

Subluxating Biceps Femoris Tendon: An Unusual Case of Lateral Knee Pain in a Soccer Athlete

A Case Report

Bernard R. Bach, Jr.,* MD, and Keith Minihane, MD

From Rush Medical College and Rush-Presbyterian–St. Luke's Medical Center, Chicago, Illinois

Symptomatic snapping of tendons about the knee is an unusual phenomenon. We describe a patient with lateral knee pain caused by subluxation of the long head of the biceps femoris over a prominent fibular head. A partial fibular head resection led to resolution of the patient's symptoms and his ability to return to sporting activities.

CASE REPORT

A 24-year-old male medical student had a 6-year history of bilateral knee pain, worse on his left side than on his right, which had increasingly limited his activities, preventing him from playing soccer. The pain was localized to the lateral aspect of his knees and was accompanied by a catching sensation. His symptoms were exacerbated with activity, particularly descending stairs and rising from a squat. There was no history of antecedent trauma.

Physical examination revealed normal knee motion, ligamentous stability, normal knee alignment, and excellent hamstring flexibility. Specifically, there was no evidence of lateral collateral ligament instability, posterolateral laxity, or fibular head instability. The fibular heads were extremely prominent in both knees. During knee extension from a flexed position, the long head of the biceps femoris muscle displaced over the fibular head, left more evident than right, reproducing his symptoms (Fig. 1). This phenomenon occurred in the extremes of flexion between 80° and 100° and only with the tibia internally rotated. The snapping or subluxation could be dampened and eliminated by manually compressing the distal biceps musculature. Radiographs demonstrated bilaterally

prominent fibular heads but were otherwise unremarkable. No arthritis of the proximal tibiofibular joint was observed. Despite nonoperative treatment with antiinflammatory medication and home physical therapy, his left knee symptoms worsened, and operative exploration of the left knee was performed.

Intraoperatively, while the patient was under anesthesia, the subluxation was reproduced. It occurred only with the lower leg internally rotated between 80° and 110° of knee flexion. When a tourniquet placed around the distal thigh musculature was inflated, we could not reproduce the subluxation in internal rotation, effectively confirming our previous result with direct manual compression. The tourniquet was released and the subluxation reconfirmed. A 4.5-inch incision was placed slightly anterior to the long head of the biceps tendon and the common peroneal nerve was identified. Under direct visualization, we observed the subluxation of the tendon anteriorly in extension and reduction of the subluxation with knee flexion (Fig. 1), but we noted no apparent anatomic anomaly of the tendon. We had been prepared to transfer a portion of the biceps tendon if it was abnormally inserted on either the tibia or the fibular head. Instead, we performed a partial resection of the fibular head prominence, removing a 1 × 1.5 cm piece without detaching the biceps tendon or violating the lateral collateral ligament or popliteal fibular ligament (Fig. 2). This procedure eliminated the snapping sensation intraoperatively when the knee was assessed in the provocative positions.

The operation was performed on an outpatient basis. Early motion and progression to full weightbearing was allowed. The patient noted immediate resolution of the snapping, regained full motion of his knee, and returned to soccer. At follow-up 1.5 years after the operation, the left knee remained asymptomatic. The right knee biceps

* Address correspondence and reprint requests to Bernard R. Bach, Jr., MD, Department of Orthopedic Surgery, Rush-Presbyterian–St. Luke's Medical Center, 1725 West Harrison Street, Suite 1063, Chicago, IL 60612.

No author or related institution has received any financial benefit from research in this study.

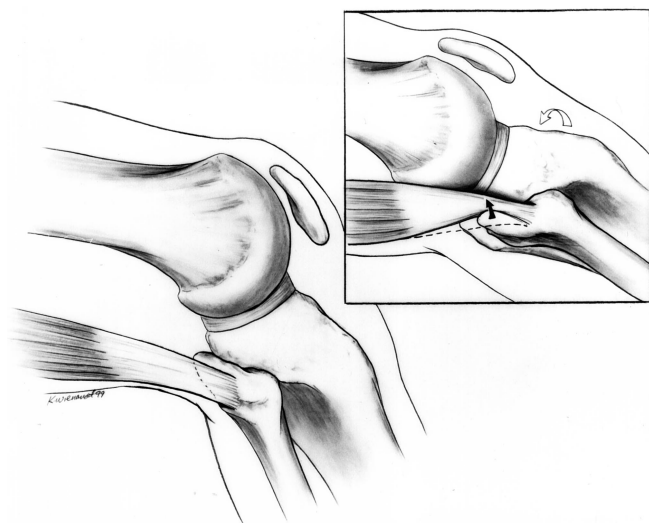


Figure 1. Mechanism of subluxation of the biceps tendon over the prominent fibular head.



Figure 2. A portion of the fibular head was resected without detaching the biceps tendon or violating the lateral collateral ligament or popliteofibular ligament.

tendon snapping persisted to a mild degree but did not warrant surgical treatment.

