Surgical Management of Traumatic Knee Dislocation With Posterolateral Corner Injury

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Purpose: To evaluate the results of our method of surgical treatment of traumatic knee dislocation with injury to the posterolateral corner by use of a standardized protocol. Methods: Twenty-five consecutive patients presented with a grossly dislocated or reduced knee. Five of these patients were not included in this series. The remaining 20 patients were treated by primary arthroscopic reconstruction. The anterior cruciate ligament (ACL) was reconstructed using gracilis tendon reinforced with artifical ligament (Ligament Augmentation and Reconstruction System [LARS] ligament); the posterior cruciate ligament (PCL) was reconstructed with semitendinosus tendon and reinforced with LARS ligament; and the posterolateral corner was treated using the gracilis and semitendinosus tendons from the uninjured knee. Twenty patients returned for subjective and objective evaluation at a minimum of 24 months after surgery. Early mobilization through continuous and active exercise was started on the fourth day postoperatively. Results: At a mean follow-up of 44 months, the mean Lysholm score was 90 points, the mean score on the survey of daily activities was 90 points, and the sports activities score on the knee outcome survey averaged 80 points. By the rating of Meyers et al. the results were excellent in 6 patients, good in 10 patients, fair in 3 patients, and poor in one patient. The final International Knee Documentation Committee (IKDC) rating was not normal in any knee. The mean loss of extension was 2° (range, 0° to 3°) and loss of flexion was 12° (range, 10° to 15°). Conclusions: By using the described method of arthroscopically assisted reconstruction of the cruciate ligaments and the posterolateral corner, 80% of the patients had good subjective results and functional stability, and according to the IKDC scale, 45% of knees were nearly normal, 45% were abnormal, and 10% were severely abnormal. No patient’s rating returned to normal. Level of Evidence: Level IV, therapeutic case series.

Injuries to the posterolateral corner of the knee, although infrequent, often present the most complex problems and can result in severe disability because of the relation between rotational instability, other ligamentous injury, and cartilage degeneration.1,2 They are often associated with disruption of the posterior cruciate ligament (PCL) or anterior cruciate ligament (ACL) or both.2 Misdiagnosis of injury to the posterolateral corner leads to a poor result after surgical reconstruction of the cruciate ligaments because of residual posterolateral instability.3,4 Many surgical techniques have been described to reconstruct or repair the ACL, PCL, and posterolateral corner.3,5,6 The posterolateral structure of the knee is an area of complicated and variable anatomy. The anatomic structures of importance include the lateral collateral ligament, the arcuate ligament, the popliteo-fibular ligament, the posterolateral capsule, and the popliteus tendon. From the standpoint of reconstruction of the posterolateral corner, the most consistent and important structures are the popliteus tendon, the popliteofibular ligament, and the lateral collateral ligament7,8 because they are considered the static stabilizers of the posterolateral corner.7 Dynamic stabilizers to the posterolateral corner include the biceps tendon, iliotibial tract, and popliteus muscle-tendon complex. The posterolateral corner controls the anterolateral and posterolateral tibial rotation relative to the femur, whereas the ACL prevents anterior translation of the tibia over the femur.9-11 The lateral collateral ligament is the
primary structure that resists the excessive varus deformity, whereas the popliteofibular ligament and the popliteal tendon resist excessive external rotation of the tibia.12,13 The proponents of early ligament repair have reported good results.14,15 Recently it was reported that early ligamentous reconstruction using allografts has also yielded good results.16,17 Autologous grafts have been used to reconstruct the cruciate ligaments; the LARS ligament has been used to reconstruct the collateral ligaments only.18,19 There are currently no reports in the orthopaedic literature describing a consistent surgical arthroscopic approach to treatment of these patients with autologous grafts of gracilis and semitendinosus tendons of the injured and uninjured knees for reconstruction of the cruciate ligaments and the posterolateral corner reinforced with LARS artificial ligament (LARS ligament is made of terephthalic polyethylene polyester fibers (JK Orthomedic, Dollard-des-Ormeaux, Quebec, Canada).20,21 The reasons we used autologous grafts reinforced with LARS ligaments is because there was not enough material to reconstruct all the injured ligaments and also because of the small size of the gracilis and semitendinosus tendons if they are used separately. In addition, the use of allografts is not allowed in our part of the world. The purpose of this study was to evaluate the clinical results of surgical treatment of knee dislocation with posterolateral corner injury by use of standardized surgical and postoperative protocols. Our hypothesis was that either good or excellent results would be achieved with reconstruction of the ACL, posterolateral corner, LCL, and popliteofemoral ligaments, without reconstruction of the popliteus tendon, after the first 3 weeks of injury.

