POSTTRAUMATIC DISLODGE OF THE INFRAPATELLAR FAT PAD: AN UNUSUAL TYPE OF SUPEROLATERAL IMPINGEMENT

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Summary
The authors report a rare case of dislodgement of the infrapatellar fat pad induced by traumatic hyperflexion. Because of the unusual clinical presentation, open excision was performed to exclude a possible tumoral etiology. This entity seems to be an acute form of superolateral fat pad impingement.

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Introduction
Impingement of the infrapatellar fat pad is a rare entity which is often diagnosed by elimination in the presence of persistent anterior knee pain [1]. These are traumatic or microtraumatic syndromes, with two main entities: postero-rior impingement in the femorotibial joint space in Hoffa’s disease and superior impingement with the lateral femoral condyle which is less well known but which seems to be more frequent [2]. The authors describe an atypical presentation of superolateral impingement whose diagnosis could only be made postoperatively. The clinical, therapeutic and etiopathogenic signs of this unusual form are discussed with a review of the literature.

Case report
A 50-year-old patient who was an amateur weight-lifter, consulted for left knee pain which had persisted for 15 days following traumatic hyperflexion from a fall. There was no prior history of trauma or pain in this knee. He presented with mechanical anterolateral pain which had begun after the fall, had continued since when walking and which was worse when going up or down stairs. The patient did not report any fluid accumulation, locking or instability. On clinical examination, knee alignment was normal, the knee was dry and range of motion was normal. There was no ligament laxity. There was palpable swelling above the lateral femorotibial joint space which corresponded to the source of pain. This was a solid mass that was painful when touched. Extension of the knee did not increase pain, but there was acute pain at 20° of flexion and the mass disappeared under the lateral condyle. There was no patellar instability. X-rays of the knee were normal, with no patella alta or patellar subluxation. Proton density MRI with fat suppression (PD fat sat) revealed an abnormal image of the superior infrapatellar fat pad with a heterogeneous oval mass near the lateral...
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joint capsule. On axial and coronal slices with the knee in extension, the mass came in contact with the iliotibial band with a peripheral high intensity signal (Fig. 1).

The results suggested a traumatic infrapatellar fat pad injury, but the unusual features of the mass posed a problem of differential diagnosis with a tumoral or pseudotumoral lesion. Open surgical excision was decided to release impingement and for histology. Surgery was performed by lateral parapatellar approach. The swelling rose from under the joint capsule in front of the iliotibial band. Arthrotomy revealed dislocation of the superior infrapatellar fat pad in the anterolateral joint space with an area of compression across from the lateral condyle and an edema in the area corresponding to the oval lesion seen on MRI (Fig. 2). The dislocated part of the fat pad was excised and an aspiration drain was placed in the joint before closing. The histopathological analysis of the resected tissue (measuring 1 × 3 cm) confirmed the absence of tumoral proliferation and showed inflammation and contusion of the adipose tissue. The postoperative course was uneventful. The patient went back to work 2 months after surgery and began biking and swimming after 3 months. Seven months after surgery, he reported occasional infrapatellar pain, with no patellofemoral pain syndrome. The knee was dry with normal range of motion and there was no amyotrophy of the quadriceps.

Discussion

Traumatic infrapatellar fat pad lesions are a rare entity which may occur following an anterior cruciate ligament tear, patellar instability or arthroscopy; or they may be part of a fat pad impingement syndrome [2]. Hoffa’s disease described in 1904 [3] is the most well-known form of this entity and includes posterior impingement in the femorotibial joint space due to infrapatellar fat pad hypertrophy following acute trauma or microtraumas [4]. The mechanism is repeated hyperextension or rotational strains [5]. In the acute stage, hypertrophy is associated with an edema from hemorrhage and inflammation. In the chronic stage, fibroblast proliferation transforms the inflammatory adipose tissue into fibrous scar tissue [3,4]. Features of superolateral impingement were recently been described on MRI [6] as a result of damage to the superior infrapatellar fat pad from chronic impingement between the patellar ligament and the lateral femoral condyle. Patella alta and/or patellar tracking anomalies are predisposing factors. Although it is not well known and has rarely been reported in the literature, superolateral impingement may be more frequent than Hoffa’s disease [2].

In the present case, an acute form of Hoffa’s disease was first suspected, but several elements did not support this. First, the Hoffa test was negative. This is performed with the knee in flexion by applying pressure to the infrapatellar fat pad on the border of the patellar ligament, then the knee is extended. The test is positive if pain is worse when the knee is extended [3]. Also, the palpable mass extended well beyond the patellar ligament and was accompanied by unusual acute pain.

MRI confirmed the damage to the infrapatellar fat pad, but did not provide a definite diagnosis. The increased signal intensity of the superior infrapatellar fat pad did not correspond to features of Hoffa’s disease, but was more

Figure 1  Axial (a) and coronal (b) PD fat sat MRI showing a heterogeneous mass of the infrapatellar fat pad.

Figure 2  Anterolateral arthrotomy revealing the dislocated part of the infrapatellar fat pad.
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tive of chronic superolateral impingement character-
ized by disappearance of the superior fat pad between the 
patellar ligament and the lateral femoral condyle [2]. The 
anterolateral oval mass was also characteristic of the for-
mation of nodules found in superolateral impingement [6]. 
However, the clinical history did not correspond to chronic 
impingement and the patient did not have predisposing fac-
tors. Moreover, the volume and heterogeneous feature of 
the mass could also suggest a tumoral lesion of the infrapat-
ellar fat pad which was revealed by trauma. A chondroma 
or lipoma was improbable because there were no visible cal-
cifications which are characteristic of the former, or low 
intensity signal on fat saturation sequences for the latter. On 
the other hand, it might have been a synovial hemangioma 
or a sarcomatous malignant tumor whose characteristics are 
non specific on MRI [7]. Histological evaluation of the mass 
was therefore necessary to avoid missing the diagnosis of a 
tumor.

Surgery is only indicated in Hoffa’s disease after 
unsuccessful medical treatment and normally includes 
arthroscopic resection of the diseased area [1,4]. There is 
no generally accepted protocol for treatment of superolat-
eral impingement and there are no series in the literature. 
Functional measures are effective and the outcome is often 
good [6]. In this patient, surgical treatment was indicated 
to exclude a suspected tumor and because of the functional 
impairment from acute pain. Open surgery was therefore 
decided upon for direct access to the lesion and to perform 
complete resection without dissemination. The pathologi-
cal examination excluded the diagnosis of a tumor and the 
fat pad dislocation corresponded to a posttraumatic form 
of superolateral impingement. It may have developed from 
tearing of the superior attachments of the infrapatellar 
fat pad on the patella and the anterior rim of the lateral 
condyle, as well as from a lesion of the infrapatellar plica 
during hyperflexion.

Conclusion

The presentation of traumatic dislocation of the infrapatel-
lar fat pad in this patient seems to be an acute form of 
superolateral fat pad impingement which has not yet been 
described. Because of the atypical clinical signs and MRI fea-
tures, the diagnosis could only be made after surgery and 
histological evaluation of the excised tissue.

Disclosure of interest

The authors declare that they have no conflicts of interest 
concerning this article.

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