Clinical examination and Imaging in shoulder disease

M. N. Naderi
Fellowship in Shoulder surgery
Rotator cuff tears
Calcific Tendinitis
Clavicle
A-C Joint
Acromion
Subacromial space
Biceps anchor
Biceps tendon
Rotator cuff tears
Calcific Tendinitis
Proximal Humerus
Labrum (instability)
Scapula
Common shoulder problems:
- Pain
- Stiffness
- Instability

1. Rotator Cuff
2. Glenohumeral joint
3. Acromioclavicular joint
4. Clavicle
5. Neck
• Common shoulder problems:
  – Pain
  – Stiffness
  – Instability

When?

How?

Degree?

Accompanying symptoms?
Shouder assessment

- History
- **Look, Feel**
- Movement
- Clinical test
- Radiography
- Sonography
- Arthrography
- CT Scan
- MRI
- CT / MRI
- Arthrogram
- Arthroscopy

- Asymmetry, scars, deltoid wasting, SCJ or ACJ deformity, swelling of the joint
- Look and feel for rotator cuff wasting, scapula shape and situation
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- Always examine the Cervical spine first
- Move both arms at the same time
- Active then passive ROM (FF, IR, ER)
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- Subacromial Impingement
- AC Joint
- Rotator cuff Integrity
  - Supraspinatus/anterosuperior cuff
  - Infraspinatus+teres minor/posterior cuff
  - Subscapularis/anteroinferior cuff
- Biceps
- Deltoid
- Serratus anterior
- Instability testing
  - Laxity tests
  - Stability test
**Shoulder assessment**

- History
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**Clinical test**

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**Subacromial Impingement**

- Hawkin's test
- Neer's sign & test
- Copeland Impingement Test
Subacromial Impingement

- Hawkin's test
- Neer's sign & test
- Copeland Impingement Test

Shoulder assessment

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**AC Joint**

- Cross body adduction test (Scarf test)
### Shoulder assessment

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  - **Arthroscopy**

## Rotator cuff Integrity

- **Muscle resisting**
  - Jobe's empty can test
  - ER stress test (Resisted ER with the arms by side)
  - Lift-off test, Belly-Press test (Napoleon test)

- **Lag signs**
  - ER Lag sign
  - IR Lag sign
  - Drop sign
Rotator cuff Integrity

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- Lag signs
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Biceps

• Speed's test
• Yergason's test
SLAP lesion

- O'Brien test (active compression test)

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<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Positive Predictive Value (%)</th>
<th>Negative Predictive Value (%)</th>
<th>Overall Accuracy (%)</th>
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<tr>
<td>Neer sign</td>
<td>68</td>
<td>68.7</td>
<td>80.4</td>
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<td>Hawkins-Kennedy sign</td>
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<td>66.3</td>
<td>79.7</td>
<td>55.7</td>
<td>69.7</td>
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<td>Painful arc sign</td>
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<td>81.1</td>
<td>88.2</td>
<td>61.5</td>
<td>76.1</td>
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<td>Supraspinatus (Jobe) muscle test</td>
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<td>89.5</td>
<td>88.4</td>
<td>46.8</td>
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<td>Cross-body adduction test</td>
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<td>81</td>
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<td>90.1</td>
<td>90.6</td>
<td>45.8</td>
<td>58.7</td>
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</table>
**Shoulder assessment**

- History
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Serratus anterior

- **Winging test**

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- Instability testing
  - Laxity tests
  - Stability test
Shoulder assessment

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Clinical test

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Laxity Test

- Sulcus sign
- Drawer Test
Hawkins and Bokor:

<table>
<thead>
<tr>
<th>Laxity Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Mild Translation (0-25%)</td>
</tr>
<tr>
<td>Grade 1</td>
<td>Feeling of Head riding onto rim (25-50%)</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Head over rim, reduces spontaneously (&gt;50%)</td>
</tr>
<tr>
<td>Grade 3</td>
<td>Head over rim, remains dislocated</td>
</tr>
</tbody>
</table>

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Stability Test

- Apprehension Test
  - Ant.
  - Post. (Jerk test)

Stability Test

- Relocation test (Jobe)

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- AP
- Axillary view
- Lat scapular view
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- **Specialized views**
  - apical oblique view
  - West Point view
  - Stryker notch view
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www.shoulderdoc.co.uk
- Reliable & fast method for evaluation of cuff
- Dependent to operator experience

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High value in diagnosis of complete cuff tear
limited in assess of size and morphology of tear

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Best Diagnostic imaging modality for assessment of bony lesion (glenoid ,,,)
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- Three dimensional CT (3D CT)
<table>
<thead>
<tr>
<th>Tissue</th>
<th>T1-weighted Image</th>
<th>T2-weighted Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat</td>
<td>Very bright</td>
<td>Intermediate to dark</td>
</tr>
<tr>
<td>Cysts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>Very dark</td>
<td>Very bright</td>
</tr>
<tr>
<td>Proteinaceous</td>
<td>Intermediate to bright</td>
<td>Very bright</td>
</tr>
<tr>
<td>Bone marrow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td>Very bright</td>
<td>Intermediate to dark</td>
</tr>
<tr>
<td>Red</td>
<td>Intermediate</td>
<td>Dark</td>
</tr>
<tr>
<td>Cortical bone</td>
<td>Very dark</td>
<td>Very dark</td>
</tr>
<tr>
<td>Cartilage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibrocartilage</td>
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<td>Very dark</td>
</tr>
<tr>
<td>Hyaline</td>
<td>Intermediate</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Osteophyte Marrow</td>
<td>Bright</td>
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</tr>
<tr>
<td>Calcified</td>
<td>Dark</td>
<td>Dark</td>
</tr>
<tr>
<td>Tendons</td>
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</tr>
<tr>
<td>Ligaments</td>
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<td>Muscle</td>
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<td>Dark</td>
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<tr>
<td>Gadolinium enhancement</td>
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<tr>
<td>Low concentration</td>
<td>Very bright</td>
<td>Bright</td>
</tr>
<tr>
<td>High concentration</td>
<td>Intermediate to dark</td>
<td>Very dark</td>
</tr>
</tbody>
</table>

Michael B. Zlatkin; MRI of the Shoulder 2nd ed, 2003, Chap 1, p 3.
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Assessment for the soft tissue lesions (labral lesion, rotator cuff, Slap lesion)
Muscle Quality

- Stage 0: normal, Ø Fat
- Stage 1: minimal Fatty infiltration
- Stage 2: Muscle > Fat
- Stage 3: Muscle = Fat
- Stage 4: Muscle < Fat

The presence and degree of fatty infiltration and atrophy of the muscle affect the success of the repair.
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- most commonly used test for evaluation for RC pathology
- significant potential for false-positive findings
- overuse
MRI Arthrogram: Improve the assessment of intraarticular structures, including the glenoid labrum GHL & capsule.

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In a study on 30 patients: A labral tear was detected on MR images in 93%, on MR arthrograms in 96%, and on CT arthrograms in 73%.

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Thank you for attention