

# Isolated Vastus Lateralis Tendon Avulsion

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## Abstract

Isolated avulsion of the vastus lateralis tendon is a very rare injury. To our knowledge, only 1 case has been reported in the literature. This tendon is crucial to knee stability and proper patellofemoral tracking. As isolated avulsion of the tendon tends to occur in young, active males, early surgical repair is recommended to allow them to maintain a high level of functional ability.

We present the case of a 49-year-old man who sustained an isolated vastus lateralis tendon avulsion injury. The injury was successfully treated with suture anchor repair.

**A**cute isolated avulsion of the vastus lateralis tendon is very rare.<sup>1</sup> This tendon provides a lateral force-vector that is important in maintaining knee stability and patella alignment.<sup>2,3</sup> Full-thickness injuries of the muscle belly are best addressed surgically to preserve knee extension and proper patellofemoral tracking.<sup>4,5</sup>

We present the case of a man who sustained an isolated vastus lateralis tendon avulsion injury. The injury was successfully treated with suture anchor repair.

The patient provided written informed consent for print and electronic publication of this case report.

## Case Report

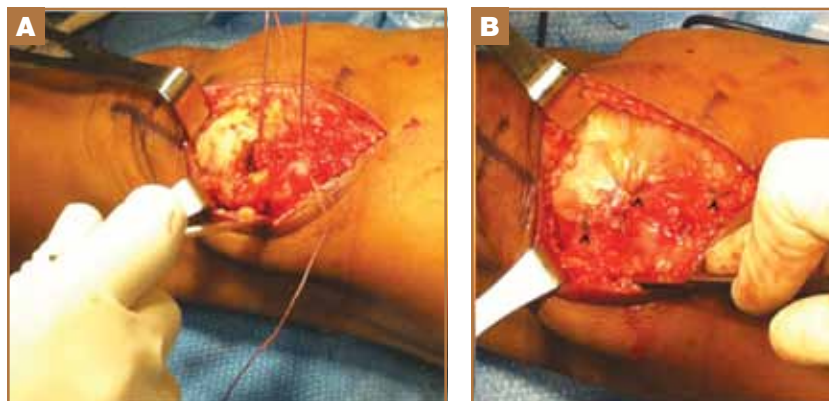
The patient was a 49-year-old, otherwise healthy male laborer, who slipped and fell while pulling a heavy object at his job. He reported immediately feeling a “pop” near the left knee upon slipping, with associated pain along the lateral aspect of the knee. Conservative treatment (rest, ice, elevation, non-steroidal anti-inflammatory drugs) for 4 weeks did not relieve the pain, and the patient noticed swelling over the left distal thigh along the lateral aspect. He reported difficulty doing deep knee bends, getting in and out of vehicles, going up and downstairs, and pushing and pulling heavy objects. He said he felt as though

the knee might give way during these activities, and noted a few recurring episodes. He did not report any catching or locking symptoms.

On referral examination 4 weeks after injury, a mild effusion was noted over the left knee, and knee range of motion (ROM) was  $-2^{\circ}$  to  $125^{\circ}$ . The patient had good patellar mobility with no subluxation or patellar apprehension. We detected palpable defect along the lateral aspect of the distal femur, with tenderness on palpation of the lateral facet of the patella. Radiographs were unremarkable. Magnetic resonance imaging showed a full-thickness tear of the vastus lateralis tendon at its insertion at the lateral facet of the patella with no other associated injuries.

Seven weeks after injury, the patient underwent open repair of the left vastus lateralis avulsion at the insertion into the patella. The proximal tendon was easily identified and tagged (Figures A, B). A stump of tendon insertion was found attached to the lateral aspect of the proximal pole of the patella and debrided. A curette was used to decorticate the patella, and a 4.5-mm BioComposite Corkscrew (Arthrex Inc, Naples, Florida) was then inserted into the superolateral aspect of the patella. Two Krakow stitches using the sutures attached to the anchor were then woven through the vastus lateralis tendon and tied down with the leg hyperextended to provide a tension-free repair (Figure A). Last, Ethibond sutures (Ethicon, Bridgewater, New Jersey) were tied in figure-eight fashion to connect the vastus lateralis tendon to the quadriceps tendon, concluding the

**Figure.** (A) BioComposite Corkscrew (Arthrex Inc, Naples, Florida) in superolateral aspect of patella, with sutures shown. (B) Vastus lateralis is tied down and reinforced with Ethibond (Ethicon, Bridgewater, New Jersey) sutures in figure-eight fashion.



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repair (Figure B). The patient tolerated the procedure well.

He was allowed partial weight-bearing with crutches for 6 weeks, and then began physical therapy. Three months postoperatively, he had regained full knee ROM. At 4 months, he had a normal gait pattern, 80% quadriceps strength, compared with the uninjured leg, and a circumference difference of 2 cm. By 6 months, he had returned to work without restrictions.

## Discussion

There has been only 1 other reported case of an isolated avulsion of the vastus lateralis tendon. The rarity of this injury supports the importance of performing a thorough clinical examination. However, clinical diagnosis still may not be straightforward, and advanced imaging studies are needed to clearly illustrate the injury pattern and inform surgical planning.<sup>6,7</sup> A missed early diagnosis of an isolated vastus lateralis avulsion may result in a more difficult surgical intervention, longer rehabilitation, and even failure and function loss.

It has been postulated that isolated avulsion of the vastus lateralis may be caused by rapid eccentric contraction of the muscle during lifting of a heavy load that is sufficient to avulse the tendon from its bony insertion.<sup>1</sup> Our patient's mechanism of injury aligns with this etiology. However, no mechanical studies have been conducted to validate this theory.

Although the more traditional surgical approach for quadriceps tendon tears involves weaving sutures into the ruptured tendon and passing them through a transpatellar tunnel, recent studies have used suture anchors in the patella.<sup>4,5</sup> These studies are limited case series, but the initial functional outcomes of the technique have been good, and other benefits have been noted (ie, smaller incision, ease of dissection for implant-site access, earlier ROM exercises, and low rates of implant failure). Biomechanical studies comparing suture anchors and tunnel fixation have found no strength differences.<sup>8</sup> The technical benefits of using suture anchors include limited dissection, which causes less trauma to the soft-tissues and potentially shortens recovery.<sup>8</sup>

In this case report, we described the efficacy of using a suture anchor technique to repair an isolated vastus lateralis

avulsion injury. In only 1 other case has use of this method been reported. Our patient sustained his injury during an everyday activity but regained full knee ROM 3 months after repair and was able to return to work within 6 months. These outcomes are evidence that suture anchor repair is an effective and safe treatment for isolated vastus lateralis tendon ruptures. This repair should be considered for patients, particularly very active patients, with this rare injury.

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*This paper will be judged for the Resident Writer's Award.*

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