Disclosures

• The following relationships exist:

1. Grants
   American Foundation for Surgery of the Hand

2. Royalties and stock options
   Arthrex, 3D Systems, McGinley Orthopaedic Innovations

3. Consulting income
   Smith and Nephew Endoscopy, Arthrex, Exsomed, Cartiva, BME

4. Research and educational support
   Arthrex

5. Editorial Honoraria
   Elsevier, Lippincott

6. Speakers Bureaus
   Arthrex, Trimed, Smith and Nephew Endoscopy
Case

- 45 year old male office worker
- 2 years of left basilar thumb pain
- Failed treatments with splinting, NSAIDs, steroid injections, even PRP!
- What now??
Open Methods of Treatment

- Trapeziectomy with hematoma distraction arthroplasty (HDA)
  - Meals, 2004
- Ligament Reconstruction Tendon Interposition (LRTI)
  - Burton, Pelligrini 1986
- APL suspensionplasty
  - Thompson, 1989
  - Soejima, Hanamura, Kikuta, Iida, Naito, 2006
- Allograft rib interposition
  - Eaton, 1984
  - Trumble, 2000
- Implant arthroplasty - Not proven
- Unique Circumstances
  - Wilson metacarpal osteotomy – younger patients
  - CMC arthrodesis – post-traumatic DJD in young laborers
What’s the Evidence?

- Cochrane Database Systemic Review (Wajon, et al)
  - 2005 (7 studies, 5 techniques, 384 patients)
  - No significant differences between techniques
    - pain, physical function, patient global assessment, range of motion or strength
  - 16% fewer complications with trapeziectomy alone
What’s the Evidence?

• Cochrane Database Systemic Review (Wajon, et al)
  – 2009 (9 studies, 7 techniques, 477 patients)
  – No significant differences between techniques
    • pain, physical function, patient global assessment, range of motion or strength
  – Fewer complications with trapeziectomy alone (10 vs 22%)
From England…

- 153 thumbs, 5-18 year f/u
- Randomized into 3 groups:
  - Trapeziectomy alone
  - Trapeziectomy with PL interposition
  - Trapeziectomy with LRTI
- No difference in grip/pinch strength, ROM, complications, revisions

Gangopadhyay S, McKenna H, Burke FD, Davis TR. JHS March 2012
The Stanford Experience

• 61 Patients
• 1995-2005
• 3 Surgeons, 3 Techniques
  – Costochondral Allograft Interposition
  – LRTI/Trapeziectomy
  – Hematoma Distraction Arthroplasty (HDA)

• Variables studied:
  – DASH
  – Pinch strength
    • preop vs postop (% improvement)
    • postop vs contralateral side
  – Total operative time

The Stanford Experience

• RESULTS?
  – NO SIGNIFICANT DIFFERENCE BETWEEN TECHNIQUES FOR ALL VARIABLES
  – EXCEPT:
    • Total operative time
      – Trapeziectomy (mean 77.45 min) vs LRTI (mean 129.41)  
        » p = 0.01
      – Costochondral Allograft Interposition (mean 90.45 min) 
        vs LRTI
        » p = 0.02

The Stanford Experience

• Conclusions:
  – Patients treated with all techniques do well
  – Treatment is largely based on surgeon preference
  – Need for ligament reconstruction??
  – Need for interposition?
  – Some secondary criteria may drive future trends
    • Operative time
    • Complications
    • Accelerated recovery
    • ? Role for Arthroscopy
Thumb Carpometacarpal (CMC) Joint Arthroscopy
Arthroscopic Hemitrapeziectomy and Interposition

- Menon, 1996 - 25/33 complete pain relief with various interposition tissues (PL, FCR, Goretex)
- Culp, 2001 - Less subsidence of the metacarpal (2-4 mm), comparable improvements in pinch strength (22%)
- Adams, 2007 (GraftJacket) - 94% partially/completely satisfied
- Badia, 2007 (Artelon) - 13/13 patients satisfied
- Hofmeister, 2009 - 18/18 satisfied at 7.6 years despite 1.8 mm subsidence
- Edwards, 2010 - 19/23 satisfied

