Infrapatellar Saphenous Nerve Is at Risk During Tibial Nailing: An Anatomic Study

Glenn G Shi MD; Arun Ramesh Kumar MD; Cameron Ledford MD; Benjamin Wilke MD
Mayo Clinic, Jacksonville, FL, United States

Purpose: Postoperative anterior knee pain is a common complication after intramedullary nailing of tibial shaft fractures, often attributed to prominent hardware or fibrosis. However, anterior knee pain may also be caused by infrapatellar saphenous nerve (IPSN) injury. The purpose of this anatomic study is to determine the location and stage of the tibial nailing procedure where IPSN injury may occur.

Methods: 12 fresh-frozen right cadaveric knees underwent tibial nailing (Synthes Expert Tibial Nail). Six knees underwent a suprapatellar approach and 6 medial parapatellar. Two proximal medial-to-lateral screws were placed using the aiming guide. The incisions were then closed with sutures. Following the procedure, under 2.5x loupe magnification, the medial retinacular and saphenous nerves were dissected along their course from a proximal to distal direction. The branch of the IPSN closest to the screws was measured. Additionally, the distance between the IPSN branch and the inferior pole of the patella was also recorded.

Results: 11 of 12 cadavers had prominent IPSN with an average 2.6 branches. Average distance from the main branch of the IPSN to the inferior pole of the patella was 38.1 ± 25.3 mm. Four medial retinacular nerve branches were identified proximal to the patella. All were cut following the medial parapatellar arthrotomy. The mean distance from the IPSN to the nearest proximal locking screw was 7.9 ± 11.3 mm. Seven of 12 had IPSN injuries. Two direct screw entrapments occurred while 2 others were lacerated by the incision. Suture closure entrapped 3 nerve branches. One specimen had injured fibers of the hamstring tendinous insertion.

Conclusion: Injury to the IPSN can occur at different locations and stages of the procedure ranging from approach, proximal locking screw insertion, and closure.