Secondary Fusions Following Total Ankle Arthroplasty

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**Introduction/Purpose:** While it is thought that stresses through the subtalar and talonavicular joints will be decreased in total ankle replacement (TAR) relative to ankle fusion, progressive arthritis or deformity of these joints may require a fusion after a successful TAR. However, after ankle replacement, it is unknown how hindfoot biomechanics and blood supply may have been affected. Consequently, subsequent hindfoot joint fusion may be adversely affected. We hypothesize that fusion rates are not significantly affected following a TAR.

**Methods:** We retrospectively identified a consecutive series of 1001 primary TARs performed between January 1998 and December 2014. We identified patients who underwent a secondary triple, subtalar or talonavicular arthrodesis to treat progressive arthritis or pes planus deformity. Clinical outcomes including pain and functional outcome scores, revision procedures, delayed union, nonunion, complications, and failure rates were recorded. We then compared these patients to patients who had a subtalar fusion after an ankle arthrodesis (13).

**Results:** 26 patients required a subtalar (18), talonavicular (3), talonavicular and subtalar (3), or triple arthrodesis (2) with a mean 70.9 months follow-up. The mean time between TAR and secondary fusion was 37.5 months. 92.7% of the patients went successfully fused. Two patients (7.7%) had a delayed union. Two patients had a nonunion who had one revision talonavicular and one revision subtalar fusion. The mean time to radiographic and clinical fusion was 26.5 weeks. Pain and functional outcome scores improved significantly. There were no differences in the rates of subsequent fusions among implant choices. Compared to thirteen patients with prior ipsilateral ankle arthrodeses and subtalar fusions, patients who had TAR had a higher fusion rate (p=0.03), but did not have a longer time to fusion.
**Conclusion:** Hindfoot arthrodesis following a TAR is safe and effective in improving function and pain. Additionally, arthrodesis following a TAR is more successful than a subtalar fusion following an ankle arthrodesis. While the time to healing is relatively long, various hindfoot fusions can be used to treat progressive arthritis and deformity with high fusion rates.