"A COMPLEX CASE OF MPFL RECONTRUCTION WITH SEMITENDINOSIS AUTOGRAFT FOR A TRAUMATIC PATELLAR DISLOCATION WITH A FULL THICKNESS MPFL TEAR IN A YOUNG FEMALE"

Abstract

Chronic patellofemoral instability is a complex problem caused by bone malformation, soft tissue abnormalities, and joint laxity and occurs mainly in adolescent females. It is also induced by medial patellofemoral ligament (MPFL) injury. The MPFL is the primary stabilizer of the patellofemoral joint (PFJ); it stabilizes the patella medially during knee motion and controls patellar tracking, providing approximately 53%–60% of restraining force. There are rare case reports of MPFL reconstruction in for a complex patellofemoral dislocation with full thickness MPFL tear in young females. We report a rare case of PFJ dislocation with MPFL tear in a young female who was injured by slip and fall at her residence; she then underwent MPFL reconstruction and exhibited satisfactory progress.

1. Introduction

Patellar dislocations are difficult surgical cases and severely incapacitating injuries for the patient. The recurrence rates of dislocations treated nonoperatively vary from 15% to 50%, whereas the incidence of patellar instability ranges from 5.8 to 77.8 per 100,000.[1] Over time, there have been changes in the management of patella instability. Currently, nonoperative treatment is the norm for most initial dislocators unless a loose osteochondral fragment is found. The usual course of treatment for recurrent patellofemoral instability is surgery.[1] Numerous surgical procedures have been reported; in recent times, the majority of these procedures have centred on medial patellofemoral ligament (MPFL) repair as opposed to rebuilding.

It has been established that the MPFL serves as the main soft tissue barrier against lateral patellar dislocation. It starts in the space directly behind the medial epicondyle, extends somewhat over the knee capsule, and ends on the superomedial patella.[2] Studies on pathoanatomy have demonstrated that when the patella dislocates laterally, the MPFL tears. Even while the MPFL is frequently the cause of patellar instability, other pathoanatomic lesions may also be at play. For this reason, treating patellar instability requires a multimodal approach. This entails looking for torsional abnormalities, pathologic patellar tilt, patella alta, lateral positioning of the tibial tubercle, pathologic limb alignment (genu valgum), and the location of the MPFL rupture.[2]

The MPFL can be repaired and rebuilt using a variety of methods, which will enable it to once again serve as a checkrein for lateral movement.[3] The treatment trend has recently shifted in favour of reconstructing the MPFL because studies have indicated that repair failure rates are significant. In contrast, reconstruction has yielded beneficial results, with good to excellent results falling between 83% and 87% of cases.[3] On the other hand, opinions about the most effective surgical procedure for recurrent patellofemoral instability are still divided.
We describe a unique instance of PFJ dislocation with MPFL tear in a young woman who was hurt in a slip and fall at home. After undergoing MPFL reconstruction, the patient made satisfactory recovery.[3]

2. Case Presentation

A 24-year-old healthy young female presented to EMD an alleged history of slip and fall at her residence, following which she sustained injury to her right knee. She complaints of pain and swelling over right knee. On examination, diffuse swelling and tenderness present over right knee. No local rise of temperature note. Range of movement of right knee 0- 40-degree. Clinically, Anterior drawer test- negative, Posterior drawer test – negative, Varus stress test – negative, Valgus stress test – negative, Apprehension test - positive

MRI of right knee was done which showed Lateral dislocation of patella with full thickness tear of medial patellofemoral ligament, Grade I injury of lateral collateral ligament, Grade 2C injury of posterior horn of medial meniscus & grade 2B injury of posterior horn of lateral meniscus, Anterior cruciate ligament sprain with Mild joint effusion. After taking written informed consent for surgery and after Pre anesthetic evaluation, Patient underwent Diagnostic arthroscopy of right knee joint, right Medio-patello femoral ligament reconstruction with semitendinosus graft under spinal anaesthesia. The post-operative period was uneventful. Static quadriceps strengthening exercise and Passive knee flexion of 30^0 was taught and done. Follow up was done, patient showed significant improvement and was able to bear weight and walk comfortably.

