# Distal Rupture of the Infrapatellar Tendon After Use of Its Central Third for Anterior Cruciate Ligament Reconstruction

## Case Report

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*ABSTRACT: Extensor mechanism complications following use of the middle third patellar bone-tendon-bone autograft for ACL reconstruction are recognized but uncommon. A case report of a patellar tendon avulsion from the tibial tubercle is described, occurring 6 weeks postoperatively. The salient points regarding establishment of the diagnosis, operative treatment, and postoperative rehabilitation are discussed. Suggestions are made to minimize the chances of this complication.*

## Introduction

Previous reports of postoperative infrapatellar tendon rupture associated with its use in intra-articular anterior cruciate ligament (ACL) reconstruction have occurred proximally at its patellar origin.[2,6] One case each of late patellar fracture and quadriceps tendon avulsion associated with cruciate surgery also have been reported.[5,7] Recently, Bonatus and Alexander reported the complication of patellar fracture and distal patellar tendon avulsion following ACL reconstruction.[3] This article reports the complication of distal rupture of the patellar tendon from the tibial tubercle after use of its central third to reconstruct the ACL.

## Case Report

On January 5, 1991, a 42-year-old police officer underwent reconstructive surgery for a chronic symptomatic ACL-deficient knee. Examination under anesthesia yielded grade II Lachman, anterior drawer, and pivot shift test scores; there was no varus or valgus laxity, nor any posterolateral instability. A diagnostic arthroscopy and partial medial meniscectomy was performed. Standard principles of arthroscopic-assisted ACL reconstruction with patellar tendon substitution were employed including notch preparation, assessment of isometry, pretensioning the graft, and interference screw fixation of the graft.[1]

The patellar tendon measured 40 mm at its proximal insertion and 32 mm distally. The central third (11 mm) of the tendon was harvested along with 2.5-cm triangular-shaped bone plugs using an oscillating saw. The

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**Figure 1: T-1 weighted sagittal MRI of the injured knee. The large effusion, soft tissue swelling, and increased signal at the distal patellar tendon insertion are indicative of total disruption.**

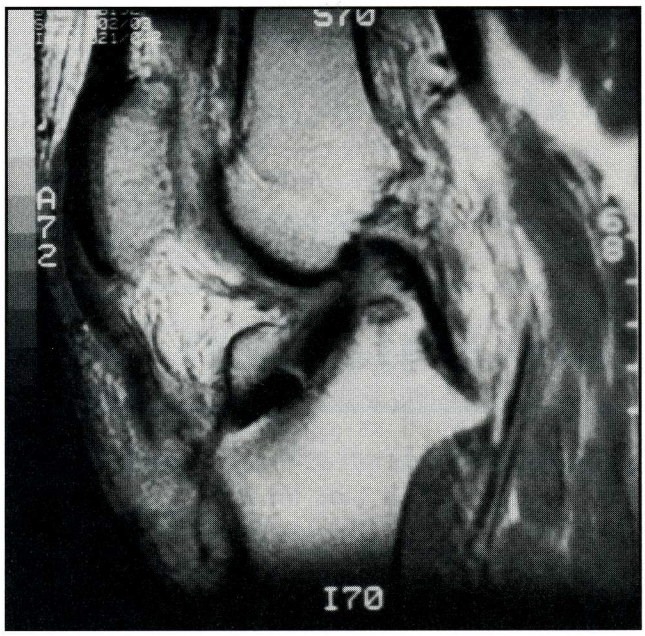
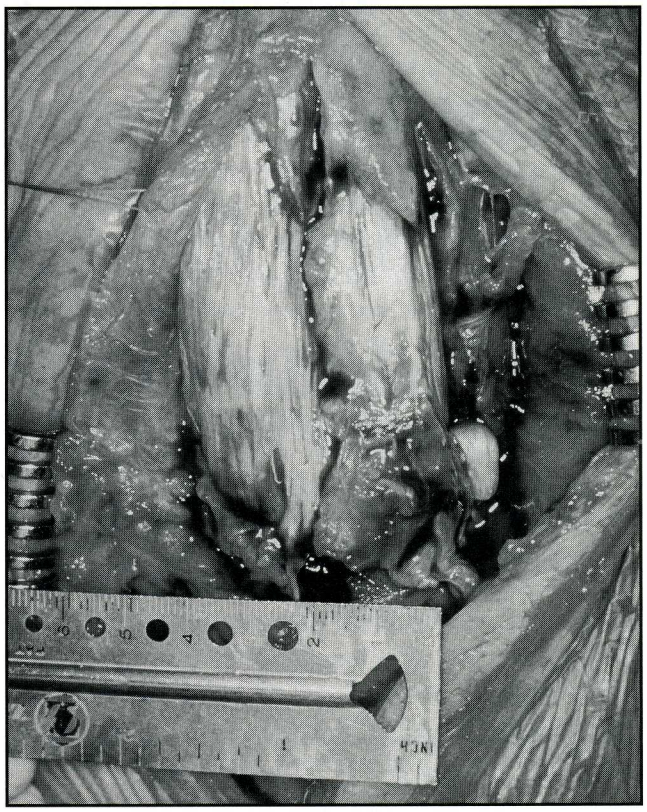


