# SURGICAL TREATMENT OF THE DISTAL PATELLAR TENDINITIS

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## SUMMARY

Distal patellar tendinitis is a young athlete's disease characterized by pain at the distal patellar pole, near the patellar ligament insertion. Early treatment recommended is generally conservative, with physical therapy. The great majority of patients present favorable responses to this approach, but, in some cases, the remission of symptoms does not occur, requiring a different approach. For this group, surgical treatment with a technique derived from that of Trillat was used, which is based on the use of a graft removed from a portion of gracile muscle tendon into patellar ligament, intraosseously inserted in the patella and fixed at the tibial anterior tuberosity. Six patients were operated, bilaterally in two cases, totaling eight knees. The minimum follow-up time was three years, with all knees presenting an EXCELLENT score, according to ARPÉGE evaluation.

**Keywords:** Patellar tendinitis, Patellar ligament, Knee.

## INTRODUCTION

Distal patellar tendinitis is generally found in athletes practicing some sportive activity requiring repeated abrupt knee extension movements resulting from the shrinkage of thigh quadriceps muscle[1,2,3], such as volleyball and basketball[4], called "jumper knee" by some authors[4,5,6,7]. In the histological analysis of the tissue affected by tendinitis, areas of changes in collagen fibers and elastin, mucous degeneration, inflammation and fibrous necrosis are present[1,3,4,6,7,8], in a progressive process that can lead to patellar ligament rupture. Clinically, pain is found at the distal patellar end, near to the ligament insertion and thigh posterior muscles retraction. Classically, pain disappears with rest[2] and, in more advanced stages of the disease, pain complaints happen at the beginning of the physical activity, disappear during it and occurs again after it is finished(1). Recommended initial treatment is always conservative[1,2,3,6,8,9,10], with surgical approach being limited to refractive cases, more common on advanced stages of the tendinitis[6]. In this study, we aim to show the results achieved by a single surgeon in six athletes presenting symptoms of persistent distal patellar tendinitis, using a technique in which the insertion of a segmental graft of gracile muscle's tendon is made on the patellar ligament, similar to the technique suggested by Albert Trillat.

## MATERIALS AND METHODS

### Series:

Our series comprises eight knees of six athletes: three volleyball players and three basketball players, with two cases being bilateral. All of them presented with symptoms of distal patellar epiphysitis, refractive to conservative treatment for at least six months. The first was surgically treated 15 years ago, and still keeps in touch with us, and the last three of them were operated three years ago, thus, the minimum post-operative follow-up time was three years. Symptoms were basically pain at the distal patellar end, mentioned when climbing and particularly when going downstairs, even precluding sports practice. At sports practice, pain was present particularly when jumps were performed, being apparent at deceleration phase, not at impulsion phase. Mentioned pain was exacerbated to local palpation. Ultimately, a clinical picture that significantly changed athlete's performance. The patients did not present other signs of intra-articular changes, atrophy or limping. Musculature had a harmonic development and was not retracted, since they came from elongation treatments.

The last three patients of the series were submitted to magnetic resonance imaging tests, where a subtle degenerative change was present at the bone patellar ligament insertion, but they didn't characterize a typical ligament rupture.

### Surgical technique:

Patients were positioned in horizontal dorsal decubitus with a pneumatic garrote in order to achieve ischemia on the limb to be operated. Through a medial curved incision on the affected knee, we performed the isolation of gracile muscle tendon in all its extension, making a longitudinal removal of a graft in a width corresponding to half the original tendon. This graft was prepared with an equal length to patient's patellar ligament with one additional centimeter in order to enable its intraosseous insertion on the patella. The graft was prepared with absorbable suture threads (Vicryl® #1) with stitches fixed in each of its ends on the auxiliary table. The patellar ligament was addressed through a median anterior incision on the same knee, followed by an anterior opening (so as to keep its posterior region intact) and longitudinal opening of its central third, from the lower patellar pole up to its insertion on the TAT.

At the lower patellar pole, a curettage of the region's affected tissue was performed, followed by a 2.5 cm-drill travel to construct two divergent tunnels from the lower patellar pole up to its upper end, forming a "V"-like image (Figure 1). The fixing threads of one of the ends of the gracile muscle graft were passed through those tunnels and sutured on the upper end of the patella for graft stabilization purposes. This step of the surgery was performed with the aid of 1.5mm perforated Kischner threads used as "needle" for suture threads to pass through the tunnels (Figure 2). In a point immediately distal to TAT, a third tunnel was made, transversely to proximal tibia, where the fixing threads of the other graft end

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were passed through, also fixated by means of suture.

