



雙和急診POCUS訓練

陳國智 醫師



醫用超音波學會指導醫師
WINFOCUS director / instructor
急救加護醫學會重症超音波負責人

急診 / 重症 / 介入 / 急性疼痛

經歷

新光急診超音波訓練中心主任

西園醫院急診醫學科主任

急診醫學會超音波委員會主委

台灣疼痛醫學會大體模擬手術講師

診
斷

監
測

介
入

POINT OF CARE ULTRASOUND

~ 存在於臨床需求之所在 ~



LE joint effusion

01/07

Airway

01/14

Needling

01/21

VExUS protocol

01/28

雙和急診POCUS訓練



Central access

02/11

Peripheral access

02/18

EFAST

02/25

雙和急診POCUS訓練



Basic ECHO

03/04

Nerve block-UE(1)

03/11

Nerve block-LE(1)

03/25

雙和急診POCUS訓練



Aorta & IVC

04/01

Liver & Biliary

04/08

Kidney & UB

07/08

Pancreas & Spleen

07/22

雙和急診POCUS訓練



GI tract scan

08/05

Basic lung & heart (PGY)

08/05

Sternum & Ribs

08/19

UE joint effusion

08/26

雙和急診POCUS訓練



急診臨床掃描指導

09/16

CVC工作坊 (1)

09/16

8 POCUS skills for PGY

09/23

Ocular US

09/30

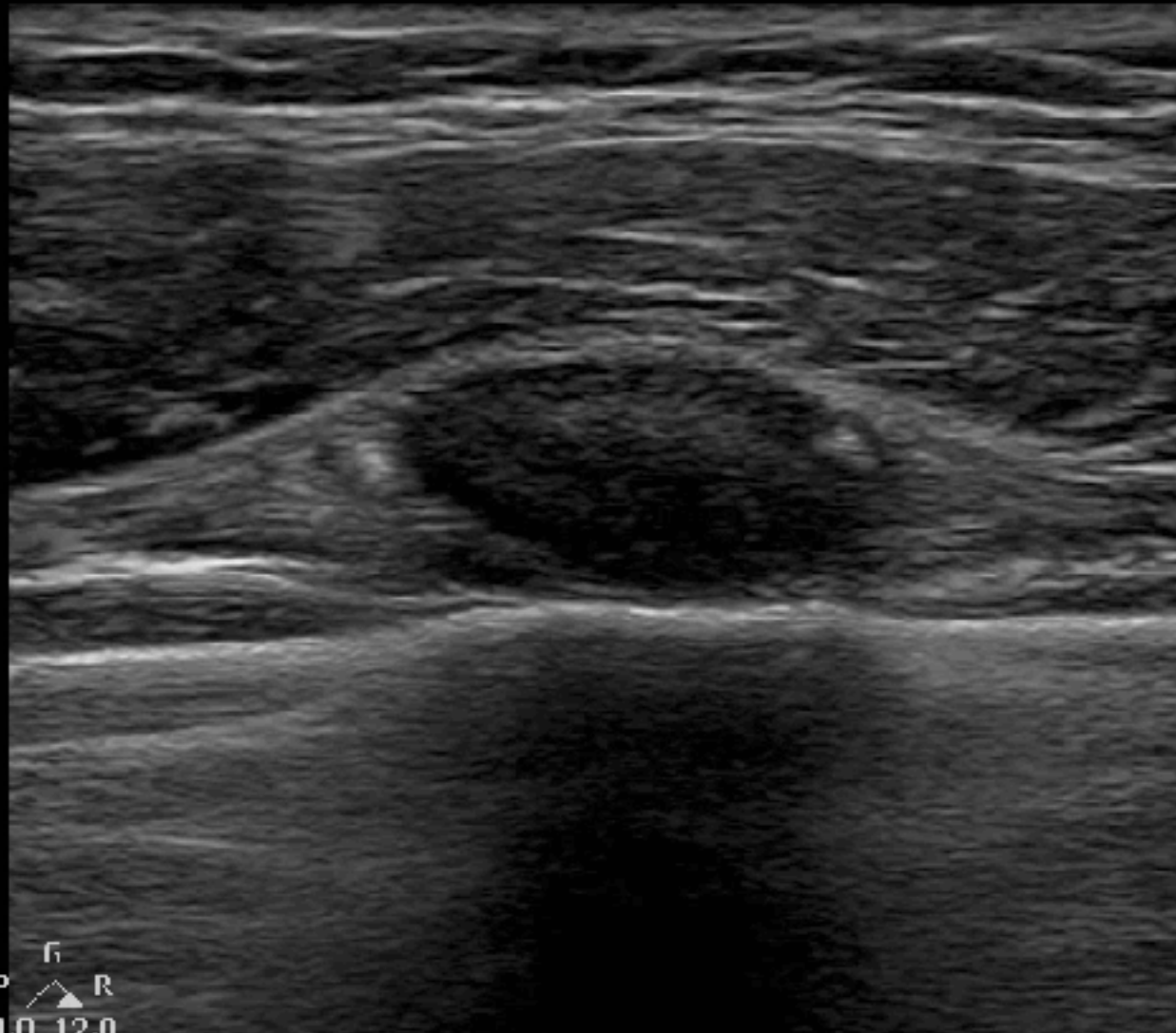
雙和急診POCUS訓練

FRACTURE ?

MSK Gen
L12-1
44 Hz
3.0cm

2D
Res
Gn 62
58
4/3/4

P

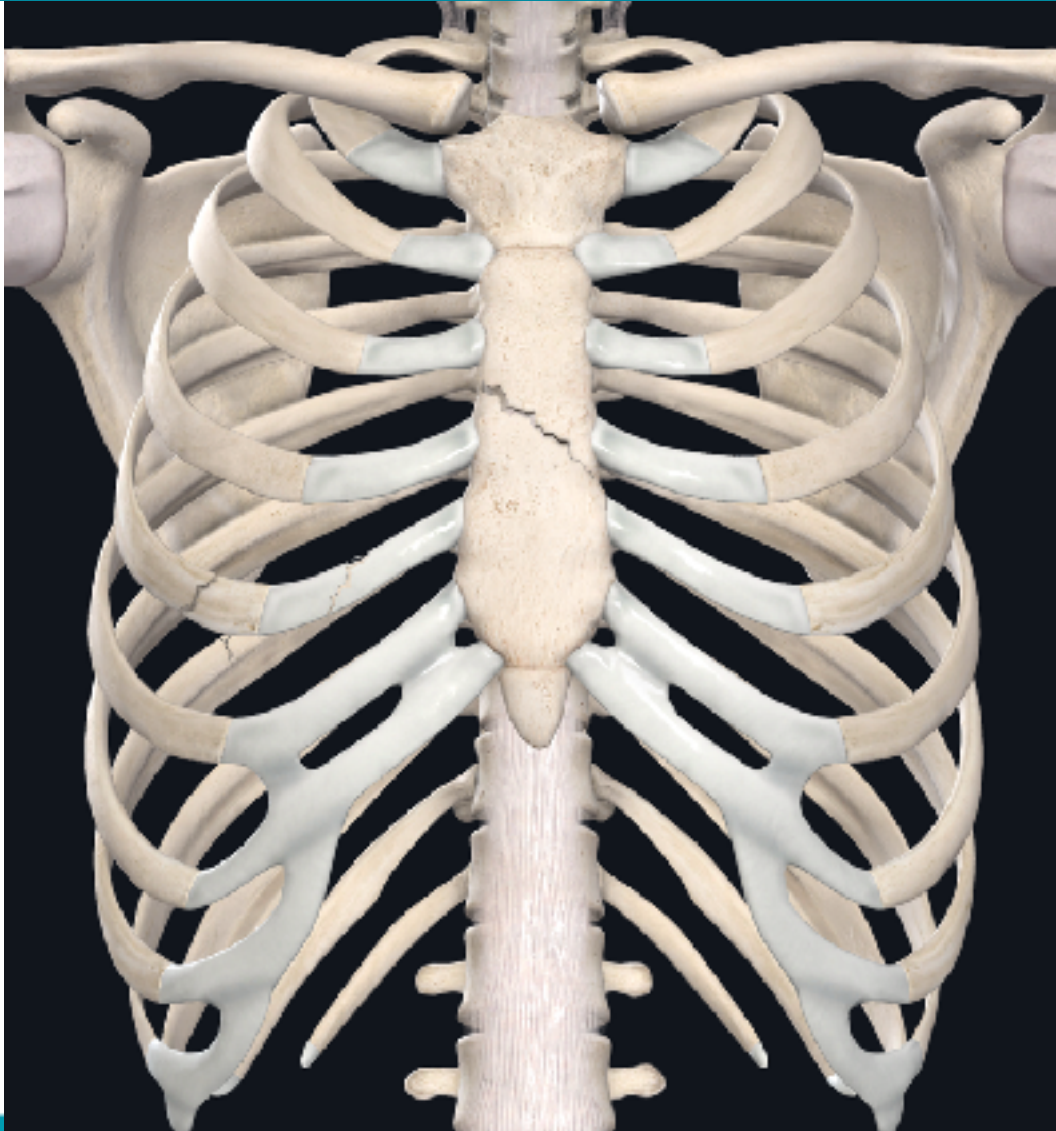


P
R
1.0 12.0



3.0cm

骨折診斷三要點



高低差

不連續

有血腫

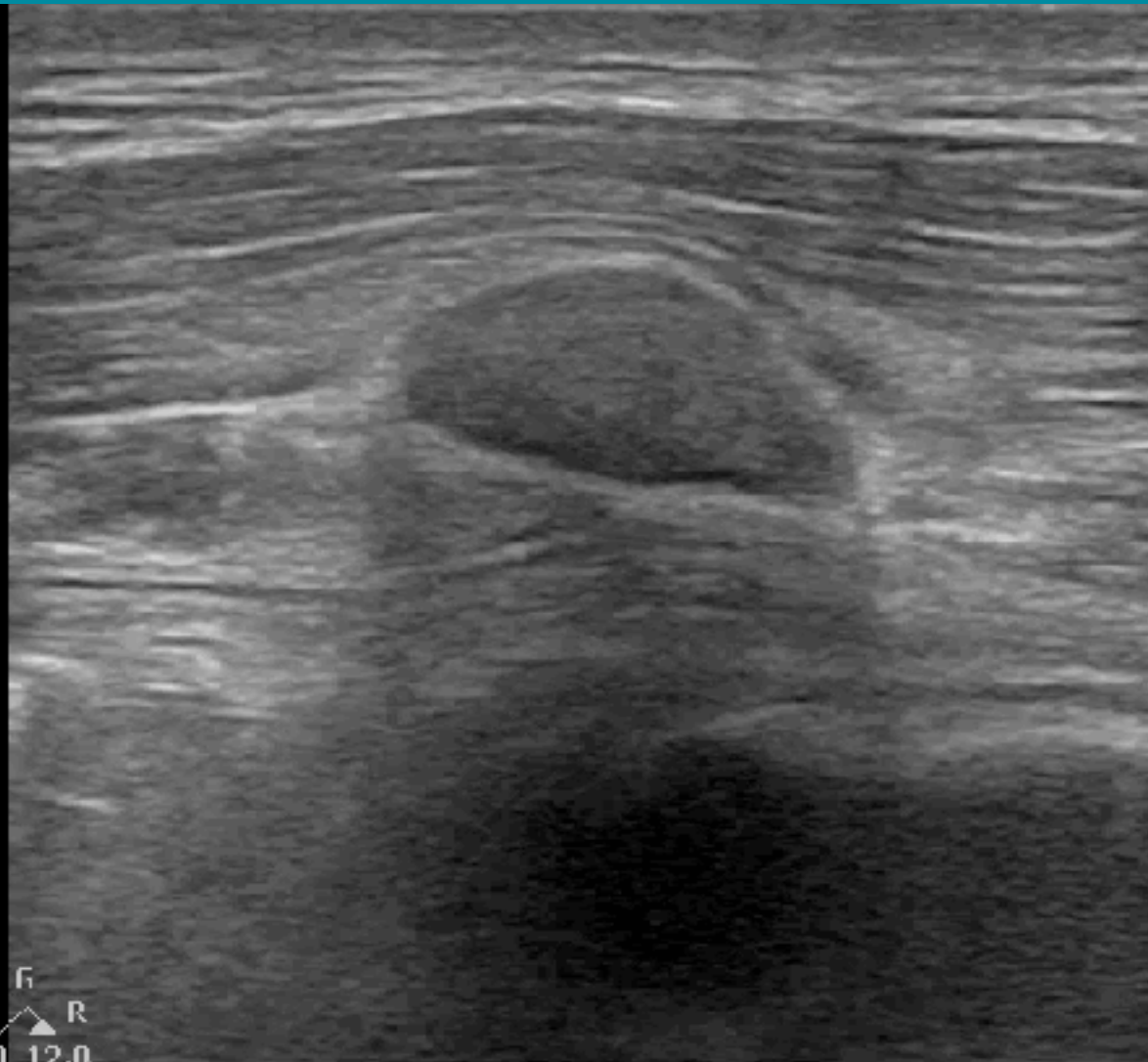
1. FRACTURE ?