Methods
This was a retrospective cohort study of patients undergoing ACL, PCL, and posterolateral corner reconstruction between January 2006 and November 2009 for knee dislocation with injury to the posterolateral corner. The reconstruction of the posterolateral corner structures was performed in cases with a side-to-side difference of greater than 10° of external rotation of the tibia or grade 3 varus instability (lateral joint space opening in varus instability: normal, 0 to 2 mm; grade 1, 3 to 5 mm; grade 2, 6 to 10 mm; and grade 3, >10 mm) compared with the unaffected knee. The reconstruction was also performed in cases of external rotation instability between 5° and 10° and grade 2 varus instability. Patients with any neurovascular injury or fractures were excluded from the study. Twenty-five patients presented with knee dislocation during the study period. Of the 25 patients, 2 had neurovascular injuries, one had a common peroneal nerve injury, and 2 had fracture dislocations of the knee. The remaining 20 patients had tears of the ACL, PCL, and posterolateral corner and were treated by primary arthroscopic reconstruction with autologous grafting of the ACL, PCL, and posterolateral corner. The ACL was reconstructed using gracilis tendon of the injured limb reinforced with LARS artificial ligament; the PCL was reconstructed with semitendinosus tendon of the injured limb and reinforced with LARS artificial ligament; and the posterolateral corner was treated using the gracilis and semitendinosus tendons of the uninjured knee. Twenty patients returned for subjective and objective evaluation at a minimum of 24 months after surgery.

Preoperative Assessment
After a detailed history was obtained, clinical examination was performed, careful assessment of neurovascular status was ascertained, and standard radiographs were taken. Continuous passive motion (CPM) was used for 5 or 6 days after the injury to achieve good range of motion before surgery and to keep the knee statically flexed to greater than 90° during surgery to reduce swelling and hematoma and to maintain joint movement after surgery. Surgery was performed 3 weeks after the injury, at which time patients had achieved nearly full range of movement and healing of soft tissues.

Surgical Treatment
We performed the examination with the patient under anesthesia and the use of the contralateral knee as a control. We placed a tourniquet on the proximal part of the thigh in all patients, and the mean time of inflation was 2 hours. Our protocol is to perform arthroscopic reconstruction with autologous grafting of the ACL using the gracilis tendon of the injured limb reinforced with artificial ligament. We reconstruct the PCL with semitendinosus tendon of the injured limb reinforced with artificial ligament, and we treat the posterolateral corner using the gracilis and semitendinosus tendons of the sound knee.

Skin Incision. We used a marker to indicate the patella, the tibial tubercle, the fibular head, and the surface anatomy of the common peroneal nerve. We made the anterolateral, anteromedial, and posteromedial portals under direct visualization with the use of the inside-out technique, if they were not marked on the skin. We made a 4-cm incision medial to the tibial tubercles on the proximal part of the tibia for the tibial tunnels of the ACL and PCL. We made a 2-cm incision medially to the medial trochlear articular surface for the PCL femoral tunnel. For the posterolateral corner, we used an incision extending between the Gerdy tubercle and the fibular head to the lateral epicondyle; this incision can be extended to explore the common peroneal nerve. We introduced an arthroscope through the anterolateral portal, and gravity inflow irrigation (not a pump) was used; we assessed the cruciate ligaments, menisci, and articular cartilage by diagnostic arthroscopy. A 70° arthroscope was placed...
through the anterolateral portal to visualize the tibial insertion of the PCL and the posteromedial portals that were to be used. If extravasation was noted and compartment syndrome was suspected, we abandoned the arthroscopic technique and performed the remainder of the procedure by means of an open technique. In this series, no extravasation occurred. We drill the PCL and ACL tunnels first.

