

# Pseudogout: A Rare Cause of Acute Arthritis Following Arthroscopic Anterior Cruciate Ligament Reconstruction

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We report a case of an acute pseudogout attack following single-bundle anterior cruciate ligament (ACL) reconstruction in a 35-year-old man. At the initial reconstruction surgery, he was found to have early degenerative changes mainly in the lateral compartment. He presented with acute onset pain and swelling following reconstruction of the ACL. Arthroscopic irrigation was performed and the synovial fluid was positive for calcium pyrophosphate crystals. A pseudogout attack must be considered in the differential diagnosis in cases of acute onset pain and swelling after arthroscopic surgery, especially with the background of degenerative knee changes, and this may signify a poorer long-term outcome.

**Keywords:** Knee, Arthritis, Pseudogout, Anterior cruciate ligament, Reconstruction

Pseudogout is a condition where crystals of calcium pyrophosphate dihydrate (CPPD) are deposited within a joint<sup>1</sup>. Calcification of cartilage in the knee is the most common finding as a result of CPPD deposition<sup>2</sup>. Pseudogout classically presents with symptoms of acute or chronic inflammation of a joint<sup>3</sup>, but patients can often be asymptomatic<sup>1</sup>. In a postoperative patient, the presentation of an attack of pseudogout can be identical to that of a septic arthritis<sup>1</sup>. We present a report of a rare case of pseudogout attack in a patient after anterior cruciate ligament (ACL) reconstruction. The common features, presentation and diagnostic difficulties are discussed.

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## Case Report

A 35-year-old man underwent ACL reconstruction of the right knee with hamstring tendons and partial lateral meniscectomy for a meniscal tear. Magnetic resonance imaging scan showed moderate osteoarthritic changes and a subchondral cyst in the central portion of the lateral femoral condyle (Fig. 1). At arthroscopy, he was found to have degenerative chondral changes in the lateral compartment, mainly on the tibial side. The medial meniscus showed evidence of previous partial meniscectomy that had been performed six years previously. He responded well initially and underwent a physiotherapy rehabilitation program.

At six weeks after surgery, he presented with a two-day history of pain and swelling in the knee. He did not report any locking or giving way, or a new injury. Clinically, he had a severe effusion in the knee, but he was able to bear weight with some discomfort. He had a limited range of movement with only 10°–90° of knee flexion; further movements were restricted by pain. The arthroscopic portals were well healed. Plain radiographs showed no chondrocalcinosis. Although he was afebrile, the inflammatory markers were raised, with the erythrocyte sedimentation rate and C-reactive protein levels at 110 mm/hr (normal range,

1 to 7 mm/hr) and 130 mg/L (normal range, 0.1 to 6 mg/L), respectively. He underwent an arthroscopic joint washout of the knee. The graft was found to be intact (Fig. 2), and there was no chondrocalcinosis of the menisci. He had no new arthroscopic findings in terms of degenerative changes. The synovial fluid was straw-colored and grew no organisms or culture but was positive for calcium pyrophosphate crystals on microscopic examination. The fluid was obtained at the time of washout, as given the amount of swelling and raised inflammatory markers, it was considered more appropriate to improve the patient's symptoms even if the diagnosis proved not to be septic arthritis.

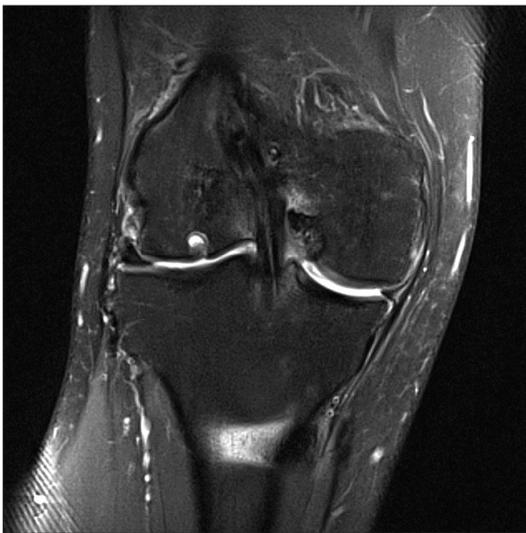
He was treated with non-steroidal anti-inflammatory drugs (Diclofenac) and his pain improved. Unfortunately, he did not follow the full postoperative physiotherapy rehabilitation and did not attend clinic appointments. One year later, he presented with

continuing pain in the knee. A further arthroscopy at that time was performed to debride the knee and alleviate the pain, which showed the graft had incorporated well but degenerative changes had progressed to involve both the lateral and patellofemoral compartments (Fig. 3).

