Biceps Tenotomy

Disclosures

• NONE
What are we talking about?

- High Incidence of bicep pathology in those with shoulder pain found on arthroscopic exam
- Most agree long head biceps is common pain generator
- Often associated with overuse injuries and other pathology of the shoulder (i.e., RTC tears)
- Pathology of the biceps tendon is often found in patients 18 to 35 years of age who are involved in sports, particularly overhead athletes.
- Becoming more commonly diagnosed as isolated source of shoulder pain (Romeo/Mazzocca)

Nho, et al. Long Head of the Biceps Tendinopathy: Diagnosis and Management. JAAOS Nov. 2010

Why are we talking about this?


- 200 consecutive shoulders underwent arthroscopic subacromial decompression for impingement syndrome
- Rotator cuff tears were evident in 70% (23% full thickness) of these cases, the mean patient age being 47 years.
- In each of 120 shoulders (60%), an extraarticular tenosynovectomy was performed, and histopathologic studies revealed chronic inflammation in 60%
- A biceps tenodesis was performed in 80 shoulders (40%) featuring macroscopic degeneration of the long head of the biceps
Anatomy

- Two Heads
  - Long Head (LHB)
  - Short Head
- Attachments
  - LHB: Superior labrum at supraglenoid tubercle
  - SHB: Coracoid process
- Course
  - As the LHB traverses from intra-articular to extra-articular it is contained within the biceps groove between the lesser and greater tuberosities by the biceps pulley (deep) and by the transverse ligament (superficial).

Anatomy

- Origin
  - Four types:
    - I: 22% posterior attachment
    - II: 37% mostly posterior
    - III: 33% equidistant
    - IV: 8% anterior
- Intra-articular
  - Approximately 3.5 cm
  - CHL is main stabilizer
- Extra-articular
  - Bicipital groove

LHB Function

- Flexor: This role of the long head of biceps in the shoulder has been open to some controversy. It has been shown to be a minor flexor providing 7% of shoulder flexion.
- Depressor: It has a weak depression effect in association with the intact cuff depressing the humeral head.
- Stabilizer: LHB acts as a stabilizer for the glenohumeral joint only in the absence of all the other dynamic and static stabilizers to the joint. It provides an equal amount of stability as the short head of biceps. (Itoi, 1993)
- Throwing: The LHB appears to be predominantly active during the overhead throwing action. It is active only during this stage of elbow flexion and most active during deceleration of the elbow (Andrews, 1985).
But the real question......

- Is the Long Head of the biceps a pain generator???
- No questions biceps pathology is symptomatic
- # of people with attritional ruptures per year in your office?
  - And what do you tell those patients, or what do they tell you???

Case #1

- 58 y.o. gentleman presents with immediate onset pain while golfing
  - Describes as “lightning bolt”
  - Noticed “bulge in my arm”
  - Questionable history of shoulder issues
  - Works as a Coal Miner

Case #1

- Palpable and visual upper arm deformity
  - + ecchymosis
  - Full ROM shoulder and elbow with some discomfort
  - Good Rotator Cuff strength
  - Pain with resisted elbow flexion and forearm supination but decent strength (4+)
  - Normal neurovascular exam
Case #1

- **Work up/Treatment**
  - Reassurance?
  - Ice/Rest/NSAIDs?
  - Physical Therapy?
  - Further Imaging?
  - Surgical management?

What would you do?
When do we treat biceps?

- Pulley Lesions
  - rare; most often seen in overhead throwers
- Tendonitis or Degenerative SLAP tear
  - Non-op: Physical Therapy; Injections
  - Surgery: Tenotomy vs Tenodesis
- LHB ruptures
  - Non-operative
    - Majority, unless high demand
  - Operative
    - Tenotomy
    - Tenodesis

Tenodesis vs Tenotomy

- Who gets which one?
  - and

  - WHY?

Surgical Indications

- Tenotomy or tenodesis of the LHB tendon is indicated:
  - When there is partial tearing >25% to 50% of the tendon diameter
  - Longitudinal tears that result in poor tendon gliding in the bicipital groove (symptomatic catching)
  - Medial subluxation of the tendon, disruption of the biceps sling, or in the setting of a subscapularis tear
  - Degenerative SLAP tears

Khazzam, George, Churchill, Kuhn. Disorders of the long head biceps tendon. JSES. 2011
Studies

- Level IV
  - Frost et al (AJSM 2009)
    - Overall, tenodesis resulted in good or excellent results in 40% to 100% of patients, with a failure rate of 5% to 48%.
    - Tenotomy resulted in 65% to 100% good or excellent results, with a failure rate of 13% to 35%.
    - The comparative studies did not show any significant differences.
  - Hsu et al (JSES 2011)
    - Post-operative bicipital pain: 17% tenotomy; 24% tenodesis****
    - Constant score: 66.9 tenotomy; 76.1 tenodesis
    - UCLA score: 33 tenotomy; 28 tenodesis
    - Deformity: 41% tenotomy vs 25% tenodesis
    - ***No differences except deformity (but what about pain????)

Studies

- Level II
  - Koh et al (AJSM 2010) compared tenotomy vs tenodesis in setting of RTC tear. Prospective study
  - Ratings/Scores (ASES and Constant score) were statistically significant (improved in both groups similarly)
  - Conclusion: Besides slightly higher incidence in biceps deformity, the authors found NO difference in treatment groups***

MORE STUDIES

From Dr. Romeo lecture
Interesting study

  - Biomechanical study
  - Release biceps tendon with portion of superior labrum included in release
  - Labrum portion approximately twice the diameter of biceps tendon
  - Theorized increased resistance to pull out through bicipital groove
  - Authors found almost 3 times increase pullout strength with labrum attached (25N compared with 73N)
  - Clinical relevance???

In Summary

- Simple or complicated
- What is your goal? Pain Relief***

In Summary

- Evidence-based recommendations are limited due to the lack of high-quality studies in the current literature.
- On the basis of what is available:
  - Tenotomy is recommended for older patients with sedentary lifestyle, obese arms, or those not concerned with cosmesis
  - Tenodesis is recommended for young (<40 years) active patients with high physical demands, thin arms, or concern for cosmesis.
Thank You