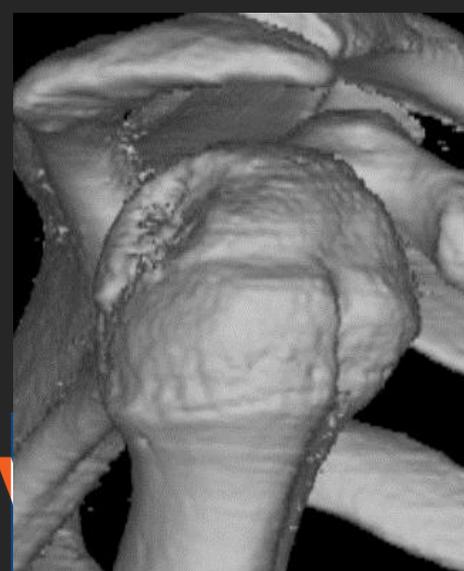
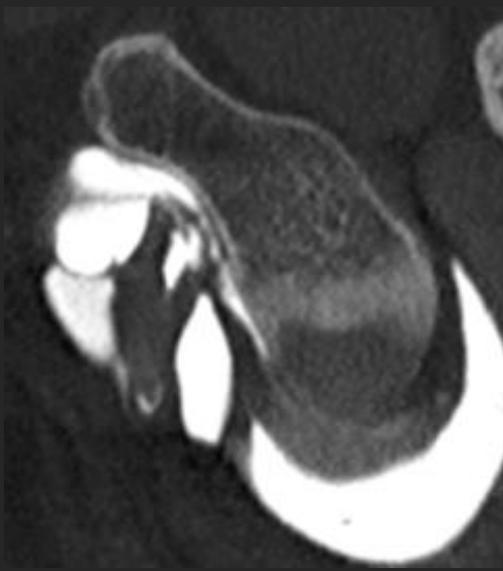
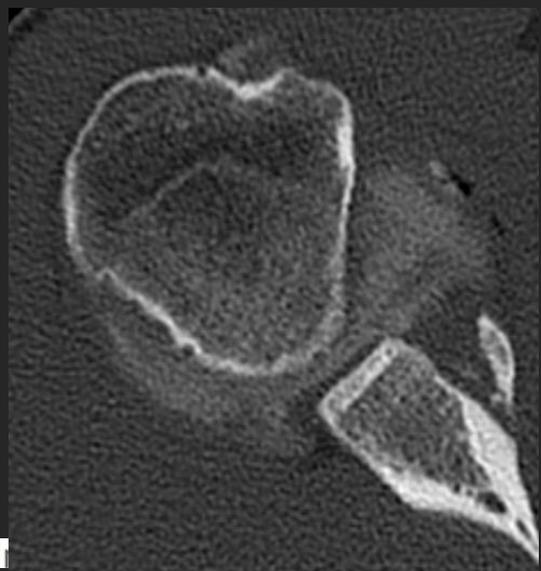
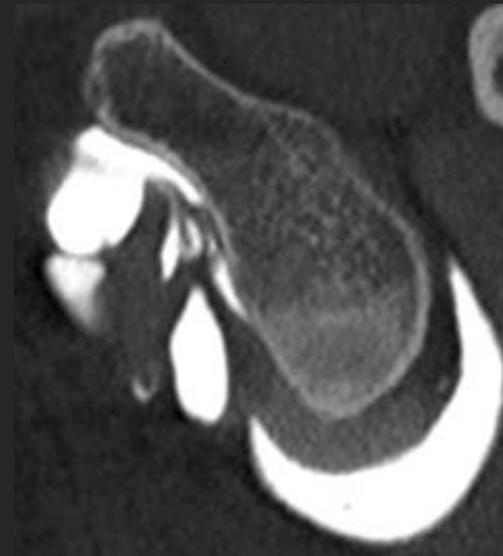
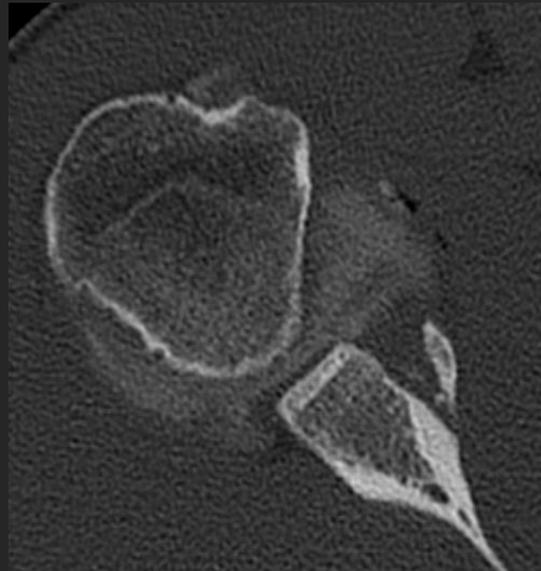


The Anatomy of Glenohumeral Instability

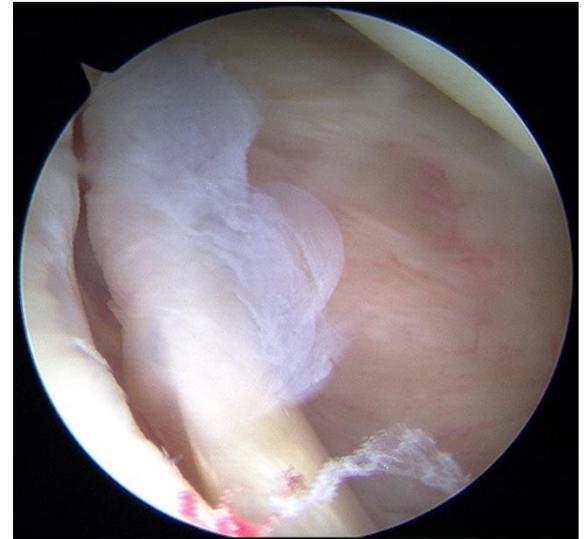
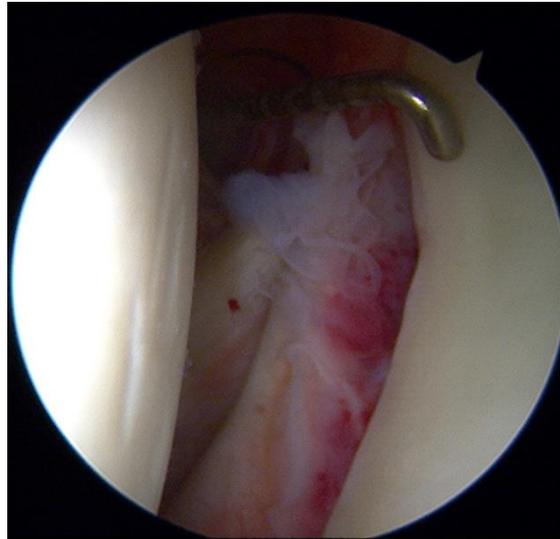
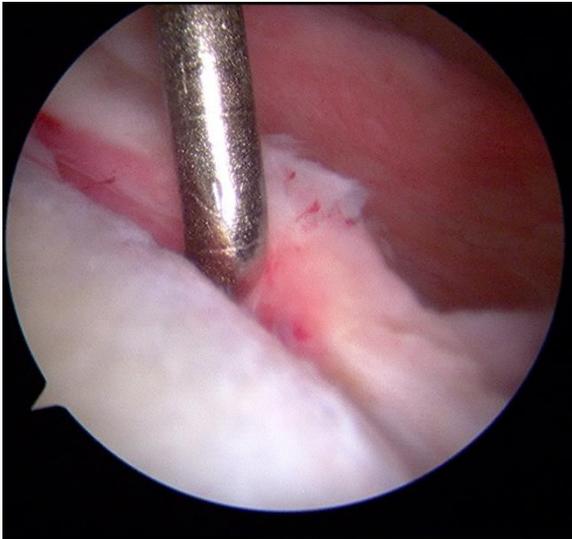
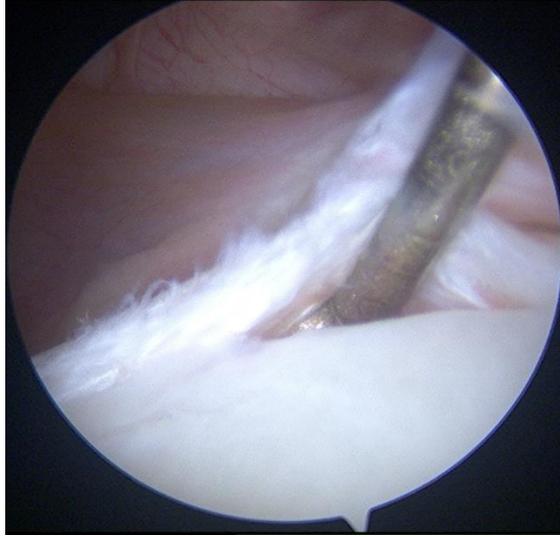
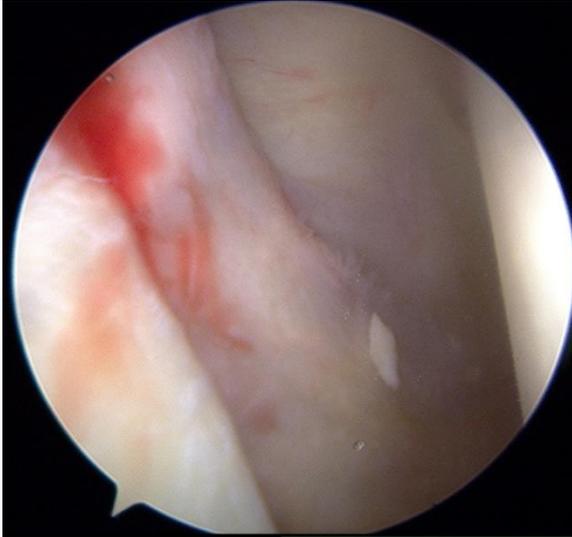
Prof Dr Nicole Pouliart
Head of the Shoulder and Elbow Unit
Professor of Anatomy and Orthopaedics



