

IAS NEWSLETTER



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EXPERTS OPINE

INDIVIDUALISED ACL SURGERY

Not all ACL injuries are the same!
Not all ACL surgeries are the same!

Acute Type I tear:

ACLR repair using single anchor inserted at AM bundle.

Subacute(>6 weeks) Type I/II tear: Biological internal bracing(ACLR) with remnant preservation

Stable ACL stump:

ACLR through the remnant stump.

Unstable Type I ACL stump :

ACLR+ Repair of the ACL remnant using curved suture anchor inserted just anterior to the femoral socket.

Unstable Type II ACL stump:

ACLR+ Suturing of the remnant to the ACL graft.

Subacute III or IV / Chronic tear : ACLR

Partial ACL tear: Bundle specific ACLR



Dr. Dinshaw Pardiwala

REPAIR OF ACUTE MPFL AVULSION AT PATELLA WITH KNOTLESS ANCHOR

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Introduction:

Medial patellofemoral ligament is an important static stabilizer of patella in first 20° - 30° of knee flexion and prevents lateral patellar subluxation. MPFL avulsion at the patellar attachment occurs in patients with acute lateral Patella dislocation. We will be discussing the acute MPFL avulsion at patellar attachment and its primary repair using knotless swivel-lock anchors

Case:

A 27 years old female patient presented with pain in knee following twisting injury while walking in the park, and presented 2 weeks after the injury. She developed immediate swelling of knee and was able to walk after the fall. She felt discomfort and knee cap moving out of knee at the time of fall and then spontaneously spring back into its position. Patient had no prior episodes in the past.

On examination, Knee joint was in slight flexion and there was moderate effusion. Tenderness was present on medial side of patella. A Defect was palpable along medial patellar border.

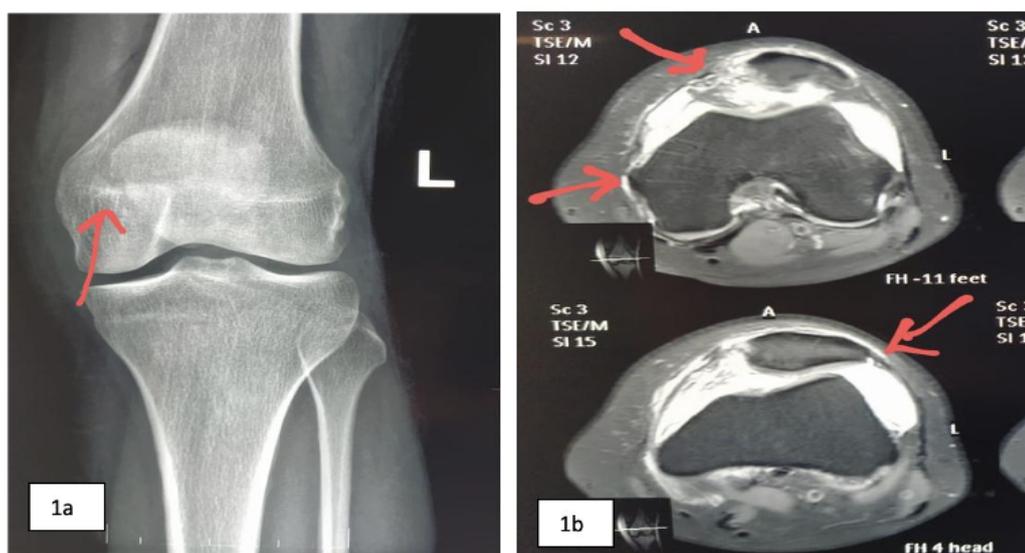


Fig. 1a showing AP view of knee with irregularity of medial patellar border with Osteochondral fragment .
Figure 1b. MRI Axial view showing tear at attachment of MPFL on patella with effusion.

The lateral patellar glide was increased as compared to opposite knee and the apprehension test was positive. There was no malalignment of lower limb on clinical examination and there was no tear in other ligaments/mensci.

Radiographs on AP view showed irregularity of medial patellar border with Osteochondral fragment medial to patella. There was some irregularity on lateral femoral condyle [Fig.1a]. MRI knee on axial image showed tear at the medial margin of patella with effusion of knee. The patella was laterally translated and there was bone bruise on lateral femoral condyle [Fig. 1b].

So, this injury was classified as Sillanpaa type P1 and its time to

presentation was 2 weeks. Thus, planned for primary repair of MPFL to patella using knotless anchors.

