Tongue-Type Fracture Following Partial Calcanectomy to Treat Calcaneal Osteomyelitis

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STATEMENT OF PURPOSE

The calcanus is treated in 7% to 8% of all cases of osteomyelitis1 and heel ulcers have been reported as the most serious type of pedal ulceration leading to partial or total amputation.2,3 When bone becomes exposed in the lower extremity non-healing wound, losing the limb becomes a reality. Non-healing and can occur more rapidly in diabetics.4 When bone becomes exposed in a lower extremity non-healing wound, losing the limb becomes a reality. Non-healing ulcerations have been linked to up to 85% of major amputations of the lower extremity, with the most significant location of debridement being the heel. The advantages of a partial calcanectomy as a limb salvage procedure include the potential to eradicate infection, ambulatory status relatively unchanged, minimal draining and avoiding joint destruction/marurbation.5

LITERATURE REVIEW

Galloway and Wagner’s in a retrospective 1981 study, examined 29 patients (18 diabetic) with heel ulcerations that underwent a partial or total calcanectomy. Documented osteomyelitis and ulcerations in 2020 patients. In the diabetic subset, their results were less than promising. 12 of the 18 went on to failure, defined by follow-up fracture and/or medioposterior amputation.6 In the non-diabetic population, only 1 of 11 went on to failure requiring more proximal amputation.

Bolinger and Thordarson reviewed 22 patients (9 diabetic) with large heel ulcers with or without osteomyelitis, who had failed conservative care that underwent partial calcanectomy with primary closure. All of the patients healed without requiring an intervention, however, all of the patients had delayed healing and required additional procedures.4

Cook et al. reviewed 46 patients (11 feet) that underwent partial calcanectomies between 2000 and 2004 at Beth Israel Deaconess Medical Center. They evaluated various factors that influence post-operative course including diabetes, age, tobacco history, albumin levels, BUN, vascular status and presence of MRSA vs. other bacteria. They found that 71.4% of patients healed within the true venous and 76.2% thereafter. Of note, they found no significant difference in time to healing between patients with vascular disease who underwent intervention compared to those without. MRSA colonized ulcers showed a 30% healing rate at 3 year vs. 71.4% healing rate for non-MRSA colonized ulcers. Of their 46 patients, 16 went on to BKA.4

They suggested that partial calcanectomy for chronic non-healing wounds is a viable alternative for limb salvage in ambulatory adults when the procedure eradicate the infection. 75% of patients in each group (partial and total calcanectomy) maintained their pre-operative ambulatory status post-operatively. Patients with diabetes experienced higher rates of motor and major complications, as well as higher extremity amputations.4

Von Roetk et al. in 2011 retrospectively reviewed 24 patients (15 heels) with large heel wounds and osteomyelitis who underwent a partial or subtotal calcanectomy. They found a mean hospital stay of 29 days and mean healing time of 220 days. Of 3 patients went on to BKA and 80% and they would undergo the same procedure again. They concluded that major amputation can be avoided and infection can be controlled in patients with large necrotic heel wounds. Also, this procedure does not compromise the result of an amputation if it fails.11

DISCUSSION

In the Randall et al. study, the Achilles tendon was re-attached in 3 of 5 feet. They found that amputation rate, healing rates from BKA and strength were all comparable to those in which the tendon was not attached.2

Beals et al. described an interesting case report in which bilateral partial calcanectomy was performed to save two feet on both sides in a 47-year-old man who developed osteomyelitis of both heels secondary to perforation from Rosary Mountain Spotted Fever. He initially amputated the left foot and kept the right foot. One month working without assistive devices beyond cushioned, custom shoe inserts in athletic shoes, he was able to walk and run on both feet. He was essentially normal and activities of daily living were not significantly limited but could not return to his previous work.

Conclusion: Surprisingly lengthening of Achilles tendon?

We present 2 patients who underwent partial calcanectomies while leaving the Achilles tendon intact. Both patients subsequently went on to develop tongue type fractures of the calcaneus. We hypothesize that using a tenotid Achilles tendon reattachment in conjunction with a partial calcanectomy will decrease the power of the tendon and likelihood of developing a tongue type fracture. We are currently in the beginning stages of performing a cadaveric study for this hypothesis.

REFERENCES