

Subacromial Impingement (diagnostic methods)

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Fellowship in shoulder and
arthroscopic surgery

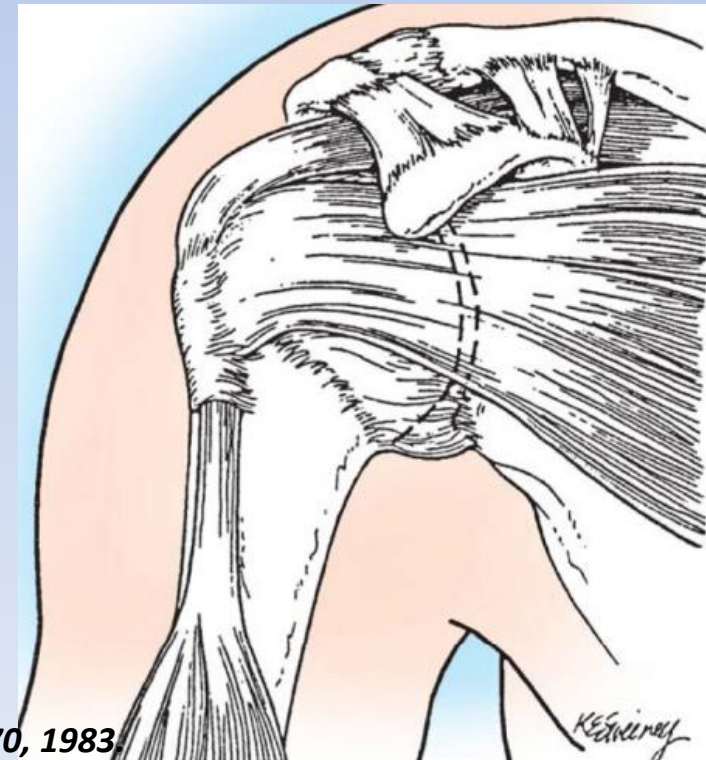
Definition

- **Neer :**

- Impingement on the tendinous portion of the rotator cuff by the coracoacromial ligament and the anterior third of the acromion

JBJS Vol. 54-A, pp. 41-50, January 1972

- **Stage 1: Edema and Hemorrhage**
- **Stage 2: Fibrosis and Tendinitis**
- **Stage 3: Bone Spurs and Tendon Rupture**



Modified from Neer CS II: Impingement lesions, Clin Orthop Relat Res 173:70, 1983

Clinical Features



- **Patients often > 30 y.**
- **chief complaint is shoulder pain**
 - sharp pain around the front of the shoulder , with dull aching pain radiating to the hand
- **Pain initially only occurs with overhead use of the arm**
- **may progress to persistent pain with any use of the arm or even nighttime pain**
- **The dominant extremity is more often affected**

Differential diagnosis

- **Acromioclavicular arthritis**
- **Glenohumeral arthritis**
- **Subtle shoulder instability in throwing athletes**
- **early adhesive capsulitis**
- **Fibromyalgia**
- **Cervical spondylosis with nerve root irritation**
- **Suprascapular nerve injury**

○ **History**

○ *Look , Feel*

○ *Movement*

○ *Clinical tests*

○ *Radiography*

○ *Sonography*

○ *Arthrography*

○ *CT / MRI*

- determine whether the **shoulder pain** is from the AC joint, Glenohumeral joint, Rotator cuff , or Neck

When ?

How ?

Degree ?

Accompanying symptoms ?

- Always examine the Cervical spine first
- Move both arms at the same time
- Active then passive ROM
(FF , IR , ER)