Bony lesions



Bankart lesion



Contents

Step by step

Anatomy

Function

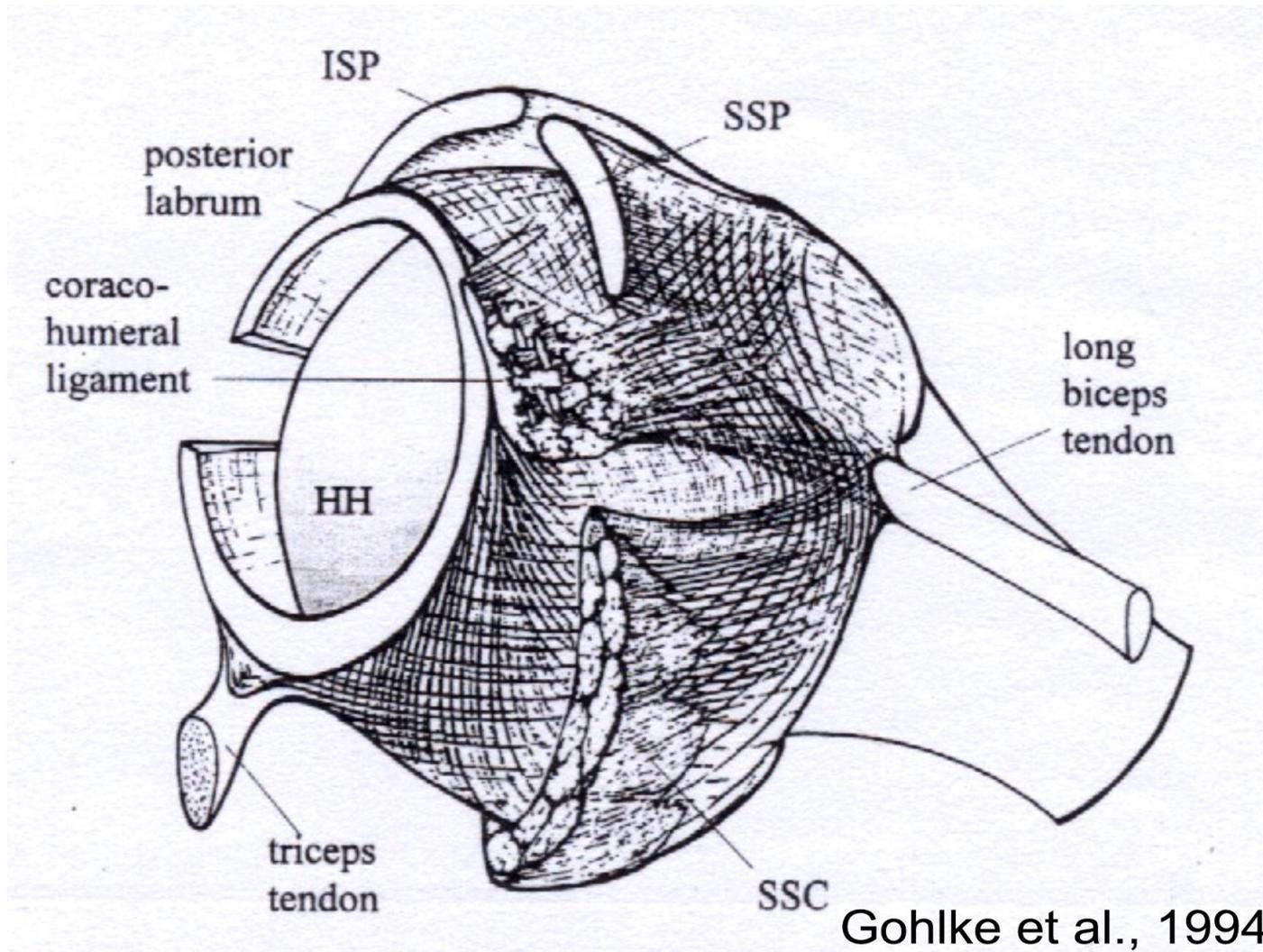
Arthroscopy

Clinical testing

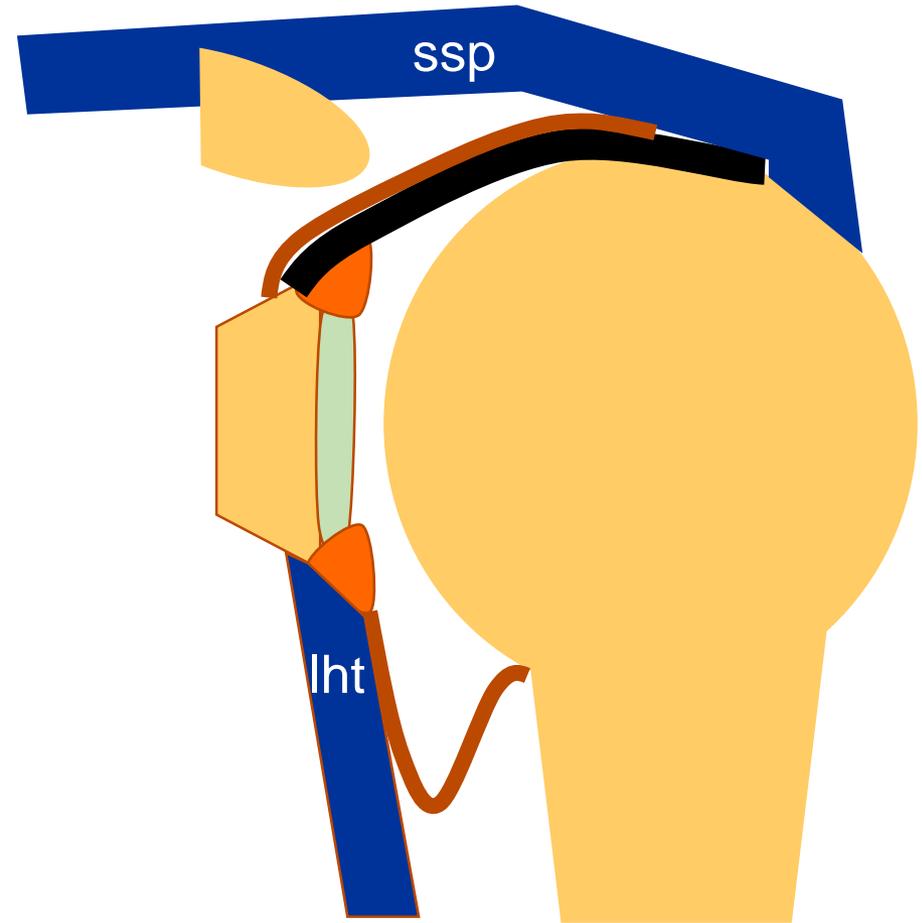
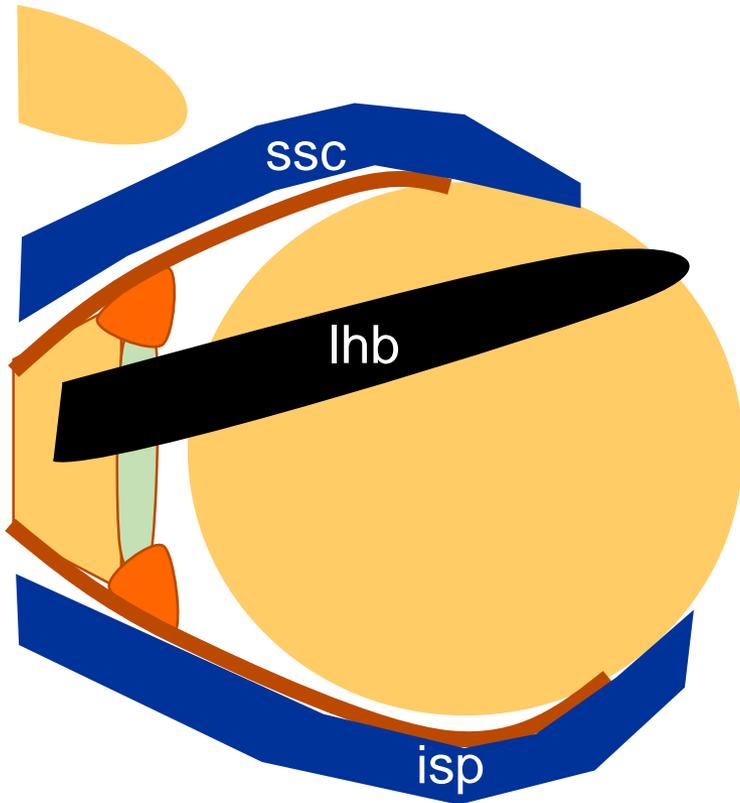
- maxROM
- Load-and-shift

Lesions

Musculocapsuloligamentous complex



Anatomy





Labrum

Anchors capsuloligamentous complex

Ring around glenoid anchoring CLC

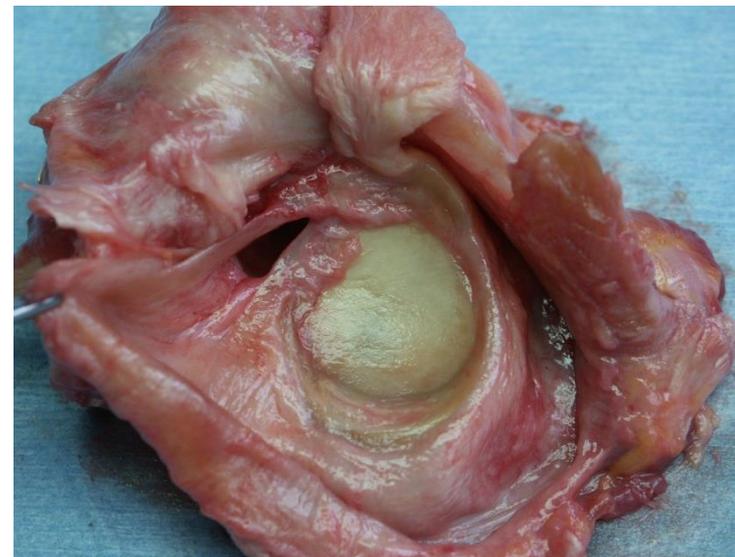
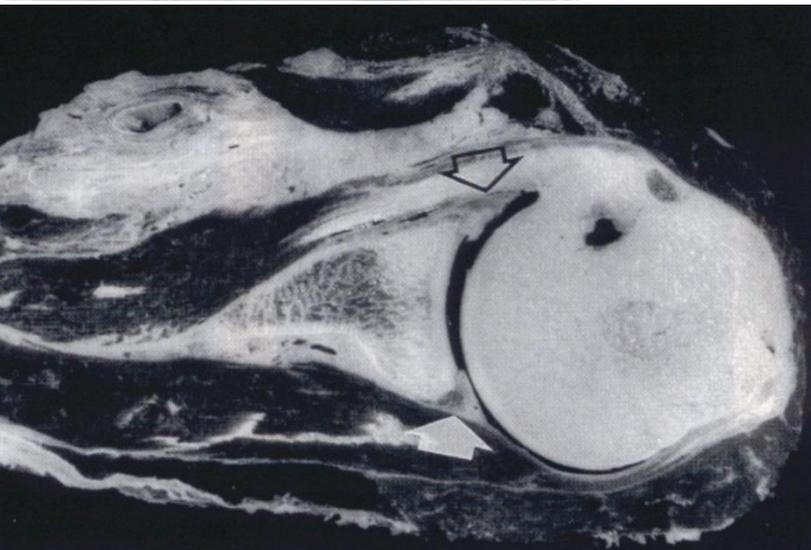
- Esp in inferior part
- In ¼ capsule not on labrum

Concavity-compression

Seal for vacuum effect (>negative IAP)

Chock-block

Conforming glenoid and humeral spheres

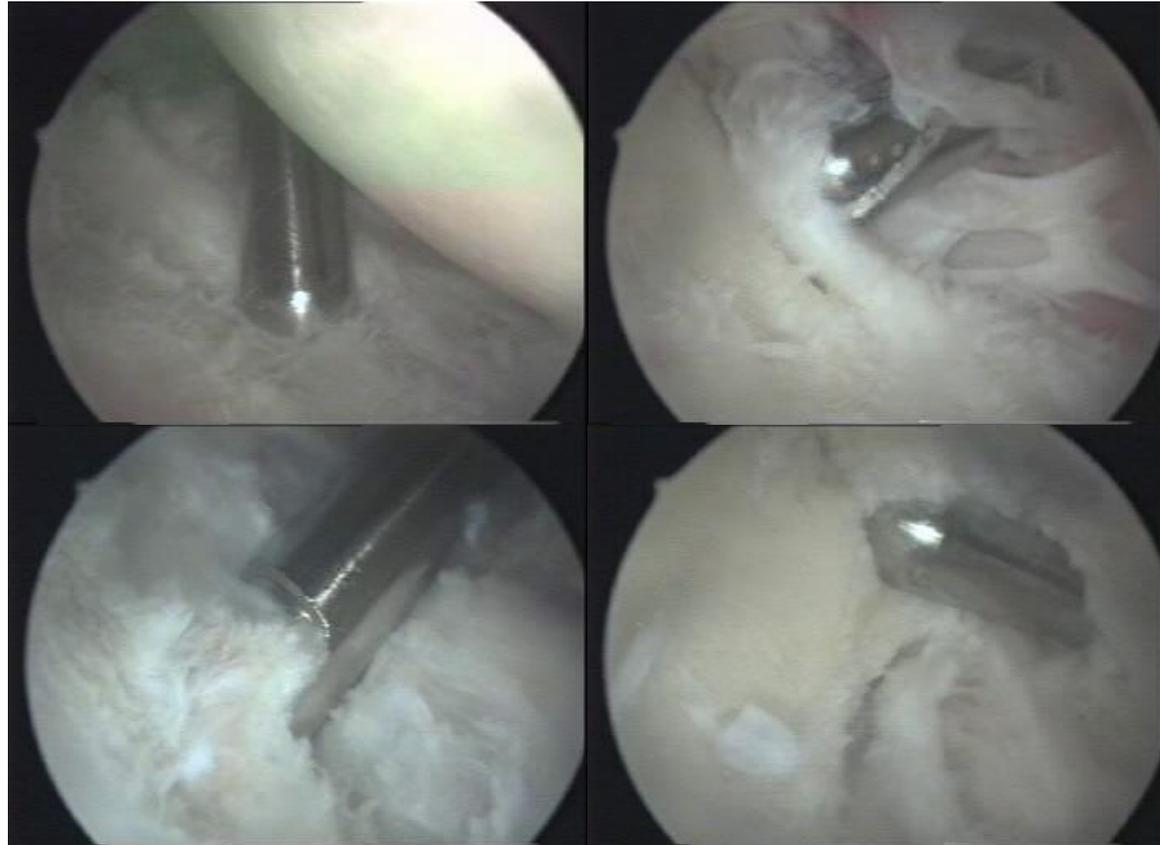


Labrum

But:

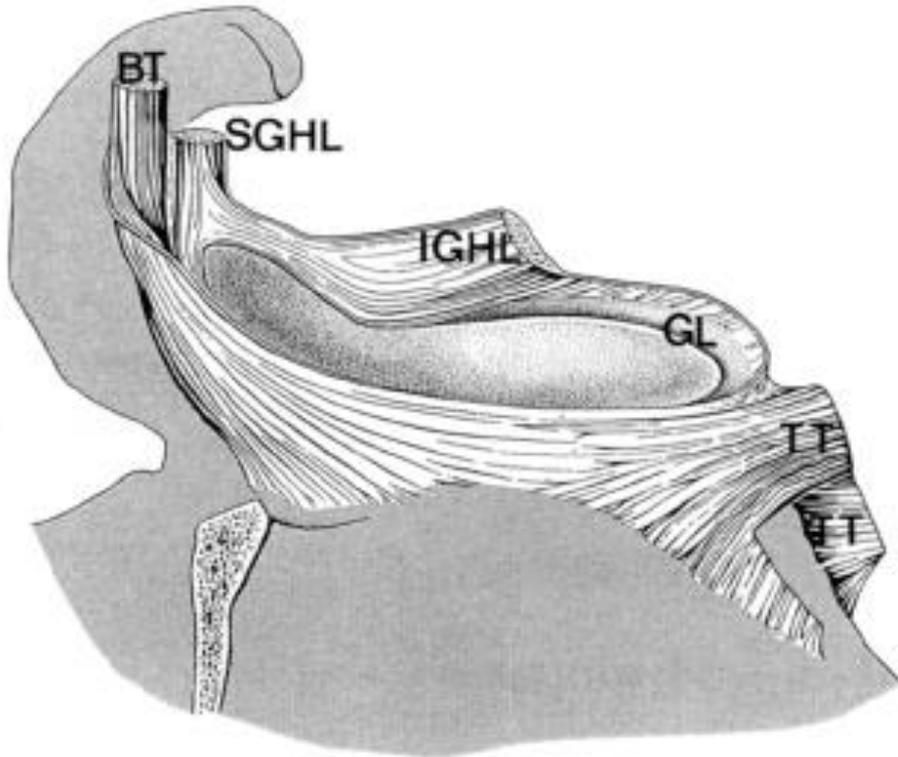
**lesion of labrum only
not enough for dislocation**