Superficial
L12-3
46 Hz
3.5cm

2D
Res
Gn 100
C. 58
3 / 2 / 1

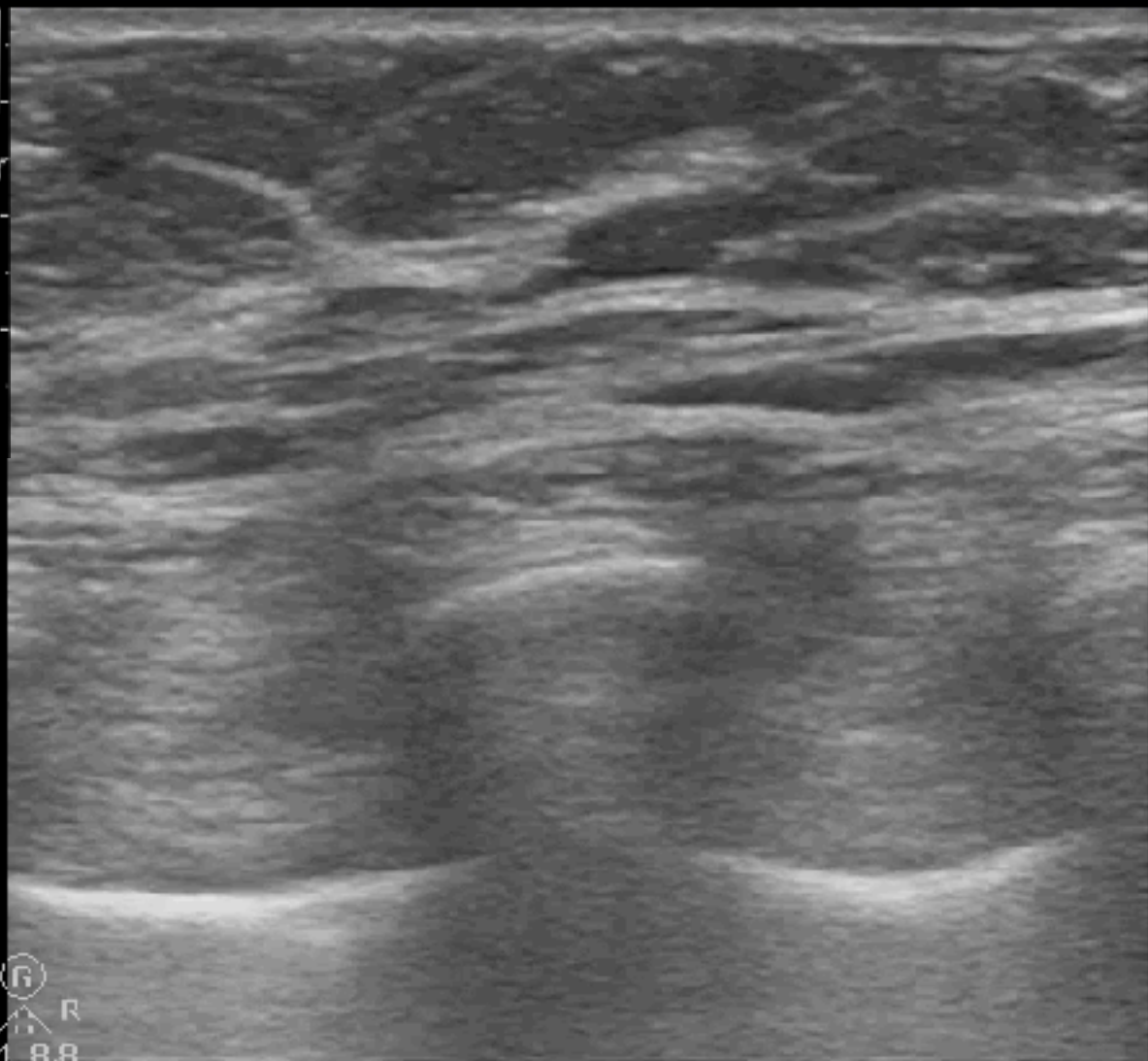
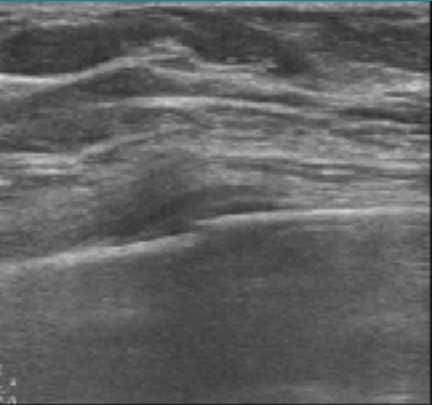


P R
3.0 12.0



3.5cm

2. FRACTURE ?



P R
1.1 9.9

3.5cm

3. RIB NO ?

Superficial

L12-3

50 Hz

2.5cm

2D

Res

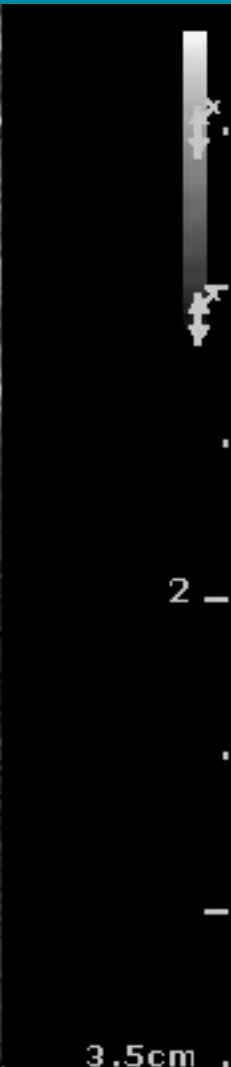
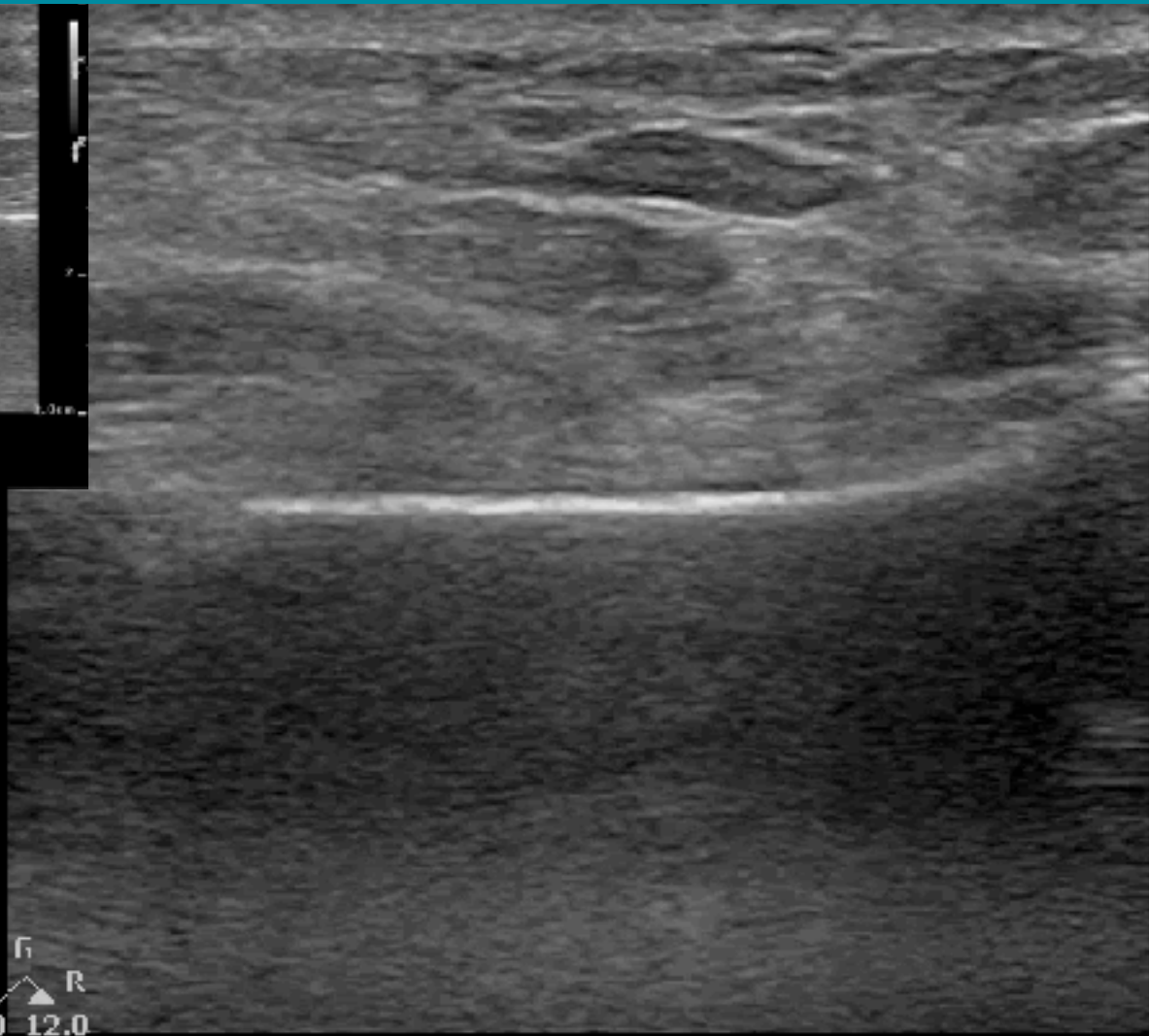
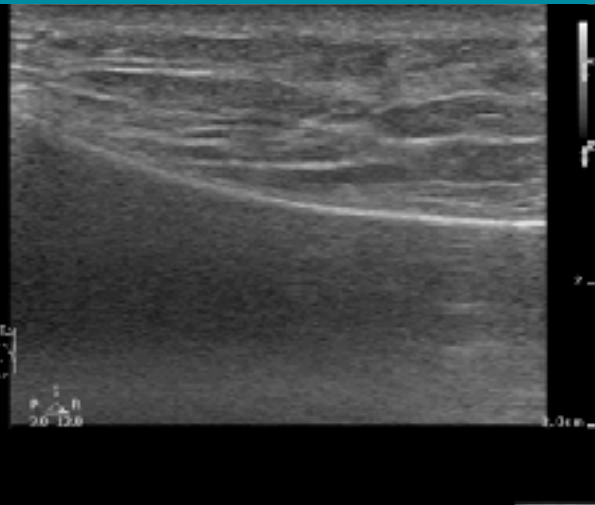
Gn 100

C. 58

3 / 2 / 1



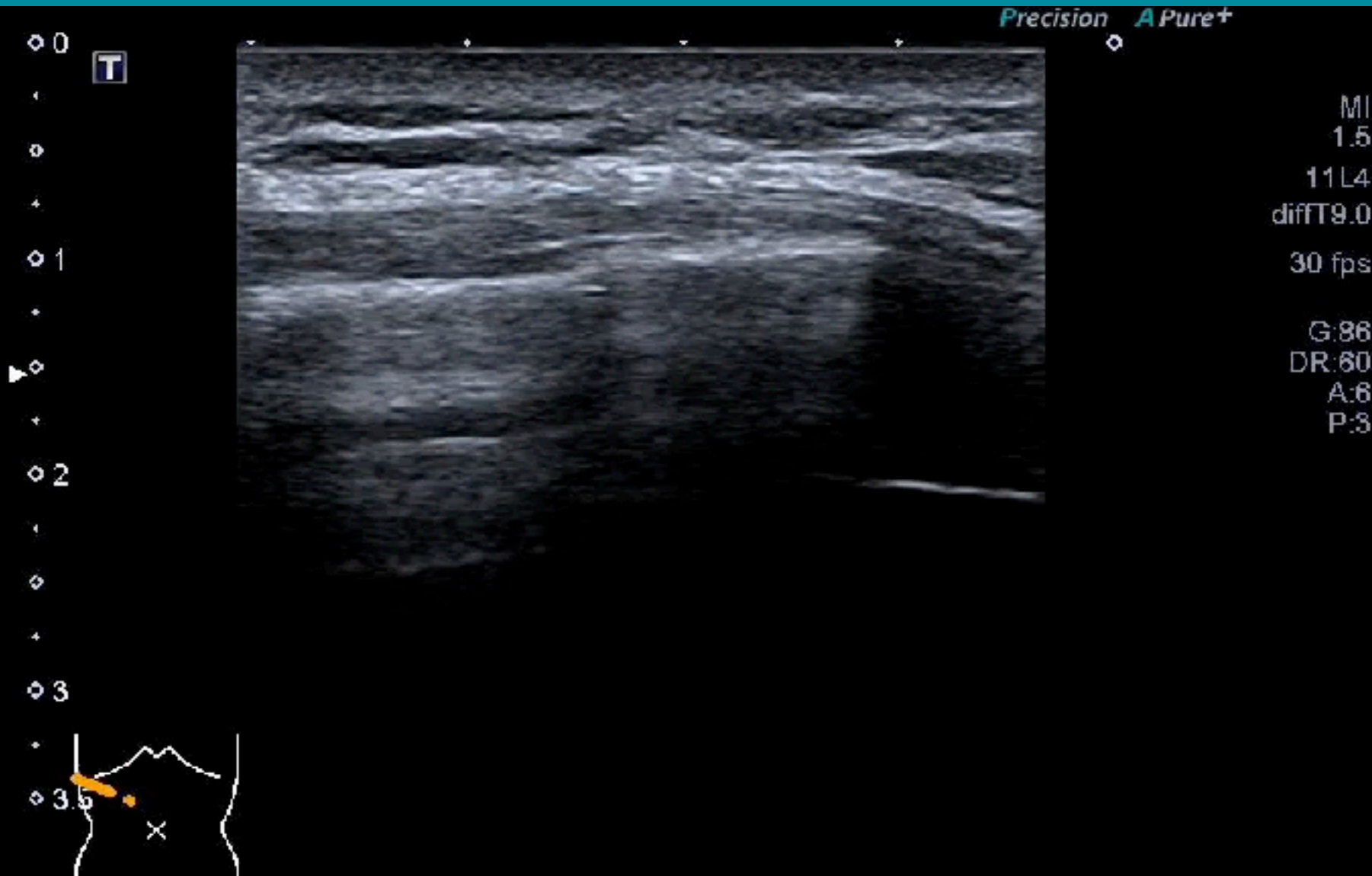
4. FRACTURE ?