○ *History*

○ *Look , Feel*

○ *Movement*

○ *Clinical tests*

○ *Radiography*

○ *Sonography*

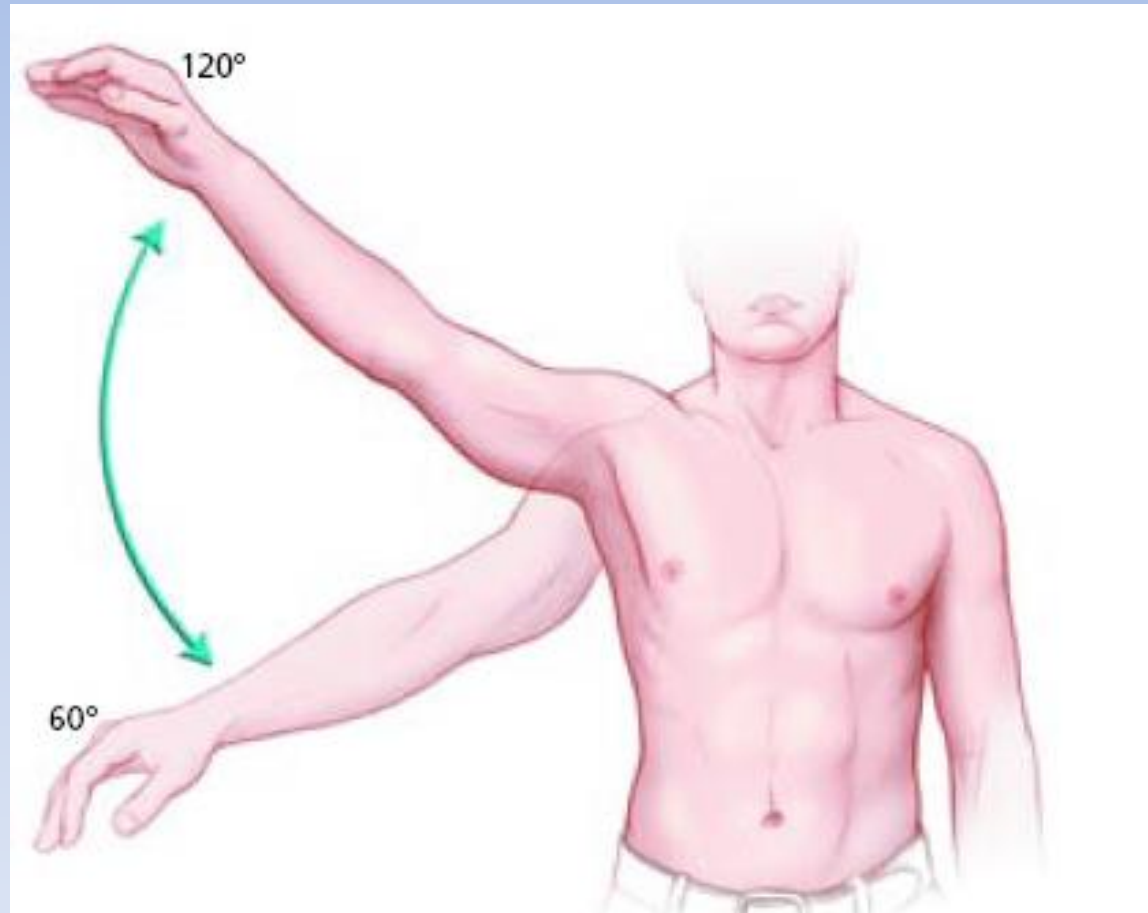
○ *Arthrography*

○ *CT / MRI*



Clinical tests

- **painful arc sign**



Clinical tests

- **Hawkin's test**



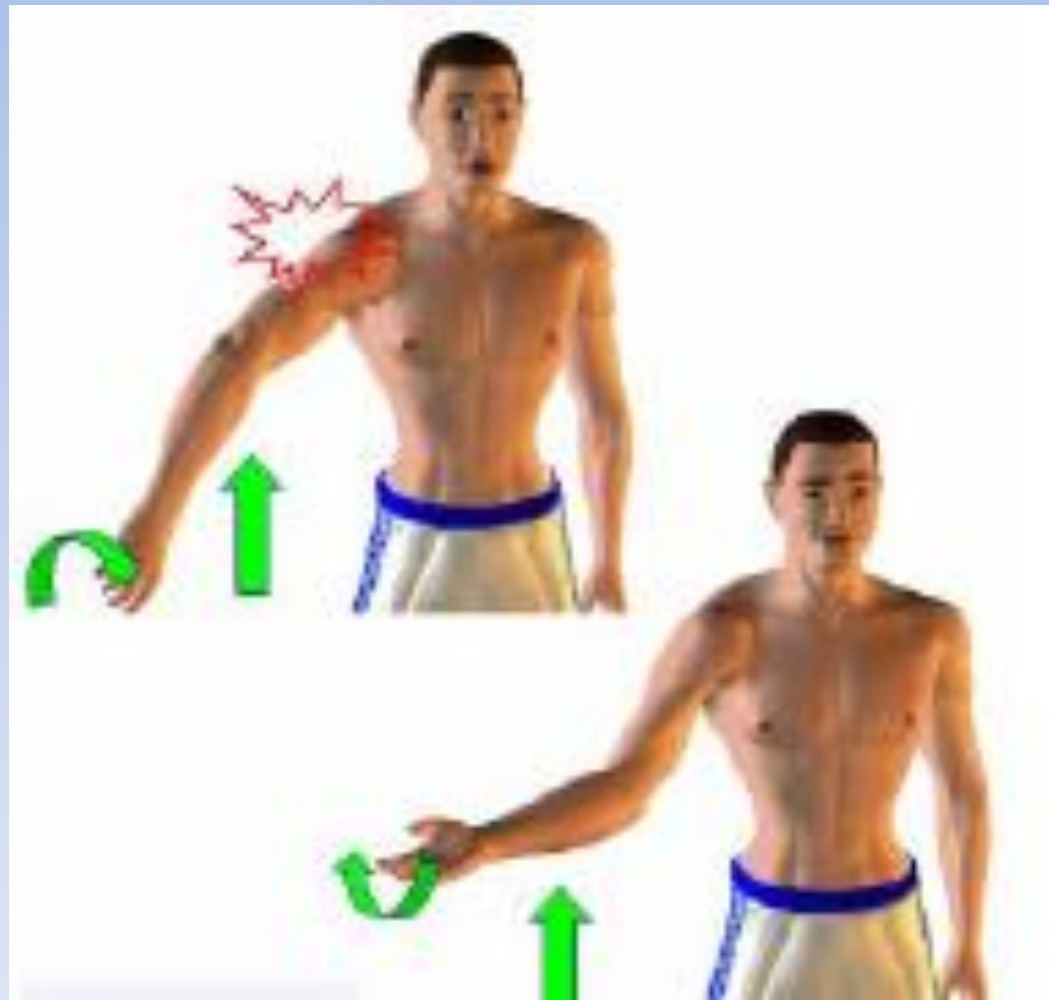
Clinical tests

- **Neer's sign**
 - False positive: adhesive capsulitis, osteoarthritis, bone lesions
- **Neer Test**