Anterosuperior part:
no instability

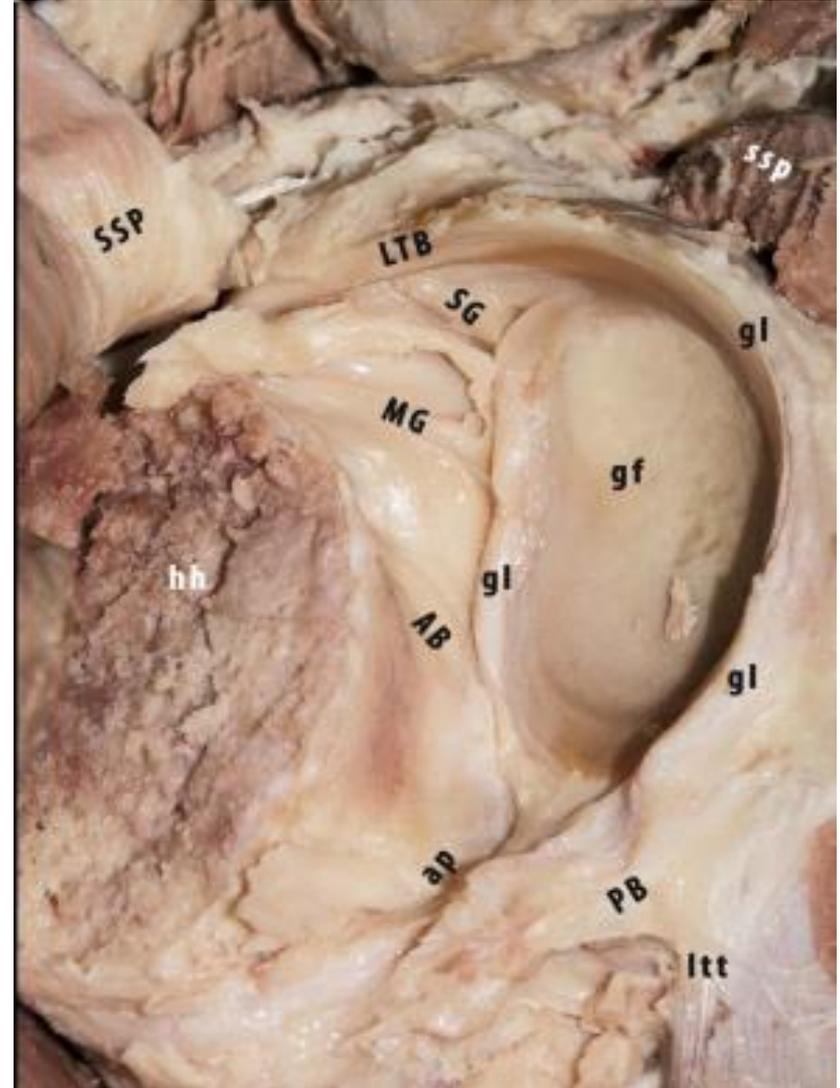


Anteroinferior part:
max subluxation

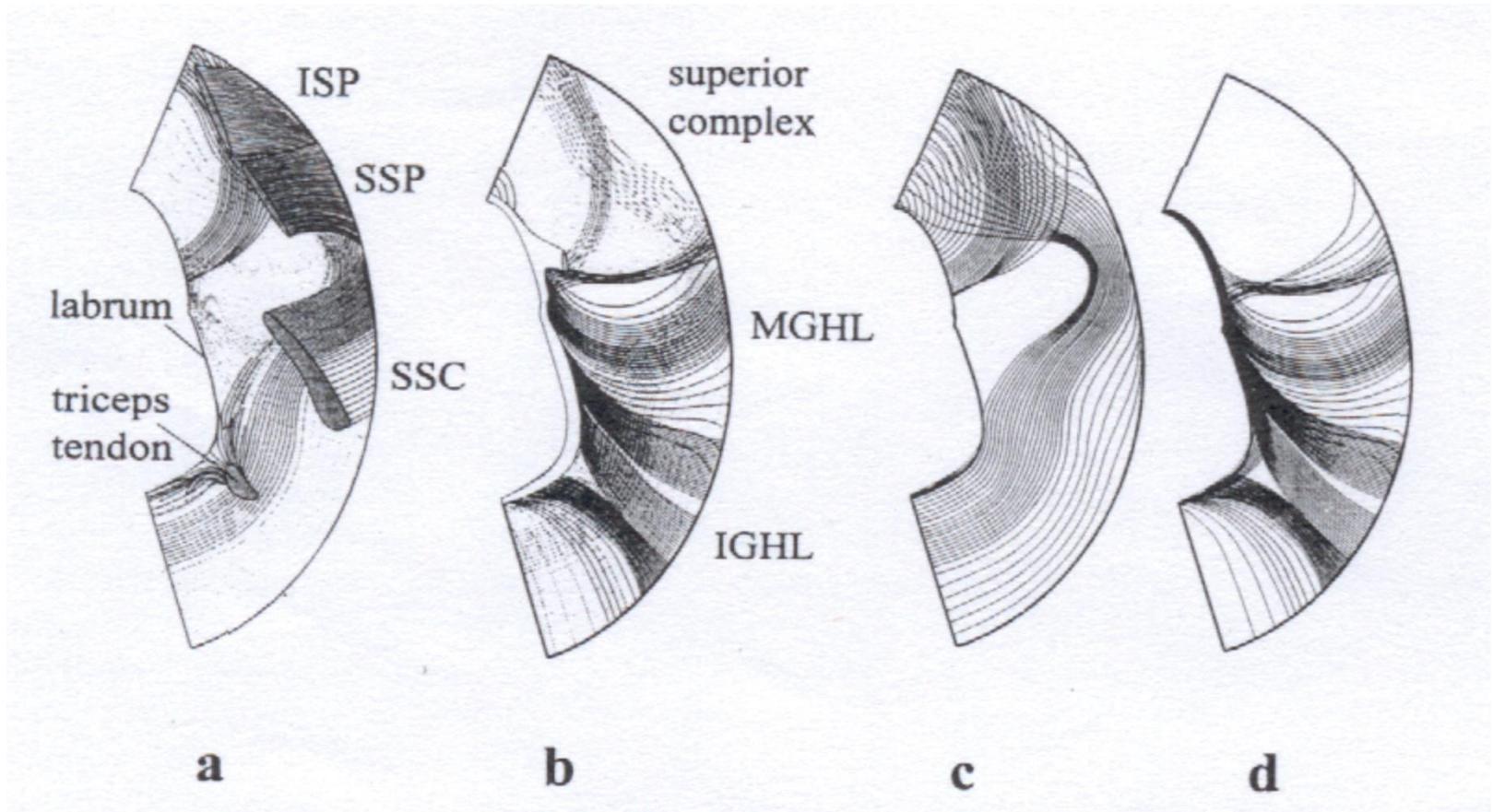
Periarticular fiber system



Huber and Putz, A'scopy 1997
Di Giacomo and Pouliart, 2008



CLC: ultrastructure

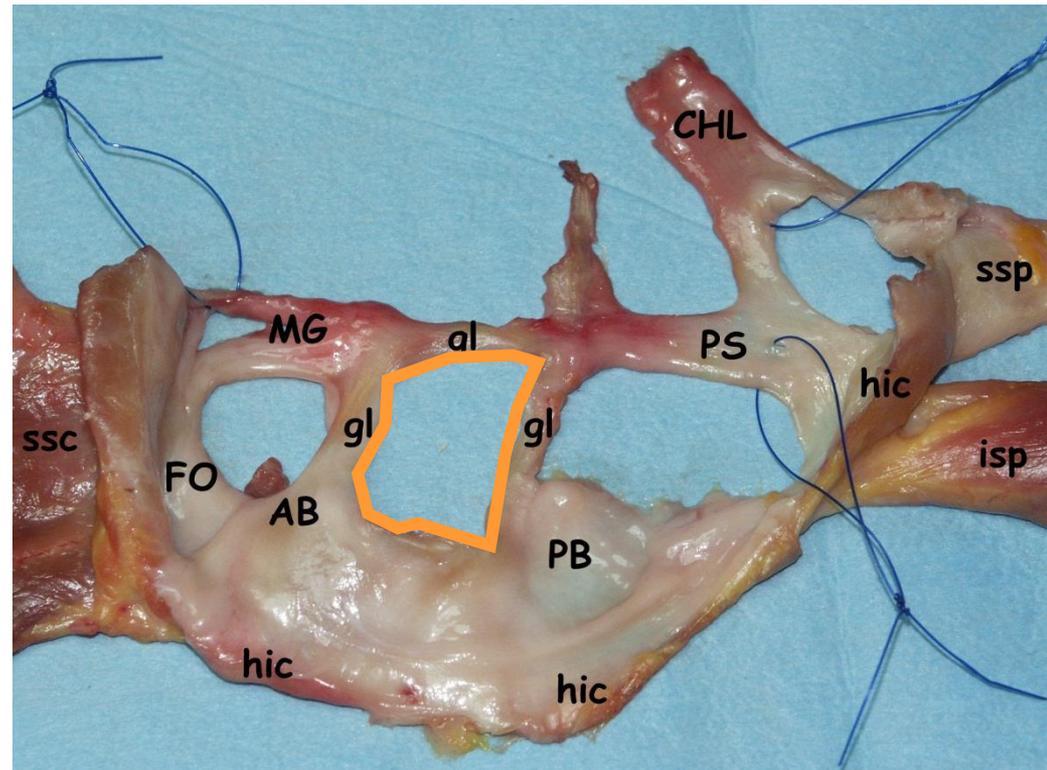
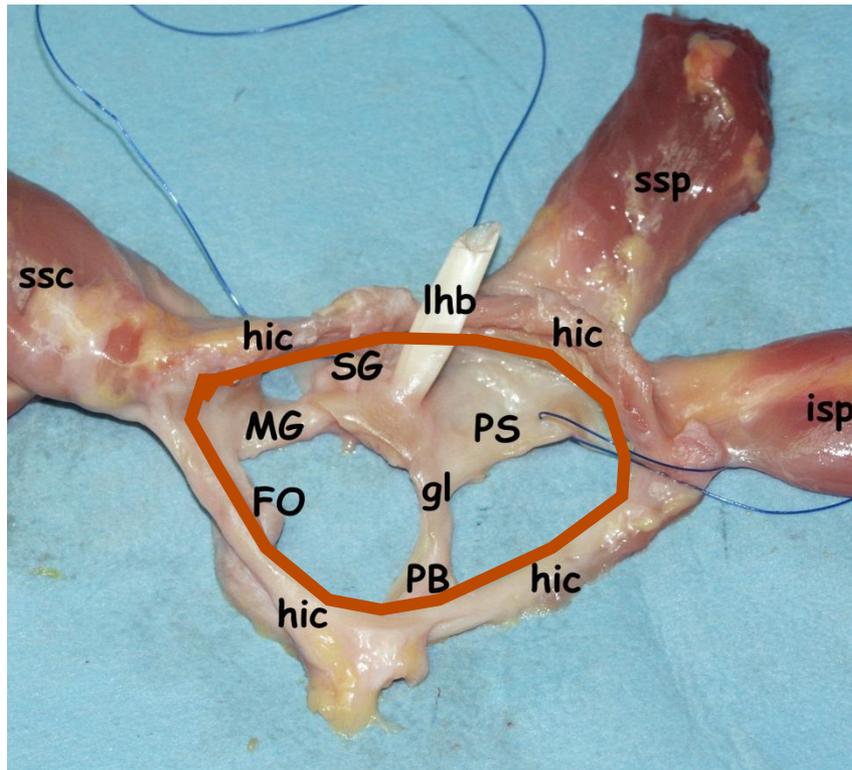


Gohlke et al., 1994

Chainmail of linked rings

Hic : humeral
insertion of capsule

Gl: glenoid labrum



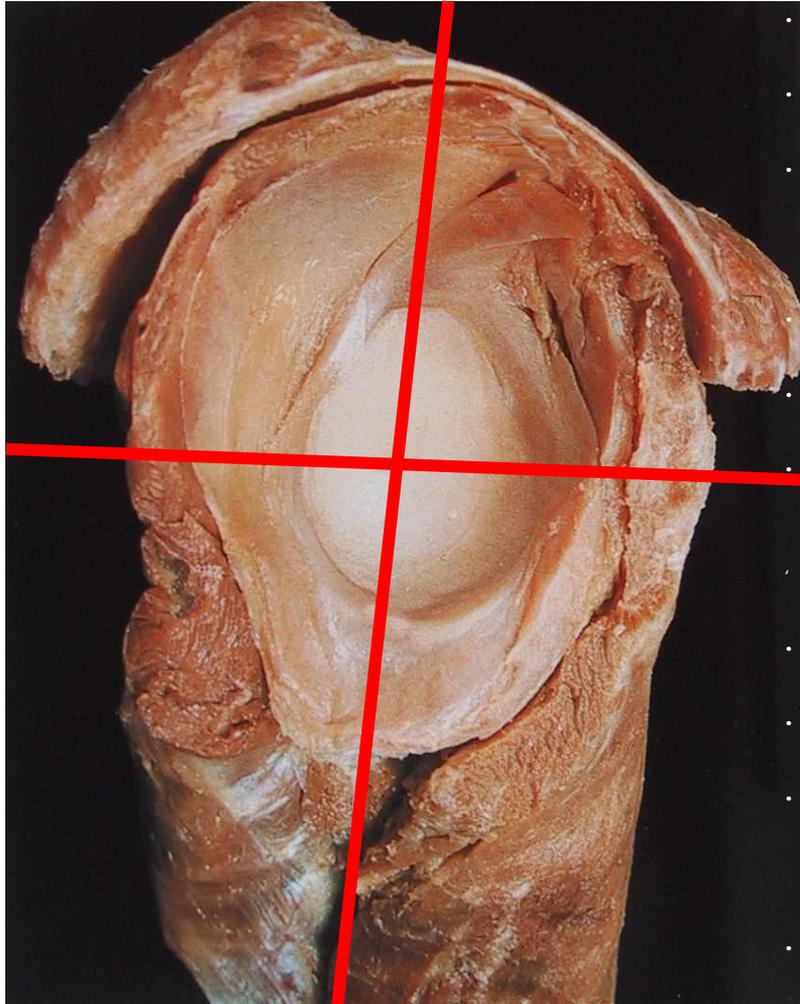
Four quadrants

Posterosuperior

ADIR

PSGHL

ISp



Anterosuperior

ADER – ABER1

90-0, 45-0 & 30-0

Castagna, ER-45

SGHL-RCI-MGHL

LHB – pulley – SSp

(SSc)

Anteroinferior

ABER - HAT

90-90

HAT, LAS

MGHL-ABIGHL-FO

SSc – Tric/LD

Posteroinferior

ABIR

Post jerk

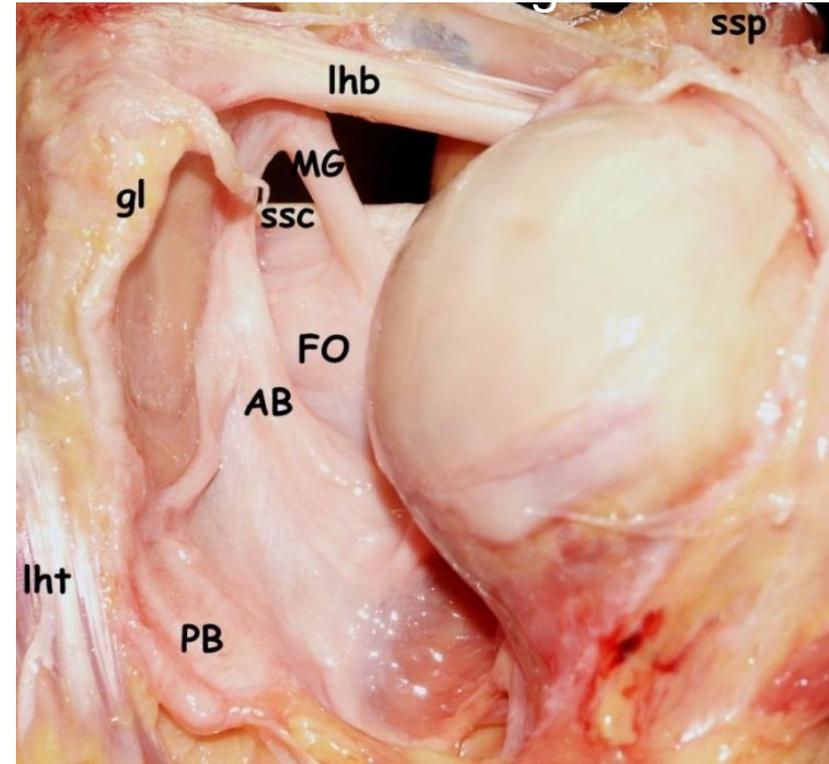
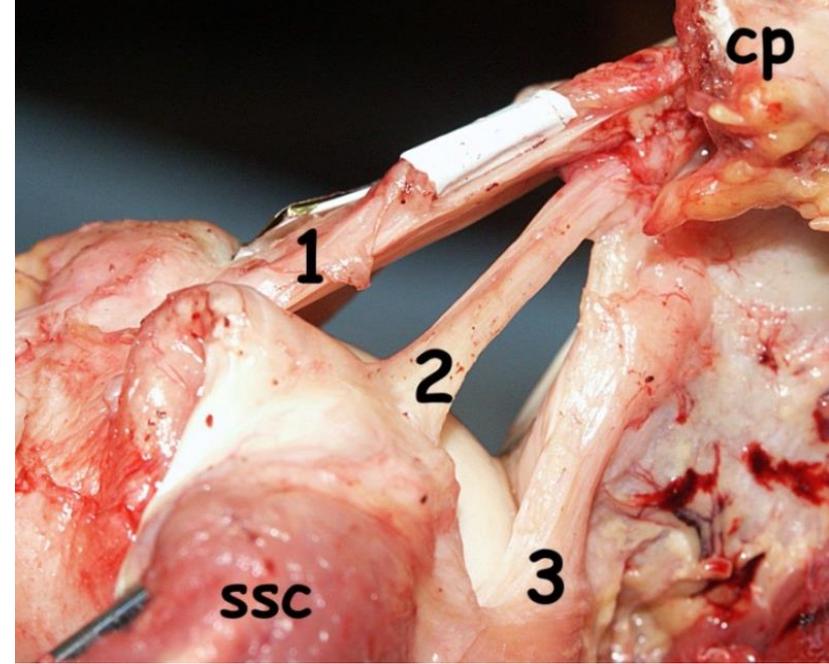
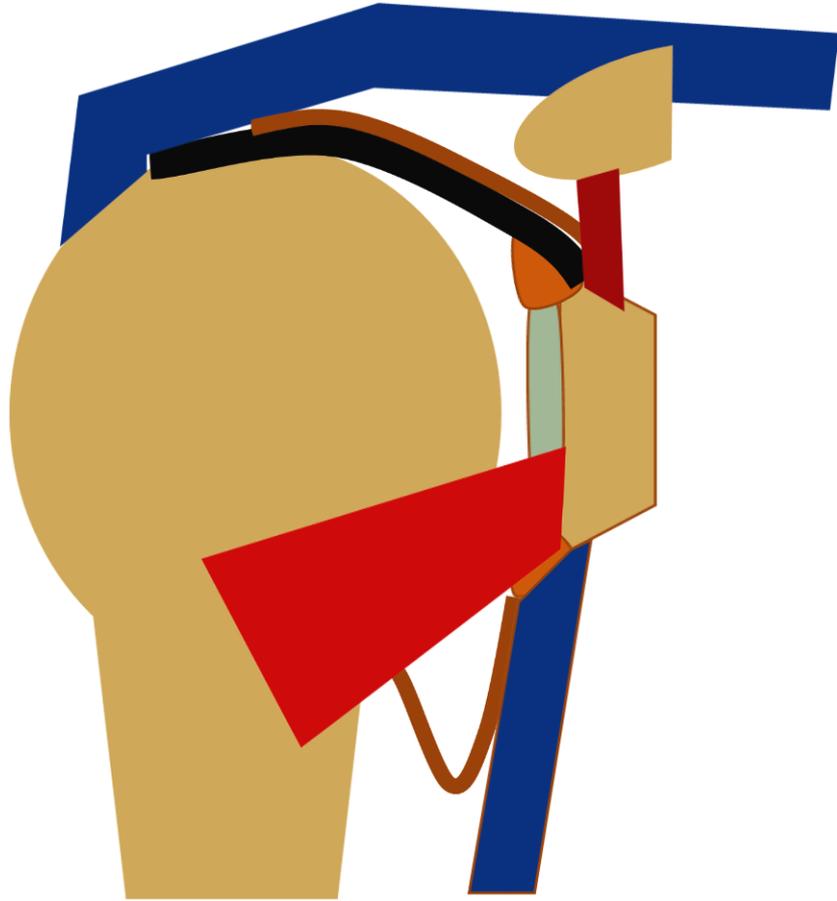
Kim