Preparation for PCL Tunnels: Cortical Button on the Femoral Side and Bio-IntraFix Screws on the Tibial Side. For the tibial tunnel, we inserted a curved rasp first to remove the PCL remnant from the posterior slope of the tibial spine. We then inserted an Arthrex PCL tibial marking hook (Arthrex, Naples, FL) with attached adapter drill guide through the anteromedial portal 10 mm distal to the posterior tibial cartilage. Of note, the tibial tunnel entry should be approximately 5 cm distal to the joint line and on the lateral side of the tibia (Figs 1-3). We inserted a guide pin until it reached the marking hook and could be seen and felt (with the position of the pin confirmed radiographically) penetrating the posterior aspect of the tibia. We then inserted a popliteal protractor cap through the anteromedial portal over the end of the guide pin, selected an appropriately sized full-thickness cannulated drill, and drilled the tibial tunnel.

Drilling the Femoral Tunnel. We used an Arthrex PCL femoral marking hook attached to an adaptive guide and inserted it through the anteromedial portal. We drilled the femoral tunnel over the drill guide pin through an incision over the medial femoral condyle. In most of our cases, either the meniscofemoral ligament or the posteromedial bundle (or both) was found to be intact and we preserved this intact part.

ACL Graft: Drilling the Femoral Tunnels and Preparing ACL Tunnels. We used Rigidfix cross-pin fixation (DePuy Mitex, Raynham, MA) through the anteromedial portal side and fixation by tibial Bio-Intrafix screws (DePuy Mitex) on the tibial side. We drilled the femoral tunnel through the anteromedial portal using a 4- or 5-mm offset EndoFemoral aimer (Smith & Nephew, Andover, MA), which we placed at the 2 o’clock or 10 o’clock position through the anteromedial portal for the left and right knees, respectively, in reference to the posterior aspect of the femoral condyle. With the knee flexed 90° to 100°, we advanced a 2.4-mm drill tip guidewire through the offset EndoFemoral guide and through the femur until the guidewire broke through the lateral femoral cortex. We advanced a cannulated 4.5-mm cortical button drill bit over the passing pin and breached the lateral cortex, and then we removed the 2.4-mm guidewire. The total length of the anteromedial femoral tunnel is usually more than 35 mm, which we measured using the EndoButton probe depth (Smith & Nephew). We used a wingless RCI router (Smith & Nephew) or an endoscopic drill bit that matched the
graft diameter used to produce the 30-mm deep femoral socket to drill the femoral tunnel socket.

Drilling the Tibial Tunnel. After the identification and insertion of the ACL footprint, we used an Acufex director ACL tip aimer (Smith & Nephew), set at 50°, for placement of the guidewire (we placed the guide pin through the medial portal and positioned using several landmarks 7 mm from the anterior border of the PCL, the posterior border of the lateral meniscus, and the interspinous area of the tibial plateau. We advanced a 2.4-mm guidewire through the tibia and advanced an appropriately sized cannulated drill bit into the joint space to match the size of the ACL graft.

We placed the Rigidfix femoral guide through the anteromedial portal with a preset rod diameter of 30 mm, the size of the graft. We positioned the proximal sleeve, assembled with the 3.3-mm trocar, while keeping the guide block perpendicular to the longitudinal axis of the femur. After removal of the Rigidfix guide, we inserted a Kirschner wire and used arthroscopic visualization to check that the positioning was correct (Fig 4).