 - subacromial injection of 10 mL of 1% lidocaine → Pain ↓



Clinical tests

- Copeland Impingement Test



Clinical tests

Subacromial Impingement

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

Clinical tests

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



Clinical tests

Rotator cuff Integrity

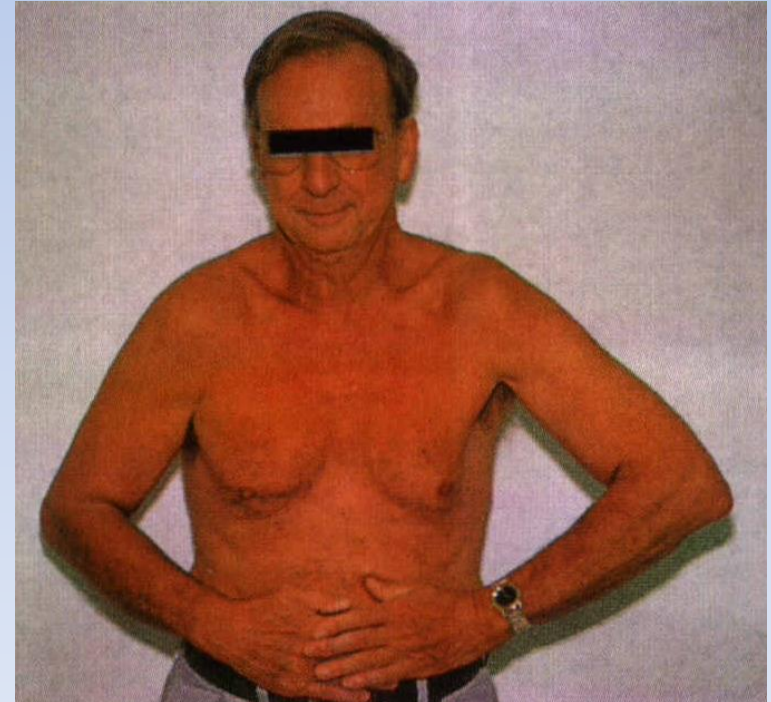
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Clinical tests

