Original article

Acute calcific tendinitis of the popliteus tendon – an unusual site and clinical syndrome

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Three cases of acute calcific tendinitis of the popliteus tendon presenting in the accident and emergency department as 'locked knee' are described. All patients presented with acute pain, flexion deformity and marked limitation of movements of the knee. All patients were unable to weight-bear on the affected side. The radiographs revealed well circumscribed calcification in two patients and faint stippled calcification in the third. All patients were referred to the next fracture clinic with a diagnosis of a mechanical problem within the knee joint due either to a 'loose body' or a meniscal tear. All patients responded to an injection of corticosteroids and local anaesthetic with immediate pain relief and lasting resolution of symptoms.

Key words: Acute calcific tendinitis – Popliteus tendon

Acute calcific tendinitis is most commonly seen in the peri-articular region of the shoulder joint affecting the supraspinatus tendon or the rotator cuff. However, the condition is well described in other sites including the hip, wrist, elbow, hand, neck and foot.^{1–4} These authors also describe calcification around the knee affecting the patellar and the biceps femoris tendon of the knee. Calcification in the medial collateral ligament of the knee following injury is well recognised.

Although acute calcification around the knee has been described previously,¹ an English literature search (including Medline) failed to reveal any report of acute calcific popliteus tendinitis. In the German literature, there is a single case of a calcifying tendinopathy in the region of the popliteus tendon in a 72-year-old woman. In this case, the calcium deposit drained spontaneously in the knee joint.⁵ The affection of popliteus tendon and the resultant clinical syndrome has not been described previously.

The clinical syndrome

The patients all presented with acute onset of pain, localised swelling, redness and marked tenderness over the lateral side of the knee, at the insertion of the popliteus tendon. There were two females and one male patient. The age range was 27–49 years (average, 35.2 years). There was no history of injury or any other predisposing factors nor was there any relevant family history. Two of the three patients woke up in the morning with acute pain in the knee and the other patient had gradual onset of pain which worsened over the next day or two. The time to presentation from the onset of symptoms varied between 1–4 days. All patients were unable to weight-bear on the affected side. Because of the pain and muscle spasm, the knees could not be extended, leading to an initial diagnosis of 'locked knee' due to an intra-articulation mechanical problem when examined by five different trainee orthopaedists.

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Figure 1 (A) Antero-posterior radiographs of the left knee of a 49-year-old Caucasian female presenting as a 'locked knee'. In the accident and emergency department, a diagnosis of 'loose body' (white arrow) was made. Radiographs revealed rounded calcific deposit at the insertion of popliteus tendon. This was effectively treated conservatively with local steroid injection, splintage and physiotherapy. (B) The same knee (LW) 1 month later. The calcific deposit has disappeared following treatment.

A tender nodule, not unlike a loose body, was palpable at the site of the popliteus tendon in two of the three cases. There were no other positive, clinical, physical signs. The radiographs revealed a dense opacity at the lateral margin of the knee joint in two patients and arguable faint stippled calcification at the same site in one patient (Figs 1A, 2 & 3).

The blood screening tests included total white cell count, ESR, rheumatoid latex test, bone biochemistry and uric acid levels were all normal.

As these patients were in agony and the diagnosis was clear both clinically and radiologically, the author did not feel any justification in delaying treatment whilst waiting for an MRI or ultrasound scan. The patients were treated by injection of 4 ml of 0.5% Marcain and DepoMedrone (20 mg) at the site of tenderness.

Relief of pain was immediate. All the patients were able to extend their knees fully while in the out-patient department. The patients were treated with Neoprin knee splints, anti-inflammatory medication (Diclofenac 50 mg tds) for 2 weeks and physiotherapy on an out-patient basis.

Within 6 weeks of treatment, all patients were normal clinically. One patient had a further radiograph taken one

month after the treatment which showed that the calcific deposit (Fig. 1B) had disappeared. There have been no recurrences.

