



Early Weightbearing After Total Ankle Arthroplasty Utilizing An Anteromedial Approach



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Statement of Purpose

The traditional anterior incisional approach for total ankle arthroplasty (TAA) has long been associated with soft tissue complications.¹⁻³ To decrease the incidence of these complications, a prolonged postoperative non-weight bearing (NWB) status for up to 6 weeks has been suggested. In 2013, Bibbo published a modified anterior ankle incisional approach which preserved perforating vessels to the skin of the anterior ankle.⁴ In 2018, Rodriguez and colleagues further modified this approach and introduced the orthoplastic anteromedial approach.⁵ The purpose of this case series is to demonstrate the ability for earlier postoperative weight bearing without an increase in soft tissue complications for patients who underwent a TAA utilizing an orthoplastic anteromedial incision.



Image 2: Pre-operative AP Radiograph with valgus deformity



Image 3: Pre-operative lateral radiograph



Image 4: TAR jig application

Procedures & Methodology

TAA utilizing an anteromedial incision was performed by the senior author (G.V.) in 8 patients for posttraumatic ankle arthritis using a CT guided 2-component, fixed bearing device. Adjuvant procedures were added based on deformities noted. These procedures included: Minimally invasive (MIS) medial displacement calcaneal osteotomy, Evans osteotomy, Cotton, and Gastrocnemius recession.

Surgical Technique

- A 10cm curvilinear incision was made along the medial border of the tibialis anterior tendon extending distal medially. If needed the incision was extended proximally across the myotendinous junction of the tibialis anterior tendon sheath.
- Care was taken to not disrupt the tendon sheath.
- Incision was then made down to bone.
- Periosteal elevator and sharp dissection was used to expose the ankle joint
- Ankle arthroplasty was performed utilizing a CT guided 2 component fixed bearing implant according to the manufacturer's protocol.
- Closure was done with 3-0 Vicryl, 4-0 Monocryl, and 4-0 Nylon.



Image 5: Anteromedial ankle exposure (Cadaveric)



Image 6: Intra-operative Implant application



Image 1: Orthoplastic Anteromedial Approach to the Ankle



Image 6: Post-operative radiograph



Image7: Post-operative lateral radiograph



Image 8: 2 weeks post-operatively

Results

TAA utilizing an anteromedial incision was performed by the senior author (G.V.) in 8 patients for posttraumatic ankle arthritis using a CT guided 2-component, fixed bearing device. Adjuvant procedures were added based on deformities noted. These procedures included: Minimally invasive (MIS) medial displacement calcaneal osteotomy, Cotton osteotomy, TN fusion, and/or Gastrocnemius recession. 2 complications/revisions were noted post-operatively. 1 medial malleolar stress riser resulted in an ORIF at 4 weeks. 1 revision due to polyethylene spacer wearing at 8 months.

Analysis & Discussion

Soft tissue complications are commonly reported in the literature following TAA. Such complications can range from minor wound dehiscence to deep infection and fulminant osteomyelitis. This can result in increased morbidity including IV antibiotic use, need for additional procedures as well as proximal amputation. Glazebrook et al created an evidence based classification system for post-operative ankle arthroplasty complications. A retrospective review based on Glazebrook's classification system was performed by Gadd and colleagues who found that 5.85% of 212 ankle replacements went on to have deep infection.⁶ Ninety percent of these patients went on to necessitate further surgical intervention and two patients went on to have more proximal amputations. Despite these findings, there has been a recent increase in popularity of total ankle replacements. When comparing TAA to the long standing gold standard, ankle arthrodesis, Lawton and colleagues found ankle arthrodesis to have a higher overall complication rate than total ankle arthroplasty. Wound complications in the TAA group were found in 5.4% of the patients as compared to 7.6% in ankle arthrodesis.⁷

Soft tissue complications following TAA can be attributed to disruption of the angiosomes and perforating vessels that supply the anterior aspect of the ankle. Another common cause of soft tissue complications is tibialis anterior tendon sheath disruption. This can result in increased friction across the surgical site, leading to incisional dehiscence. Attinger and colleagues described the perforators that supply the anterior ankle from the anterior tibial and peroneal arteries. The anterior tibial and peroneal arteries continue along with the posterior tibial artery to supply the six angiosomes to the foot. Disruption of the angiosomes of the ankle not only increases the likelihood of incisional dehiscence, but also makes coverage via adipo-facial or musculotaneous flaps difficult.⁸

Additionally, prolonged postoperative NWB is not free of complications in itself. Postoperative protocol and rehabilitation following a TAA varies by surgeon preference in the literature. Typically, the lower extremity is placed in protected immobilization for 2 to 6 weeks. Schubert and colleagues immobilize all patients for 6 weeks in a short leg splint or cast during the initial postoperative period. At 6 weeks postoperatively, full weight bearing is allowed in a cast boot, with early progression to regular shoe gear as tolerated along with physical therapy.⁹ Hendy and colleagues immobilize patients in a short leg plaster splint for 2 weeks. Sutures are removed if incisions are adequately healed at 2 weeks postoperatively. The patient is placed in a fracture boot and is allowed to do passive ankle ROM but still NWB until 6 weeks. Formal physical therapy is started at 6 weeks postoperatively.¹⁰ The senior author (G.V.) has the patient start passive ROM exercises at home after sutures are removed at 2 weeks postoperatively. Protective WB in a CAM boot is initiated between post op days 17-21 along with physical therapy. To date, the precise protocol and length of immobilization after TAR is highly subjective and hasn't been sufficiently studied. Our study demonstrates an anteromedial incisional approach can decrease postoperative NWB duration, without increasing soft tissue or component complications.

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