P R
3.0 12.0

3.5cm

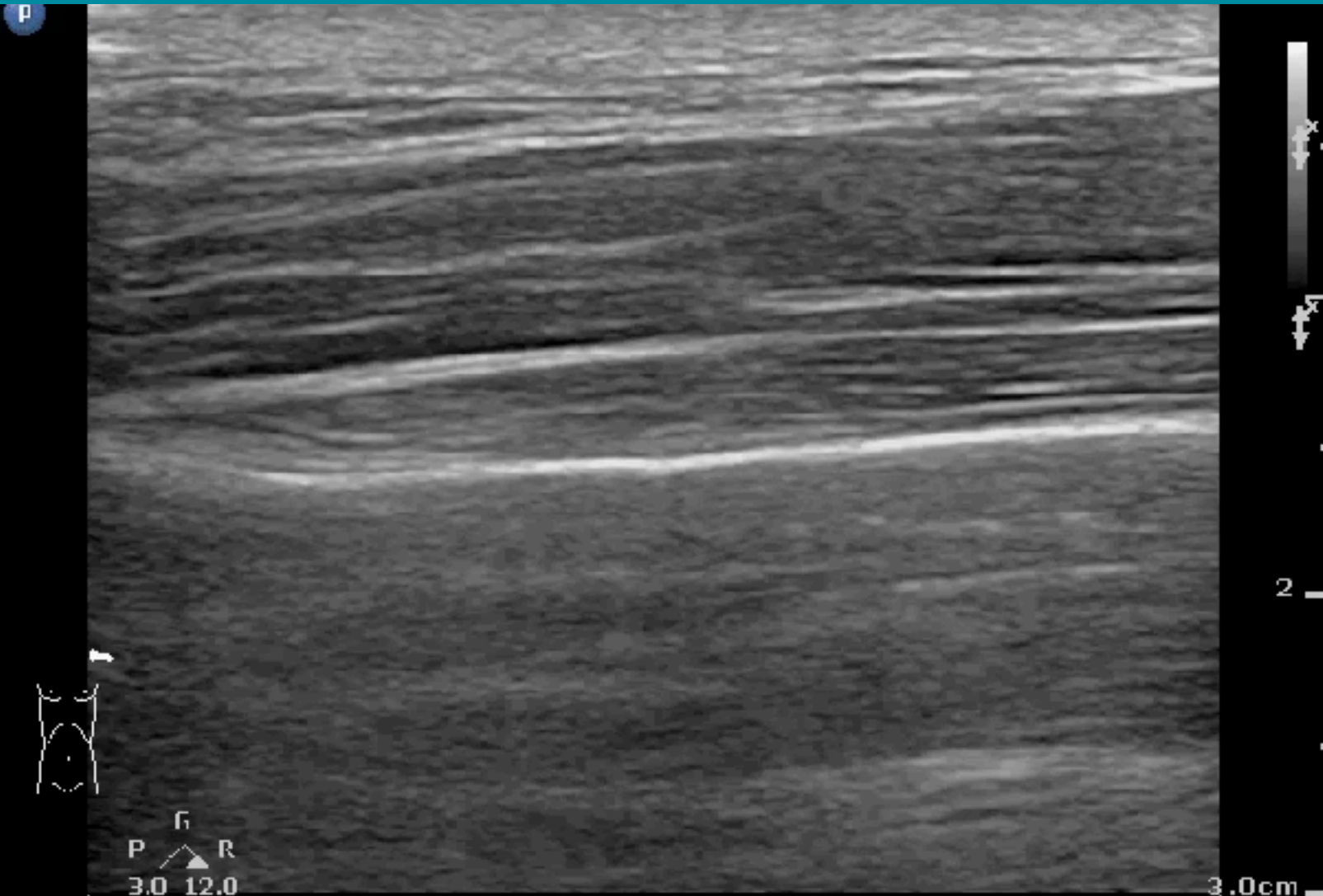
5. FRACTURE ?