Surgical technique:

Diagnostic arthroscopy was performed through standard AL and AM portals. Tear was seen at medial margin of patella [Fig. 2a]. The tissue quality was healthy and margins of bone were fresh. There was no chondral fragment or loose body in joint and no cartilage injury elsewhere. Open repair was then performed through medial parapatellar Incision, starting proximally from superior pole of patella to inferior pole distally. After dissection of deep crural fascia, tear site was identified, cleaned of loose debris and margins of patella freshened [Fig. 2b].

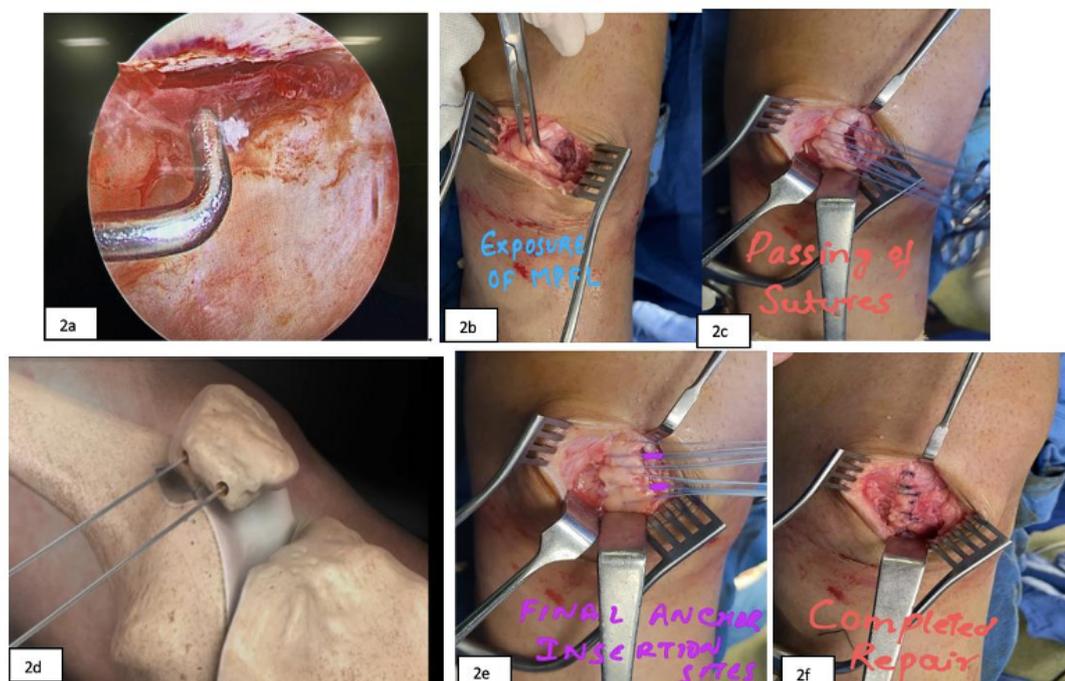


Fig 2a to 2f showing steps of surgical procedure

The tissue bites were then taken with No. 2 fiber wire sutures. A total of six fiber wire sutures passed from proximal limit of tear to its distal extent equidistant to each other [Fig. 2c].

The proximal three sutures were then shuttled through 3.5 mm swivel-lock anchors and anchor fixed in the proximal slot with knee in 20° knee flexion. Next inferior sutures loaded in the anchor and anchor fixed in patella [Fig. 2e]. The sutures were then cut flush with bone. The repair was augmented by suturing the medial retinaculum over patella [Fig.2f]. Diagnostic arthroscopy was again performed to see the adequacy and completeness of the repair.

Postoperative, knee brace was applied for 6 weeks and weight bearing as tolerated was started. After 2 weeks, knee ROM exercises was started to achieve 90° flexion by 6. After 6 weeks, brace was removed and full ROM by 8 weeks.

Discussion :

Acute MPFL tears have been classified by Nomura et al (1) into avulsion and substance tears. They suggested that acute avulsion tears should be repaired to get good outcome.

Silanpaa et al(2) studied the clinical outcome in 31 patients of MPFL tear at patellar side. They classified these tears into three types : P0 acute ligamentous disruption, P1 bony avulsion from patella without articular cartilage and P2 Bony avulsion involving articular margin of patella.

They noted that patient with P1 injury who are treated conservatively had high chances of recurrent subluxation of patella and suggested acute surgical repair.

