

Anatomical Single-Bundle Anterior Cruciate Ligament Reconstruction With a Transtibial Technique

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ABSTRACT

To position a single-bundle anterior cruciate ligament reconstruction anatomically on the femoral side while still using a transtibial technique, we recommend performing a posterolateral notchplasty, inserting the tibial aimer through an accessory inferomedial portal, using a more proximal tibial starting point, removing bone from the posterolateral corner of the tibial tunnel, and externally rotating the over-the-top guide.

Recent literature has emphasized the importance of anatomical reconstruction of the anterior cruciate ligament (ACL) with the suggestion that the ACL is composed of 2 discrete ligamentous bundles^{1,2} and that nonanatomical single-bundle reconstructions may fail to restore adequate rotational stability to the knee.^{3,4}

In this report, we present 6 key tips for obtaining an anatomical position on the lateral wall of the intercondylar notch using a single-

bundle reconstruction with a transtibial technique, a method that has been recently shown to simultaneously reconstruct portions of both ACL bundles.⁵

Tip 1. Perform a posterolateral notchplasty. After the wall of soft tissues is cleared with a radio-frequency device and a shaver, a bony notchplasty is initiated with

position. This maneuver reduces the tendency of the aimer to slide “higher” in the notch and facilitates rotation of the aimer (see tip 4). Afterward, the surgeon should be able to easily hook a probe around the posterior wall.

Tip 2. Insert the tibial aimer through an accessory inferomedial portal. We use a more distal and lateral acces-

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a quarter-inch osteotome through the anteromedial portal. The bone resection is started along the anteromedial aspect of the lateral femoral condyle, where a mark is made 10 mm from the lateral aspect of the posterior cruciate ligament (PCL), corresponding with roughly 2 to 3 mm of bone removal from the anterior part of the notch. After resection with the osteotome is initiated, a spherical burr is used to complete the resection from anterior to posterior, gently contouring the roof and superolateral corner of the notch from a triangular configuration to one with more of an acute angle to its corner—resembling a Roman arch (Figure 1). The best resection is performed from the posterolateral notch, as this removes bone that might otherwise prevent the “over-the-top” guide from being placed at the lowest possible

sory portal for insertion of the tibial aimer. A spinal needle is inserted through the patellar tendon approximately 1 cm lateral and distal to



Figure 1. Intercondylar notch appearance after adequate notchplasty. Note clear visualization of entire anterior cruciate ligament course and smooth right-angle corner of “Roman arch” bony notchplasty in this left knee reconstruction. Removal of bone principally from posterolateral aspect of notch opens up space for later positioning of over-the-top guide. Probe is used to confirm easy hooking of back wall.

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