Rotator cuff Integrity

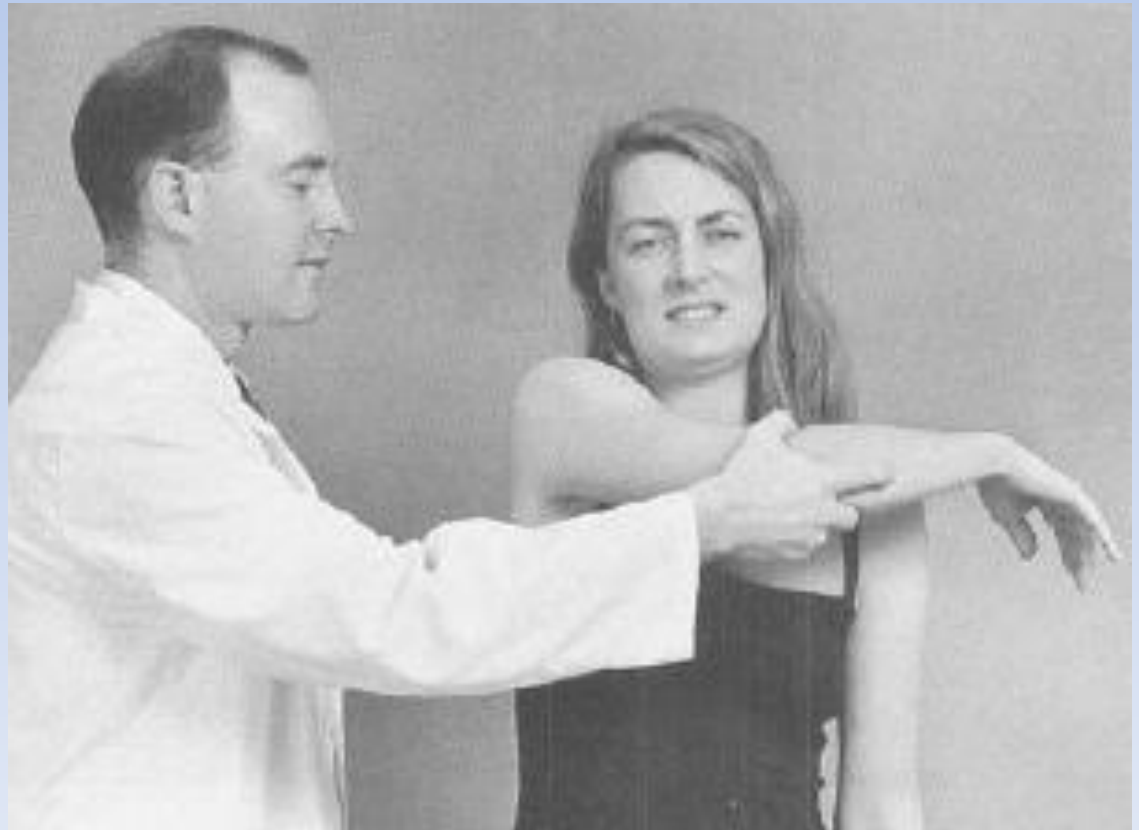
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Clinical tests

AC Joint

- Cross body adduction test (Scarf test)



Clinical tests

Rotator cuff Integrity

- **Muscle resisting**
 - Jobe's empty can test
 - ER stress test (Resisted ER with the arm)
 - Lift-off test, Belly-Press test (Napoleon test)
- **Lag signs**
 - ER Lag sign
 - IR Lag sign
 - Drop sign



Clinical tests

Biceps

- Speed's test
- Yergason's test



L. Silva, J. L. Andreu, P. Munoz, et al: Accuracy of physical examination in subacromial impingement syndrome , Rheumatology 2008 47(5):679-683;

- **Most PE manoeuvres identify reasonably well subacromial impingement of the shoulder, although, they have low specificity**
- **imaging techniques should be recommended to better define shoulder lesions**

Park HB, Yokota A, Gill HS, et al: Diagnostic accuracy of clinical tests for the different degrees of subacromial impingement syndrome, J Bone Joint Surg 87A:1446, 2005.