Luis camanho et al (3) and Lebsteiner et al(4) in two separate randomized control trials have found that patient who have been treated conservatively in acute MPFL with Osteochondral fractures had high chances of recurrent patellar dislocation

There are multiple review articles (5)(6) in literature who have suggested that osteochondral fragment with MPFL tear or large parapatellar complex tear in acute lateral patellar dislocation should be treated with repair of MPFL to give best results in these cases.

Different techniques and method have been used to repair these types of lesions. Nomura et al(1) did augmented repair with medial retinaculum in five patients and reported good outcome. Abdel aziz et al(7) repaired acute MPFL tear using ultra braid sutures and three parallel tunnels drilled across patella. Knots were tied on to the lateral patella. Augmented repairs with suture tapes and anchors have been described in the literature.

Benefits of knotless repair:

1. Knotless anchors avoid the complications of knot loosening over a period of time
2. Avoids multiple knots irritating the soft tissue.
3. Adequate tension of MPFL can be adjusted with anchors
4. Decreases the risk of patellar fracture.
5. Restores biology without any hardware problem

CONCLUSION:

1. Acute MPFL avulsion injuries with Osteochondral fragment or large parapatellar complex tear should be primarily repaired
2. Single incision and there is no need of graft and no donor site morbidity
3. Anatomical repair with early rehabilitation can be advised.
4. This can be used only in cases with no trochlear or patellar dysplasia or malalignment of lower limb- Case selection is important for optimum results.

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ARTHROSCOPIC ANATOMICAL ACL RECONSTRUCTION AND MEDIAL MENISCUS POSTERIOR ROOT REPAIR

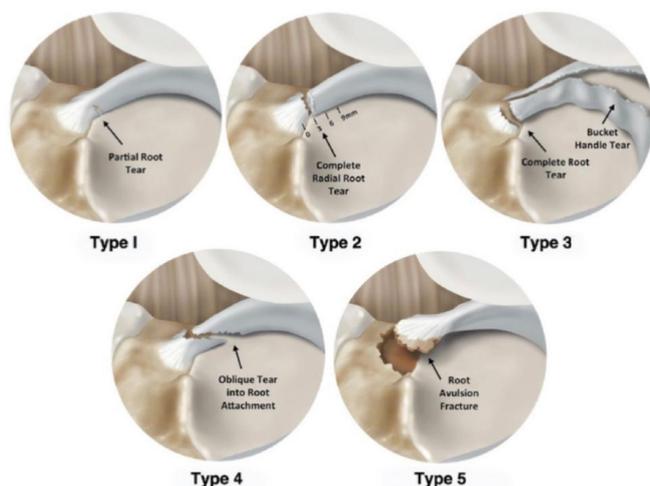


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Abstract:

23year old male, working in the armed forces presented to us with knee pain and instability with history of twisting injury 1 year back. MRI showed an ACL tear plus medial meniscus posterior root tear. He was taken up for Arthroscopic anatomical ACL reconstruction plus medial meniscus root repair. The review of literature and surgical technique is discussed in this report.



Introduction:

Medial meniscus posterior root tear is rare with ACL tear unlike lateral meniscus root tear. Medial meniscus root tear is equivalent to complete meniscectomy. Medial meniscus root repair should be done along with ACL reconstruction in young and active patient to restore knee stability. Repair will decrease the tibio-femoral contact pressure and increase hoop pressure there by preventing degenerative changes in the joint (1).

The Transtibial two tunnel technique is preferred compared to Suture anchor technique (2). LaPrade(Fig 1) has classified medial meniscus root tear in to 5 types. Type 1: Partial stable tear. Type 2: Complete radial tear within 9 mm from attachment. Type 3: Bucket-handle tear with complete root detachment. Type 4: Complex oblique or longitudinal tear with complete root detachment. Type 5: Bony avulsion fracture of the root attachment(3).

Fig 1:La Prade's Classification for medial meniscal root tears.

Case Report:

23yr male, working in the armed forces presented to us with knee pain and instability with history of twisting injury 1 year back.

On examination: Lachman & anterior drawer test was positive with a grade 2 Pivot shift test. Medial joint line was tender & Mc Murray test positive for medial meniscus
Radiography of knee AP and lateral was normal.

MRI knee joint shows ACL tear
Sherman type 3 and medial meniscus posterior root tear (LaPrade type 2B)
(Fig 2)

Diagnostic arthroscopy was done medial Meniscus posterior root tear was identified and ACL tear was noted near femoral side.

