

# Medial Patellofemoral Ligament Reconstruction Using a Peroneus Longus Tendon Graft Case Report

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**Abstract:** Medial patellofemoral ligament (MPFL) reconstruction is commonly performed in the surgical treatment of patellar dislocation. In addition to conventional grafts, the peroneus longus (PL) tendon has also been efficiently used as an alternative. In this study, we describe the rare case of a patient with chronic patellar dislocation who underwent MPFL reconstruction using the PL tendon graft and anteromedialization of the tibial tuberosity. A 30-year-old male patient with a history of pain and instability in the left knee due to recurrent patellar dislocations over the past three years, previously treated conservatively. In the last month, he experienced an irreducible lateral patellar dislocation requiring open reduction, followed by another irreducible dislocation 20 days later. Physical examination and imaging revealed MPFL injury and a TT-TG distance of 22 mm. Open patellar reduction, MPFL reconstruction with part of the peroneus longus tendon, and tibial tuberosity anteromedialization were performed. After the usual preparation, the peroneus longus and brevis tendons were identified and isolated, and the former was harvested. Subsequently, patellar reduction and tibial tuberosity anteromedialization osteotomy were performed, followed by fixation of the PL graft at the anatomical femoral insertion point of the MPFL. After ligament reconstruction and osteotomy, the knee demonstrated satisfactory stability, with no dislocations during mobilization and no ankle pain complaints, while maintaining a preserved range of motion. Recent studies have shown favorable outcomes using the peroneus longus tendon in ligamentous knee reconstructions. Thus, the use of this tendon as a graft for MPFL reconstruction represents a viable and valuable alternative that should be mastered by orthopedic surgeons.

**Keywords:** Medial Patellofemoral Ligament; Chronic Patellar Dislocation; Peroneus Longus Tendon; Case Report.

## 1. Introduction

The stabilization of the patella within the femoral intercondylar groove is achieved through both static stabilizers, such as tendons and ligaments, and dynamic stabilizers, represented by muscles. The primary function of the patella is to centralize the traction forces exerted by the muscles that compose the quadriceps femoris, thus playing a significant role in knee extension movement [1]. Acute patellar dislocation is the second most common cause of hemarthrosis in the knee joint, making it highly relevant in the context of orthopedic conditions. Chronic patellar dislocation, on the other hand, is characterized by recurrent episodes, occurring mainly in young women with predisposing factors such as trochlear or patellar dysplasia, increased Q angle, ligamentous laxity, or patella alta [2].

In most cases, patellar dislocations are spontaneously reduced without the need for intervention. However, there are rare cases in which the patella does not reduce spontaneously, characterizing an Irreducible Patella. These cases are generally associated with complex predisposing factors, including osteochondral injury on the medial aspect of the patella, vertical axis rotation, or entrapment of the patella in the lateral femoral condyle [3-4].

Both acute and chronic patellar dislocations can be treated conservatively or surgically. The medial patellofemoral ligament (MPFL) is primarily responsible for medial force in patellar stabilization, and its reconstruction is therefore commonly performed in surgical treatment [5]. Studies such as that by Migliorini et al. [6] have demonstrated the effectiveness of using autologous grafts, including gracilis, semitendinosus, and patellar tendons, as efficient approaches to restore patellar stability in cases of recurrent dislocation [6]. In addition to these grafts, the long fibular (peroneus longus) tendon (PL) has also been effectively used for treating patellar dislocation [7]. Tibial Tuberosity Osteotomy (TTO) can also be performed to promote anteromedialization and thereby improve patellar alignment in cases requiring a bony approach [8].

In this study, we describe the rare case of a patient with chronic patellar dislocation who underwent MPFL reconstruction using a PL tendon graft, along with bony correction through anteromedialization of the anterior tibial tuberosity, as well as his postoperative follow-up.

## 2. Case Report

A 30-year-old male patient presented with a history of pain and instability in the left knee, evolving over three years with recurrent patellar dislocations managed conservatively. In the month prior to admission to our service, the patient experienced an irreducible lateral patellar dislocation requiring open reduction. Twenty days after this procedure, he presented again with a new irreducible dislocation. On physical examination, the patella was laterally dislocated and immobile, with mild valgus alignment of the knee (Figure 1). Imaging studies confirmed the dislocation, medial patellofemoral ligament (MPFL) injury, and a tibial tuberosity–trochlear groove (TT–TG) distance of 22 mm.

Preoperative planning included open reduction of the dislocation, MPFL reconstruction using the anterior half of the ipsilateral peroneus longus tendon, and anteromedialization of the tibial tuberosity (TT). The peroneus longus tendon was chosen as a graft due to its minimal impact on thigh circumference and knee flexion strength, thereby facilitating rehabilitation. Furthermore, its biomechanical properties are comparable to the semitendinosus tendon. With the patient in the supine position and a pneumatic tourniquet applied to the left thigh, a 2-cm incision was made posterior to the lateral malleolus. The peroneus longus and brevis tendons were dissected and identified. An "L"-shaped cut was made in the peroneus longus tendon, and the anterior half was harvested and sutured (Figure 2).

