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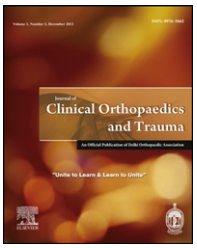

Case report

Medial patellofemoral ligament reconstruction – A novel technique☆

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ABSTRACT

Patellofemoral instability is initially treated conservatively and surgical treatment is reserved for resistant cases. Reconstruction of medial patellofemoral ligament has gained popularity these days as it attempts at restoring soft tissue anatomy and biomechanics of medial patellar restraint back to normal. Here we describe our novel transverse patella single tunnel and femoral interference screw technique to reconstruct the medial patellofemoral ligament using free autologous gracilis and semitendinosus grafts.

1. Introduction

Patellar instability is a relatively common problem, with prevalence of 6–77 per 100,000 population.[1] The cause of recurrent patellar dislocation (RPD) is multifactorial including alterations in articular geometry (trochlear dysplasia), limb alignment, rotational deformity, patellar height and ligamentous laxity.[2,3] However pathological insufficiency of the medial patellofemoral ligament (MPFL) has been described as the essential lesion of RDP.[4]

The medial side of the knee consists of three layers: the first layer consisting of the deep or crural fascia forming a layer which invests sartorius (but is superficial to gracilis and semitendinosus), the second forming the fibers of the superficial medial ligament whose anterior fibers pass upwards to blend with the vastus medialis, and posterior fibers run from the patella to insert at the medial epicondyle (medial patellofemoral ligament) and the third deep layer forming the capsule of the knee joint. Vertically aligned fibers form the deep layer of the medial ligament or the middle capsular ligament to the mid portion of the medial meniscus and the tibia. The MPFL is thus a distinct soft tissue structure within the medial retinaculum (second layer of knee), which originates from saddle between the adductor tubercle and epicondyle and inserts at the superior two-thirds of medial border of patella, typically at the location where the perimeter of the patella becomes more vertical (Fig. 1). It is approximately 55 mm long and its width ranges from 3 to 30 mm and has a mean tensile strength of 203N. This ligament is most taut in full extension, with the quadriceps contracted, and

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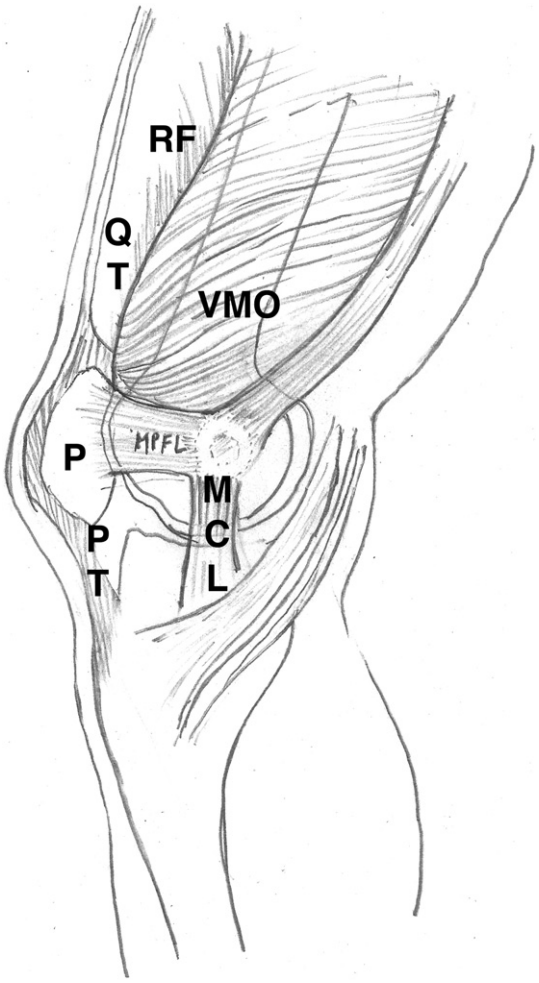

