Iliotibial Band Rupture and Multiligamentous Knee Injury in a Football Player

Mikiko Nakajima, EdD, ATC • California State University, Long Beach; Mallori Tittle, ATC • Auburn University

Lateral knee injuries, such as iliotibial (IT) band friction syndromes, are fairly common knee injuries that account for 12–22% of all running knee injuries1–3 and 15% of all cycling knee injuries.4 However, serious lateral knee injuries are rare and only account for 1% of all knee injuries.5 Typically, when the lateral side of the knee is injured, it is due to multiligament knee injuries or knee dislocations.6 Knee dislocations are relatively rare incidents, and are referred to as multidirectional instability of the knee.7 They are most commonly defined as the rupture of at least two of the five major knee ligament structures: the anterior cruciate ligament (ACL), the posterior cruciate ligament (PCL), posterolateral corner (lateral collateral ligament [LCL], popliteus and popliteofibular ligament), and the medial collateral ligament (MCL).8 In addition to the ligaments, muscular tendon ruptures also can occur with knee dislocations. Typically, biceps femoris or popliteus muscle tears occur in conjunction with lateral knee dislocations.6 An iliotibial band rupture or avulsion from the Gerdy’s tubercle is extremely rare, especially in adults.8

One of the major concerns with knee dislocations is the association of neurovascular injuries due to the close proximity of structures such as the popliteal artery and peroneal nerve. Since the popliteal artery sits within the popliteal fossa, it is injured in approximately 20–40% of knee dislocations, particularly anterior and posterior dislocations.10 The peroneal nerve is also injured in approximately 33% of knee dislocations, as it enfolds the proximal fibula. This usually occurs in lateral and posterolateral dislocations.10 Because neurovascular complications may result in permanent functional limb loss, immediate reduction of knee dislocations is important, followed by assessment of neurovascular status.11 Researchers from previous magnetic resonance imaging (MRI) studies found that two-ligament tears of the knee, which are frequently encountered in daily practice, do not always result in neurovascular injuries. Instead, the data suggests that this association is more common with three or more torn ligament injuries.11

Although knee dislocations are usually linked with high-velocity incidents such as motor vehicle accidents, they can also occur during collision sports such as football, rugby, or soccer.6,8,10,11 In a study by Bui, Ilaslan, Parker, and Sundaram, only four of the 15 knee dislocations were associated with high-velocity trauma, while the rest occurred playing sport at the amateur level.10 In addition, Shelbourne, Haro, and Gray reported that 18 out of 19 knee

Key Points

Low-velocity force can cause knee dislocations among the athletic population.

Knee dislocations with lateral side injuries are rare (1% of serious knee injuries), especially with involvement of IT band among adults.

It is important to recognize knee dislocations due to increased possibility of neurovascular compromise.
dislocations with three-ligament tears were low-velocity injuries from football, basketball, and soccer. Therefore, low-velocity injuries of knee dislocations can be equally as damaging as high-velocity injuries.

**Case History and Data**

The patient was a 19-year-old football player who sustained a right knee injury during a regular season game at his community college. The mechanism of injury was abnormal rotation of the right knee after landing from a jump and getting his foot stuck in turf. During the fourth quarter of the game, the athlete jumped to catch a pass and upon landing was tackled above the hips while his foot remained fixed to the ground. This caused his right lower leg to stay stationary while his upper body was flexed rotating opposite of his knee. After the tackle, the athlete was unable to get up and immediately assessed by the head athletic trainer (AT) and the team orthopedic surgeon on the field. On assessment, a lateral and upward shifted deformity of the knee was noted. The team physician performed a Lachman’s test on the field, which showed a positive indication of a torn ACL. The athlete was then carried off the field for further evaluation.

During the evaluation, the athlete complained of an onset of right knee pain immediately after the hit as well as instability, but did not report hearing a pop. The athlete denied any previous history of knee injuries. Swelling and a visible divot on the lateral side of his knee were apparent upon visual inspection. Extreme tenderness to touch was present along the LCL. Significant laxity (3+) was evident with varus stress testing at 0° and 30° of knee flexion when bilaterally compared. The athlete also exhibited a positive anterior drawer test with a soft endpoint and had very limited range of motion secondary to the pain. In addition to the knee injury, the athlete also presented with signs of a concussion. He was not alert and oriented to time and space and was unable to recount his injury as it occurred. After the evaluation, the athlete was referred to the hospital for further evaluation of his knee and head. On arrival, a radiograph was conducted to determine the possibility of fracture to his tibia. A computerized tomography scan for the suspected head injury was also performed. Imaging results for both the head and knee were negative. The athlete was placed in a straight knee immobilizer with crutches and was released from the hospital. The athlete was referred to the team physician for further evaluation.

**Differential Diagnosis**

The differential diagnosis included: (1) anterior cruciate ligament tear, (2) lateral collateral ligament tear, (3) tibia fracture (which was ruled out at the hospital the night of the injury), and (4) other knee capsular injury.

**Treatment**

When the athlete was seen by the team orthopedic surgeon three days following the injury, the team orthopedic surgeon ordered an MRI to determine the severity of the injury. The MRI revealed a partially torn ACL, a tear of the LCL, a complex tear of the lateral meniscus, a bone contusion on the medial femoral condyle, an avulsion of the iliotibial band from its insertion, lateral calf and biceps femoris strain, and extensive lateral subcutaneous edema (Figures 1, 2, 3). Due to the extensive nature of this injury, surgery was scheduled 14 days postinjury to repair the damage. The team orthopedic surgeon consulted with another surgeon and concluded that a staged approach would be the most appropriate, as conducting the entire repair at once would put too much stress on the injured knee. This is a common approach practiced by many surgeons, in which the PCL and medial/lateral structures are reconstructed first, followed by ACL reconstruction at a later date.

**Figure 1**  MRI of right knee—Tear and mild proximal retraction of IT band from tibial insertion.