Correction of Hallux Valgus with the Mini TightRope Device

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George B. Holmes, Jr., MD
My disclosure is in the Final AOFAS Program Book.
I have a potential conflict with this presentation due to a consulting and royalty agreement with Arthrex, Inc.

Andrew R. Hsu, MD
My disclosure is in the Final AOFAS Program Book.
No potential conflicts with this presentation.
BACKGROUND

• Hallux valgus is a common foot ailment causing pain and disability with ~200,000 operations performed in the US each year for deformity correction.

• Correction of first intermetatarsal angle (IMA) is most commonly accomplished using a distal or proximal osteotomy of the first metatarsal.

• Osteotomies can be technically challenging and lead to loss of fixation, dorsiflexion angulation, shortening, transfer metatarsalgia, malunion, and nonunion.
BACKGROUND

- Use of Fiberwire suture-attached endobuttons (Mini TightRope device) is an alternative to first metatarsal osteotomies for IMA correction.

- Construct uses a 2-0 Fiberwire that anchors endobuttons on medial aspect of first metatarsal to a mini buttress plate and endobuttons on the lateral aspect of the 2nd metatarsal.

- **Purpose:** To determine the short-term clinical and radiographic outcomes of hallux valgus correction using the Mini TightRope.
METHODS

• 30 cases representing 28 patients (ave age: 47 years, range 24-79): 27 females and 1 male.

• All patients with symptomatic hallux valgus and no previous foot surgery.

• Mini TightRope technique with 1.1-mm drill bit and mini buttress plate performed by single surgeon (GBH).

• Clinical exams and radiographs performed pre-op and at 1 wk and 3 mo post-op.
METHODS

- Xrays at 1 wk post-op were non-weight bearing (NWB) and at 3 mo post-op weight-bearing (WB).

- Paired two-tailed Student t-tests with significance set at $P \leq .01$ to determine differences in pre-op and post-op radiographic angulations.

- Data analyzed for all patients then broken down into 2 Groups:
  - Group 1 had a pre-op IMA 8-12°
  - Group 2 had a pre-op IMA 13-20°
• A. Pre-op AP standing view (WB) of the Left foot, B. Post-op 1 wk (NWB) after Mini TightRope, C. Post-op 3 mo (WB) after deformity correction.
RESULTS

- Significant decreases in HVA and IMA for all patients at 1 wk (NWB) and 3 mo (WB) post-op compared with pre-op.
- At 3 mo post-op, overall decreases in HVA and IMA of 6° and 17°, respectively.
RESULTS

- Significant angular decreases present for Groups 1 and 2.
- 3 minor soft-tissue complications, 1 intraoperative 2\textsuperscript{nd} metatarsal fracture treated with buttress plate.
- No post-op 2\textsuperscript{nd} metatarsal stress fractures.
CONCLUSIONS

- Significant decreases in pre-op HVA and IMA at 1 wk post-op that were maintained at 3 mo post-op using the Mini TightRope.

- Decreases found for both patients with smaller (8-12°) and larger (13-20°) IMA angles pre-op.

- Mini TightRope osteotomy sparing technique eliminates most of the complications seen with osteotomies and facilitates faster post-op recovery with few procedure complications.

- Long-term results still need to be determined.