Posterolateral Corner of the Knee: Microsurgical Analysis of Anatomy and Morphometry

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abstract
Full article available online at Healio.com/Orthopedics. Search: 20130821-11

Reconstruction of the posterolateral corner (PLC) of the knee is essential to restore knee joint function. Controversy exists regarding a standardized nomenclature, the connective attachments and the relationships between them, and the frequency of occurrence among all structures of the PLC. Thirty human cadaveric knee specimens were investigated. The lateral collateral ligament, popliteus tendon, popliteofibular ligament, fabellolateral ligament, arcuate ligament, oblique popliteal ligament, posterior meniscofemoral ligament, and popliteal hiatus (including the popliteomeniscal ligaments) were studied. The length, diameter, variations, course, and morphology of these structures, as well as the position and dimension of the insertion, were measured and referenced the footprints to adjacent bony landmarks. Compared with existing studies, the lateral collateral ligament footprint was more proximal to the lateral femoral epicondyle (average, 3.61 ± 0.75 mm) and the popliteus tendon insertion was more distal and anterior to the lateral collateral ligament footprint (average, 5.69 ± 1.36 mm and 4.97 ± 1.73 mm, respectively). Only minor data have been published on the fabellolateral ligament (average length, 33.79 ± 4.98 mm; average diameter, 4.04 ± 1.22 mm), arcuate ligament (average length, 31.54 ± 2.82 mm; average diameter, 7.27 ± 1.56 mm), oblique popliteal ligament (average length, 45.56 ± 4.67 mm; average diameter, 14.90 ± 4.67 mm), posterior meniscofemoral ligament (average length, 23.75 ± 3.17 mm; average diameter, 3.62 ± 1.03 mm), and popliteomeniscal ligaments (average mediolateral popliteal hiatus diameter, 9.83 ± 2.16 mm; average superoinferior popliteal hiatus diameter, 8.23 ± 1.86 mm).

Figure: Dorsal photograph of the posterolateral corner of a right knee showing the popliteus muscle with musculotendinous junction (1) popliteus tendon (2), lateral collateral ligament (3), popliteofibular ligament (4), and lateral femoral condyle (5). Right = lateral, left = medial, top = superior, and bottom = inferior.

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The authors have no relevant financial relationships to disclose.

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doi: 10.3928/01477447-20130821-11
The posterolateral corner (PLC) of the knee has been identified as an essential stabilizing complex restraining varus, external rotation, and combined posterior translation and external rotation of the tibia on the femur. The posterolateral structures described in literature include the lateral collateral ligament, popliteus tendon, popliteofibular ligament, fabellofibular ligament, and arcuate ligament. Several studies have addressed the anatomy of the PLC but controversy exists regarding a standardized nomenclature, the connective attachments and the relationships between them, and the frequency of occurrence among all structures of the PLC. The use of microsurgical techniques to precisely describe the anatomy and measurement of the ligaments that form the PLC has been reported and has proven its potential to clarify some of the cited questions. Numerous reconstructive procedures addressing acute and chronic PLC injuries have been developed to restore knee joint function and stability.

To obtain an anatomic reconstruction, it is important to identify ligament attachment sites in acute trauma and chronic instability when edema, hematoma, multiple avulsion or retraction, and scar tissue formation impede the conception of normal anatomy. This necessitates precise quantitative and qualitative descriptions that specify measurable parameters that characterize the ligaments and their shapes and orientation and references all structures involved in adjacent bony landmarks. The current study also addressed the oblique popliteal ligament, the posterior meniscofemoral ligament, and the anatomy and morphology of the popliteal hiatus, including the popliteomeniscal ligaments.

The objectives of this study were to establish a comprehensive anatomy and morphometry of all structures that form the PLC using microsurgical exposure techniques and to provide a reference system for the ligament insertion areas to adjacent bony landmarks. To the authors’ knowledge, no other study has extensively addressed these objectives.

