Editorial

Is anatomy of the posterolateral corner always the same?

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Multiple ligament injuries of the knee usually occur after high-velocity trauma, with the posterolateral corner (PLC) being the most commonly injured. It has been estimated that 60% of patients with posterior cruciate ligament (PCL) injuries also have a concomitant injury to one or more of the posterolateral structures (1-4).

PLC reconstruction has been a more reliable treatment option because of the high failure rates associated with primary repair (5,6). Numerous reconstruction techniques have been described (7-10). Since LaPrade *et al.* first published on the anatomy and biomechanics of the PLC (11,12), there has been evidence of improved biomechanical and clinical outcomes with anatomic reconstruction techniques (13-18). Based on previous anatomical research, Feng *et al.* also described an anatomic popliteus tendon (PT) reconstruction with arthroscopic surgery (19).

The recent paper "Posterolateral corner repair and reconstruction: overview of current techniques" systemically discussed current concepts of PLC repair and reconstruction techniques. After reading this paper, we gained a more profound understanding of the anatomy and treatment options of PLC injuries. We also noticed that this paper cited a schematic diagram from LaPrade's original research (11). This schematic describes the anatomical relationship between the femoral insertions of the lateral collateral ligament (LCL) and PT. LaPrade's original paper included a photograph of the PLC anatomy in a cadaver knee. The appearance of the femoral PLC attachment in this photograph looks slightly different from the schematic diagram. It appears as though the center of the femoral attachment of the PT is not as anterior as seen in the schematic diagram. The paper also described the relationship and distance between the femoral insertions of the LCL and PT. It described the center of the PT footprint being anterior and inferior to the center of the LCL footprint with a mean distance of 18.5 mm. The author's anatomic reconstruction technique is based on this anatomical study.

We previously performed an anatomical study of the PLC on Asian cadavers. We discovered that there is a difference between our findings and that of LaPrade *et al.* (*Figure 1*). We found that the femoral attachments of both the LCL and PT remain posterior to the lateral femoral epicondyle (*Figure 2*). The center of the LCL attachment is about 6 mm posterior to the lateral femoral epicondyle. The center of the PT attachment is about 10 mm distal and slightly posterior to the LCL attachment (*Figure 3*). We have also described a reconstruction technique based on our research. We prefer to use a single strand semitendinosus tendon to reconstruct the LCL and the popliteofibular ligament (PFL), while using a double strand gracilis to reconstruct the PT (*Figure 4*). This is typically performed using four small incisions (*Figure 5*).

While our findings are different from LaPrade *et al.*'s pioneering research on the PLC, we believe it is because of inherent anatomical differences between the Asian and Caucasian populations. We recommend modifying anatomic reconstruction techniques based on these anatomical differences.

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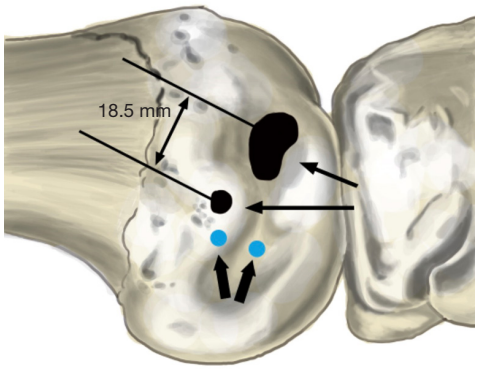

Figure 1 This schematic diagram depicts the differences of the PLC's femoral attachments between our research on Asian cadavers (thick arrows) and LaPrade *et al.*'s research (thin arrows). PLC, posterolateral corner.

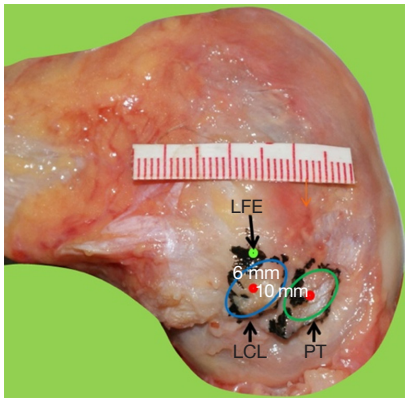

Figure 3 This photograph shows that the center of the LCL attachment is about 6 mm posterior to the lateral femoral epicondyle (LFE). The center of the PT attachment is about 10 mm distal and slightly posterior to the center of LCL attachment. LCL, lateral collateral ligament; PT, popliteus tendon.

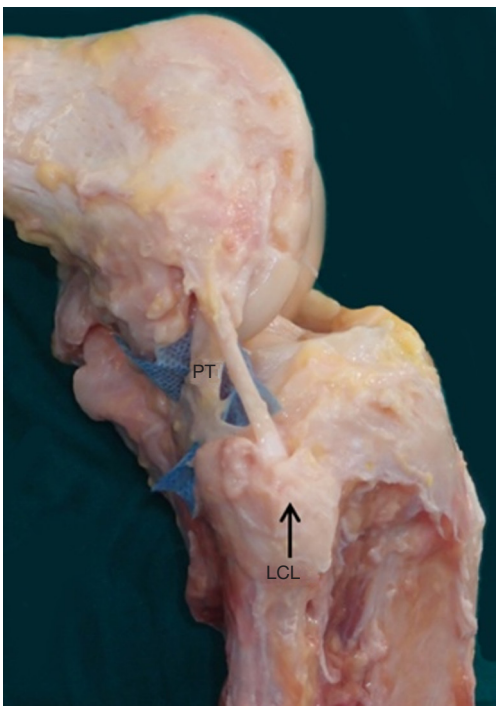

Figure 2 This is a photograph from our research on the anatomy of the PLC in Asian cadavers. The femoral attachments for both the LCL and PT are posterior to the lateral femoral epicondyle. PLC, posterolateral corner; LCL, lateral collateral ligament; PT, popliteus tendon.

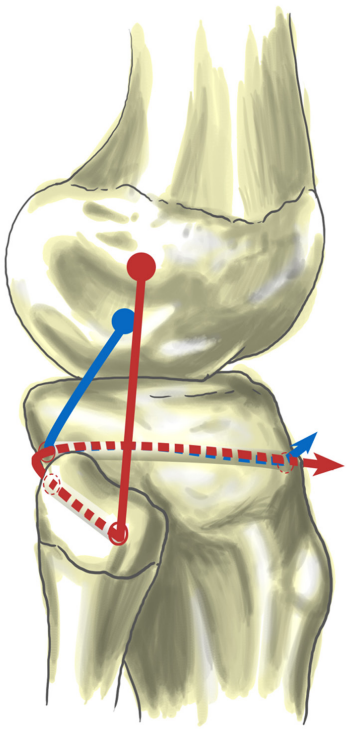

Figure 4 This is a schematic diagram of our PLC reconstruction technique (the blue line indicate the orientation of PT and the red line indicate the orientation of LCL and popliteofibular ligament). PLC, posterolateral corner; PT, popliteus tendon; LCL, lateral collateral ligament.

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Figure 5 This photograph shows our PLC reconstruction technique using four small incisions. PLC, posterolateral corner.

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Footnote

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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