



All-Inside Posterior Cruciate Ligament Reconstruction

Alexander H. King, BS,^{*,†} Matthew R. Prince, DO,^{*,†} Patrick J. Reardon, BS,^{*,†}
Bruce A. Levy, MD,^{*,†} and Michael J. Stuart, MD^{*,†}

Posterior cruciate ligament injuries can occur in isolation or in combination with other knee ligament injuries. In the setting of a multiligament injury, posterior cruciate ligament reconstruction enhances patient function. Several techniques and graft options exist; however, the optimal treatment strategy has yet to be elucidated. This article describes a safe, effective, and reliable all-inside, arthroscopic approach using a quadrupled tibialis anterior or peroneus longus allograft secured with both tibial and femoral suspensory fixation.

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Graft Preparation

Identical to the all-inside anterior cruciate ligament (ACL) reconstruction, the technique for all-inside posterior cruciate ligament (PCL) graft preparation uses a frozen, nonirradiated tibialis anterior or peroneus longus allograft measuring at least 320 mm in length. The graft is quadrupled through the ACL Tightrope RT (Arthrex, Naples, FL) with a button on the femoral end and through the TightRope ABS loop without a button on the tibial end. This technique produces an 80-90-mm-long graft providing at least 20 mm of graft in both the femoral and tibial sockets. A diameter of 10-12 mm is desired. From each end of the graft, 20 mm is marked with a pen for direct visualization of the length of graft entering the sockets.¹⁻¹³

Tibial Socket Creation

After a thorough diagnostic arthroscopy and meniscus and articular cartilage treatment, a posteromedial portal is established under arthroscopic visualization with a 30° arthroscope in the anterolateral portal. A posteromedial portal is established to prepare the PCL tibial footprint and retract the neurovascular bundle posteriorly (Fig. 1). A flexible cannula allows for easy portal access and maneuverability. A shaver (Stryker,

Kalamazoo, MI) and radiofrequency device (Arthrocare, Austin, TX) through this posteromedial portal allow for exposure of the anatomical tibial socket position. Care is taken to preserve the posterior horn attachments of the lateral and medial menisci. A 70° arthroscope is used to fully visualize the tibial PCL footprint. With the arthroscope in the anterolateral portal, an anatomically contoured PCL tibial guide (Arthrex, Inc) is placed through the anteromedial portal, fitting around the ACL and hooking onto the posterior tibial margin between the mammillary bodies at the base of the PCL facet. The “hook and drop” technique is then applied by firmly hooking the guide on the base of the PCL facet; then the surgeon drops his or her hand, until the guide sits flush with the tibial plateau at the level of the joint line (Fig. 2). The drill sleeve on the exterior of the guide is placed approximately 1 cm medial to the tubercle on the anterior tibia. The arthroscope is then inserted through the posteromedial portal for direct visualization of the 2.4-mm guide pin (Arthrex, Naples, FL) and Flipcutter (Arthrex, Naples, FL) as they penetrate the tibial cortex and hit the PCL guide (Figs. 3 and 4). The guide serves as a neurovascular shield while drilling. The tibial socket (10-12 mm in diameter) is reamed retrograde to a depth of 35-40 mm (Fig. 5). A Fiberstick (Arthrex, Naples, FL) is used to establish a passing suture that is retrieved out of the anteromedial portal for later graft passage (Fig. 6).

Femoral Socket Creation

The 30° arthroscope is reinserted in the anteromedial portal. An accessory anterolateral portal is created 1 cm distal and

*Department of Orthopedic Surgery, Mayo Clinic, Rochester, MN.

†Sports Medicine, Mayo Clinic, Rochester, MN.

Address reprint requests to Michael J. Stuart, MD, Department of Orthopedic Surgery, Mayo Clinic, 200 First St SW, Rochester, MN 55905. E-mail: Stuart.Michael@Mayo.edu