Graft Preparation and Insertion. For the PCL graft, we passed a braided nonabsorbable suture loop (Ethicon, Somerville, NJ) connected to the eye of the pullout pin in a retrograde manner through the tibial tunnel of the PCL and through the femoral tunnel to come out at its proximal end through the wound on the medial femoral condyle; the loop then guided the graft anterogradely and pulled it down from the tibial tunnel until the EndoButton lay on the femoral cortex. We looped the PCL autologous and LARS ligament graft with the suture, and pulled down the pullout pin until the graft came out through the distal end of the tibial tunnel and the EndoButton lay on the femoral cortex (Fig 5).

Final Graft Passage of the ACL Graft. We prepared the autologous graft and the LARS ligament at the femoral end by joining them with absorbable suture up to 3? mm using a whip stitch. We prepared the tibial extremity with suture threads, keeping the 2 ends separated.

We inserted a passing suture through the femoral tunnels through the anteromedial portal, and inserted 2.7-mm passing pins with transport thread through the anteromedial portal. We pulled these until they breached the femoral cortex, where the 30-mm mark on the graft could be seen endoscopically. We then used a grasping forceps to retrieve the sutures through the corresponding tibial tunnels (Fig 8). We performed femoral fixation by inserting the cross-pin into the sleeve using a specific mallet, and removed the sleeves. We did not perform the tibial fixation of the ACL and PCL at this stage; attention was now directed to the posterolateral corner.

Lateral Ligament and Posterolateral Corner. We made a lateral incision that extended between the Gerdy tubercle and the fibular head to the lateral epicondyle of the femur. We identified the nerve around the fibular head and performed the repair and reconstruction with the knee flexed 30°. We repaired peripheral

Fig 4. We inserted a Kirschner wire and used arthroscopic visualization to check that the positioning was correct for fixation of the ACL graft.

Fig 5. The PCL femoral marking hook attached to an adaptive guide and inserted through the anteromedial portal. We drilled the femoral tunnel over a drill guide pin.

Fig 6. We passed an Ethibond loop connected to the eye of the pullout pin in a retrograde manner through the tibial tunnel of the PCL and then through the femoral tunnel to come out at its proximal end.
tears of the lateral meniscus in 5 patients with the use of nonabsorbable FastFix sutures (Smith & Nephew). We repaired the lateral structures using sutures that were first inserted through the peripheral capsule and were then passed through drill holes in the tibia. We identified the arcuate complex and tagged it with several sutures, which were later drawn to its origin on the tibia. We retrieved the popliteus tendon and passed it through a bone tunnel, if these structures were torn (in our series the capsule was healed and we did not reconstruct the popliteus tendon).

Reconstruction of the Lateral and Popliteofemoral Ligaments. For reconstruction of the lateral collateral and popliteofemoral ligaments, we used the technique of Larson et al.22: We made a fibular drill hole to match the size of the gracilis and semitendinosus tendon graft and drilled another hole the same size at the lateral femoral epicondyle; we passed the graft through the fibular head and then through the tunnel in the femoral epicondyle, where fixation took place around a screw and washer, and the graft was sutured to the native lateral ligament, which usually had ruptured at midsubstance (Fig 9). After completing reconstruction of the collateral lateral ligament and the popliteofibular ligament, the knee was flexed to 90°. We secured the grafts of the ACL and PCL on the femoral side. For fixation of the grafts on the tibia, we flexed the knee to 90° and tensioned and fixed the PCL graft at 90°; we then placed the knee at 10° to 30°, and tensioned and fixed the ACL graft with bioabsorbable Bio-INTRAFIX interference screws (DePuy Mitek) that were 1-mm larger than the tunnel diameter (Fig 10).