**MATERIALS AND METHODS**

Thirty cadaveric knee specimens from 14 female and 16 male Caucasian donors with no evidence of surgical scars and no instability on clinical examination were used for this study. Average age of the donors at the time of death was 76.7 ± 8.7 years. Thirteen right and 17 left knees with at least 30 cm of bone and soft tissue proximal and distal to the joint line were investigated. No medical history excluding previous injuries was available. To determine a consistent variable for comparison of the sample, the mediolateral and anteroposterior diameters of the tibial plateau were used.

Gross anatomic dissection was performed using a magnifying loupe. For a precise dissection of the deep layers of the posterolateral aspect, a surgical microscope and microsurgical instruments were used. After removal of skin and subcutaneous tissue en bloc, the iliotibial band was dissected from the Gerdy tubercle from distal to proximal. The attachments of the short and long heads of the biceps femoris muscle were released from the femoral origin and reflected distally, allowing for a visualization of the lateral collateral ligament and the popliteofibular ligament. The biceps femoris tendon and its aponeurotic fibers blending into the iliotibial band were traced to the insertion site at the posterolateral aspect of the fibular head and were carefully dissected to identify the margins and attachments of the lateral collateral ligament and the popliteofibular ligament at the posteromedial aspect of the fibular head. The lateral collateral ligament extending from the styloid process to the lateral femoral condyle was dissected, and its dimensions were recorded. To accomplish an exposure of the entire popliteus tendon, the lateral collateral ligament had to be transected.

The presence of a fabella was next noted in the lateral head of the gastrocnemius muscle, and measurements of the fabellotibial ligament were conducted in specimens in which it was present. Afterward, the lateral head of the gastrocnemius muscle was detached. By dissecting the deep layer of the popliteal fossa, the inferolateral genicular neurovascular bundle was located and served as a guiding structure to the PLC. The attachment of the popliteus muscle to the posterolateral aspect of the tibia was exposed, and its tendon was traced to the insertion at the lateral femoral condyle, identifying the popliteofibular ligament attachment at the musculotendinous junction (Figure 1) and the anteroinferior and posterosuperior popliteomeniscal ligaments extending to the lateral meniscus that form the popliteal hiatus. For complete exposure of the popliteal hiatus, a transverse incision of the proximal insertion of the posterior capsule was performed. The fibers
of the arcuate ligament extending between the fibular head and the posterior capsule were identified. Simultaneously, the oblique popliteal ligament was dissected and studied. Its length was measured from the semimembranos tendon origin to the capsular insertion.

After removal of the posterior capsule, the posterior meniscofemoral ligament was exposed (Figure 2). Relevant bony landmarks on the fibular head and the lateral femoral condyle, including the most proximal point of the styloid process and the tip of the lateral femoral epicondyle, were simultaneously identified (Figure 3). The center of the ligament insertion areas and bony landmarks were marked with cannulas. For the quantitative measurement of the distances between the ligament insertion areas and their reference to bony landmarks, a digital slide gauge was used. The metering precision of the instrument is accurate to 0.01 mm.

**RESULTS**

Average mediolateral and the anteroposterior diameters of the tibial plateau were 78.35±5.02 and 51.22±6.20 mm, respectively. All reference measurements refer to the midportion of the insertion areas and the center of the tubercles, respectively.

**Lateral Collateral Ligament**

The lateral collateral ligament was identified in all 30 knee specimens. Its morphology was consistently a round and well-defined structure with a slight intraligamentous rotation. The femoral attachment site was triangular, clearly definable, and located posterior and proximal to the lateral epicondyle. The fibular insertion area on the anterolateral aspect of the fibular head, slightly anterior and distal to the styloid process, had a fan-shaped morphology and blended with the attachment of the biceps femoris tendon. Quantitative characteristics of the lateral collateral ligament are shown in Table 1.

**Popliteus Tendon**

The popliteus tendon originated from the posteromedial aspect of the proximal tibia and inserted into the anterior and proximal quarter of the popliteal sulcus. The femoral attachment was anterior and distal to the lateral collateral ligament attachment and anterior and distal to the lateral epicondyle. Average femoral popliteus tendon footprint was 10.36±1.80 mm in an anteroposterior direction and 6.08±1.33 mm in a superoinferior direction. Average length of the popliteus tendon was 36.36±4.53 mm, and average diameter was 8.40±1.31 mm.

