

ANATOMY OF THE SHOULDER

-

OPEN AND ARTHROSCOPIC

Gabor Puskas, MD

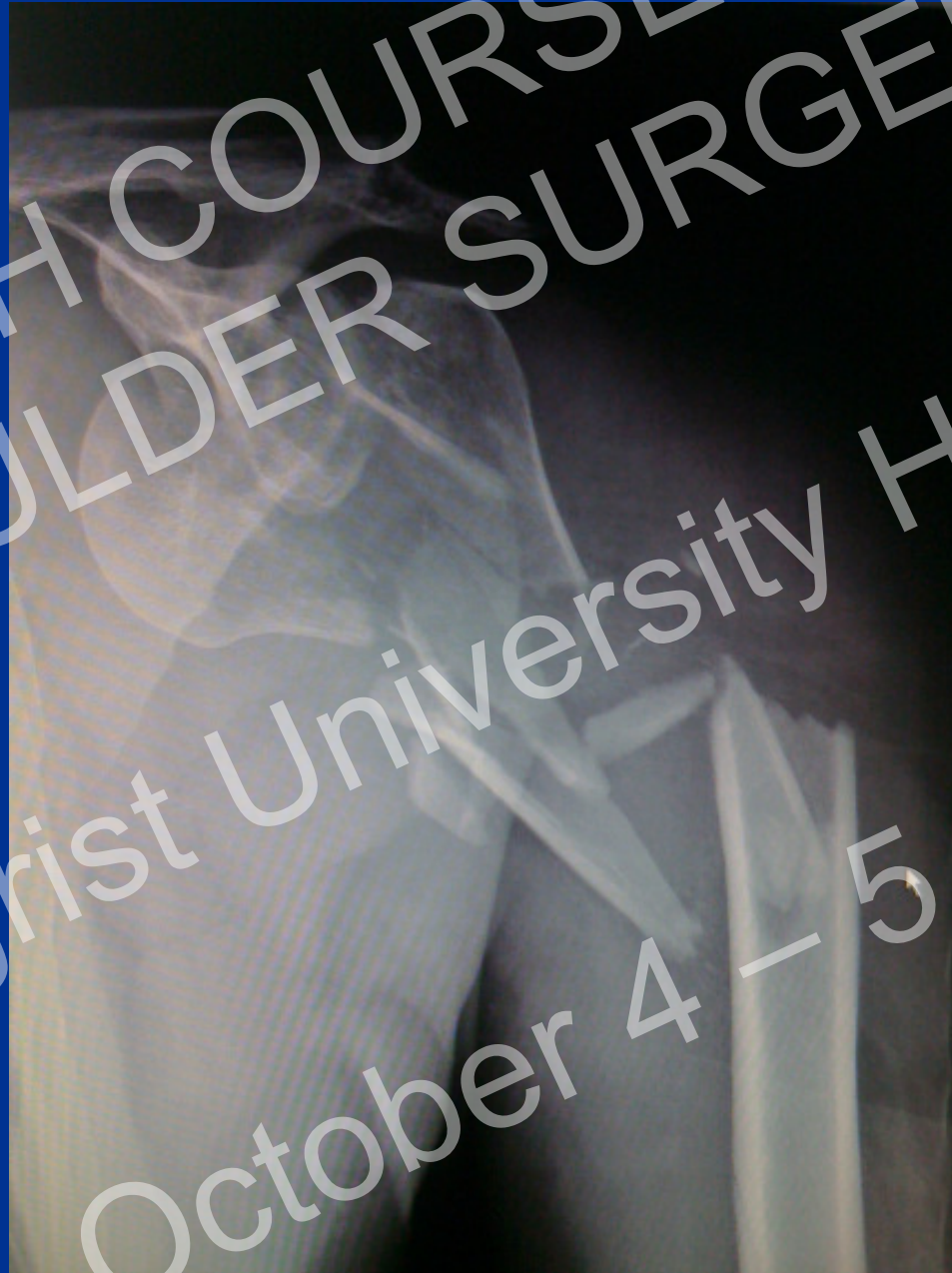
Department of Orthopedics, University of Zurich, Balgrist, Switzerland

www.balgrist.ch

WHY ANATOMY ?

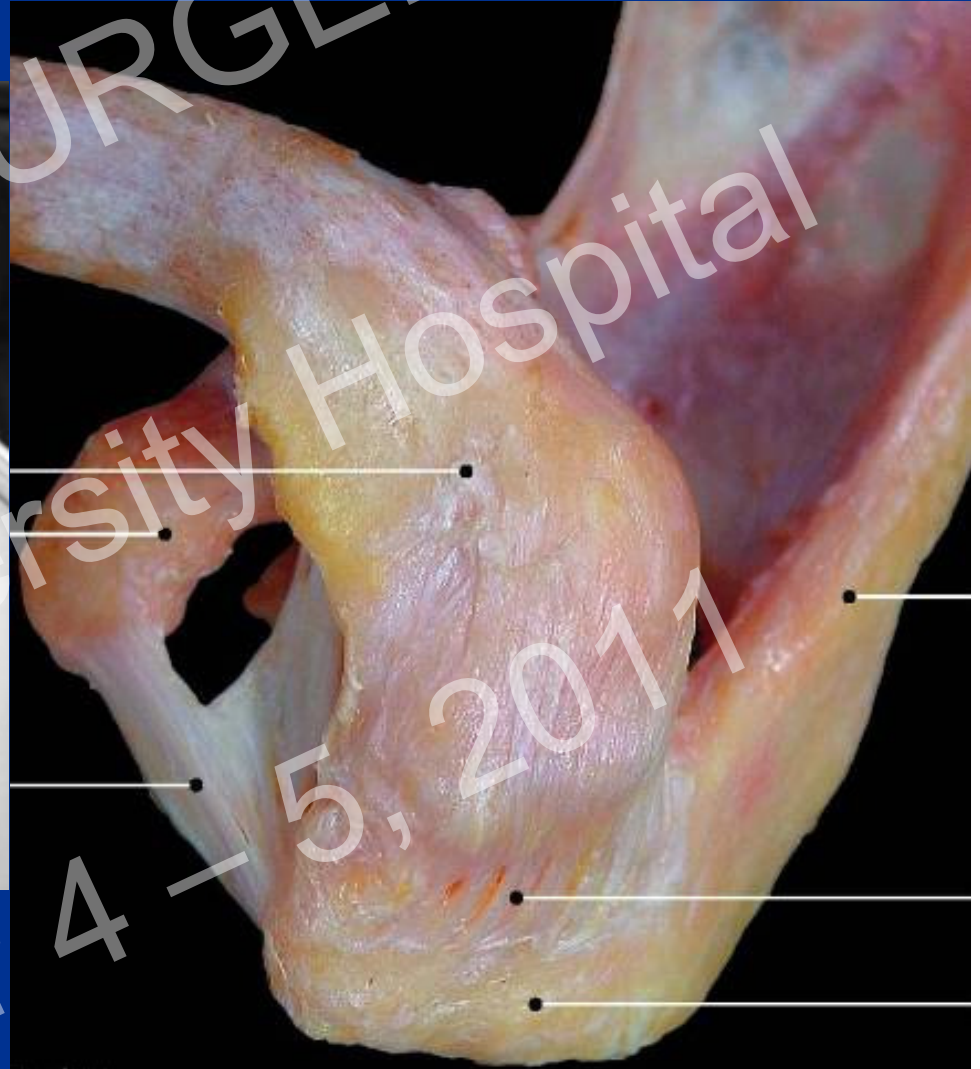
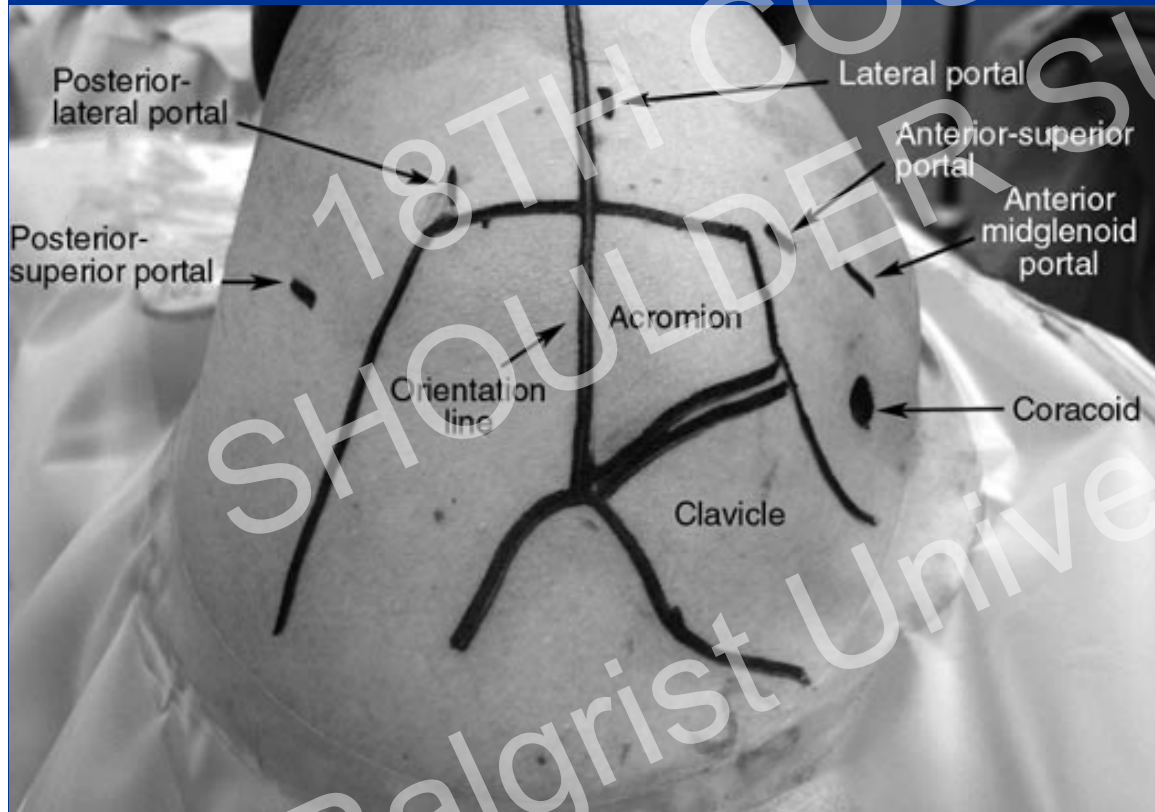


WHY ANATOMY ?