Rehabilitation
We placed the limb in an above-knee back slab in full extension for the first 5 days postoperatively. Exercise immediately after surgery included passive knee extension and isometric quadriceps exercise with the knee in full extension. An early rehabilitation program was started on the fourth postoperative day by the use
of a CPM machine; the rehabilitation program was standardized for all patients and they followed the protocol with the physical therapist. On the fifth or sixth day, the wound was inspected and the patient’s limb was attached to a CPM machine ranging from 0° to 30°; this was gradually increased to 60° to 90° according to the patient’s tolerance. Active and passive exercise started in the fourth week. Patients were allowed to use crutches once they were able to do straight-leg raising. Weight bearing progressed from partial weight bearing at 3 to 4 weeks to full weight bearing as tolerated. Balance and proprioception exercises were started as soon as the patients were able to walk with full weight bearing (at 5 to 6 weeks). Sedentary workers were able to return to work within 9 to 11 weeks, whereas those with strenuous jobs did not return to work until 9 to 11 months postoperatively. Return to sports activities was not permitted before 12 months. The mean hospital stay after surgery was 10 to 14 days postoperatively because of the use of the CPM machine, which is an inpatient program.

**Follow-up and Assessment**

Clinical assessment included completion of a series of self-administered Knee Outcome Survey questionnaires. The survey consists of 2 scales that assess a variety of knee disorders: the first scale ranges from 0 to 100 points, indicating absence of symptoms and functional limitation during activities of daily living. The second scale measures symptoms and functional limitation during sports activities. All patients underwent physical examination by one of the authors, which included evaluation of range of motion and stability. We assessed stability manually and with a KT-1000 Arthrometer (MEDmetric, San Diego, CA). We performed examination with the KT-1000 with the knee at the quadriceps-neutral angle to determine the corrected anterior and posterior translation. Functional assessment was graded as excellent, good, fair, or poor as proposed by Meyers et al. Patients who were able to return to work and had no symptoms or instability were graded as excellent. Those with mild pain and instability that did not preclude a return to work were graded as good, those with considerable instability were graded as fair, and those who were disabled and unable to return to work because of pain or instability were graded as poor. We used the Lysholm knee score to assess the functional result. We also administered the Lachman test and the anterior drawer test. Care was taken to ensure a normal tibiofemoral step-off before application of stress to the tibia. Assessment of varus and valgus instability was determined at 30° of flexion. The final overall IKDC rating was determined as recommended by Hefti et al.

**Results**

Twenty patients were available for evaluation at a mean of 44 months (range, 24 to 52 months). The mean age of the patients at the time of surgery was 26.4 years (range, 18 to 48 years). Patient demographics are shown in Table 1. Eight patients had been injured in automobile accidents, 8 in work accidents, 3 in motorcycle accidents, and one during sports activity. All patients underwent surgery after 15 days (range, 15 to 21 days) from injury because all patients were transferred from other hospitals 7 to 10 days after their injuries. Examination under anesthesia and arthroscopy showed that all patients had a torn ACL and PCL and injury to the posterolateral corner.

**Clinical Results**

Clinical results were evaluated by subjective patient assessment through the use of a questionnaire and physical examination. The Mean Activities of Daily Living score of the Knee Outcome Survey was 90 ± 3.4 points (range, 70 to 92 points) and the mean score on the Sports Activity Scale was 80 ± 5.3 points (range, 55 to 85 points). Of the 20 patients, 10 rated their outcome as excellent or good, 8 rated it as fair, and 2 considered it poor. Physical examination showed the mean loss of extension was 1° or 2° degrees (range, 0° to 2°). Four patients lost between 10° and 15° of flexion.

We examined the injured knee compared with the uninjured knee: The Lachman test was negative in 16 patients, grade 1 in 2 patients, and grade 2 in 2 patients. The anterior drawer test was negative in 14 (70%)
patients, grade 1 in 3 (15%) patients, and grade 2 in 3 (10%) patients. The posterior drawer test was negative in 11 (55%) patients, grade 1 in 5 (25%) patients, and grade 2 in 4 (20%) patients. Varus stress testing at 30° of flexion showed that 14 (70%) patients had no laxity, whereas 3 (15%) patients had 1+ laxity and 3 (15%) patients had 2+ laxity (Table 2). The mean Lysholm knee score was 90 ± 2 points (range, 75 to 95 points) (Table 3). Tegner activity score decreased in all patients (Table 4). The Meyers functional rating showed that the result was excellent in 3 patients, good in 12 patients, fair in 3 patients, and poor in 2 patients.