6. FRACTURE ?

Superficial
L12-3
46 Hz
3.0cm

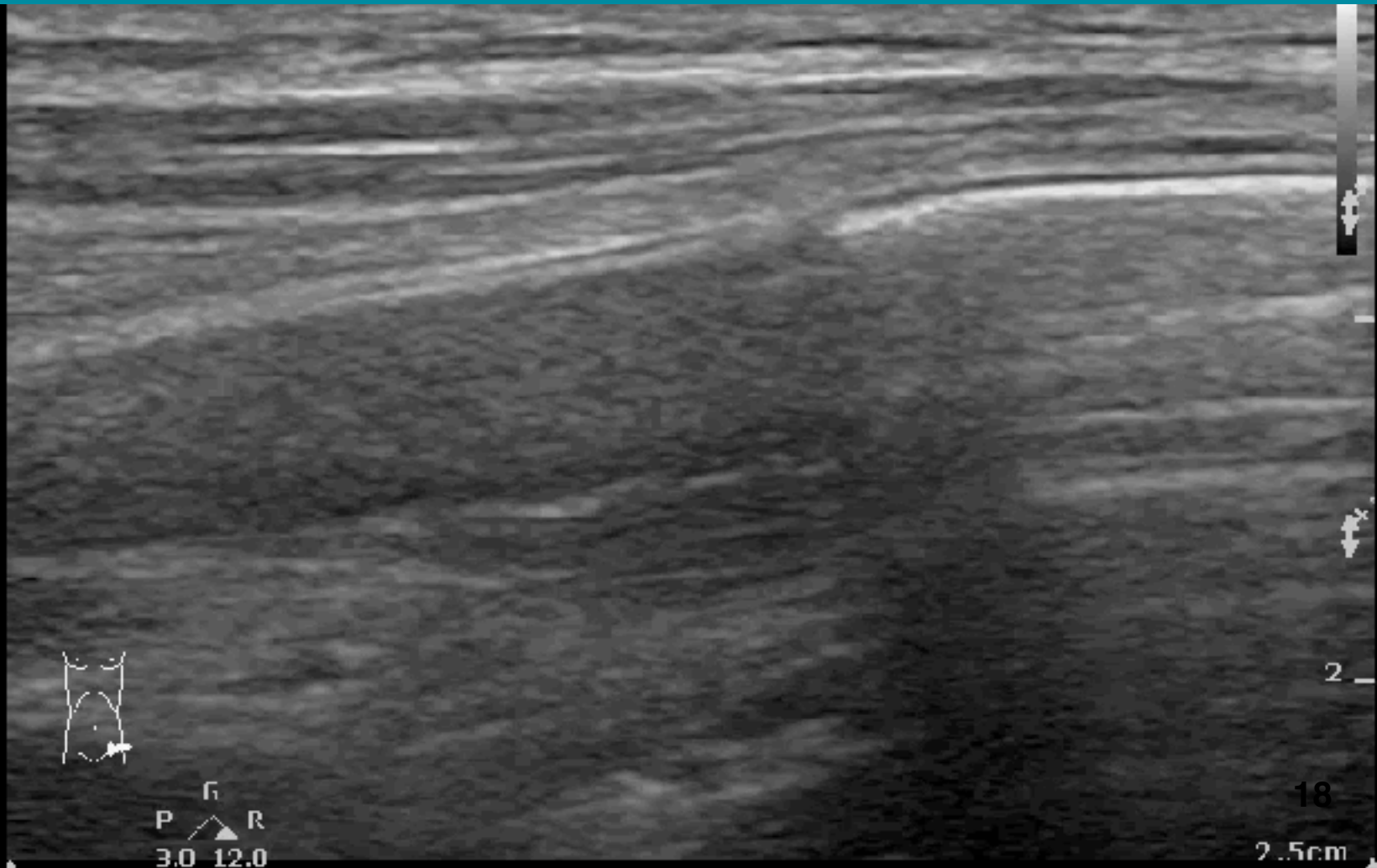
2D
Res
Gn 60
C. 56
3/2/1



7. FRACTURE ?

L12-3
50 Hz
2.5cm

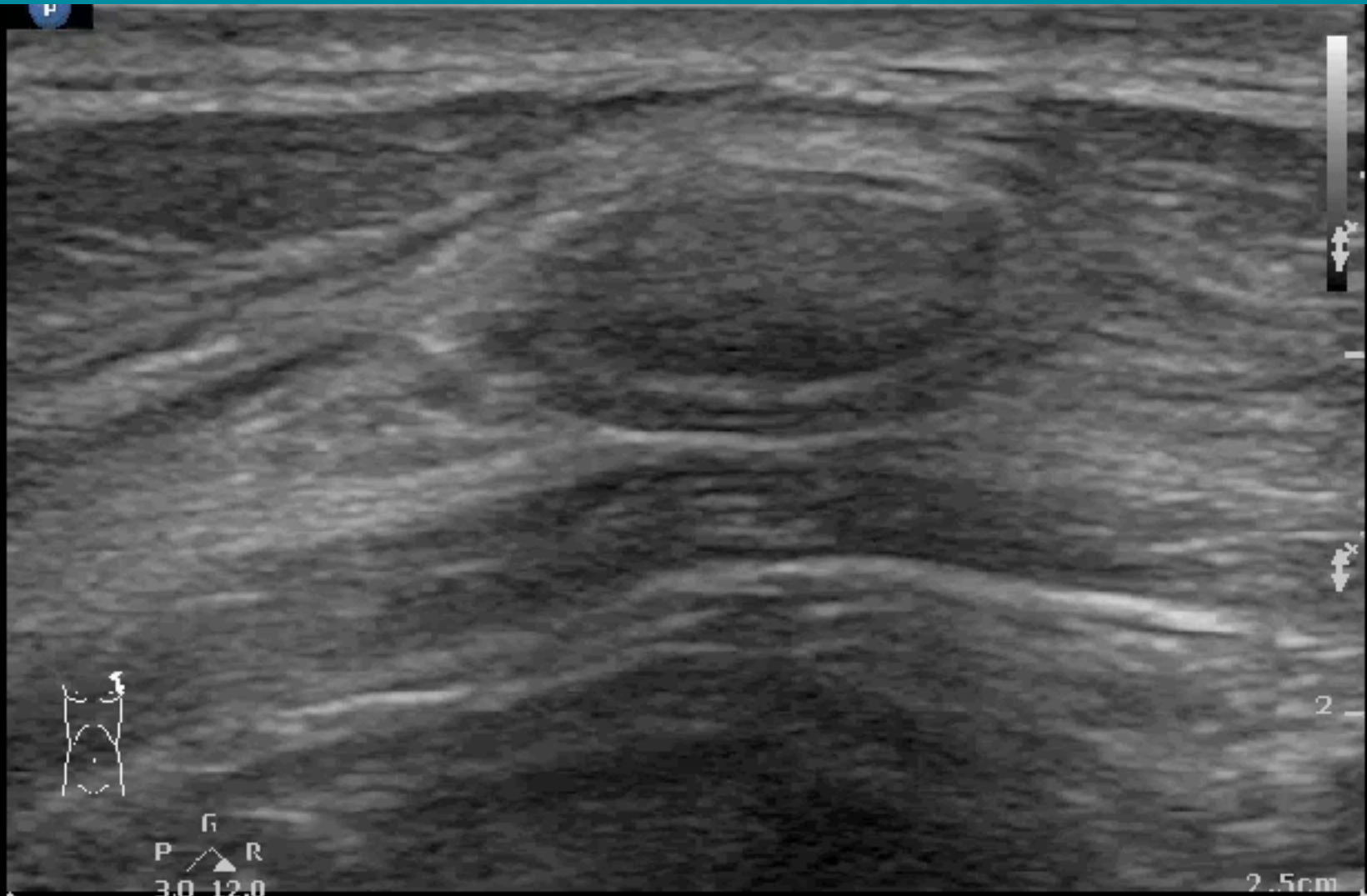
2D
Res
Gn 100
C. 56
3 / 2 / 1



8. FRACTURE ?

Superficial
L12-3
50 Hz
2.5cm

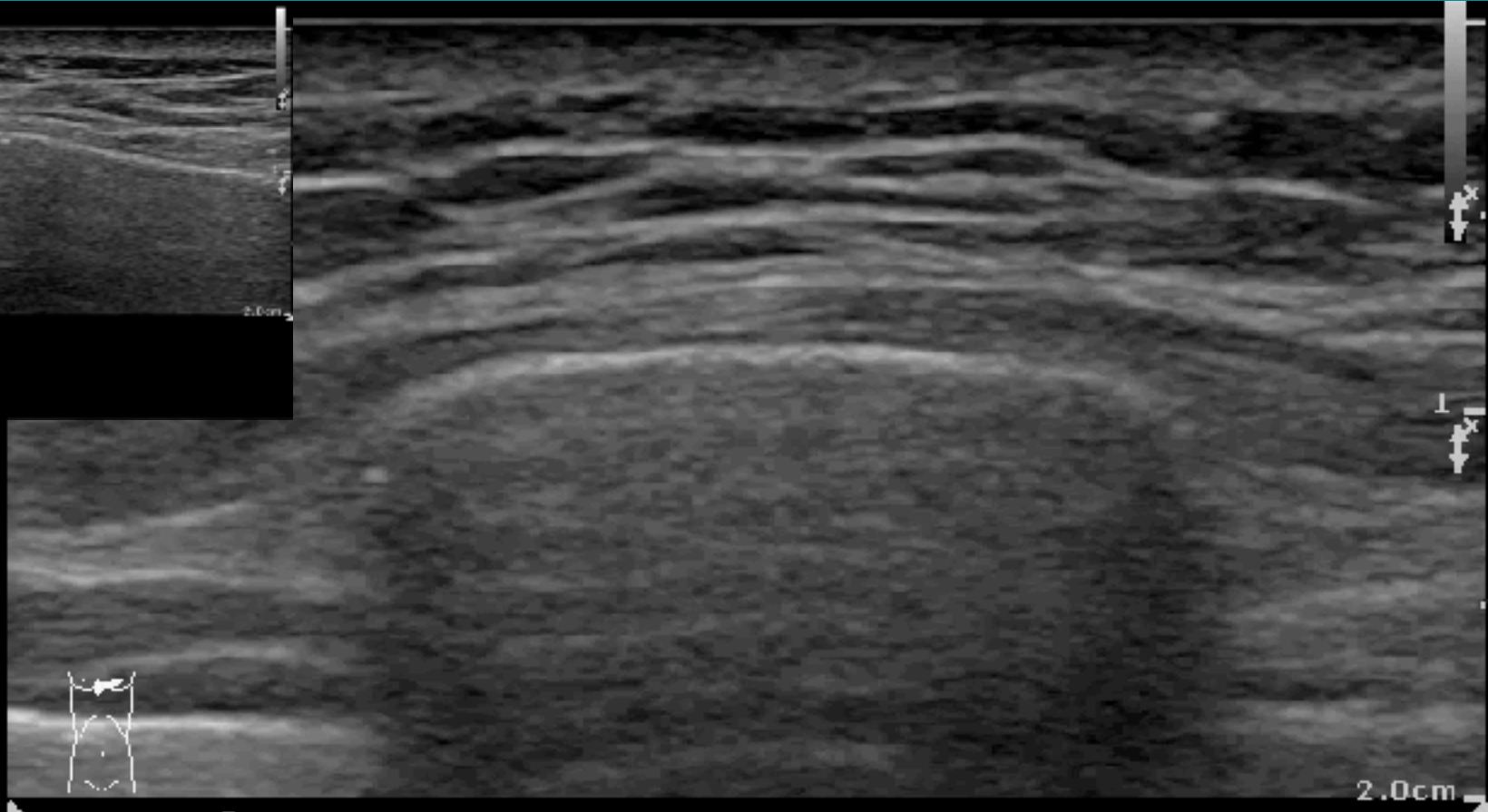
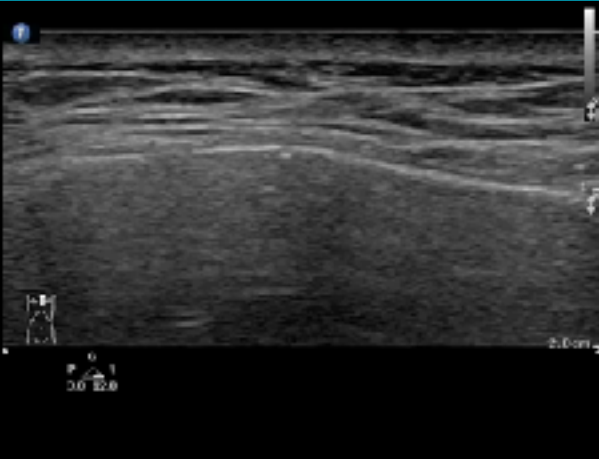
2D
Res
Gn 100
C. 56
3/2/1



9. FRACTURE ?

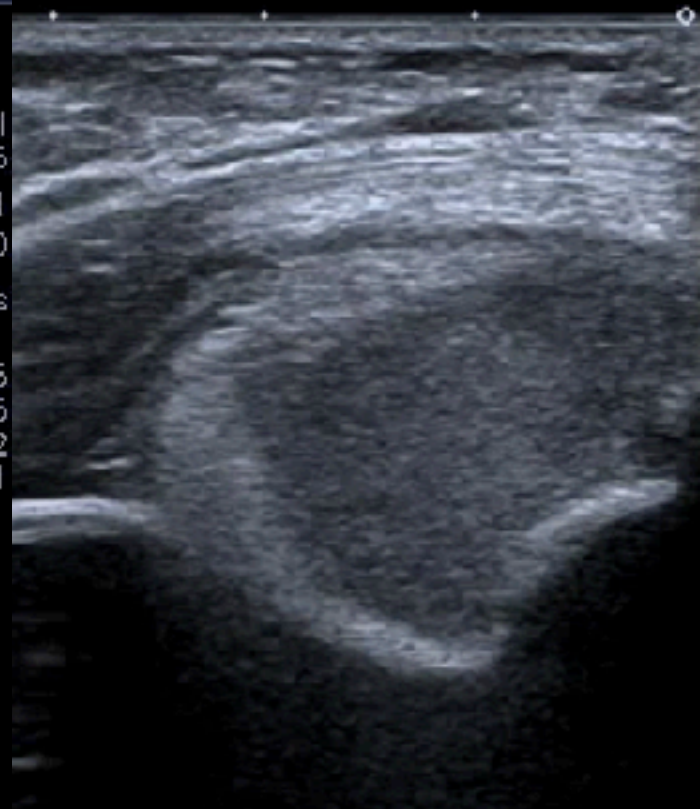
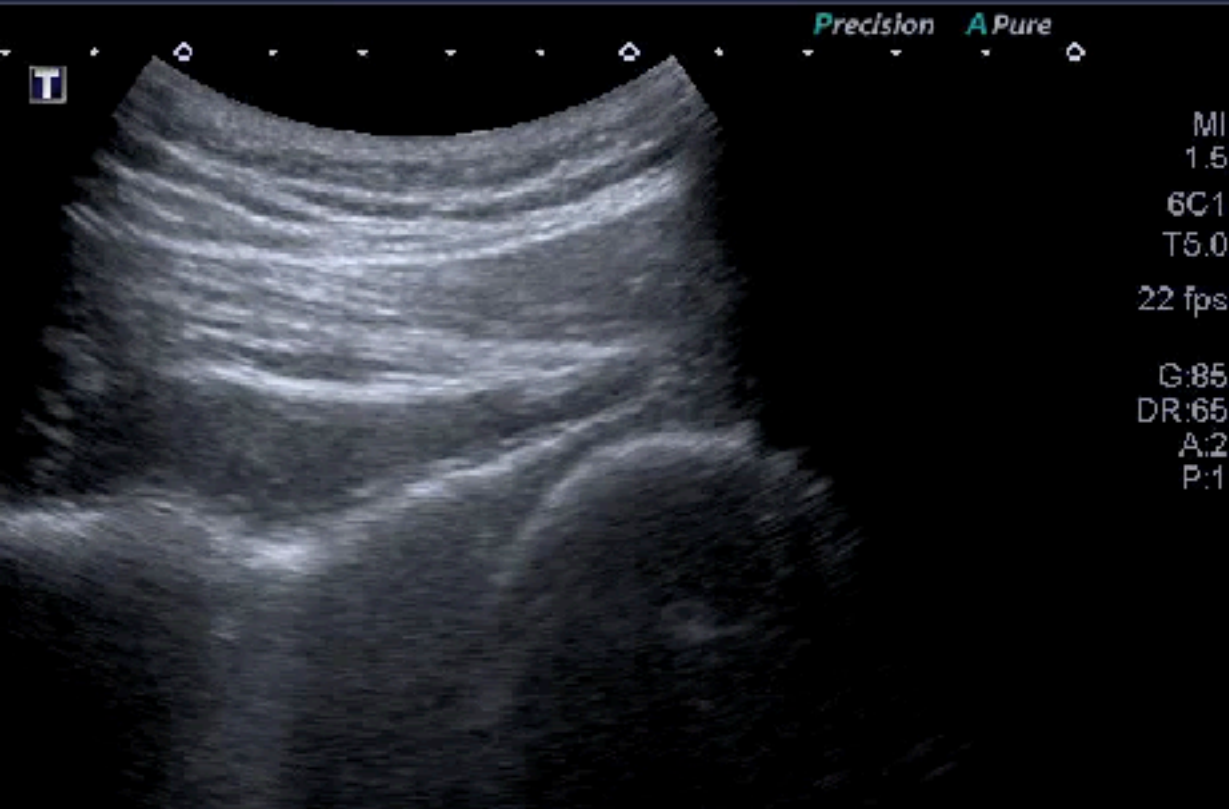


10. FRACTURE ?



Fr
P R
3.0 12.0

2.0cm



UPPER EXTREMITY JOINT

SHOULDER

ELBOW

I-AIM

POINT



Acquire



Interpret



**Make
decision**

MSK 常用探頭

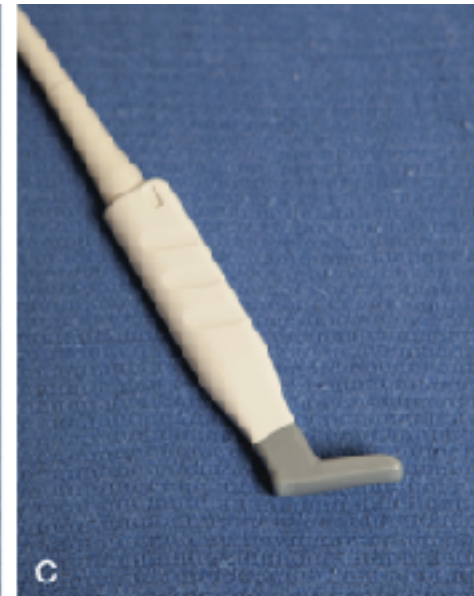
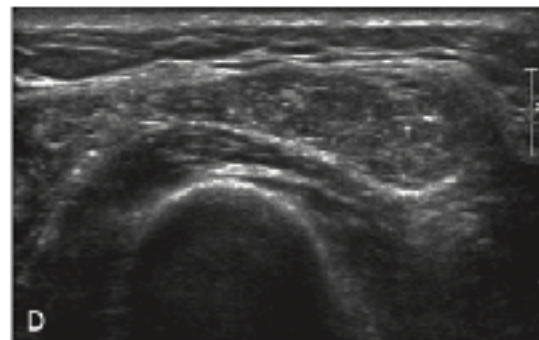
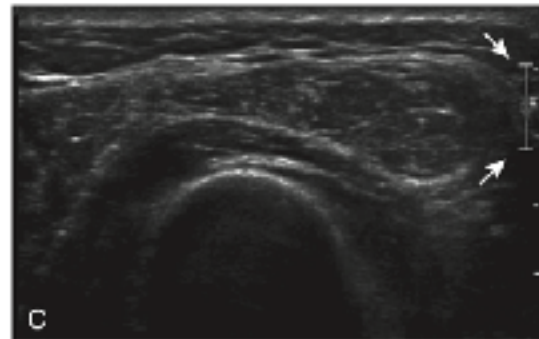
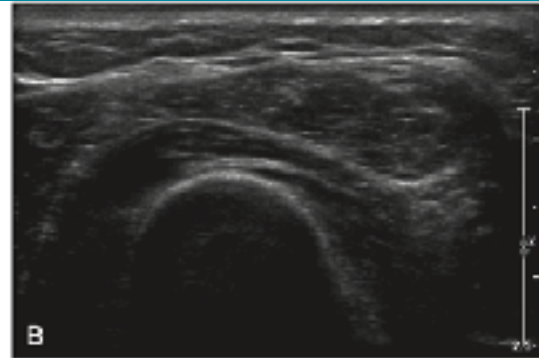


