Distal Semitendinosus Tendon Rupture: Is There Any Benefit of Surgical Intervention?

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INTRODUCTION

Isolated rupture of the distal semitendinosus is rare, and as a result, there is paucity of evidence over the best method of managing the injury, that is, surgical or nonsurgical, particularly in light of the fact that the tendon is routinely harvested for anterior cruciate ligament (ACL) reconstruction. We present the cases of 2 elite sprinters with isolated ruptures of the distal semitendinosus who were managed nonsurgically, and we take the opportunity to look at the literature surrounding the management of this injury.

CASE 1

While performing sprint-start drills, a 19-year-old male sprinter felt a sudden snap behind the medial side of the right knee. Initially, he described a sense of relief around the knee, but an escalation of pain over the following hours prevented any further sprinting.

He had a 3-year history of a tight discomfort around the posterior–medial side of the right knee, which had recently turned into a constant clicking and “gritty” sensation during knee flexion. Although it did not affect his performance, achieving a personal best (PB) of 10.37 and 20.85 seconds over 100 and 200 m, respectively, he felt restriction at this site. He denied any history of local injections or steroid use.

On examination, there was a palpable gap along the distal medial hamstring tendons that was accentuated on knee flexion. There was pain on palpation along the medial side of the popliteal fossa, which was exacerbated by resisted knee flexion. A full range of knee movement was maintained, and there was no medial joint laxity on valgus straining at 0 and 30 degrees of flexion.

A complete midsubstance tear of the distal semitendinosus tendon at the level of the medial epicondyle was confirmed with ultrasound and magnetic resonance imaging. The tendon was described as thickened in its entirety suggestive of overload or chronic tendinosis.

Nonoperative management with initial rest, ice, and compression was initiated followed by a focused rehabilitation program. The athlete returned to competitive sprinting 12 months after the injury (Figure 1) subsequently achieving a season best time of 10.57 and 21.13 seconds over 100 and 200 m. To date, he has had no further problems associated with this injury.

CASE 2

During a 100-m preliminary round, a 25-year-old male sprinter felt a pop at the posterior–medial aspect of his right knee. He was able to complete the race in a time of 10.37 seconds (PB 10.22 seconds) but, due to increasing pain, did not compete in subsequent rounds.

Two weeks later while competing in a 100-m relay meet, he felt a sudden recurrence of pain in the same area but managed to finish his relay leg. Examination revealed a visible and palpable absence of the distal semitendinosus tendon (Figure 2) with associated tenderness extending to the proximal tibia. Full range of knee movement was maintained with no discernable ligamentous laxity. Magnetic resonance imaging confirmed a rupture of the semitendinosus tendon at its tibial insertion.

A nonoperative approach was adopted with focused physical therapy to maintain the strength and conditioning of the hamstrings. Sonography performed 6 months postinjury showed that the ruptured tendon had retracted and was tethered to the underlying semimembranosus muscle belly. The semitendinosus belly had changes consistent with disuse denervation, which corroborated the clinical findings of focal muscle wasting within the hamstring compartment.

The athlete returned to competitive sprinting 10 months after the injury achieving a season best time of 10.30 seconds over 100 m. He is presently back to full training.

DISCUSSION

Although it is the smallest of the hamstring muscles, the semitendinosus makes a significant contribution toward dynamic stability of the knee during deep flexion and internal rotation of the tibia.1,2 Weakness of the hamstrings and quadriceps occurs after hamstring tendon harvest for ACL reconstruction, but some spontaneous recovery does occur.3 It is concern over the residual deficit and the implications it may have on an athlete’s performance that raises the debate over surgical repair versus nonoperative treatment in the management of isolated ruptures of the distal semitendinosus.

Concern over donor-site morbidity may influence the surgeon’s choice for ACL graft in athletes whose sports require...
sprinting or hamstring power. Routine harvesting of semitendinosus for ACL reconstruction does not seem to hinder the athlete’s ability to return to preinjury levels of competition. Despite the evidence, there is still a fear that without the tendon, the elite athlete may not be able to fulfill his or her potential: Performance in many sports involves sprinting over short distances, and a return to competition does not necessarily reflect a full recovery from the injury. In the case of track sprinters, the measure of performance, and recovery from injury, is reflected in their sprint times over a given distance. Through both sprinters being able to reproduce close to their PB times, we have shown that full recovery after semitendinosus rupture is possible without surgical intervention. To our knowledge, this is the first time recovery from this injury has been objectively demonstrated in this manner.

One possible explanation for this recovery is the regeneration of a functional neotendon. Radiological and histological studies have shown restoration of a tendon-like structure after hamstring tendon harvesting for ACL reconstruction in a majority of cases.

Potentially, there is a role for surgery in cases where there is pain associated with scarring around the ruptured tendon. In their case series, Schilders et al performed tenotomies to complete partial tendon ruptures of the distal semitendinosus associated with pain. One patient had previously had a tendon repair but remained symptomatic. In all cases, the symptoms resolved after tendon release permitting the athletes to return to sports. Daniel E. Cooper, MD and John E. Conway, MD (unpublished data, July 2007) presented their series of 17 distal semitendinosus ruptures in elite athletes. Twelve were treated conservatively and 5 underwent acute surgical resection of the tendon end. Of the non-operatively managed patients, 5 underwent surgical resection of the scarred tendon to relieve pain. In both reports, tendon repair was not attempted, and all the athletes involved returned to preinjury levels of activity demonstrating that distal semitendinosus repair is not critical for high-level participation in sports.

After a hamstring injury, a period of recovery and rehabilitation is necessary. In our 2 sprinters with distal semitendinosus rupture, full recovery took approximately 12 months. This level of performance may not necessarily be required in other sports, thereby allowing for a shorter recovery period. Sekhon and Anderson described 2 cases where a professional National Football League player returned to competition 2 weeks after injury with infiltration of a local anesthetic for pain control and a professional baseball player who resumed competition after 4 weeks of rehabilitation alone. The evidence suggests that given time, athletes do make a complete recovery without the need for surgical repair.

CONCLUSIONS

We are in the habit of reporting the outcome of our interventions, particularly after a surgical course of action, but it is as important to document outcomes after nonsurgical management. It is our opinion that isolated distal semitendinosus tendon ruptures should be treated nonoperatively as full recovery is achievable, even in a demanding sport such as track and field athletics.

REFERENCES