**Popliteofibular Ligament**

The popliteofibular ligament was present in all 30 knee specimens. It originated from the popliteal musculotendinous junction, developed distally and anteriorly with a mean angle of 51° (range, 47°-55°) to the longitudinal axis of the tibia, and inserted on the deep portion of the posterosuperior aspect of the styloid process with a fan-shaped footprint. The popliteofibular ligament attachment was posterior and proximal to the lateral collateral ligament fibular attachment and distal, posterior, and medial to the tip of the fibular styloid process. Morpho-

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**Figure 2**: Posteromedial photograph of the popliteal hiatus of a right knee showing the posterior cruciate ligament (1), posterior meniscofemoral ligament (2), popliteal hiatus with popliteus tendon (3), posterosuperior popliteomeniscal ligament (4), anteroinferior popliteomeniscal ligament (5), lateral meniscus posterior horn (6), and popliteus muscle (7). Right = posterolateral, left = anteromedial, top = superior, and bottom = inferior.

**Figure 3**: Schematic details of a right knee. Lateral view of the fibular head showing the fibular styloid process (1), fibular lateral collateral ligament insertion (2), and fibular popliteofibular ligament insertion (3). a1 = proximal and a2 = posterior distance between the lateral collateral ligament and popliteofibular ligament footprint. c1 = distal and c2 = posterior distance between the styloid process and popliteofibular ligament footprint (A). Posterior view of the fibular head showing the fibular styloid process (1) and fibular popliteofibular ligament insertion (3). c3 = medial distance between the styloid process and popliteofibular ligament footprint (B). Lateral view of the lateral femoral condyle showing the lateral femoral epicondyle (4), femoral lateral collateral ligament insertion (5), and femoral popliteus tendon insertion (6). a1 = proximal and a2 = posterior distance between the epicondyle and lateral collateral ligament footprint. b1 = distal and b2 = anterior distance between the epicondyle and popliteus tendon footprint. d1 = distal and d2 = anterior distance between the lateral collateral ligament and popliteus tendon footprint (C).
logical variations consisted of a singular bundle, a double ligament, or an inverted Y-shaped structure. A separated anterior and posterior bundle was found in 8 (26.7%) specimens and a Y-shaped ligament in 4 (13.3%) specimens. Eighteen (60%) specimens had a single anterior or posterior ligament. Length, diameter, and footprint dimensions are shown in Table 1.

Fabellofibular Ligament

The fabellofibular ligament was identified in 12 (40%) of the dissected knees. It originated from the lateral aspect of the fabella (if a fabella was present) and the posterior aspect of the supracondylar process of the femur, and it blended with fibers from the lateral gastrocnemius muscle. The insertion was on the posterior and lateral edge of the fibular styloid process. The fibular attachment of the fabellofibular ligament blended with the fibers of the arcuate ligament in 7 (23.3%) specimens. The occurrence of the fabellofibular ligament depended on the presence of a fabella and was difficult to distinguish from the arcuate ligament in specimens without a fabella. Average length of the fabellofibular ligament was 33.79 ± 4.98 mm, and average diameter was 4.04 ± 1.22 mm.

Average femoral footprint was 3.84 ± 2.44 mm in a superoinferior direction and 5.87 ± 1.67 mm in a mediolateral direction. Average fibular footprint was 4.20 ± 1.33 mm in a superoinferior direction and 3.76 ± 0.53 mm in a mediolateral direction.

Arcuate Ligament

The arcuate ligament was found in all knee specimens. It originated from the posterior capsule and the cap of the lateral femoral condyle and formed a triangular structure thickening the posterior capsule. The insertion area was on the lateral edge of the fibular styloid process just lateral to the popliteofibular ligament attachment. The arcuate ligament is a stabilizing structure against hyperextension with considerable variability. The ligament crosses the popliteus tendon superficial and the oblique popliteal ligament profound. Fibers from the popliteus muscle blend into the ascending limb of the arcuate ligament. The arcuate ligament was a narrow and thin fiber bundle found in 18 (60%) knees. The quantitative characteristics of the arcuate ligament and its footprints are shown in Table 1.