PBIGHL

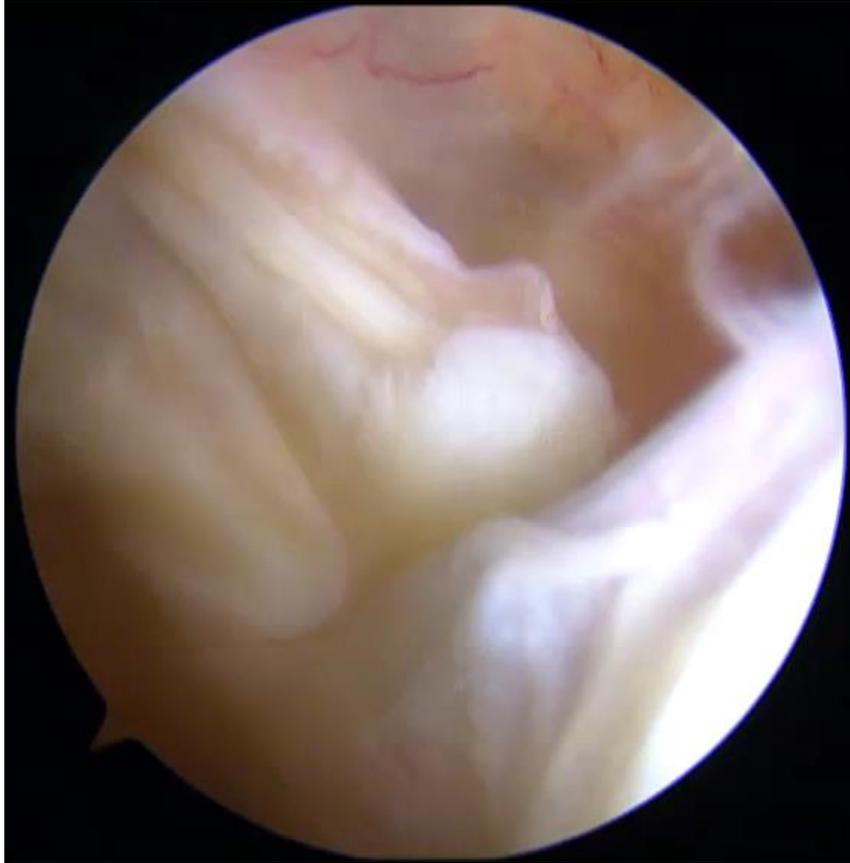
Ter min



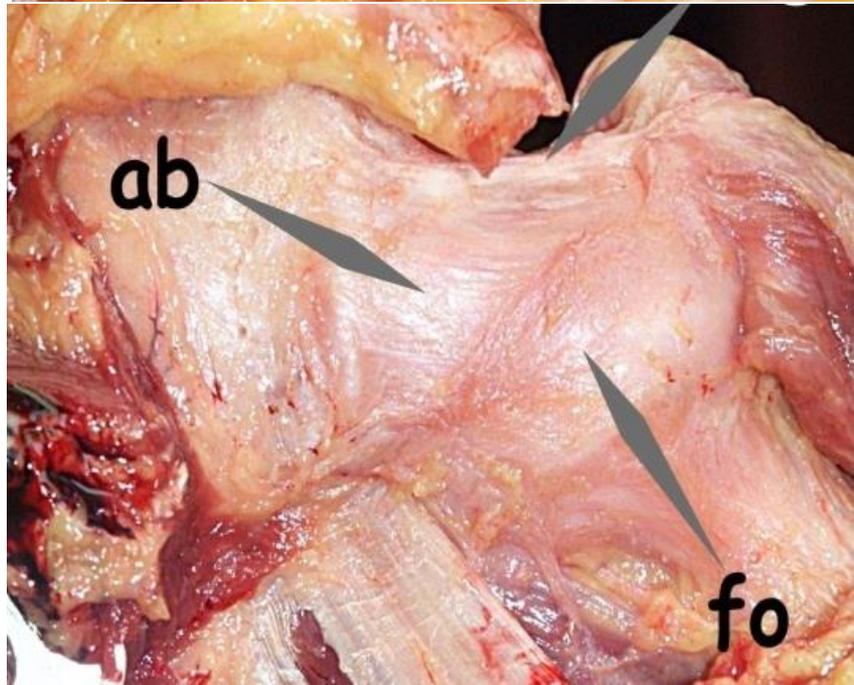
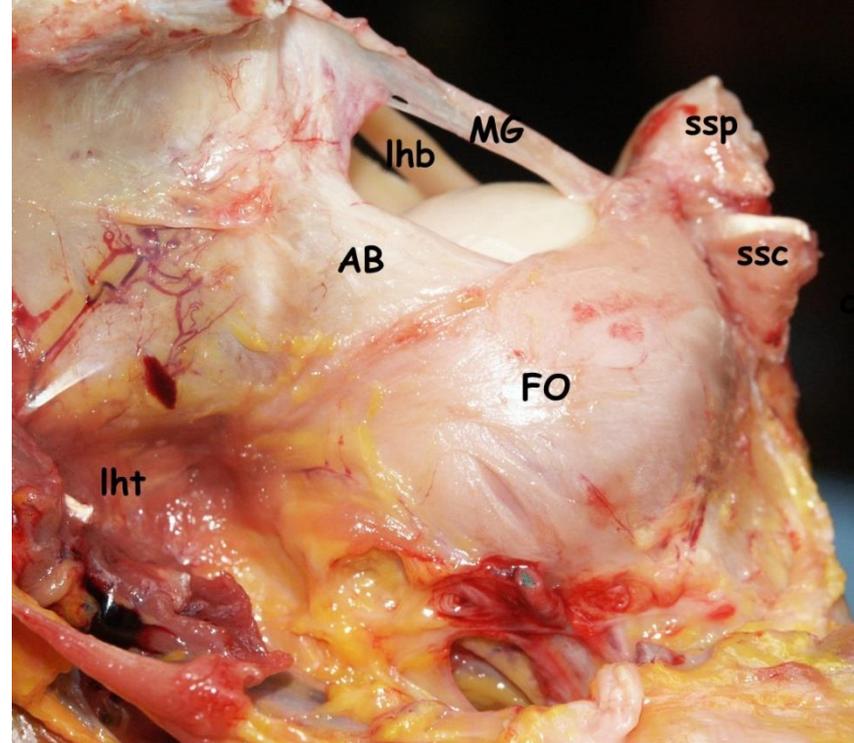
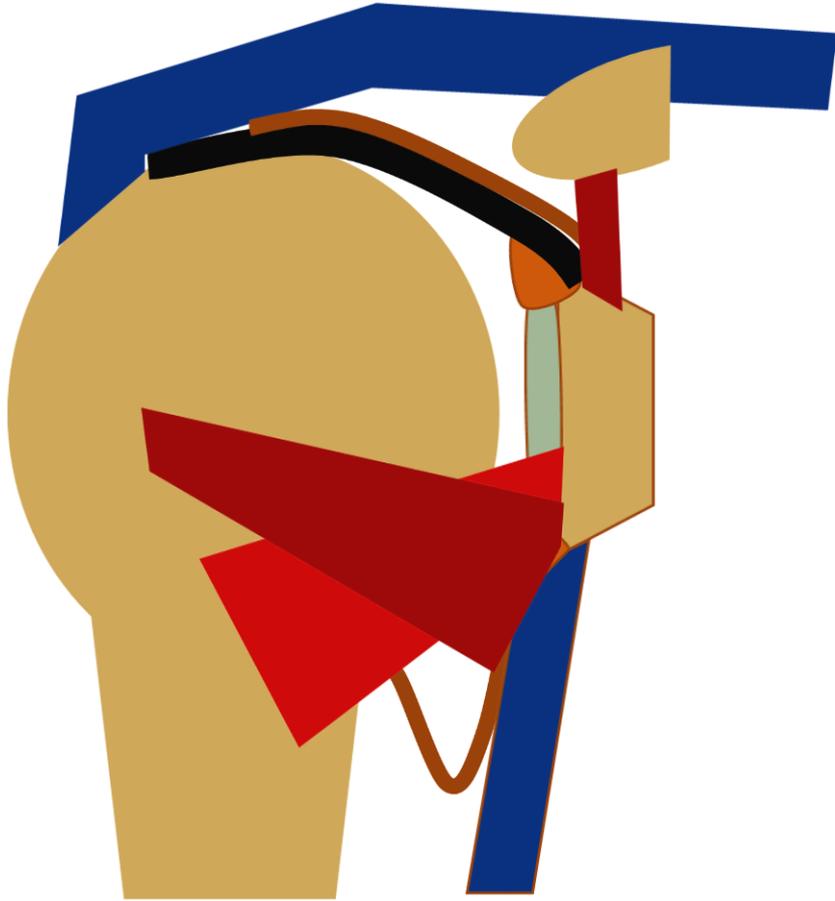
ABIGHL

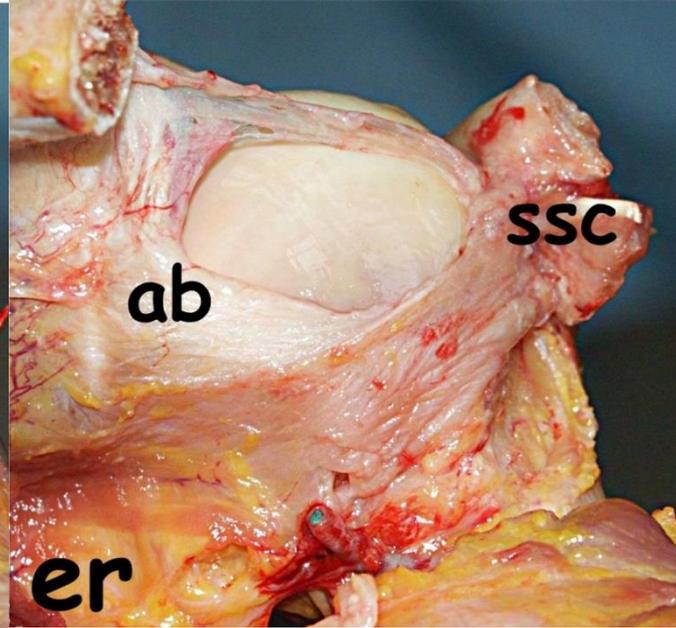
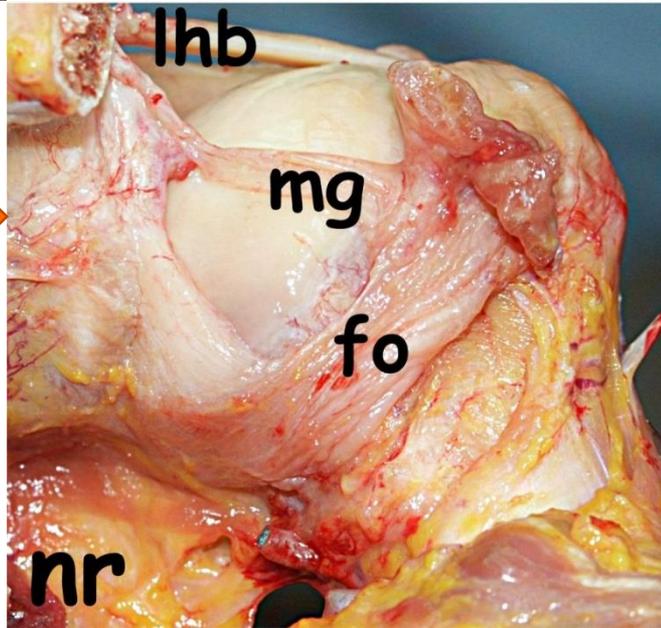
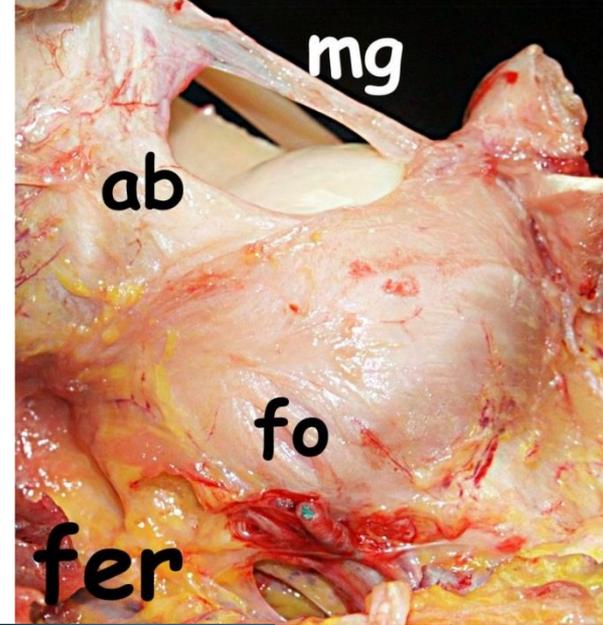
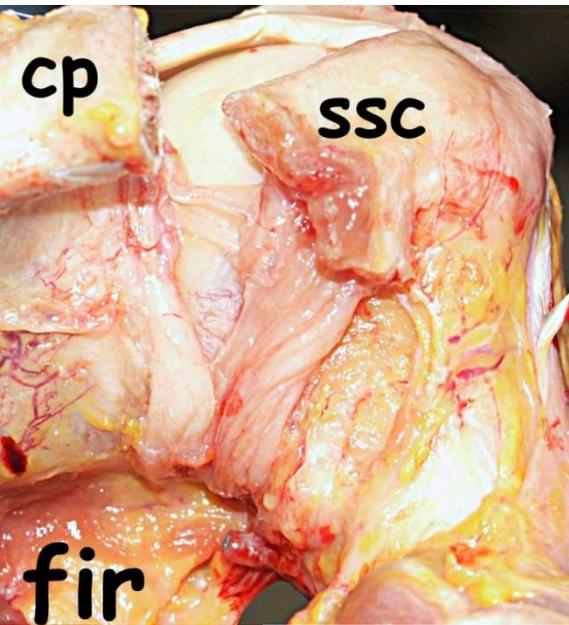


ABIGHL



Fasciculus Obliquus





Arthroscopic signs

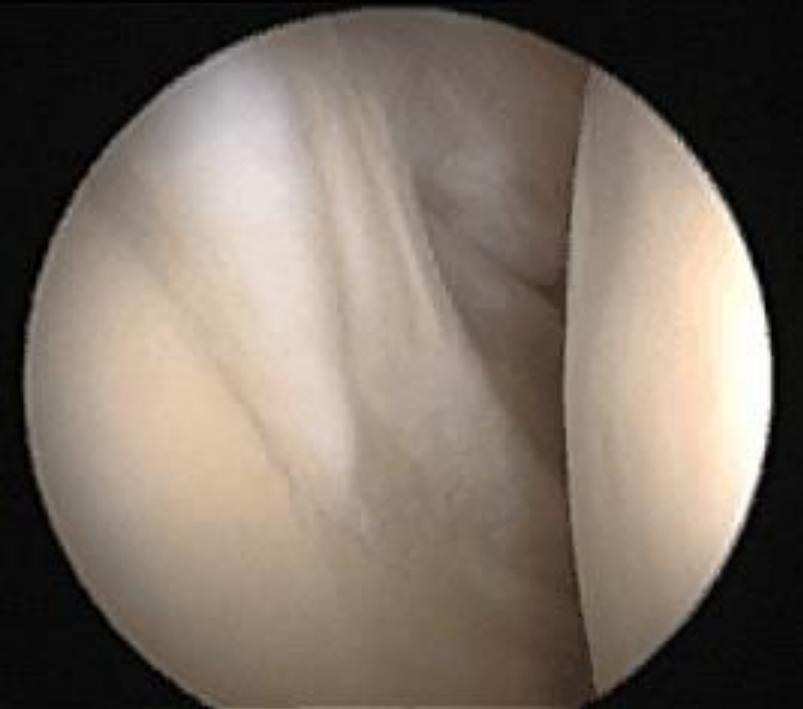
Folding-unfolding mechanism = Indication of ligament insufficiency

folds indicate MGHL and IGHL
more prominent (folded)

- in adduction (AD) and internal rotation (IR)

smoothed out (tensioned)

- upon abduction (AB) and external rotation (ER)
- at a maximum of 45°ER and 45°AB
= normal tension MGHL and IGHL
- when no or incomplete FUM within this
45°-45° range
 - MGHL and IGHL = probably insufficient
(torn or stretched)





