

CASE REPORT

Re-establishing Patellofemoral Stability through MPFL Reconstruction: A Case Report

Dr. Muthu Akilan T P^{1*}, Dr. Surya S², Prof. Dr. Vijay Narasimman Reddy³, Dr. Ashin Khan⁴

^{1*}Junior Resident, Department of Orthopaedics, Bharath University, Sree Balaji Medical College and Hospital, Chennai 600044, Tamil Nadu, India, Email: tpmakilan@gmail.com. ORCID id : 0009-0005-2940-8784

²Senior Resident, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Chennai 600044, Tamil Nadu India, Email Id: doctorsurya1997@gmail.com

³Professor, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Chennai 600044, Tamil Nadu, India Email id: Vijayanarasimhan2003@yahoo.co.in

⁴Junior Resident, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Chennai 600044, Tamil Nadu, India, Email: aashinkhan.31@gmail.com ORCID id :0009-0006-2906-9564

* **Corresponding author** - Dr. Muthu Akilan T P

Junior Resident, Department of Orthopaedics, Bharath University, Sree Balaji Medical College and Hospital, Chennai 600044, Tamil Nadu, India, Email: tpmakilan@gmail.com, ORCID id : 0009-0005-2940-8784

ABSTRACT

Background: The medial patellofemoral ligament (MPFL) is the primary soft tissue restraint preventing lateral patellar displacement. Its disruption is a key factor in recurrent patellar instability. Surgical reconstruction restores mechanical stability and facilitates an optimal biological environment for ligament healing and functional recovery.

Case Report: A young adult presented with recurrent lateral patellar instability following a traumatic episode. Clinical examination revealed lateral patellar tracking with a positive J sign and increased lateral glide. Imaging confirmed MPFL insufficiency without significant bony abnormalities. The patient underwent anatomical MPFL reconstruction using ipsilateral gracilis tendon autograft with femoral fixation at Schöttle's point. Postoperative rehabilitation was protocol-driven. At six months follow-up, the patient demonstrated significant improvement in functional scores, full range of motion, and no recurrence of instability.

Conclusion: MPFL reconstruction using autologous graft effectively restores patellofemoral stability and promotes favorable conditions for biological healing. It remains a reliable treatment option in appropriately selected patients with ligamentous instability.

Keywords: MPFL reconstruction, Patellar instability, Gracilis autograft, Ligament healing, Functional outcome

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INTRODUCTION

The medial patellofemoral ligament contributes nearly 60–80% of the restraining force against lateral patellar translation, particularly during early knee flexion [1,2]. Traumatic disruption is commonly associated with patellar dislocation and recurrent instability.

While conservative management and primary repair have demonstrated variable outcomes, reconstruction has emerged as the preferred modality due to lower recurrence rates and better functional outcomes [3]. In addition to restoring stability, reconstruction re-establishes a favourable biological milieu that promotes graft incorporation and joint homeostasis.

CASE REPORT

A young adult patient presented with complaints of recurrent episodes of knee giving way and anterior knee discomfort following a prior traumatic patellar dislocation. Symptoms included difficulty during activities involving knee flexion and a sense of instability during ambulation.

On clinical examination, the patella demonstrated lateral maltracking with a positive J sign. The patellar glide test revealed increased lateral translation. Apprehension test was negative, and there were no signs of generalized ligamentous laxity. Range of motion was preserved but associated with discomfort during terminal flexion.

