Shoulder anatomy and clinical assessment of the shoulder
Shoulder anatomy

• Highly mobile joint where stability has been sacrificed for mobility.

• Shoulder girdle comprises:
  • Glenohumeral (ball and socket) joint
  • Acromio-clavicular joint
  • Scapula sitting on thoracic wall / rib cage ("floating" joint)
Glenohumeral (ball and socket) joint

Courtesy Nicki Delves
Glenohumeral (ball and socket) joint

Courtesy Nicki Delves
Glenohumeral (ball and socket) joint

Courtesy Nicki Delves
Glenohumeral (ball and socket) joint

Coraco-acromial ligament (CAL)
Glenohumeral (ball and socket) joint

- Rotator Cuff muscles
Glenohumeral (ball and socket) joint

- Rotator Cuff muscles
Subscapularis

TeachMeAnatomy.info

Courtesy Nicki Delves
Supraspinatus
Infraspinatus
Bursae

Courtesy Kate Norris & Nikki Meredith
Rotator cuff tendons

Courtesy Nicki Delves
Biceps tendon in rotator interval

Courtesy Nicki Delves
Biceps tendon in rotator interval

Courtesy Nicki Delves
Rotator interval

Courtesy Nicki Delves
Rotator interval

Courtesy Nicki Delves
Biceps tendon

Courtesy Nicki Delves
Acromio-clavicular joint
Acromio-clavicular joint
Acromio-clavicular joint

© Lydia Kibuk (2000)
Courtesy Dr Kai Win
Scapula sitting on thoracic wall / rib cage
Scapula sitting on thoracic wall / rib cage
Scapula sitting on thoracic wall / rib cage
Diagnosis of Shoulder problems in Primary Care:
Guidelines on treatment and referral

Is it Neck or Shoulder?

- Ask the patient to first move the neck and then move the shoulder.
- Which reproduces the pain?

Red Flags = Urgent Referral
1. Severe neck and shoulder pain
2. Acute cuff tear
3. Any mass or swelling
4. Any deterioration
5. Infection
6. Intracapsular fracture of the neck of the humerus
7. Loss of rotation and abnormal shape
8. Immunological Rejection

Neck
- Follow local specialisation guidelines
- Is the pain localised to the AC joint and associated with tenderness?
- Is there high arm pain?
- Is there a positive cross arm test?

Shoulder
- History of trauma?
- Does the shoulder move easily or is there restriction?
- Is your patient worried that their shoulder injury might be taking more than one month to settle?

Primary Care

Instability
- Conservatively: 6-9 yrs
- Physio / Analgesic

Refer to Shoulder Clinic

Instability
- Traumatic dislocation
- Osteoporotic
- Arthrokinematic with labral patho

Acromioclavicular Joint
- Is there reduced passive external rotation?

Acromioclavicular Joint Disease
- Is it tender or not responsive to injection and physio?

Glenohumeral Joint
- Frozen shoulder
- Is there reduced passive external rotation?
- Is there pain on abduction with the thumb down, without against resistance?
- Ask the patient with a torn rotator cuff if they remember a sentinel lift?
**Diagnosis of Shoulder problems in Primary Care:**

**Guidelines on treatment and referral**

**Is it Neck or Shoulder?**
- Ask the patient to first move the neck and then move the shoulder.
- Which reproduces the pain?

**Neck**
- Follow local special interest guidelines.

**Shoulder**
- History of instability?
- Does the shoulder feelparity or weakness?
- In your patient’s record, has there been any injury that might have caused shoulder pain or in your patient’s history?

**Primary Care**
- **Instability**
  - Common age 15-90 yrs.
  - Fracture/Atraumatic
  - **Red Flags = Urgent Referral**
    - Can’t move shoulder
    - Any mass or swelling
    - Tumor
    - Joint fluid, fever, erythema/foul smell or infection
    - Arm palsy
    - Avascular necrosis
    - Traumatic dislocation
  - **Glenohumeral Joint**
    - Frozen shoulder
    - Common age 56-76 yrs.
    - **Rotator Cuff**
      - Common age 40-67 yrs.
      - Subacromial injection
      - Avascular necrosis
      - Traumatic dislocation
      - Avascular necrosis
      - **Glenohumeral Joint**
        - **Other cause of Neck or Arm pain**

**Refer to Shoulder Clinic**
- **Instability**
  - Traumatic dislocation
  - Osteoarthritis
  - Arthroplasty with hip dislocation

**Aromnoclaricular Joint**
- Common age 16 yrs.
- Traumatic dislocation
- Non-traumatic dislocation
- **Glenohumeral Joint**
  - Have it treated or not responsive to injection and physio.