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BONY LANDMARKS



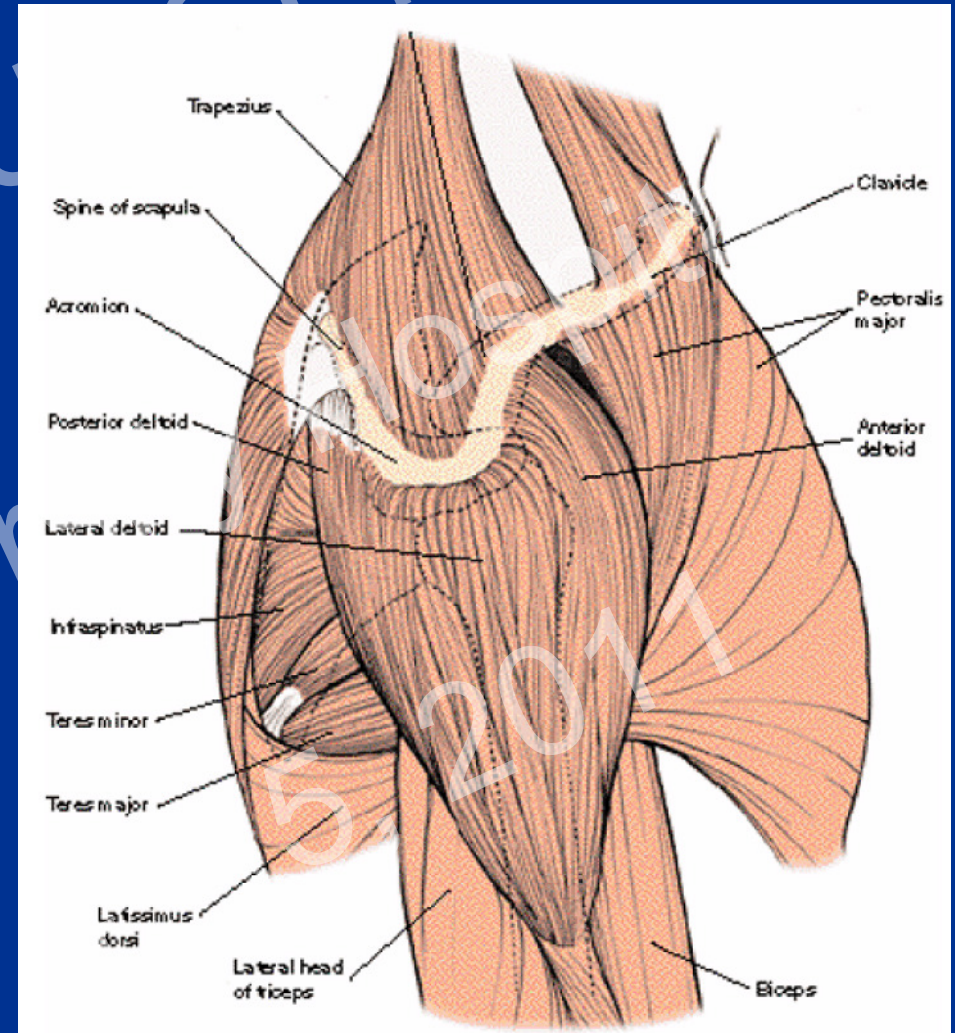
DELTOID MUSCLE



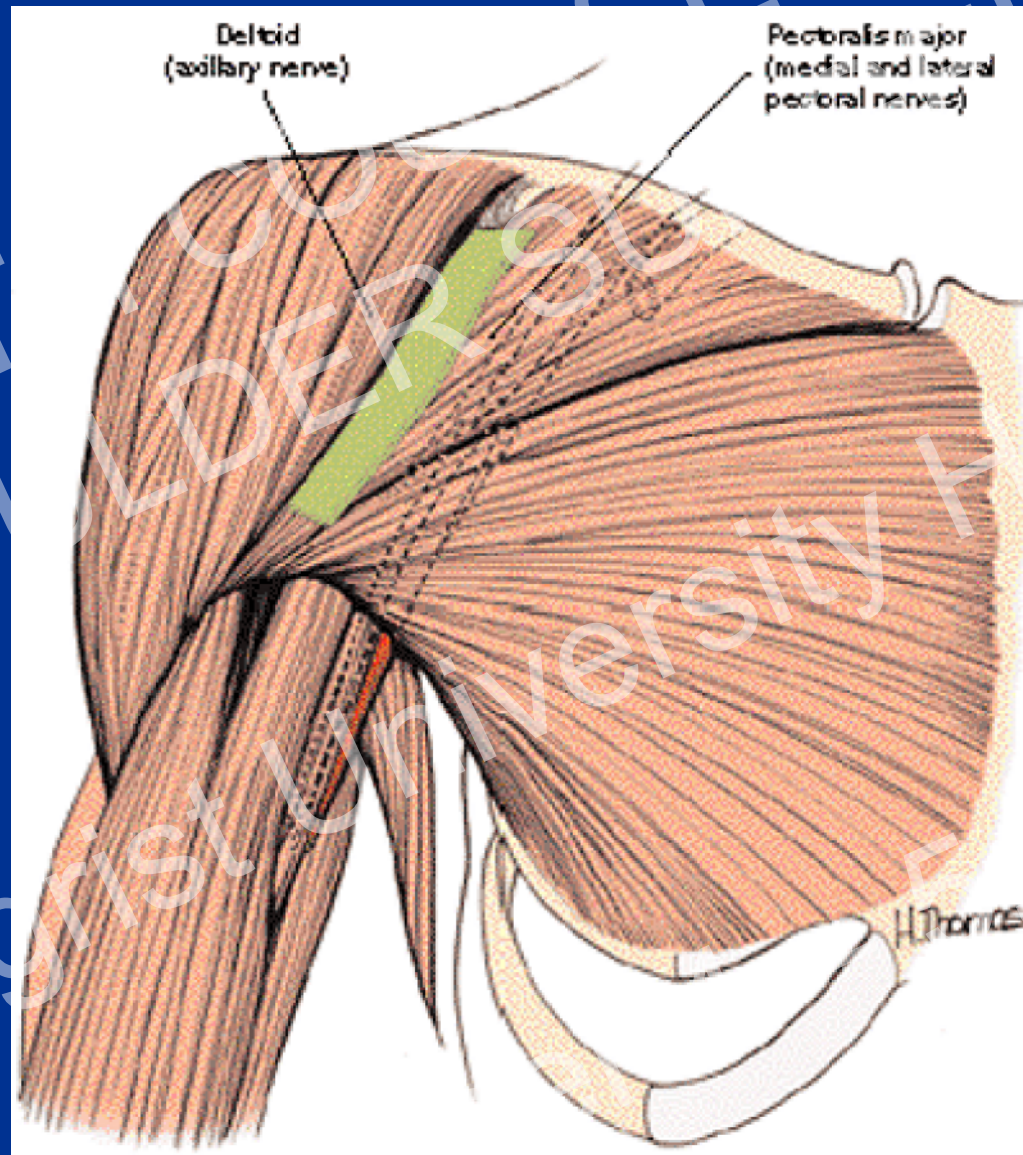
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DELTOID MUSCLE

- origin:
 - clavicular
 - acromial
 - spinous
- insertion: deltoid tuberosity
- innervation: axillary nerve (C5, C6)