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Image 1 - Pre-op Xray

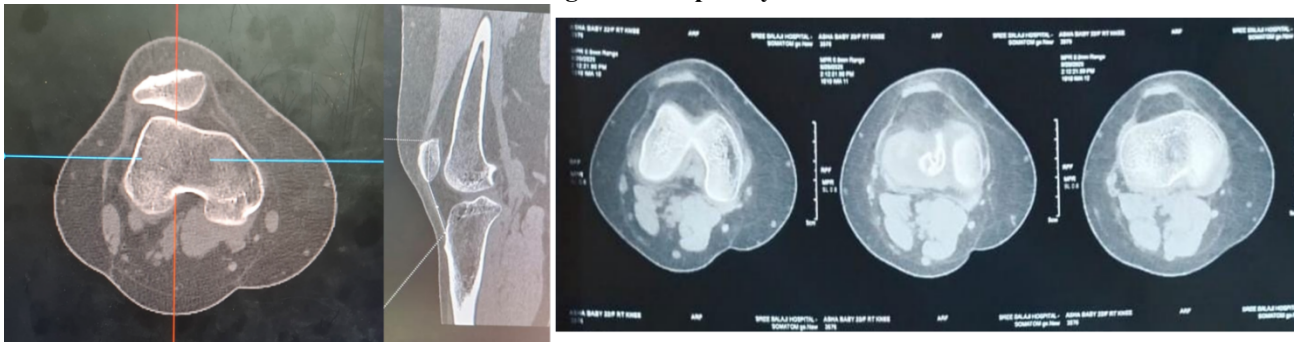


Image 2 - Pre-op CT

Radiographic evaluation showed no evidence of fracture or gross malalignment.



Image 3 - Computed tomography revealed a trochlear angle of 147°, suggestive of mild trochlear flattening.

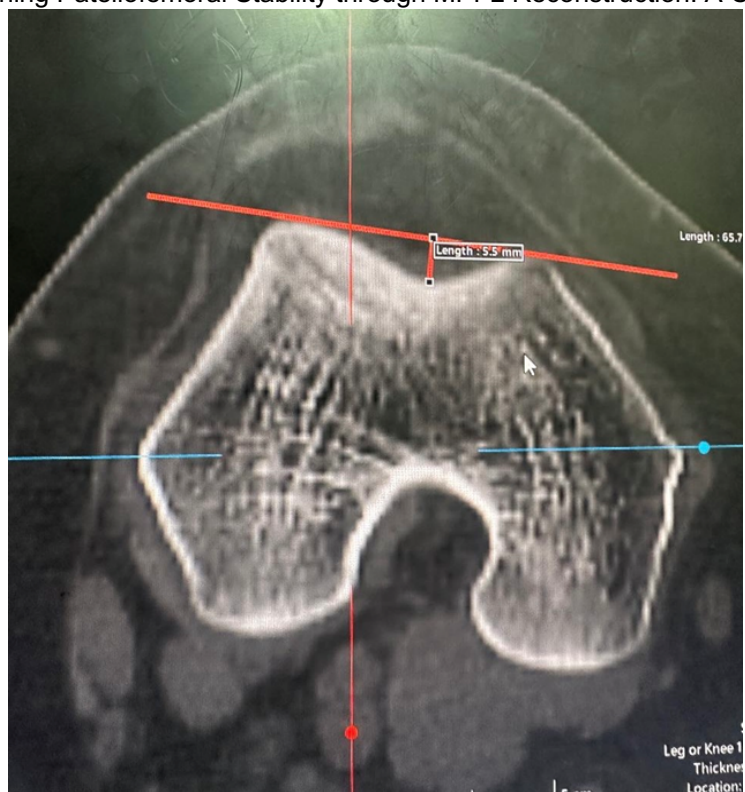


Image 4 - The sulcus depth measured 5.5 mm.



Image 5 - Insall–Salvati ratio was 1.35, indicating patella alta.

Magnetic resonance imaging confirmed MPFL disruption without significant chondral injury. Based on clinical and radiological findings, a diagnosis of recurrent patellar instability secondary to MPFL insufficiency was made.

SURGICAL TECHNIQUE

The procedure was performed under spinal anaesthesia with tourniquet control in the supine position.

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Diagnostic arthroscopy confirmed intact intra-articular structures, including cruciate ligaments and menisci. The ipsilateral gracilis tendon was harvested and prepared as a graft.