The graft fixation resistance test was performed with total passive flexion and extension of the operated knee, and then the simple-stitch suture with Vicryl® 3-0 was done to meet patellar ligament borders, which, in turn, buried the graft and a continuous suture with the same thread for patellar ligament aponeurosis closing. We finished with the subcutaneous tissue and skin closing, and with the placement of a immobilizing splint in 30 degrees of flexion (degree of the longest patellar ligament) for 10 days, followed by physical therapy aiming the passive gain of range of motion and muscular strength recovery after sixty days.

**Evaluation:**

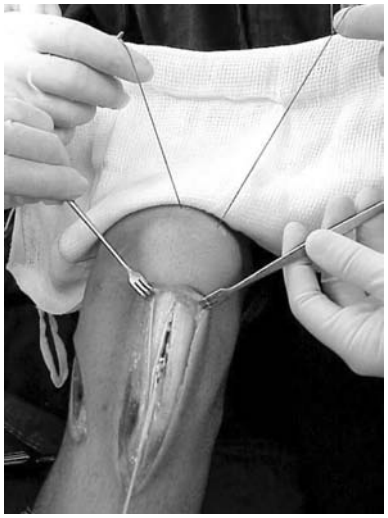
All patients were evaluated in three years of follow-up, using the ARPÈGE[11] evaluation whose global final result is divided into EXCELLENT, GOOD, FAIR, or BAD. This method is based on pre- and post-operative criteria, which are required for achieving global final result and include three items:

1 – level of return to physical activities (CLAS);

2 – functional evaluation (stability-S, pain and fatigue resistance-P, and functional mobility-M);

3 – patient's subjective evaluation (very satisfied, satisfied, not satisfied and unhappy).

*Photograph 1: Tunnels construction*



*Photograph 02: Graft travel*

## RESULTS

All evaluated knees achieved the Excellent criterion on the global final result (Table 1). On item CLAS, the six patients were competitive athletes, three of them were basketball players (contact sports, with knee rotation – C3), and the other three were volleyball players (non-contact sports, with knee rotation – C2) and all of them returned to their original sports activities. Within the funcional evaluation, the eight knees received a 9 score for stability, a score equal to eight or higher for pain and fatigue resistance and a 9 score for functional mobility. On the subjective evaluation, the six patients reported themselves as very satisfied, including the cases in which both knees were operated. This set of results meets the requirements for excellent criterion on the global final result (stability = 9, pain and fatigue resistance > or = 8, very satisfied and returning to original sports activities).

| CASE | SIDE | DATE SO | FOLLOW UP | CLAS | FUNCTIONAL SCORE S-P-M | SUBJECTIVE EVALUATION | GLOBAL FINAL RESULT |
|---|---|---|---|---|---|---|---|
| 01 | r | 19/7/1989 | 15 years | C3 | 9-8-9 | Very happy | Excellent |
| 02 | r + l | 4/11/1998 | 6 years | C3/C3 | 9-8-9/9-8-9 | Very happy | Excellent |
| 03 | l | 8/3/1999 | 5 years | C2 | 9-9-9 | Very happy | Excellent |
| 04 | r | 3/5/2000 | 3 years | C3 | 9-9-9 | Very happy | Excellent |
| 05 | r + l | 24/10/2001 | 3 years | C2/C2 | 9-8-9/9-9-9 | Very happy | Excellent |
| 06 | r | 9/4/2001 | 3 years | C2 | 9-9-9 | Very happy | Excellent |

r-right, l-left,S-stability, P-pain and fatigue resistance, M-functional mobility

*Table 1: Patients with patellar distal tendinitis operated using Gracile muscle graft technique*

## DISCUSSION

The surgical treatment of the patellar tendinitis presents many techniques described in literature: resection of the posterior patellar pole[5] and of the degenerated area of the tendon[1,2,7,9,12], opened [7,8] or arthroscopic[3,5] longitudinal tenotomy, opened[3] or arthroscopic[10,13] scarifications, perforations on the lower patellar pole[4,8] and patellar realignment[4]. But, as the surgical approach is not the first-option treatment for patellar tendinitis, being limited to a minority of patients who are refractive to conservative treatment, we can see that many of those publications are limited to show the surgical technique and its results in a small series[1,3,10]. Following this trend of worldwide literature, we intended to divulge the technique created by Trillat and standardized by us for patellar tendinitis and its results in competition athletes, which are very exciting to date, since the six athletes operated achieved the maximum criterion on Arpége evaluation by presenting the effective return to original sports activities and the unanimity of being very satisfied with the result of the surgery. We outline that this technique continues to be used in our patients, totaling 18 to date, not mentioned due to the lack of enough post-operative follow-up, but presenting a similar post-operative evolution and the same regression of symptoms as shown in the six patients evaluated in this publication.

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