**Glenohumeral Joint**
- If frozen shoulder with normal x-ray – refer if surgical arthroplasty needs surgical consideration.
- Rule out arthritis on a x-ray and poor response to analgesics and physio.

The Oxford Shoulder Clinic at the Nuffield Orthopaedic Centre
(see www.noc.nhs.uk/shoulderandelbow for patient information booklets)
**Diagnosis of Shoulder problems in Primary Care:**

**Guidelines on treatment and referral**

- **Is it Neck or Shoulder?**
  - Ask the patient to first move the neck and then move the shoulder.
  - Which reproduces the pain?

- **Neck**
  - Follow local spine protocol guidelines.

- **Shoulder**
  - History of trauma?
  - Does the shoulder feel painful or difficult to move?
  - Is the patient unsure about how to describe their symptoms through asking about on contact activities?

- **Is the pain localized to the AC joint and associated with tenderness?**
- **Is there high air pain?**
- **Is there a positive cross arm test?**

- **Axillary Nerve Injury**
  - Common age 10 - 50 yrs
  - Neuropathy / Neuralgias
  - Tinel’s
  - Allen test
  - X-rays
  - MRI

- **Rotator Cuff Tear**
  - Common age 50+ yrs
  - Painful / Neurally-conducting
  - X-rays
  - MRI

- **Other cause of neck or arm pain**

**Red Flags = Urgent Referral**

- **History of trauma**
- **Any mass or swelling**
- **Tumor**
- **Red skin, fever of systemic illness**
- **Infection**
- **Rashes / exudative / itchy / electric shock leading to lack of rotation and abnormal shape**
- **Unprecedented Presentation**

**Shoulder Clinic**

- **Stare**
- **Dislocation**
- **Coring symptoms**
- **Synovitis with limited physio**

- **Axillary Nerve Injury**
  - Common age 10 - 50 yrs
  - Neuropathy / Neuralgias
  - Tinel’s
  - Allen test
  - X-rays
  - MRI

- **Rotator Cuff Tear**
  - Common age 50+ yrs
  - Painful / Neurally-conducting
  - X-rays
  - MRI

- **Other cause of neck or arm pain**

**The Oxford Shoulder Clinic at the Nuffield Orthopaedic Centre**

(see - www.noc.ox.ac.uk/shoulderandelbow - for patient information booklets)
Instability

End View of Scapula

Glenoid Fossa
Head of Humerus
Scapula
Humerus

Joint capsule (cut)
Labrum

Biceps muscle tendon (cut)
Glenoid cavity

Glenoid
Clavicle
Acromion
Coracoid process

Joint capsule
Head of humerus
Scapula

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Courtesy Nicki Delves
Acromio-clavicular joint

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Courtesy Dr Kai Win
Frozen shoulder; GHJ OA

Courtesy Nicki Delves
Diagnosis of Shoulder problems in Primary Care: Guidelines on treatment and referral

Is it Neck or Shoulder?
- Ask the patient to first move the neck and then move the shoulder.
- Which reproduces the pain?

Shoulder
- History of trauma?
- Is there restriction of movement or pain?
- Is the pain localized to the AC joint and associated with tenderness?
- Is there high arm pain?
- Is there a positive cross arm test?

Primary Care
- Instability
- Comerage age 15 - 3 yrs
- Physio + Aromatotic

Refer to Shoulder Clinic
- Instability
- Traumatic dislocation
- Osgood-Schlatter
- Anamnetic with direct phyisis

Aromatricular Joint
- Comerage age 16 yrs
- Labral/SLAP/Arthrogram
- Bacterial infection
- Physio
- KAP unless no improvement

Aromatricular Joint Disease
- Rad if transient or no response to injection and physio.