ABER2max

Hyperrotation test

Often ▲ in overhead athletes
w/wo ▼ internal rotation



Experimental & Clinical study

- $> 100^\circ$ when $LAS \geq 2$
- $\geq 100^\circ$ $>$ clc damage ≥ 2 zones
- $\leq 90^\circ$ regardless of zones if $LAS \leq 1$

~ integrity of chinese finger trap
only ↗ when clc damage results in
positive LAS-tests

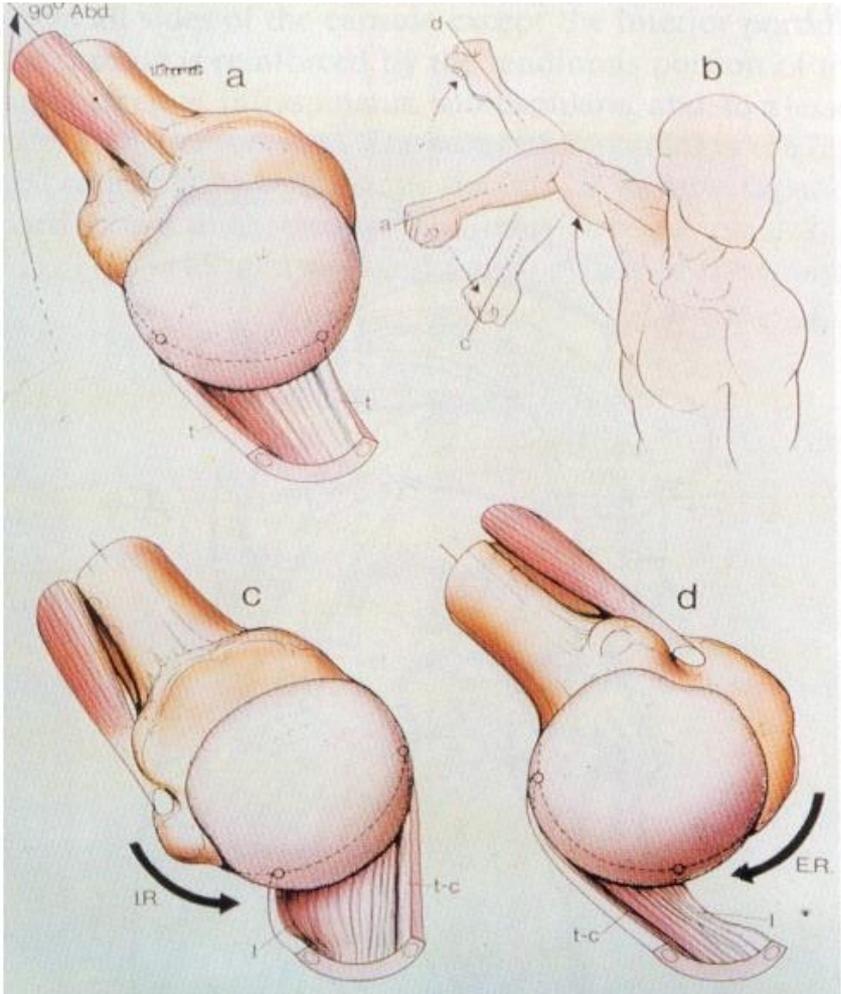
LAS-test ABIGHL 90-90



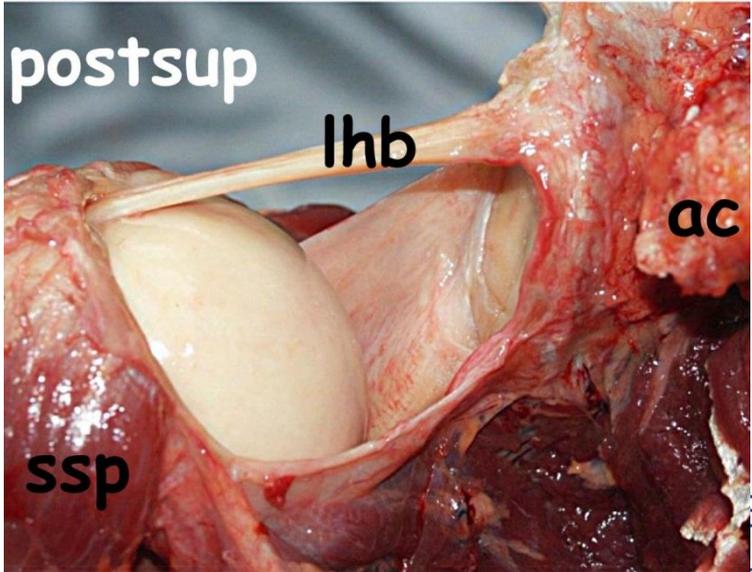
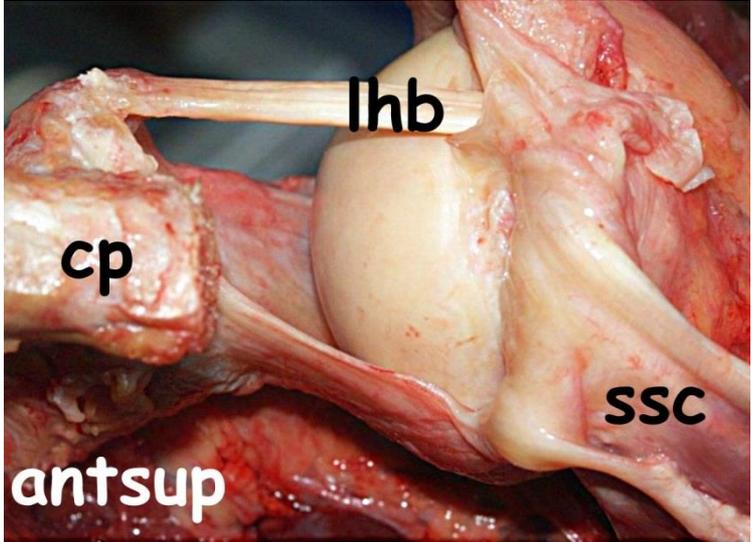
ABIGHL



IGHLC



O'Brien et al., 1990





HAT



Hyperabduction test (Gagey 2001)

>105° = inferior instability =
lesion IGHLC

Experimental & Clinical study

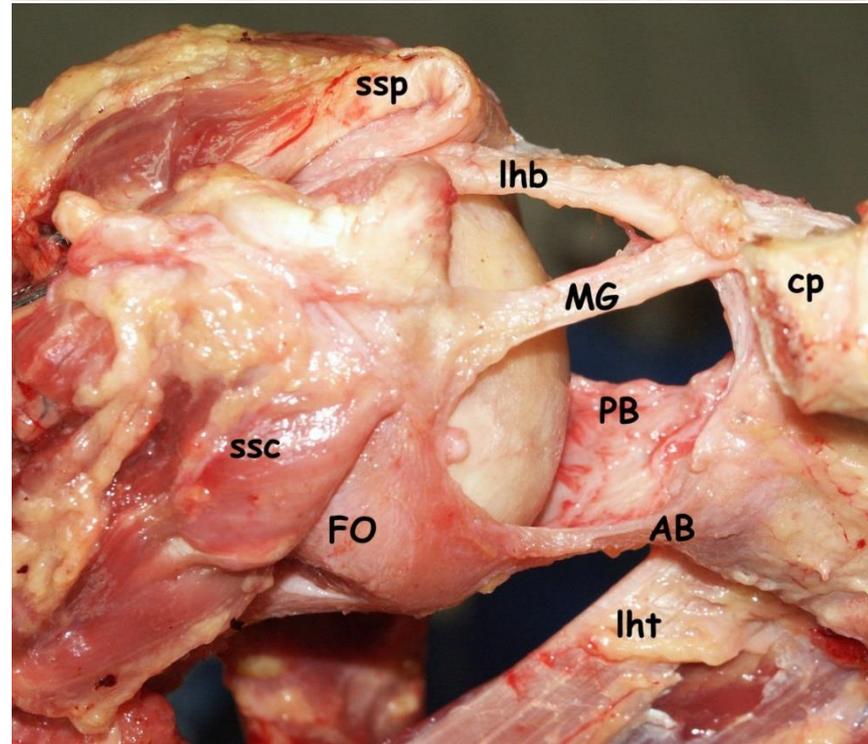
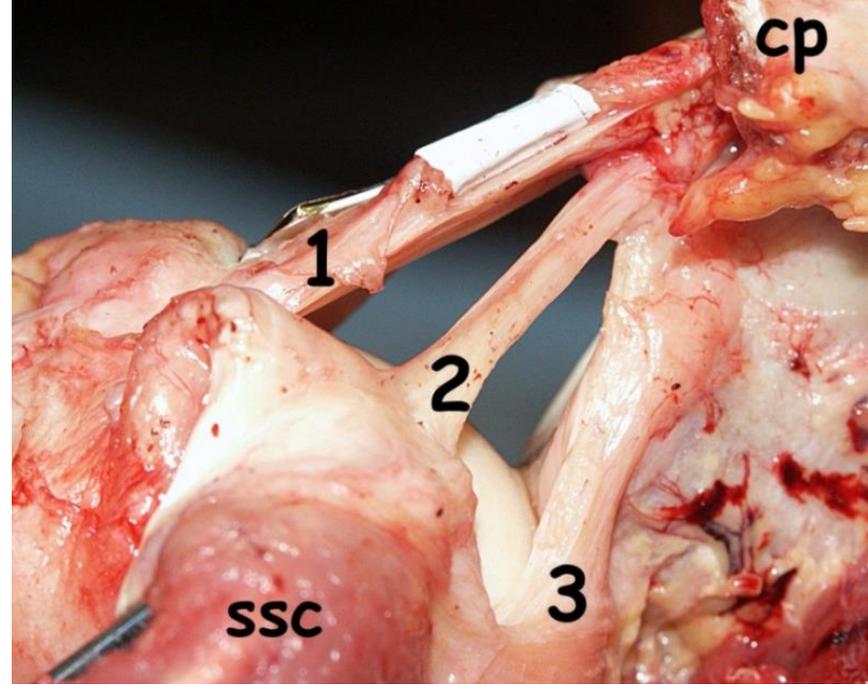
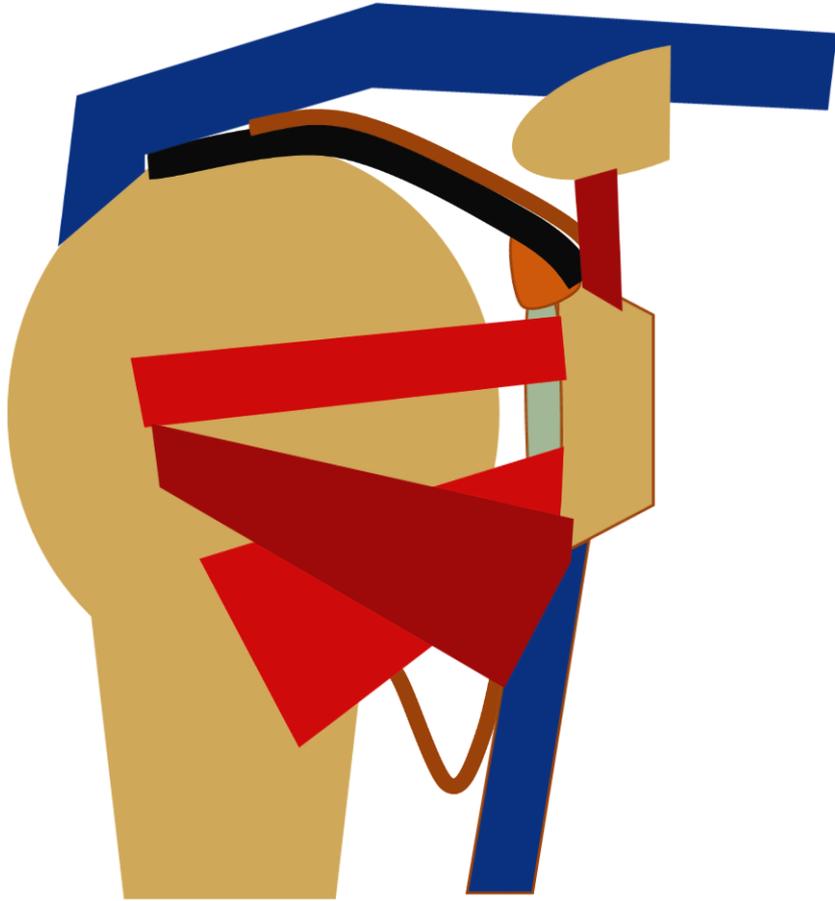
Progressive increase with
extent of clc damage

- 100-110° > clc damage 1 or 2 zones
- >110° > clc damage ≥ 3 zones
- Regardless of pathology

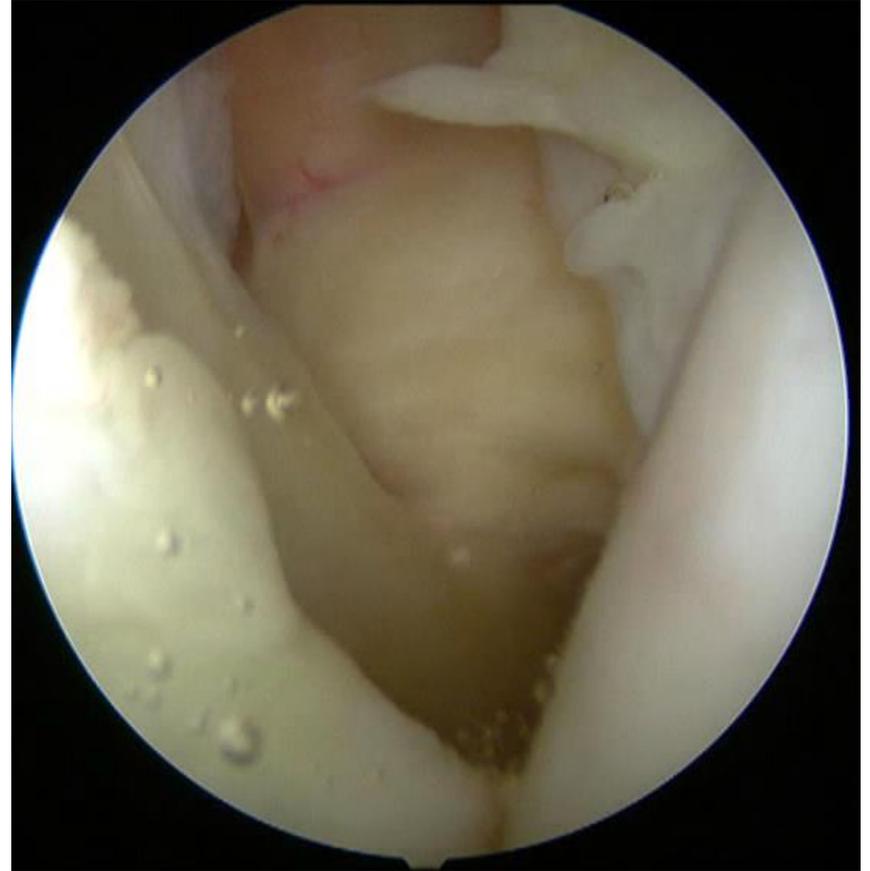
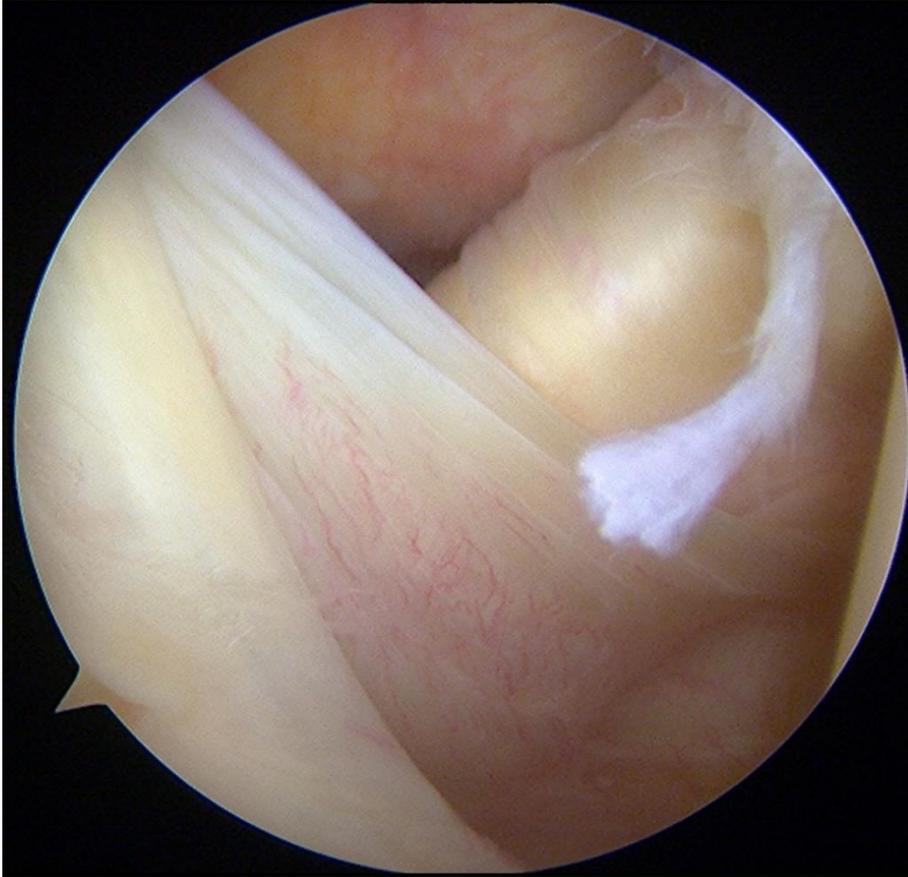
~ Dependent on attachment of
circular systems

