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a core concepts musculoskeletal health group newsletter

Knee Pain: Fat Pad Irritation or Hoffa's Syndrome

Fat pad irritation (Hoffa's syndrome) is a condition that falls under the broad umbrella of knee dysfunction leading to anterior knee pain. It is a potential source of pain referral to the anteromedial knee and a source of pain in knee osteoarthritis.

Because of the proximity of the fat pad and it's surrounding structures, the symptoms of fat pad irritation is often be mistaken for patella femoral pain syndrome or patella tendinitis.

There are however signs and symptoms that are unique to an individual with fat pad irritation, allowing for the diagnosis of this condition.

Once accurately diagnosed, it is fairly simple condition to treat as long as the causative factors are recognised and managed.

Physiotherapy treatment includes local cryotherapy, taping, local muscle flexibility and strengthening exercises, and correcting lower limb biomechanics to reduce symptoms.

Mechanism of injury

The richly innervated fat pad can become irritated due to direct trauma to the anterior aspect of the knee or during the course of time.

Chronic irritation occurs when the inferior pole of the patella, tilts posteriorly, excessively leading to impingement of the underlying fat pad. This is often the result of hyperextension of the knee.

In such clients, the combined effects of hyperextension and anterior hip rotation causes the fat pad to be squashed between the femur, tibia, patella and the quad tendon.

Recurrent episodes of this will result in swelling and inflammation of the fat pad setting up the vicious cycle of increased impingement

from the patella leading to further irritation of the fat pad.

Signs and symptoms

- Patients can present with an acute or chronic complaint of a sharp pain in the infrapatella region.
- A patient will often complain of pain with walking, prolonged standing, wearing high heel shoes, in fact any activities that puts their knee into full extension.

Clinical signs of a fat pad impingement

On examination, there is obvious swelling or puffiness in the infra patella region that is also tender on palpation.

Conversely, patients will report significant relief if the inferior pole of the patella is tipped up and away from the fat pad. This is achieved by pushing the superior border of the patella posteriorly which has a see-saw effect of subsequently lifting the inferior pole of the patella. This offloads the fat pad from direct pressure from the patella, relieving symptoms.

Excessive hyperextension of the knee predisposes the knee to fat pad impingement. Anterior pelvic tilt is seen commonly in ladies wearing high heel shoes. This biomechanical position pushes the knee into hyperextension and also shorten the quadriceps specifically the rectus femoris. A tightened quadriceps pull the patella superiorly, which tilts the inferior pole posteriorly. The posterior displacement increases if the patella tendon is taut, especially in cases where the patient presents with a pre-existing patella tendinopathy. It is thus no wonder a fat pad irritation can literally be hidden behind a tendinopathy.

Biomechanical factors therefore that are worth considering that may predispose an individual to such a condition are genu recurvatum, anterior pelvic tilt, tight quadriceps.

Differential diagnosis of fat pad

Fat pad impingement can be easily mistaken as a patella tendinopathy at first glance because of the location of pain. The latter tends to produce