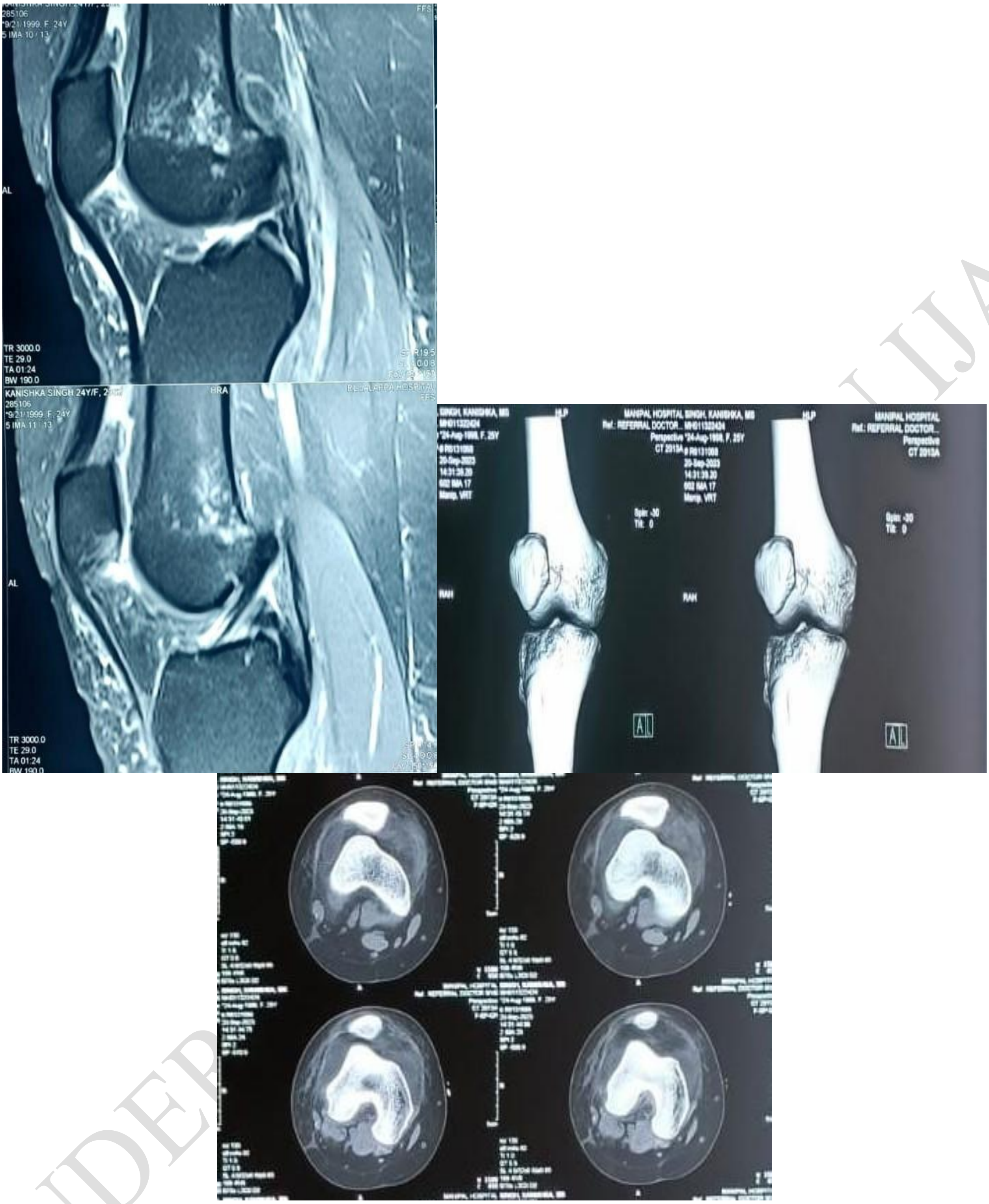

Figure 1 MRI OF RIGHT KNEE WITH CT RIGHT KNEE WITH 3D RECONSTRUCTION

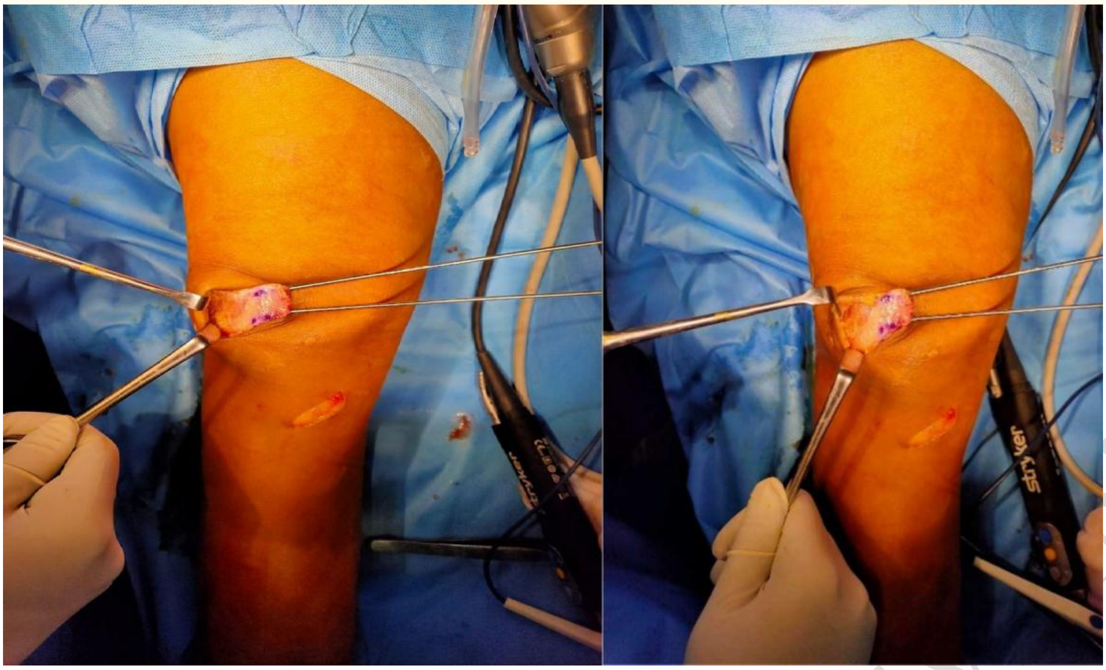

Figure 2
(a) INTRA-OPERATIVELY IMAGES OF MPFL RECONSTRUCTION

3. MAJOR SURGICAL STEPS

- The SEMITENDINOSUS tendon is harvested through a short suprapatellar transverse incision using a dedicated instrument that makes it possible to measure the graft's width, thickness and length.
- The knee is placed in 90° flexion during the graft harvest.
- The transverse suprapatellar skin incision is 2–3 cm long, depending on the patient's morphology.
- The transplant width is 10–12 mm. The minimum length is 8 cm and the thickness 2–3 mm.
- The graft is pedicled to the patella and passed under the periosteum at the patellar insertion of the MPFL.
- It is secured to the patellar periosteum with sutures.
- The femoral fixation area is found using Schöttle's techniques with bone drilling under fluoroscopic guidance.
- After the graft has been inserted into the blind femoral bone tunnel, an interference screw is used to fix the graft with the knee in 20° flexion and after cyclic loading, to avoid excessive graft tension.

3. Discussion

The MPFL sustains damage at a rate ranging from 94% to 100% after a patellar dislocation. If left untreated, traumatic injuries to this ligament can cause osteochondral lesions, early osteoarthritis, and, in 14–44% of instances, recurrent dislocation.[4] Surgical re-establishment of normal anatomy is required to prevent future complications because conservative measures of any kind have a lower chance of preventing further repeated bouts of dislocation.

A 2015 Cochrane review found that while functional scores are identical for both types of treatment, the difference between non-operative and operational treatment lies in the lower likelihood of recurrent dislocations that come with surgery, albeit at the expense of surgical complications.[5] As previously mentioned, there is a strong belief that patients who sustain multiple patellar dislocations should have MPFL reconstruction. This may be the most pertinent indication for ligament replacement, particularly in cases when conservative treatment has failed. After only one dislocation, MPFLR is often reserved for elite athletes.[6]