A second incision was made in the anterior aspect of the knee, revealing the patella dislocated in the lateral recess (Figure 3). The patella was reduced, and an anteromedializing osteotomy of the tibial tuberosity was performed, achieving approximately 1.5 cm of medial translation (Figure 4). The osteotomy was fixed with two screws with washers and a cerclage wire (Figure 5). Two metallic anchors were inserted into the proximal third of the lateral patella, and the center of the peroneus longus graft was fixed to the patella. The graft ends were fixed at the anatomic femoral MPFL insertion site using an interference screw under fluoroscopic guidance. Graft tensioning was performed at 30° of knee flexion. Following the reconstruction and osteotomy, intraoperative assessment confirmed stable patellar tracking with no signs of redislocation.

In the postoperative follow-up, the patient reported no pain in the left ankle, with preserved range of motion and no recurrence of patellar dislocation. Surgical outcomes were assessed using the Lysholm score, with a result of 95. Patellar glide and apprehension tests were negative, confirming the success of the procedure. Long-term evaluation

of ankle stability and function using the AOFAS and FADI scores yielded excellent results, with scores of 100 at both 12 and 24 months postoperatively.

**Figure 1.** Lateral dislocation of the patella with no mobility. Mild valgus alignment of the knee is also observed.



**Figure 2.** Visualization of a 2-cm incision made posterior to the lateral malleolus on the same side as the patellar dislocation. Dissection was performed with identification and isolation of the peroneus longus and peroneus brevis tendons. An “L”-shaped incision was made in the peroneus longus tendon, and its anterior half was sutured.





**Figure 3.** An incision was made in the anterior region of the knee, allowing visualization of the dislocated patella in the lateral recess.



**Figure 4.** Visualization of patellar reduction and anteromedialization tibial tubercle osteotomy (TTO), with patellar translation of approximately 1.5 cm.



**Figure 5.** Finalized osteotomy observed, fixed with two screws with washers and cerclage wire.



### 3. Discussion and Conclusion

Currently, the surgical treatment of irreducible patellar dislocations primarily consists of medial patellofemoral ligament (MPFL) reconstruction and bony correction via tibial tubercle procedures. The choice of graft for reconstruction has been the subject of numerous recent studies. In our setting, hamstring tendons are commonly the first choice for ligament reconstructions in the knee, including MPFL reconstruction. Procedures using these grafts are often associated with less postoperative pain and lower morbidity at the donor site, since harvesting from the flexor apparatus does not affect extensor functionality. However, in reconstructions requiring a larger graft volume, such as in multiligament injuries, the use of quadriceps or patellar tendon grafts is well recognized in the literature for increasing graft length and diameter. Nonetheless, clinical practice shows that these extensor mechanism autografts may not be ideal for certain techniques and can cause postoperative anterior knee pain and limited range of motion—especially when kneeling. Furthermore, these grafts carry a higher risk of morbidity and hypotrophy of the quadriceps muscle. There are documented cases of anterior knee pain and muscle atrophy following ACL reconstructions using extensor mechanism grafts [9].

Given this context, the use of the Peroneus Longus (PL) tendon has emerged as an alternative for ligament reconstructions, including chronic patellar dislocations. A 2023 study by Fowler et al. reported favorable outcomes in patients undergoing such procedures. Notable advantages of the PL graft include its biomechanical strength and stiffness, which are similar to those of hamstring autografts. In addition, its superficial anatomical location facilitates access during surgery, and its sufficient length allows for versatility in various reconstruction techniques, as was the case in this report. The use of the PL graft aims to reduce anterior knee pain and preserve lower limb mobility. However, potential impacts on ankle biomechanics and stability must be considered when harvesting this tendon.

Previous studies indicate that patients who undergo PL graft harvest do not exhibit significant differences in muscle strength, range of motion, load distribution, or gait compared to the non-operated limb [7, 9]. Moreover, eversion torque does not decrease to a level that impairs daily or athletic activities [11], patients frequently experience recovery without pain or loss of physical function. Additional studies assessing ankle function after

partial or complete PL harvest for knee ligament reconstruction up to 24 months postoperatively have shown excellent results [10], based on scores such as the AOFAS (American Orthopedic Foot and Ankle Score) and FADI (Foot and Ankle Disability Index). However, the long-term function of the ankle beyond 24 months remains uncertain, and potential joint degeneration in the future cannot be ruled out.

Therefore, continued long-term follow-up is essential to confirm whether these excellent outcomes persist. According to the same study, complications at the graft donor site were of low morbidity and did not compromise patient rehabilitation or the overall surgical outcome, supporting the safety of PL graft harvesting [10]. Thus, the literature supports that harvesting an ipsilateral peroneus longus autograft for ligament reconstruction is safe and carries a low risk of complications, justifying its use in the patient presented in this study.

Recent research has demonstrated favorable results with the use of the peroneus longus tendon in anterior cruciate ligament (ACL) and posterolateral corner reconstructions. MPFL reconstruction has become a topic of growing clinical and scientific importance. In a patient with chronic patellar dislocation and predisposing bony risk factors, using a graft with easy surgical access and appropriate biomechanical properties—combined with osteosynthesis for anteromedialization of the tibial tubercle—was considered the most appropriate treatment. Therefore, we conclude that the use of the peroneus longus tendon as a graft for medial patellofemoral ligament reconstruction represents a viable and valuable alternative that should be part of the surgeon's technical repertoire, thus expanding the range of available reconstructive strategies.

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**Research Ethics Committee Approval:** We declare that the patient approved the study by signing an informed consent form and the study followed the ethical guidelines established by the Declaration of Helsinki.

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