Acute Repair of Anterior Tibial Artery and Extensor Tendons

J. Joseph Anderson DPM, FACFAS; Loren K. Spencer DPM, ACFAS; Gregory Paul Rowe DPM, ACFAS; Zilan Fowler BS

Purpose

Traction to the extensor tendons of the leg can cause significant complications and long-term deformity. Traction to the anterior tibial artery can yield a large source of arterial blood flow to the foot that can significantly help with the perfusion and debridement of a contaminated soft tissue injury. Immediate repair of the arterial injury supports restoration of perfusion to the tissues and aids in the ability to remove devitalized tissue and any foreign debris (2). The “zone of injury” must be determined to decide whether temporary wound coverage is needed or definitive wound closure (3,4). It’s important to realize that long-term management and rehabilitation is required and plays a vital role in the surgical success and outcome (5).

Literature Review

Despite being less common than osseous or ligamentous trauma, tendon injuries in the foot and ankle present a significant management challenge to the physician and can demonstrate long-term functional consequences if not addressed correctly. Traction to the anterior tibial artery sacrifices 1/3–1/2 of the major arterial blood supply to the foot. A step wise approach to the complex soft tissue injury is imperative to insure optimal surgical results (2). Evaluation of the structures from superficial to deep is done to identify what structures have been affected by the trauma. Soft tissue viability is also assessed, as well as contamination of the wound. It is important to realize that temporary wound coverage is needed or definitive wound closure (3,4). It’s important to realize that long-term management and rehabilitation is required and plays a vital role in the surgical success and outcome (5).

Procedure

A case study is presented on a 25-year-old male who sustained a traumatic injury to the right anterior tibial artery. The patient had sustained a fall and sustained damage to the anterior tibial artery. He was taken immediately to the OR for repair of the anterior tibial artery, TA tendon, and EDL tendon. After the initial wound evaluation it was determined that the patient had lacerated all major extensor tendons and the anterior tibial artery. The injury extended to the anterior tibial, as was evident on the AP ankle radiograph. Cephalic vein pressure injection was performed to remove foreign debris. The extensor tendons were identified and tagged with sutures. The anterior tibial artery was located at the proximal and distal end. The artery was pulsating and not clotted off proximally when localized. The two arterial ends were secured with bulldog clamps and the ends were incised cleanly to remove the clot and to prepare for approximation. Heparin was injected into the IV to decrease the risk of the artery clotting off from the trauma. The patient could not ambulate without assistance, after being transitioned out of a low tide fracture boot during his rehabilitation.

Analysis/ Discussion

This case study demonstrates the need for immediate surgical intervention to restore blood flow to the anterior tibial artery and repair of the extensor tendons to optimize functional outcomes. We have found that the attention to the patients’ recovery and rehabilitation is equally as important to the surgical outcomes as the surgery steps themselves. The patient needed continual encouragement and assessment of the tendons function and extensive work with physical therapy for strengthening and rehabilitation. Informing the patient on realistic expectations can help with the rehabilitation process.

Results

The patient is 10 months postop with good function of the extensor tendons and normal blood flow through the anterior tibial artery. The patient has full cutaneous sensation along the dorsal aspect of the foot. The low tide fracture boot was transitioned out after 8 weeks. Sutures to the anterior tibial artery and repair of the extensor tendons are 9/10 with continued rehabilitation and strengthening exercises. The patient currently ambulates without assistance, after being transitioned out of a low tide fracture boot during his rehabilitation.

References