Image optimization



深度/Depth

焦點/Focus

亮度/Gain

Transducer Positioning

探頭

操作者的手

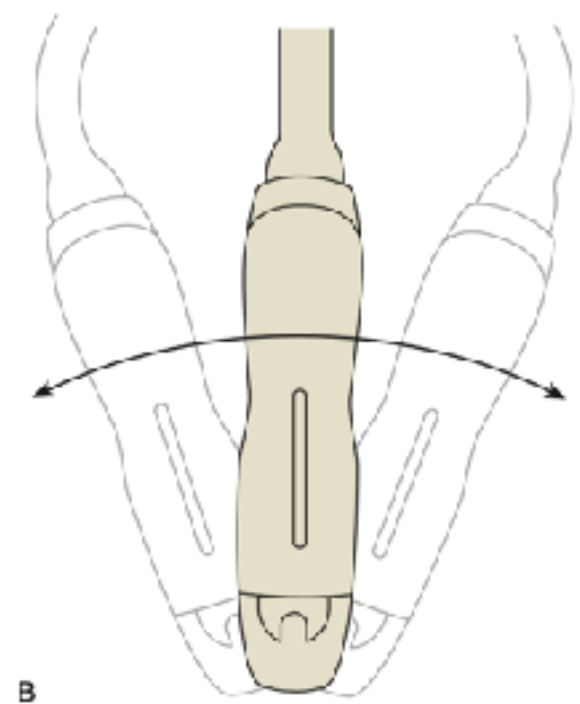
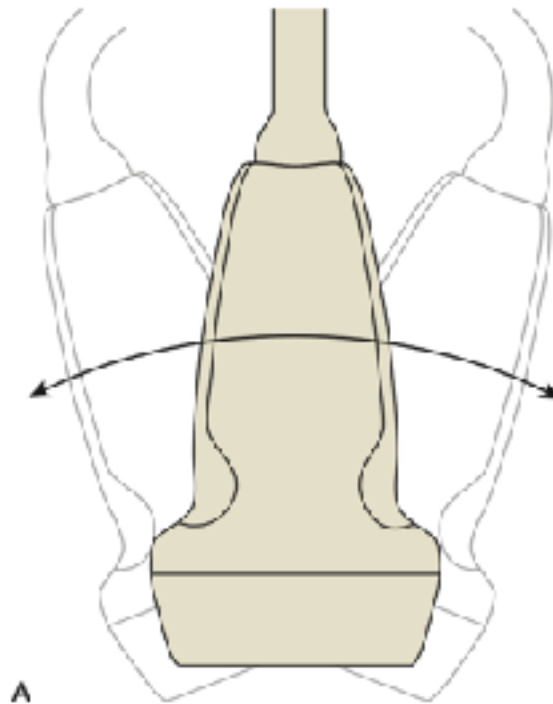
皮膚



