Adhesive Capsulitis of the Shoulder

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Disclosures

• None
Goal

• Help conference participants recognize adhesive capsulitis in order to discuss treatment options with their patients
Objectives

• Discuss what is known and what is unknown
  – Pathogenesis
  – Natural history
  – Clinical presentation
  – Treatment options
五十肩
(Wǔshījiān – 50’s shoulder)

오십견
(Osibgyeon- 50 years old shoulder)
Definition

• “. . . a condition of uncertain etiology characterized by significant restriction of both active and passive shoulder motion that occurs in the absence of a known intrinsic shoulder disorder”

  American Shoulder and Elbow Surgeons, 1994

• “. . . a condition characterized by functional restriction of both active and passive shoulder motion for which radiographs of the glenohumeral joint are essentially unremarkable except for the possible presence of osteopenia or calcific tendonitis”

  American Shoulder and Elbow Surgeons, 2011
Terminology

- Periarthritis scapulohumerale (Duplay 1896)
- Frozen shoulder (Codman 1934)
- Adhesive capsulitis (Neviaser 1945)
- Fibrotic capsulitis (Hsu 2011)
  - No adhesions
“After incision through the anterior capsule, the capsule separated from the head of the humerus rather like peeling adhesive plaster from the skin”

Neviaser, 1945
Incidence

- Lifetime cumulative incidence risk ~ 2%
  - Often quoted throughout the literature

- Incident rate of 2.4 per 100 person years
  - “capsular syndrome” including capsulitis

- 4% of MedSport shoulder pain patients
  Housner, *unpublished data*
Etiology

- We Don’t Know
Pathogenesis

• No adhesions

• Evolution of synovial inflammation to capsular fibrosis
  – Combination/progression of inflammation and fibrosis similar to Dupuytren’s
  – Chronic inflammatory response with fibroblastic proliferation which may be immunomodulated (Hand, JBJS, 2007)

• Contracture of the rotator interval, coracohumeral ligament, and anterior/inferior capsule
Age and Sex distribution

• Mostly women
  – Range 60-70 %
  – MedSport data - 67% (Housner, 2018)

• Majority between 40-60 years old (peak age 50)
  – Range 70-75%
  – MedSport data -72% (Housner, 2018)
Recurrence

- Risk of recurrence in contralateral shoulder 15-20%
  - Usually within 5 years; range of 6 months to 7 years
- Risk of recurrence in same shoulder essentially 0%.
  Codman 1934, Lippman 1944, Hsu 2011
Classification

- Primary or idiopathic
  - Cases for which associated condition cannot be identified
- Secondary*
  - Systemic – e.g. related to diabetes or thyroid disorders
  - Limb trauma
  - Surgery (shoulder, cardiac, neurologic, ipsilateral breast)
  - Prolonged immobilization

*Secondary may have different etiology than primary
Associated Conditions

• Endocrine
  – Diabetes
  – Thyroid disease
  – ACTH deficiency

• Dupuytren’s

• Autoimmune disease

• Drug related
  – Matrix metalloproteinase inhibitor
  – Protease inhibitor
Natural History (theory of 3 stages)

• Duration may be 12 to 40 months

  Reeves, *Scand J Rheum*, 1975

• Usual dogma

  “... recovery is always sure and can be confidently expected.”

  Codman, 1934
Natural History (dispute of dogma)

- Residual pain and/or loss of motion of 50% patients at 7 years (but functionally not limiting)
  
  Shaffer, JBJS 1992

- “Contradictory evidence and a lack of supporting evidence shows that the theory of recovery phases leading to complete resolution without treatment for frozen shoulder is unfounded”
  
  Wong, Physio 2017
Natural History (theory of 3 stages)
Natural History (theory of stages)

Severity

- Freezing
- Frozen
- Thawing

Range

Pain

0-3 months  3-9 months  9-18 months

Time
Natural History (data compiled by Wong et al)
Natural History

- **Stage 1 (painful, or “freezing”)**
  - May last up to 9 months from onset of symptoms
  - Typically pain precedes the restriction in motion
    - Sharp pain at end range of motion
  - Gradual loss of motion
    - Earliest (and latest to return) exam finding usually loss of external rotation
  - May affect sleep

- **Aggressive synovitis/angiogenesis**
Natural History

• Stage 2 (“frozen”)
  – 6 to 15 months from onset
  – Loss of motion in all planes
  – Throbbing pain worse with motion
  – Usually affects sleep

• Capsuloligamentous fibrosis
Natural History

• Stage 3 ("thawing")
  – 12 to 24 months from onset
  – Gradual spontaneous improvement of shoulder mobility and function
  – Pain decreases
  – Range of motion improves
    • Mild mobility deficits and pain may persist, although most report minimal to no disability

