Case 16986

Eurorad

Anterior suprapatellar fad pad impingement syndrome

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Section: Musculoskeletal system
Area of Interest: Extremities Musculoskeletal system
Imaging Technique: MR
Case Type: Clinical Cases
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Patient: 24 years, female

Clinical History:

A 24-year-old female was referred with recurrent anterior knee pain since 6 months. Clinical examination revealed restricted motion and cracking sounds with flexion and extension of the knee. Clinical history included radiographically documented leg length discrepancy with shortening of the right leg of 1.5 cm and bilateral thigh splints.

Imaging Findings:

Sagittal T1-weighted MR image showed suprapatellar fat pad swelling with heterogeneous signal intensity compared to subcutaneous fat with a convex posterior border and mass effect on the suprapatellar joint recess (Fig 1a). Swelling is quantified by a maximum anteroposterior diameter of 12.2 mm (Fig 1b).

Fat-suppressed (FS) T2-weighted MR images demonstrated edematous enlargement of the suprapatellar fat pad with increased signal intensity compard to subcutaneous fat and slightly increased joint fluid (Fig 2a:sagittal, Fig 2b:axial, and Fig 2c: coronal). Protrusion of the posterior border toward the suprapatellar pouch was also noticed (Fig 2a) with normal appearance of the quadriceps tendon (Fig 2b).

Discussion:

Anterior knee pain (AKP) is commonly encountered in daily clinical practice. AKP may be caused by a variety of traumatic and non-traumatic disorders affecting various peripatellar structures, including the peripatellar fad pads[1] . Peripatellar fat pads play an important role in facilitating normal knee movements. They are subdivided according to their location: 1. suprapatellar fat pad, posterior to the quadriceps tendon and anterior to the suprapatellar recess 2. prefemoral fat pad, posterior to the suprapatellar recess and anterior to the distal shaft of the femur 3. infrapatellar fat pad (Hoffa fat pad), posterior to the patellar tendon, and anterior to the intercondylar notch[2].

The suprapatellar fat pad prevents direct friction of the quadriceps tendon against the femoral condyle, allowing for normal movement of the knee [2]. It is hypothesized that repetitive microtrauma or overuse injury may cause mechanical impingement resulting in oedema and enlargement of the suprapatellar fat pad[2, 3].

Imaging plays a pivotal role in the diagnostic workup of AKP. In case of suspicion of suprapatellar fat pad impingement syndrome (SPIS), MRI is the preferred imaging modality. On T1-weighted images, the oedematous and enlarged fat pad is of heterogeneous signal compared to subcutaneous fat with posterior protrusion of the inner margin of the fatpad into the suprapatellar recess [2]. Size is an important aspect to take into account when evaluating the suprapatellar fat pad, by measuring the anteroposterior, craniocaudal, and oblique diameters, with the anteroposterior diameter being the most significant [3]. The normal anteroposterior diameter of the suprapatellar fat pad measures 6+/-2 mm in females and 7+/-2 mm in males [4]. Fat pad oedema is best demonstrated by high signal intensity compared to subcutaneous fat on T2-weighted images. Mass effect may result in slightly increased

Written informed patient consent for publication has been obtained.

Differential Diagnosis List: Anterior suprapatellar fat pad impingement., Anterior suprapatellar fat pad impingement, Quadriceps tendinosis, Patellar maltracking, Patella tendon lateral femoral condyle friction syndrome, Prefemoral fat pad impingement

Final Diagnosis: Anterior suprapatellar fat pad impingement.