Discussion

Holt and Keats,¹ in a review article entitled *Calcific tendinitis: review of the usual and unusual*, described calcification of the quadriceps femoris tendon, patellar ligament and biceps femoris tendon. When the acute calcification occurs in quadriceps femoris or patellar insertion, the clinical picture is similar to that seen in gout or septic arthritis of the knee. When the calcification occurs in biceps femoris tendon, the resultant tendinitis may be associated with pain resembling sciatica as the long head of the biceps femoris runs laterally across the sciatic nerve. Alternatively, if the calcification occurs at the insertion of biceps femoris over the fibular head, localised pain and tenderness at the site of its attachment over the fibular head may be present. Radiographs may reveal calcific deposits or stippled calcification in the affected tendon. Relief of 'sciatic pain' following surgical

Figure 2 Antero-posterior view of left knee of a 31-year-old Caucasian woman presenting as a locked knee. She woke up with sudden onset of acute pain in the left knee. There was a history of minor injury to the left knee whilst playing with the children on the previous night. The radiograph was incorrectly interpreted as 'loose body' (white arrow) due to an avulsion fracture. Acute calcific tendinitis of popliteus tendon was treated with injection of Marcain and steroid with immediate relief.

removal of calcific foci from the tip of fibular head (biceps femoris) has been described in a patient.⁶

In contrast, when unusually the popliteus tendon is the site of acute calcification, then it presents with an acutely painful flexed knee due to severe spasm of the affected popliteus muscle giving an erroneous impression of a locked knee leading to a miss-diagnosis of a mechanical problem within the knee joint.

Calcific tendinitis most commonly affects the tendons around the shoulder. The supraspinatus tendon is the most frequent site of involvement. The calcium hydroxyapatite crystal deposits may be located within the tendon in the peri-articular muscular attachments. The most frequently associated symptom is pain. There is an acute inflammatory reaction with local swelling, redness and exquisite site tenderness. The presenting symptoms of acute pain and localised inflammatory signs are similar in both acute popliteus and supraspinatus tendinitis. Due to acute spasm of the popliteus tendon, the patient presents as a 'locked knee' and any movement of the knee is extremely painful. The resolution of symptoms in the

Figure 3 Antero-posterior view of right knee of a 27-year-old Caucasian male presenting as locked knee in the accident and emergency department. He woke up with acute pain 4 days previously. There was localised exquisite tenderness over the insertion of popliteus tendon and radiographs were thought to be suggestive of faint stippled calcification. He was incorrectly diagnosed in the accident and emergency department to have suffered a meniscal tear. Acute popliteus tendinitis was effectively treated with local steroid injection, splintage and physiotherapy

case of acute popliteus tendinitis was immediate in all cases described here. Whereas, in cases of acute supraspinatus tendinitis, on occasion needle aspiration of calcium deposits becomes necessary and the resolution of symptoms is slower. The radiographic changes in both popliteus and supraspinatus tendinitis are similar. The supraspinatus calcific deposit may become hidden behind the internally rotated humeral head and may not be apparent on the radiographs unless special views are obtained. Similarly, when the calcification is present in the

proximal part of the popliteus tendon (rather than at its insertion in the lateral femoral condyle), it may not be seen on the radiographs as it is hidden behind the femoral condyle due to popliteus spasm and resultant flexion of the knee.

Whatever the site of calcification, the acutely painful phase of the disorder is thought to occur as the organic matrix binding the calcific deposit disintegrates and stimulates an inflammatory response and phagocytosis.^{7,8} Various theories as regards the mechanism of origin and resolution of calcium deposits have been described. These include response to injury and healing by calcification,⁹ local stress necrosis,¹⁰ and local hypoxia secondary either to mechanical or vascular factors.⁷ The prevalence and possible pathological significance of calcium phosphate salt accumulation in tendon matrix degeneration was studied by Riley *et al.*¹¹ Their study suggests that 'dystrophic calcification' of degenerative tendon matrix is a pathological entity distinct from cell-mediated 'calcifying tendinitis'. The exact mechanism of its pathogenesis, however, remains unclear.

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