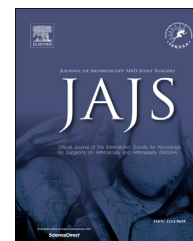




ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

[www.elsevier.com/locate/jajs](http://www.elsevier.com/locate/jajs)

## Review Article

# A review of functional anatomy and surgical reconstruction of medial patellofemoral ligament

Deiary F. Kader<sup>a,b,\*</sup>, Aysha Rajeev<sup>a,b</sup><sup>a</sup>North East Orthopaedic and Sports Injury Research Group, Tyne and Wear, UK<sup>b</sup>Department of Orthopaedics, Queen Elizabeth Hospital, Gateshead, UK

## A B S T R A C T

## Keywords:

Medial patellofemoral ligament  
 Anatomical attachments  
 Femoral tunnel placements  
 Graft selection

**Background:** Recurrent patella dislocation is a very disabling condition. The stability of patellofemoral joint depends on many general and local factors. It is believed that the Medial Patellofemoral Ligament (MPFL) is one of the major stabilisers of the patellofemoral joint in early knee flexion. Injury to the MPFL occurs in almost every patellar dislocation. This result in a significant increase in lateral patellofemoral joint tracking and contact pressures, which may affect long-term articular cartilage health. Therefore, in recent years MPFL reconstruction has become a popular surgical option in the treatment of patella instability. However there is still a growing debate regarding the correct surgical technique and post-operative rehabilitation. In addition, the long-term effect of MPFL reconstruction procedure on the patellofemoral joint is unknown. Recent research has emphasised the importance of anatomic femoral tunnel placement with the help of intraoperative radiograph. Mal-positioned femoral tunnels and over tensioned grafts during MPFL reconstruction have been reported to result in adverse outcomes such as joint stiffness, pain, recurrent instability and possibly early degenerative joint changes.

**Aim:** To review of our current knowledge of the anatomy, function and the surgical reconstruction of MPFL

**Methods:** We conducted cadaveric dissection to understand the anatomy of MPFL, its femoral and patellar attachments and its role in the functional stability of the patellofemoral joint. We also describe the surgical reconstruction of the MPFL using hamstring tendons, technique and accurate placements of femoral tunnel.

**Results:** Our findings showed that the MPFL insert in an area midway between the adductor tubercle and medial epicondyle of the femur, dorsal to an extended line from the posterior cortex of the femur and attaches to the superomedial portion of the patella, and under the surface of the Vastus Medialis Obliquus tendon (VMO). The ideal graft for reconstruction is the gracilis tendon. The femoral tunnel entry point is behind the posterior cortex of the femur and above the Blumensaat's line.

**Conclusion:** We conclude that anatomic femoral attachment and minimal tension during reconstruction of MPFL is essential for a successful outcome.

Copyright © 2014, International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty. Published by Reed Elsevier India Pvt. Ltd. All rights reserved.

\* Corresponding author. Department of Orthopaedics, Queen Elizabeth Hospital, Gateshead, UK.

E-mail address: [deiary.kader@btinternet.com](mailto:deiary.kader@btinternet.com) (D.F. Kader).

2214-9635/\$ – see front matter Copyright © 2014, International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty. Published by Reed Elsevier India Pvt. Ltd. All rights reserved.

<http://dx.doi.org/10.1016/j.jajs.2013.11.006>

## 1. Introduction

Patellar dislocation has been reported to account for 3% of all knee injuries,<sup>1</sup> with an incidence of between 29 and 43 individuals per 100,000 reported.<sup>2,3</sup> The results of conservative treatment have been unsatisfactory at short- and long-term follow-up. Clinical reports highlight instability, pain and loss of function. These undesirable symptoms are frequently identified in follow-up studies from clinical populations suffering patellar dislocation.<sup>4-6</sup>

Patellofemoral joint stability is maintained by three mechanisms.<sup>7</sup> Dynamic stability is provided mainly by the quadriceps and the gluteal muscles to a certain extent.<sup>8</sup> The static stability is provided by the bony anatomy and configuration of the patella and trochlear groove.<sup>9</sup> The passive joint restraint is provided by the local ligaments and retinacula.<sup>10</sup> Each mechanism is thought to have an important role in the range of knee flexion, with the Medial Patellofemoral Ligament (MPFL) identified as the most important joint stabiliser from 0°–30°. It contributes to more than 50–60% of the passive resistance to lateral patellar motion through this early range.<sup>11</sup>