DISCUSSION

Snapping tendons about the hip, shoulder, and elbow are more commonly reported than about the knee region. Conditions that may cause painful snapping about the knee include congenital snapping knee,⁵ discoid lateral meniscus in children,¹⁵ a torn meniscus, intraarticular rheuma-

toid nodules,¹⁴ synovial plicae,⁴ and iliotibial band syndrome.^{7,12} Subluxation of tendons has been reported to cause this painful snapping syndrome about the knee, medially by the gracilis and semitendinosus tendons,^{1,11,13} and laterally by the biceps femoris^{6,8-10} and popliteus tendons.^{2,3}

Snapping biceps femoris tendon as a source of lateral knee pain has seldom been reported. Kristensen et al.⁹ described a snapping of the knee caused by the tendon of the long head of the biceps femoris sliding over the fibular head because of an anomalous insertion onto the anterolateral aspect of the proximal tibia. Resolution of the symptoms was achieved by resecting the lateral portion of the fibular head. Lokiec et al.¹⁰ reported an abnormal insertion of the tendon onto the anterolateral aspect of the fibular head, causing a similar snapping. Partial repositioning of the tendon resolved the symptoms. Hernandez et al.⁶ also reported an anomalous insertion of the tendon onto the anterior tibia; however, correction was accomplished by complete repositioning of the tendon onto the fibular head. Kissenberth and Wilckens⁸ recently reported a bilateral case of snapping biceps tendon that occurred at 90° of knee flexion, but they did not comment on any role of internal rotation. The authors observed an anomalous insertion of the anterior arm of the biceps tendon.

In all of these cases, the snapping was noted bilaterally, but the patients had symptoms that warranted surgery on only one side. Although our patient had snapping and symptoms bilaterally, one knee was more symptomatic and disabling. Similar to the case described by Hernandez et al.,⁶ the snapping in our patient was only apparent when the fibular head was brought to a more anterolateral position with internal rotation of the tibia. In contrast, the snapping was not caused by an abnormal tendon insertion but rather by a prominence of the posterolateral aspect of the fibular head.

In our patient, the subluxation of the biceps femoris tendon was eliminated with manual compression of the biceps tendon, simulating a tenodesis. Attempts made to immobilize the tendon with distal thigh straps were unsuccessful. The subluxation was also eliminated intraoperatively when the tourniquet was elevated, it was therefore released for the operation. The subluxation was no longer apparent after the partial fibular head resection, making a tendon transfer or tenodesis unnecessary. In this case, we believe the fibular head had an abnormal posterolateral shape that was the contributing factor for tendon snapping. There was no degenerative joint disease of the proximal tibiofibular joint, no exostosis, and, as there was no specific anatomic structure attached to the prominence, a traction enthesopathy would be unlikely. We would not recommend complete fibular head resection for this condition.

Subluxation of the biceps femoris tendon can be asymptomatic, or the patient may develop progressive symptoms that limit activity. It may be more common than is reported; the senior author (BRB) has established this diagnosis in two additional patients. Both of these patients demonstrated biceps tendon subluxation with knee flexion and internal rotation. Neither patient had symptoms suf-

ficient to warrant surgical treatment. If the patient's symptoms are unresponsive to nonoperative treatment of rest, medications, therapy, or mechanical strapping, surgical correction can be effective. Subluxation of the biceps femoris tendon, although unusual, should be excluded in patients with lateral compartment mechanical symptoms. Establishing this diagnosis may preclude an unnecessary diagnostic arthroscopic procedure.

REFERENCES

1. Bae DK, Kwon OS: Snapping knee caused by the gracilis and semitendinosus tendon. A case report. *Bull Hosp Jt Dis* 56: 177-179, 1997
2. Cooper DE: Snapping popliteus tendon syndrome. A cause of mechanical knee popping in athletes. *Am J Sports Med* 27: 671-674, 1999
3. Crites BM, Lohnes J, Garrett WE Jr: Snapping popliteal tendon as a source of lateral knee pain. *Scand J Med Sci Sports* 8: 243-244, 1998
4. Dupont JY: Synovial plicae of the knee. Controversies and review. *Clin Sports Med* 16: 87-122, 1997
5. Ferris BD, Jackson AM: Congenital snapping knee. Habitual anterior subluxation of the tibia in extension. *J Bone Joint Surg* 72B: 453-456, 1990
6. Hernandez JA, Rius M, Noonan KJ: Snapping knee from anomalous biceps femoris tendon insertion. A case report. *Iowa Orthop J* 16: 161-163, 1996
7. Holmes JC, Pruitt AL, Whalen NJ: Iliotibial band syndrome in cyclists. *Am J Sports Med* 21: 419-424, 1993
8. Kissenberth MJ, Wilckens JH: The snapping biceps femoris tendon: Case report. *Am J Knee Surg* 13: 25-28, 2000
9. Kristensen G, Nielsen K, Blyme PJH: Snapping knee from biceps femoris tendon. A case report. *Acta Orthop Scand* 60: 621, 1989
10. Lokiec F, Velkes S, Schindler A, et al: The snapping biceps femoris syndrome. *Clin Orthop* 283: 205-206, 1992
11. Lyu SR, Wu JJ: Snapping syndrome caused by the semitendinosus tendon. A case report. *J Bone Joint Surg* 71A: 303-305, 1989
12. Renne JW: The iliotibial band friction syndrome. *J Bone Joint Surg* 57A: 1110-1111, 1975
13. Smillie IS: *Injuries of the Knee Joint*. Fifth edition. Edinburgh, Churchill Livingstone, 1978, p 121
14. Torisu T, Yosida S, Takasita M: Painful snapping in rheumatoid knees. *Int Orthop* 21: 361-363, 1997
15. Washington ER III, Root L, Liener UC: Discoid lateral meniscus in children: Long-term follow-up after excision. *J Bone Joint Surg* 77A: 1357-1361, 1995