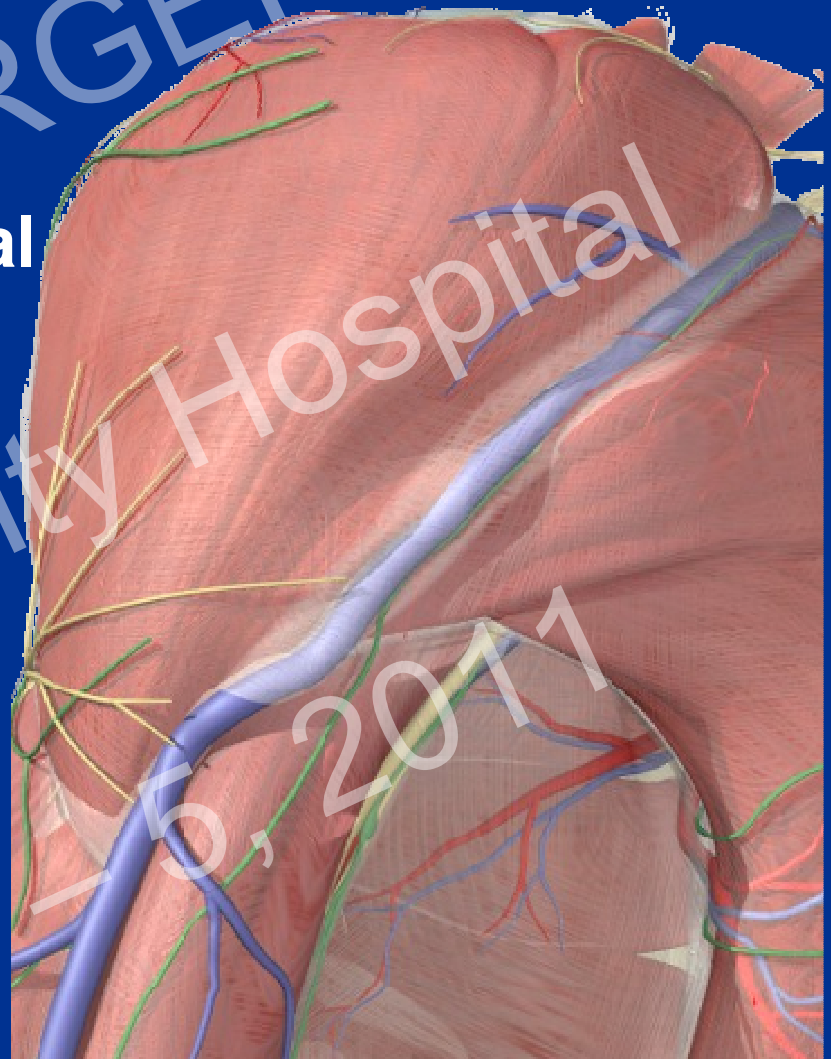
DELTOPECTORAL APPROACH



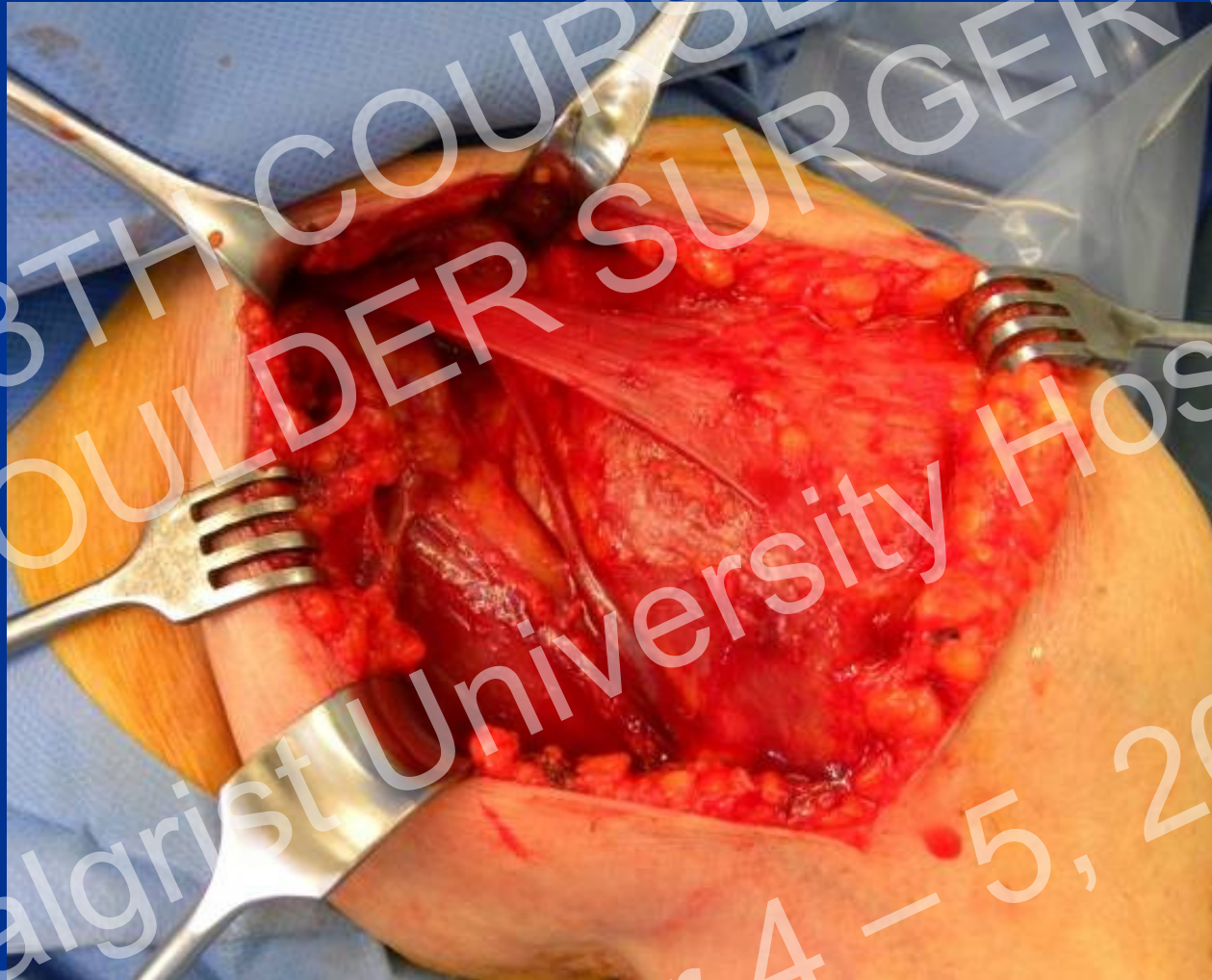
CEPHALIC VEIN

- Indicates the deltopectoral interval
- absent in 4 %
- feeder vessels: lat > med
→ retract vein laterally

