The Incidence of Acute Patellar Tendon Harvest Complications for Anterior Cruciate Ligament Reconstruction

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Purpose: This study was performed to determine the incidence of acute bone–patellar tendon–bone autograft harvest complications after anterior cruciate ligament (ACL) reconstruction. **Methods:** Over a nearly 20-year period (September 1986 to April 2006), 1,725 consecutive patients underwent primary ACL reconstruction using bone–patellar tendon–bone autograft by 3 fellowship-trained sports medicine surgeons at our institution. Three acute complications related to patellar tendon harvest were identified from surgical databases, and the charts of these patients were reviewed. **Results:** In this series of 1,725 consecutive patients, 3 acute complications (0.2%) related to patellar tendon harvest were noted. These complications consisted of 2 patellar fractures (1 intraoperative and 1 postoperative) and 1 postoperative patellar tendon rupture. All 3 patients healed and went on to satisfactory outcomes. **Conclusions:** A 0.2% overall acute complication rate related to patellar tendon harvest for primary ACL reconstruction supported our hypothesis. Bone–patella tendon–bone autograft remains a safe and viable choice for surgeons performing ACL reconstruction. **Level of Evidence:** Level IV, therapeutic case series. **Key Words:** ACL reconstruction—Bone–patellar tendon–bone autograft—Extensor mechanism complication—Patellar fracture—Patellar tendon rupture.

Anterior cruciate ligament (ACL) reconstruction is well established as the standard of care in ACL-deficient patients with functional instability. While alternative graft choices are gaining popularity, bone–patellar tendon–bone (BPTB) autograft remains the most widely used graft source for ACL reconstruction.[1] Although advances in surgical techniques have minimized the rate of complications related to harvest of the patellar tendon, acute complications such as patellar tendon rupture, patella fracture, and dropping the harvested graft still occur. The purpose of this study was to determine the incidence of BPTB autograft harvest complications for 3 fellowship-trained sports medicine surgeons at our institution. The hypothesis of this study was that acute extensor mechanism disruptions (patellar tendon rupture or patellar fracture) are unusual.

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The authors report no conflicts of interest.

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0749-8063/08/2402-7107$34.00/0
doi:10.1016/j.arthro.2007.08.020

METHODS

Over a nearly 20-year period (September 1986 to April 2006), 1,725 consecutive patients underwent primary ACL reconstruction using BPTB autograft by 3 fellowship-trained sports medicine surgeons at our institution. Data were reviewed using the computerized surgical databases maintained by 2 of the attending surgeons and the surgical logbook maintained by the other attending. Common variables between the databases included patient demographics (age, gender, and laterality), surgical demographics (procedure[s] performed and choice of graft), and outcomes (presence of acute postoperative complications). The surgical experiences of the attending surgeons were 20, 17, and 10 years, respectively (Table 1).

TABLE 1. *Demographics of Surgical Caseload for Isolated Patellar Tendon Autograft*

Surgeon	Dates	Cases	Male	Female	Left	Right	Unknown	Age (SD)
1	September 1986-April 2006	1,062	708	354	504	549	9	27.0 (9.3)
2	November 1989-April 2006	533	374	159	234	280	19	25.9 (9.2)
3	October 1997-April 2006	130	112	18	59	67	4	24.8 (9.8)
Totals		1,725	1,194	531	797	896	32	26.5 (9.4)

The method of BPTB harvest was similar for all 3 surgeons. A vertical incision was made from the distal pole of the patella to the inferior portion of the tibial tubercle with the knee flexed. Skin flaps were created and the incision was sharply carried down through the transverse fibers of the paratenon. A No. 15 blade scalpel was then used to incise the paratenon at its midpoint, and Metzenbaum scissors were then used to extend proximally and distally and expose the entire width of the patellar tendon. Next, the tendon was maintained in a stretched position by flexing the knee as a No. 10 blade scalpel was used to incise the tendon first on one side of the graft followed by the other side to yield a 10-mm wide graft. Then, a No. 238 blade oscillating saw was used to create the tibial bone plug by scoring the tibial cortex and removing an equilateral triangle of bone with the saw. The tibial bone block was temporarily left in place while we harvested the patellar bone plug. We cut the patellar plug as a trapezoidal shape, no more than 6 or 7 mm deep, to help protect the articular cartilage underneath. Then we used a curved osteotome to carefully lift the tibial bone plug from its bed onto a lap pad followed by gentile removal of the patellar bone plug. Metzenbaum scissors were then used to remove any remaining soft tissue attachments, and the graft was removed by the harvesting surgeon.

In our study, we excluded patients who underwent multiligamentous reconstructions and those individuals who had patellar tendon allografts used for ACL reconstruction; 1,194 men (69.2%) and 531 women (30.8%) comprised our series. Our study consisted of 797 left knees (46.2%), 896 right knees (51.9%), and 32 knees (1.9%) unspecified as to laterality. The mean age of our series was 26.5 years of age (standard deviation, 9.4 years). Three acute complications related to patellar tendon harvest were identified via review of the surgical databases and the charts of these patients were retrospectively reviewed.

RESULTS

Overall, the incidence of significant acute extensor mechanism complications in our study was 1 in 1,725 (0.06%) for an intraoperative patellar fracture, postoperative patellar fracture, and patellar tendon rupture, respectively. When combined, there were a total of 2 of 1,725 intra- and postoperative patellar fractures (0.12%). We did not have any incidents of graft contamination secondary to dropping the harvested graft on the floor.

Case 1

A 24-year-old woman who worked for a health-consulting firm injured her right knee while playing soccer. She was found to have an isolated ACL tear by examination, KT-1000 (MEDMetric, San Diego, CA), and magnetic resonance imaging (MRI). She elected to undergo reconstruction using a patella tendon autograft 6 weeks after the injury, following motion recovery.

After diagnostic arthroscopy confirmed an isolated ACL tear, a longitudinal incision was made to expose the patella and patella tendon. Using an oscillating saw, a 10 × 25 mm bone block was harvested from the patella and tibial tubercle. After flexing and extending the knee for visualization, a crack was heard and a displaced longitudinal fracture of the patella was noted. Immediate fixation using two 4.5-mm cortical screws using a lag by application technique was performed (Fig 1).

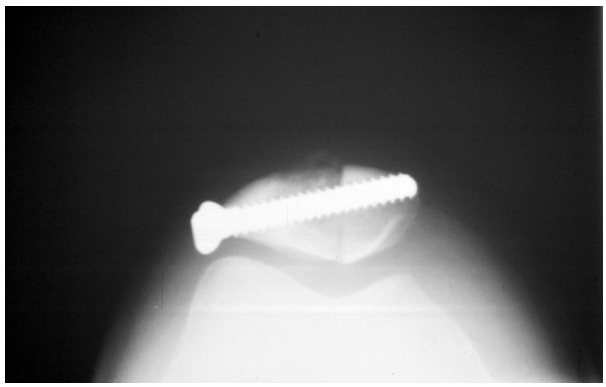

FIGURE 1. An intraoperative patellar fracture has been recognized and fixed using the standard AO technique.