Oblique Popliteal Ligament

The oblique popliteal ligament originates from the posterior surface of the tibial head, blends with fibers from the semimembranosus tendon, develops mediolaterally, and attaches at the upper margin of the intercondylar fossa and the posterior surface of the femur, blending into the posterior capsule. Some of its fibers connect to the lateral aspect of the fabella and to the arcuate ligament, forming a round, arch-shaped structure within the posterolateral capsule. The ligament width was variable in this study. A broad

<table>
<thead>
<tr>
<th>Ligament/Insertion Area</th>
<th>Length</th>
<th>Diameter</th>
<th>Femoral Footprint</th>
<th>Fibular Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCL</td>
<td>61.69 ± 3.95</td>
<td>5.47 ± 1.14</td>
<td>9.89 ± 1.66 AP, 10.41 ± 1.74 SI</td>
<td>9.42 ± 1.42 AP, 7.49 ± 1.92 SI</td>
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<tr>
<td>PT</td>
<td>36.36 ± 4.53</td>
<td>8.40 ± 1.31</td>
<td>10.63 ± 1.80 AP, 6.08 ± 1.33 SI</td>
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<tr>
<td>PFL</td>
<td>14.06 ± 3.20 A, 12.45 ± 2.21 P</td>
<td>6.59 ± 1.69 insertion, 7.04 ± 2.31 midportion</td>
<td>4.92 ± 1.59 AP, 5.53 ± 2.20 ML</td>
<td></td>
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<tr>
<td>FFL</td>
<td>33.79 ± 4.98</td>
<td>4.04 ± 1.22</td>
<td>5.87 ± 1.67 ML, 3.84 ± 2.44 SI</td>
<td>3.76 ± 0.53 ML, 4.20 ± 1.33 SI</td>
</tr>
<tr>
<td>AL</td>
<td>31.54 ± 2.82</td>
<td>7.27 ± 1.56, max width 6.86 ± 5.12</td>
<td>12.28 ± 2.56 capsule</td>
<td>5.63 ± 1.76 AP, 6.29 ± 1.30 SI</td>
</tr>
<tr>
<td>OPL</td>
<td>45.56 ± 4.67</td>
<td>14.90 ± 4.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pMFL</td>
<td>23.75 ± 3.17</td>
<td>3.62 ± 1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Popliteal hiatus</td>
<td>9.83 ± 2.16 ML, 8.23 ± 1.86 SI</td>
<td></td>
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</tbody>
</table>

Abbreviations: A, anterior; AL, arcuate ligament; AP, anteroposterior; FFL, fabellofibular ligament; LCL, lateral collateral ligament; max, maximum; ML, mediolateral; OPL, oblique popliteal ligament; P, posterior; PFL, popliteofibular ligament; pMFL, posterior meniscofemoral ligament; PT, popliteus tendon; SI, superoinferior.
and distinctive structure was found in 7 (23.3%) specimens, whereas a weak fiber bundle was found in 4 (13.3%). Average length and width of the oblique popliteal ligament were 45.56±4.67 and 14.90±4.67 mm, respectively.

**Popliteomeniscal Ligament**

The popliteomeniscal fascicles were identified in all knee specimens. Arising from the anterior surface of the popliteal tendon on the level of the posterior transition area between joint cartilage and tibial bone, 2 well-defined bundles confined the popliteal hiatus. The posterosuperior fascicle was attached to the superior border of the posterior horn of the lateral meniscus, and the anteroinferior fascicle was attached to the bottom edge of the posterior horn of the lateral meniscus. Average diameter of the popliteal hiatus was 9.83±2.16 mm in a mediolateral direction and 8.23±1.86 mm in a superoinferior direction.