Fig. 1 – Anatomy of normal medial patellofemoral ligament.

assists in guiding the patella into the trochlea during the early stages of flexion. The common attachment of the tendon of the vastus medialis muscle and the ligament to the superiomedial patella suggests that there may be a dynamic element for stability.[2,5,6]

The initial treatment of patellar instability is always conservative, comprising of pelvi-femoral rehabilitation, quadriceps progressive strengthening exercises (focusing on vastus medialis obliqus) and braces.[4,7] Surgical treatment is indicated only when patient remains symptomatic after a good conservative trial.[8] Medial patellofemoral ligament (MPFL) is the most important static stabilizer of the patella, contributing 50–60% (average 53%) of the restraint during initial 30° of knee flexion and 94% patients of patellar dislocation have been found to have involvement of MPFL, 70% at the patellar insertion and the rest at the femoral origin. In all, however, there is also interstitial damage. Patellar tracking is significantly affected by a lateral force in the absence of the MPFL, but returns to normal following reconstruction.[9–11] So MPFL reconstruction surgeries are increasingly being used for recurrent patellar dislocations. In the present case report we are presenting a new method for MPFL reconstruction.

2. Case report

A 30 years old housewife presented to the clinic complaining of recurrent pain and instability in the front of right knee. There was no elicitable history of preceding trauma. On examination she was obese (body mass index 29.2), patella was dislocatable at moderate pressure, patellar apprehension test was positive, patellar maltracking was present and vastus medialis was wasted. The medial femoral condyle was more prominent as compared to opposite side. There was no swelling, retropatellar tenderness or any other ligament laxity. There was no angular deformity of the knee, and the quadriceps angle was 21°. The Insall–Salvati index was 1.4 and the sulcus angle was 130° with hypoplasia of the lateral condyle (Dejour type C) with facetal asymmetry.

As she continued to have pain and apprehension even after a rigorous physiotherapy programme, reconstruction of the MPFL was planned. The patient was informed regarding the need and nature of surgical intervention and also that her case will be considered for publication in a medical journal including electronic publication on the internet and she consented. Under spinal anesthesia and tourniquet control after the administration of prophylactic antibiotics, first the semitendinosus and gracilis tendons were harvested in the usual fashion, and a double bundle was prepared. Through a small (1 cm) incision on the lateral border of patella in superior half a bony patellar tunnel was then drilled from lateral to medial (avoiding articular penetration) and the graft was passed lateral to medial and taken out through another small medial parapatellar incision. Medial epicondyle was palpated percutaneously and exposed through another medial incision, on the medial aspect of distal femur centered over the palpated point. Blunt dissection was used to expose the superficial medial retinaculum adjoining the inferior border of the vastus medialis obliqus. The retinaculum was opened carefully, and with meticulous blunt dissection, the layer containing the medial patellofemoral ligament was exposed above the capsule. The saddle area on medial femoral condyle (between the adductor tubercle and the medial epicondyle) was palpated and a tunnel drilled directed laterally and slightly upward under image intensifier guidance. A curved hemostat was placed through the patellar incision, tunneled under the skin between the retinaculum and medial patellofemoral ligament remnant (i.e. between the second and third fascial layers), and used to retrieve the tendon graft into the femoral incision. The tunnel was then enlarged and the medial free end of the graft passed medial to lateral up to the lateral femoral cortex. The graft was sutured to the patella at both medial and lateral ends. Maintaining adequate tension in the graft, the knee was cycled several times from full flexion to full extension to ensure that graft is pre-stretched to eliminate "give", and with the patella centered on the trochlea and the knee at 30° flexion final fixation was done with a cancellous screw with washer at the medial cortex (Fig. 2 a–d). The graft thus acted as a checkrein ensuring that the patella is stabilized within the trochlea. The wound was closed and a knee immobilizer was applied.

Static quadriceps exercises and non-weight bearing walking with walker were started as soon as the patient