- Either glenoid (labrum + ligaments)
- Or humerus (cuff – capsule –
ligaments)

MGHL

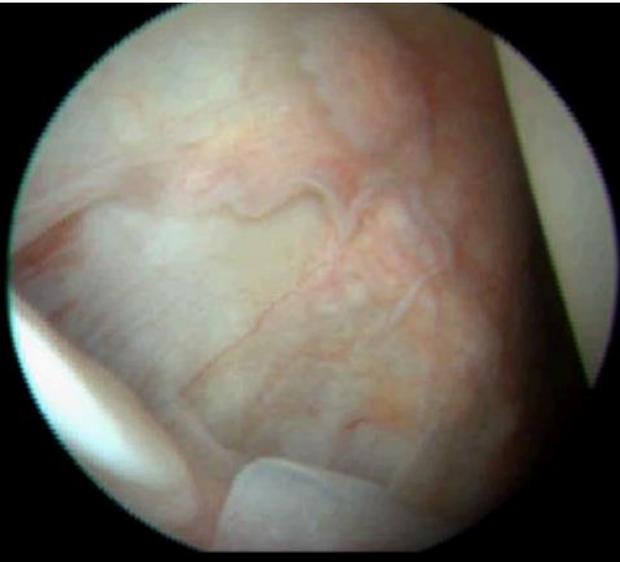


MGHL



MGHL - varianten

Cordlike



Sublabral hole



Buford



ADER – ER-45

ADER in 0-30° > SGHL – RCI

ABER1 in 30-60° > MGHL – RCI

Also limited by SSc – PM –pm

Castagna test (2007)

apprehension-relocation test

max ER in 45° abduction

ER-45 (Gagey 2014)

Max ER in 45° abd + 45° elev

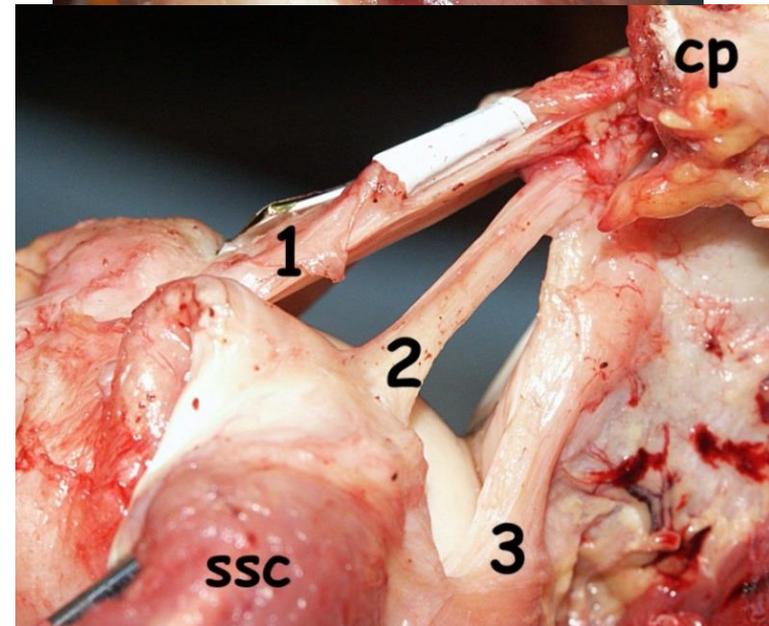
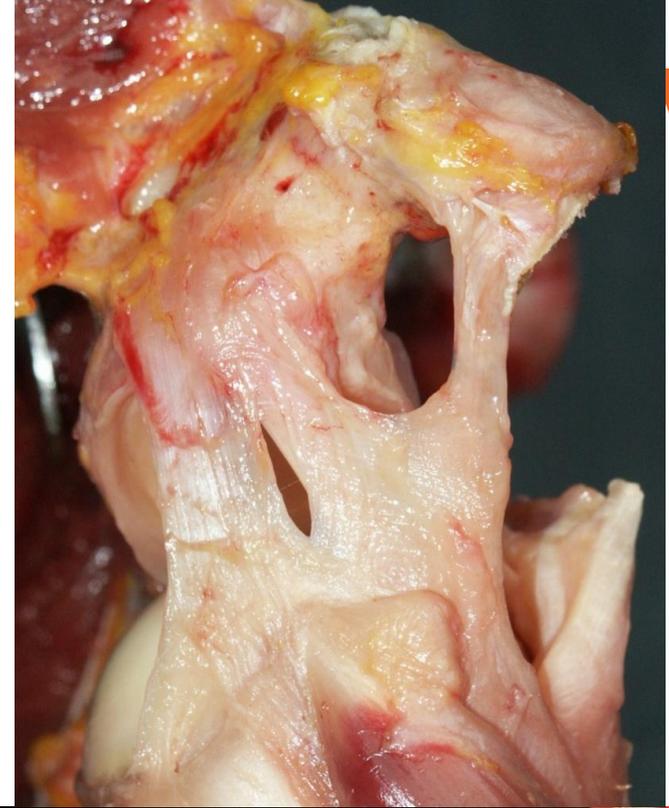
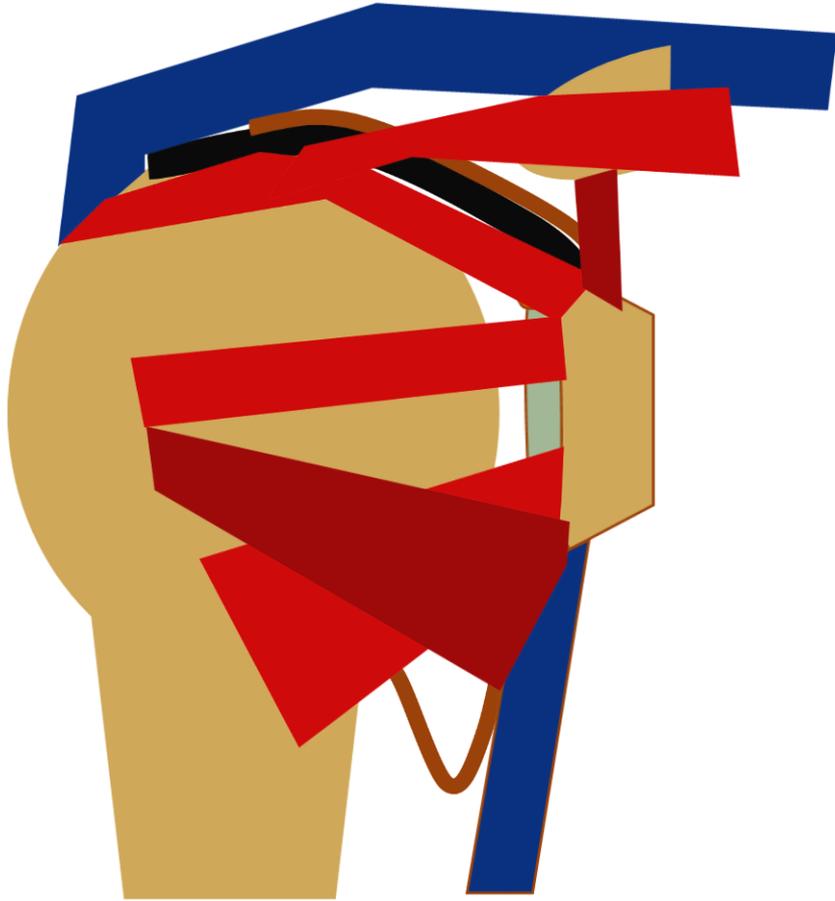
- nl < 15°
- > 15° > lesion MG or SSc
- > 30° > lesion MG and SSc



LAS-test MGHL 90-0



SGHL (superior complex)

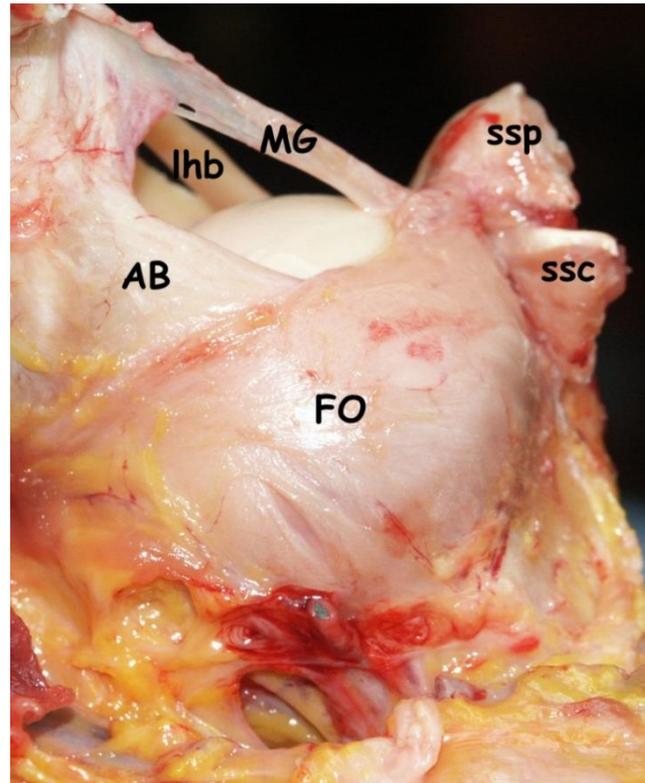


LAS-test S-MGHL 30-0



Integration

Anterior sling and ring



Bankart lesion and extension



Omoumi 2016

BANKART: periosteum torn

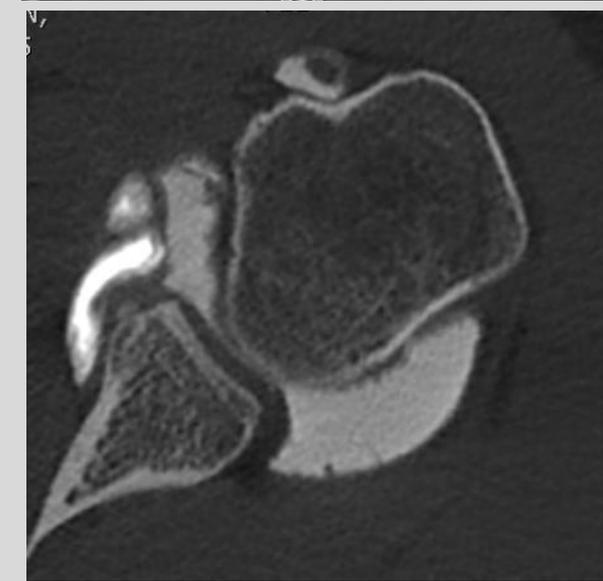
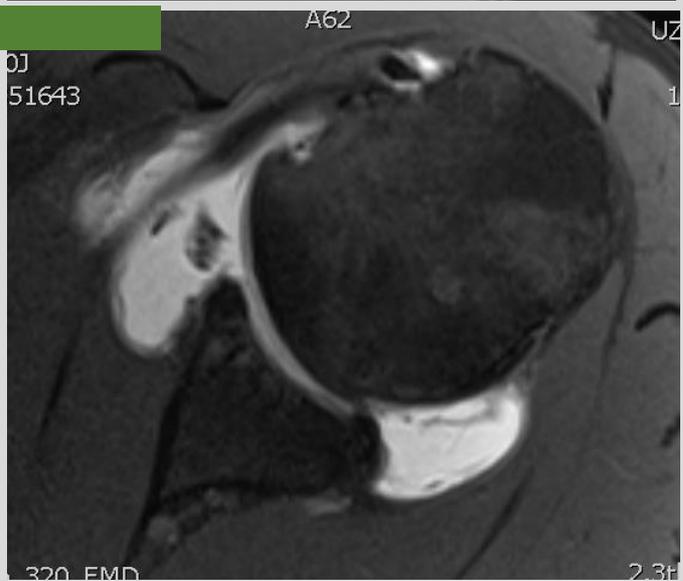
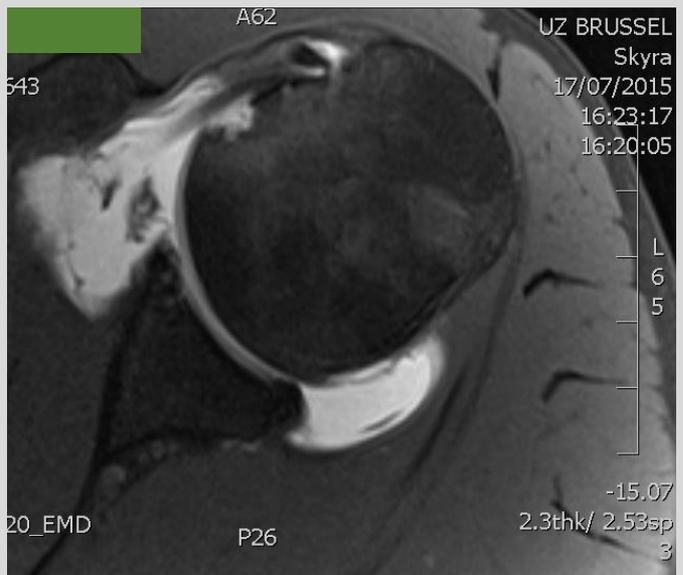


