Anatomical Aspects of Tibiotalocalcaneal Nail Arthrodesis

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Disclosure

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Our disclosures are in the Final AOFAS Program Book.

This research was supported by a grant from DJO Global.
Introduction

- Medial translation of the hindfoot by 1 cm has been suggested in the literature to improve alignment and bone purchase when performing a retrograde TTC nail arthrodesis.
- Limited literature
- Important concept
Questions?

• What is the normal axial relationship of the tibia and the hindfoot?
• What theoretical effect would medialization of the hindfoot have on TTC nail placement?
Purpose

- Review the position of a guidewire as it relates to the normal axial alignment of the hindfoot
- Discuss what effect medialization of the hindfoot would have when passing a TTC nail
Materials & Methods

- Cadaver study
- 10 specimens with BKA’s
- Guidewire for TTC nail inserted antegrade in standardized fashion exiting plantar foot
- Dissection & radiographs to assess position of guidewire in tibia, talus & calcaneus
Results

- Width of medial malleolus averaged 9.9mm
  - Measured on mortise radiograph
- 7 of 10 wires lateral to midline on talar dome
  - Average of 6.15mm lateral to midline
  - Average mediolateral dimension of 33mm
Results

- Guidewire demonstrated an average position of 1 cm medial to posterior calcaneal tuberosity
  - Range of 0-23mm medial to tuberosity
Discussion

- A medial translation of 1 cm is roughly equivalent to the width of the medial malleolus.
- A majority of wires in our series entered the talar dome lateral to the midline.
  - With 1 cm of medial translation of the hindfoot, some wires could miss the talus laterally.
Discussion

- Medial translation of the hindfoot 1cm may not provide adequate bone purchase into the calcaneus in all patients.
Strengths

• No other studies have reviewed this important concept
Limits

- Cadaver study
- Did not perform medial hindfoot translation
Conclusions

• If 1cm medial translation of the hindfoot were to occur:
  – It may cause the nail to miss or have insufficient bone purchase in the talus
  – Additionally, it might not be sufficient to position the nail in the body of the calcaneus
References

THANK YOU