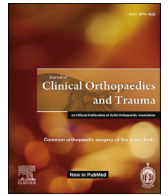




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Diagnosing posterior tibial tendon tear with dynamic ultrasound following tibial intramedullary nailing

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ABSTRACT

Complications following tibial intramedullary nailing include anterior knee pain, malunion, nonunion, and symptomatic/prominent interlocking screws. We report a case of a posterior tibial tendon tear caused by placement of a distal interlocking screw which was detected via dynamic ultrasound. This is a rare and possibly underreported complication which could be the cause of persistent medial sided ankle pain following locked tibial nail placement.

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1. Introduction

Tibial intramedullary nails (TIMN) have become a common and widely accepted modality for treating fractures of the tibial shaft.^{1,2} Though TIMNs are successful in allowing patients to return to function, they are not without complication. Widely reported complications include anterior knee pain, prominent/symptomatic interlocking screws, malunion, nonunion, and infection.^{3,4} We present a case of a posterior tibial tendon tear due to distal interlocking screw placement following TIMN.

2. Case history

A 62 year old Caucasian male was brought to our institution's trauma bay after being hit by a motor vehicle while riding a bicycle. His orthopaedic injuries included a right Type 3 open distal femur fracture and a left Type 1 open tibial shaft fracture. He received cefazolin, gentamicin, tetanus, and initial stabilization in the trauma bay. Next, the patient was taken to the operating theatre for irrigation and debridement of both open fracture sites as well as placement of a right knee spanning external fixator and splinting of the left tibia.

The following day, the patient was taken back to the OR for definitive fixation of the left tibia using a TIMN. A median parapatellar incision was used and access to the anterior tibial crest was

achieved sparing the patellar tendon. Following reduction of the fracture a reamed TIMN was placed down the shaft of the tibia with interlocking screw placement both proximally and distally. The operation commenced without complication. A week later, open reduction internal fixation of his right femur was performed.

Following both surgeries, the patient was made non weight bearing on his bilateral lower extremities. His postoperative course was largely uneventful. His postoperative radiographs showed union with both of his right femur and left tibia, and he had progressed to full weight bearing bilaterally. Figs. 1–3 show his preoperative and postoperative radiographs of the tibia. However, he still had complaints of persistent pain at the medial aspect of his left ankle near the site of the distal interlocking screw especially after ambulating long distances. He had tenderness to palpation over the medial aspect of his ankle. A dynamic ultrasound was ordered to evaluate the integrity of his posterior tibial tendon. The ultrasound showed posterior tibial tendon irritation due to one of the distal interlocking screws.

The patient was taken back to the operating theatre for removal of hardware and exploration of the posterior tibial tendon. Upon exposure, the more distal screw of the two distal interlocks was found to have violated the tendon sheath of the posterior tibial tendon, causing it to sublunate anteriorly. There was also a 2 cm longitudinal tear of the tendon as it was in direct contact with the distal interlocking screw. A decision was made to debride and

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Fig. 1. Preoperative AP radiograph of injury to L tibia.



Fig. 2. Postoperative AP radiograph of L tibia.



Fig. 3. Postoperative lateral radiograph of L tibia.

3. Discussion

Complications widely reported from TIMN include anterior knee pain, pain from prominence of interlocking screws, and issues with fracture union.^{3,4} Pain due to posterior tibial tendon pathology from a distal interlocking screw however, may represent a rare yet underreported complication. Often, interlocking screws are placed in a somewhat “blind manner.” A stab incision is made and blunt dissection is carried out to bone followed by drilling and screw placement. Further attention should be carried out especially when the placement of the distal interlocking screw(s) has more of a posterior starting point. As seen in Fig. 3, our TIMN was placed slightly posterior within the distal tibia. Structures on the medial side of the tibia include the great saphenous vein, saphenous nerve, posterior tibial tendon, posterior tibial artery, tibial nerve, flexor digitorum longus, and flexor hallucis longus.

In addition, the value of ultrasound should be underscored in the evaluation of tendinous structures with the presence of metal implants. Dynamic ultrasound is a useful tool in detecting tendon impingement due to implants. It can also be used to detect union, infection, ligamentous injury, and nerve compression.⁵

With this case report, we aim to bring attention to possible sources of medial sided ankle pain following TIMN as well as the use of dynamic ultrasound to aid in diagnosis.

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repair the tendon and sheath following removal of the interlocking screw. Postoperatively, he was made non weight bearing in a short leg splint. He was transitioned to a cast and eventually started weight bearing at 6 weeks following surgery. He stated that his pain was markedly improved, and he was working well with physical therapy.

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