

Functional outcome of PCL Tibial avulsion fixation by C.C.screw by modified Burks and Schaffers approach

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Abstract: Injuries of the posterior cruciate ligament are rare. Isolated PCL disruption most commonly occurs as avulsion at its tibial insertion as opposed to its femoral origin or as a mid-substance tear. Most commonly it is injured by dashboard injury or severe hyperextension of knee. Here we present PCL tibial avulsions fixation by CC screw by modified burks and schaffers approach. Patients were evaluated clinically by posterior drawer test, and radiologically using functional scale of Tegner-Lysholm. Mean tegner lysom score of 8 patients was 85.47, which was excellent. After 6 weeks 75% has grade 0 posterior drawer test, 12.5 % has grade 1 and 12.5% has grade laxity after 6 weeks. This approach is comparatively easier, with lesser neurovascular structure. Single 4 mm CC screw is sufficient for avulsion fixation.

Keywords: Burk and schaffers, tegner lysholm, PCL.

I. Introduction

Injuries of the posterior cruciate ligament (PCL) are rare. Isolated PCL disruption most commonly occurs as avulsion at its tibial insertion as opposed to its femoral origin or as a midsubstance tear as PCL insertion is larger. In PCL avulsion there is posterior subluxation of the tibia, causing an abnormal pressure on the patellofemoral joint is created, leading to chronic pain and early cartilage degeneration. Firstly an early diagnosis is usually possible on standard radiographs where a bony fragment may be visible, and secondly the treatment protocol is fairly standardized. Surgical fixation of the bony avulsion by either a screw or K-wire is advocated and it has given almost uniformly excellent results, whereas non-surgical treatment has a significant incidence of morbidity in form of residual instability and early degenerative arthritis. Some orthopaedic surgeons are apprehensive about treating tibial avulsions of the PCL because of their unfamiliarity with the standard posterior approach to the knee and the potential for damage to the important neurovascular structures.^{1,2,3}

Many series dealing with PCL injuries have followed the standard posterior approach through the popliteal fossa as described by Abbott¹, which is a complex approach requiring a meticulous and time consuming dissection of the neurovascular bundle in the popliteal fossa. Trickey² described a modification of the above mentioned approach with the aim of decreasing the surgical dissection and time. However the medial head of gastrocnemius needed to be divided and the neurovascular bundle was still at risk due to its proximity. Ogata⁴ and McCormick⁵ described a posterolateral approach of the knee for the treatment of PCL injuries. It required osteotomy of the fibular neck which endangered the nerve and required extensive mobilisation of the tendon of the popliteus. These factors increased the complexity of the approach besides affecting the postoperative rehabilitation. Burk and Schaffer⁶ described a simplified approach to the PCL which avoided the problems associated with the standard posterior approach. This has become the standard approach for approaching the PCL, either for fixing avulsions or for onlay reconstructive grafting.

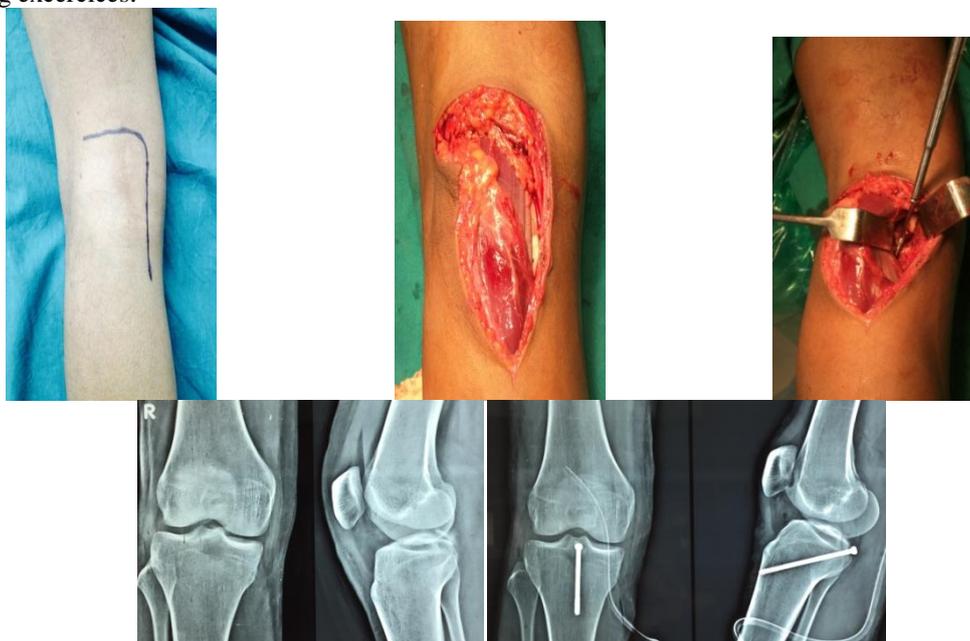
So we had use modified Burk and Schaffers approach and found it to be less time consuming and effective postoperative rehabilitation.

