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Mucoid Degeneration of Posterior Cruciate Ligament – A Case Study

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Learning Point of the Article:

Posterior Knee pain even after conservative treatment needs thorough examination and radiological evaluation and should not be neglected and mucoid degeneration of PCL may be one of the causes.

Abstract

Introduction: Mucoid degeneration of the cruciate ligament is a well-known entity, but symptomatic lesions are rare. It is even rarer to find symptomatic posterior cruciate ligament mucoid degeneration than the anterior cruciate ligament.

Case Report: A 63-year-old male presented to our hospital complaining of posterior knee pain was induced when the knee approached full flexion without episodes of trauma, despite conservative treatment over the preceding 8 months, his symptoms persisted. Physical examination of the right knee revealed on terminal flexion and cross-leg sitting pain get exaggerated. Right knee ROM 0–110° and a further terminal flexion was limited and painful. On ligament examination, posterior sagging and Lachman test were negative, and no clinical finding indicative of ligament insufficiency was noted. Magnetic resonance imaging showed a diffusely thickened posterior cruciate ligament with increased signal intensity on the T2-weighted sequence. A intact PCL fibers were observed with continuous margins from origin to insertion. Based on the patient's history and the magnetic resonance imaging findings, we suspected mucoid degeneration of the posterior cruciate ligament as the cause of the patient's symptoms. Since conservative treatment had failed to relieve the symptoms, arthroscopic treatment was indicated. Arthroscopic examination revealed yellowish crumbly tissues along the thickened posterior cruciate ligament. Tension and bulk of the posterior cruciate ligament were well preserved. Curettage of degenerative tissue and decompression of the posterior cruciate ligament resulted in symptom relief without instability of the knee joint. We did a notchplasty of the medial wall and roof to accommodate the posterior cruciate ligament and avoid impingement.

Conclusions: Arthroscopic decompression of the posterior cruciate ligament may relieve knee pain and facilitate early return with good functional results.

Keywords: Mucoid degeneration of PCL, posterior knee pain, arthroscopic decompression of PCL

Introduction

Mucoid degeneration of the anterior cruciate ligament (ACL) is a benign knee pathology with a frequency of 1.8–5.3% [1-8]. Prevalence in magnetic resonance imaging (MRI) is 1.8–5.3%, but not all lesions are symptomatic. Mucoid degeneration of ACL is more common and literature has also reported many cases, but for PCL only a few cases have been reported in English literature. Because unlike meniscal tears and chondral defects, reported mucoid degeneration of PCL is a rare cause of knee pain. However, there are some situations that make knee pain. We herein describe a case of PCL mucoid degeneration presented with impingement symptoms.

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Author's Photo Gallery


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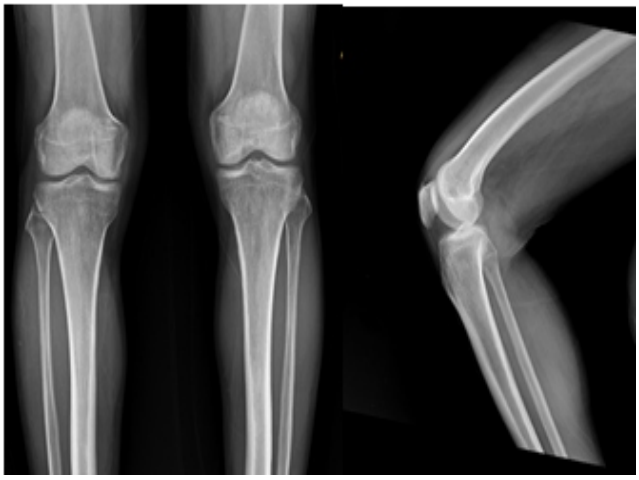

Figure 1: X-ray AP/lateral normal.

Case Report

A 63-year-old male presented to our hospital complaining of posterior knee pain was induced when the knee approached full flexion without episodes of trauma. Despite conservative treatment over the preceding 8 months, his symptoms persisted. Physical examination of the right knee revealed on terminal flexion and cross-leg sitting pain get exaggerated. Right knee ROM 0–110° and a further terminal flexion was limited and painful. On ligament examination, posterior sagging and Lachman test were negative, and no clinical finding indicative of ligament insufficiency was noted. The radiograph of the knee was normal (Fig. 1). Magnetic resonance imaging (MRI) revealed longitudinal increased signal intensity area within the PCL on T2-weighed images with an adjacent defined rim of hypointense PCL fibers (Fig. 2). The characteristics of those images were coincident with a "Tram-Track" appearance according to the description by McMonagle et al. [3]. Based on the patient's history and the MRI findings, we suspected mucoid degeneration of the PCL as the cause of the patient's symptoms. Since conservative treatment had failed to relieve the symptoms, arthroscopic treatment was indicated. On arthroscopic observation, the yellowish tissue was present in deeper regions while retention of fluid was not observed within the ligament substance. Arthroscopic treatment consists of PCL reduction-plasty by debridement of yellowish material in the PCL fiber and radiofrequency ablation (RFA) proves to reduce the volume of the hypertrophied PCL (Fig. 3 and 4). The goal was to return the PCL to its original volume. Tension and bulk of the PCL were well preserved. Other intra-articular tissues such as ACL, menisci, and cartilage were intact. The PCL tissue was split, and evidently, degenerated tissue was carefully removed while meticulous care was taken to preserve the longitudinal fiber of the PCL. We restricted curettage when the thickness of PCL decreased because the extensive curettage would cause damage of PCL tensions. We did medial wall notchplasty and checked again for impingement in flexion and extension. After the arthroscopic procedure, the Lachman test was negative ruling out instability. The meniscus was normal. The cartilage of the femoral condyle and patella was normal.