**Figure 2: Intraoperative photograph of the infrapatellar ruptured tendon. Note the increased width of remaining tendon, the extent of the disruption, and the retraction of tendon.**



tendon defect was closed with interrupted no. 1 absorbable sutures. The knee was placed in a long leg brace with free knee motion. Complete knee extension, especially at night and while ambulating toe-touch weightbearing with crutches was encouraged during the first 4 postoperative weeks. Quadriceps and hamstring strengthening were begun immediately including 45° bent knee straight leg raises. Progressive active and assisted range-of-motion exercises, stationary bicycling, and electrical muscle stimulation were used.

Follow-up evaluation at 2 weeks showed −5° to 95° of motion, a benign wound, and a normal Lachman test. Standard AP and lateral radiographs obtained at the first postoperative visit were unremarkable. Formal physical therapy was initiated and crutch use was continued for 2 more weeks.

On February 5, 1991, the patient slipped on ice while on crutches, sustaining a hyperflexion injury resulting in acute onset of knee pain and swelling. The patient was seen in urgent evaluation on February 6, 1991 and demonstrated an inability to actively extend his knee or perform a bent knee leg raise. Local tenderness at the tibial tubercle and no palpable defect in the infrapatellar tendon were noted secondary to diffuse swelling. Comparison lateral knee radiographs demonstrated no difference in patellar height.

A presumptive clinical diagnosis of infrapatellar tendon rupture was made based on the local tenderness and inability to actively extend the knee, and a magnetic resonance imaging (MRI) scan was obtained. The scan demonstrated a large effusion, intact cruciate ligament reconstruction, soft tissue swelling, and high signal uptake at the distal patellar tendon insertion consistent with total disruption (Figure 1).

On February 12, 1991, the patient underwent operative repair. Examination under anesthesia revealed a stable knee with a negative Lachman score. A palpable defect in the infrapatellar tendon was noted distally near the tibial insertion. Intraoperatively, a 1½-in transverse defect with a ½-in retraction of the tendon was apparent at the tibial tubercle (Figure 2). It was interesting to note that the tendon width appeared to have hypertrophied distally measuring 30 mm. A double layer Bunnell suturing of the tendon ends was performed. The gracilis and semitendinosis tendons were harvested through the same incision using a tendon stripper (Concept Inc, Key Largo, Florida). Augmentation of the repair was performed via a double-loop of these tendons secured to the patella via drill holes over a screw and post distally (Figure 3). This was further reinforced with a figure-eight tension-band 18 ga wire loop. Intraoperative patellar height was confirmed via a lateral radiograph and compared with the opposite knee.

Postoperatively, the patient was placed in a continuous passive motion machine and a hinged knee brace allowing 0° to 30° of motion. He was allowed partial weightbearing in extension, was on crutches for 6 weeks, and wore the brace a total of 8 weeks. At 2 weeks postsurgery, radiographs were unchanged, motion was increased to 60° of total flexion, and quadriceps active and passive extension exercises were initiated. The patient continued strength and range-of-motion exercises, and on June 1, 1991 he underwent