Technique, Complications, and Mid-Term Results of Hindfoot Arthrodesis with a Posterior Blade Plate

A. Barg, T. Gorman, T.C. Beals, F. Nickisch, M. Lyman, C.L. Saltzman

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Disclosure

- No conflict to disclose
Hindfoot Arthrodesis

- Hindfoot arthrodesis:
  - different surgical technique have been described in the current literature\(^1-3\)

- High-risk patients with tenuous soft-tissue envelopes:
  - salvage surgery often necessary
  - posterior approach can provide a fresh soft tissue plane for surgery and good coverage of hardware\(^4\)

- Only few studies have evaluated the use of a blade plate from a posterior approach
Objectives

- Evaluation of a relatively large and diverse population of patients who underwent either tibiotalocalcaneal or tibiotalar arthrodesis using a posterior approach with blade plate fixation
- What proportion of patients treated with this technique achieved osseous union?
- What complications were observed?
- Were any patient demographic or health-related factors associated with the likelihood that a patient would develop a complication?
### Patients

- **Study design**
  - patient identification by searching the University of Utah Department of Orthopaedics’ medical database between January 1, 2001 and July 31, 2014

- **Patients:**
  - 27 male and 13 female patients
  - mean age of 56 ± 13 years (range, 24-83 years)
  - Major comorbidities:
    - diabetes mellitus n = 11
    - peripheral neuropathy n = 12
    - tobacco use n = 11

- Patients had undergone a median of two previous hindfoot or ankle surgeries (range, 0-9 surgeries)
Patients

- 28 of 40 patients had a tibiotalocalcaneal arthrodesis:
  - primary \( n = 6 \)
  - primary staged \( n = 10 \)
  - revision \( n = 9 \)
  - revision staged \( n = 3 \)
- 11 of 40 patients had tibiotalar arthrodesis:
  - primary \( n = 7 \)
  - revision \( n = 4 \)
- One patient had conversion of failed total ankle replacement to tibiotalocalcaneal arthrodesis
Surgical Technique

- A 10- to 12-cm straight, midline, posterior incision
- Z-type lengthening of the Achilles tendon
- 3.5-mm cannulated 90° blade plate
- Additional fixation:
  - one or two 7-mm, fully threaded screws
- In some cases, distal tibiofibular arthrodesis using two 4-mm cortical screws
A 52-year-old female patient with subtalar OA and status post revision tibiotalar arthrodesis who underwent primary staged TTC arthrodesis.

A 67-year-old male patient with TT non-union and subtalar OA who underwent revision TTC arthrodesis with status post TTC arthrodesis using intramedullary fixation.
33 of 40 patients had complete osseous union
4 of 33 patients had a delayed union
7 patients with non-union:
  - all had undergone TTC arthrodesis
  - ankle non-union $n = 3$
  - subtalar non-union $n = 3$
  - combined non-union $n = 1$
Including the delayed unions and non-unions, 21 of 40 patients had complications

18 major complications:
- non-union \( n = 7 \)
- delayed union \( n = 4 \)
- deep infection \( n = 4 \)
- persisting pain \( n = 2 \)
- deep vein thrombosis \( n = 1 \)

8 patients had minor complications

Patients with or without complications were comparable in terms of demographic data and surgical details
Discussion

- Delayed union and non-union were more common in our report than in current literature\(^5\)\(^-\)\(^8\):
  - available studies included less-complicated patient populations\(^5\)\(^-\)\(^8\)
- With the numbers available, we did not identify any factors associated with postoperative complications or non-union
- Specifically in patients with compromised soft tissues, a posterior approach with a blade plate fixation can be considered a viable surgical option
References

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