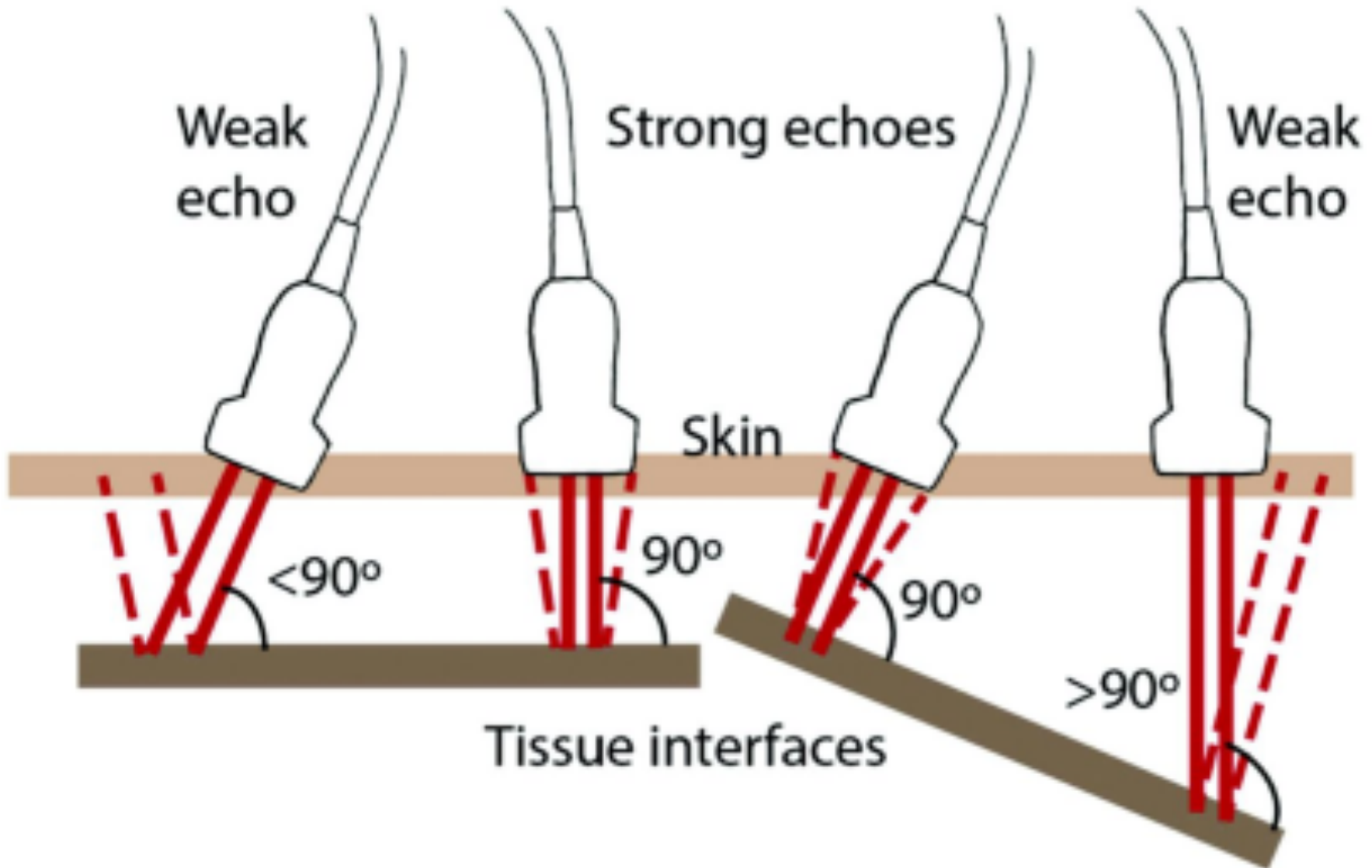
Transducer maneuver

探頭的操控

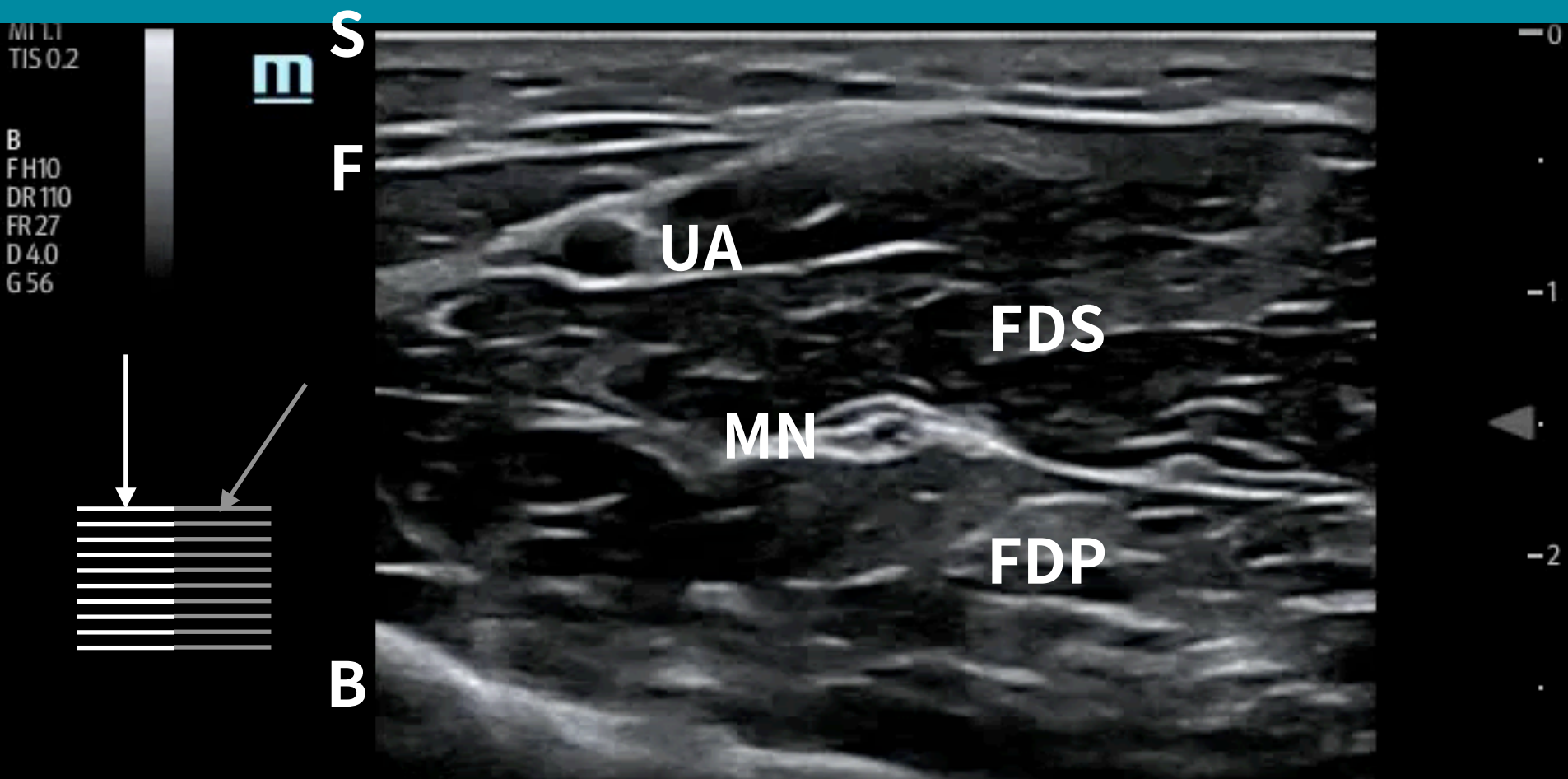
Rock 扇 Tilt



Perpendicular to Target



Anisotropy

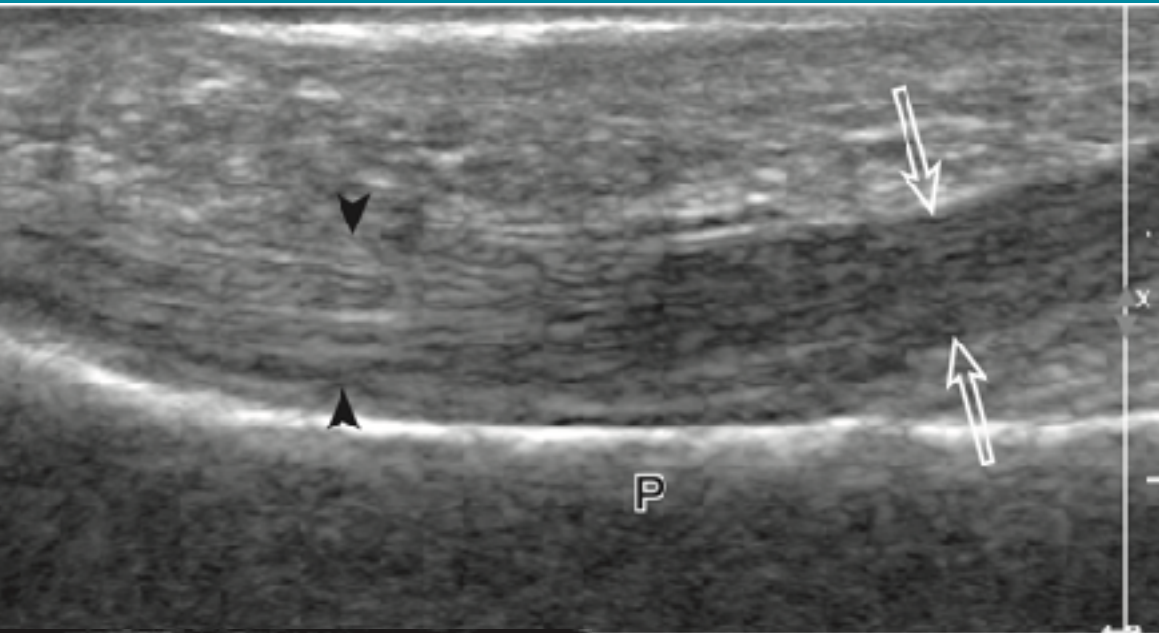


Tendon

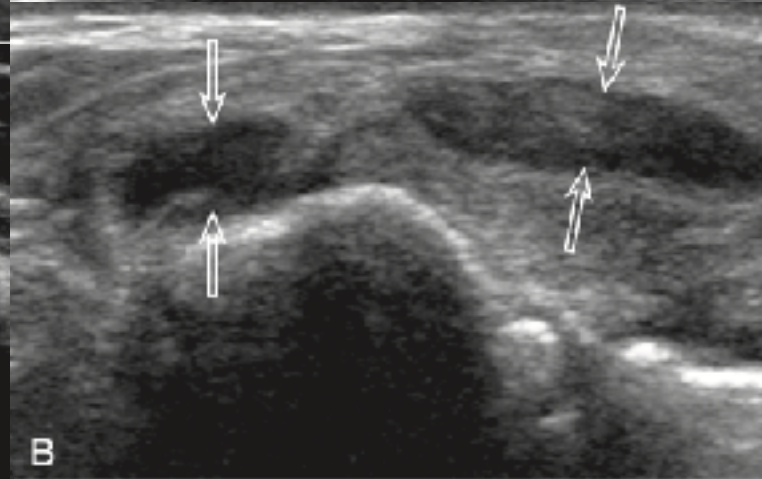
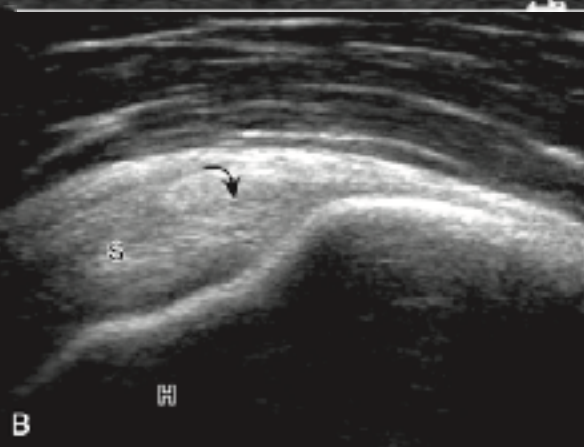
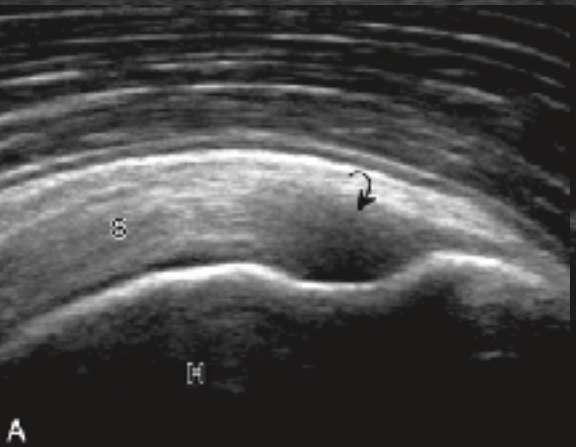
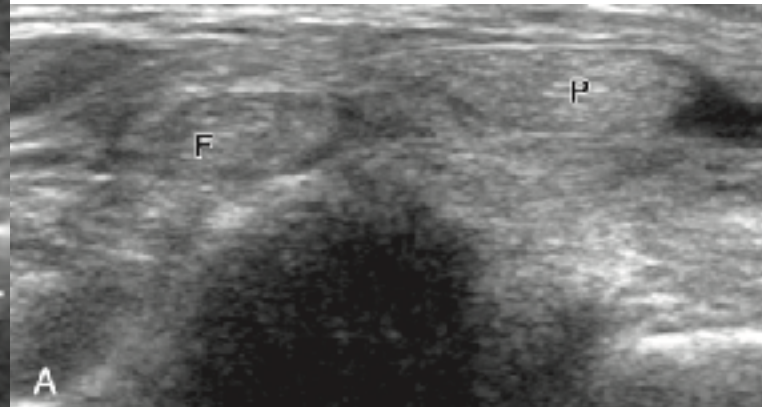
Nerve

Muscle

Anisotropy



角度/垂直



Anisotropy

Gen MB



Vas
HFL
19%
MI
0.7
TIS
0.1

Patient

Auto Gain

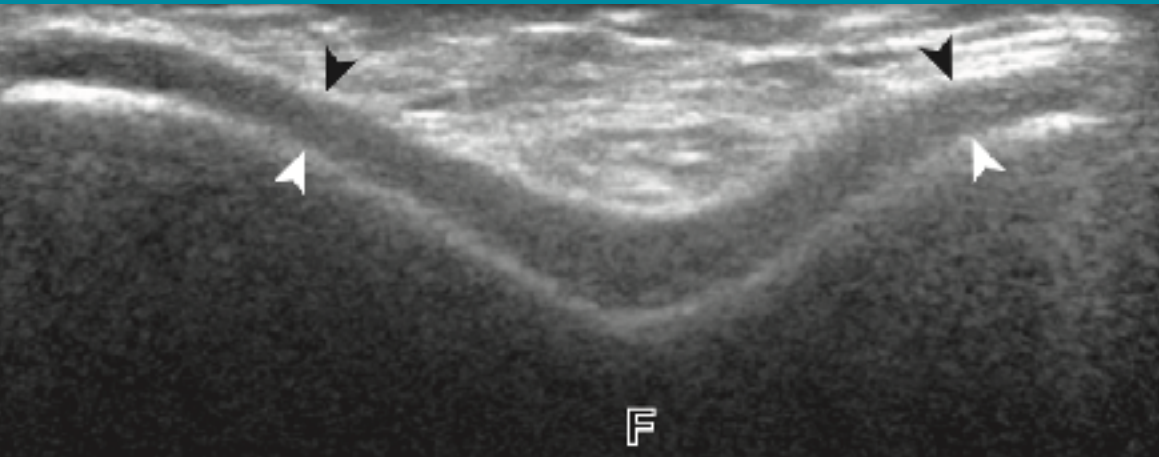
Gen

Clip

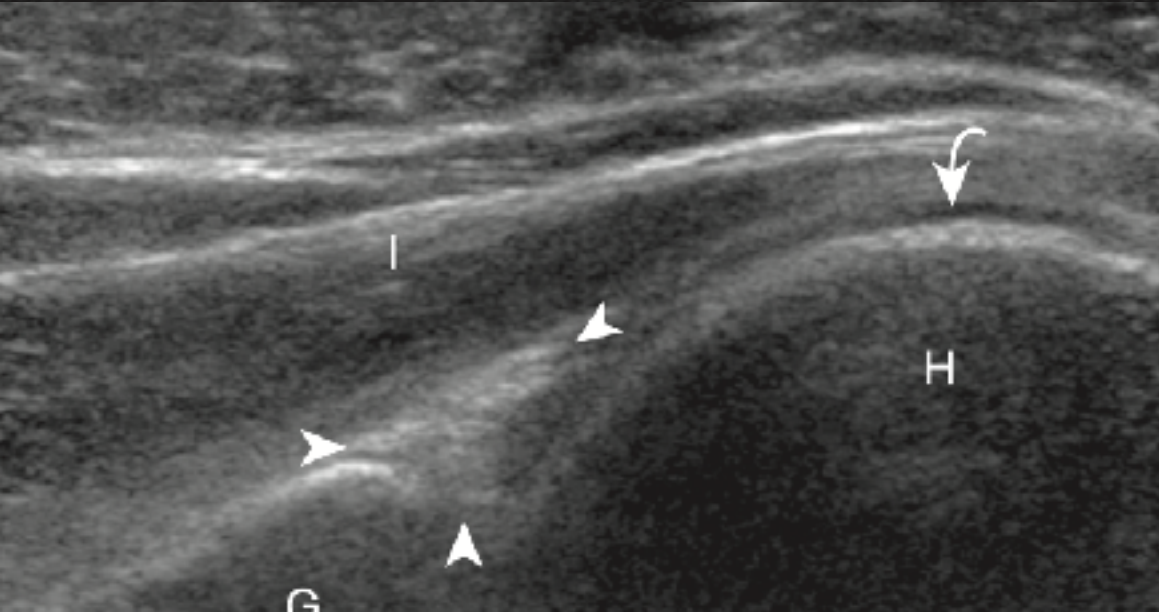
Page 1/3

4.0

Cartilage



**Hypoechoic
hyaline
cartilage**



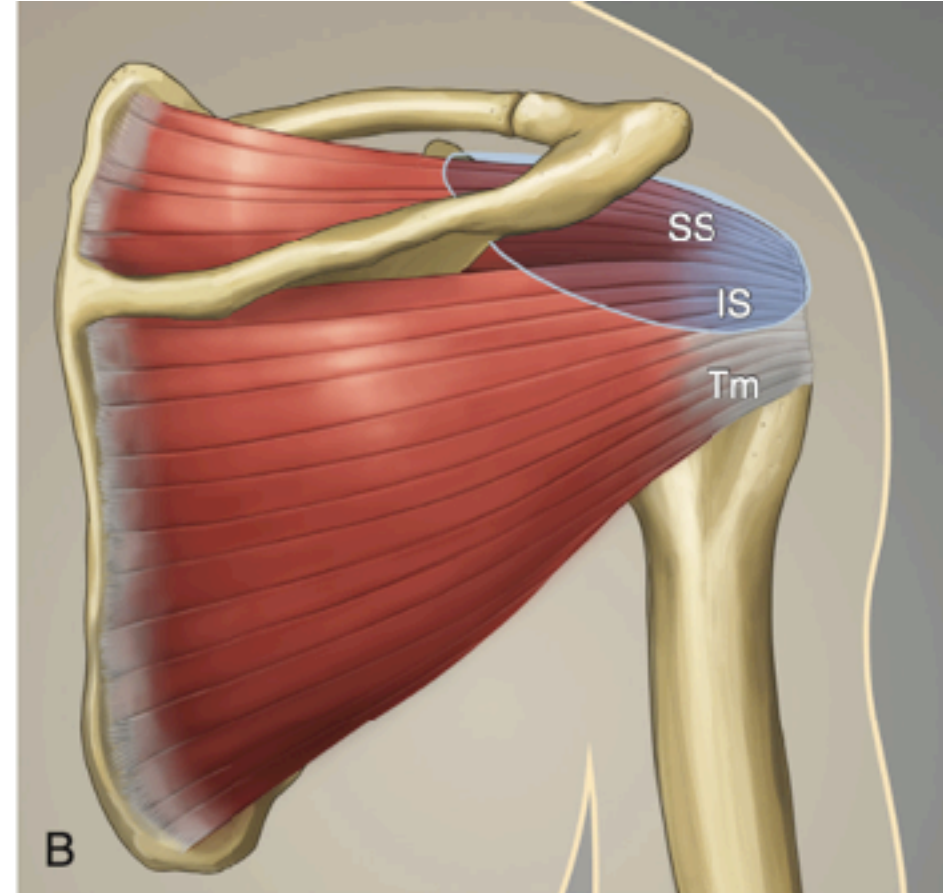
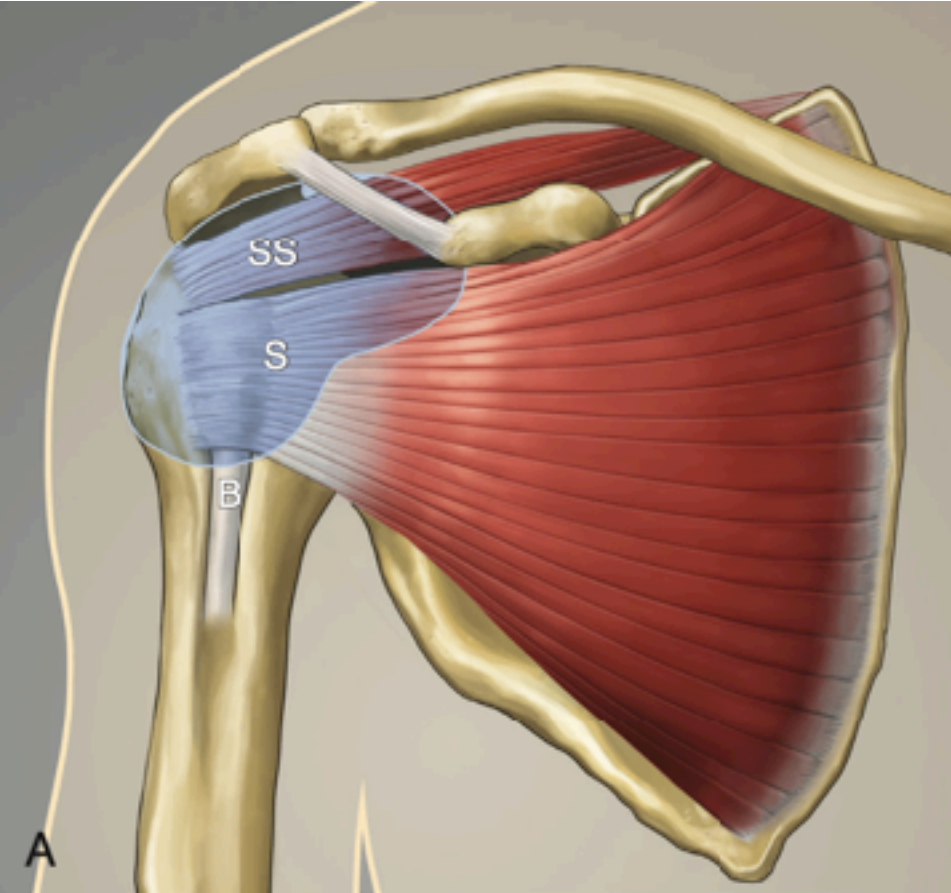
**Hyperchoic
fibrocartilage**

Clinical Scenario 臨床情境: effusion ?