Radkowski CA, CORR 442:139, 2006

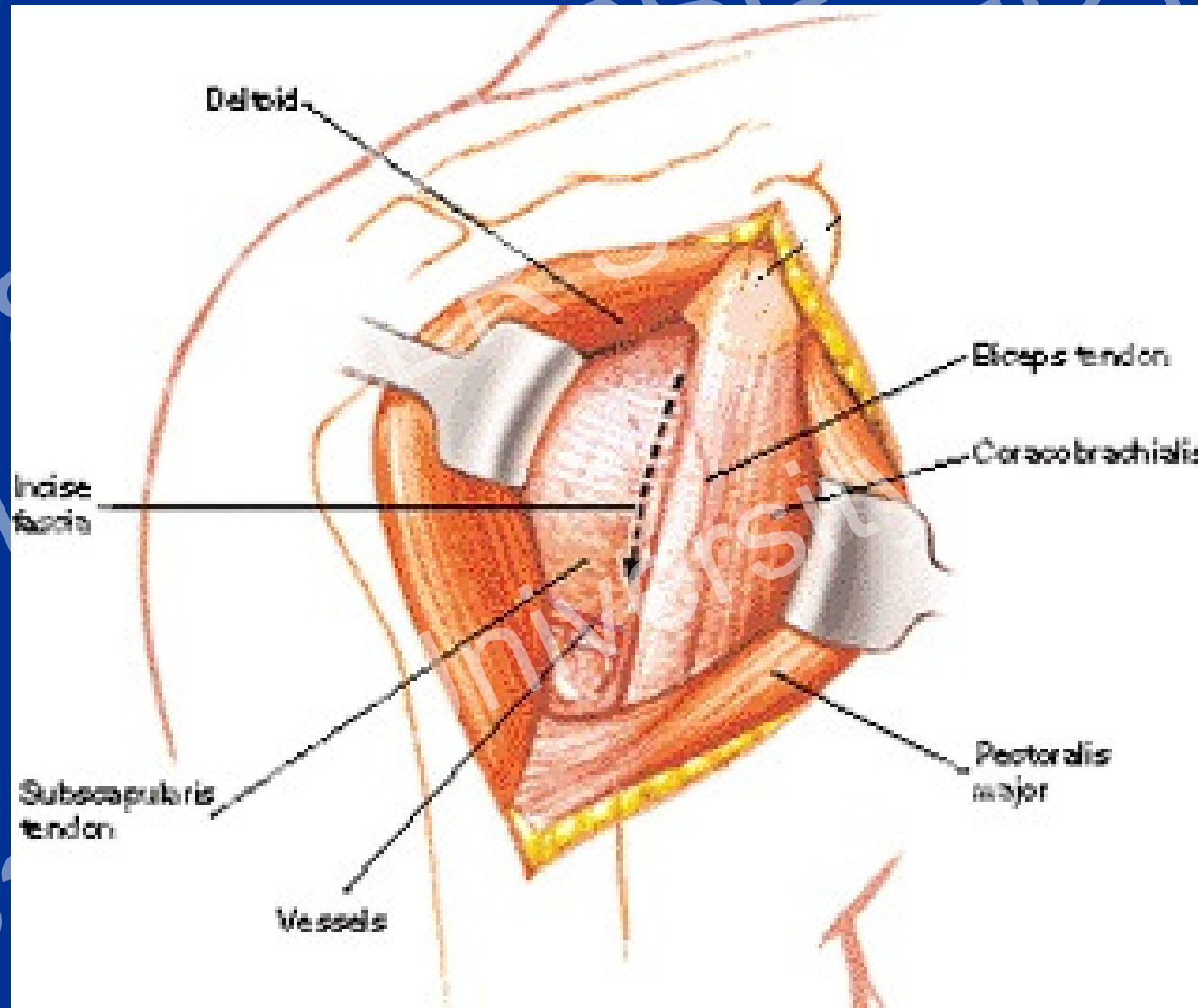


DELTOPECTORAL APPROACH M. INFRACLAVICULARIS



By courtesy: R. Nyffeler

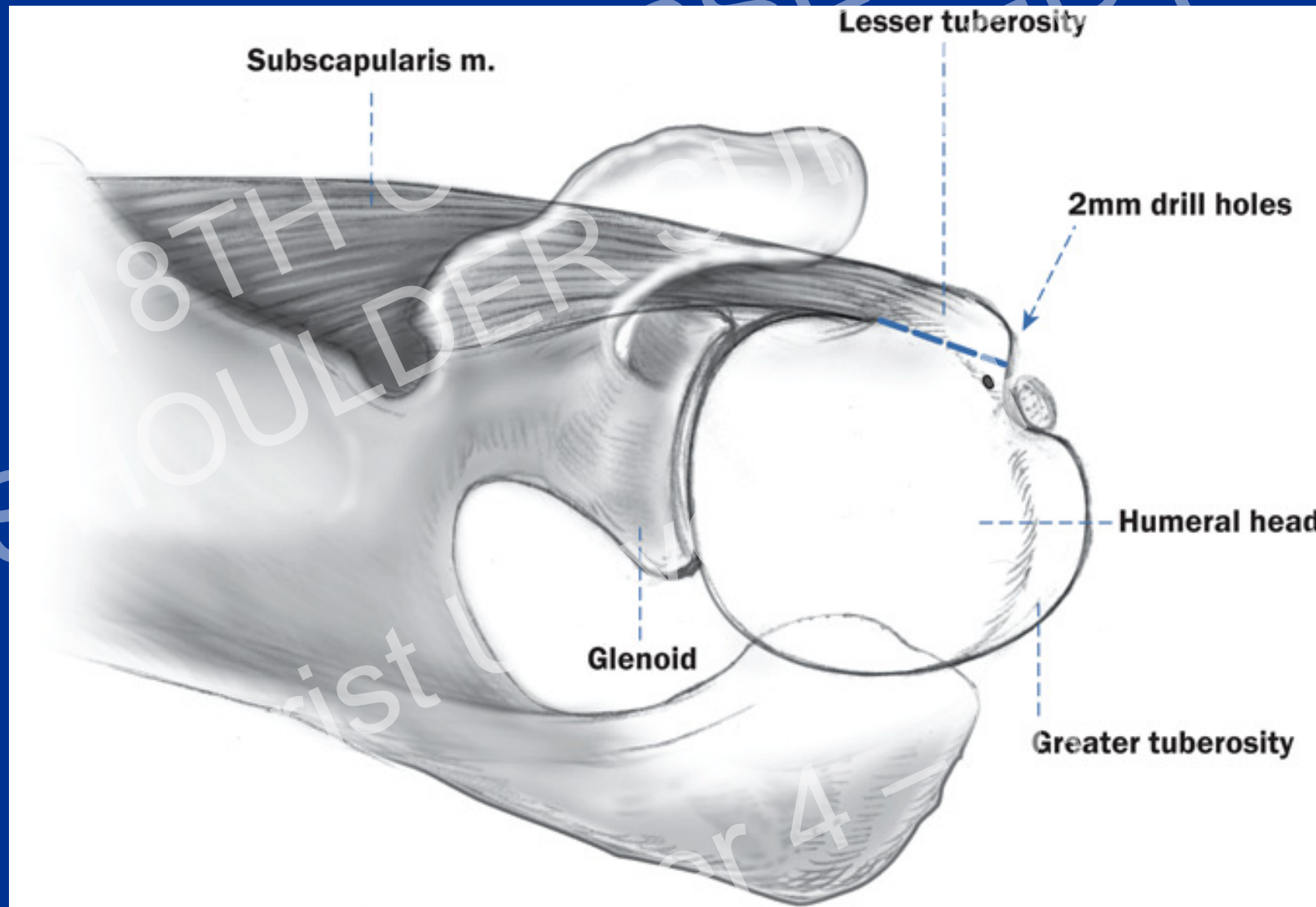
OSTEOTOMY OF LESSER TUBEROSITY



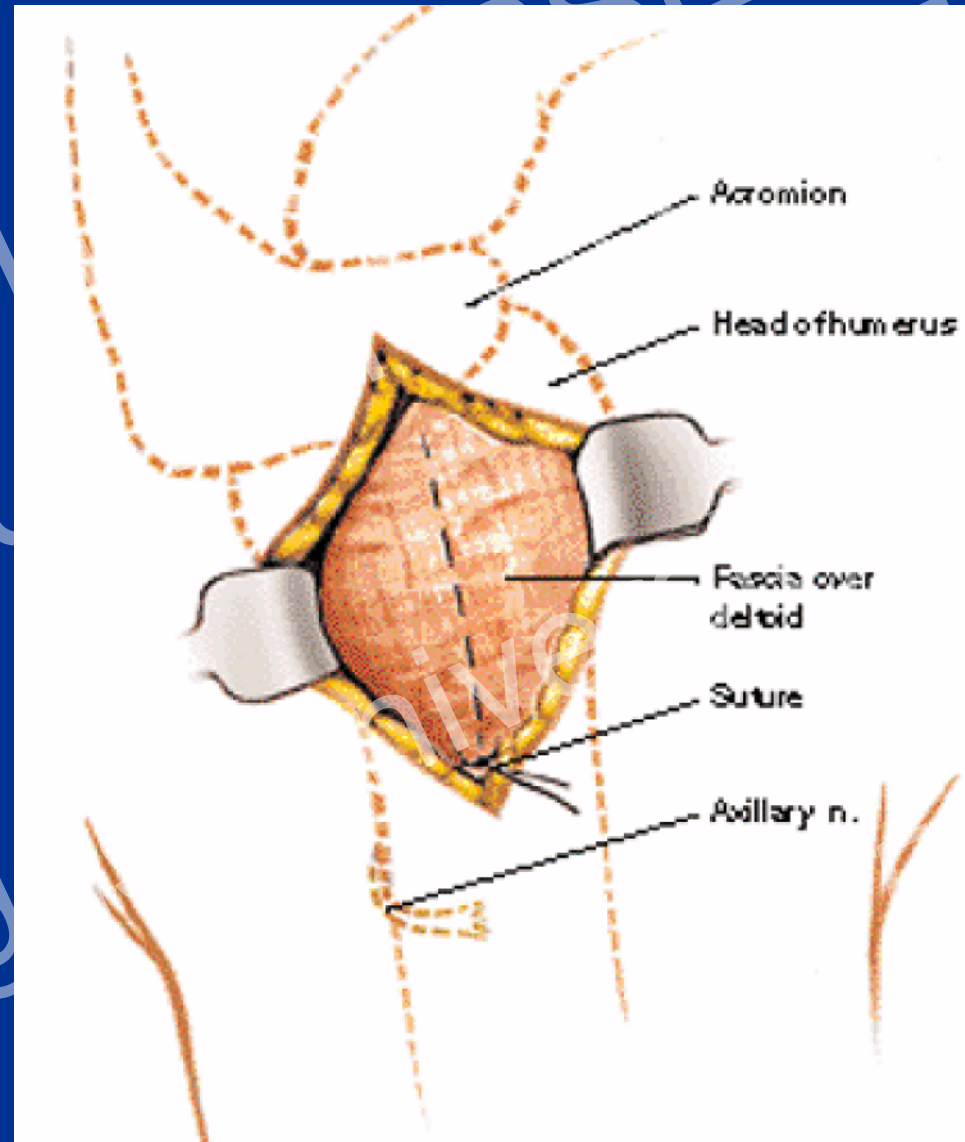
OSTEOTOMY OF LESSER TUBEROSITY



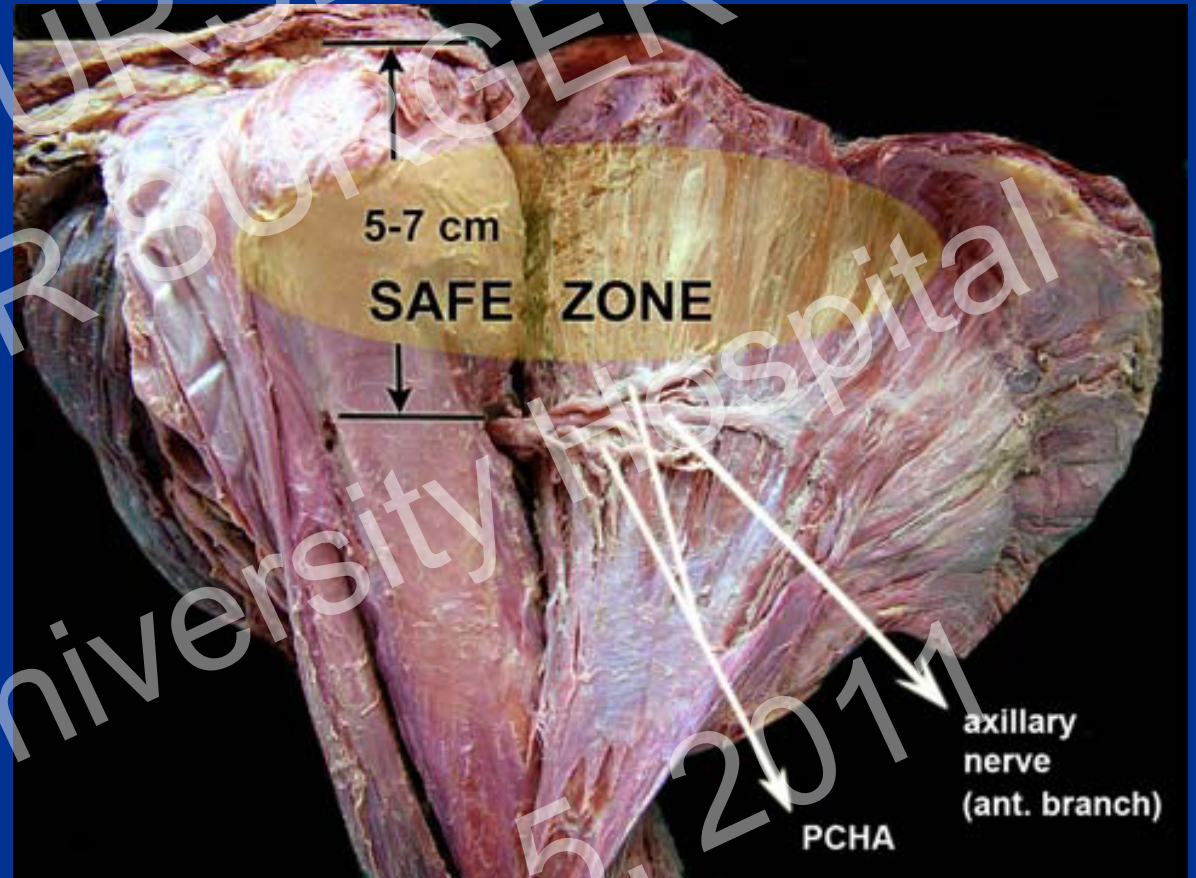
OSTEOTOMY OF LESSER TUBEROSITY



DELTOID SPLITTING APPROACH

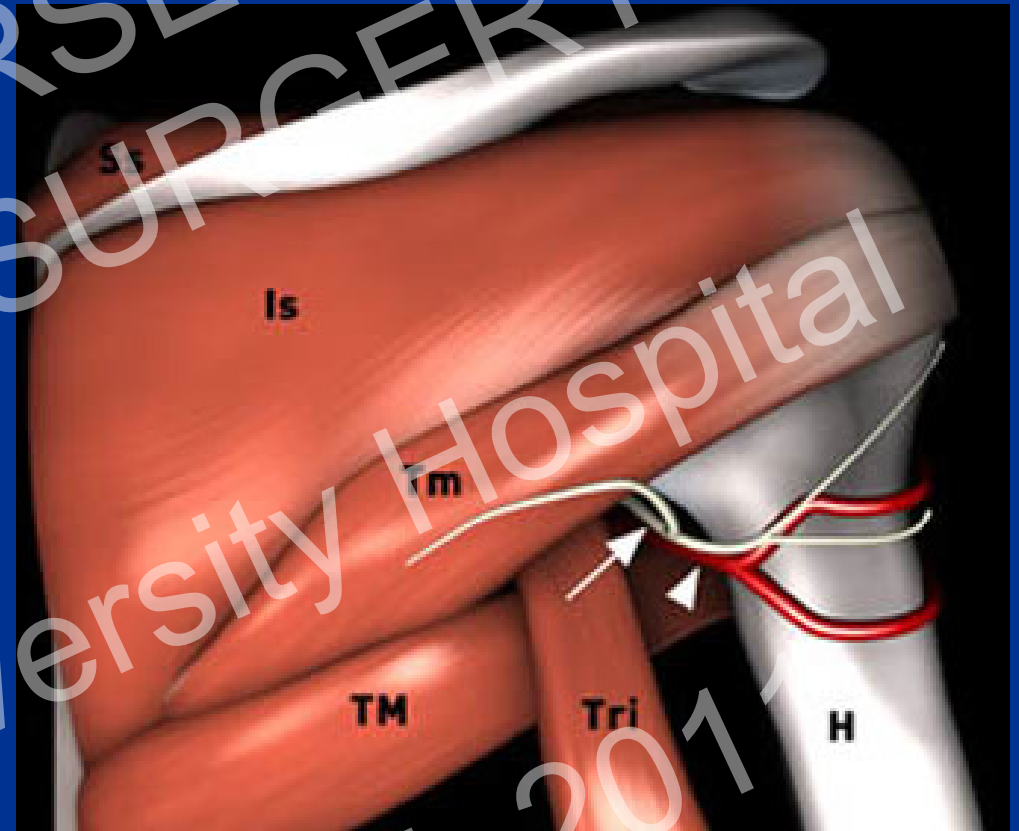
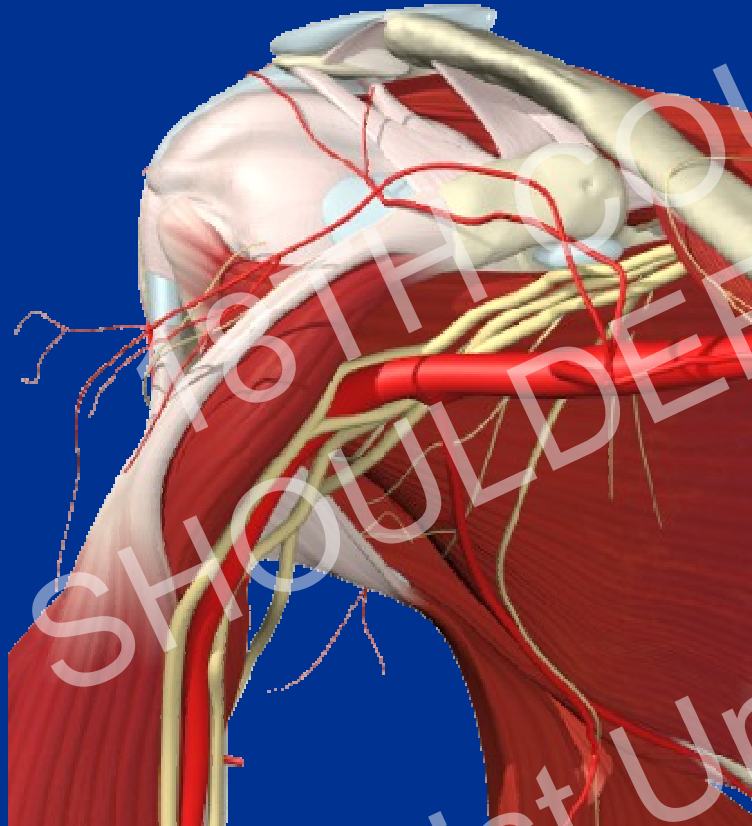