Post-operatively, the patient was allowed to bear full weight on the following day. Rehabilitation protocol included early motion and quadriceps strengthening exercises.

Discussion

The true incidence of PCL mucoid degeneration is difficult to assess because it is, as in our patient population, typically asymptomatic and incidentally noted. As a point of reference, Bergin et al. reported that the incidence of ACL mucoid

Figure 2: (A) Diffusely thickened and characteristic homogenous longitudinal increased signal intensity in the PCL on T2 image with an adjacent well-defined intact rim of hypo-intense PCL fibers giving tram track appearance. (B) The fibers of the PCL were continuous from origin to insertion. (C) Coronal image showing crowding in notch occupied with ACL and Mucoid PCL. (D) Axial image showing impingement due to mucoid PCL with homogenous appearing ACL.

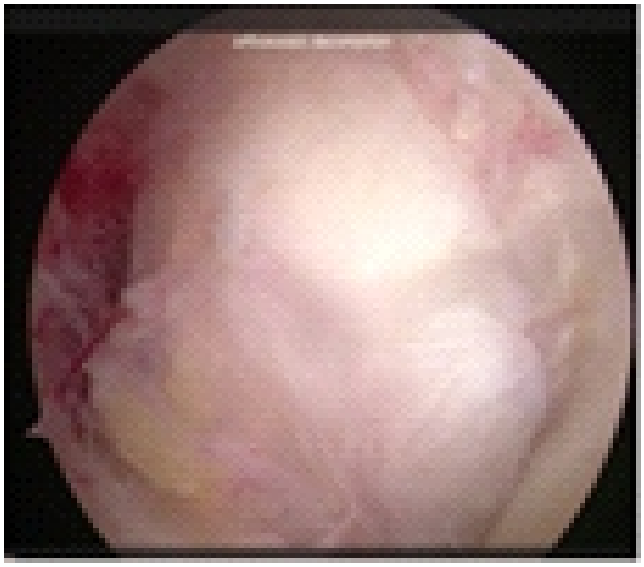

Figure 3: Arthroscopic image showing A. The grossly thickened PCL.

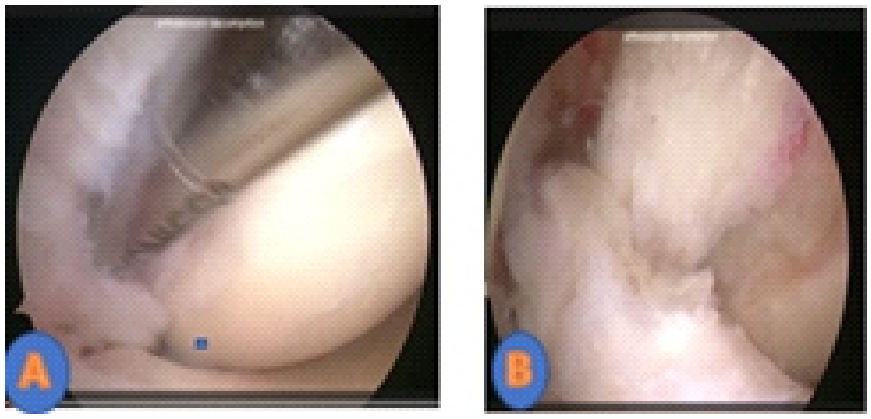

Figure 4: Arthroscopic image A showing notchplasty of medial wall and roof with burr B. ACL and PCL after partial debulking of PCL and notchplasty.

degeneration is 1.0% (44/4221) compared with an incidence of PCL mucoid degeneration in reference was 0.1% (14/12972) [4, 9]. Mucoid degeneration of PCL has been described before and there are few case reports but these cases are of asymptomatic patients or with PCL symptoms in terms of pain on flexion with restricted terminal flexion [5, 7]. Mucoid degeneration of PCL can produce symptoms of pain on flexion or restricted terminal flexion. Our patient presented with pain on terminal deep flexion after 110°. MRI images in the sagittal plane showed PCL is thickened and characteristic homogeneous longitudinal increased signal intensity in the PCL in all planes on proton density and T2 images with an adjacent well-defined intact rim of hypo-intense PCL fibers that give the PCL a tram-track appearance and on coronal images notch is crowded with hypertrophic PCL. Thickened PCL with a yellowish hue are characteristic and the PCL was led with a yellowish substance. The yellowish hue was not liquid, but a fibrous tissue like ACL mucoid degeneration as described in reports on ACL mucoid degeneration [6, 10]. We debride a yellowish substance to debulk a PCL as precisely as possible to avoid posterior instability with medial wall notchplasty. Debulking of PCL hue resulted in immediate pain relief in full flexion and improved range of motion without instability. At 1 year follow-up, the patient remains asymptomatic without instability.

Conclusion

Almost Mucoid degeneration of the posterior cruciate ligament may be asymptomatic, but in the case of PCL mucoid degeneration with pain and restriction in terminal flexion, enlarged PCL can make impingement in the femoral notch with ACL. Then, Partial debulking surgery of PCL is an effective treatment to pain relief and restoring the range of motion of the knee.

Clinical Message

Posterior cruciate ligament mucoid degeneration may be a cause of posterior knee pain and even after conservative treatment the pain may not subside. Arthroscopic decompression may be a good treatment in those cases.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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