Calcaneal Fractures with Soft Tissue Compromise Treated with Abductor Hallucis Flap and ORIF with Dual Locking Plates

Michael M. Romash, M.D.¹, Glenn R. Carwell, M.D.², Ashlee P. MacDonald, B.S.

¹Sports Medicine and Orthopedic Center, Chesapeake, VA; ²Coastal Plastic Surgery, LTD, Virginia Beach, VA
Disclosure

- Michael M. Romash: consultant for Integra/Ascension whose calcaneal plates were used for fixation in all procedures
Calcaneal fractures are often complicated by soft tissue damage, including fracture blisters\textsuperscript{1,2,3} and infection\textsuperscript{4}.

Following ORIF, development of wound complications may require additional surgery for resolution\textsuperscript{5}.

Post-ORIF infection exposing calcaneal fixation plates
Background

- Muscle flaps can be used as a treatment for calcaneal defects and for complications following calcaneal ORIF.
- It has been previously advised to avoid disrupting fracture blister during fixation of calcaneal fractures.
- The goal of this study was to retrospectively assess the outcomes of ORIF of calcaneal fractures with abductor hallucis flap performed within a single surgery.
Methods

- 9 calcaneal fractures with soft tissue compromise were treated with ORIF and abductor hallucis within a single procedure.
- Sanders classification was used to assess the severity of the calcaneal fractures.
- Surgery was delayed $21.2 \pm 3.6$ days following the injury to allow swelling to decrease enough to obtain a “positive wrinkle sign.”
The Procedure

- Excision of the necrotic tissue and zone of injury medially
- ORIF with dual locking plates using a combined medial and lateral approach (small incision technique laterally)\(^{10}\)

![Zone of injury excised medially exposing the fracture](image)

![Locked titanium hindfoot plate applied to medial wall](image)

![Small incision technique; mini calcaneal titanium locking plate laterally](image)
The Procedure

- Abductor hallucis muscle flap with skin grafting to cover the fracture site and fill the soft tissue defect
Results

Surgical Outcomes:
- Abductor hallucis had a 100% success rate.
- Reduction and fixation of the fracture was accomplished in all patients.
- No occurrences of hallux valgus post-operatively.
- No post-operative infections.
- 2 skin graft revisions due to necrosis.
- 1 non-union, unable to contact for follow-up.

Demographics:
- 7 males, 2 females, average age 42.9 ± 14.1.
- 4 tobacco users, 1 diabetic, 2 drank alcohol regularly.
Conclusion

Excision of damaged and non-viable tissue:

- Removes a potential source of post-operative complications that may otherwise contribute to infections, ORIF failure, and need for secondary surgeries.
- Allows for greater exposure of the fracture site medially and small incision technique laterally, thereby avoiding large skin flaps.

Additional advantages of fixation and flap within a single procedure:

- Enhances blood supply and nutrition to the injured site to promote healing.
- Allows for a tension-free closure.
References