- **Shorter recovery**
Our Case (Eaton 2/3)
Setup

Standard Portals:
- 1R
- 1U
- Thenar (Walsh)
- Volar Radial (Chow)
- Dorsal Distal (Slutsky)

Thumb CMC Synovitis
Debridement of CMC Joint
Excision of Loose Bodies
Arthroscopic Hemitrapeziectomy
Fluoroscopic Guidance
Thermal Shrinkage of Beak Ligament
A word on shrinkage....
Ligament/Capsular Shrinkage

- Restore stability by thermal shrinkage
- Secondary fibroplasia and scarring
- Destruction of sensory receptors

Initial loss of stiffness requires protection against elongation post-op 6-8 weeks immobilization

Thanks, Lee Osterman
Thermal Modification of Collagen

- Heat sensitive bonds break at 60°C
- Crystalline extended structure begins to uncoil
- As molecule contracts, its diameter increases

Collagen triple helix molecule

Thanks, Lee Osterman
Pinning of CMC Joint
Final Radiograph

Before

After
Post-Operative

• Thumb spica splint for 2 weeks
• Suture removal and thumb spica cast for an additional 2 weeks
• Pin removal, OT for ROM exercises; splint for lifting and sleep
Results of Arthroscopic Hemitrapeziectomy with Interposition

- Park, Lee and Yao
  - 23 patients
  - Mean 14 month follow-up
  - Very little pain after a few days!
  - Full ROM achieved at 3 months in all patients
  - Pinch strength improved to 70% contralateral
  - Grip strength improved to 84% contralateral
  - Mean DASH: 14
  - Mean PRWE: 30
  - Mean return to full activity: 6 months
Pin Complications?

- Suture Button Suspension
Biomechanical Study

- Yao and Zlotolow, et al., JHS 2010
  - 10 matched pairs of fresh-frozen cadaveric wrists
  - Trapeziectomy performed
  - Wrists randomized to suture button fixation versus K-wire fixation
  - Loaded using a simulated active ROM protocol
  - NO difference in subsidence
Safety and Trajectory

- 6 matched pairs
- Mean distance to nerve to 1st DI
  - 10.8 and 16.6 mm
- No significant differences in subsidence, radial/palmar abduction

Song, Cox and Yao, *Hand* 2013
Technique

Suture Button Suspensionplasty After Arthroscopic Hemitrapeziectomy for Treatment of Thumb Carpometacarpal Arthritis

Christopher A. Cox, M.D., Dan A. Zlotolow, M.D., and Jeffrey Yao, M.D.

Abstract: A myriad of techniques for reconstruction of the arthritic thumb carpometacarpal joint have been described. In the modern era, there has been a push, driven by both clinicians and patients, for more rapid rehabilitation after these procedures. A majority of the historically described techniques require pinning of the thumb ray for 4 weeks. Suture button placement between the thumb and index ray metacarpals has been shown in biomechanical studies to effectively resist subsidence of the thumb ray. We describe a novel technique of using a suture button for suspensionplasty of the thumb ray after arthroscopic partial trapeziectomy. This technique allows for early mobilization and may offer a potential improvement on current techniques. Early results of use of this technique are encouraging, but well-conducted follow-up studies are necessary.
Our Case
Hemitrapeziectomy
Insertion of Guidewire
Suture Button Passed
With and Without Suspension
Post-Operative

• Thumb spica splint for 7-10 days
• Suture removal and scar massage
• Start ROM exercises at 7-10 days
  – AROM for 4 weeks, advance to strengthening as tolerated
Our Guy 2 Months Post-Op
Our Guy 12 Months Post-Op
What I tell my patients

Arthroscopic Hemitrapeziectomy:

- Less pain post-operatively
- Much earlier return to activity
- Comparable results to open
- No morbidity from tendon autograft
- May be able to eliminate pin complications
- No bridges burned
Thank You!