

Chronic Patellar Tendon Rupture

Surgical Reconstruction Technique Using 2 Achilles Tendon Allografts

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ABSTRACT: Delayed reconstruction of chronic patellar tendon ruptures classically has yielded suboptimal results. Quadriceps contracture, distal patella mobilization, quadriceps lengthening (eg, V-Y lengthening), prolonged postoperative immobilization, residual quadriceps weakness, surgical macro failure, and loss of knee flexion are some of the complications associated with treatment for chronic patellar tendon rup-

ture. Reinforcement hardware (eg, cerclage wire) may necessitate subsequent removal and the possibility of breaking with migration through the body. This article details the use and short-term success of a surgical technique using 2 Achilles tendon allografts for reconstruction of a chronic patellar tendon rupture.

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INTRODUCTION

Late reconstruction of patellar tendon ruptures usually yields less favorable results than does immediate reconstruction.¹⁶ This disparity has been attributed to proximal patella migration, poor tissue quality, and quadriceps atrophy. Growing experience with soft-tissue manipulation through the use of autograft and allograft tissue has enabled results for the reconstruction of chronic ruptures to approach those seen with immediate repair.^{4,5,7,10,14}

This article describes a technique for repairing chronic patellar tendon ruptures and demonstrates its dramatic short-term clinical success. This technique avoids the use of reinforcing hardware for a chronic proximally migrated patella following patellar tendon rupture.

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CASE REPORT

A 34-year-old man presented with difficulty ascending and descending stairs in a reciprocal fashion and the inability to actively extend his left knee. His symptoms began after sustaining a hyperflexion injury of the left leg while playing basketball 1.5 years prior to presentation. He had no history of knee problems before this injury, and he initially ignored the injury, thinking it was a muscle strain. With continued symptoms, he was referred to the senior author (B.R.B.) for operative treatment. Preoperative functional and subjective evaluations completed at the initial visit are summarized in the Table.

On physical examination, the patient was 6' 5" tall and weighed 325 lb. He walked with a limited gait pattern and was able to comfortably bear weight on the injured extremity. Examination of his left lower extremity revealed marked patella alta that was displaced approximately 8 cm proximal to the joint line. Palpation of the knee demonstrated a palpable defect in the patellar tendon. There was no erythema and only limited swelling. Passive range of motion was nearly intact (0°/0°/120°); however, active range of motion was limited with a 45° extension lag. Manual quadriceps testing was 2/5. His ligamentous examination was normal and the leg was neurovascularly intact. The contralateral leg had full range of motion (0°/0°/125°) and normal strength.

Plain radiographs of the left knee demonstrated extreme patella alta with an Insall-Salvati ratio⁸ of >2.8 (normal, 1.0-1.2) (Fig-

TABLE

FUNCTIONAL AND SUBJECTIVE OUTCOME SCORES

	Preoperative	6 Months Postoperative
IKDC score ¹	43	51
KOOS Score ¹⁵		
Pain	100	97
Symptoms	100	100
Activities of daily living	76	97
Lysholm score ¹³	70	91
SF-12 score ¹⁷		
Mental	55	62
Physical	40	45
HSS knee score ¹⁸	58	88

Abbreviations: IKDC=International Knee Documentation Committee, KOOS=Knee Injury and Osteoarthritis Outcomes, SF-12=Short Form-12, HSS=Hospital for Special Surgery.

ure 1). Magnetic resonance imaging showed a chronic rupture of the patellar tendon.

Initial surgical considerations included the use of an Ilizarov external fixation device to distract the patella to a more appropriate position to allow for reconstruction.⁹ However, concerns of infection related to the use of an external fixation device made this a less than desirable option. A decision was made to proceed with reconstruction of the extensor mechanism with 2 non-irradiated, fresh-frozen Achilles tendon allografts (AlloSource, Denver, Colo) without attempting to normalize the position of the patella. The use of a second allograft was unique and was indicated based on the patient's size and weight.

SURGICAL TECHNIQUE

Preoperative Evaluation

Preoperatively, lateral plain radiographs of both the injured and uninjured knees were obtained. The radiograph of the contralateral knee was used for appropriate measuring and for determining normal height alignment of the extensor mechanism reconstruction. A reconstruction that is too long will compromise the mechanical advantage of the extensor mechanism, and a reconstruction that is too short will limit flexion and may be more likely to re-rupture. Function and anatomical limitations were discussed with the patient to establish realistic postoperative goals and expectations. In this case, one goal was to add collagen (ie, Achilles tendon allograft) to replace missing tissue and restore active knee extension; however, during the preoperative discussion, the patient was made aware that restoration of normal, symmetric patellar tendon length was improbable.

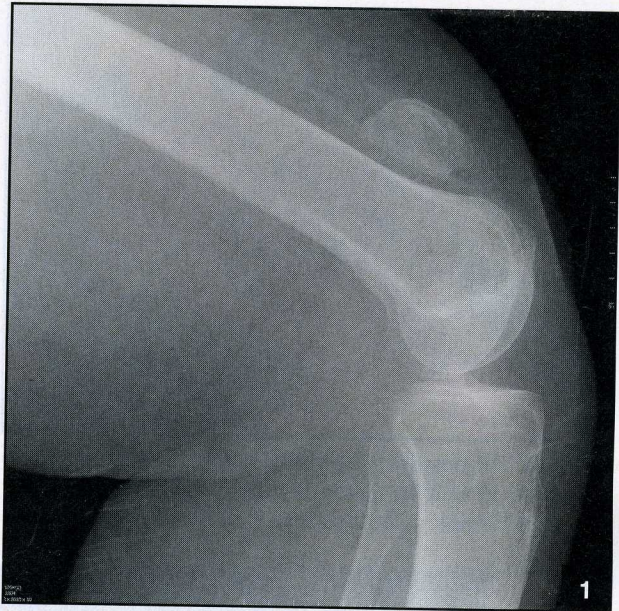


Figure 1. Lateral radiograph showing a chronic, neglected patellar tendon rupture with marked patella alta.

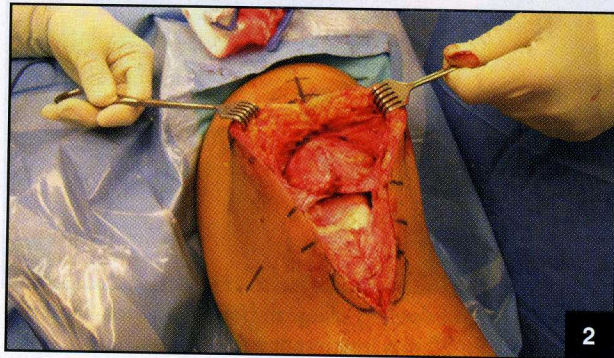


Figure 2. After a midline incision longitudinally from the patella proximally to the tibial tubercle distally, the defect in the patellar tendon at the rupture site was exposed.

Patient Positioning

The patient was positioned supine with the operative leg draped at the proximal thigh in the standard fashion. A sterile tourniquet was applied and used as needed. General anesthesia was required for paralysis to achieve muscle relaxation. Preoperative antibiotics (ie, first-generation cephalosporin) were administered.

Exposure

After injecting the skin with 1% lidocaine with epinephrine, a midline incision was made longitudinally from the patella proximally to the tibial tubercle distally. The dissection was carried down through the subcutaneous tissues to identify the defect and the patellar tendon pseudocapsule, which was incised and tagged to create medial and lateral flaps (Figure 2).