KT-1000 Arthrometer results showed a mean corrected side-to-side difference of 0.1 mm (range, −2 to 2.6 mm) in anterior translation and 2.7 mm (range, −2 to 8 mm) in posterior translation. The mean corrected side-to-side difference in anterior tibial translation was less than 3 mm in 14 patients (70%), 3 to 5 mm in 4 (20%) patients, and more than 5 mm in 2 (10%) patients. The difference in posterior translation was less than 3 mm in 12 (60%) patients and between 3 and 5 mm in 5 (25%) patients; the remaining 3 (15%) patients had more than 5 mm of increased corrected posterior translation. The final IKDC rating was not normal in any patient; it was nearly normal in 9 (45%) patients, abnormal in 9 (45%) patients, and severely abnormal in 2 (10%) patients (as a result of the loss of flexion and consequent symptoms) (Table 5).

Complications

Postoperative stiffness occurred in 4 patients, all of whom were treated with manipulation under anesthesia (correcting loss of flexion) and arthroscopic release of adhesions. All patients improved their range of motion except one patient who had loss of flexion of 10°. One patient sustained a hematoma in the uninjured limb, which required incision and drainage. The symptoms were resolved in this patient.

Discussion

The purpose of our study was to evaluate the clinical results of surgical treatment of knee dislocation with posterolateral corner injuries by use of a standard treatment protocol including CPM at 5 to 6 days and after 3 weeks from injury. In this study, reconstruction of the ACL, PCL, and posterolateral corner (the lateral ligament and the popliteofibular ligament) achieved a good result. We did not reconstruct the popliteal tendon, and 15 patients showed excellent and good results by the Meyers functional rating score. Some authors advise the reconstruction or repair of the popliteal tendon, whereas others claim that the tendon has no significant effect on varus stability and rotator stability of the knee. Yoon et al.28 reported that reconstruction of the popliteal tendon in anatomic reconstruction of the posterolateral corner did not have a significant effect on varus instability and rotatory instability of the knee on physical and radiologic examination. They also stated that the reconstructed popliteal tendon had no effect on the functional aspect of the knee on Tegner activity score, Lysholm score, and IKDC subjective score. Anatomic and biomechanical study of the posterolateral corner of the knee has contributed significantly to understanding its complex anatomy, particularly the popliteofibular ligament and the popliteal tendon. Some authors recommend reconstruction of all 3 important structures (popliteal tendon, popliteofibular ligament, and lateral ligament). Some investigators have performed anatomic reconstruction of the 3 structures using allografts, and they reported good results on Lysholm score, varus stability, and external rotation.29,30 Our series showed good results without reconstruction of the popliteal tendon on Lysholm and Tegner activity scores, whereas the IKDC scale showed that 9 patients had nearly normal knees and 9 patients had abnormal knees, with agreement that reconstruction of the popliteal tendon in anatomic reconstruction of the posterolateral corner did not have a significant effect on varus and rotatory instability. We used the Larson technique figure-of-8 course of the graft, which will optimize the isometry in each limb, in which both anterior and posterior bands are isometric to each other and provide a restraint to varus rotation and external rotation of the tibia.22

Biomechanical studies31-33 have shown that the popliteofemoral ligament and the popliteal tendon have

### Table 1. Patient Demographics

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<tr>
<td>Female sex</td>
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<tr>
<td>Age</td>
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<td>Time from trauma to surgery</td>
<td>21-28 d</td>
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<td>Follow-up duration</td>
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### Table 2. Clinical Results After Surgery in 20 Patients

