Rotator Cuff Tears and Subacromial Pain Syndrome: Surgery vs Non-operative Care

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Rotator Cuff Disease: Heterogeneous pathology

- Subacromial Pain Syndrome (SPS)
  Includes: SPS, PT-RCT
  Signs & Sx of FT-RCT can present as SPS
- Full-thickness Rotator Cuff Tear (FT-RCT)

...and heterogeneous mechanisms...

Rotator Cuff Disease

- Full-thickness RC tear
- Partial thickness RC tear
- Bursitis
- Tendinitis
- Tendinopathy
- Subacromial impingement

Same general approach, but impairments and irritability considered for staged approach for rehabilitation

Subacromial pain syndrome

Tendinopathy → Partial thickness RC tear → Full Thickness RC tear
- Potential inflammation (Dean, 2015)
- Partial thickness RC tear
  - Articular, bursal, mid-substance
- Full-thickness RC tear
  - Complete rupture superior to inferior
  - Not necessarily side to side
  - 'Hole' in the sock
Subacromial Impingement Syndrome → RCD

2 predominant theories

If mechanical compression is the predominant mechanism, then….

… ALL patients would benefit with an acromioplasty

• Acromioplasty + rehab was not clinically more beneficial than rehab alone in multiple RCTs (Brox et al; 1993, 1999; Haahr, 2005, 2006; Ketola S, 2009, 2013)

• Bony pathology is not the only mechanism

• ‘Impingement’ – INappropriate umbrella term.

Mechanisms of RC (Tendon) Disease

• Biomechanical
  – Tendon Overload
  – Impingement
    • Subacromial: anterior – superior
    • Internal: posterior – superior

Tendon overload

• Tendon degeneration with overload
  • Micro-tearing → to tearing?
    • Tendon thickens (Michener LA, 2015; Joensen J, 2009; Leong HT, 2012)
    • Inflammation (Dean BJ, BJSM; 2015)
    • Abnormal collagen laydown
Tendon overload

- Neovascularization?
- Conflicting evidence (Lewis J, 2000; Kardoun J, 2013)
- Is the tendon painful?

Outlet Impingement

Compression or ‘impingement’ of RC tendons
- SA space

SA space measured

Tendon compression – is it possible?

SA space and shoulder pain:
- ↓ AHD in those with ‘impingement’
  - Greater occupation ratio of supraspinatus tendon / AHD in patients with ‘impingement’ pain (Michener LA, 2013)
- Compression observed – cadaveric (Hughes PC, et al, 2012)
- But in vivo…
  - Tendon is not ‘available’ for compression (under the acromion) above ~ 70° elevation (Giphart JE, 2012; Thompson MO, 2011; Bay MJ, 2007)
- Compression MAY occur – lower arm angle
- Is compression the culprit??

Glenohumeral impingement

- Posterior / Internal
  - Compression between the posterior glenoid and the humeral head
  - Described in overhead athletes
So is it compression or is it degeneration?

- Both compression AND degeneration are causes
  - Less support for compression

Intrinsic factors:
- Tendon degeneration
  - Aging
  - Vascularity
  - Morphology
  - Mechanical
    - (and extrinsic factors)

Extrinsic factors:
- Strength/ m. control
- Shoulder tightness
- GH joint laxity
- Posture: spine, sh
- Bony abnormalities
- Scap & GH kinematics

Impairments
- Weak and/or motor control
  - Cuff, scapula, shoulder
- Tightness- pec minor, post shoulder
- Posture – thoracic & shoulder
- Scapular humeral motion deficits

Rehabilitation or Surgery?
- What should the first approach be?
  - For whom: Tendinopathy, FT-RCT?
  - Other considerations?
    - Patient expectations can predict outcome
    - Psychosocial factors
    - Lifestyle factors
    - Other related diagnoses?
Non-operative Treatment: how successful is it?

- Tendinopathy → partial-thickness tears
  - 85-90% of patients report ‘successful’ outcomes after rehabilitation
- No benefit of acromioplasty vs. rehab only
  - Rehabilitation first

Non-operative Treatment: how successful is it?

- Tendinopathy → partial-thickness tears

Surgery – for whom?
- Failed treatment after 6 months
- Dependent on goals, functional demands, age, co-morbidities, psychosocial

Considerations

- Full-thickness tears
  - Pain does not correlate with (Dunn W, 2014; Unrah, 2014)
- Size of the tear
- Tendon retraction
- Superior HH translation
- Impairments

- But - Are we ‘kicking the can down the road’?

** Rehab should be first option
Who should have surgery as the first option?

- Full-thickness tears
  - Age, acute tears, functional demands, goals

Young/younger, acute tear, hi function, hi goals
Younger with chronic tears, and hi function/goals

**Consider surgery as the first option?**

Surgical Treatment?

- Full-thickness tears – Surgical repair
  - Good outcomes generally (Moosmayer, 2010, 2015; Koh, 2014; Carr, 2012)
  - Re-tear rates – 22 – 48%  
  - Difference in outcomes if re-tear vs. not? NO

Chronic FT-RCT
> 60 yo
Irreparable tear?

Acute Tears
Chronic FT-RCT
< 60 yo

Tendinopathy
PT-RCT – Small tears
< 1 cm

Initial Non-Operative Treatment
Early Surgical Repair
Prolonged Non-Operative Treatment