic findings of a ganglion cyst on MRI include a fluid-filled lesion with low signal intensity on T1-weighted and high signal intensity on T2-weighted and fat suppressed images [6].

Histopathology reveals dense connective tissue capsule with a thick jelly-like material within. Microscopy shows a pseudocystic space with small multifocal areas of mucoid degeneration. Spontaneous size reduction of the cyst has been reported in the literature [11]. USG and CT guided percutaneous aspiration has excellent results [15]. Recently, arthroscopic excision of ganglion cysts is preferred for small lesions restricted to synovium [16,17]; however the recurrence rate is high and needs careful follow up [18,19]. Open excision with complete resection of the cyst minimizes the risk of recurrence as compared to arthroscopic treatment [18].

This case report emphasizes that ganglion cysts are rare entity and should be considered in the differential diagnosis of swelling in the infrapatellar fat pad of the knee joint. A careful clinical assessment and MRI can contribute significantly to the determination of the nature, location and size of ganglionic cyst and also helps in treatment planning.

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