**Posterior Meniscofemoral Ligament**

The posterior meniscofemoral ligament extends between the medial side wall of the femoral intercondylar groove and the posterior horn of the lateral meniscus. Its fibers originate proximal to the femoral posterior cruciate ligament (PCL) attachment and remain superficial and posterior to the PCL. The posterior meniscofemoral ligament orientates laterally at the cartilage surface level and blends into the most posterior aspect of the lateral meniscus beneath the aperture of the popliteal hiatus. The prevalence of the posterior meniscofemoral ligament was 83.3% in this study. Average length of the posterior meniscofemoral ligament was 23.75±3.17 mm, and average diameter was 3.62±1.03 mm. The results for ligament length, diameter, and insertion areas are shown in Table 1.

Average distance between the ligament insertion area and bony landmarks was 3.61±0.75 mm between the femoral lateral epicondyle and the lateral collateral ligament footprint proximal and 3.81±0.87 mm between the femoral lateral epicondyle and the lateral collateral ligament footprint posterior. The popliteus tendon insertion was an average of 6.43±0.77 mm distal and 4.24±1.53 mm posterior to the femoral lateral epicondyle. The popliteofibular ligament footprint was an average of 2.31±1.06 mm distal, 4.52±2.54 mm posterior, and 4.39±2.80 mm medial to the fibular styloid process. Average distance between the lateral collateral ligament insertion and popliteus tendon insertion was 5.69±1.36 mm distal and 4.97±1.73 mm anterior. Average popliteofibular ligament footprint was 16.57±5.72 mm proximal and 10.26±5.17 mm posterior from the fibular lateral collateral ligament insertion area. The results of referencing the ligament insertion areas to each other and to adjacent bony landmarks are shown in Table 2.

### Table 2

<table>
<thead>
<tr>
<th>Ligament Insertion Area and Bony Landmark</th>
<th>Mean±SD, mm</th>
</tr>
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<tbody>
<tr>
<td>Femoral lateral epicondyle to LCL proximal (a1)</td>
<td>3.61±0.75</td>
</tr>
<tr>
<td>Femoral lateral epicondyle to LCL posterior (a2)</td>
<td>3.81±0.87</td>
</tr>
<tr>
<td>Femoral lateral epicondyle to PT distal (b1)</td>
<td>6.43±0.77</td>
</tr>
<tr>
<td>Femoral lateral epicondyle to PT anterior (b2)</td>
<td>4.24±1.53</td>
</tr>
<tr>
<td>Fibular styloid process to PFL distal (c1)</td>
<td>2.31±1.06</td>
</tr>
<tr>
<td>Fibular styloid process to PFL posterior (c2)</td>
<td>4.52±2.54</td>
</tr>
<tr>
<td>Fibular styloid process to PFL medial (c3)</td>
<td>4.39±2.80</td>
</tr>
<tr>
<td>LCL to PT distal (d1)</td>
<td>5.69±1.36</td>
</tr>
<tr>
<td>LCL to PT anterior (d2)</td>
<td>4.97±1.73</td>
</tr>
<tr>
<td>PFL to LCL fibular proximal (e1)</td>
<td>16.57±5.72</td>
</tr>
<tr>
<td>PFL to LCL fibular posterior (e2)</td>
<td>10.26±5.17</td>
</tr>
</tbody>
</table>

Abbreviations: LCL, lateral collateral ligament; PFL, popliteofibular ligament; PT, popliteus tendon.

**Discussion**

The objectives of this study were to provide quantitative and qualitative data on the posterolateral structures and to reference them to identifiable bony landmarks. Based on previous reports, the current authors used the lateral epicondyle on the femur and the tip of the styloid process on the fibula to describe the ligaments’ relationship to each other in a reproducible way. They attempted to clarify the confusion in the literature originating from inconsistent terminology and a variety in anatomy by incorporating all known ligamentous structures and by using microsurgical techniques superior for establishing accurate descriptions of anatomic components of this region.

