Tension Band Ankle Arthrodesis: An Effective Technique

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My disclosure is in the Final AOFAS Program Book.
I have no potential conflicts with this presentation.
Introduction

• Ankle arthrodesis is preferred treatment method for ankle arthritis for many surgeons
• Many methods described; arthroscopic fusion gaining use
• Anterior tension band technique has shown to increase construct stiffness, is proven and reliable
• **Purpose:** review the clinical results of anterior tension band plating with those reported from other techniques, both open and arthroscopic
Surgical Technique

- Curved lateral incision for fibula osteotomy and joint exposure
- Prepare joint to determine congruuity
  - Osteotomies done if required (figure B)
- Medial incision to expose gutter
- Anterior plate is placed compressing joint
- Screw fixation is performed medially and laterally with fibula
Methods

• 157 consecutive adult patients, 103 males and 54 females
• Comorbidities: peripheral neuropathy (27), AVN of talus (8), diabetes (21), smokers at time of surgery (15), and immunosuppressed (16)
• Diagnoses: traumatic arthritis (77), primary degenerative arthritis (70), rheumatoid arthritis (6), hemophilia (3) and one sarcoma
• 148 were primary, 9 were revisions of prior fusion or arthroplasty
• 61 pts had coronal deformity >10° pre-op, 11 pts were > 25°
• Patients followed until clinical and radiological union or nonunion
• Radiographs were reviewed by a blinded musculoskeletal radiologist to determine timing of successful fusion, which was defined as bridging by bony trabeculae
• Paired AOFAS scores were determined to be non-normal using the Anderson Darling test. AOFAS scores were compared using the paired sign test.
Results

• 155/157 went on to fuse successfully (98.7%), which compares favorably (figure 1, next slide)
• Average time to fusion was 11.9 weeks
• 155/157 patients described their pain pre-op as moderate/severe
  – At 3 months, 110 pts reported no pain, 45 mild pain, 2 moderate pain and 0 pts severe pain
• AOFAS scores improved from 47 (range15 to 78) at pre-op to 83 (60 to 92, p<0.001) at 6 months
• **Complications:** 5 superficial and 2 deep infections, one of which required a free flap. 3 pts required revision, 2 for nonunion and 1 for malunion. Hardware irritation occurred in 17 patients, 12 required removal. One patient had a stress fracture at the proximal end of the plate.
Results

Figure 1: Systematic review with pooled data analysis of fusion rates (%) comparing anterior plating technique to open fusion and arthroscopic fusion techniques.
Discussion

- The tension band arthrodesis technique results in a high union rate, decreased pain, improved functional outcome, with an acceptable complication rate.
- Allows for correction of pre-op deformity that may be challenging with arthroscopic technique.
- Time to fusion (11.9 wks) was comparable to that reported for arthroscopic fusion.
Conclusion

Anterior tension band technique is a reliable technique regardless of the diagnosis, associated comorbidities, or the amount of coronal deformity.
References

- Clare M, Mormino M, Walling A. Clinical Results of the Anatomic Compression Arthrodesis Technique with Anterior Plate Augmentation for Ankle Arthrodesis. Fri., 10/9/09 Pilon/Foot & Ankle, Paper #60, 4:46 pm OTA-2009