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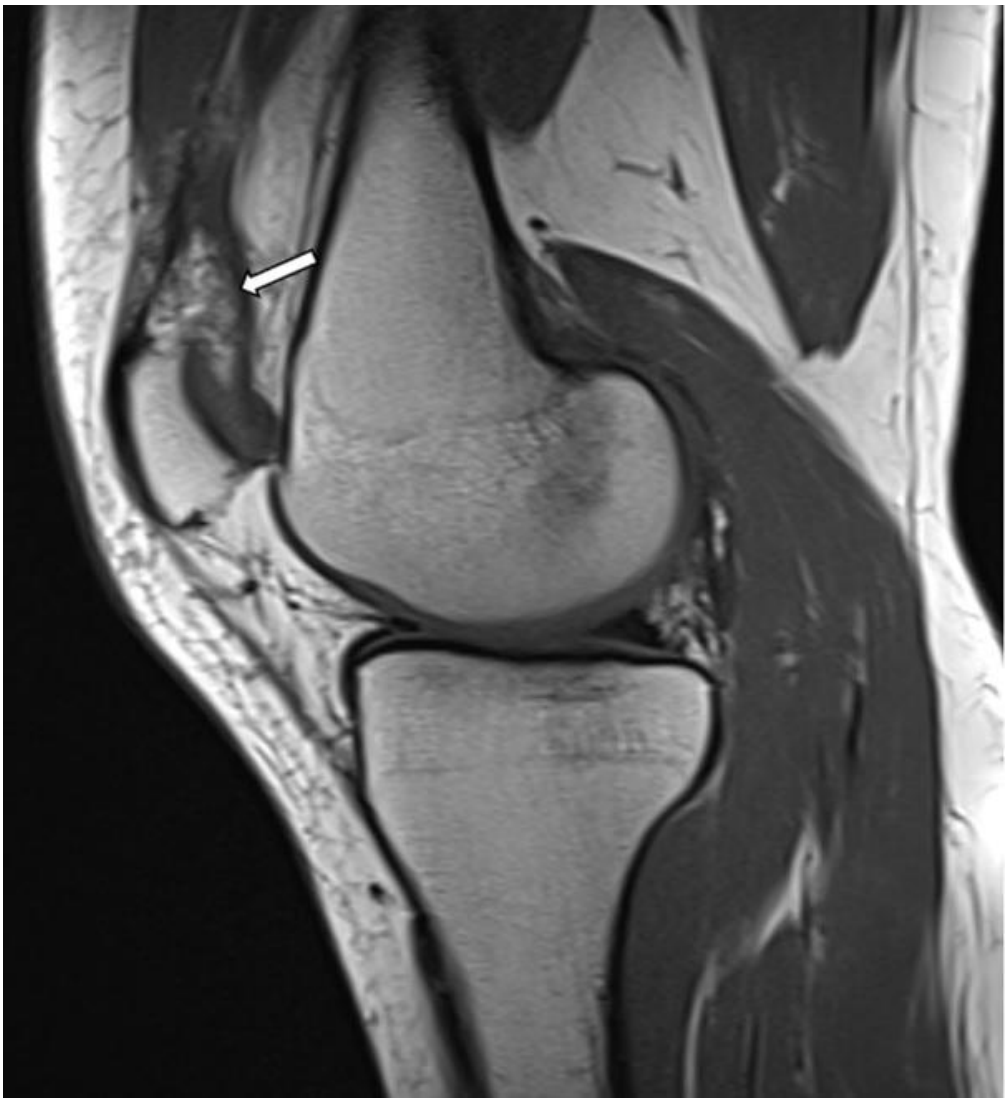
(PMID: 19546338).