Clinical Tests for Subacromial Impingement (Regardless of Severity of Rotator Cuff Disease)

Test	Sensitivity (%)	Specificity (%)	Positive Predictive Value (%)	Negative Predictive Value (%)	Overall Accuracy (%)
Neer sign	68	68.7	80.4	53.2	68.3
Hawkins-Kennedy sign	71.5	66.3	79.7	55.7	69.7
Painful arc sign	73.5	81.1	88.2	61.5	76.1
<u>Supraspinatus (Jobe) muscle test</u>	44.1	89.5	88.4	46.8	60.2
Speed test	38.3	83.3	80.5	42.9	54.4
Cross-body adduction test	22.5	82	69.3	36.9	47.8
Drop-arm test	26.9	88.4	81	39.7	48.6
<u>Infraspinatus muscle test</u>	41.6	90.1	90.6	45.8	58.7

Radiologic evaluation

- AP
- Axillary view
- Lat scapular view

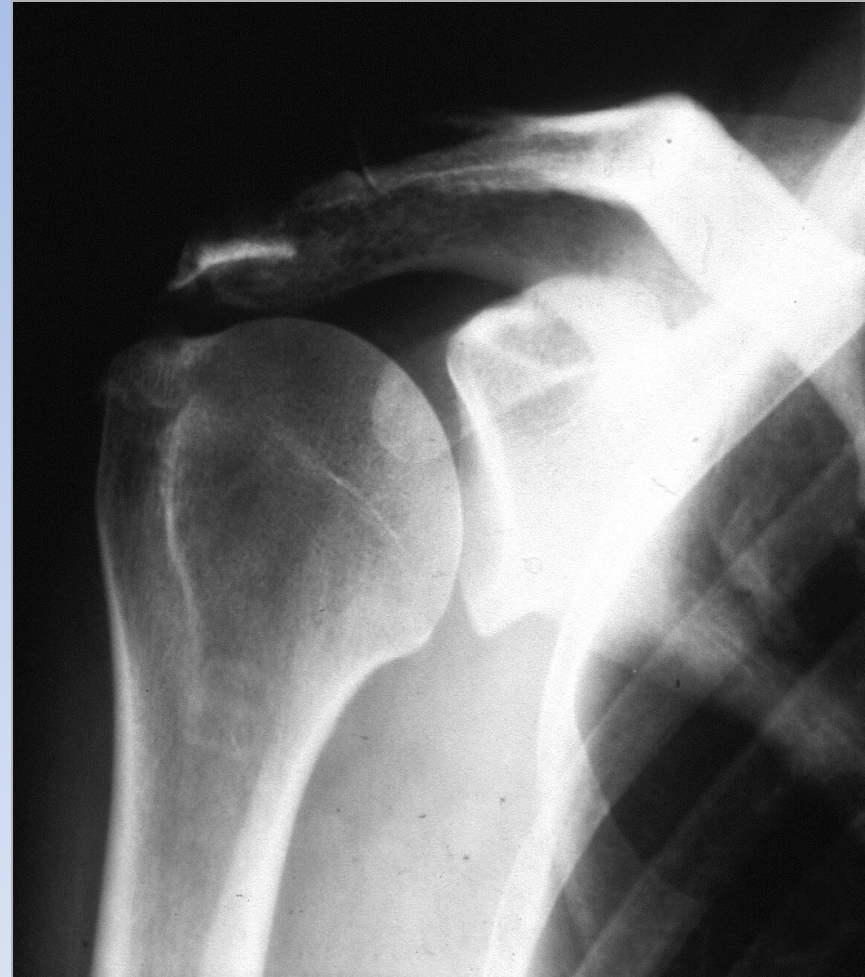


- decreased interval (normal, 7–15 mm) between the humeral head and the acromion (tear of RC)