Predisposing conditions such as patella alta, trochlear dysplasia, or increased TT-TG distance can increase the likelihood of traumatic first episodes occurring, but they can also raise the likelihood that they will recur.[7] Because of the significant risk of graft rupture, all the criteria rule out a straightforward MPFL reconstruction. To reduce the chance of re-injury, related procedures must be carried out.

Numerous graft sources, such as semitendinosus, gracilis, partial quadriceps, partial patellar tendon, allograft, or artificial tendons, have been proposed in the literature; however, none of them has shown to work better than the others.[8] Additionally, there are differences in the angle of knee flexion during fixation as well as in the patellar and femoral fixation. Even if the procedure has been improved due to a greater understanding of the ligament's origin and insertion, there are still numerous aspects to consider while determining the optimal surgical treatment.[9]

Thankfully, there is agreement that anatomical positioning of the femoral bone tunnel—in particular—is necessary to rebuild a correct and isometric ligament, making surgical operations more reproducible. The precise location of the Schöttle point is where the femoral tunnel should be positioned throughout the restoration process in order to restore the ligament's isometry.[10]

As mentioned, there are problems with every approach. Sutures for MPFL are thought to be simpler to operate but less stable than trans-patellar bone tunnels (24% vs. 8.6% of hypermobility, respectively), according to the literature. Conversely, bone tunnels have the highest prevalence of complications (21.6%) and the risk of iatrogenic fractures (0.9-3.6%).[10]

According to Shah et al., the cumulative rate of problems after reconstruction is 26.1% overall. This rate may be impacted by undiagnosed predisposing diseases and, in particular, by technical errors, which are responsible for 50% of graft failures.[11]

4. Conclusion:

In summary, there is currently a dearth of research on result comparisons, making it difficult to determine which approach is best. In addition, the best candidates for MPFL rebuilding need to be chosen following a thorough assessment and meticulous planning. The patient in this case study suffered from a full thickness MPFL tear in addition to patellofemoral dislocation. After MPFL restoration with a semitendinosus autograft, the patient had good results in terms improvement in range of movement of the knee joint which was 0 – 120 degree in subsequent follow up and ability to walk without difficulty.

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