Glenohumeral Joint
- Frozen shoulder
- Comerage age 50 yrs
- Non-operative
- Painful
- NSAIDs/Corticosteroids
- Patient information
- Corten injection

Glenohumeral Joint Disease
- If frozen shoulder with normal x-ray – refer to physical therapist follow functional limitations
- Rule out arthritis, stress fractures, synovitis or rotator cuff issues

Other cause of neck or arm pain
- Is there reduced passive external rotation?

Rotator Cuff
- Comerage age 50 yrs
- Physiotherapy
- May require injection
- Referral if fails to respond to injection and physiotherapy.

The Oxford Shoulder Clinic at the Nuffield Orthopaedic Centre
(see www.noc.nhs.uk/shoulderandelbow for patient information booklets)
“Impingement”

Courtesy Nicki Delves
Bursal involvement
Rotator cuff tears
Some orthopaedic tests

www.shoulderdoc.co.uk – so far 129 found

• Empty can test
  • Pain, muscle weakness
• Hawkins Kennedy

• Neer impingement test
  • Scapular held down, examiner passively abducts the arm
• ACJ
  Scarf test

• Others:
  • Anterior apprehension
  • Scapular assistance test

• Various rotator cuff tests
“Ask the questions you felt too self-conscious to ask”

• The management of certain conditions, post scan, e.g.
  1. Calcified tendinopathy, in its varying forms; perhaps comparison of clinical management over barbotage.
  2. Adhesive Cap - in its varying stages and when more urgent Physiotherapy fits in.

This can empower the sonographer to gauge the clinical significance of the scan findings and to be able to discuss this in an informed way with the patient.

• Q. What is the difference between tendinosis and tendinopathy? When do you use the terms in reporting? Symptomatic non symptomatic

• Q. What thickness should Supraspinatus be, age affecting etc

• Q. Should we always comment on impingement?
“Ask the questions you felt too self-conscious to ask”

- does a specific orthopaedic test mean the patient has a particular pathology?
- should I try and reproduce their symptoms when I scan them?
- if they have neck pain then is there any point in scanning them?
- what is actually causing pain at the shoulder?
- is a frozen shoulder the only reason for a stiff shoulder?
- what are the 3 things I should ask before I scan them?
- what are the 3 things I should do to them / ask them to do before I scan them?
- what should I tell them if I find a tear, calcific deposit, etc?
Special Tests – all taken from previous MSK SiG presentation by Eoghan Murray

• “it is not possible to make a definitive diagnosis with the clinical tests currently in use” (Lewis, J & Tennent, D., 2007)

• “Currently, almost without exception, there is a lack of clarity with regard to whether common tests used in clinical examination are useful in differentially diagnosing pathologies of the shoulder” (Hegedus et al. 2008)

• No test is absolutely diagnostic of a particular shoulder pathology

• No test series capable of selectively assessing r/c + S.A bursal tissues + integrity of the S.A space

• All clinical tests stretch and/or compress S.A bursae

• Reduce specificity and ability to differentiate

• Difficult to isolate individual tendons and other structures and inform accurate diagnosis:

  • –r/c morphology -r/c cable
  • –Position + innervation of sub-acromial bursae
  • –Lack of correlation between symptoms and imaging, U/S + MRI

• Tests reasonably reliable when used in combination and in context to clinical
Special Tests (cont)

• Validity of the Tests
  • Neer 72% sensitivity, 60% specificity
  • Hawkins Kennedy 79% sensitivity, 59% Specificity
  • Painful arc 53% sensitivity, 76% specificity
  (Hegaduset al., 2012)

• Impingement Tests:
  • –Relatively high sensitivity but low specificity
  • –Substantially decreases utility in deriving a specific diagnosis.
  • Not all structural failure correlates with symptoms

• Tests reasonably reliable when used in combination and in context to clinical picture.

• Testing must be used in conjunction with the subjective history
• Combination of tests provides more conclusive diagnosis
Special Tests (cont): radiological correlation?

- Poor correlation between structural failure and symptoms
- R/C pathology related to age