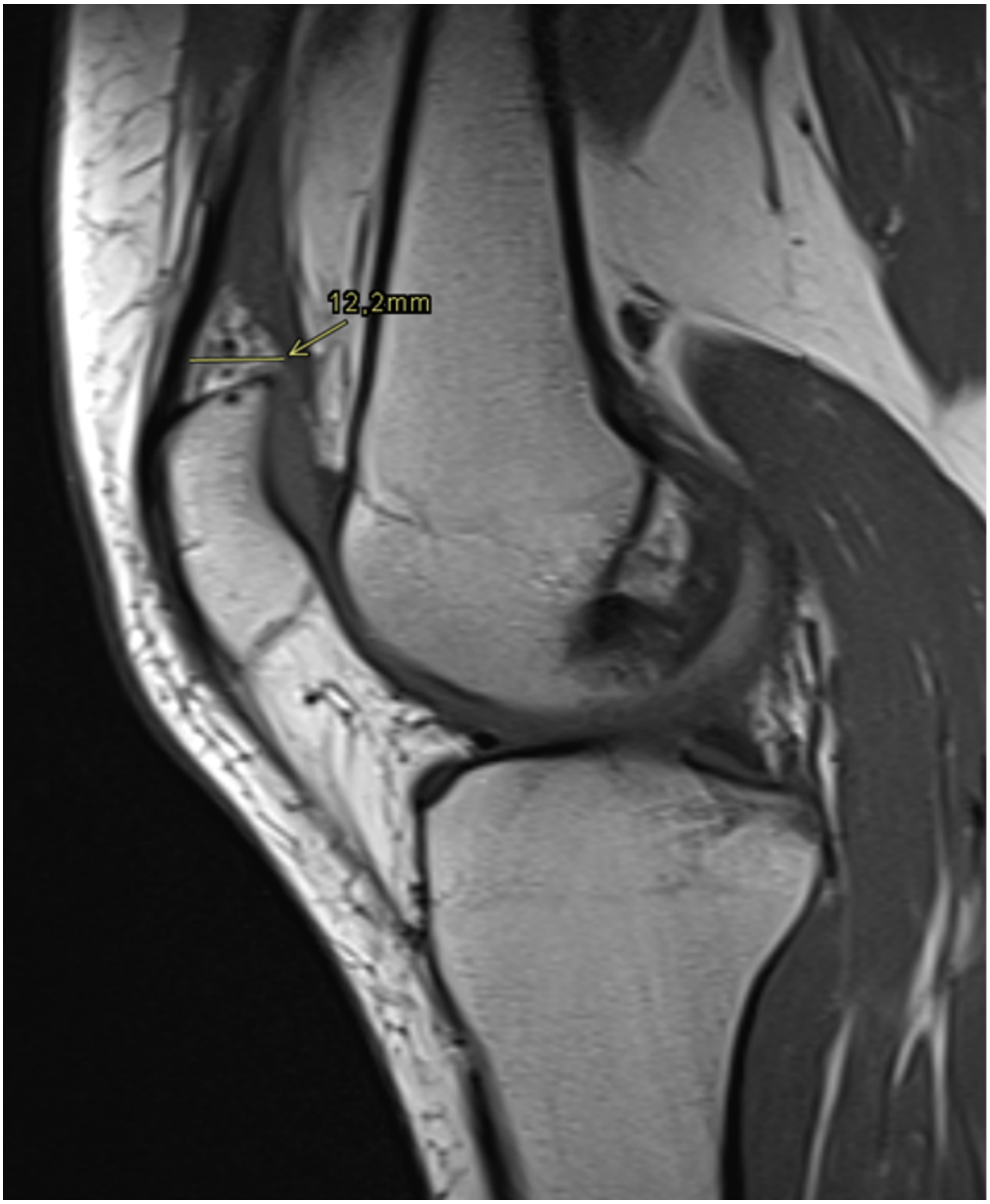
Figure 1

a



Description: Sagittal T1-weighted MR image shows heterogeneous signal intensity of the suprapatellar fat pad compared to subcutaneous fat, with a convex posterior border and mass effect on the suprapatellar joint recess (arrow). **Origin:** © Department of Radiology, Algemeen Ziekenhuis Sint-Maarten, Mechelen, Belgium,2020