AXILLARY NERVE



Cetik O, JBJS(Am) 11: 2395, 2006

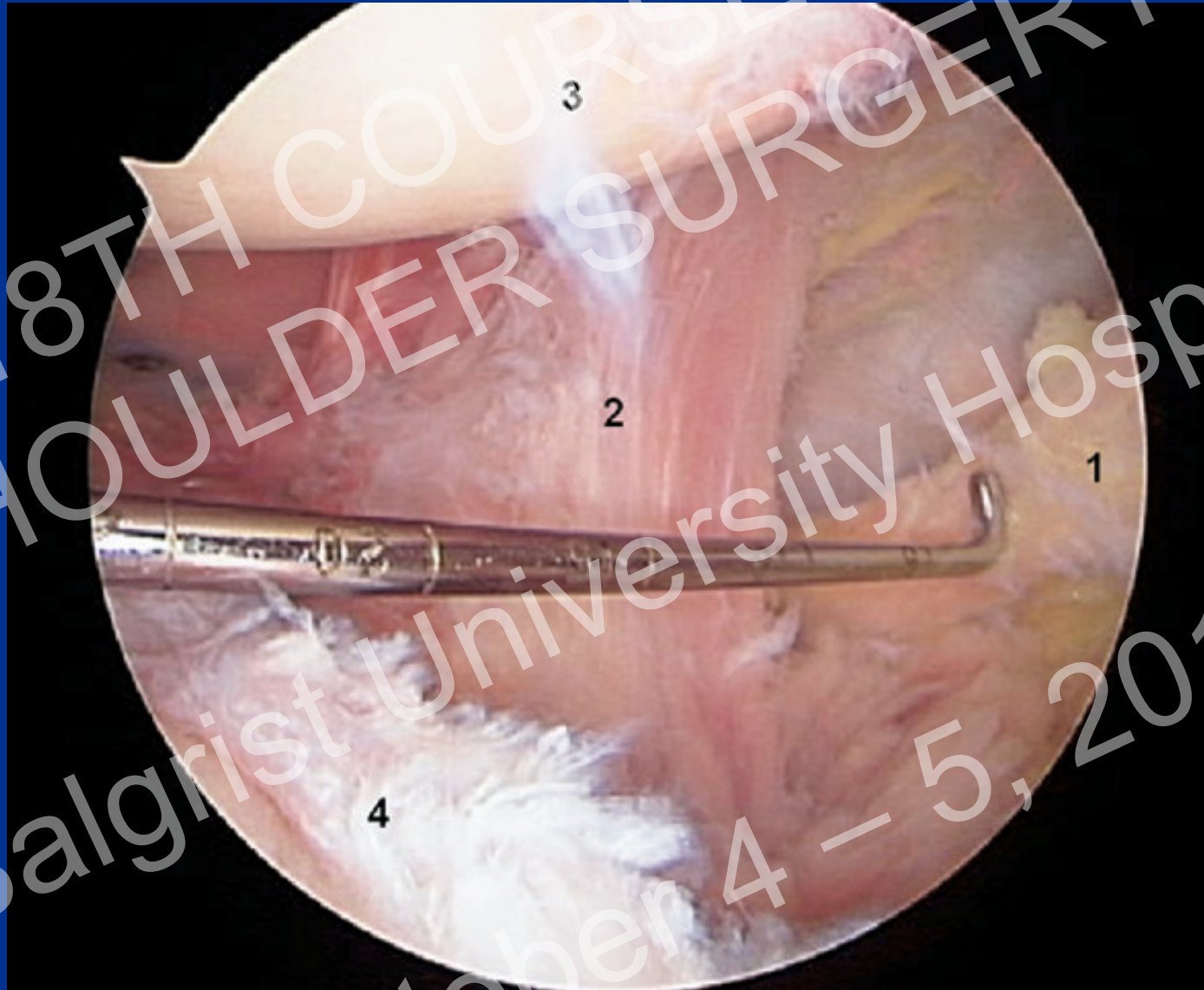
AXILLARY NERVE



- posterior cord
- level of coracoid

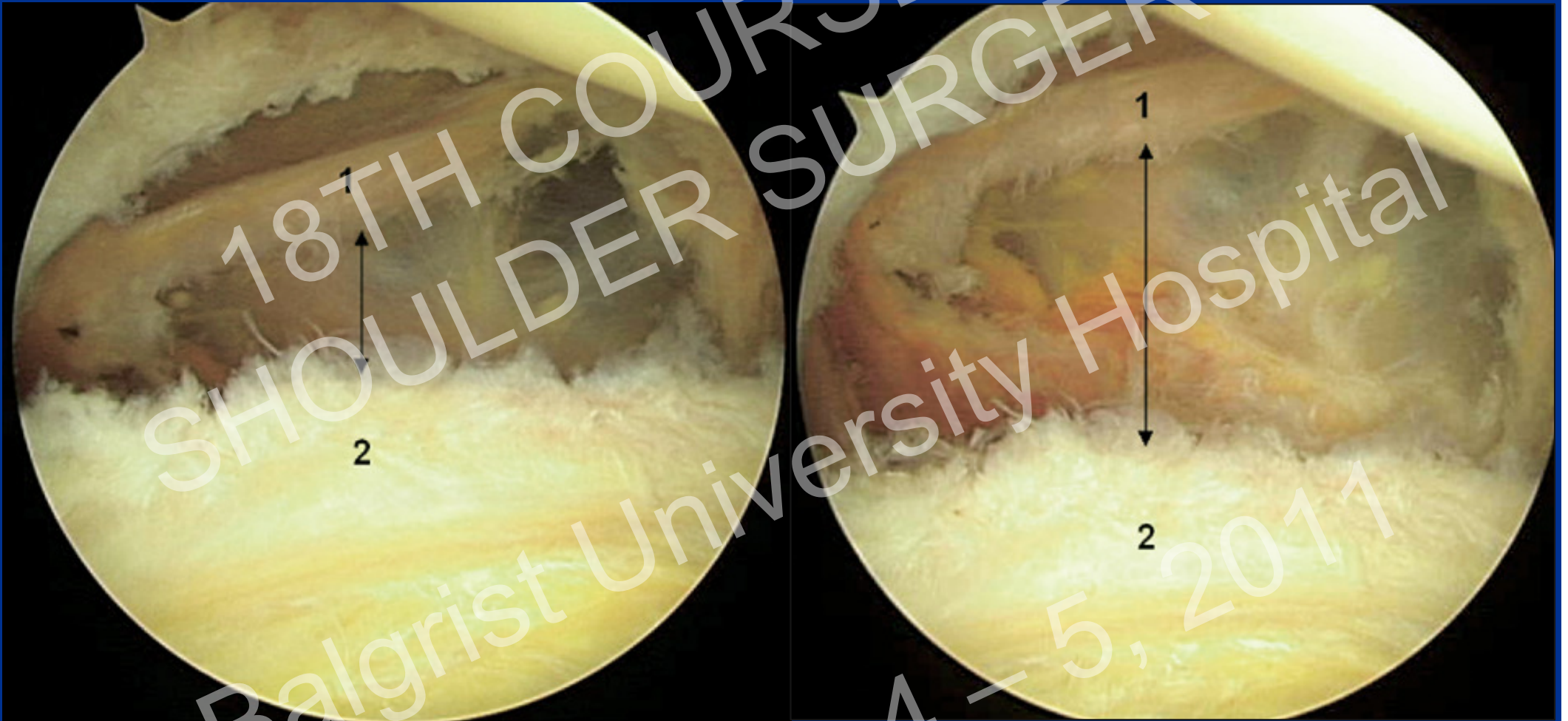
- quadrilateral space
- around surgical neck

ARTHROSCOPY AXILLARY NERVE



Jae Chul Yoo, Arthroscopy, 23: 1271, 2007

ARTHROSCOPY AXILLARY NERVE



arm in adduction

arm in abduction

ROTATOR CUFF



subscapularis

supraspinatus

infraspinatus / teres minor



internal rotation

abduction

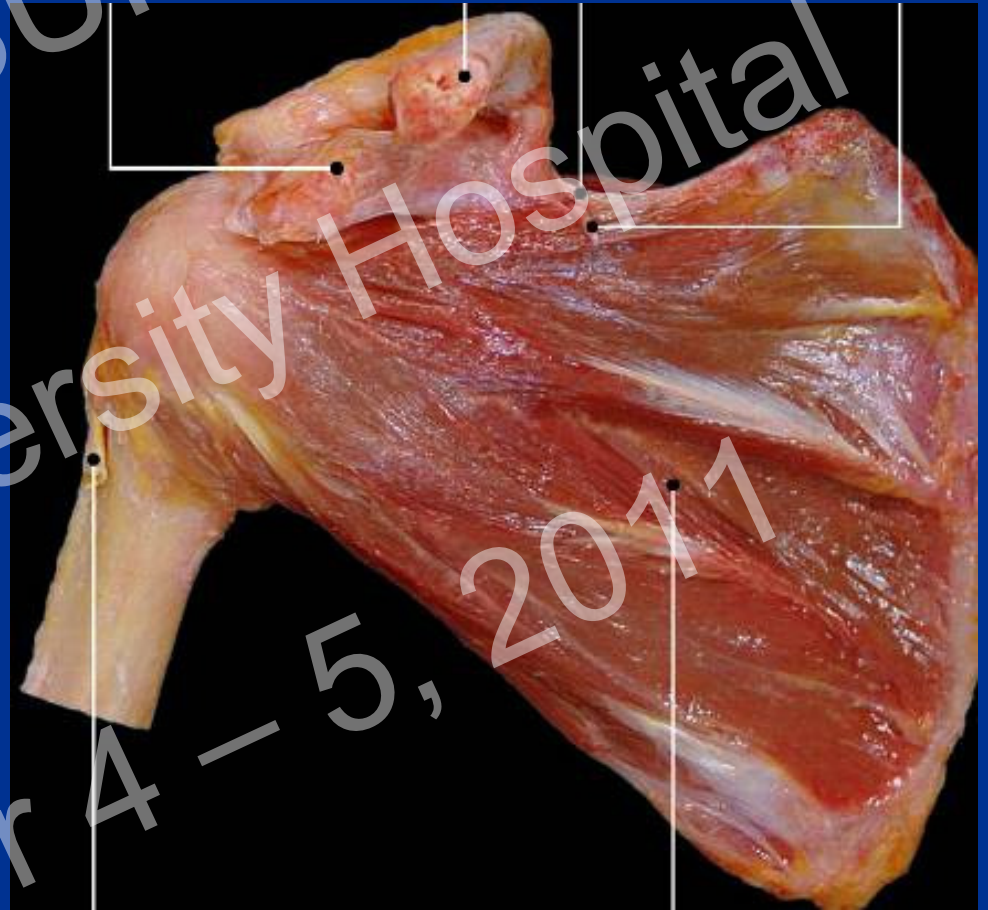
external rotation

SUBSCAPULARIS MUSCLE

- origin: subscapularis fossa
- insertion: lesser tuberosity
- innervation:
 - 2 branches (C5,C6)
 - sup. subscapular nerve
 - inf. subscapular nerve