II. Materials And Methods

10 cases with radiographically demonstrated avulsion of the PCL were fixed using this approach. Preoperative evaluation was done clinically and radiologically. MRI was advised for suspected other ligaments and meniscal injuries. Postoperatively patients were evaluated clinically by posterior drawer test, and radiologically using functional scale of Tegner-Lysholm score. Study period was from January 2015 to September 2015.

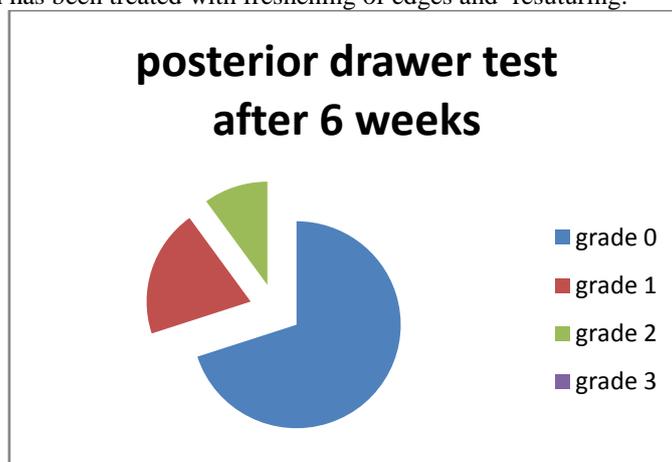
III. Surgical technique

Under suitable anesthesia, under tourniquet control, patient positioned in prone position. An inverted L shaped incision taken with a horizontal limb just proximal to the flexion crease of the knee and a vertical limb overlying the medial aspect of the gastrocnemius muscle. Dissection carried to deep fasial layer. An interval created between medial head of gastronemius and semimembranous. Posterior joint capsule is reached through this interval. An longitudinal cut in the capsule gives good exposure of the avulsed fragment. The avulsed bony attachment of the PCL was reduced with gentle flexion of the knee and temporarily stabilized with K-wires prior to fixation with one or two 4-mm partially threaded cancellous screws. Closure done in layers. Limb immobilised with posterior tibia support brace for 4 weeks. Patient was mobilised non weight bearing with walker. Physiotherapy started after 4 weeks which included active range of movement and quadriceps strenthening excercices.⁶



IV. Results

Mean tegnor lysholm score of 10 patients was 84.70, which was excellent. After 6 weeks 70% has grade 0 posterior drawer test,20% has grade 1 and 10% has grade 2 laxity after 6 weeks.One case had wound necrosis at corner which has been treated with freshening of edges and resuturing.



Case no	Posterior drawer test after 6 wks	TegnerLysholm Knee Scoring Scale after 6 wks
1	1	85
2	0	82
3	0	86
4	0	84
5	0	88
6	0	89
7	2	75
8	0	89
9	1	82
10	0	87

V. Conclusion

PCL Tibial avulsion fracture gives best results when treated surgically which can be done with either open techniques or arthroscopic techniques. Arthroscopic repair has steep learning curve.

Open procedure can be done by Classical S shaped direct posterior approach(Abbott and Carpenter) or by Modified Burk and Schaffers approach.

This approach is comparatively easier, requiring less time, with less neurovascular risk through this approach and it can be extended proximally and distally. There are excellent results when done properly using single 4mm cannulated cancellous screw.

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