## 2. Anatomy

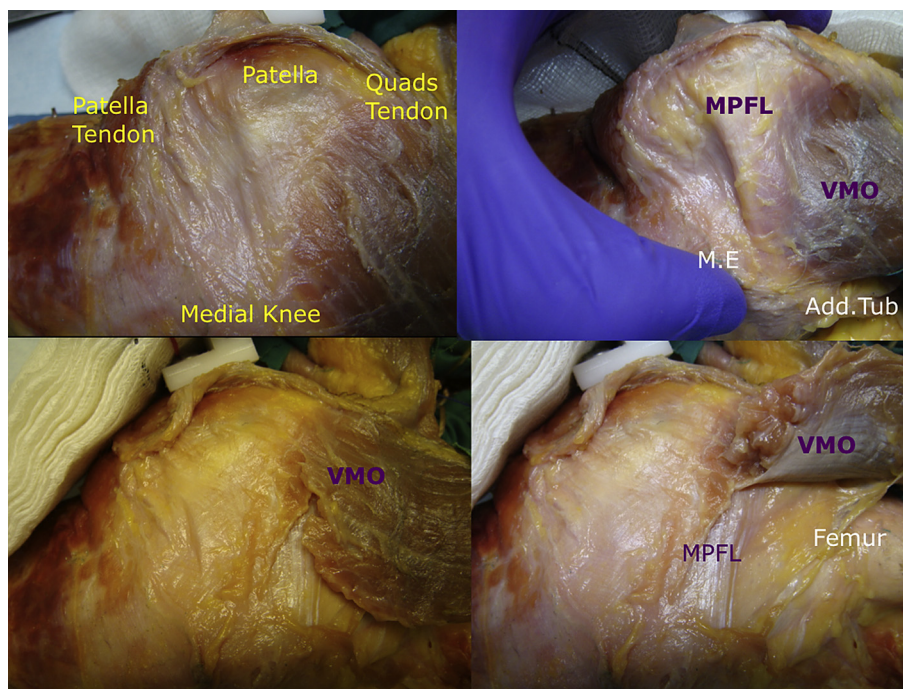
The MPFL was initially thought to only be present in 29–88% of knees,<sup>12</sup> but has since been shown to be a consistently present structure in all knees.<sup>13</sup> However there is discrepancy and debate about its precise anatomical attachment on the femur.<sup>14</sup> This has been attributed to by the complex anatomy on the medial side of the knee.<sup>15</sup> On an average of the MPFL is

approximately 53 mm long, with a range of 45–64 mm in anatomical specimens.<sup>16</sup> Ligament fibres have been reported to widen towards both patellar and femoral attachments. The width of MPFL at the femoral origin has been reported to range between 10 and 25 mm.<sup>8,13,17</sup>

The tissues covering the antero-medial aspect of the knee has been identified to be arranged into three distinct layers.<sup>1</sup> The MPFL has been defined in the second layer below the deep fascia, but superficial to the joint capsule.<sup>18</sup> Here it shares a close relationship with the superficial and superior fibres of the medial collateral ligament (MCL) and adheres to the vastus medialis oblique muscle (VMO) (Fig. 1). Significant overlapping of the ligament fibres of both the MPFL and MCL at this point makes identification of MPFL as single unit very difficult.<sup>10,15,17,19</sup>

### 2.1. Femoral attachment

The medial femoral condyle is covered by many closely compact structures that are very difficult to separate and hence the discrepancies in describing the femoral attachment of the MPFL. Most authors describe the femoral attachment of the MPFL in relation to landmarks such as the medial epicondyle, medial collateral ligament and the adductor tubercle and indeed some reports use these interchangeably.<sup>11,16</sup> Amis et al<sup>1</sup> inaccurately concluded that the MPFL originated from the origin of the medial epicondyle of the femur, whilst Davis et al<sup>20</sup> described the MPFL to take its femoral origin from adductor tubercle and medial epicondyle. Desio et al<sup>10</sup> describes a wide attachment for MPFL which is spread by decussating fibres attaching to both the adductor tubercle and the superficial fibres of the MCL, with more direct attachment



**Fig. 1** – Medial aspect of the knee showing the MPFL attachment to the upper 2/3 of the patella and to the area between the medial epicondyle and the adductor tubercle. It also shows how the VMO adheres to the MPFL.

Download English Version:

<https://daneshyari.com/en/article/3245137>

Download Persian Version:

<https://daneshyari.com/article/3245137>

[Daneshyari.com](https://daneshyari.com)