Frick, Thieme, 1980

Bouchet, Simep, 1990



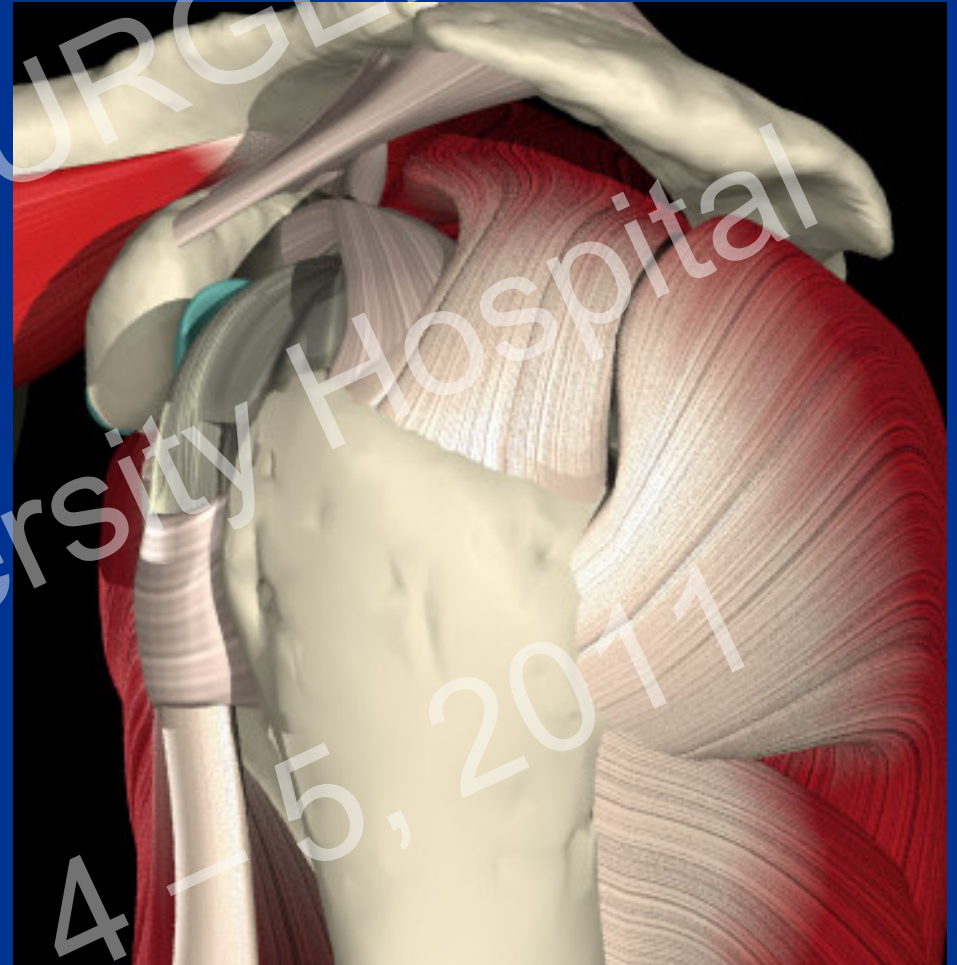
SUBSCAPULARIS MUSCLE

function: internal rotation (lift-off test)



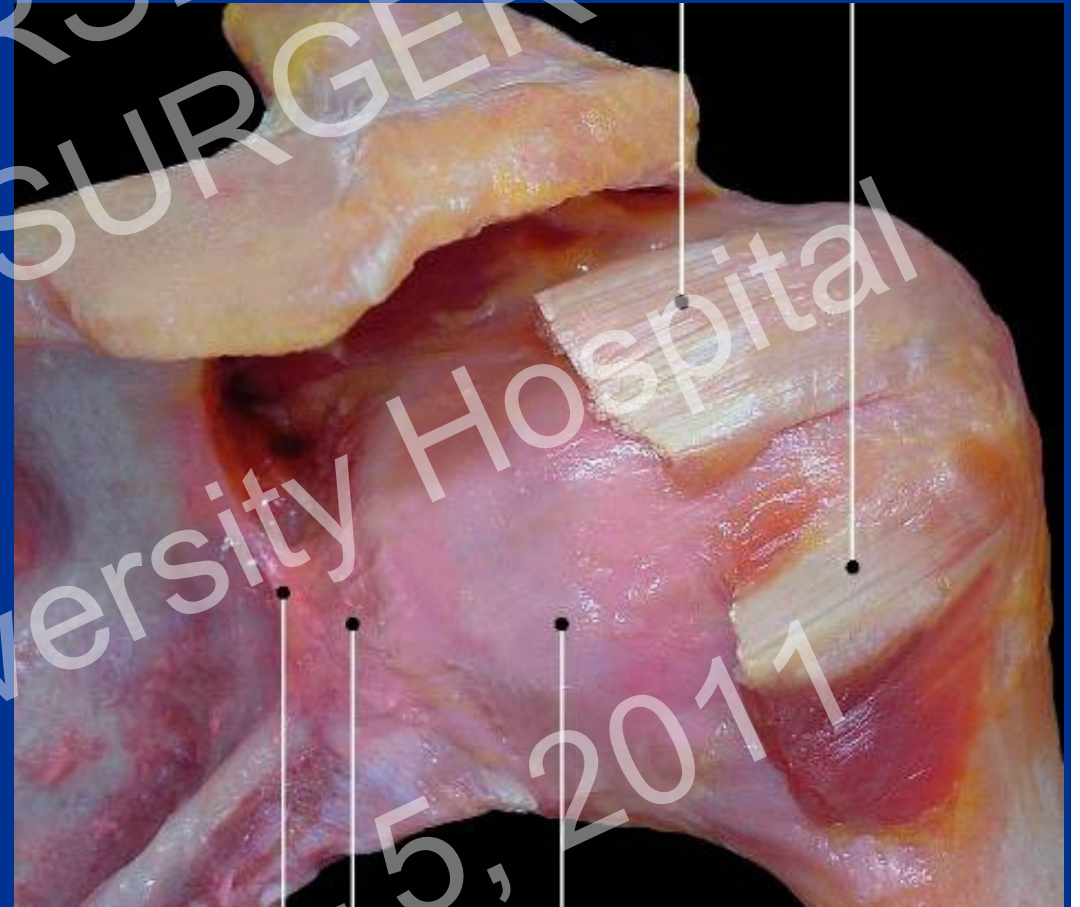
SUPRASPINATUS MUSCLE

- origin: supraspinatus fossa
- insertion: greater tuberosity
- function: abductor (Jobe test)
- suprascapular nerve (C5,C6)



INFRASPINATUS AND TERES MINOR MUSCLE

- origin: infraspinatus fossa
- insertion: greater tuberosity
- function: external rotation



INFRASPINATUS AND TERES MINOR MUSCLE



external rotation lag in adduction



external rotation lag in abduction (Horn blower sign)

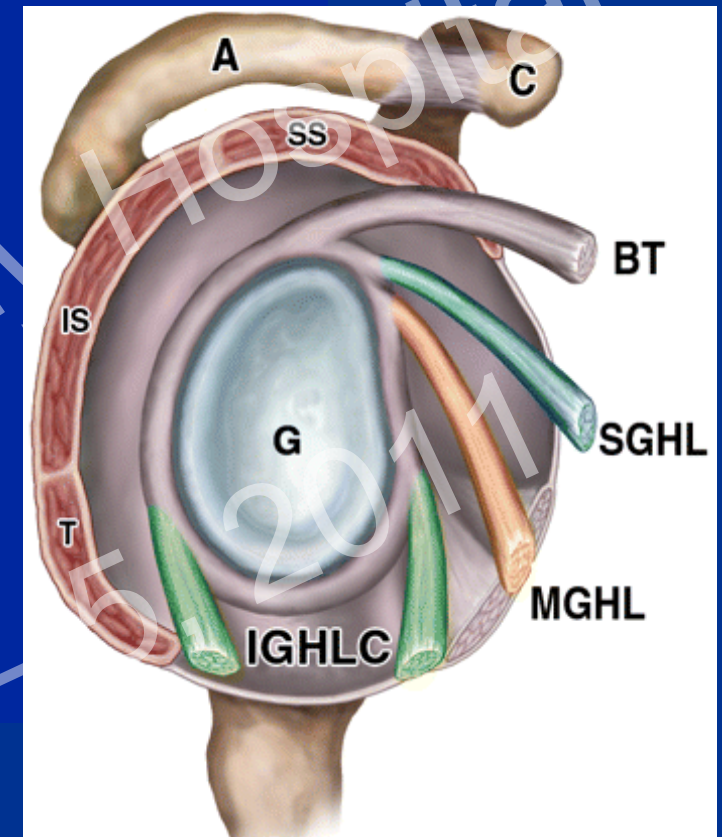
JOINT CAPSULE

- fused with tendons of the rotator cuff (~ 2.5 cm)



GLENOHUMERAL LIGAMENTS

- superior, anterior, inferior reinforced with glenohumeral ligaments:
 - superior (SGHL)
 - middle (MGHL)
 - inferior (IGHL)
- not visible from outside
- posterior: thin, no ligaments