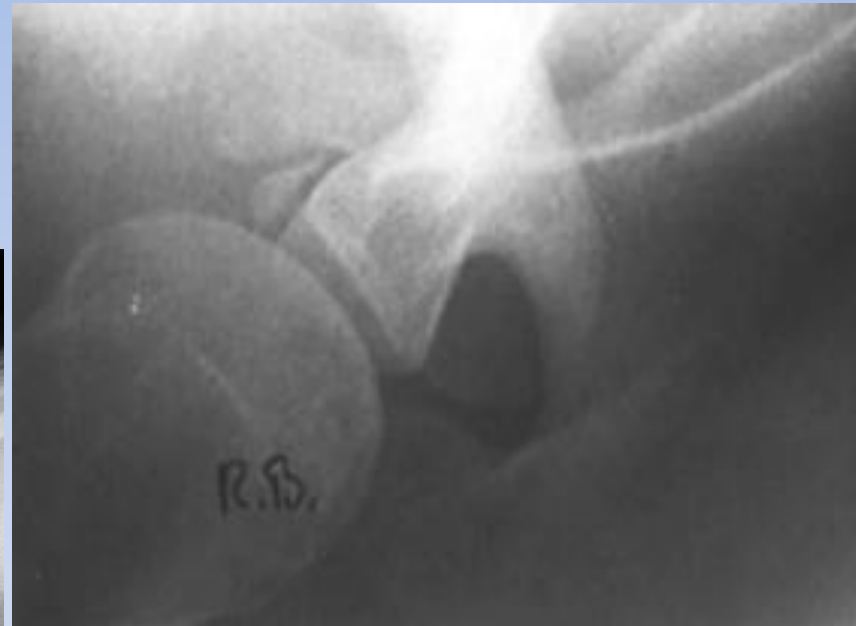
Radiologic evaluation

- AP
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-
- sclerosis and cysts in the area of the greater tuberosity
 - Subacromial sclerosis (sourcil sign)



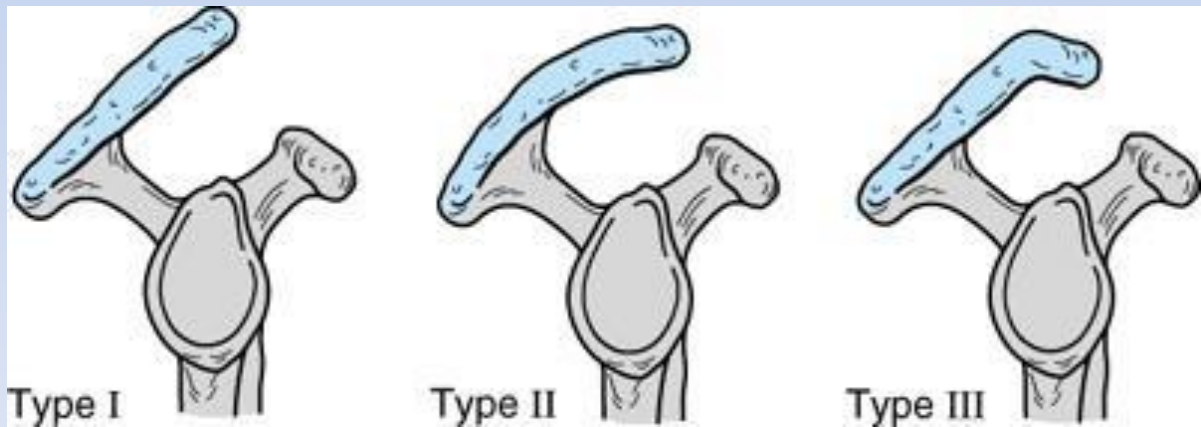
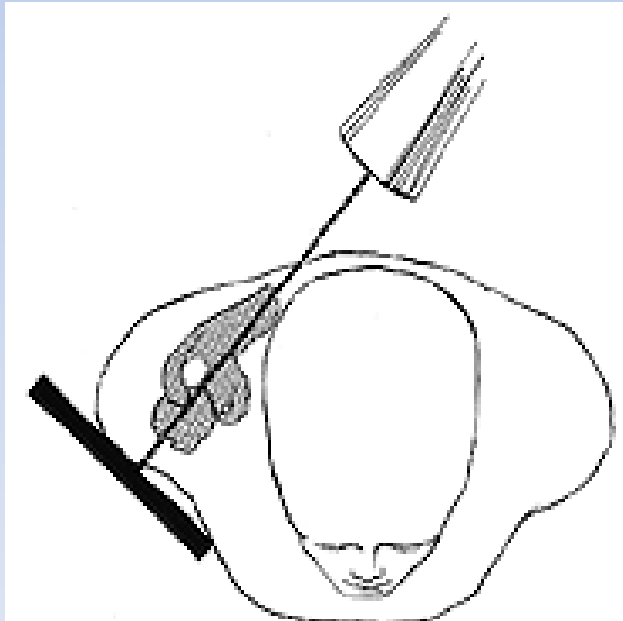
Radiologic evaluation