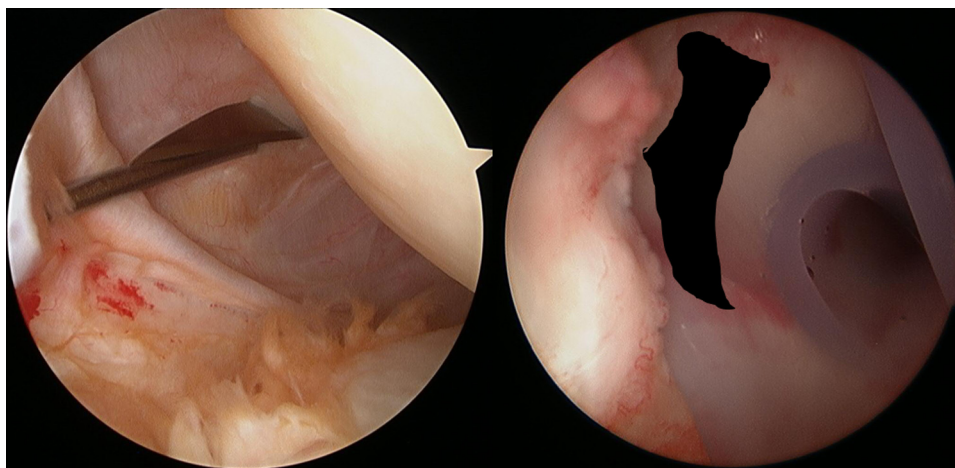


Figure 1 View from the anterolateral portal while establishing the posteromedial portal with the “needle-and-knife” technique and inserting a flexible cannula. (Color version of figure is available online.)

1 cm lateral to the standard anterolateral portal. A 10-11 mm low-profile reamer (Arthrex, Naples, FL) is positioned at the center of the PCL anterolateral bundle footprint through the accessory portal. Its placement should be directly adjacent to the distal and anterior articular cartilage margin of the medial femoral condyle. A 2.4-mm guide pin (Arthrex, Naples, FL) is inserted and the femoral socket is created by drilling to a depth of 25 mm with the low-profile reamer (Fig. 7). Interosseous length is measured using a spade tip guide pin (Arthrex, Naples, FL) and a passing suture is inserted.

Graft Passage and Tensioning

A flexible passport cannula (Arthrex, Naples, FL) is placed into the accessory anterolateral portal to avoid a soft tissue bridge during retrieval of the femoral and tibial passing sutures and is then removed. The femoral end of the graft is marked at the measured interosseous length. The tibial end of the graft is

passed deep into the tibial socket, which facilitates passage of the femoral end (Fig. 8). The femoral passing suture is used to insert the graft into the femoral socket. A suture grasper holds constant tension on the tightrope while the tightrope button is then pulled into the femoral socket. The button flips onto the femoral cortex as the interosseous length mark enters the socket (Fig. 9). Pulling the tightrope strands sequentially docks the graft into the femoral socket at a depth of 20 mm (Fig. 10). With the scope in the posteromedial portal, the magnitude of graft in the tibial socket is measured. If more than 20 mm of graft is noted in the socket, additional graft is pulled into the femur. The ABS button (Arthrex, Naples, FL) is attached to the tibial tightrope and the tibial end of the graft is preliminarily tightened. The knee is cycled through flexion and extension to remove creep. Final tensioning of both femoral and tibial sides is performed with the knee in 80°-90° of flexion to recreate the normal anterior tibial stepoff. Backup fixation is attained by securing the sutures to the tibia with a 5.5-mm Swivel lock (Arthrex, Naples, FL) (Figs. 11 and 12).

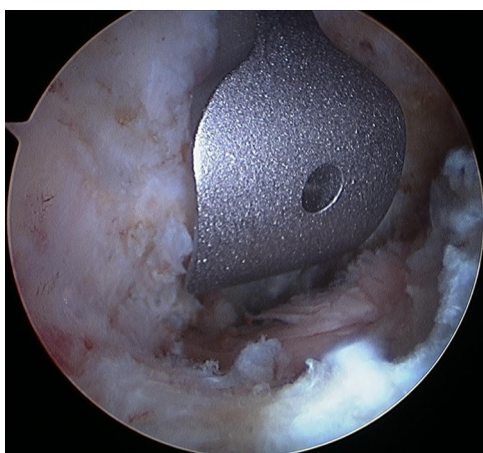


Figure 2 View from the posteromedial portal of the anatomically contoured PCL guide wrapping around the base of the PCL facet. (Color version of figure is available online.)

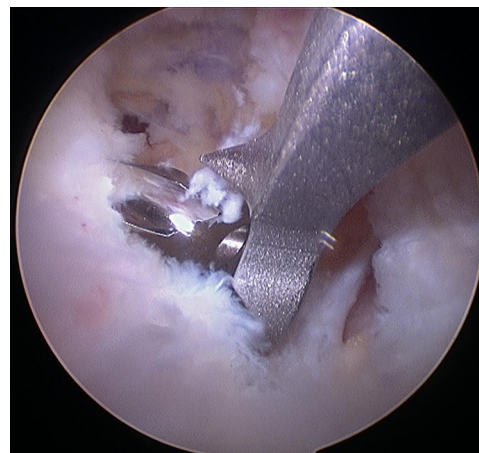


Figure 3 View from the posteromedial portal of the guide pin at the base of the PCL facet. Note that the PCL guide acts as a neurovascular protector. (Color version of figure is available online.)

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