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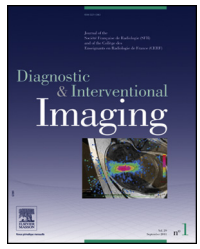

SHORT ORIGINAL ARTICLE / *Musculoskeletal imaging*

Hoffa's disease: A report on 5 cases

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Abstract We report the case of five patients referred to our department with Hoffa's disease: three patients were at the initial stage of the disease and the two others had reached the chronic stage. This condition is one of the less well-documented causes of pain in the anterior compartment of the knee. The pathophysiological mechanism is still unclear. It is probably caused by repetitive micro trauma resulting in inflammatory, haemorrhagic and fibrous changes to Hoffa's fat pad. The final outcome of the disease is an osteochondroma. The diagnosis is established by MRI, which demonstrates inflammation of the fat pat. At the chronic stage, a standard X-ray is sufficient to demonstrate ossification of the fat pad.

Hoffa's disease sometimes called hoffitis is an intrinsic disease of Hoffa's fat pad (also called the infrapatellar adipose body). It was described for the first time in 1904 by Albert Hoffa and is defined as acute or chronic inflammation of the infrapatellar fat pad. From an anatomical point of view, Hoffa's fat pad is a partly adipose wedge-shaped mass formed in the anterior region of the knee that is intracapsular but extrasynovial (and therefore extra-articular). It extends superiorly from the patella and alar folds to the tibia and infrapatellar bursa and is delimited anteriorly by the patellar ligament and joint capsule and posteriorly by the synovial membrane (Fig. 1) [1].

Hoffa's fat pad has a soft consistency and is mobile and lateralised in flexion. It is a deformable structure, which allows the expansion of the synovial compartment and facilitates the distribution of the joint fluid.

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Figure 1. MRI of knee, T1-weighted sagittal view, showing the intracapsular but also extrasynovial position of Hoffa's fat pad (asterisk). The latter is bounded anteriorly by the patellar ligament (long arrow), superiorly by the patella (short arrow) and posteriorly by the synovium (arrowheads).

There is a wide inter-individual variability in its volume, which decreases after loss of subcutaneous fatty tissue during extreme weight loss.

It consists of adipocytes and connective tissue. Unlike subcutaneous fat, Hoffa's fat pad contains pluripotent cells that can differentiate into osteoblasts and chondrocytes [2].

It has an anastomotic type of vascularisation supplied by two vertical arteries located on either side of the patellar ligament and two to three horizontal arteries that connect the vertical arteries. These arteries emanate from the upper and lower geniculate arteries. This vascularity is rich at the periphery and poor in the centre [3,4].

Innervation is ensured by anterior fibres of the popliteal plexus connected to the posterior articular nerve, a branch of the tibial nerve.

There are two synovial folds in this Hoffa fat pad: a superior fold with a vertical orientation and a horizontal inferior synovial fold (Fig. 2). Above the latter is an anteroposterior fibrous structure called the adipose ligament, which attaches the Hoffa pad between the patellar apex and the condylar fossa or the ACL. The adipose ligament is present in 65% of cases. It is also called ''infrapatellar plica'' in particular in a pathological setting.

Clinical cases

Case 1

A 32-year-old male tiller consulted for anterior knee pain lasting for several months. Pain was induced during palpation of the medial and lateral edges of the patellar ligament during extension (Hoffa's test).

Figure 2. MRI of knee, T1-weighted sagittal view showing the upper synovial fold (arrow) with a vertical path and horizontal lower synovial fold (arrowhead).

Plain radiographs revealed no particular abnormality. MRI showed a diffuse oedema signal (hyposignal on T1-weighted images and hypersignal on PD fat sat sequences) within the Hoffa fat (Fig. 3).

The diagnosis of Hoffa disease was made from this MRI.

The pain regressed after conservative treatment with physiotherapy and oral nonsteroidal anti-inflammatory drugs (NSAIDs).

Case 2

A 37-year old man and former basketball player presented with chronic anterior knee pain. Radiography detected enthesopathy of the extensor apparatus. MRI (Fig. 4) showed

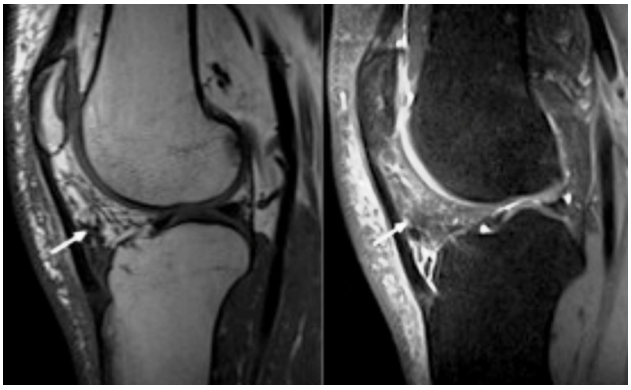

Figure 3. Case 1. Typical MRI appearance of Hoffa's disease in this 32-year male tiler, with anterior knee pain. Sagittal T1- and DPFS-weighted sequences. Note the diffuse oedema-type signal (hyposignal on T1-weighted images and hypersignal on PD fat sat sequences) within the Hoffa fat (Fig. 3).