Original Article

Avulsion fracture of tibial insertion of PCL-operative management and outcome

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Abstract

There are controversies about the management of the PCL injuries among the Orthopaedic surgeons. We present our result of 14 cases that underwent surgical management for the avulsion fracture of the tibial insertion of the PCL. Open reduction and internal fixation of the avulsion fracture of the tibial insertion of the PCL were done and results were analyzed. The study group consisted of 13 males and 1 female; the mean age was 27 years. The avulsion fractures of more than 3 weeks old were excluded. The result showed that there were no instability in any of the patients and each patient obtained pain free, full range of movement for the affected knee within a mean follow-up period of 11 months. Therefore it is recommended to take up surgical management for avulsed PCL if presented within 3 weeks of injury.

Introduction: PCL is the stronger of the two cruciate ligaments of the knee. It is the primary constraint to the posterior tibial translation at 90º of knee flexion. PCL avulsion injuries are not uncommon in our country. Though there are controversies, most authors have recommended operative management of a displaced bony avulsion of the tibial insertion of the PCL.[1,2] Torisu, Trikey, Lee, Myers are sought to be giants in PCL surgery & their researches stated that excellent result can be achieved by fixation of the avulsed fragment. However the result of surgery is less satisfactory when performed beyond 11 weeks from the time of injury.[3] To identify the results and gain further confidence about the surgical management of the avulsed PCL we have conducted this study and found that OR & IF (Open Reduction & Internal Fixation) can provide excellent outcome in the management of the avulsed PCL from tibial attachment. On the contrary without surgery there would have been early OA[4,5] of the knee & sometime instability would cause significant difficulty in activities in daily living (ADL).

Material & Methods: In this series there were 14 cases. The average age of the patient was 27 years, extending from 19 to 35 years of age. Male female ratio was 13:1. In all the cases the injuries were less than 3 weeks old. In each case the injury was isolated and there was no history of surgery of the affected knee before. It is to be mentioned here that the fracture fragment has to be large enough to be fixed by an at least 3.5mm screw with washer. In this regards real image by digital x-ray can provide necessary information. Even though, in half of the cases where fracture fragment needed further evaluation, we did CT scan. From the history it was evident that the motor bike accidents were the main cause of the injury (78%), then dash board (14%) and also fall from rickshaw on a hard object in a flexed knee (7%).

Technique: Surgeries were performed under spinal anesthesia in 10 cases, and spinal - epidural anesthesia in 4 cases. In all cases tourniquet was applied. Diagnostic arthroscopy for all cases was done to identify any associated injuries of the knee. The patient was then shifted to prone position and the surgery was done through posterior approach of the knee.[6]

Figure 1:

Results: Between 2005 to 2009, 13 men and one woman aged from 19 to 35 years underwent OR & IF by 3.5 mm screw and washer after diagnostic arthroscopy. At 11 months of mean follow-up it has been seen that the tests for instability (posterior sag sign and posterior drawer test) were negative in 100% of cases, 98% achieved full ROM within 5 months post-op. It was also found that 91% patients were pain free by 11 months and equal percentage of patients were satisfied with the management.

Discussion: Treatment is indicated in patients when there is posterior instability on physical examination and a bony fragment is seen on x-ray. The fragment also has to be large enough to be fixed. We selected only those cases where there is isolated PCL avulsion from tibial attachment (no other intra-articular structural damage/injuries) with > 2 mm displacement. We did CT scan of the knee to select the best fit fixation devices and in cases when there appeared any doubt about the details of the fragment. We have not done any MRI in this study as we know that the chance of intra-substance injury is a remote possibility in avulsion injury of any ligament. We performed the surgeries in acute phase of the

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injury; and fixed the fragments with 3.5mm cannulated cancellous screws with washer. Though the surgeries were performed at acute phase, there were no arthrofibrosis, might be due to arthroscopic washout.[7] These patients had been immobilized for 6 weeks by pop and another 6 weeks with knee braces. The early removal of the pop and application of the knee brace is to achieve early ROM and rehabilitation. Study shows there were no, or minimum instability following the procedure in this series and obtained solid bony union and functional capacity along with satisfaction. It is evident that the associated intra-substance injury if any has not affected the postoperative posterior instability of the knee (8)

Conclusion: In conclusion, open reduction and internal fixation for avulsed PCL from tibial attachment after diagnostic arthroscopy is a reliable and effective method of management for the avulsed PCL from tibial attachment. So, it should be practiced.

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