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Case Reports and Series

# A Case of Posterior Tibial Nerve Injury After Arthroscopic Calcaneoplasty

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ABSTRACT

We report the first case of distal posterior tibial nerve injury after arthroscopic calcaneoplasty. A 59-year-old male had undergone right arthroscopic calcaneoplasty to treat retrocalcaneal bursitis secondary to a Haglund's deformity. The patient complained of numbness in his right foot immediately after the procedure. Two years later and after numerous assessments and investigations, a lateral plantar nerve and medial calcaneal nerve lesion was diagnosed. In the operating room, the presence of an iatrogenic lesion to the distal right lateral plantar nerve (neuroma incontinuity involving 20% of the nerve) and the medial calcaneal nerve (complete avulsion) was confirmed. The tarsal tunnel was decompressed, and both the medial and the lateral plantar nerve were neurolyzed under magnification. To the best of our knowledge, our case report is the first to describe iatrogenic posterior tibial nerve injury after arthroscopic calcaneoplasty. It is significant because this complication can hopefully be avoided in the future with careful planning and creation of arthroscopic ports and treated appropriately with early referral to a nerve specialist if the patient's symptoms do not improve within 3 months.


Haglund's disease was first described in 1928 by a Swedish orthopedic surgeon, Patrick Haglund (1–3). This condition is caused by a painful bony prominence in the posterior aspect of the heel called a Haglund's deformity (2,4). The initial management of this condition is conservative and includes local treatment, such as avoidance of tight shoes and stretching programs. Pharmacotherapy can also be introduced to control pain (1,5,6). If conservative management fails, surgical interventions can be offered to treat the pain (5,7). The traditional approach is an open procedure (5,6,8). Because the open procedure was found to be associated with complications, a minimally invasive endoscopic or arthroscopic approach was introduced in the 1990s (1,3,6,9–11).

Both open and endoscopic or arthroscopic ankle surgery have been associated with a risk of injury to the surrounding neurovascular structures. Lohrer et al (12) compared open and endoscopic calcaneoplasty on cadaveric specimens and found iatrogenic soft tissue lesions, specifically sural nerve injuries, in both techniques. No other nerve injuries were noted in the study. Cugat et al (13) and Freedman and Barron (14) were the first to report cases of injury to the posterior tibial nerve as a result of ankle arthroscopy. A review of the published data showed that iatrogenic complications with damage to the posterior tibial nerve have been reported with ankle arthroscopy or endoscopy but never after arthroscopic calcaneoplasty (13–17). We report a case of delayed diagnosis of iatrogenic distal posterior tibial nerve injury after arthroscopic calcaneoplasty for the treatment of Haglund's deformity. This case is significant because this complication can hopefully be avoided in the future with proper placement of arthroscopic ports. Furthermore, awareness of this possible complication could lead to early diagnosis, referral, and treatment by a specialist with interest in the peripheral nerves.

## Case Report

A 59-year-old male family physician was referred with persistent right foot pain, numbness, and weakness after arthroscopic resection of a Haglund's deformity 2 years earlier. The patient had no medical

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or surgical history and reported no allergies. Before the surgery, he had been taking no medications.

Two years before the present presentation, the patient had been seen by an orthopedic surgeon because of right ankle retrocalcaneal bursitis secondary to a Haglund's deformity. This was affecting his ability to run and wear shoes. The patient then underwent arthroscopic resection of the Haglund deformity with a thigh tourniquet under regional anesthesia, specifically, a popliteal block. A posterolateral medial incision was performed with the patient in a supine position. Through this incision, the retrocalcaneal burse was resected, followed by burr removal of the Haglund deformity. Immediately postoperatively, the patient complained of right foot pain and numbness along the lateral aspect of his foot and over the heel. He complained of intermittent, shooting electrical pain into the fourth and fifth toes. The patient described the feeling as "walking on marbles." This was treated with a "watch and wait" approach.

Two months later, the patient was continuing to experience numbness and pain over the lateral aspect of his right foot and heel. He also noted weakness of the foot, which affected his ability to ambulate and exercise. The patient was found to have a positive Tinel's sign over the medial malleolus and reduced sensation over the lateral plantar surface and heel of the affected foot. The patient was then referred to a neurologist. The electromyography (EMG) nerve conduction studies were suggestive of an injury to the right popliteal area with involvement of both the peroneal and the posterior tibial nerve territories. Specifically, the nerve conduction test results confirmed absent right lateral plantar sensory responses. It was thought at this time that these findings were consistent with a possible "double strike" injury with one at the level of the popliteus due to the regional anesthetic and the second at the level at the posterior tibial nerve due to the surgery. A magnetic resonance imaging (MRI) scan of the right ankle and foot was ordered. The initial report included the finding of "no signal change in the nerves and no fatty changes or atrophy in the muscles of the sole of the foot." On our review of the MRI scan, subtle feathery edema was present in the abductor digiti minimi muscle (Fig. 1). In addition, a linear track was identified at the site of the previous surgery that appeared to be closely related to the course of the posterior tibial nerve (Fig. 2). After the MRI scan, conservative management was continued, and pregabalin was initiated to control the pain.

