Increased Rates of Postoperative Complication Following Tibiotalocalcaneal Arthrodesis with Concomitant Fibular Osteotomy

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INTRODUCTION:

Tibiotalocalcaneal (TTC) arthrodesis is commonly performed for complex deformity, arthritis, or unstable Charcot about the hindfoot. Due to this complexity, these procedures are often associated with increased morbidity and postoperative complications. There is limited data analyzing the prevalence of various preoperative diagnoses and comorbidities, as well as treatment modalities on the outcomes of TTC arthrodesis. As such, this study aims to investigate how various preoperative and intraoperative factors affect the outcomes of patients undergoing TTC arthrodesis. METHODS:

A multi-center retrospective review was conducted on the TTC fusions performed from 2016-2023 by one of four fellowship trained foot and ankle surgeon at an academic medical center. 74 ankles (75 patients) underwent TTC arthrodesis. Preoperative diagnosis and indications, fixation method, clinical success, and complications were obtained from the patients' charts. Surgical indications included arthritis (n=39), Charcot neuropathy (n=23), post-traumatic (n=14), and cavovarus (n=10), osteomyelitis (n=4), and foot drop (n=3). Patients were excluded if their clinical or radiographic data were unavailable for review, or if they had less than 6 months of follow-up. Mean age was 58.2 (range 31-81) years and mean follow-up was 1.7 (range .50-5.17) years. Statistical analysis was performed using *t*-Student and Chi-squared tests with a *p*-value of 0.05 defining significance. Midline tibiotalar angle (MTA) was measured before and after surgery to assess position of fusion. Thirteen patients had preoperative ulcers at the time of surgery. RESULTS:

The most common surgical approach was lateral (n=47), then anterior (n=21) and posterior (n=7). Patients undergoing a lateral and posterior approach had statistically significantly higher rates of overall postoperative complication (lateral=51.1%, posterior=57.1%, anterior=19.0%; p=.029), although this was not specific to any single complication. Patients undergoing concomitant fibular osteotomy (n=41, 55%) experienced significantly higher rates of postoperative complications (osteotomy=61.0%, no osteotomy=21.2%; p<.001). Multivariate backward stepwise regression analysis on the occurrence of overall postoperative complications was performed to control for preoperative and intraoperative factors, finding that only concomitant fibular osteotomy was associated with increased risk of postoperative complication (odds ratio [OR]=7.494; p=.009).

DISCUSSION AND CONCLUSION:

TTC arthrodesis continues to have high rates of postoperative complications and adverse outcomes. The present study found increase rates of complication in patients receiving TTC via a lateral approach, patients receiving a plate construction, and patients undergoing concomitant fibular osteotomy. Multivariate regression analysis found only concomitant fibular osteotomy to statistically significantly independently predict postoperative complication. Further studies with larger sample size are needed to confirm these findings and further identify factors which place patients at increased risk for adverse postoperative complications.