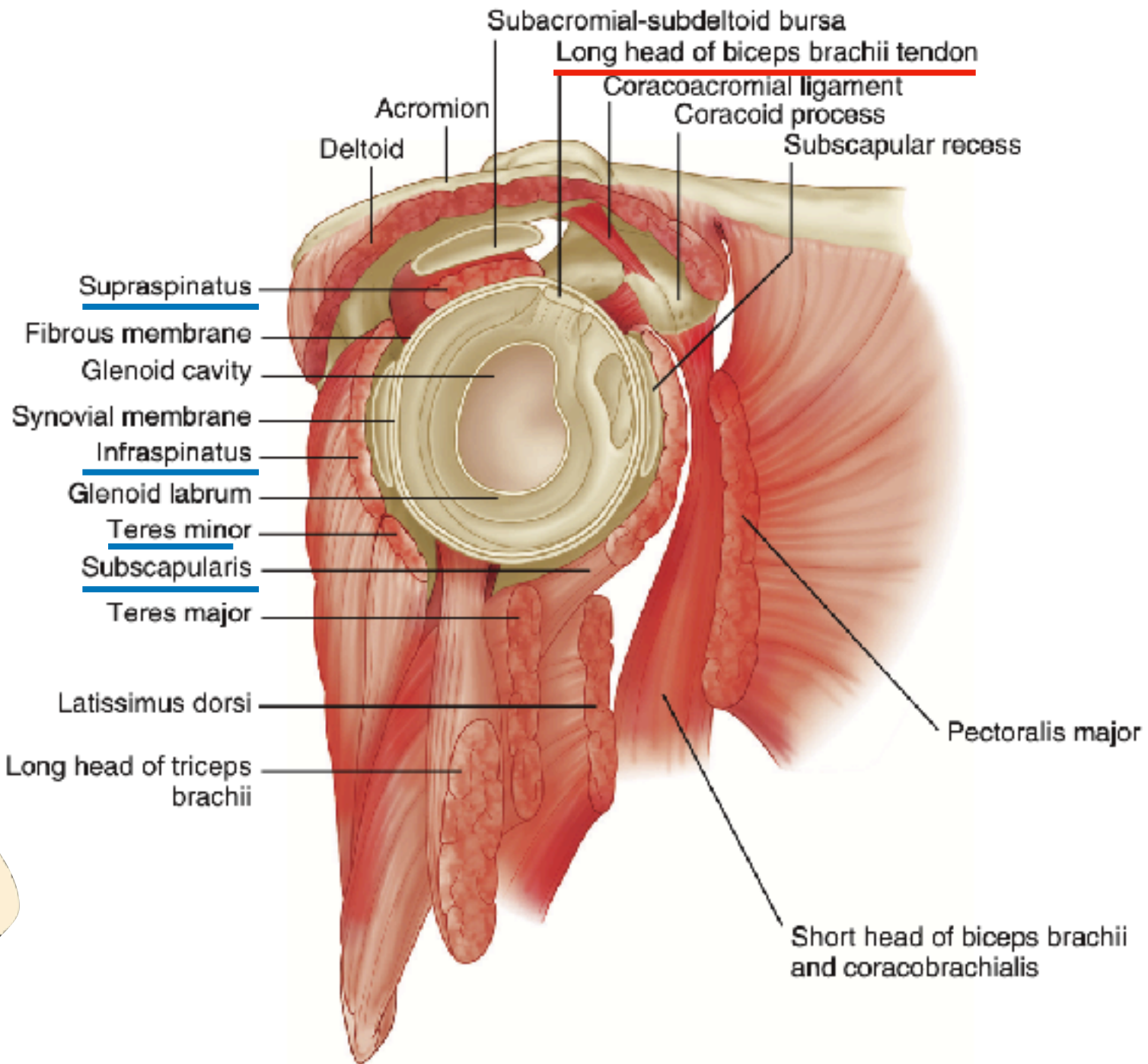


Shoulder anatomy

Rotator cuff (4)



