Distal Biceps Injuries

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Thank you

Rachel Frank M.D.
• Literature review

Jacob Kirsch M.D.
Manny Schubert M.D.
• Video assistance
Distal Biceps Tendon Ruptures
An Epidemiological Analysis Using a Large Population Database

Mick P. Kelly, * † BS, Scott G. Perkinson, ‡ MD, Robert H. Aboye, § MD, and Jonathan L. Tueting, † MD
Investigation performed at the University of Wisconsin Hospitals and Clinics, Madison, Wisconsin, USA

- Incidence of rupture = 2.6/100,000 pt-yrs
- Mean age = 46 yrs
- Sex = male 95%
- Increased likelihood = smoking, elevated BMI
Can we treat non-op?
Conclusion:

- Patients overall satisfied with outcomes
- Supination 63% vs contralateral
Conclusion:

- Repair w/ endobutton
  - Near normal strength and function
  - Significantly better than non-op
Conclusion:

• Biceps tendon inserts on ulnar aspect of tuberosity
• Insertion of footprint is ribbon shaped
Proper placement of the distal biceps tendon during repair improves supination strength—a biomechanical analysis

Marc Prud’homme-Foster, MD, FRCSC*, Hakim Louati, BASc, J. Whitcomb Pollock, MD, MSc, FRCSC, Steven Papp, MD, MSc, FRCSC

• Cadaveric study

Conclusion:
• if tendon repaired too radially
  • loss of cam effect
  • inability to generate full supination strength
Anatomic and biomechanical analysis of the short and long head components of the distal biceps tendon

Claudius D. Jarrett, MD\textsuperscript{a}, David M. Weir, MS\textsuperscript{b}, Eric S. Stuffmann, MD\textsuperscript{c}, Sameer Jain, MD\textsuperscript{d}, Mark Carl Miller, PhD\textsuperscript{b}, Christopher C. Schmidt, MD\textsuperscript{a,*}

- Cadaveric study

**Conclusion:**

- **Short head**
  - inserts distal
  - more efficient elbow flexion
  - more efficient supination w/ elbow neutral/pronation

- **Long head**
  - inserts more proximal
  - more efficient supination w/ elbow supinated

*Figure 5* Example of topographic relationship of long and short head insertions. Short head footprint is distal and occupied apex of bicipital tuberosity. The long head footprint is proximal and more posterior. Notice that the entire footprint is oriented obliquely to the shaft of the radius.
Technique

Single incision

Nerve injury

Two incision

Heterotopic ossification
• 22 studies, 494 pts
• Complication rate = 25%
  – 1 incision = 24%
  – 2 incision = 26%
  – Most common = LACN
  – Utilized hardware
    • Suture anchors = 26%
    • Bone tunnels = 20%
    • Screws = 45%
    • Cortical buttons = 0%
• 40 studies/ 1074 pts
  – Overall complication rate= 33.2%
    • LACN most common
  – Techniques and constructs
    • No difference in ROM or strength
  – 2- incision
    • Significant decrease in complication rate
Mayo registry

- 190 cases
  - 91%- modified 2-incision technique

Re-rupture rate = 1.5% (N=3)

- All within 3 weeks of surgery
- All due to patient compliance
  - excessive force placed on repairs
1. Interference Screw
   - Arthrex
2. Endobutton
   - Smith and Nephew
3. Suture Anchor
   - Mitek
4. Bone Tunnel
Biomechanical Evaluation of 4 Techniques of Distal Biceps Brachii Tendon Repair

Augustus D. Mazzocca,* MD, Kevin J. Burton,† MD, Anthony A. Romeo,* MD, Stephen Santangelo,* Douglas A. Actsas,* PhD, and Robert A. Arciero,*§ MD

- 4 Groups
- 63 specimens
- BMD on all Specimens

- Cyclical loading:
  - 0 to 90° at 0.5 Hz
  - 3600 cycles (50 N)

- Maximum load testing:
  - 120 mm/min at 90° flexion
Load to failure
Button greatest load to failure

![Bar chart showing load to failure comparison for different materials.](chart.png)
Displacement

Interference screw least amount of slippage

More aggressive rehab?
Case- Acute

- 55y/o LHD injury to L elbow
- Healthy, active
- 5 days out
- Grabbed street sign on bike
  - Eccentric loading
- Reverse Popeye
- + Hook test
Acute Repair
Chronic Tears

Ruptures of the Distal Biceps Tendon

James P. Ward, M.D., Mark C. Shreve, M.D., Thomas Youm, M.D., and Eric J. Strauss, M.D.
Most studies suggest operative:

- better patient outcomes
- anatomic reattachment distally
Clinical Outcomes After Chronic Distal Biceps Reconstruction With Allografts

Nimrod Snir,* MD, Mathew Hamula,* BS, Theodore Wolfson,* BSE, Robert Meislin,* MD, Eric J. Strauss,* MD, and Laith M. Jazrawi,*† MD

Investigation performed at New York University Hospital for Joint Diseases, New York, New York

• Retrospective
• 18 pts
• Allograft reconstruction
  – Achilles in 83%
• Mean f/u 9.3 months
Clinical Outcomes After Chronic Distal Biceps Reconstruction With Allografts

Nimrod Snir,* MD, Mathew Hamula,* BS, Theodore Wolfson,* BSE, Robert Meislin,* MD, Eric J. Strauss,* MD, and Laith M. Jazrawi,*† MD
Investigation performed at New York University Hospital for Joint Diseases, New York, New York

• Mean f/u 9.3 mos- full ROM
• Elbow strength 4.7/5

• Mean f/u 21 months
  – DASH 7.5
  – MEPS 94.2
• 17/18 acceptable cosmetic deformity
Case - Chronic

• 33M RHD with Rt elbow pain
  – Pain and dysfunction
  – UPS driver
  – Initial injury w/ ”pop” arm wrestling 3 years prior
  – 10 weeks ago, lifting heavy box
    • Felt “pop” and worsening of pain
  – Feels unable to work
    • Discomfort and weakness
  – Reverse Popeye
Achilles Allograft
Post-op

• Acute
  – Post splint 5 days
  – Hinged brace 90°
    • Open 30° each way per week
      – Starting week 1
    • 6 wks total
  – 2 wks- PROM>AAROM>AROM
  – 6 wks- strengthening
    • Supination

• Achilles
  – Post splint 5 days
  – Hinged brace 90°
    • Open 30° each way per week
      – Starting week 6
    • 10-12 wks total
  – 6 wks-PROM>AAROM>AROM
  – 10-12 wks- strengthening
    • Supination
Thank you