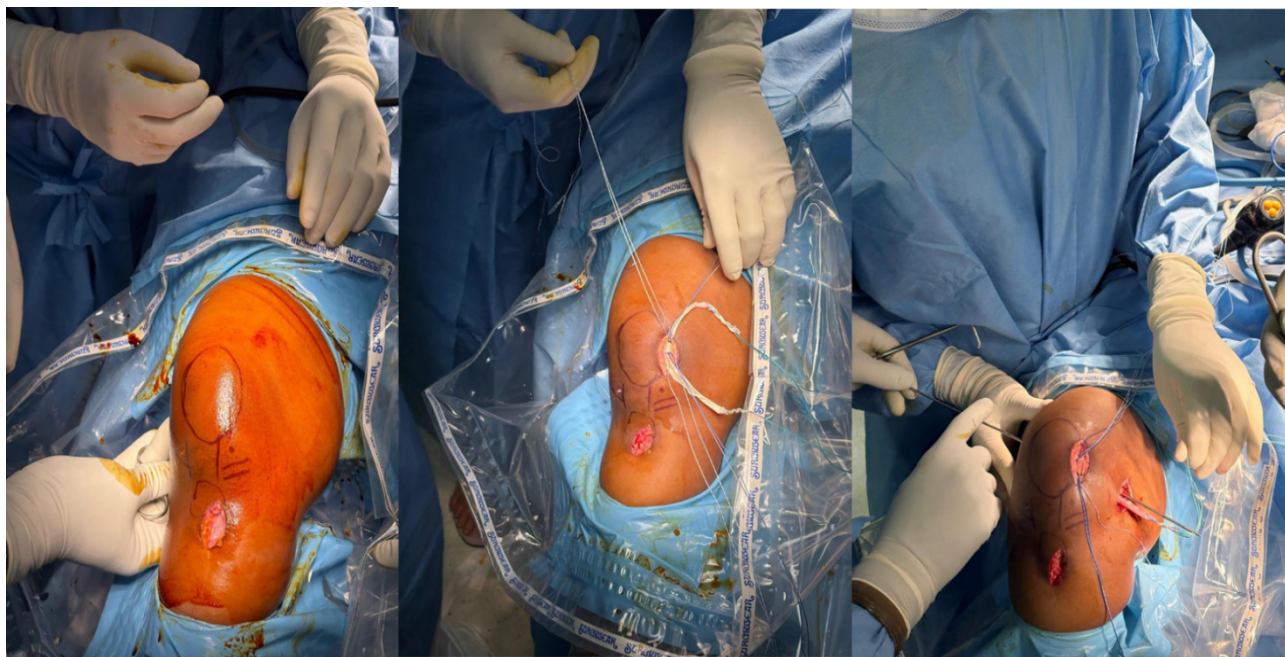


Image 6 - Intra-op Images

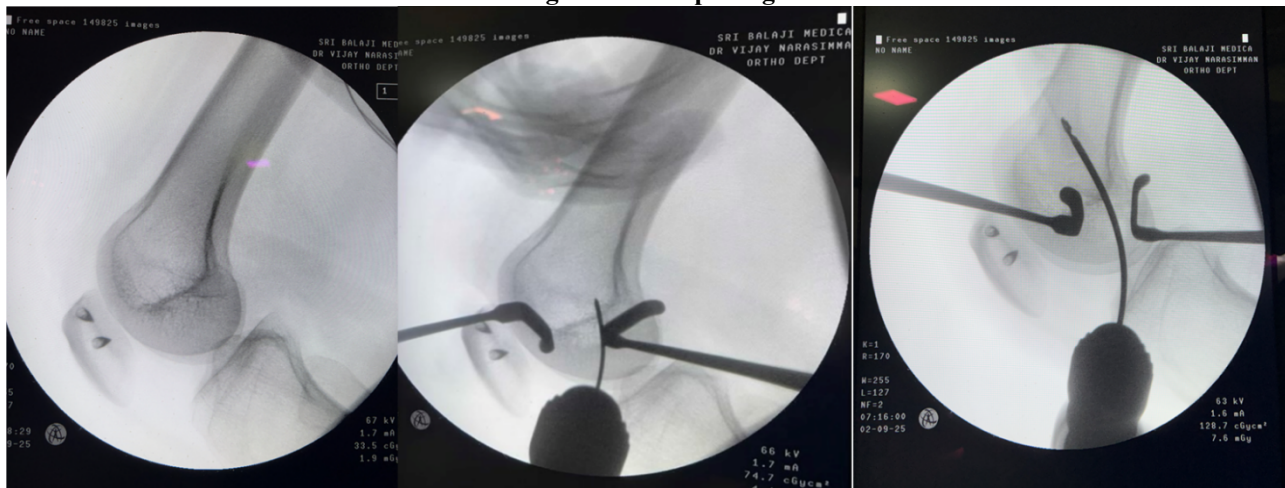


Image 7 - Intra-op C-arm images

A medial patellar incision was made, and fixation was achieved using a suture anchor in a double-bundle configuration. The femoral insertion site was identified at Schöttle's point using fluoroscopic guidance. A femoral tunnel was created, and the graft was secured using a bioabsorbable interference screw at approximately 30° of knee flexion, ensuring appropriate tensioning.

