



## Augmentation of a patellar tendon repair with an autologous semitendinosus graft

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**Patellar tendon ruptures are rare but very invalidating lesions. We describe a case of re-rupture of a sutured patellar tendon. An autologous semitendinosus graft was used for tendon augmentation in the reconstruction procedure. This technique uses an easy-to-harvest graft which has low donor site morbidity. Additionally, the strength of the graft allows early rehabilitation, and no further surgery for hardware removal is necessary. For these reasons we recommend this procedure for acute patellar tendon ruptures with a poor tissue quality or for revision surgery of the patellar tendon.**

**Keywords :** patellar tendon ; semitendinosus ; surgery ; rehabilitation.

### INTRODUCTION

Patellar tendon ruptures are rare but very invalidating lesions (3). They usually occur in the setting of a long-standing patellar tendon irritation and are the result of a progressive degeneration of the tendon. The typical mechanism of the injury is a sudden eccentric contraction of the quadriceps. Complete ruptures of the patellar tendon most often occur in older individuals. Primary suture of the tendon is generally advocated (2). Tendon repair can be especially difficult and is further complicated by pre-existing poor tissue quality. Therefore the use of an augmentation procedure is advised to protect the tendon and to prevent patella alta. We describe a case report in which re-rupture of a sutured patel-

lar tendon occurred and an autologous semitendinosus graft was used as augmentation.

### CASE REPORT

A 46-year-old male patient presented to the emergency department after a fall on the left knee. The diagnosis of a patellar tendon rupture was made on a clinical basis, and was confirmed radiographically (Blackburne and Peel index : 1.03).

Suturing of the tendon with non-resorbable wire was performed. Postoperatively the patient wore a long leg cast for one week, followed by a hinge knee brace. No problems occurred during the first six weeks after operation. After 6 weeks the patient had a sudden feeling of giving way and instability

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Table I. — Values for patella alta, infera, and norma as described by the respective authors in their original publications

	Patella norma	Patella alta	Patella infera
Blackburne – Peel	0.8	> 1.0	< 0.5
Caton – Deschamps	< 1.2	> 1.2	< 0.6
Insall – Salvati	1	> 1.2	< 0.8

in his left knee. The diagnosis of a re-rupture was made on a clinical basis and was confirmed by echography.

Revision surgery was performed and an autologous hamstring graft was used to augment the reconstruction. A free ending semitendinosus graft was harvested and prepared such as done in anterior cruciate ligament reconstruction surgery. After harvesting the tendon, a longitudinal midline incision was made from the patella to the tibial tuberosity. Horizontal mediolateral bone tunnels were drilled through the lower pole of the patella and the tuberosity. The graft was guided through the bony tunnels as a loop. To determine the correct patellar height and the correct tension on the extensor mechanism, the method described by Labelle *et al*, was used (4). With the knee bent at 90°, a K-wire, slipped over the anterior surface of the femoral shaft, should touch the upper margin of the patella. With the patella at the correct height, the semitendinosus graft was sutured to itself and the free patellar tendon endings were sutured end-to-end with a Krakow suture. Postoperatively a long leg cast was applied for a period of one week, followed by 6 weeks in a hinge knee brace. The flexion range in the knee brace was increased weekly by 15°.

The patient was clinically evaluated at 1 week, 1 month, 2 months, 3 months, 6 months and one year postoperatively. At the 2 months follow-up full extension was noted with an active range of flexion of 122° and a passive range of 134°. Physiotherapy and strength regaining exercises were prescribed. Four months postoperatively, the patient resumed his heavy job as a longshoreman.

Finally a good mobility and a normal function of the left knee were obtained. Radiographic control showed a good position of the patella with a Blackburn and Peel index of 0.91 (fig 1).



Fig. 1. — Postoperative patellar height, measured by the Blackburne and Peel Index.

## DISCUSSION

Ruptures of the quadriceps tendon as well as of the patellar tendon are rare lesions, but cause major functional deficits of the leg (3). To determine the preoperative and postoperative patellar height on radiographs, the Blackburne and Peel method was used because it has the lowest interobserver variability and discriminates best among the groups alta, norma and infera (10).

Once diagnosed, these lesions can be treated by suturing the tendon stumps or can be reinforced by an augmentation procedure. Multiple augmentation techniques using wire cerclage or PDS cord have been described. These techniques have the disadvantage that further surgery is necessary for hardware removal. Augmentation techniques of the patellar tendon reconstruction with an allograft (bone-tendon-bone, Achilles tendon, fascia lata) are often reported in literature as giving good to excellent results in difficult cases, even if there is a complete loss of the patellar tendon (5). The use of allografts however involves risks of disease transmission, host immune response, delayed incorporation and local bone resorption. Others describe patellar tendon reconstruction using an autologous quadriceps tendon graft or a contralateral bone-tendon-bone autograft (9). Recent studies report the use of a cell-scaffold combination to improve the induction of autogenous tissue from the synovium.

Some authors report the combined use of autologous grafts and a heavy-gauge wire (1) or autologous grafts and Z-plasties of the patellar tendon and quadriceps tendon (7).

Numerous techniques have been described but most of them require further surgery for hardware removal or demand prolonged immobilisation of the leg (1).

The technique used was described by Larson and Simonian (6). It avoids major donor site morbidity (6) and is suitable for the reconstruction of a patellar tendon rupture with poor quality of the remaining tendon, a traumatic defect of the tendon or after failure of a previous repair. This technique uses an easy-to-harvest graft with low donor site morbidity. The strength of the graft allows rapid rehabilitation and no further surgery for hardware

removal is necessary. For these reasons we recommend this procedure for acute patellar tendon ruptures with poor tissue quality or for revision surgery of the patellar tendon.

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