- AP
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Radiologic evaluation

- AP
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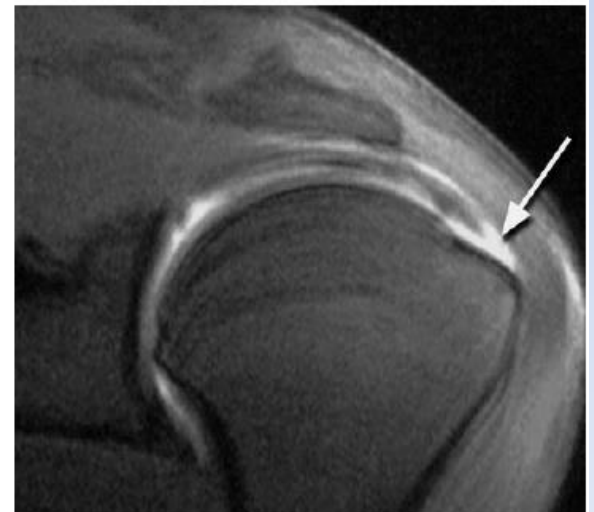
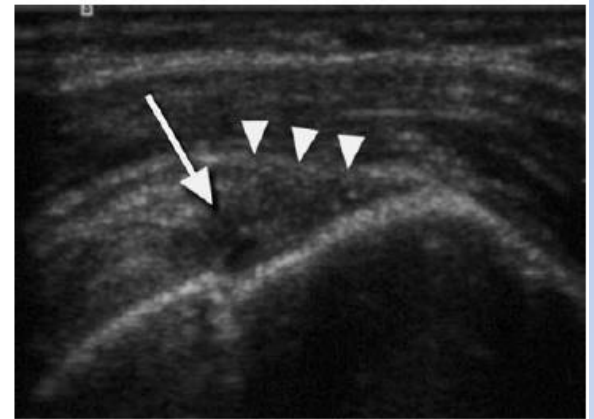
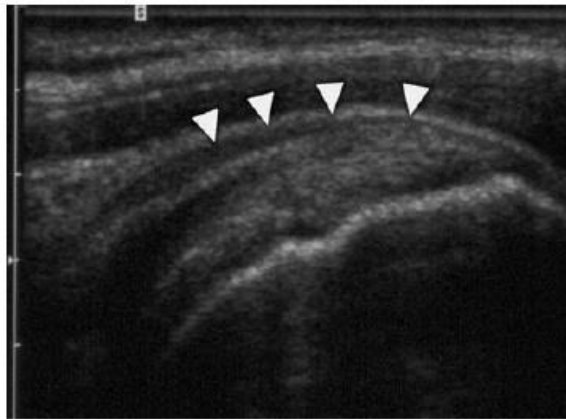
Morrison DS, Bigliani LU. The Clinical Significance of Variations in Acromial Morphology. Orthop Trans 1987;11:234.