After confirming satisfactory patellar tracking, the wound was irrigated and closed in layers. A knee brace was applied postoperatively.



Image 8 - Immediate post-op Xray

POSTOPERATIVE MANAGEMENT

Rehabilitation followed a structured protocol aimed at protecting the reconstruction and gradually restoring function.

- **0–2 weeks:** Immobilization with limited range of motion, quadriceps activation exercises
- **2–6 weeks:** Progressive increase in range of motion and weight-bearing
- **6–12 weeks:** Full range of motion with strengthening exercises

- **3–6 months:** Advanced strengthening and proprioceptive training
Return to unrestricted activity was permitted after six months based on clinical recovery.

RESULTS

At six months follow-up, the patient demonstrated significant improvement in functional outcomes.



Image 9 - Clinical images at 6 months follow-up

- Kujala (AKPS) score improved markedly, indicating reduced anterior knee pain
- Tegner–Lysholm score showed improvement in activity level and knee function

The patient achieved full range of motion with no episodes of recurrent instability. Quadriceps strength improved, and the patient returned to routine daily activities without limitations.

DISCUSSION

Patellar instability is a multifactorial condition influenced by both traumatic disruption and underlying anatomical predispositions such as trochlear dysplasia, patella alta, malalignment, and soft tissue imbalance [4,5]. The MPFL serves as the primary passive restraint to lateral patellar displacement, particularly in early knee flexion, and its integrity is essential for maintaining normal patellofemoral biomechanics [1,2]. Following traumatic dislocation, the MPFL is frequently disrupted and demonstrates limited intrinsic healing potential. Repair of this ligament has historically shown

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inconsistent outcomes, largely due to compromised tissue quality and inability to restore native biomechanics [3]. In contrast, reconstruction using autologous graft provides a more reliable restoration of ligament function, with reported success rates exceeding 90% and significantly lower redislocation rates [6].

In the present case, careful preoperative evaluation was essential to exclude significant bony abnormalities that would necessitate additional procedures. Although the patient demonstrated mild trochlear flattening and patella alta, these findings were not severe enough to contraindicate isolated MPFL reconstruction. This highlights the importance of individualized surgical planning based on a combination of clinical and radiological parameters.

From a biomechanical perspective, accurate identification of the femoral insertion site at Schöttle's point is critical to avoid graft malposition, which can lead to abnormal patellar tracking, increased contact pressures, and early failure [7]. Proper graft tensioning at approximately 30° of knee flexion ensures physiological restraint without overconstraint.

Beyond mechanical stabilization, MPFL reconstruction contributes to restoration of the biological environment within the knee joint. The use of an autologous gracilis graft facilitates cellular integration, revascularization, and remodeling, which are essential for long-term graft viability [8]. Stable fixation further enables early mobilization, which is known to enhance collagen organization and functional recovery.

Postoperative rehabilitation plays a crucial role in outcome optimization. Gradual restoration of range of motion, strengthening of the quadriceps mechanism, and proprioceptive training are essential components of recovery. Failure to adhere to rehabilitation protocols can compromise outcomes.

Potential complications include anterior knee pain, stiffness, graft failure, patellar fracture, and recurrent instability [9]. In this case, no such complications were observed, and the patient achieved excellent functional recovery.

The findings of this case are consistent with existing literature supporting MPFL reconstruction as an effective and reliable treatment for recurrent patellar instability in appropriately selected patients [10–12].

LIMITATIONS

This report describes a single case with short-term follow-up. Long-term outcomes and comparative studies are required to further validate these findings.

CONCLUSION

Anatomical MPFL reconstruction using autologous gracilis tendon is an effective treatment for recurrent patellar instability in selected patients. The procedure restores patellar stability, improves functional outcomes, and supports biological healing within the joint environment.

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