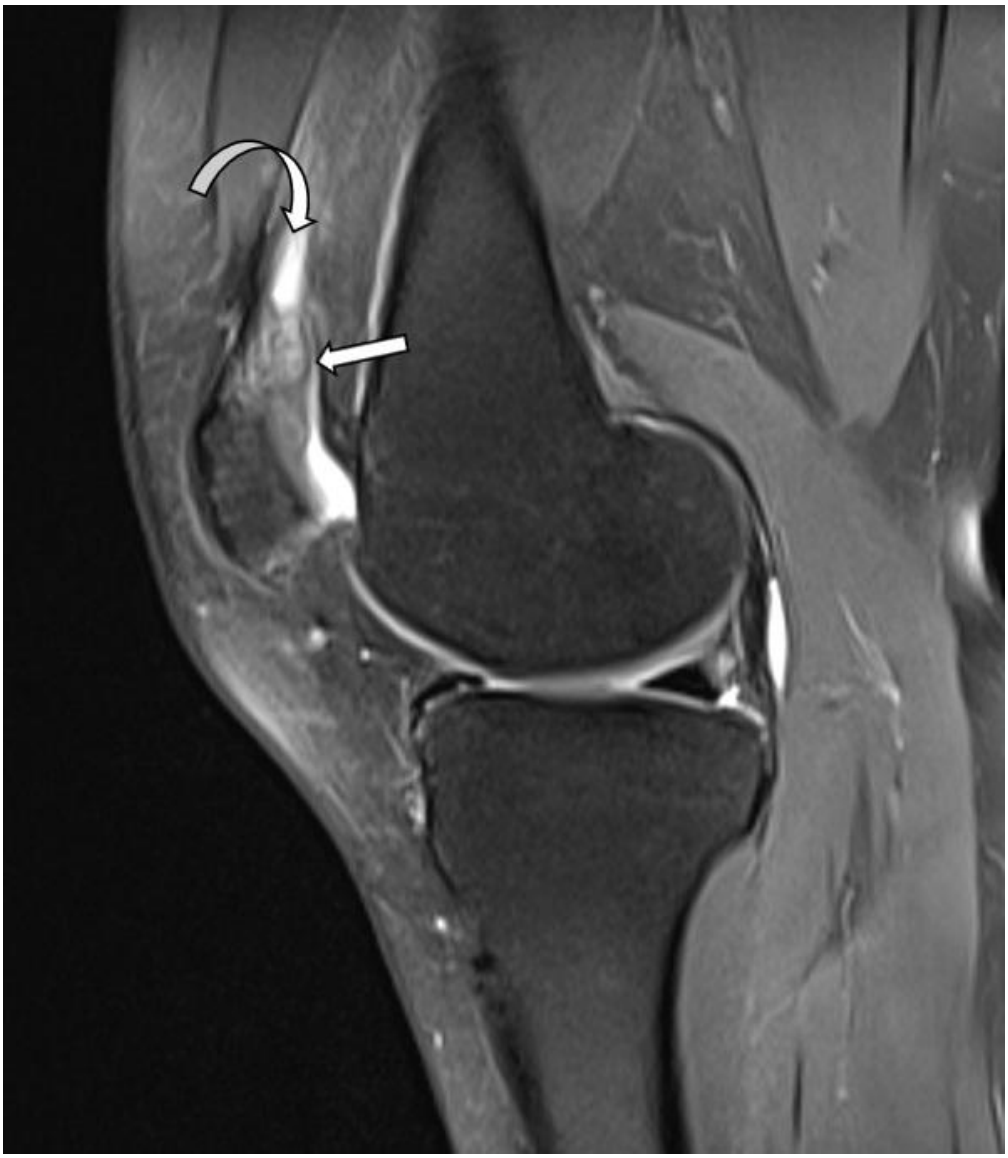
b



Description: Sagittal T1-weighted MR image shows enlargement of the suprapatellar fat pad with a maximum anteroposterior diameter of 12,2 mm. **Origin:** © Department of Radiology, Algemeen Ziekenhuis Sint-Maarten, Mechelen, Belgium,2020

