

NiTiNOL Low Profile Multi-pronged Memory Metal Staple in Small Bone Fusion



JOHN J. FAILLACE, MD, FAAOS

INTRODUCTION

Use of a low profile multi-pronged NiTiNOL memory metal staple rapidly achieves a high rate of union for small bone arthrodesis in the wrist and hand.

FIGURE 1



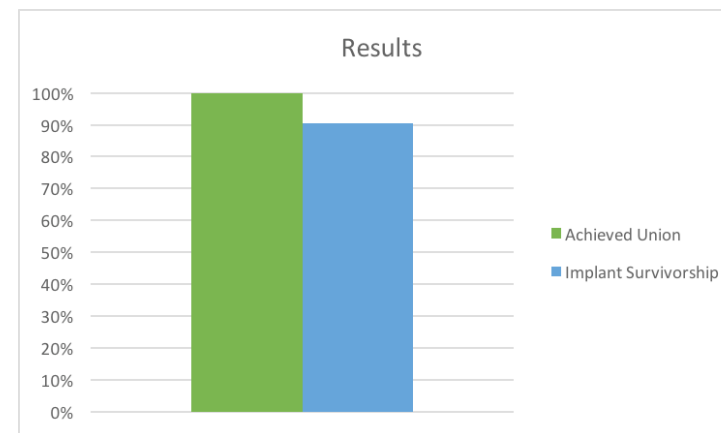
METHODS

- 32 consecutive patients from two surgeons using the implant in different states were collected.
- Age averaged 51 years old (range 19 to 75, median 53).
- 25 men and 7 women.
- Four patients had concomitant procedures (not including scaphoid excision or radial styloidectomy).
- Inclusion Criteria: limited fusion in the wrist. Grip and pinch measurements were obtained in the office on each visit and the QuickDASH was also administered. Determination of adequate fusion was based on radiographs and clinical exam. The implant was considered a failure if union was not achieved within 12 weeks.

RESULTS

100% of patients achieved union, usually within 6 weeks. The average length of follow up was 13 months. The average QuickDASH score improved from 66 to 53 and the grip strength increased from 65% of the unaffected limb to 100% of the unaffected limb. There were 3 removals, all had achieved union.

FIGURE 2



SUMMARY

Low-profile NiTiNOL multi-pronged staples are an effective way to achieve fusion between the small bones of the wrist and hand with a low complication rate.

- Meticulous removal of cartilage and appropriate treatment of the subchondral bone as well as the use of bone graft is required for ANY arthrodesis to be successful.
- The average age (51) is comparable to other studies evaluating Four-Corner arthrodesis.

- N Pauchard et al. Dorsal locking plates versus staples in four-corner fusion: A comparative clinical and radiological study. Orthopaedics & Traumatology: Surgery & Research. v100; 8. Oct 2014 593-7
- Gaston et al. Clinical Outcomes of Scaphoid and Triquetral Excision with Capitoulante Arthrodesis versus Scaphoid Excision and Four-Corner Arthrodesis. J Hand Surg 2009; 34A: 1407-1412
- R Strauch. Scapholunate Advanced Collapse and Scaphoid Nonunion Advanced Collapse Arthritis - Update on Evaluation and Treatment. J Hand Surg 2011; 36A: 729-735.
- M Skie et al. Scaphoid Excision with Four-Corner Fusion: A Biomechanical Study. Hand 2007 Dec 2(4) 195-198.
- B Bedford and S Yang. High Fusion Rates with Circular Plate Fixation for Four-corner Arthrodesis of the Wrist. Clin Orthop Relat Res 2010 Jan 468 (1) 163-168.

I would like to acknowledge Dr. Steve Boyea for providing his data.