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Case Report

A rare case of bony avulsion of posterior cruciate ligament from its femoral attachment

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Case report

A 32-year-old male patient had sustained injury to the right knee one year back following a road traffic accident. He had developed haemarthrosis. On initial evaluation at another center, he was found to have fracture of intercondylar eminence of the right tibia. MRI right knee was reported as a chip fracture intercondylar eminence, a complete anterior cruciate ligament (ACL) tear, and a partial PCL tear. Individual was offered arthroscopic evaluation; however, he refused for the same. Haemarthrosis was aspirated and the limb was immobilized for four weeks followed by knee physiotherapy.

He continued to have pain, difficulty in running, restricted flexion of right knee with difficulty in squatting, and presented at our institution for evaluation. There was no history of instability or locking episodes.

On evaluation, there was no effusion or tenderness. Thigh was wasted. Knee flexion was restricted to 110°. Extension was full. Movements elicited palpable crepitus. Varus and valgus stress were normal. Grade II posterior tibial translation and loss of anterior tibial step were present. Dial test was negative. Grade I ACL laxity was present on anterior drawer and Lachman tests. The clinical findings more or less correlated with the initial MRI findings.

Plain radiographs showed a displaced bony fragment in the intercondylar notch (Fig. 1).

Arthroscopy revealed a bony fragment in the notch which was restricting full flexion of the knee (Fig. 2). Few anterolateral fibers (approx. 20%) of the PCL were still attached to this loose fragment. This fragment was separated from the lateral aspect of the medial femoral condyle. Corresponding defect in the medial femoral condyle was found. Rest of the PCL was attached to the femoral condyle. There was partial

Introduction

Posterior cruciate ligament (PCL) injury in adults is usually a mid-substance rupture or a tibial avulsion. Although few cases of PCL avulsion from femoral insertion have been reported in children, such injury pattern is extremely rare in adults. Injury from the femoral side is usually a 'peel off' lesion which is a soft tissue disruption from femoral attachment without bony injury. PCL femoral avulsion with bony fragment is extremely rare. Only five cases of such PCL bony avulsion from its femoral attachment have been reported in adults. We present an extremely uncommon case of a PCL avulsion fracture from the femoral insertion in an adult presenting as a symptomatic bony fragment in the intercondylar notch.

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Fig. 1 – Plain radiographs of the knee showing bony fragment in the region of intercondylar notch.

Fig. 2 – Bony fragment in the intercondylar notch. Few PCL fibers were attached to this fragment.

tear of the ACL near its femoral origin. Both menisci were normal. Degenerative changes were present over the lateral tibial plateau and the patellofemoral articulation (Fig. 3).

This fragment was carefully dissected off from the PCL fibers and was removed by enlarging the medial portal. As the

patient was not symptomatic with instability and there were only partial tears of PCL and ACL, reconstruction was not performed. This fragment was approximately 3 cm × 2 cm and 6 mm thick (Fig. 4). The individual regained full knee flexion postoperatively aided with physiotherapy. At one-year follow-up, the individual remained pain-free with full knee movements. He was comfortable in most low-level daily activities with brace support without any instability. He had difficulty in performing sporting activities and clinically had ACL and PCL laxity as before but opted to continue with bracing and restricted activity level.

Discussion

Injuries to the PCL usually involve mid-substance or tibial insertion and, rarely, avulsion from the femoral insertion. Few cases of avulsion of PCL from its femoral attachment in children have been published in literature.¹⁻³ Literature search in pubmed revealed only five cases of PCL avulsion from medial femoral condyle in adults.

Fig. 3 – The fragment re-approximated to the corresponding defect in the medial femoral condyle.

Fig. 4 – The excised avulsed fragment was approximately 3 cm long × 2 cm broad × 6 mm thick.

Gregory et al.⁴ noted that the incidence of isolated PCL injury in 222 acutely injured knees was rare (3.5%, 3 of 85 knees with associated PCL injuries). Majority had a mid-substance PCL tear with only two knees having a tibial avulsion injury. Only one knee had an injury near the femoral attachment (but not avulsion). In 1950, O'Donoghue⁵ reported the case of a 20-year-old patient with MCL tear from femoral origin, ACL tear at its tibial insertion, and PCL tear from its femoral origin. However, it was not clear whether this PCL injury was a femoral 'peel off' or a bony avulsion. In 1975, Drucker and Wynne⁶ reported a case of PCL avulsion from femur with a small fragment of bone attached to the detached PCL.

In 2005, Park et al.⁷ reported a case of a 42-year-old man with an avulsion of PCL from its femoral attachment along with ACL avulsion from tibia. In 2009, Lee et al.⁸ reported a case of a 22-year-old soldier in which imaging had revealed bony fragments and an osteochondral defect in the medial femoral condyle which on arthroscopic evaluation was found to be originated from medial femoral condyle with a connection to the PCL fiber. In 2012, Xu et al.⁹ reported an avulsion of the PCL from femoral origin in a 22-year-old man.

In the present case, a large fragment avulsed from the medial femoral condyle with fibers of the PCL attached to it. There was a defect in the medial femoral condyle corresponding to the size of the avulsed fragment. This avulsed fragment was lying in the notch and restricting knee movements. Such large avulsion fracture of PCL from the medial femoral condyle has never been reported earlier.

Clinical significance: Bony fragments in the notch may include ACL avulsion from tibia, osteochondritis dissecans, chondromatosis, calcified meniscal loose body, broken osteophytes, and PCL tibial avulsion. Present case of PCL avulsion from the femoral side also presented as a bony fragment in the notch. This injury was not recognized initially and was even missed on MRI. Such large bony fragments can be fixed if recognized early. In present case, it developed a nonunion which was restricting full flexion and warranted excision. During removal of a bony fragment from the notch, this injury pattern should be remembered and if recognized then the fragment should be carefully dissected so as to prevent unnecessary damage to PCL.

Conflicts of interest

The authors have none to declare.

Appendix A. Supplementary data

Supplementary video related to this article can be found, in the online version, at [doi:10.1016/j.mjafi.2015.11.014](https://doi.org/10.1016/j.mjafi.2015.11.014).

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