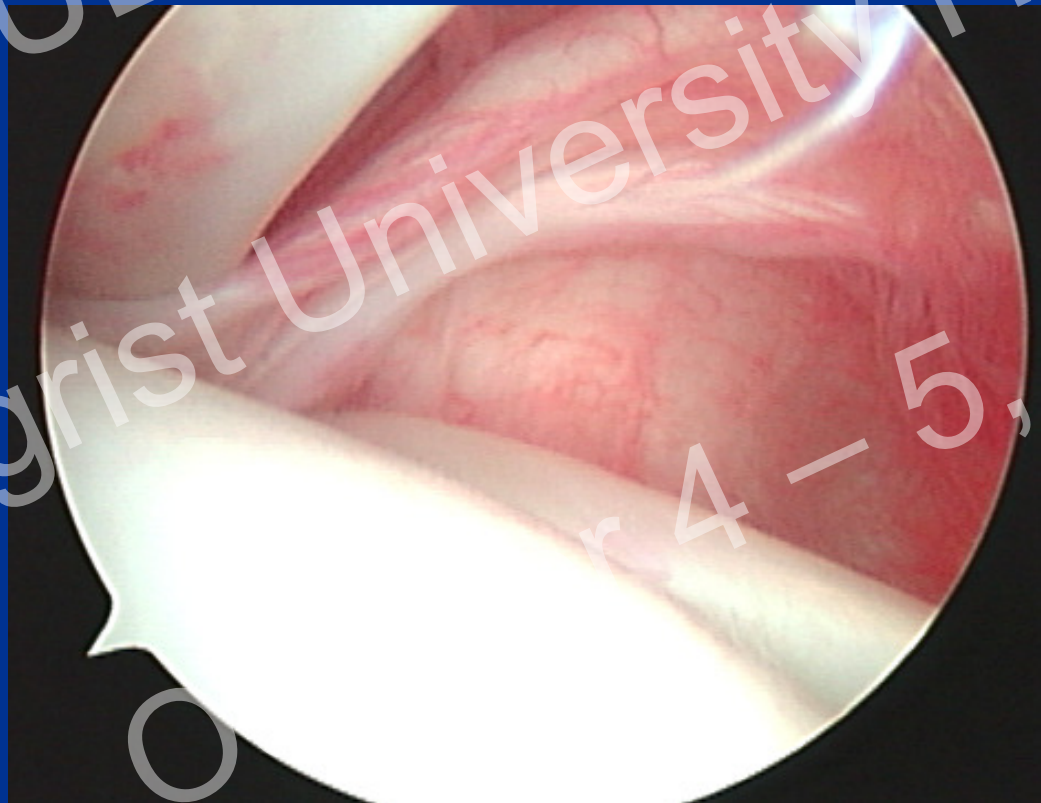
SGHL

- 1/3 - 2/3 of thickness of long biceps

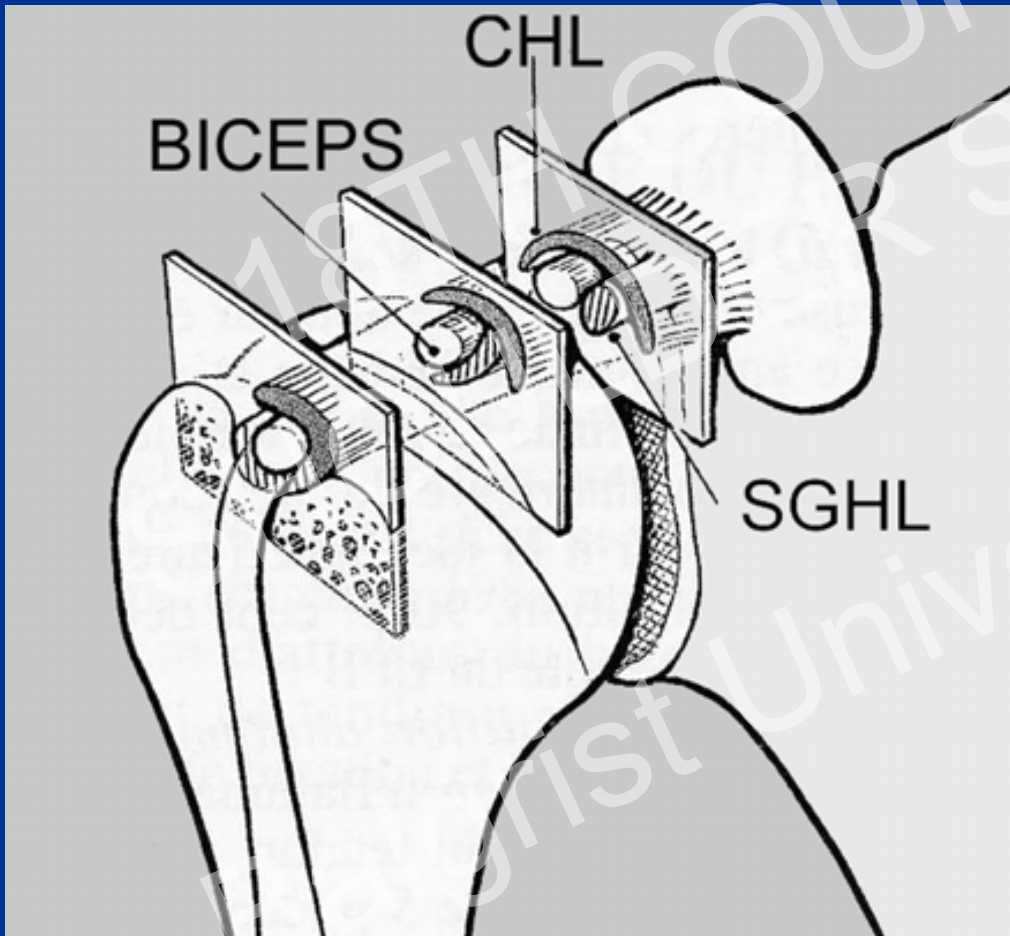
Warner JP, Am J Sports Med, 1992

- in 42 % only thin / rudimentary

Jost B, JSES, 2000



ROTATOR INTERVAL AND BICEPS PULLEY



MGHL

- very variable

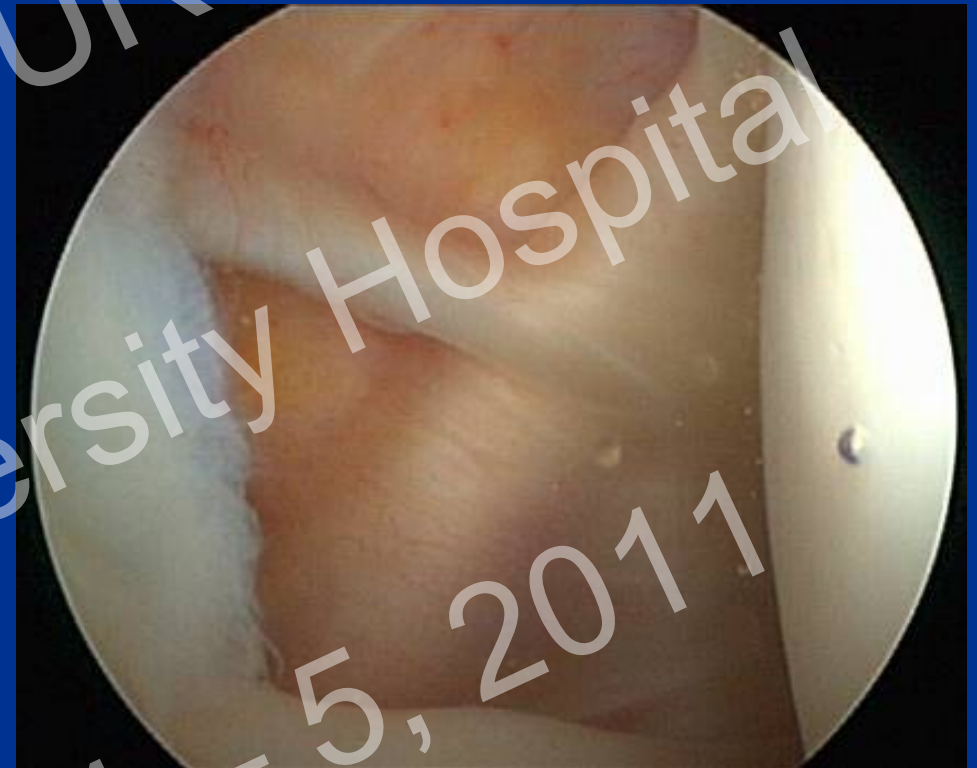
- in 55 % thin

Warner JP, Am J Sports Med, 1992

- absent in:

- 13 % DePalma, AAOS, 1949

- 27 % O'Brien, Saunders, 1990

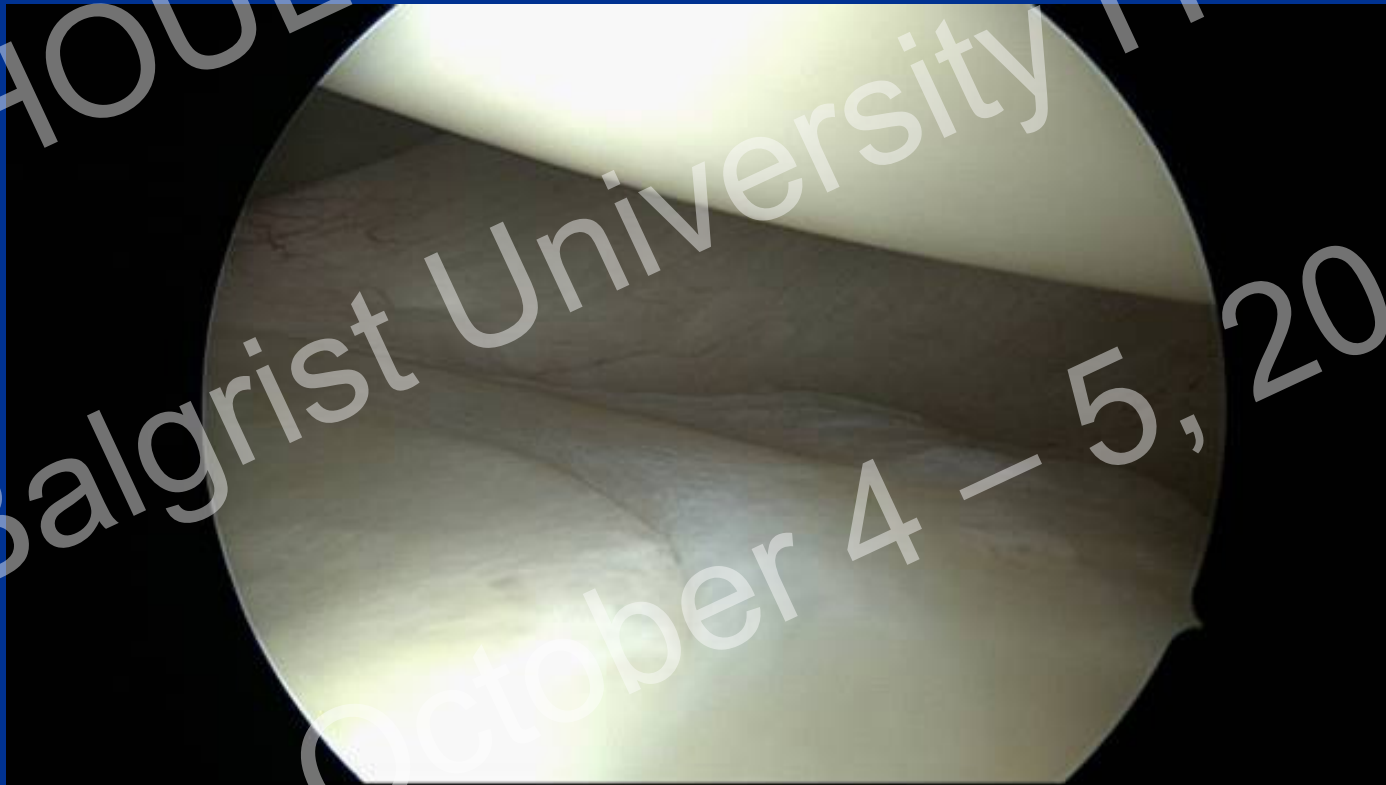


BUFORD COMPLEX



IGHL

- always present O'Brien, Saunders, 1990
- consists of:
 - anterior band
 - axillary recess
 - posterior band