**Lateral Collateral Ligament**

Average length and diameter of the lateral collateral ligament were 61.69±3.95 mm and 5.47±1.14 mm, respectively, which are comparable to the results of Espregueira-Mendes and da Silva, who reported an average length of 63.1±5.2 mm and average width of 8.5±2.2 mm, and with the results of additional studies. Average dimensions of the anteroposterior and superoinferior axis of the femoral footprint were also in accordance with previous reports, with Espregueira-Mendes and da Silva reporting dimensions of 10.9±0.1 mm superoinferior and 10±0.1 mm anteroposterior. The dimensions of the anteroposterior and superoinferior axis of the fibular footprint averaged 9.42±1.42 mm and 7.49±1.92 mm, respectively. Regarding the reference of the lateral collateral ligament femoral attachment to the lateral femoral epicondyle, a posterior distance of 3.81±0.87 mm...
was found, which supports the findings of LaPrade et al\(^6\) (3.1 mm posterior), but the proximal distance was more than twice that found by LaPrade et al\(^6\) (3.61 ± 0.75 vs 1.4 mm proximal, respectively).

**Popliteus Tendon**
Average length and diameter of the popliteus tendon were 36.36 ± 4.53 and 8.40 ± 1.31 mm, respectively. Average length of the anteroposterior and superoinferior axes of the femoral footprint were 10.63 ± 1.80 and 6.08 ± 1.33 mm, respectively. In this study, the femoral footprint had dimensions approximately equal to those reported in the only previous report on the dimensions of the femoral footprint.\(^7\) Average distances between the femoral lateral epicondyle and popliteus tendon were 6.43 ± 0.77 mm distally and 4.24 ± 1.53 mm anteriorly, which are similar to results reported by Brinkman et al\(^6\) (mean distance, 9.7 ± 3.9 mm distal to the epicondyle). Average distances between the femoral lateral collateral ligament insertion and popliteus tendon insertion were 5.69 ± 1.36 mm distally and 4.97 ± 1.73 mm anteriorly, which is less distally and more anteriorly compared with the results of Brinkman et al\(^6\) (average, 11 ± 0.8 mm distally and 0.84 ± 0.4 mm anteriorly).

**Popliteofibular Ligament**
The popliteofibular ligament was found in all specimens, which supports previous reports in the literature of an incidence between 93% and 100%.\(^7,9,16,22\) The ligament’s construction seems to be polymorphic. Although Stäubli and Birrer\(^23\) and LaPrade et al\(^6\) consistently found a structure with 2 separate divisions, the current study’s findings confirm the results of Diamantopoulos et al\(^7\) who classified 3 different types of the popliteofibular ligament: single bundle, double bundle, and inverted y-shaped. The distribution in the current study was 60%, 26.7%, and 13.3%, respectively. Average length was 14.06 ± 3.20 mm anterior and 12.45 ± 2.21 mm posterior. Average width was 6.59 ± 1.69 mm at the insertion and 7.04 ± 2.31 mm at the midportion. These results are similar to those reported by Diamantopoulos et al.\(^7\)

Average fibular insertion area was 4.92 ± 1.59 mm in an anteroposterior direction and 5.53 ± 2.20 mm in a mediolateral direction. To the authors’ knowledge, no comparable reports exist in the literature regarding the fibular footprint. Brinkman et al\(^6\) reported a mean distance of 11.2 mm anterior and 12.3 mm distal between the fibular lateral collateral ligament and popliteofibular ligament insertion, whereas the current study reports distances of 10.26 ± 5.17 and 16.57 ± 5.72 mm, respectively. Average distances between the fibular styloid process and the popliteofibular ligament were 2.31 ± 1.06 mm distally, 4.52 ± 2.54 mm posteriorly, and 4.39 ± 2.80 mm medially. LaPrade et al\(^9\) reported a mean distance between the popliteofibular ligament attachment and the tip of the styloid process of 2.8 mm (range, 1.2-3.8 mm) for the anterior division and 1.6 mm (range, 0.6-2.8 mm) for the posterior division of the popliteofibular ligament.