• Synovial involvement recedes
Subjective complaints

- Insidious onset, and gradual progression of vague dull pain, may be diffuse, many times at deltoid insertion
- Onset may be attributed to a minor injury, but “incident” is trivial and does not explain onset of pain
- Night pain
- Poor function
  - Reaching overhead (washing hair, putting on deodorant)
  - Reaching behind back (putting on shirt/coat/bra)
  - Reaching out to the side (getting mail, using ATM)
Examination findings

- Tenderness of anterior and posterior capsule (maybe)
- Painful and restricted active *and* passive ROM
  - Elevation - forward flexion/abduction
  - Rotation - external/internal rotation
  - Helpful in some cases to control scapulothoracic motion (supine)

- Rotator cuff strong

- Caution with interpretation of special shoulder tests
  - All usually cause pain and “false” positive
Examination

- Loss of passive internal and external rotation with shoulder abducted 90°
Imaging

• X-ray to rule out
  – Glenohumeral arthritis
  – Calcific tendonitis
  – Neoplastic process
  – Posterior dislocation
• Usually not helpful to diagnose, rather rule out other pathology
  
  — MRI
  
  • Thickening of coracohumeral ligament
  
  • Thickening of joint capsule in the rotator interval
  
  • Smaller axillar recess volume
  
  — Ultrasound
  
  • Thickening of coracohumeral ligament
  
  • Increased vascularity in the rotator interval
Differential Diagnosis

- Osteoarthritis **
- Calcific tendonitis
- Rotator cuff tendinopathy
- Impingement syndrome
- Chronic dislocation (very rare) **
- Neoplasm
- Cervical spine disorders

** - only other diagnoses with loss of active and passive ROM
Treatment

- Success measured by significant reduction in pain, improved function, and high level of patient satisfaction (not necessarily full range of motion)
- Difficult to study because of various stages of presentation
- Minimum of 6 months of supervised conservative treatment should be attempted before surgical treatments considered
Conservative Treatment

• Self-limited disease course
  – Help with analgesia
  – Non-steroidal anti-inflammatory medications
    • May provide pain relief (no placebo controlled studies)
    • No impact on stiffness
  – Modalities
    • Heat/Ice
  – Oral corticosteroids
    • Reduction in pain short term, only while taking medication
    • Potential serious side effects
Conservative Treatment

- Physical therapy
  - Response dependent upon stage of the disease
  - Home exercises of range of motion with analgesia can be effective
  - Supervised neglect more favorable compared to “intensive” physical therapy
    
    Diercks, JSES 2004
  
  - Inconsistent results with stretching, joint mobilization
    
    • More studies are needed on assessing the effect of angular and translational mobilization techniques
    
    Noten, APMR 2016
  
  • Instruct on stretching exercises with intensity of stretching determined by patient’s current level of tissue irritability
Conservative Treatment

- Physical therapy combined with corticosteroid injection
  - Literature not definitive as to benefit

Carette, *Arth Rheum* 2003
Ryans, *Rheum* 2005
Maund, *Health Tech* 2012
Conservative Treatment

- Corticosteroid injections effective for pain relief

  - Glenohumeral/Intra-articular
    - Landmark-guided
    - Image-guided
      - Ultrasound
      - Fluoroscopy
  
  - Subacromial
    - No difference in outcome between glenohumeral and subacromial

- Intra-articular corticosteroid injection more effective than oral corticosteroids

  Lorbach, JSES 2010
Conservative Treatment

• Hydrodilation/joint distention –
  – Intra-articular corticosteroid injection as effective as hydrodilation/distention in improving shoulder function, reducing pain, and increasing external rotation

  Lin, APMR 2017

• Suprascapular nerve blockade
Surgical Treatment

• Exhaust conservative treatment for a minimum of 6 months – ideally 12 months – before orthopedic surgical referral
• Closed manipulation under anesthesia
• Arthroscopic or open release of anterior capsule
Case

- 49 year old right hand dominant female presents with right shoulder pain that began 4 months prior when she tossed her briefcase into the back seat of her car
- Pain reported at deltoid insertion
- Pain initially tolerable, but now affecting sleep
- Examination demonstrates decreased active and passive external rotation (most notable when shoulder abducted 90 degrees), yet resistance testing of external range of motion strong and not painful
- X-rays of the shoulder are normal
Case

• Presentation consistent with diagnosis of adhesive capsulitis
• Consider advanced imaging to rule out other shoulder disorders
• Use heat, analgesic medications if needed
• Consider subacromial or glenohumeral joint injection
  – I prefer ultrasound guided glenohumeral injection
  – I may do a 2nd injection in 3-4 months using shared decision making
• Cautious discussion of physical therapy/stretching
• Exhaust conservative management for as long as tolerable
Thank You!