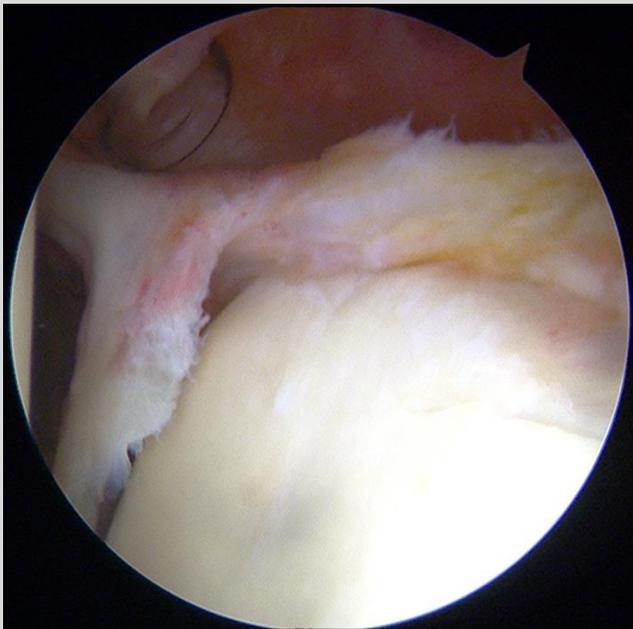
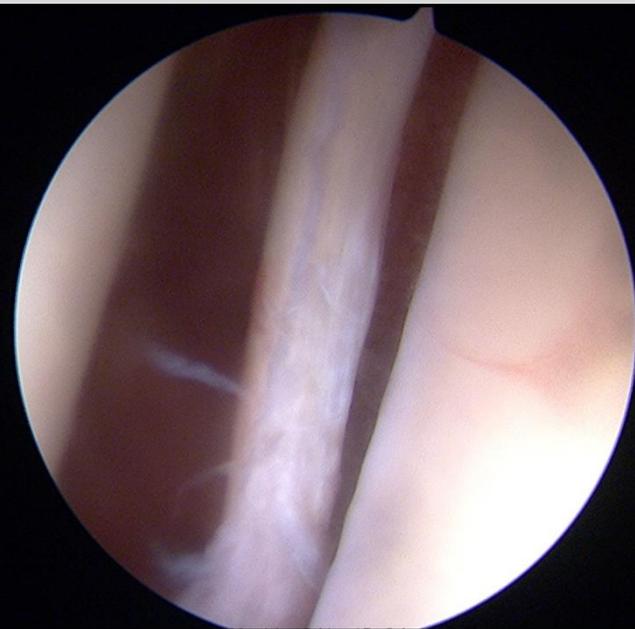
BANKART variants: periosteum continuous

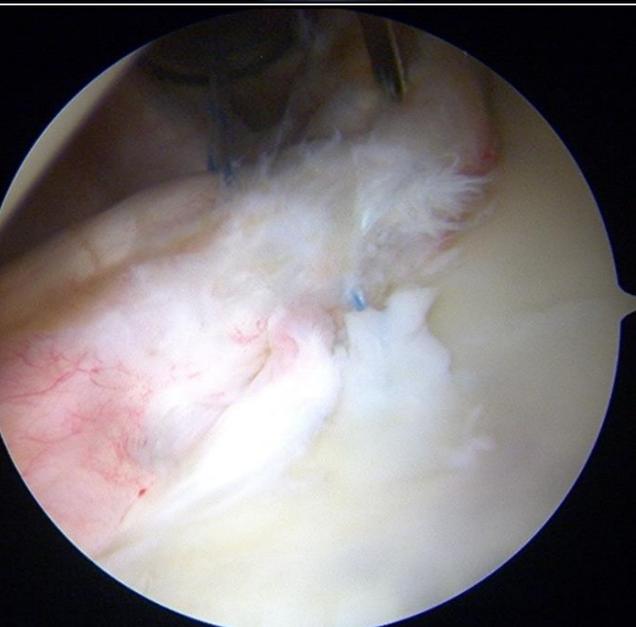
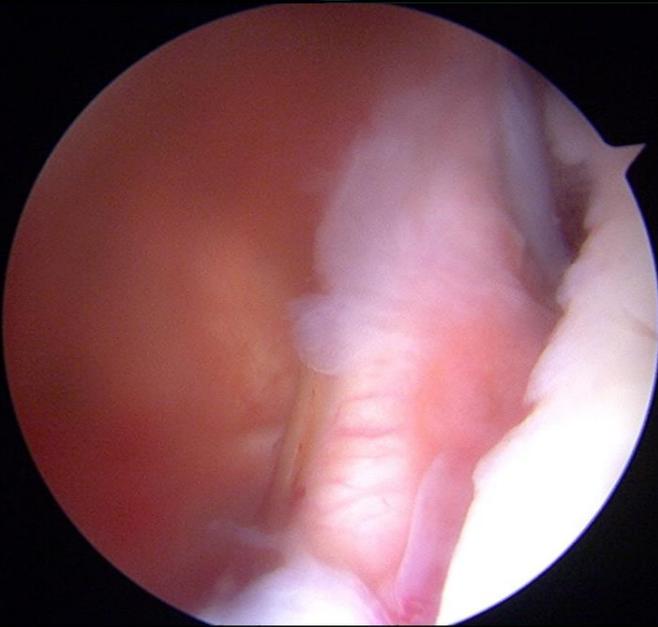


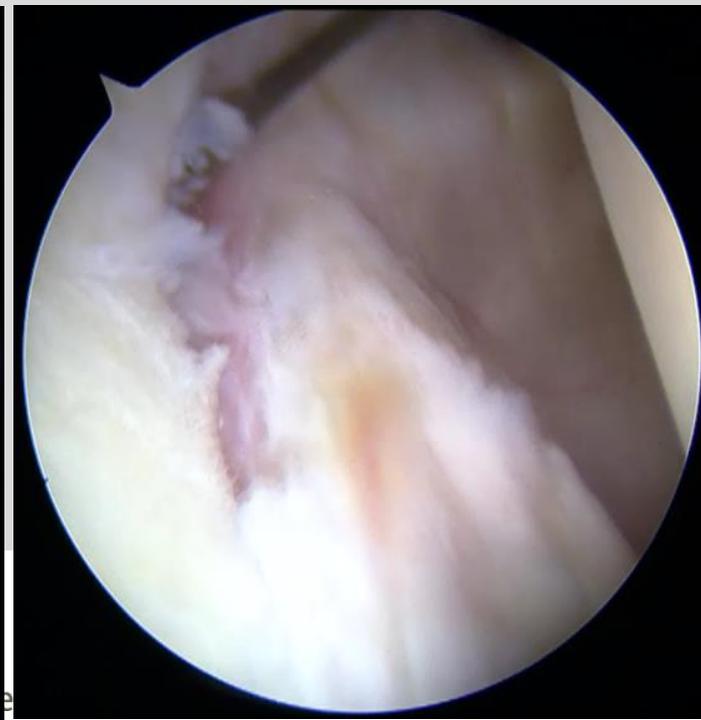
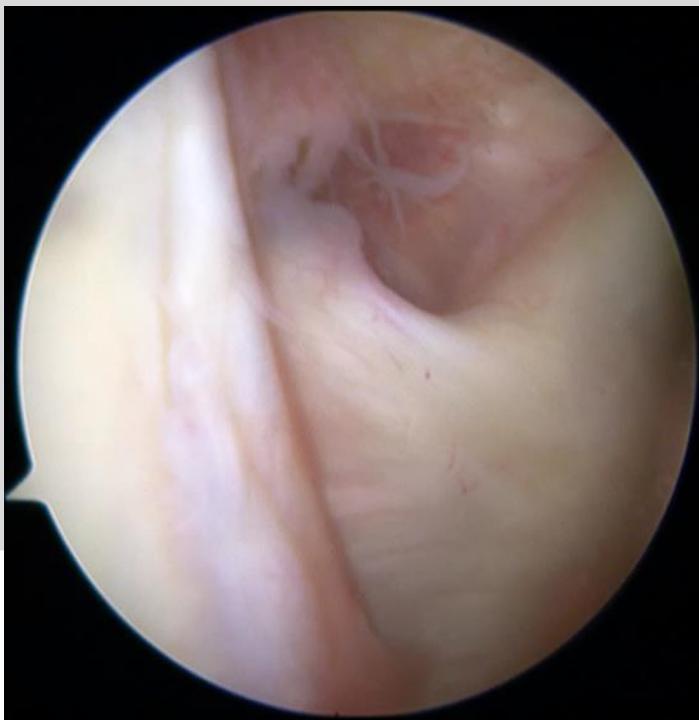
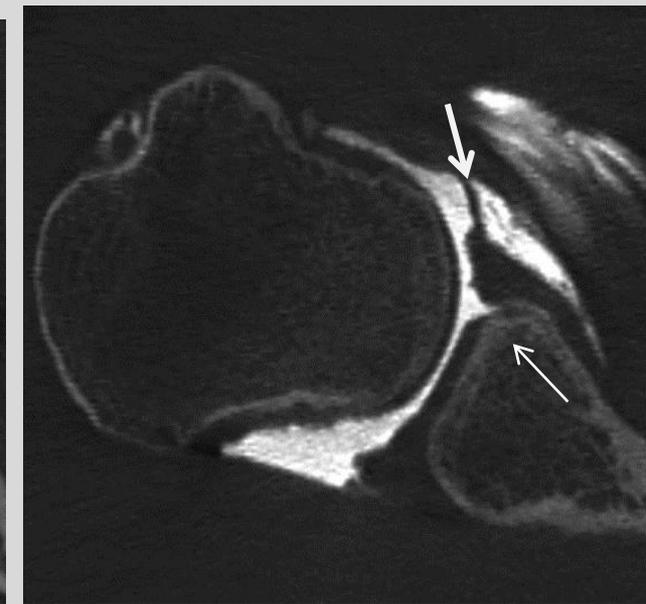
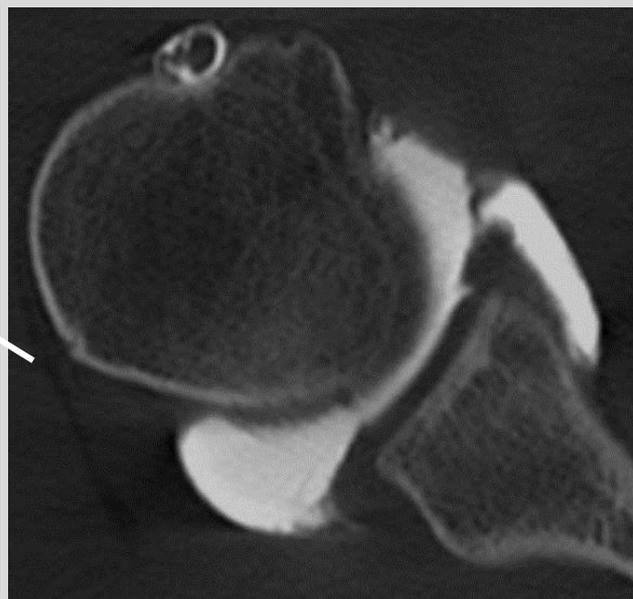
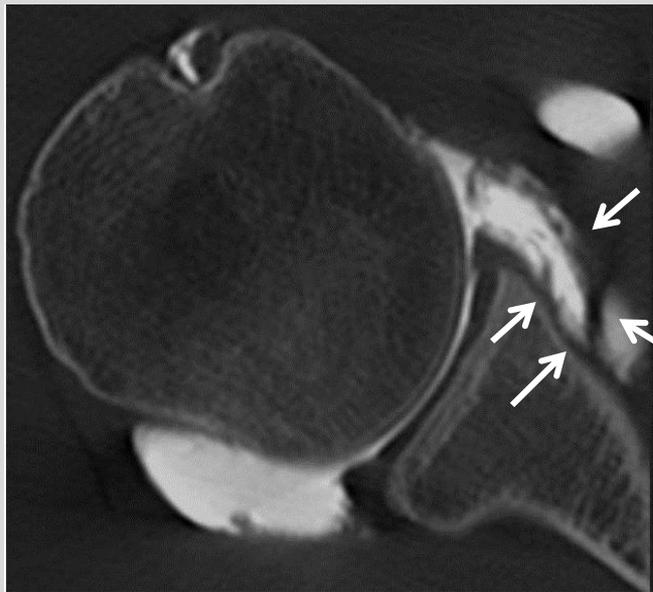
Chronic



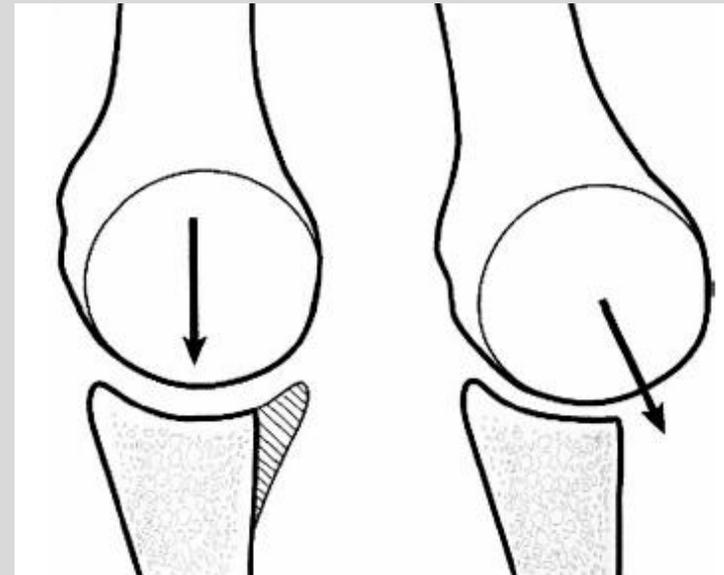
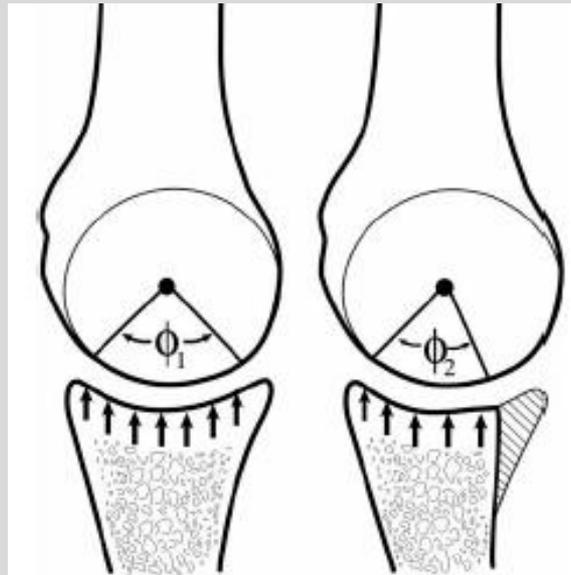
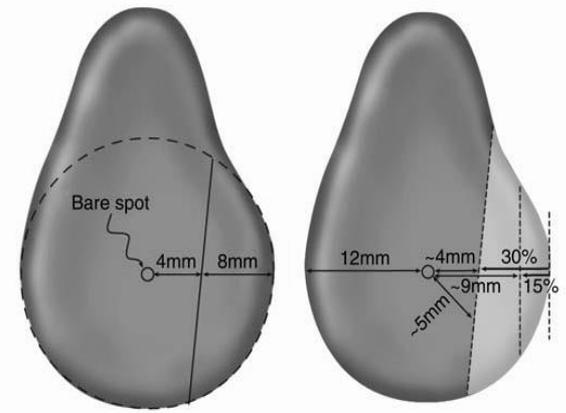