Medial meniscus posterior root was freshened. Footprint was prepared with curette and bur. Two bites of the remnant root were taken using fibrewire and knee scorpion. Viewing portal was anterolateral and working portal was anteromedial.

2.4mm guide wire was passed from anteromedial proximal tibia to the foot print of posterior root of medial meniscus. Guide wire was over reamed with 4.5mm drill bit. With help of lasso loop suture threads were retrieved in to tibial tunnel(Fig 3& 4)

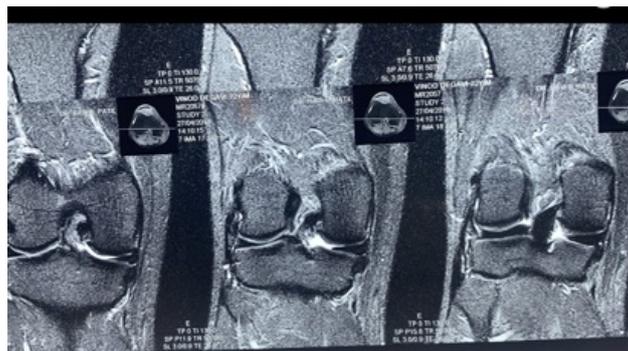


Fig 2: MRI coronal images showing LaPrade type 2B medial meniscus posterior root tear



Fig 3: Medial meniscal root tear, jig & guide pin at the posterior meniscal root.

Anatomical femoral tunnel is made for ACL on femoral side and tibial side. Semitendinosus graft was harvested & quadrupled & measured to be of 8mm diameter. Femoral side was fixed with 20mm fixed loop while tibial side was fixed with interference screw. Later meniscus root repair threads were tied over anteromedial tibia at 30-degree knee flexion.

Discussion:

Posterior root tear of medial meniscus along with ACL rupture is rarely found. There are only a few published studies that discuss the steps of repair of this combination.

PRMM tear can cause meniscal extrusion, narrowing of the medial joint space & may lead to eventual varus of the affected knee.



Figure 4: Showing bites taken of the meniscal root, fibre wires shuttled across the tibial tunnel & completed root repair.



Fig 5: Reconstructed ACL using hamstring graft

The sequence of repair is to repair the medial meniscal root and then proceed to ACL reconstruction.

Meniscal root repair should be attempted whenever possible to prevent meniscus damage and OA, except in cases in which the patient is a poor surgical candidate (significant comorbidities or advanced age), diffuse Outerbridge grade 3 or 4 OA of the ipsilateral compartment, non-symptomatic chronic meniscal root tears, and/or significant limb malalignment unless concurrently corrected (2,4). Commonly used repair techniques are suture anchor repair and transtibial meniscal root repair.

Suture anchor technique is technically demanding and has mainly been reported in patients with grade 3 medial collateral ligament tears where a high posteromedial portal is taken (5,6). Transtibial single tunnel and double tunnel techniques have been described to better reproduce the anatomical footprint and enhance biologic healing (7)

Fixation with a button is advantageous given that it is less invasive and reduces the risk of soft tissue irritation compared with screw and washer fixation (8).

Feucht et al. reported an improvement of the Lysholm score after MPRT repair by arthroscopic transtibial pull-out technique (9). Chung et al., reported significantly better clinical and radiological outcomes in the repair group. The rate of conversion to a TKA was 34% in the partial meniscectomy group and none in the root repair group (10). In a meta-analysis by Chung et al, it was reported that progression of arthrosis was observed in only 10% of patients at a mean follow-up of 30.3 months and mean age of 54 years after meniscal root repair (11). Therefore, it was concluded that a minimum of 79.7% of patients with PRMM repair could avoid degenerative changes with surgical repair.

The advantage of a cinch suture included ease of placement of the loop through the meniscus which could potentially improve the strength compared with other configurations such as simple sutures (8).

Previous studies investigated the effects of 4 different repair constructs using a No. 0 FiberWire, including a single (simple) suture, double (2 simple) sutures, a loop stitch, and a locking loop stitch. They found that although none of these constructs sufficiently replicated the native load-to-failure strength of the meniscal root, the loop stitch came the closest(12)(13)(14).

Take home message:

Single stage ACL reconstruction and root repair is possible.

Root repair with simultaneous ACLR prevents progression of OA.

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