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<tr>
<th>Grade</th>
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<th>Anterior Drawer</th>
<th>Lachman Test</th>
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<tr>
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<td>14 (70%)</td>
<td>14 (70%)</td>
<td>16 (80%)</td>
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<td>1+</td>
<td>3 (15%)</td>
<td>3 (15%)</td>
<td>2 (10%)</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>2+</td>
<td>3 (15%)</td>
<td>3 (15%)</td>
<td>2 (10%)</td>
<td>4 (20%)</td>
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### Table 3. Lysholm Knee Score

<table>
<thead>
<tr>
<th>Score</th>
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<tr>
<td>88-95</td>
<td>7 (35%)</td>
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<tr>
<td>80-85</td>
<td>11 (55%)</td>
</tr>
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<td>75-79</td>
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### Table 4. Tegner Activity Score

<table>
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<th>Score</th>
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</tr>
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<tbody>
<tr>
<td>8-9</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>6-7</td>
<td>11 (55%)</td>
</tr>
<tr>
<td>5-6</td>
<td>4 (20%)</td>
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</table>
an important role in limiting posterior translation of the tibia, varus deformity, and external rotation. Some authors have reported that good results could be achieved by reconstruction of the posterolateral corner in limiting posterior translation of the tibia, varus of the knee, and external rotation of the tibia.\textsuperscript{8,28} In our study, good results were achieved in restoring stability in varus and posterolateral rotation of the knee by our described method. The function of the popliteus tendon is to provide posterior and external rotation stability of the knee.\textsuperscript{8,33} Harner et al.\textsuperscript{33} reported that in rupture of the PCL, the popliteus tendon provides a dynamic posterior stability to the knee. Some authors\textsuperscript{8,33,34} recommend reconstruction of the popliteus tendon because it has an important function in limiting external rotation and posterior translation of the tibia. However others do not recommend reconstruction of the popliteus tendon during reconstruction of the posterolateral corner.\textsuperscript{9,28} They have stated that there is no rigid attachment to the tibia except to the capsule, resulting in limited external rotation so that knee motion cannot be restored with reconstruction using a static graft.\textsuperscript{8,28,34} In our study, when the popliteus tendon was not reconstructed, good results were achieved by our method of restoring stability of the posterior translation of the tibia, varus deformity, and external rotation, and this was in agreement with other authors.\textsuperscript{9,28,34} From our study, we feel that reconstruction of the lateral ligament and the popliteofibular ligament in posterolateral corner injury in a traumatic knee dislocation will result in good functional stability without reconstruction of the popliteus tendon.

**Limitations**

We know our results had short follow-up, the subjective and the objective evaluations were at a minimum of 24 months after surgery, and the number of the patients was small. Other limitations were that this was a retrospective study with no comparison group, and there are no biomechanical data to support the surgical technique. Also, we did not perform statistical analysis because the number was very small. It is difficult to get large numbers in complex cases like these. We feel that a longer follow-up and a large number of patients are needed to evaluate the results of the described method.

**Conclusions**

With the described method of arthroscopically assisted reconstruction of the cruciate ligaments and the posterolateral corner, 80% of our patients had good subjective results and functional stability and according to the IKDC scale, 45% of knees were nearly normal, 45% were abnormal, and 10% were severely abnormal. No patient’s rating returned to normal.

**References**


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**Table 5. IKDC Rating**

<table>
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<tr>
<th>IKDC Rating</th>
<th>Normal knee</th>
<th>Nearly normal knee</th>
<th>Abnormal knee</th>
<th>Severely abnormal knee</th>
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<tr>
<td>IKDC Results</td>
<td>Normal</td>
<td>Nearly normal</td>
<td>Abnormal</td>
<td>Severely abnormal</td>
</tr>
<tr>
<td>No. of Knees</td>
<td>–</td>
<td>9 (45%)</td>
<td>9 (45%)</td>
<td>2 (10%)</td>
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</table>

IKDC, International Knee Documentation Committee.