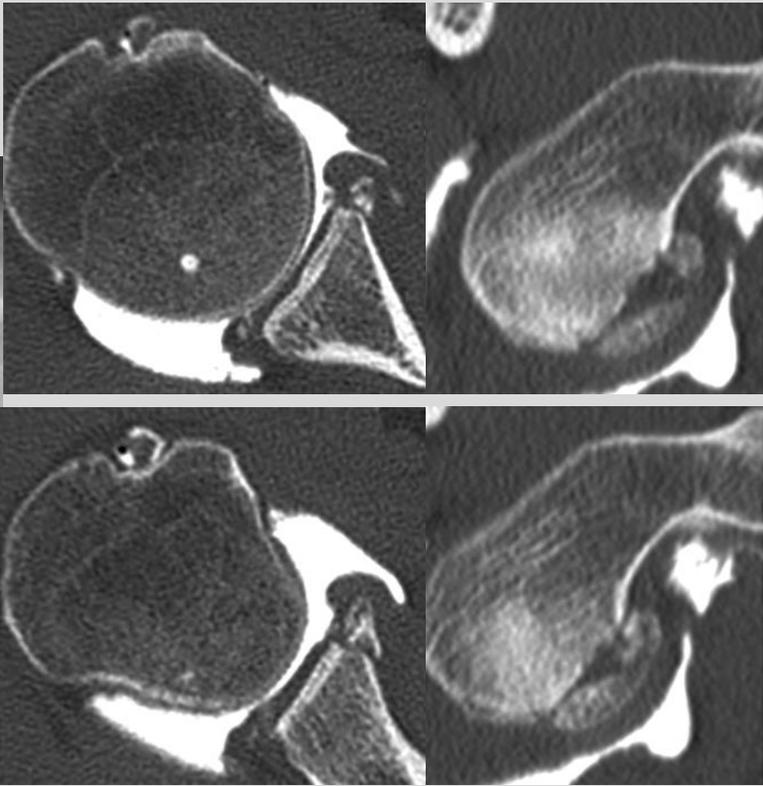


Glenoid bone loss

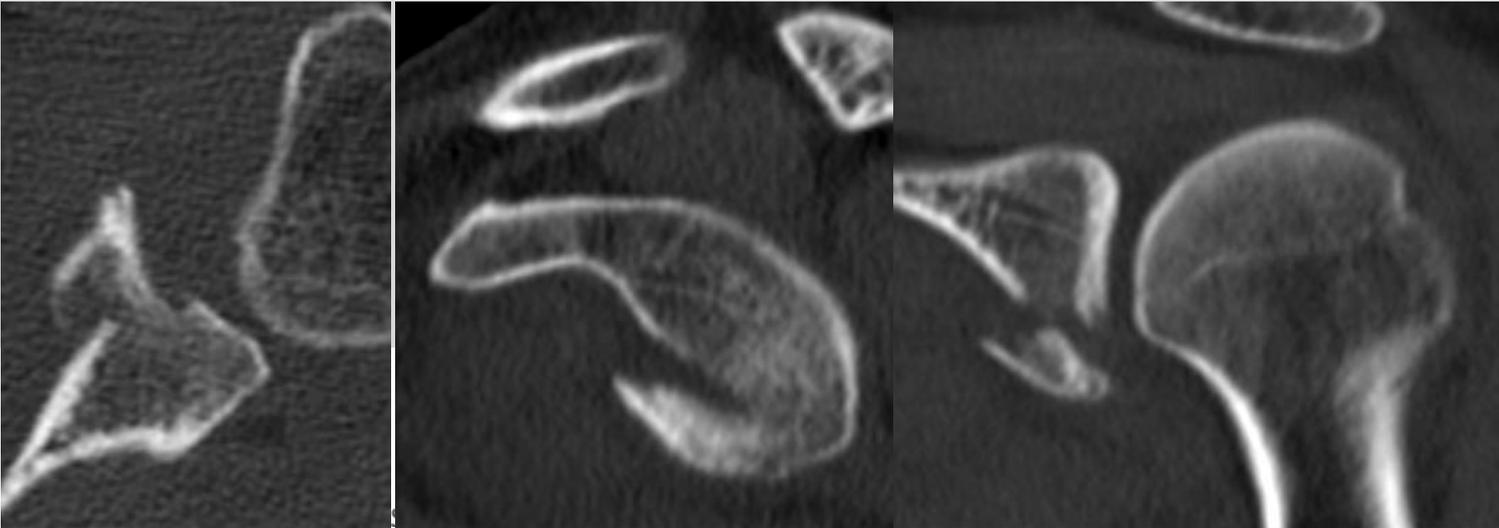




Case 1

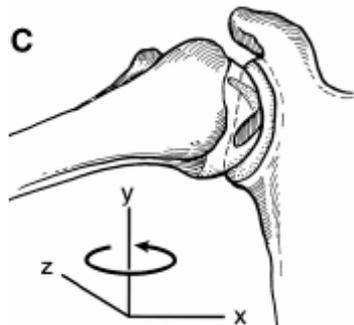
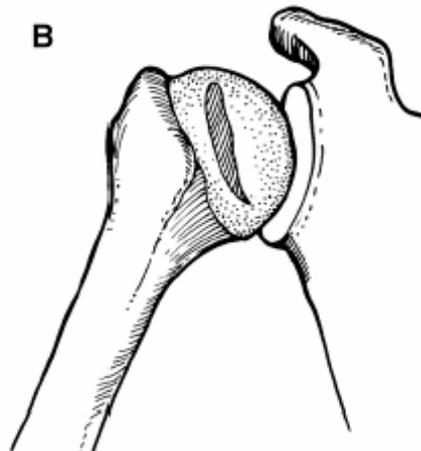
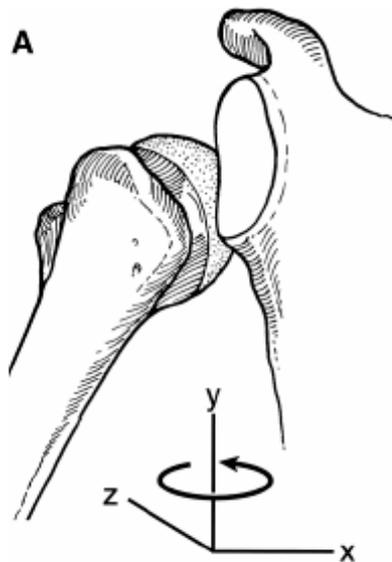
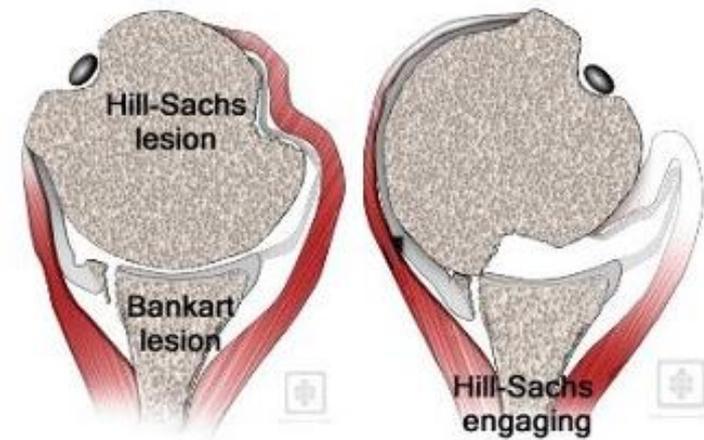


Case 2

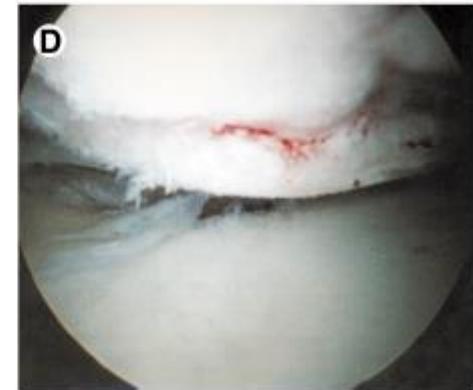
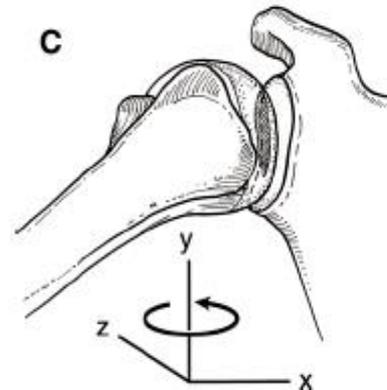
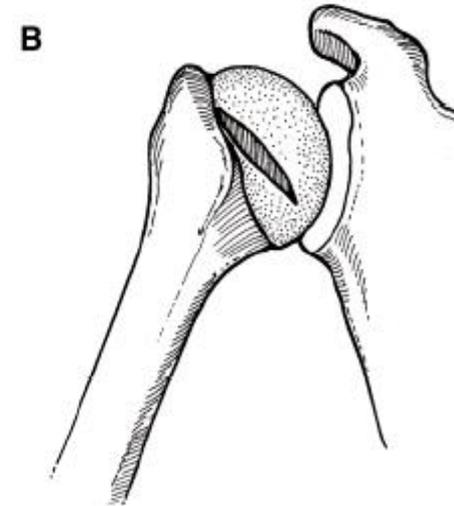
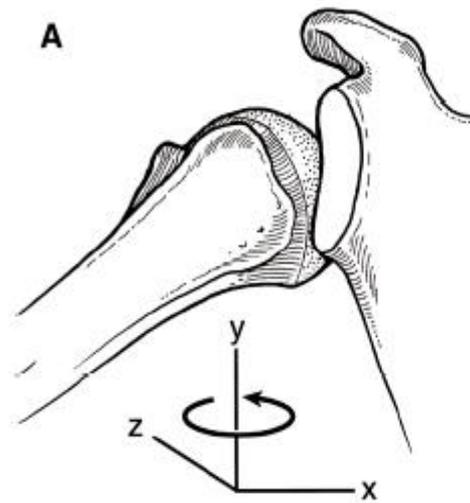


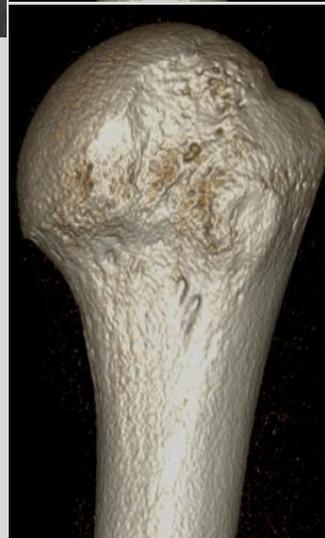
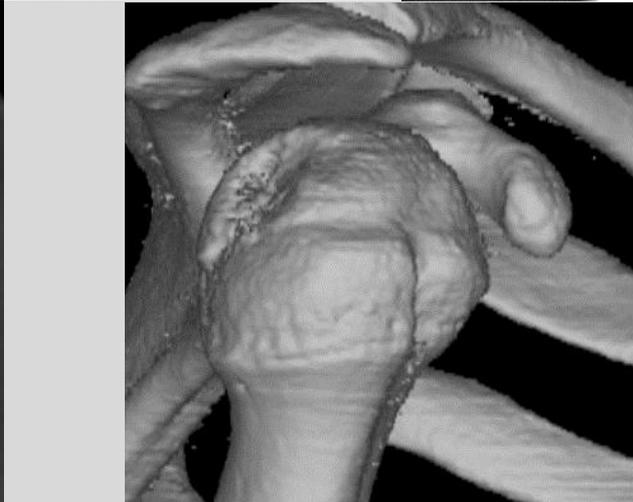
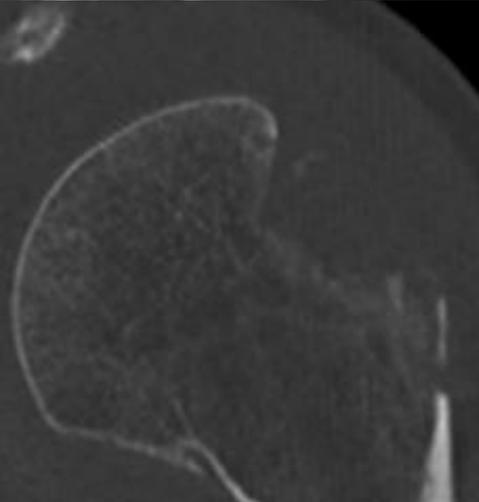
Hill-Sachs (Non-)Engaging?

Burkhart & De Beer 2000, Shoulderdoc.co.uk

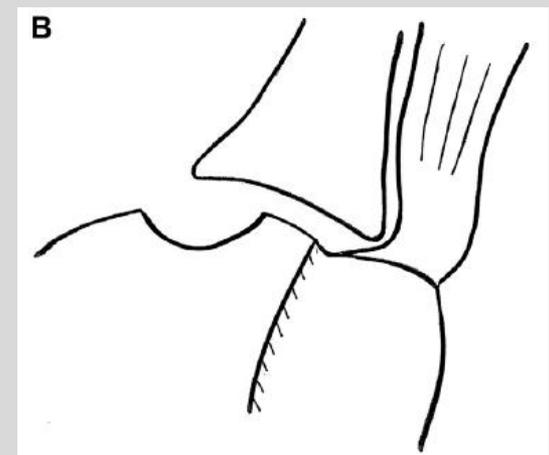
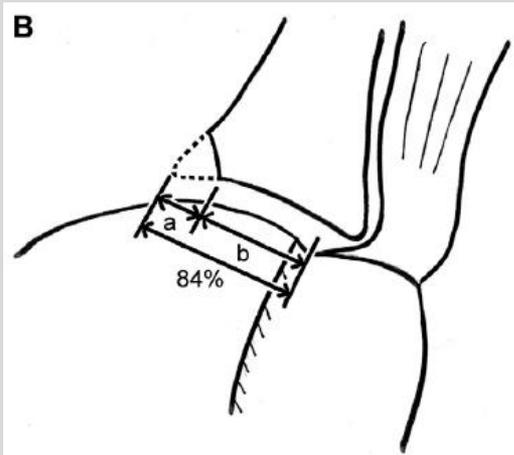
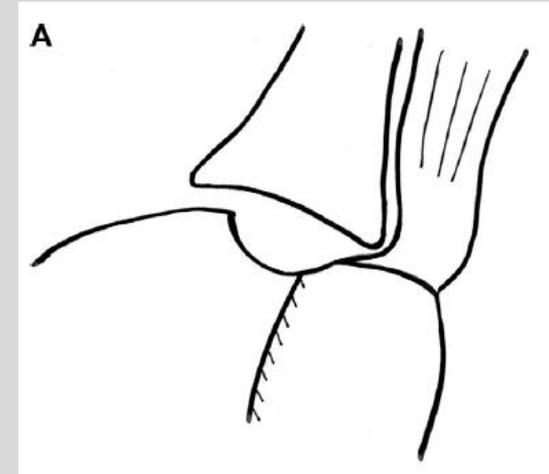
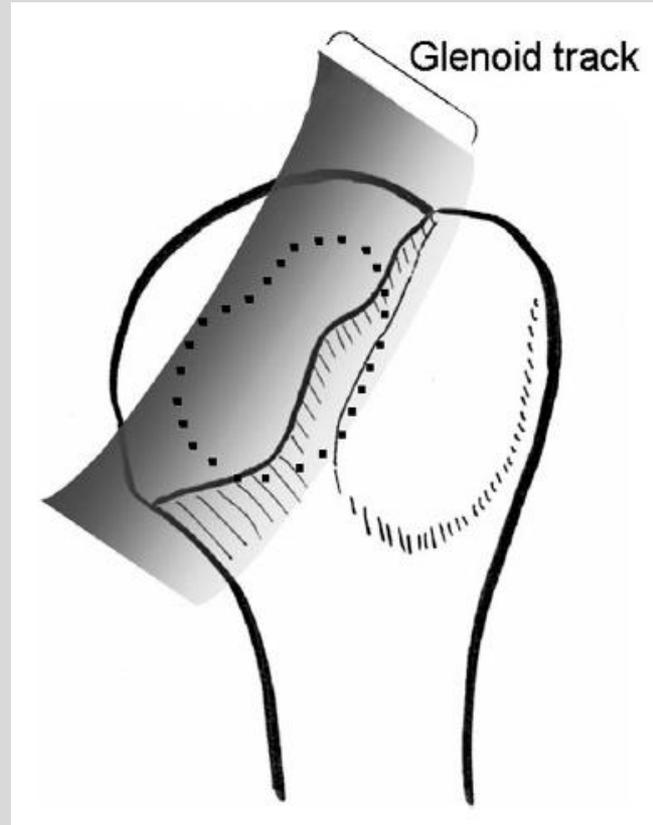
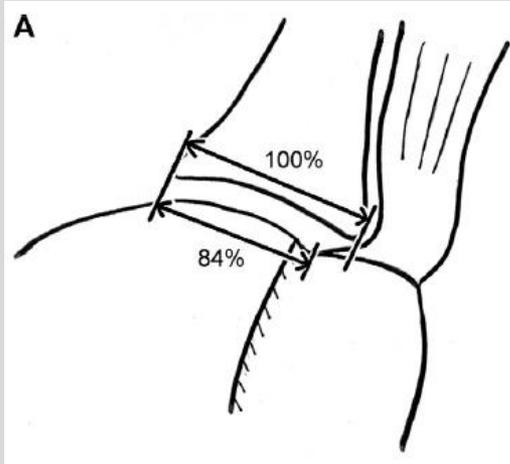


lesion was created with the arm at the side and in some extension and will engage only with the arm at the side with external rotation and extension, which is not a functional position. (B) Oriented Hill-Sachs lesion. (C) In a functional position of abduction external rotation, the Hill-Sachs lesion is diagonal to the superior margin of the glenoid and does not engage.





Glenoid track: On or Off



Yamamoto 2007

Small glenoid + Large HS (on-track)