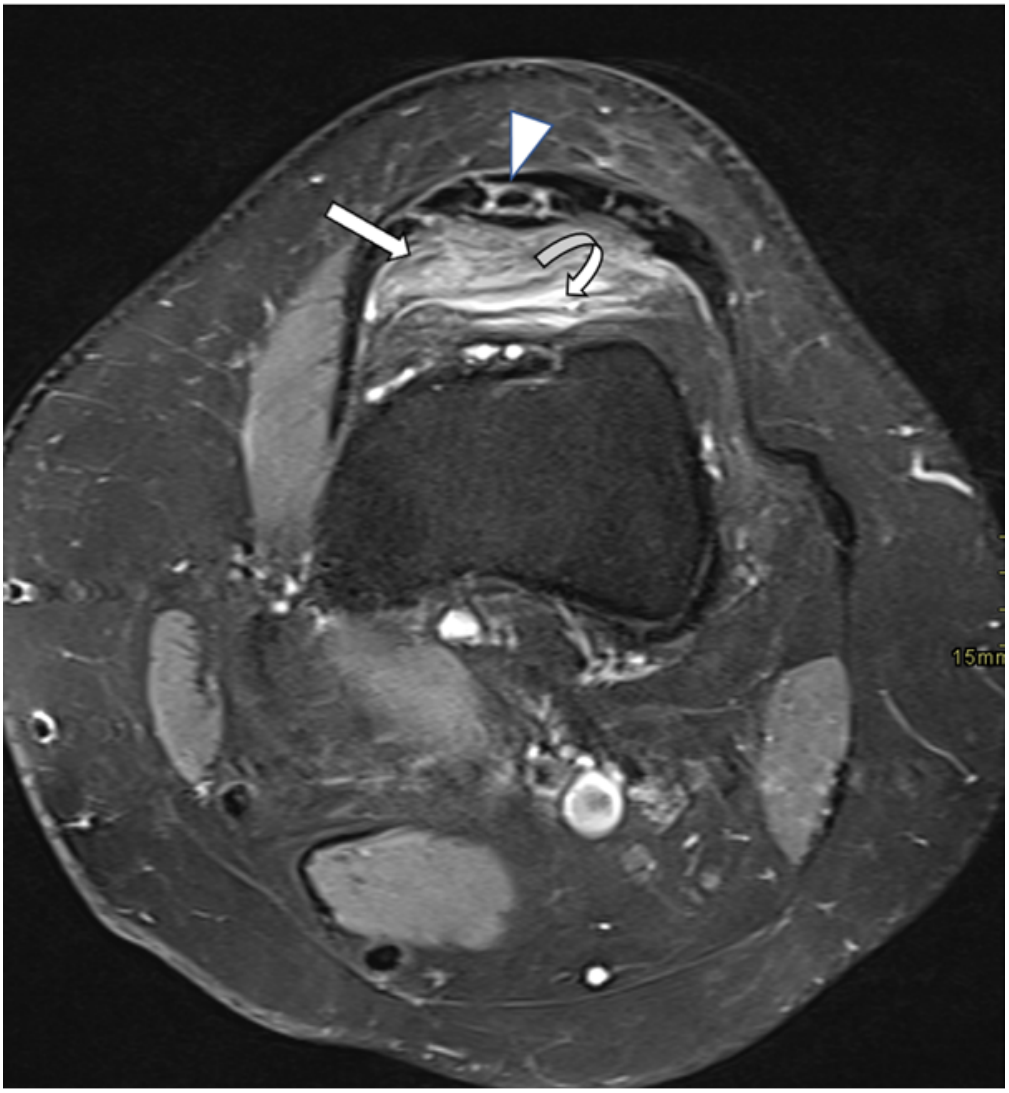
Figure 2

a



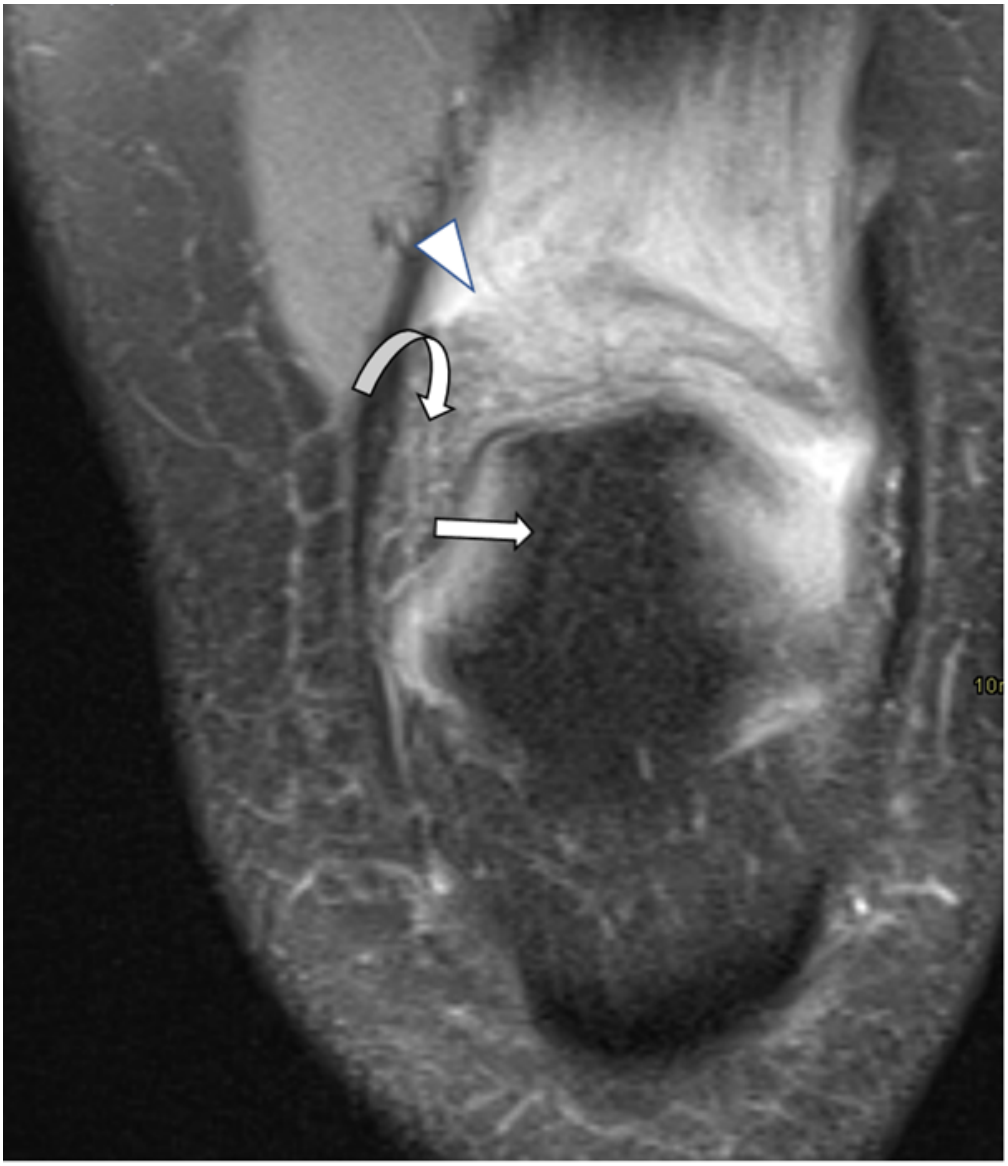
Description: Sagittal fat-suppressed (FS) T2-weighted MR image shows heterogeneously increased signal intensity compared to subcutaneous fat, enlargement and mass effect on the suprapatellar joint recess with convex posterior delineation of the suprapatellar fat pad (arrow) and slightly increased joint fluid (curved arrow). **Origin:** © Department of Radiology, Algemeen Ziekenhuis Sint-Maarten, Mechelen, Belgium,2020

b



Description: Axial fat-suppressed T2-weighted MR demonstrates a bulging edematous suprapatellar fat pad (straight arrow). Note adjacent fluid in the suprapatellar recess (curved arrow) and a normal quadriceps tendon (arrowhead). **Origin:** © Department of Radiology, Algemeen Ziekenhuis Sint-Maarten, Mechelen, Belgium,2020

c



Description: Coronal fat-suppressed T2-weighted MR image demonstrates slightly increased signal within the suprapatellar fat pad and surrounding mild joint effusion (patella=straight arrow, quadriceps fat pad=curved arrow, joint fluid=arrowhead). **Origin:** © Department of Radiology, Algemeen Ziekenhuis Sint-Maarten, Mechelen, Belgium,2020