Distal Biceps Tendon Ruptures

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No disclosures
Biceps Tendon Anatomy

- Two indistinct insertions
  - Short head inserts distally on the radial tuberosity
  - Long head inserts proximally on the radial tuberosity
- Lacertus Fibrosis
  - Aponeurosis that comes off of the medial tendon
  - Can be mistaken for intact tendon
Biceps Tendon Anatomy

Figure 1

Long head tendon insertion
Short head tendon insertion

AL = 6.7mm ± 1.4mm

24.0° ± 3.0°

Short
Long

Anterior
Posterior
Biceps Biomechanics

- Radial Tuberosity
  - Anterior protuberance acts as a supination cam
Biceps Biomechanics

- Short head medial to the long head at myotendinous junction
- Tendon externally rotates 90 deg to place the short head distal to the long head on the radial footprint
- Short head exerts 15% greater flexion torque due to distal attachment
- Long head exerts greater supination moment due to posterior insertion
Males, 40s (93%)
Dominant arm (86%)

Risk factors
- Smoking
- Hypovascularity
- Mechanical impingement?
Presentation

- Eccentric load on a flexed elbow
- Often accompanied by a "pop"
- Pain in antecubital fossa
- Pain or weakness in supination and/or elbow flexion
- "Hook" sign/deformity
Presentation

- Hook Test
MRI

- May be helpful to determine complete vs partial rupture
- Helpful to determine tendon retraction
- Muscle vs tendon tear
Treatment

- Non operative repair
  - Generally reserved for low-demand or high-risk patients
  - Results in up to 30% elbow flexion weakness, 40-50% supination weakness
  - Partial tears < 50%
Treatment

- Operative Repair
  - One Incision
    - Suture anchors
    - Cortical button
    - Interference screw
  - Two Incision
    - Bone tunnels
Treatment
Treatment
Anatomic Repair
Complications

- Transient Neuropraxia
  - LACN
- PIN palsy
- Heterotopic ossification
Results

- Overall results are excellent regardless of technique
  - Clinical results
    - Avg 85-90% return of flexion and supination strength
    - Slightly decreased ROM and increased incidence of HO with 2-incision technique
  - Mazzocca, et.al. AJSM 2007
    - Biomechanical testing
      - Bone tunnel, suture anchor, cortical button, interference screw
      - Evaluated load to failure and cyclic loading
      - No significant difference in displacement of repair
      - Greater load to failure with Endobutton
Results

Anatomic Repair
Partial Biceps Ruptures
Presentation

- Chronic pain and weakness with elbow flexion and supination
- Following an acute injury (usually remote)
- Physical exam findings are most often normal
Treatment

- **Nonoperative**
  - Same indications as complete rupture
  - Low demand

- **Operative**
  - Chronic symptoms
  - Antecubital pain
  - Supination, occasional flexion weakness
Chronic Biceps Ruptures

- Typically presents with stiff, proximally contracted, shortened, atrophic tendon

- Bosman, et.al. JSES 2012
  - 6 patients
  - FROM
  - Mild supination weakness
  - No reruptures

- Morrey, et.al. JSES 2014
  - Retrospective study
  - Fixed in 60-90 deg flexion
  - No difference in clinical strength, rerupture rates, range of motion, or complications
Chronic Biceps Ruptures

- Allograft or autograft augmentation
  - Musculotendinous junction tears
  - Poor tendon quality
  - Flexion greater than 90 deg?
References


Thank You