At 5 months postoperatively, the patient was referred to a plastic surgeon for assessment of his persistent right foot pain, numbness, and weakness. The plastic surgeon did not believe a significant nerve injury was present after the arthroscopic surgery. It was that surgeon's impression that multifactorial trauma from the popliteal block and procedure (bruising and swelling) had contributed to the patient's current complaints. Close observation, an increased pregabalin dose for improved control of pain, and repeat nerve conduction studies were recommended.

At 7 months postoperatively, the neurologist reassessed the patient. Repeat EMG studies revealed improvement overall since the previous EMG study, with reinnervation of both the peroneal and the posterior tibial nerves, localized, in these studies, below the sciatic bifurcation. The pregabalin was discontinued because of the poor response and sedative side effects.

At 1 year postoperatively, the neurologist reassessed the patient. The patient at that point reported significant disability. He could no longer run and was unable to stand for prolonged periods owing to the cramping and pain in his right foot. The heel and lateral aspect of his foot remained painful and numb. EMG nerve conduction studies were repeated. These showed findings similar to those of the previous studies. However, in contrast, the axonal injury was mainly in the peroneal nerve distribution and to a lesser extent in the posterior tibial nerve distribution. A repeat MRI scan demonstrated mild fatty atrophy and infiltration of the abductor digiti minimi and quadratus plantae muscles. (Fig. 3).

With these new findings, the patient sought a second opinion from another neurologist and followed up with the plastic surgeon. Examination by these specialists revealed abnormal pinprick sensation in the distal territory of the tibial nerve. A positive Tinel's sign was present at the right tarsal tunnel. The plastic surgeon discussed decompression surgery of the peroneal nerve and tibial nerve with the patient; however, the patient was hesitant to undergo future surgery with no guarantees of improvement. The neurologist stated that these findings were consistent with right distal tibial

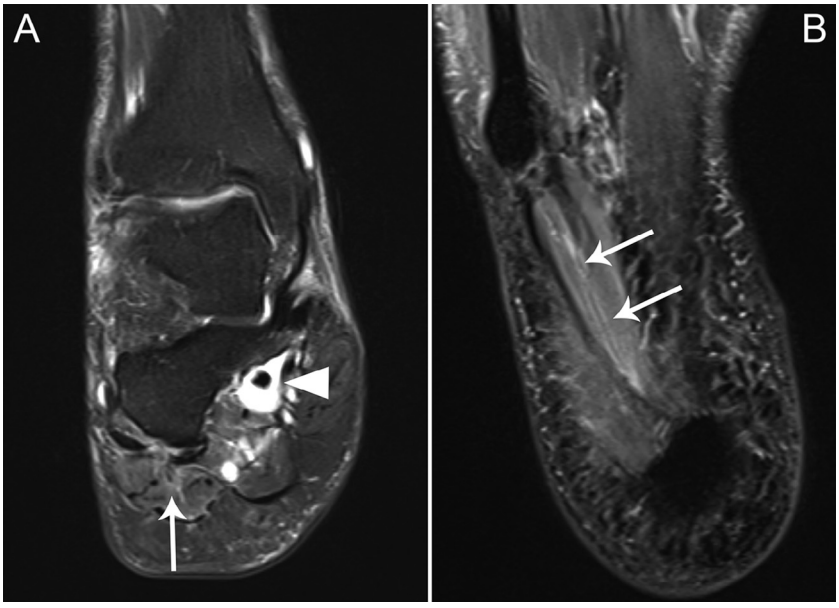


**Fig. 1.** *(A)* Coronal T2-weighted magnetic resonance image with fat saturation showing subtle high T2 signal intensity in the abductor digiti minimi muscle *(arrow)*. Fluid can also been seen surrounding the flexor hallucis longus tendon *(arrowhead)*. *(B)* Axial T2-weighted magnetic resonance image with fat saturation showing subtle high T2 signal intensity in the abductor digiti minimi muscle *(arrows)*.