

## Technical Note

# The Docking Technique for Posterolateral Corner Reconstruction

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**Abstract:** Posterolateral corner injuries of the knee are an uncommon but potentially debilitating injury. They are easily missed on physical examination and are often associated with alternate ligament pathology. When identified early, these injuries are best managed by primary repair with or without augmentation of the involved structures. However, chronic injuries are generally not amenable to primary repair and often require reconstruction. Experimental data suggest that the lateral collateral ligament and popliteofibular ligament present critical biomechanical restraints of the posterolateral aspect of the knee and should be incorporated into contemporary reconstruction techniques. We describe a novel method of reconstructing these critical components of the posterolateral corner using a new docking technique for fixation on the femur with a graft placed through a fibular head tunnel. **Key Words:** Posterolateral corner—Ligament—Reconstruction—Allograft—Knee.

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High-grade posterolateral corner injuries of the knee are rare but potentially devastating injuries. When untreated, it has been shown that these injuries result in persistent instability and progressive articular cartilage damage.<sup>1</sup> Acute high-grade injuries can be successfully treated with direct repair with or without augmentation.<sup>2,3</sup> However, in patients with symptomatic chronic posterolateral instability, primary repair is rarely successful and reconstruction is recommended.<sup>4,5</sup>

Because of the anatomic variability of the posterolateral corner<sup>6</sup> and inconsistent combination of injured structures, multiple surgical techniques have been described for its reconstruction.<sup>3-5,7,8</sup> Published biomechanical data have shown the critical importance of

the lateral collateral ligament (LCL) and the popliteofibular ligament (PFL) for resisting, posterior translation, varus opening, and external rotation.<sup>9,10</sup> Given the biomechanical importance of these anatomic structures, it has been recommended that surgical reconstruction techniques should attempt functional restoration of the LCL and PFL.<sup>10,11</sup> Based on previous techniques for anatomic reconstruction of the posterolateral corner used at our institution,<sup>12</sup> we have developed a new technique that uses an allograft tendon placed through a tunnel in the fibular head and a unique docking technique to accomplish fixation of the graft at the femoral epicondyle.

## SURGICAL TECHNIQUE

The patient is placed on the table in a supine position. Once adequate anesthesia has been achieved, a thorough examination is conducted. Stability of the knee should be evaluated using Lachman, posterior drawer, pivot-shift, and varus/valgus testing. The posterolateral drawer should be performed and compared with the opposite side. Finally, external rotation spin

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should be evaluated at 30° and 90° of knee flexion and compared with the opposite side.

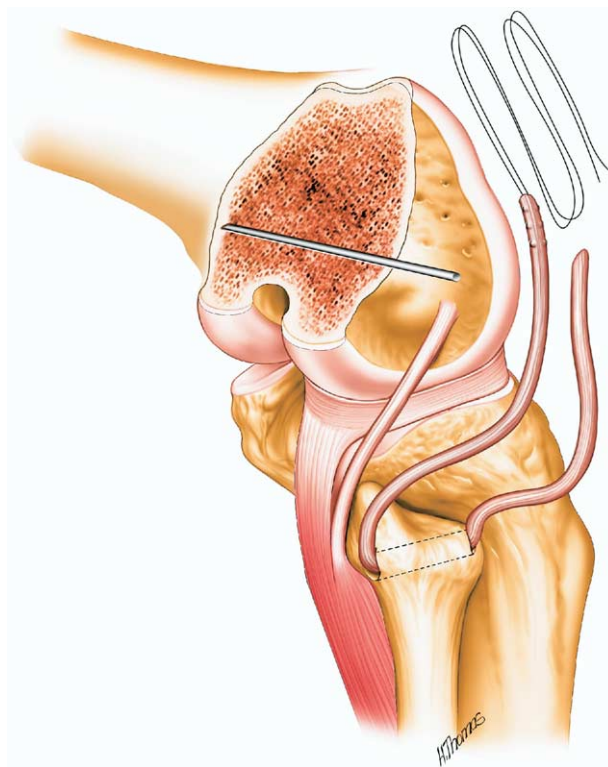
Once the presence of a posterolateral corner injury has been confirmed, the tourniquet is inflated and the skin incision is marked out with the knee flexed approximately 30° over a bump. The lateral epicondyle is palpated and marked along with the fibular head. The incision should begin proximal and just posterior to the lateral epicondyle, curving posteriorly with the bend of the knee, and ending just distal and proximal to the fibular head. With the knee in full extension, the incision should form a straight line.

The incision is made and carried down to the underlying fascia and iliotibial band. Skin and subcutaneous tissue flaps are raised both anteriorly and posteriorly to allow for adequate visualization of the lateral epicondyle and posterior aspect of the biceps femoris muscle belly and fibular head.

Next, the peroneal nerve should be identified and protected. The nerve is most easily visualized proximally, just posterior to the muscle belly of the biceps femoris. Once the nerve is identified, it is dissected distally as it passes across the fibular neck and enters the peroneal muscle belly. A vessel loop is passed around the nerve for its identification and protection throughout the remainder of the reconstruction.

Once the nerve has been isolated, the anterior and posterior borders of the fibular head are exposed subperiosteally using a combination of electrocautery and a periosteal elevator. A guidewire is then passed from anterior to posterior through the fibular head while using a broad periosteal elevator to protect the nerve posteriorly. Care must be taken to assure that the guidewire is placed medially to prevent lateral cortical fracture with subsequent reaming. A bone-block sizing guide from an anterior cruciate ligament reconstruction system can then be used as a soft-tissue protector as the guidewire is over-reamed with a 7- or 8-mm reamer. Finally, a No. 5 Ethibond suture (Ethicon, Somerville, NJ) is passed through the tunnel for later graft passage.

At this point, the lateral epicondyle of the femur is identified by direct palpation. The overlying iliotibial band is then incised for approximately 3 to 4 cm directly over this point. Blunt dissection allows visualization of the underlying remnants of the LCL and popliteal tendon, which will confirm proper identification of the isometric point. The remnants should be preserved as augmentation of the reconstruction. Subperiosteal dissection is carried out along the isometric point, and a slotted guide pin is drilled across the distal femur starting at the lateral epicondyle (Fig 1).



**FIGURE 1.** Guidewire placement in the lateral femoral epicondyle for drilling of the femoral tunnel. The pin is placed parallel to the knee joint and perpendicular to the shaft of the femur. It is drilled out the medial side of the knee percutaneously for later suture passage.

The pin should be parallel to the axis of the joint and perpendicular to the axis of the femur. It is brought out the medial side of the knee percutaneously.

We prefer to use allograft tissue for posterolateral corner reconstruction. Graft options include hamstring, Achilles tendon, or anterior tibial tendon allograft. One end of the graft is prepared by placing a No. 2 Fiberwire (Arthrex, Naples, FL) suture in a Krackow-type fashion. The opposite end of the graft is left free for later measurement once initial graft passage is complete.

At this point, the guidewire is overdrilled with an 8-mm reamer creating a 30-mm blind tunnel. Two No. 5 Ethibond passing sutures are then passed through the tunnel and out the medial side of the knee using the slotted guidewire. The graft is brought to the operative field and is passed through the fibular tunnel using the passing suture. A large Kelly clamp is then used to create a tunnel under the iliotibial band through which both limbs of the graft are passed.

Next, the limb of the graft that had sutures already

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