

CT Scan Outcomes of Ankle Arthrodesis with Anterior Plating

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Introduction/Purpose: Ankle arthrodesis is the most common treatment for tibiotalar joint arthritis in the US. Anterior plate fixation has become increasingly popular over the last 10 years. Purported benefits include improved stability, sparing the fibula, and ease of conversion to ankle replacement in the future if indicated.

Previous reports on anterior plate fixation for ankle arthrodesis have been relatively small series, and none have utilized CT scanning for definitive confirmation of fusion. Plain films alone have been shown to be inadequate and misleading in identifying successful arthrodesis. The purpose and importance of this study is to definitively quantitate and assess true fusion rates of anterior plating for ankle arthrodesis based on CT scans and to evaluate a larger series of patients for functional outcomes and complications.

Methods: This study is a retrospective chart review (with prospectively collected data) of all patients who have undergone anterior ankle fusion with plate fixation at a single center by 5 foot/ankle fellowship trained physicians over the last 7 years. Inclusion criteria included patients ≥ 18 years of age, isolated ankle (primary and revision) fusions, and non-neuropathic etiology. If CT scanning had not already occurred at least 4 months after surgery, this was performed to determine the fusion mass percentage. All CT scans were read by an independent musculoskeletal radiologist and quantitated within 25% ranges. The primary outcome measure was fusion defined as osseous bridging of 50% or more of the tibiotalar joint of the ankle. Secondary outcome measures included AOFAS score, FFI, subjective satisfaction, and complications.

A comparison to a similar cohort that underwent crossed-screw fixation for ankle fusion during the same time frame was also performed.

Results: 158 patients were identified that had undergone anterior ankle fusion with plate fixation (3 different implant manufacturers) since 2009. CT scans, at least 3 months postoperatively, were obtained for 91 patients. The union rate defined as $\geq 50\%$ osseous bridging on CT, was noted to be 85%. A similar cohort of patients treated during the same time period with cross-screws alone demonstrated a union rate of 78% (40/51).

For the anterior plating group, 5 tibial stress fractures occurred above the plate and 2 required revision fixation. Anterior wound complications were rare, and none required re-operation for wound dehiscence or deep infection.

75% of the patients reported good/excellent outcomes (subjectively). Median FFI and AOFAS scores were 78 and 71, respectively.

Conclusion: Anterior ankle plating for arthrodesis is an increasingly popular technique. Although biomechanically more stable than crossed-screw fixation, there are no large published reports on the rate of fusion based on CT scan. This large single-center multi-surgeon series demonstrates an 85% fusion rate based on quantitated CT studies. This was higher than a similar cohort treated by the same physicians with the crossed-screw technique. After plating, stress fractures are not rare (5 reported here) and attention to lower profile or anterolateral plate configuration may be considered.



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