

## **Δ Negative Pressure Therapy Dressings versus Standard Dressings for Closed Calcaneus Fractures: Preliminary Results of a Prospective Randomized Study of Wound Complications**

*Camille Connelly, MD; Amanda Schroeder, MD; Michael Archdeacon, MD; Ryan Finnan, MD; Frank Avilucea, MD; Theodore Toan Le, MD; John Wyrick, MD; Michael Archdeacon, MD*  
*University of Cincinnati, Dept of Orthopaedics, Cincinnati, Ohio, USA*

**Purpose:** This study was undertaken to compare early wound complications obtained with incisional negative pressure wound therapy (NPWT) versus standard wound dressings after open reduction and internal fixation of calcaneus fractures.

**Methods:** Skeletally mature patients with operative closed calcaneus fractures presenting consecutively to our Level I trauma center between February 2011 and February 2016 were randomized to the incisional NPWT or standard dressing groups. All surgeries utilized the standard lateral extensile approach to the calcaneus. Patients randomized to the standard wound care group received standard absorptive dressings (small hemovac wound drain, bacitracin / polysporin ointment, nonadherent dressing, and gauze). Patients randomized to the incisional NPWT group received an incisional vacuum dressing (nonadherent dressing, NPWT sponge, single-use pump and a small hemovac wound drain). All fractures were splinted postoperatively. NPWT dressings were maintained for 2-4 days. Main outcomes measures were: initial surgical wound healing (first 4-6 weeks postoperatively) with specific attention directed toward epidermolysis / skin edge necrosis, superficial infection (prolonged wound drainage [more than 8 days], wound erythema, oral antibiotic prescription, and deep infection (hospital readmission, parenteral antibiotics, surgical intervention). Secondary outcomes compared visual analog scale (VAS) scores through 6 weeks and functional outcome scores at 12 months (Short Form-36, Short Musculoskeletal Function Assessment, American Orthopaedic Foot & Ankle Society).

**Results:** 39 patients with 44 closed calcaneus fractures were prospectively enrolled and randomized to the treatment groups. All patients were available for primary outcome evaluation (surgical wound healing) and VAS evaluations through 6 weeks postoperatively. 29 of 44 patients were available for follow-up at least 6 months ( $12 \pm 0.8$ , range 2-45 months). 26 patients had associated injuries and 13 presented with isolated calcaneus fractures. Comparison of incisional NPWT and standard dressings showed the following: 4 acute complications requiring intervention, including 1 superficial infection in the NPWT group (5%) and 3 deep infections in the standard dressing group (13%),  $P = 0.2389$ . Late complications included 2 deep infections in the NPWT group presenting at 7 and 8 weeks postoperatively. VAS scores in NPWT and standard groups were  $7.1 \pm 2.7$  and  $7.6 \pm 2.4$  at hospital discharge ( $P = 0.5723$ ) and  $2.4 \pm 1.9$  and  $3.5 \pm 2.9$  at 6 weeks ( $P = 0.2673$ ).

**Conclusion:** Preliminary results have shown no significant difference in pain, functional outcome scores, and overall wound complications in incisions treated with incisional NPWT versus standard gauze dressings. There is a trend toward lower acute deep infection rates in the incisional NPWT dressing group; however, continued enrollment to reach statistical power is needed.

Δ OTA Grant

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.