Tenodesis Screw Fixation of Tendon Graft for Scapholunate Dissociation: Biomechanical Analysis of a New Surgical Technique

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Disclosures

- None

Outline

Introduction
Methods
Results – Preliminary Discussion

Introduction - Scapholunate Anatomy

- Osseous
- Ligamentous
  - Volar
  - Dorsal

Short, JHS 2009
Mitsuyasu, JHS 2004
Elsaidi, CORR 2004
Verges, JHS 1999
Introduction – Scapholunate Dissociation

SLAC

Pollock et al, J Hand Surg 2010

Complete SL dissociation

- Primary repair
- Capsulodesis
- RASL
- Ligament reconstruction
- Intercarpal fusions (salvage)

Modified Brunelli

Goals
- Withstands stress over time
- Stronger fixation
- Reduce technical challenge of the scaphoid tunnel
- All-dorsal approach

Our technique: the beginning

- Tenodesis screws
New Technique

Methods

- 6 paired cadaver specimen
- Free of pre-existing wrist injury
- SL diastasis and DISI: SLIL, DRC, DIC
- Modified Brunelli or new technique
- Repetitive grip loaded in jig with 100N load
- Fatigue tested
- Interval measurements scapholunate gap and angle

Meade et al., J Hand Surg 1990
Pollock et al., J Hand Surg 2010
Elsaidi, CORR 2004
Mitsuyasu, J Hand Surg 2004
Short, J Hand Surg 2009
Preliminary Results

- 2 pairs
- Modified Brunelli
  - Evidence of dynamic gap at 100 cycles
  - Static gap at 200 cycles
- New technique
  - No evidence of gap or DISI at 5000 cycles

Discussion

- New technique:
  - SLIL and DIC
  - Fixation
  - Eliminates tunnel
  - Auto or allograft options
- Leaves unsolved
  - DRC – did not want to cross
  - Volar ligaments
  - Effect of healing, scarring
Future Studies: Clinical

- Long term follow up
  - Pain
  - Arthritis
  - Grip strength
  - Wrist range of motion
  - Scapholunate gap, angle

- Prospective randomized clinical trial

Conclusions

- When there are >5 proposed procedures for the same problem, there is no right answer… yet

- This new technique potentially reduces surgical morbidity, restores dorsal anatomy which is the most important, and allows for tendon-bone healing

- Biomechanical studies should be followed by clinical studies

References


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