The Posterolateral Corner of the Knee

Anatomic Dissection and Surgical Approach

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ABSTRACT: The surgical anatomy and biomechanical role of the posterolateral corner of the knee has received significant attention in recent years. Nevertheless, because of the relative infrequency with which injuries to this area are treated operatively, the surgical approach to this area of the knee may be unfamiliar to many residents and practicing orthopedic surgeons. Accurate knowledge of the appropriate anatomy, planes of dissection, and surgical approach is vital to the safe access of these structures for purposes of repair or reconstruction. This article describes the step-by-step anatomic approach to the posterolateral corner of the knee using paired cadaveric images, with emphasis on the relevant surgical anatomy.

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INTRODUCTION

Disruption of the posterolateral corner (PLC) of the knee can produce laxity in varus rotation, external tibial torsion, and posterior tibial translation,[3,11] generally referred to as posterolateral rotatory instability.[1,4,6,13] The mechanism of injury to the posterolateral structures of the knee occurs either with knee hyperextension during excessive varus rotation or after direct impact to the anteromedial proximal tibia.[3] Although posterolateral corner injuries can occur in isolation, they are frequently associated with injury to the posterior cruciate ligament (PCL), anterior cruciate ligament (ACL), or both.[4,6] Posterolateral knee injuries can also result in injury to the common peroneal nerve. In cases where reconstruction of the PCL is indicated and associated with significant laxity to varus stress, combined reconstruction of the PCL and repair or reconstruction of posterolateral corner structures is necessary to limit strain on the reconstructed graft and restore rotary, as well as posterior, instability.[5,11,15] In instances of ACL and PLC injury, combined reconstruction is advised to decrease the incidence of ACL graft failure.[3,12,17]

The goal of PLC repair or reconstruction is to correct the varus instability and excessive external tibial rotation that occurs with damage to the PLC. Knowledge of the anatomy and the specific surgical approach to the posterolateral aspect of the knee is necessary. The surgical approach should offer broad exposure to the common peroneal nerve, popliteus tendon, fibular collateral ligament, fabellofibular ligament, popliteofibular ligament, lateral head of the gastrocnemius, and the iliotibial tract. The purpose of this article is to describe, using fresh cadaveric dissections, a step-by-step sequence demonstrating the posterolateral surgical approach to the knee, along with relevant superficial and deep surgical anatomy.

MATERIALS AND METHODS

Side-by-side images depict the relevant anatomy and surgical approach to the posterolateral corner using two separate dissections of the same fresh-frozen cadaveric knee. The first dissection depicts the common limited surgical approach, with a subsequent global anatomic dissection. These images outline a step-by-step anatomic approach to the posterolateral corner of the knee,

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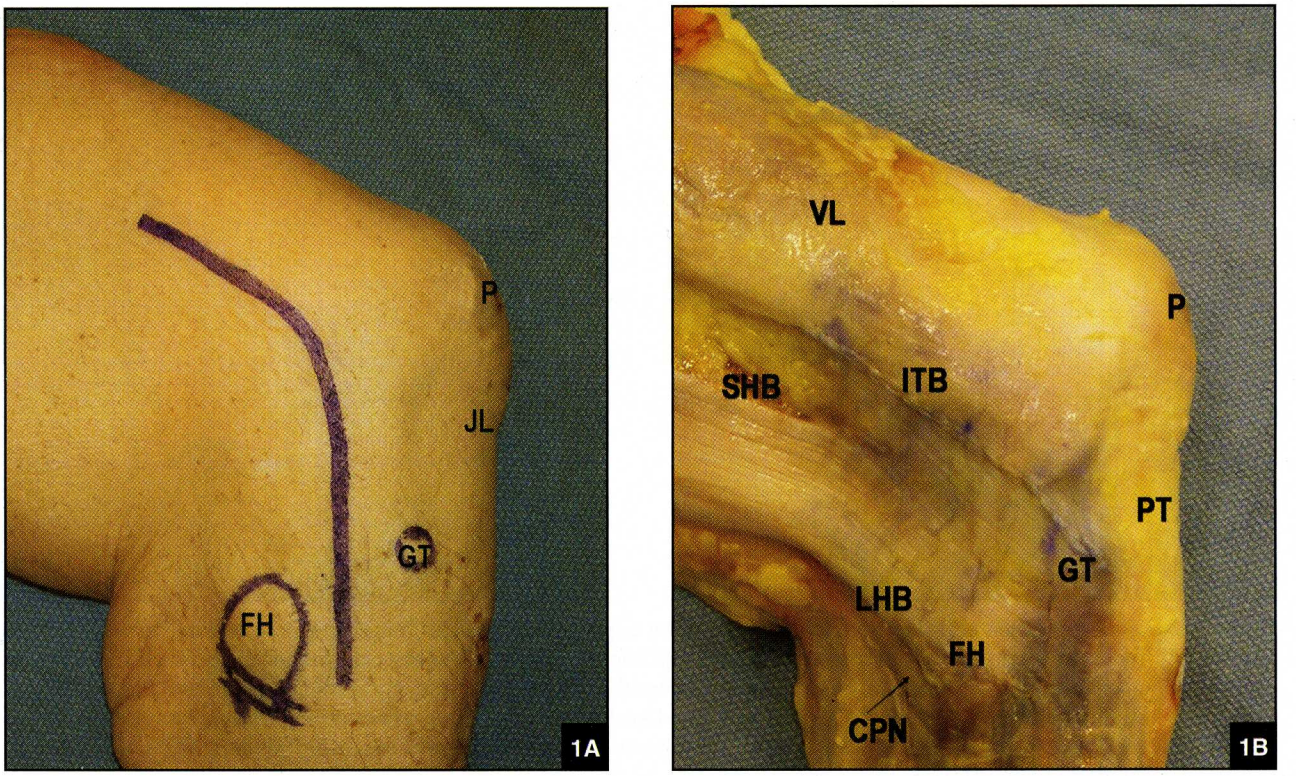

