

Treating Avulsion fractures of the PCL tibial insertion by Posterior Approach – A Case Report.

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Abstract

Introduction: The posterior cruciate ligament is one of the four major ligaments of the knee. It connects the posterior intercondylar area of the tibia to the medial condyle of the femur. In the quadruped stifle (analogous to the human knee), based on its anatomical position, it is referred to as the caudal cruciate ligament. The posterior cruciate ligament (PCL) acts as a primary restraint against posterior displacement of the tibia on the femur. Conservative treatment, with distraction of the fracture components, commonly results in nonunion and may predispose to late functional instability of the knee.

Case presentation: 35 yrs old male presented to our OPD with pain over right knee following RTA. X-ray showed avulsion fracture of the posterior aspect of the tibial plateau suggesting PCL injury. Surgery was performed through posterior approach and fracture fragment was fixed with 3.5 mm cannulated cancellous screw.

Conclusion: The patient had full range of motion at the knee joint with no residual instability. The technique is easy with all good results without any complications.

Keywords: PCL, Cannulated, Cancellous.

Introduction

Avulsion fractures of the posterior cruciate ligament (PCL) are uncommon. The most common mechanism of avulsion fractures of the PCL at the tibial insertion is a dashboard injury, in which the knee is in a flexed position, and a posteriorly directed force is applied to the pretibial area [1]. Many studies have demonstrated that the chronic PCL insufficiencies may result in medial and patellofemoral compartments, degenerative arthritis and increased risk of meniscal tear [2,3]. The management of an isolated PCL intrasubstance tear is still controversial. However, in cases with the bony avulsion of PCL of the tibia, surgical treatment is strongly indicated to avoid the morbidities associated with the nonunion of this fracture [4].

Case Report

35 year old male, labourer by occupation, resident of Dhule; underwent RTA and presented to our OPD with pain over right knee.

On examination, the patient had swelling, tenderness and instability over right knee. X-ray right knee AP / Lateral, left oblique and right oblique views (Fig1) were done which showed avulsion fracture of the posterior aspect of tibia indicating PCL avulsion fracture. MRI was done for further confirmation (Fig 2 & 3). The patient was given above knee slab. Once the patient was haemodynamically stable and medically fit surgery was performed. A lazy s-shaped incision (Fig 7) was taken over the posterior aspect of the knee joint (popliteal fossa). All the structures were retracted and bone was reached. The fracture fragment was identified, was placed on its bed and was fixed with a k-wire. A 3.5 mm cannulated cancellous screw was used for fixation and k-wire was removed. The wound was closed in layers and above knee slab was given for 3 weeks. Quadriceps exercises were started from post operative day 1. Post operative X-ray showed stable fixation (Fig 4). Knee bending was started at 3 weeks and full weight bearing at 6 weeks with short hinge knee brace. The patient was assessed for instability at 1 month follow-up

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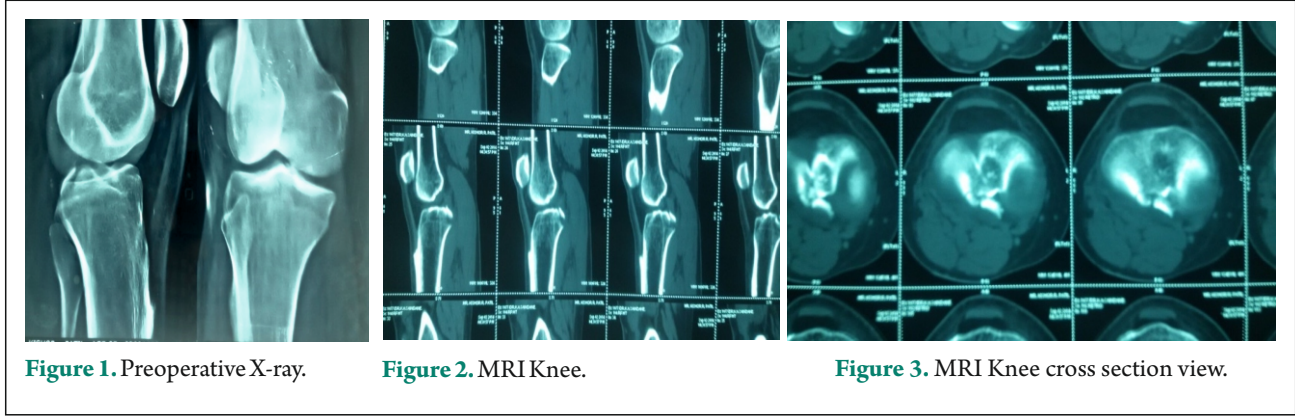


Figure 1. Preoperative X-ray.

Figure 2. MRI Knee.

Figure 3. MRI Knee cross section view.

and there was no instability at the knee joint. The patient then returned to his routine work without any complaints and full range of motion (fig 5 & 6).

Discussion

Successful PCL reconstruction is still a challenge because of its complexities in structures and variable reconstruction techniques. The clinical outcomes have been inconsistent and dependent on the injury condition. PCL injury is frequently associated with multiple ligamentous injuries. The PCL plays an important role in the posterolateral stability of the knee, and its injury may cause mild to moderate instability. Avulsion fractures of the tibial insertion of the PCL represent a small subgroup of the spectrum of injuries to this ligament and are believed to occur more frequently in the younger patient [5].

Posterior approach allows for direct visualization of the neurovascular structures. A limited distal arthrotomy exposes the fracture and allows for direct reattachment of the avulsed component. However, this approach has risk involved in it as the complex anatomy in the popliteal fossa can be injured during dissection. Postoperative swelling due to tissue edema may increase interstitial pressure with the development of a compartment syndrome. Retraction of the soft tissues during surgery may lead to a traction neurapraxia of the common peroneal nerve. But inspite of all these complications, posterior approach yields excellent results in terms of post- op rehabilitation and functional mobility of the knee joint.

Avulsion fractures of the PCL tibial insertion usually constitute only a small subgroup of PCL injuries. Although several fixation techniques

have been reported in the literature, surgical fixation is usually recommended. Treatment of tibial PCL avulsion fractures, which includes fixation through a modified open posterior approach and early postoperative range of motion, results in healing of the fracture, good functional outcomes, stability to posterior draw testing, and does not lead to gastrocnemius weakness.

In our case report, we treated Avulsion fractures of the PCL tibial insertion by open reduction and internal fixation by using a posterior approach and a 3.5 mm cannulated cancellous screw. The fracture fragment healed well without any complication and the patient gained full range of motion (0-160 degrees) without any instability at the knee joint.

Conclusion

Posterior approach for Treating Avulsion fractures of the PCL tibial insertion is a novel technique with all good results and minimal complications.

Clinical Message

Though avulsion fractures of the PCL tibial insertion usually constitute only a small subgroup of PCL injuries, treating them cautiously is the need to obtain stability and functional movement of the knee joint. Though various options are available and arthroscopy being the choice, open reduction and fixation with screw under direct vision gives you excellent reduction and has its own benefits and excellent results without complications.



Figure 4. Immediate post op X-ray.

Figure 5. Full extension.

Figure 6. Full flexion.

Figure 7. Incision for surgery.

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