

Factors affecting the outcomes of tibiototalcalcaneal fusion. Pitts C, Alexander B, Washington J, et al. *Bone Joint J.* 2020;102-B(3):345-351.

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Level of Evidence: 3

Reviewer:

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Tibiototalcalcaneal (TTC) fusion has been considered as a last resource procedure in correcting hindfoot and ankle deformity. The primary goal of this study was to explore the rate of and risk factors for non-union and other complications associating with TTC fusions.

A level III retrospective study was conducted at a single medical institution from 2011 to 2018. 101 patients who underwent unilateral TTC fusion with a median follow up of 12.9 months were selected for this study. The operations were performed by 3 fellowship trained orthopedic surgeons. Demographic information, including age, sex, and body mass index (BMI), use of tobacco, alcohol, and illicit drugs were all documented. The perioperative factors including the side of surgery, approach, use of bone graft, and operating time were also recorded. Pre-operative radiographic imaging including talar tilt was also documented. The primary outcome was determined by analyzing common complications after primary TTC fusion, including the rate of nonunion, infection, hardware failure, below-knee amputation (BKA), and revision surgery.

Of the 101 patients:

- 29 (28.7%) - nonunion
- 5 (4.9%) - BKA
- 40 (39.6%) – revision / returned to OR
- 16 (15.8%) – hardware failure
- 22 (21.8%) – postoperative infection

Patient with history diabetes and chronic renal disease were approximately 2 times more likely to have a nonunion. Furthermore, patients aged over 60 years had significantly increased risk of infection. The use of autograft appeared to be significantly protective against infection. Patient with a diagnosis of Charcot arthropathy or non-traumatic arthropathy had significantly higher rates of non-union of 44.4% and 39.1% and infection rate of 29.6% and 37% respectively. Although it was found to be not statistically significant, patients with an increasing BMI were found to have an increased rate of non-union. Lastly, it was found that surgical approach, preoperative talar tilt, smoking history, cardiovascular disease and sex were not significant factors influencing the outcome of the procedure.

Out of 101 patients with unilateral TTC fusion via transfibular approach, 28.7% of patients were noted to have non-union at the six-months follow up. Out of all pre-operative and perioperative factors, age over 60 years, diabetes, chronic renal disease, Charcot arthropathy, and atraumatic arthropathy were shown to be significant contributing factors to the rate of non-unions and post-operative infections. However, there were several limitations to this study including lack of time to union outcome, no specification of using statically compression locked nail or dynamically compression locked nail, and lack of reported HbA1c. Overall, the findings from this study can aid surgeons in discussing with patients regarding TTC fusion and what can be done to optimize the best possible outcome for surgery.



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