**Fabellofibular, Arcuate, and Oblique Popliteal Ligaments**
The fabellofibular, arcuate, and oblique popliteal ligaments are only sporadically found in all knee specimens, which supports previous reports in the literature. Watanabe et al\(^24\) found the fabellofibular ligament in 51.3% and the arcuate ligament in 47.9% of 115 dissected cadaveric knees. In the current study, average length and diameter of the fabellofibular ligament were 33.79 ± 4.98 and 4.04 ± 1.22 mm, respectively. The relative frequency of occurrence was 40%. The ligament’s position is lateral to the arcuate ligament, and the separation from the latter was difficult in some specimens, indicating a more frequent presence than previously estimated.\(^23\) The fibular insertion at the posterior and lateral edge of the styloid process in the current study confirms the findings of Diamantopoulos et al\(^7\) Average length of the fibular footprint was 4.20 ± 1.33 mm in the superoinferior axis and 3.76 ± 0.53 mm in the mediolateral axis. Average femoral footprint was 3.84 ± 2.44 mm in the superoinferior axis and 5.87 ± 1.67 mm in the mediolateral axis. To the authors’ knowledge, no comparable data exist in the literature.

The arcuate ligament was found in all knee specimens in the current study. Sudasna and Harnsiriwattanakit\(^22\) reported a frequency of occurrence of 24%. Diamantopoulos et al\(^7\) and Watanabe et al\(^24\) found the arcuate ligament in 70% and 47.9% of 10 and 115 cadaveric knees, respectively. It is unclear whether the amount of dissected knee specimens, the variability in existing nomenclature, or the influence of magnification instruments is responsible for the inhomogeneity of these differing results. It was difficult to separate the arcuate ligament from the oblique popliteal ligament and the posterior capsule in specimens where only a weak and narrow fiber bundle was present. Average length of the anteroposterior and superoinferior axes of the fibular footprint were 5.63 ± 1.76 and 6.29 ± 1.30 mm, respectively. To the authors’ knowledge, no comparable data exist in the literature.

The oblique popliteal ligament connects the medial to the lateral corner of the posterior aspect of the knee joint and blends with fibers of the arcuate ligament and the fabellofibular ligament. The frequency of occurrence was 100%. Average length and width were 45.56 ± 4.67 and 14.90 ± 4.67 mm, respectively. To the authors’ knowledge, no comparable data exist in the literature.

**Popliteal Hiatus**
The anteroinferior and the posteroinferior popliteomeniscal fascicles were clearly identified in all knee specimens. The majority of studies agree that the connective attachments of the popliteus tendon to the lateral meniscus contribute to stabilization and retraction, and, therefore, the protection of the lateral meniscus.
Posterior Meniscofemoral Ligament

Average length and diameter of the posterior meniscofemoral ligament were 23.75±3.17 and 3.62±1.03 mm, respectively. Its prevalence was 83.3%. Both measurements are comparable with those in previous reports in the literature. Some inaccuracy remains when comparing the results of studies using different methods and materials. The use of specimens from patients aged an average of 76.7±8.7 years limited the current study because patients requiring PLC surgery are predominantly younger. Moreover, no medical history of the donors was available to exclude previous injuries of the PLC. The sample size was not determined because a power analysis is difficult to conduct with this type of data.

CONCLUSION

Concerning the most frequently and accurately studied components of the PLC of the knee, this study confirms the results previously reported in the literature. However, the current study found a more proximal position of the lateral collateral ligament footprint on the lateral femoral epicondyle and a more distal and anterior position of the popliteus tendon insertion area relative to the lateral collateral ligament footprint. This study provides additional information regarding the popliteus tendon femoral footprint; the quantitative characteristics of the fabellotibial, arcuate, and oblique popliteal ligaments; and the dimensions of the fabellotibial ligament and arcuate ligament fibular footprints. Few data have been previously published on these structures. Reports on most major ligaments of the PLC, including femoral and fibular insertion areas, may help develop a more standardized nomenclature. Microsurgical exposure techniques are necessary for accurate preparation resulting in precise measurements. The current method of referencing ligament footprints to adjacent bony landmarks may be helpful for surgical reconstructive techniques for the PLC regarding graft position, graft orientation, and selection of tunnel position and diameter.

REFERENCES