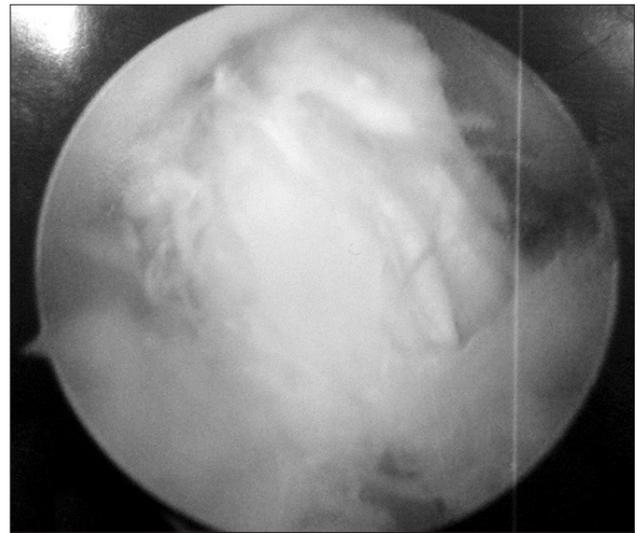
## Discussion

Acute onset of pain following an ACL reconstruction can raise the possibility of infective arthritis. In our case, the knee was washed out and the synovial fluid was positive for pseudogout crystals.

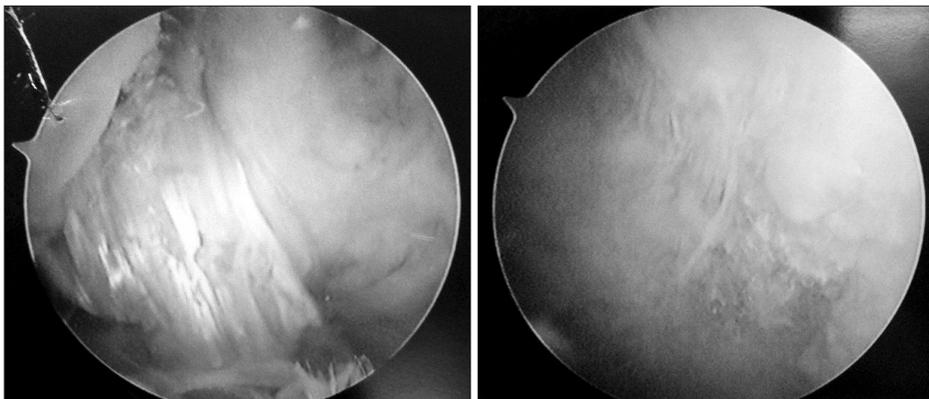
Pseudogout is characterised by the deposition of CPPD crystals in the synovial fluid or menisci. It usually presents in one or multiple large joints, with severe joint pain, redness and swelling due



**Fig. 1.** Coronal magnetic resonance imaging scan of the knee showing abnormal bone in the lateral femoral condyle and the adjacent tibial plateau.



**Fig. 2.** Arthroscopic image obtained during knee washout after anterior cruciate ligament reconstruction showing the intact graft.



**Fig. 3.** Arthroscopic images obtained one year after anterior cruciate ligament (ACL) reconstruction showing the ACL graft fully incorporated and intact, and extensive cartilage loss over the trochlear region.

**Table 1.** Comparison of Our Case with a Previously Reported Case of Pseudogout Following Anterior Cruciate Ligament Reconstruction

Variable	Minezaki et al. <sup>2)</sup>	Our case
Age (yr)	34	35
Sex	Female	Male
Knee observations	Medial meniscal tear	Lateral meniscal tear, chondral changes in lateral
Graft used	Leeds-Keio artificial ligament	Hamstring tendons
Time of presentation	Seventeen months post-operative	Six weeks post-operative
Presentation	Pain and occasional effusion in the right knee	Sudden onset of pain and swelling in the knee
Diagnosis method	Microscopic joint fluid examination, radiographs	Microscopic joint fluid examination
Treatment	-	Non-steroidal anti-inflammatory medications

to effusion<sup>1-4)</sup>.

Several causes of CPPD deposition have been proposed, with its occurrence being classified as either primary (non-traumatic) or secondary (traumatic). Primary deposits are thought to be due to a metabolic cause, such as hyperparathyroidism and haemochromatosis where crystallization occurs within the synovial fluid<sup>2,5,6)</sup>. Secondary deposits are more likely to occur in the presence of degenerative knee changes as a result of trauma and surgery<sup>2)</sup>. It has been proposed that the mechanism for this is either that the crystals are liberated or 'shed' from preformed deposits within the joint or alternatively that an intra-articular insult may trigger their formation<sup>2,5)</sup>.

Symptoms of acute pseudogout are similar to that of septic arthritis<sup>1)</sup>, which poses diagnostic difficulties. Investigations such as joint aspiration, synovial fluid microscopic examination and microbiological culture as well as radiological imaging may help in the diagnosis<sup>1)</sup>. Where doubt exists, arthroscopic washout of the knee is performed.

Pseudogout attack following an ACL reconstruction is a very rare event with only one previous report having been described (Table 1). Minezaki et al.<sup>2)</sup> described a 34-year-old female who was found to have calcification of the medial and lateral meniscus due to CPPD at 17 months after ACL reconstruction. Our report seems to be the first presentation of an acute pseudogout attack in the early postoperative period following ACL reconstruction. One can only postulate why such an attack occurs. We suggest that it may be that the trauma of surgery (including notch debridement and drilling of the femoral and tibial tunnels), when superimposed on pre-existing degenerative changes, can precipitate an acute attack, and that pseudogout attack may signify the progression of degenerative changes and a poorer outcome in the

long-term.

In summary, pseudogout must be considered as a differential diagnosis of acute onset pain following ACL reconstruction, especially in a knee with pre-existing degenerative changes.

### Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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