Sonography



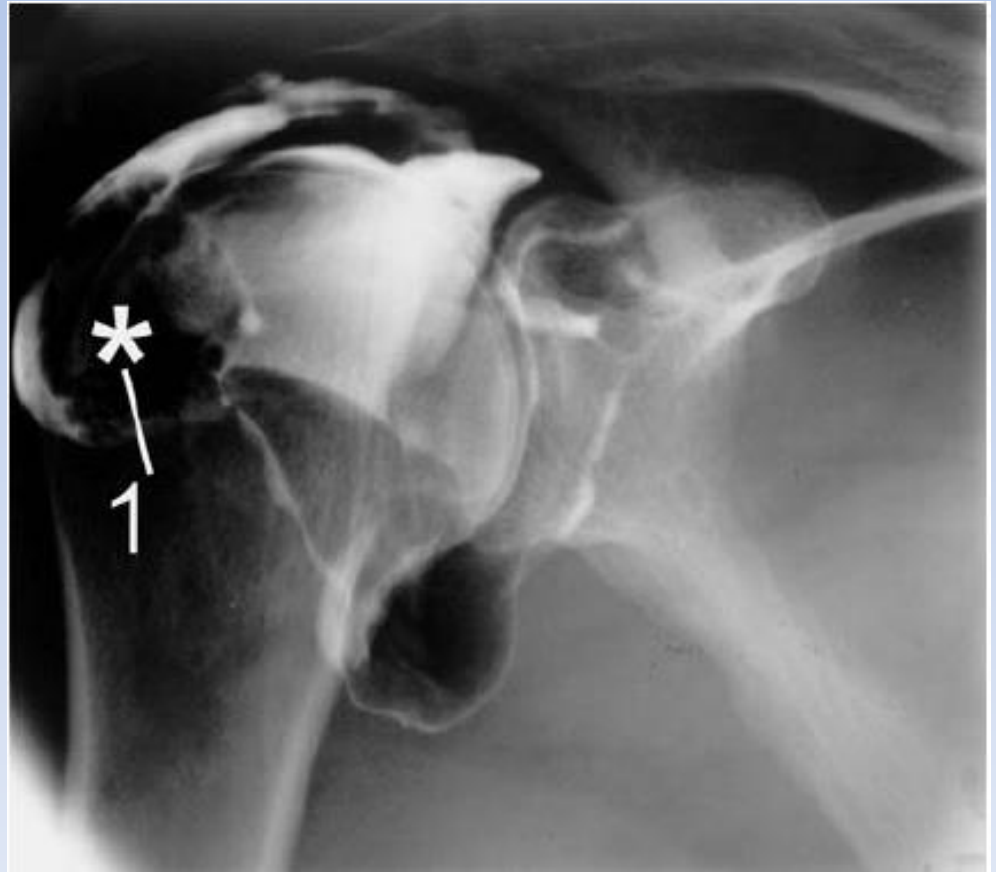
Sonography

- Reliable & fast method for evaluation of cuff
- Dependent to operator experience



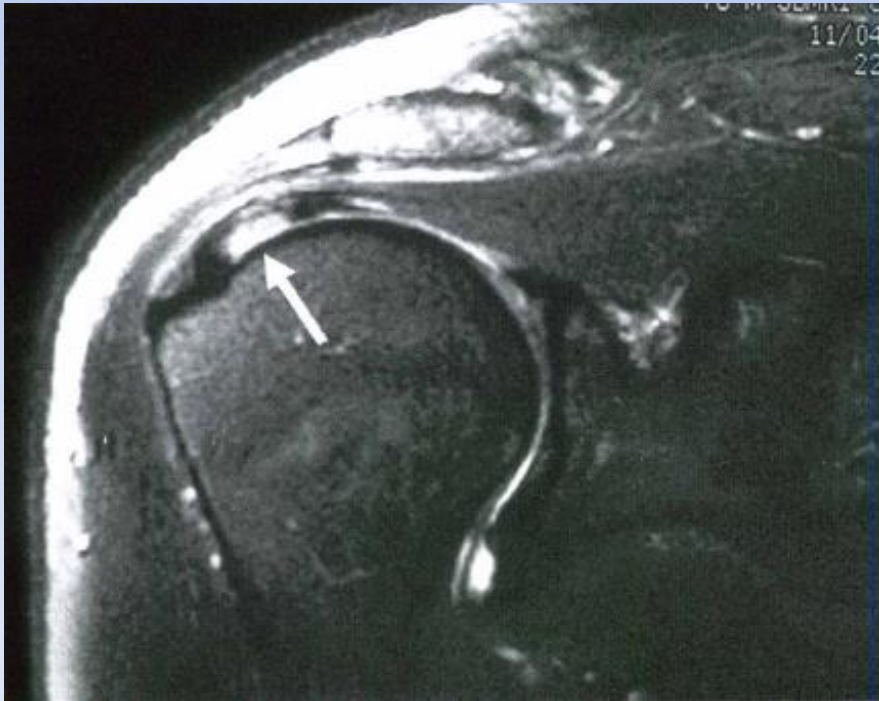
Arthrography

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



MRI

- most commonly used test for evaluation for RC pathology
- significant potential for false-positive findings
- overuse



When doing MRI?

- **No evidence of improvement in symptoms after 6 - 12 wk of conservative treatment**
- **If the clinical indications for surgery exist, then MRI is helpful in confirming the diagnosis and evaluating of extent of the pathology**

Summery

- **The clinical evaluation of a patient with shoulder pain presents a diagnostic challenge**
- **By following precise physical examination and X-ray , the diagnosis can be made accurately in most cases**
- **Further study (Sonography, MRI,,,) can yield more information in suspicious cases**