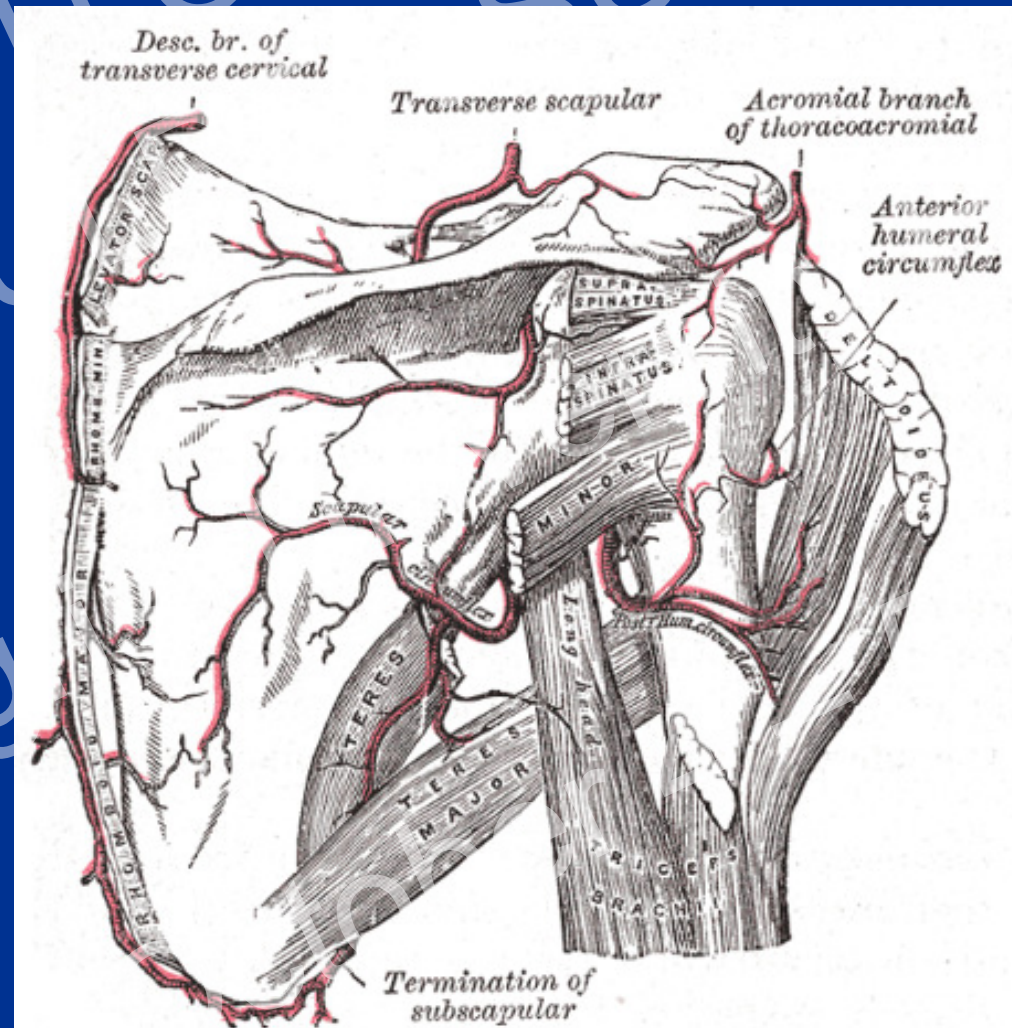
DIAGNOSTIC ARTHROSCOPY



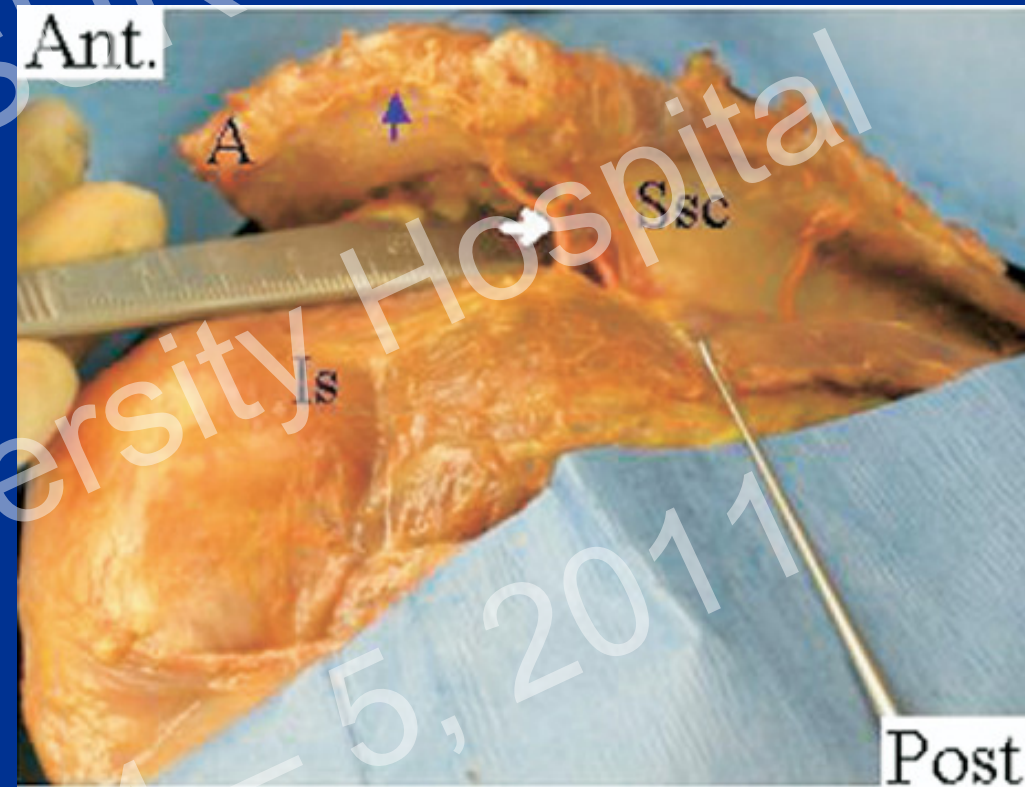
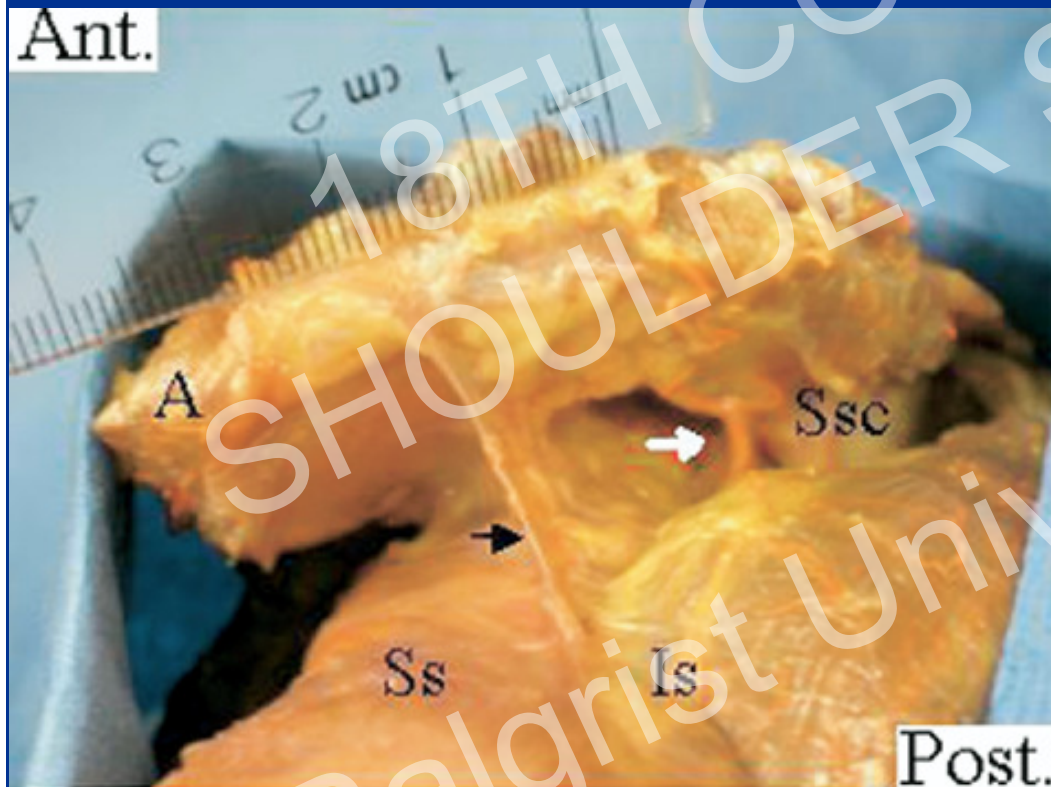
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MAJOR SOURCES OF BLEEDING

- Branches of the suprascapular artery
- Acromial branch of the thoracoacromial trunk

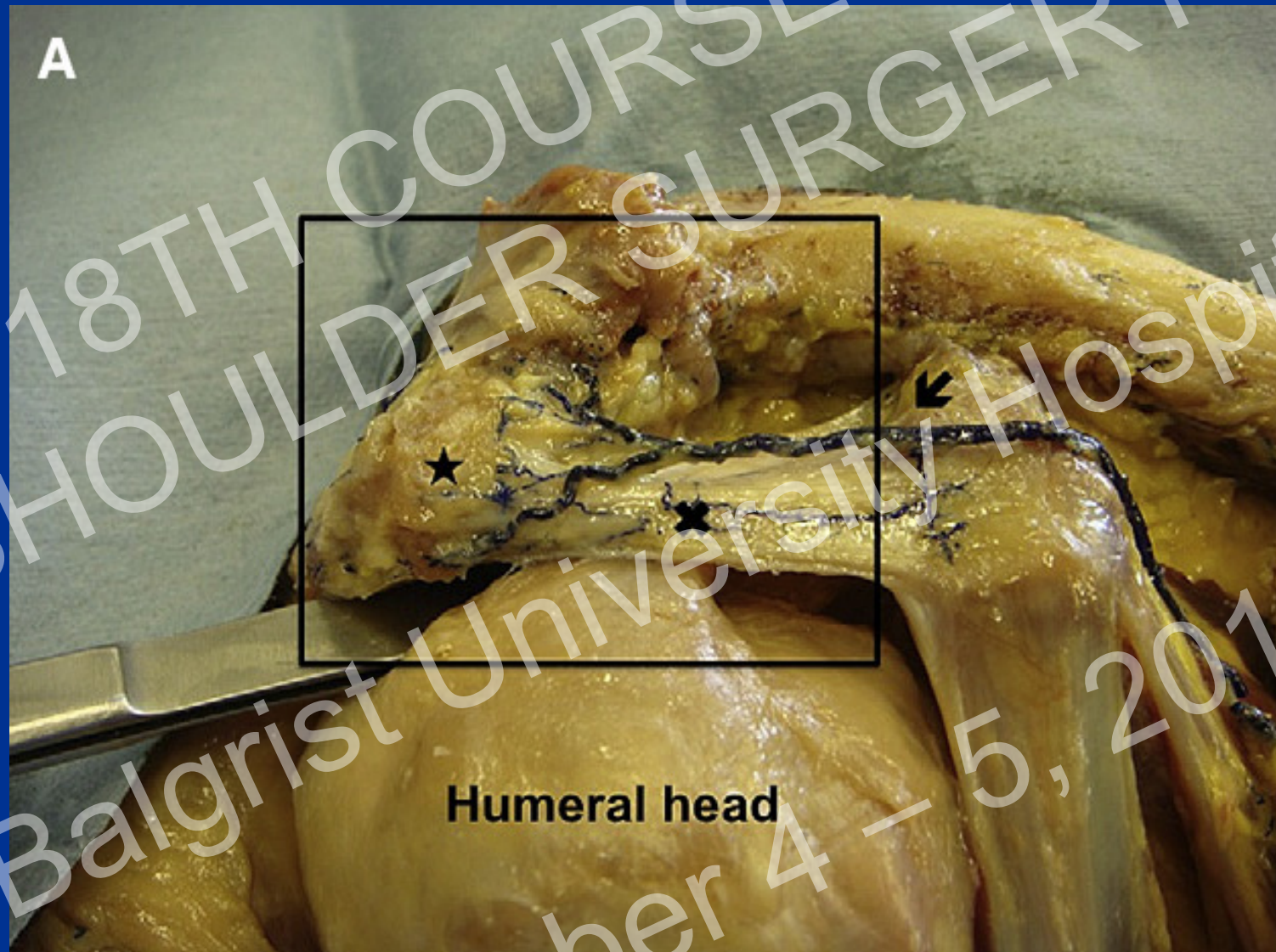


MAJOR SOURCES OF BLEEDING: SUPRASCAPULAR ARTERY



Yepes, Arthroscopy, 23(9):978, 2007

MAJOR SOURCES OF BLEEDING: ACROMIAL BRANCH



Moor et al, JSES, Jul 1, 2011

ROTATOR CUFF SUBACROMIAL SPACE



THANK YOU



October 4 – 5, 2011