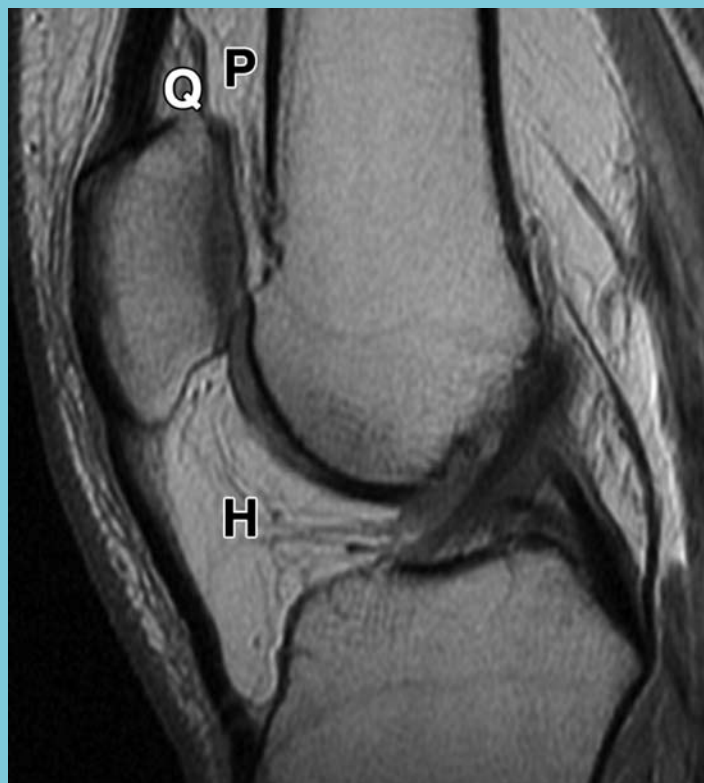


Figure 1: 37-year-old man with knee pain and small joint effusion but normal fat pads. Midsagittal intermediate-weighted MR image shows normal quadriceps (Q), prefemoral fat pad (P), and Hoffa's fat pad (H). Source: American Roentgen Ray Society

localised pain on palpation of the tendon by bending the knee, which can be done superficially with the knee in a bent position.

Pain from the fat pad cannot be as easily palpated in this position unless the palpation is deep on either side of the tendon.

Stressing the patella tendon with resistance to the quadriceps, eg doing a squat, reproduces pain to the tendon. Wearing a patella tendon band increases the pain to the fat pad but brings relief to patella tendinopathy.

Hoffa's test is a useful diagnostic test which involves palpating the infra patella region for pain. The patient is then asked to contract the quadriceps muscle, increasing the tension in the quad tendon and limiting the access to the fat pad. A reduction of pain may point to fat pad irritation over patella tendonitis.

If the pain increases with activation of quad muscles this may be more indicative of a patella tendon condition.

Management of inflamed fat pad

1. Swelling management

The initial treatment for an inflamed fat pad is to manage the swelling and inflammation. Ice can be applied to the infrapatella region for approximately 15-20 minutes, 2-3 times a day, about an hour apart especially at the end of the day. Therapeutic ultrasound with iontophoresis using anti-inflammatory gel can also help to bring down the swelling. Once the swelling reduces, the condition is a lot easier to manage as there is less chance for recurrent impingement.

2. Taping

A commonly used taping technique involves lifting up the inferior pole to offload the fat pad and prevent impingement. As shown in the pictures above, the medial and lateral border of the patella is pulled diagonally upwards to sling the patella superiorly. The superior border will be taped across horizontally to tilt the inferior pole away from the fat pad. This provides mechanical relief to the fat pad, giving it an environment to heal. The tapes may restrict knee range of movement but will be able to achieve functional range. Depending on the situation, the physiotherapist may decide to use an elastic tape like kinesio tape rather than rigid tape to off load the fat pad.

Taping techniques to prevent excessive hyperextension of the knee is also a useful option especially in the acute phase of the injury. This will aid in reducing the individuals symptoms, allowing for the other factors to be treated.

3. Stretching

The patient will also be put through a



unstable knee joint will go through an increased load thou. Strength training for the quadriceps should include stability training to improve on the control and coordination of the quadriceps.

References.

1. Brukner P and Khan K (2004) Clinical Sports Medicine. 2nd ed Anterior Knee Pain. McGraw-Hill. Chap 24 Pg 480-481.
2. Hodges PW, Mellor R, Crossley K, Bennel K, Pain induced by injection of hypertonic saline into the infrapatellar fat pad and effect on coordination of the quadriceps muscles. Arthritis Care & Research 2009. Vol 6: Issue 1: 70-77

stretching regime of the quadriceps, specifically the rectus femoris which contributes to anterior pelvic tilt and hyperextension of the knee. Myofascial release techniques can be applied to the quadriceps and patella tendon to help in off loading the inferior pole. The manual techniques help to release the tight connective tissues that otherwise will not be effectively release with stretching alone.

4. Strengthening

Progressive strengthening of the quadriceps (especially within 0-15 degrees range) with emphasis on muscle control and coordination will be prescribed to help in patella tracking, and reduce hyperextension in functional tasks and provide mechanical support to the knee.

5. Biomechanics

Other than treating the localized inflammation and realigning the patella, the biomechanical factors also need addressing. Advice to avoid heels may be recommended as the tip toe position with high heel shoes encourages the knee to hyperextend, and the pelvis to go into anterior tilt.

Hodges et al found that pain in the fat pad changes motor control of the quadriceps muscle when ascending and descending stairs. Without proper control of the quadriceps, the

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