Case Report

Chronic Irreducible Posterolateral Knee Dislocation: Two-Stage Surgical Approach

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Abstract: Posterolateral knee dislocation is a small subset of knee dislocations. Irreducible posterolateral dislocation has been reported and is caused by buttonholing of the medial femoral condyle into the anteromedial knee capsule, with interposition of the medial retinacular structures between the femoral and tibial condyles. Open reduction has been advocated to reduce the knee. We present a case of chronic irreducible posterolateral dislocation of the knee for 14 months associated with anterior and posterior cruciate ligament (ACL, PCL) and medial collateral ligament (MCL) rupture. The patient presented with continued instability. The classic dimple sign was absent in this case because of chronicity, but the limb was in valgus alignment compared with the other side. The magnetic resonance imaging (MRI) report commented only on the torn cruciates and the MCL, but missed the tissues preventing reduction. A 2-stage surgical procedure was performed. The first stage included arthroscopic debridement of the intervening tissues, which were thickened and resembled meniscal tissue, followed by reduction of the knee and open MCL repair to maintain the reduction. The second stage was done for ACL and PCL reconstruction. In conclusion we bring the attention of the surgeon to the clinical, radiographic, and MRI findings associated with this chronic irreducible posterolateral knee dislocation. **Key Words:** Knee dislocation—Posterolateral dislocation—Irreducible dislocation—Two-stage surgery.

Irreducible knee dislocations are rare, with the majority of cases being posterolateral knee dislocations. The knee is injured with a valgus force causing rupture of the medial capsule and retinaculum, with buttonholing of the medial femoral condyle through the torn medial structures. The medial collateral ligament (MCL), anterior cruciate ligament (ACL), and posterior cruciate ligament (PCL) are usually torn, with preservation of the lateral, posterolateral, and neurovascular structures.

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CASE REPORT

A 14-year-old boy fell off his bicycle, injuring his knee. He presented at the primary hospital and radiographs taken there showed posterolateral subluxation and widening of the medial joint space (Figs 1 and 2). Neurovascular assessment did not show injuries. His treatment later continued nonoperatively with an above-knee cast, followed by sessions of physiotherapy. He had continuing pain and instability, and was referred to the senior author for surgical repair 14 months after his injury.

Examination under anesthesia showed valgus alignment of the leg in comparison with the other side. The MCL showed grade 3 rupture with opening of the medial joint line in full extension and 30° of flexion. The ACL and PCL were deficient on examination. However, his lateral collateral ligament (LCL) and posterolateral structures were intact, with no hyperextension of the knee. There was no dimple sign seen in this case.

FIGURE 1. Anteroposterior radiograph at initial injury showing lateral subluxation of the tibia with widening of the medial joint space.

Magnetic resonance imaging (MRI) of the knee showed the posterolateral subluxation, and MCL, ACL, and PCL rupture (Fig 3), but there was no comment on structures preventing reduction of the knee. However, on hindsight, the intervening tissues can be seen passing into the notch (Fig 4).

Arthroscopic assessment initially was disorientating because of the medial retinacular structures intervening between the medial femoral condyle (MFC) and medial tibial condyle (MTC), and going posteriorly in the intercondylar notch (Fig 5). The arthroscope could pass lateral to these structures, which brought the edge of the medially displaced meniscus and MTC into view.

After careful evaluation, it was assessed that these structures were irreducible because of the chronic element of the injury, which resulted in shortening, and the decision was to remove these structures from the medial compartment. These were divided and removed with the shaver. This allowed the knee to reduce back into normal alignment. However, because of the long duration, the intervening tissues had indented the cartilage on the MTC.

The knee was still unstable and was subluxing, so MCL open repair was undertaken. The posterior and distal tissues had a reasonable consistency that allowed a secure repair with anchors placed on the MFC. This held the knee in a reduced position (Figs 6 and 7). The patient was then put in a plaster cast for 6 weeks. A second stage was then performed to reconstruct his ACL and PCL after 3 months.

DISCUSSION

Irreducible knee dislocation has been reported in the literature as rare cases.[1-3] The majority are posterolateral dislocations. The dimple sign has been reported as a characteristic sign, and possibly pathognomonic.[4] Irreducibility results from the interposition of the anteromedial capsule and ligaments into the medial compartments.

These cases are commonly associated with cruciate ligament injuries, but because of the relative minimal displacement, neurovascular injuries have not been reported.[5] The treatment has included either open or arthroscopic removal of these tissues, with or without MCL and cruciate ligament repair.[1-6]

FIGURE 2. Lateral radiograph at initial injury showing posterior subluxation of the tibia with widening of the medial joint space.