Figure 1. Initial surgical approach (A). With the knee flexed 60° to 70°, the incision courses parallel to the femur, curving distally, and bisecting Gerdy's tubercle and the anterior aspect of the fibular head. Superficial dissection (B). Part of the iliotibial band has been removed for visualization purposes. (P=patella, JL=joint line, GT=Gerdy's tubercle, FH=fibular head, VL=vastus lateralis, IT=iliotibial band, SHB=short head biceps, PT=patellar tendon, LHB=long head biceps, CPN=common peroneal nerve.)

with emphasis on the popliteus tendon, fibular collateral ligament, fabellofibular ligament, popliteofibular ligament,[14,20,22] lateral head of the gastrocnemius, and iliotibial tract.

SURGICAL TECHNIQUE

The patient is placed in a supine position with a well-padded tourniquet on the proximal thigh of the operative extremity, although in most circumstances inflation of the tourniquet is not required. A low-profile, circumferential thigh holder or lateral post is used to stabilize the extremity and maximize the surgical field. The foot of the table is dropped completely, and the nonoperative extremity is positioned in a well leg holder, with particular attention given to protecting the peroneal nerve in the region around the fibular head. The operative extremity is then prepped and draped in typical fashion.

The knee is flexed approximately 60°, and a longitudinal incision is made parallel to the posterior aspect of the iliotibial band, starting just proximal to the lateral femoral condyle and continuing distally to a point midway between the fibular head and Gerdy's tubercle. If the

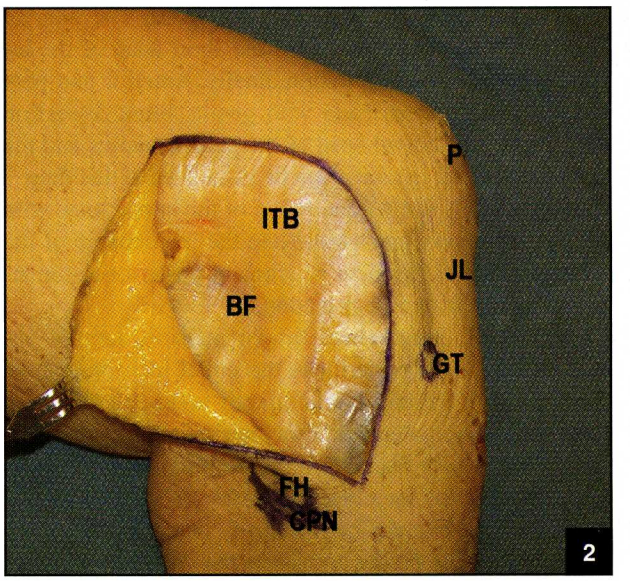

Figure 2. Initial surgical approach, posteriorly based flap. The iliotibial band and biceps femoris muscle fibers are identified. (P=patella, JL=joint line, GT=Gerdy's tubercle, ITB=iliotibial band, BF=biceps femoris, FH=fibular head, CPN=common peroneal nerve.)