Rotator Cuff

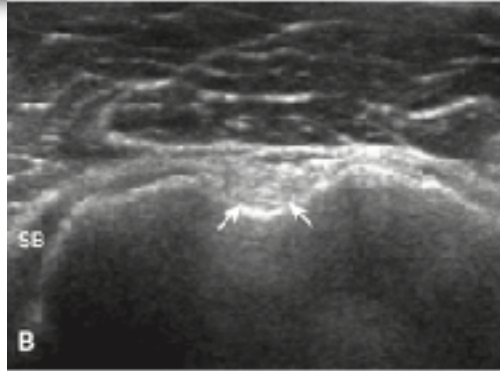


Shoulder US Examination

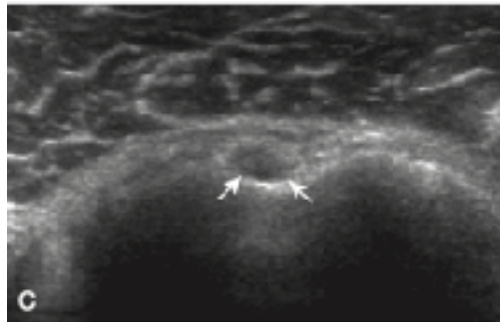
Patient & Examiner



Biceps brachii long head tendon

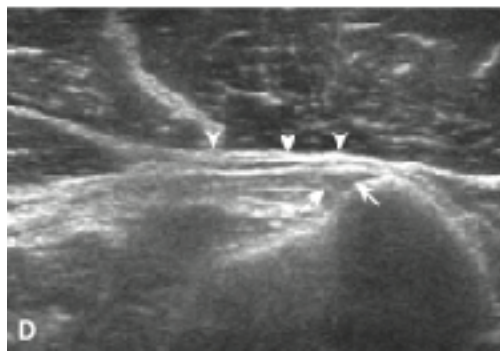


Short axis



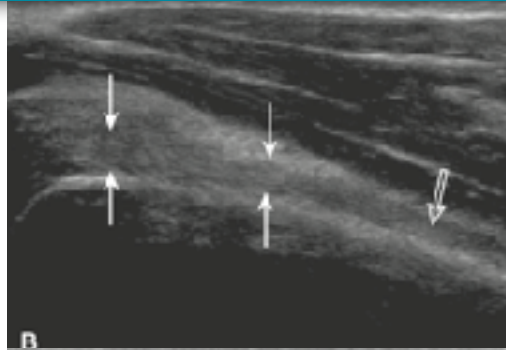
Bicipital groove

Anisotropy

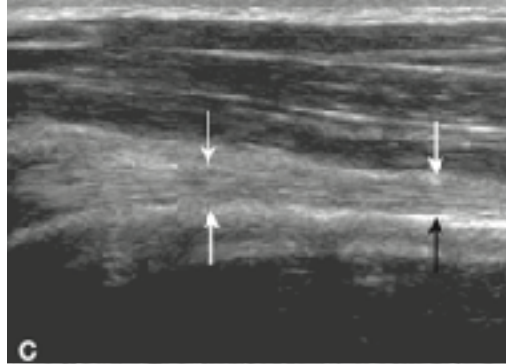


PM tendon

Biceps brachii long head tendon

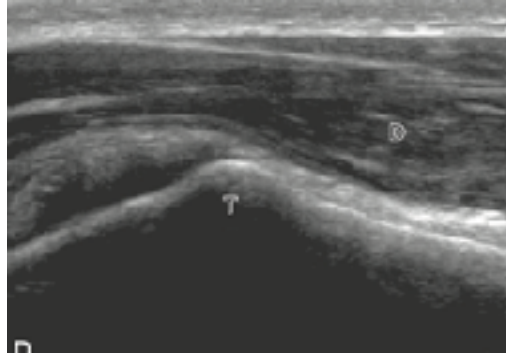


Long axis



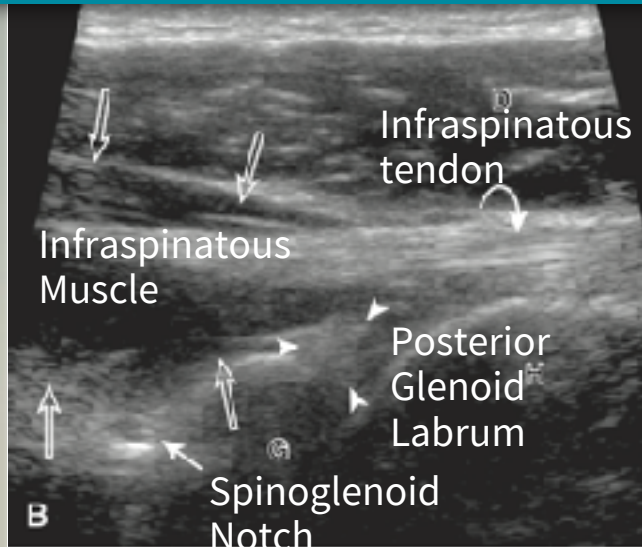
Bicipital groove

Anisotropy

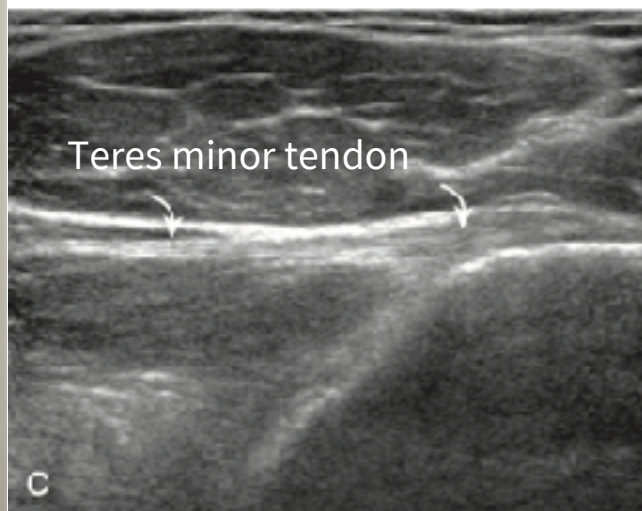


Lesser tuberosity

Posterior shoulder



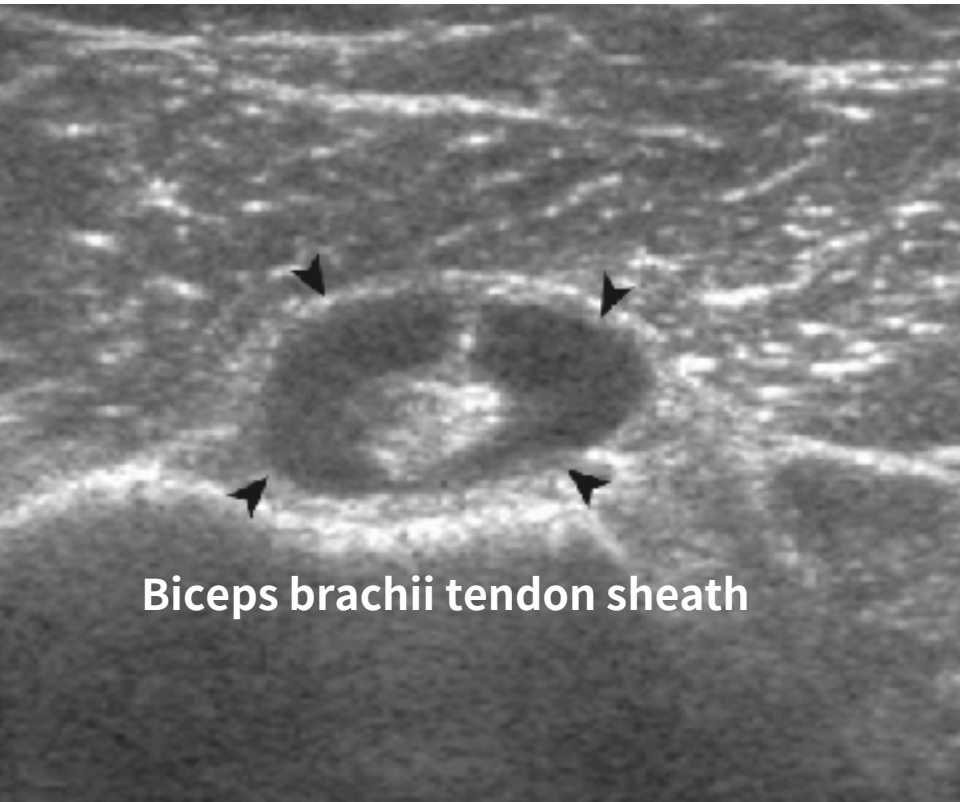
IST



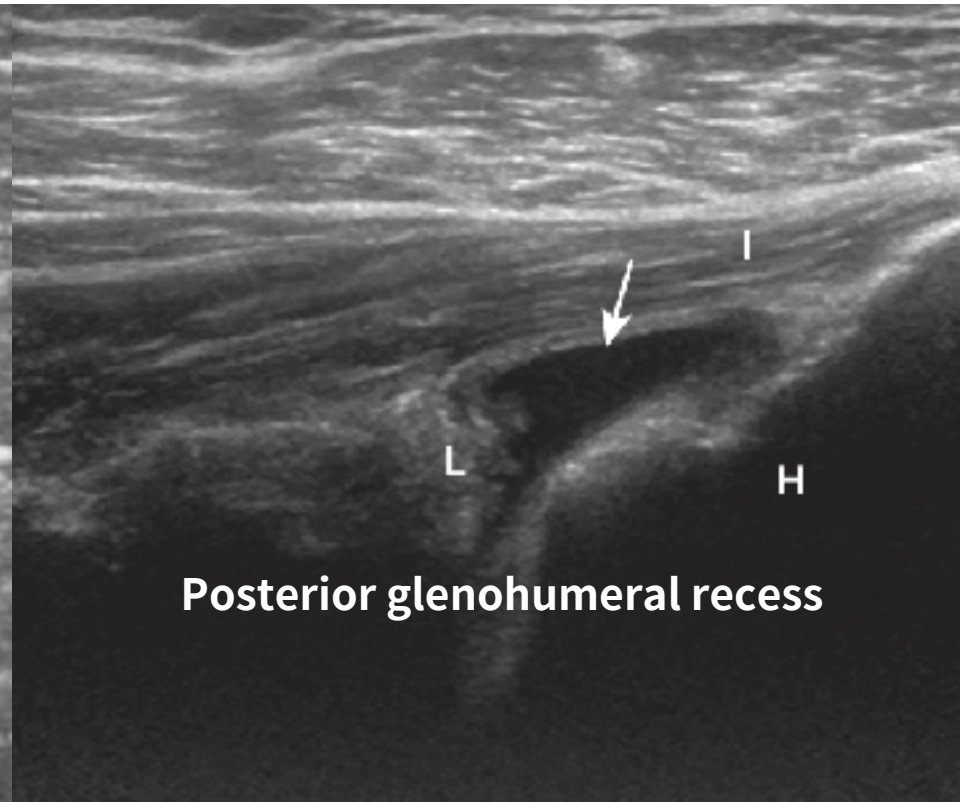
Tm

Shoulder joint effusion

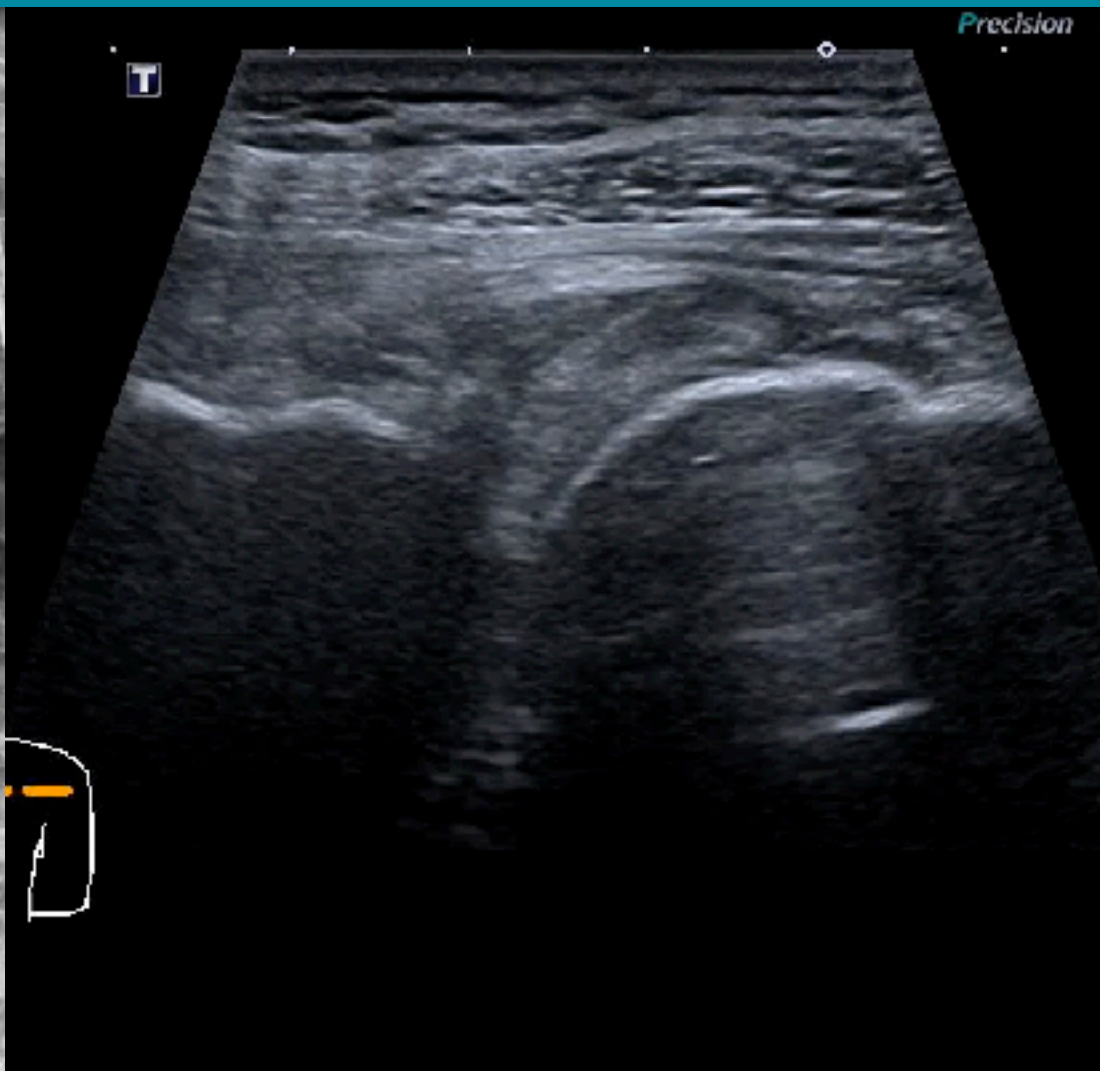
Anterior approach



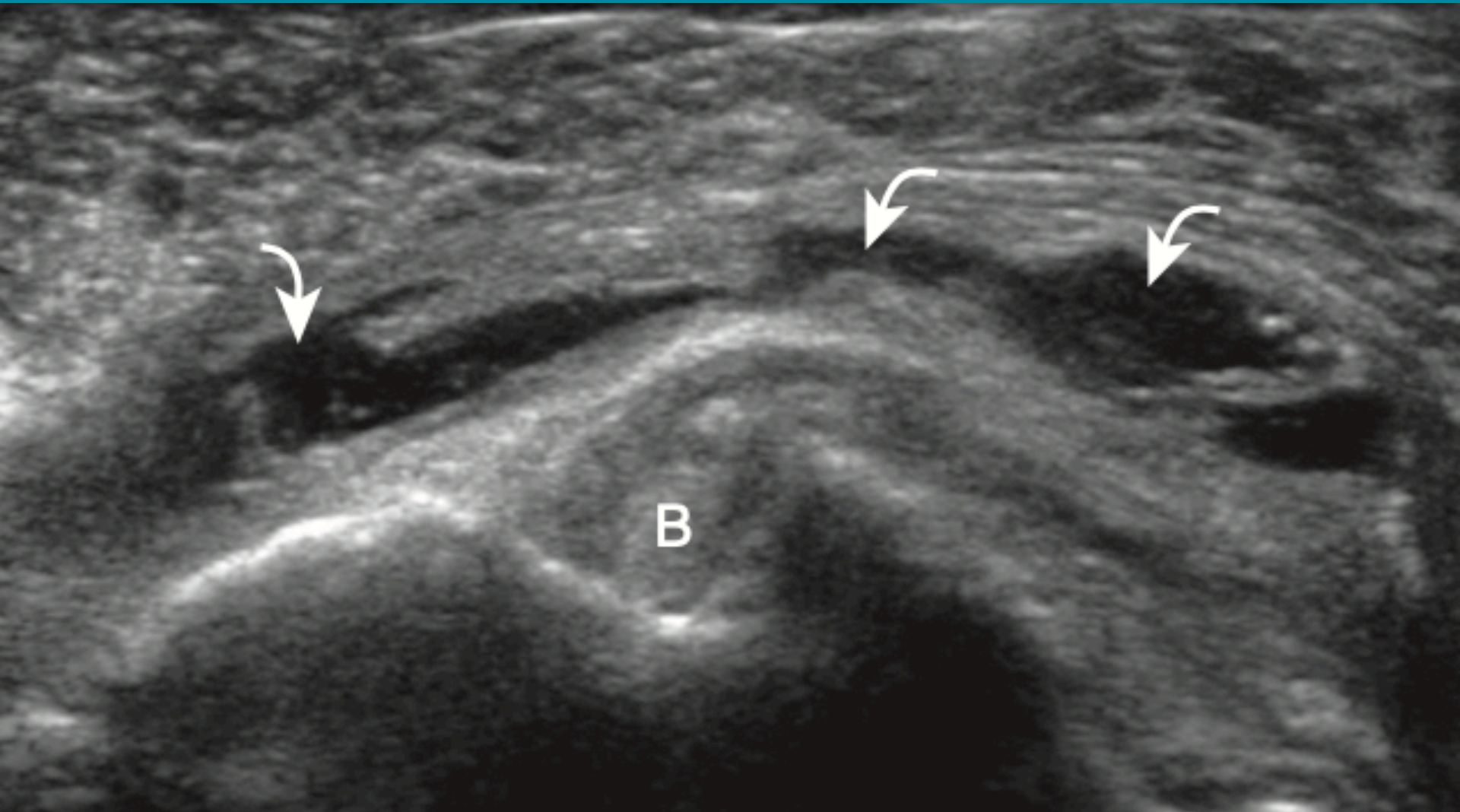
Posterior approach



66M, 跌倒撞到右肩，無法舉起

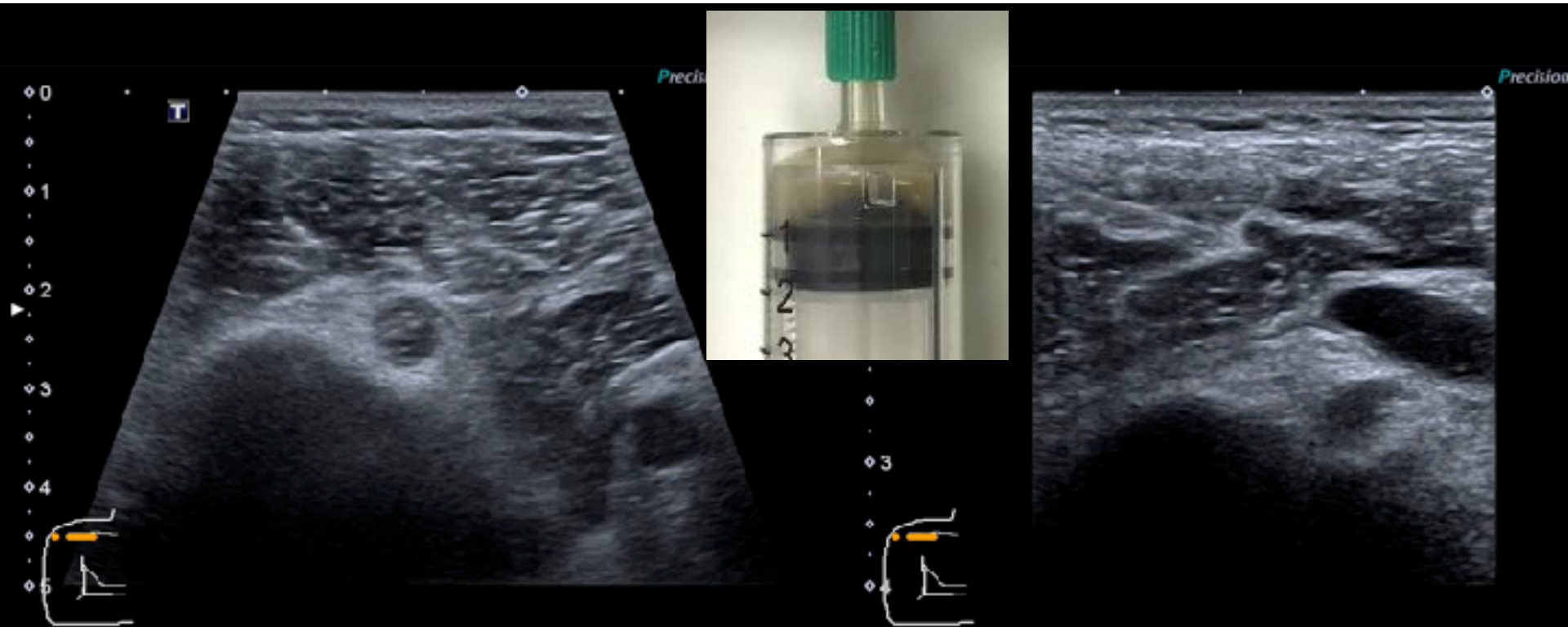


Subacromial-Subdeltoid (SASD) Bursa

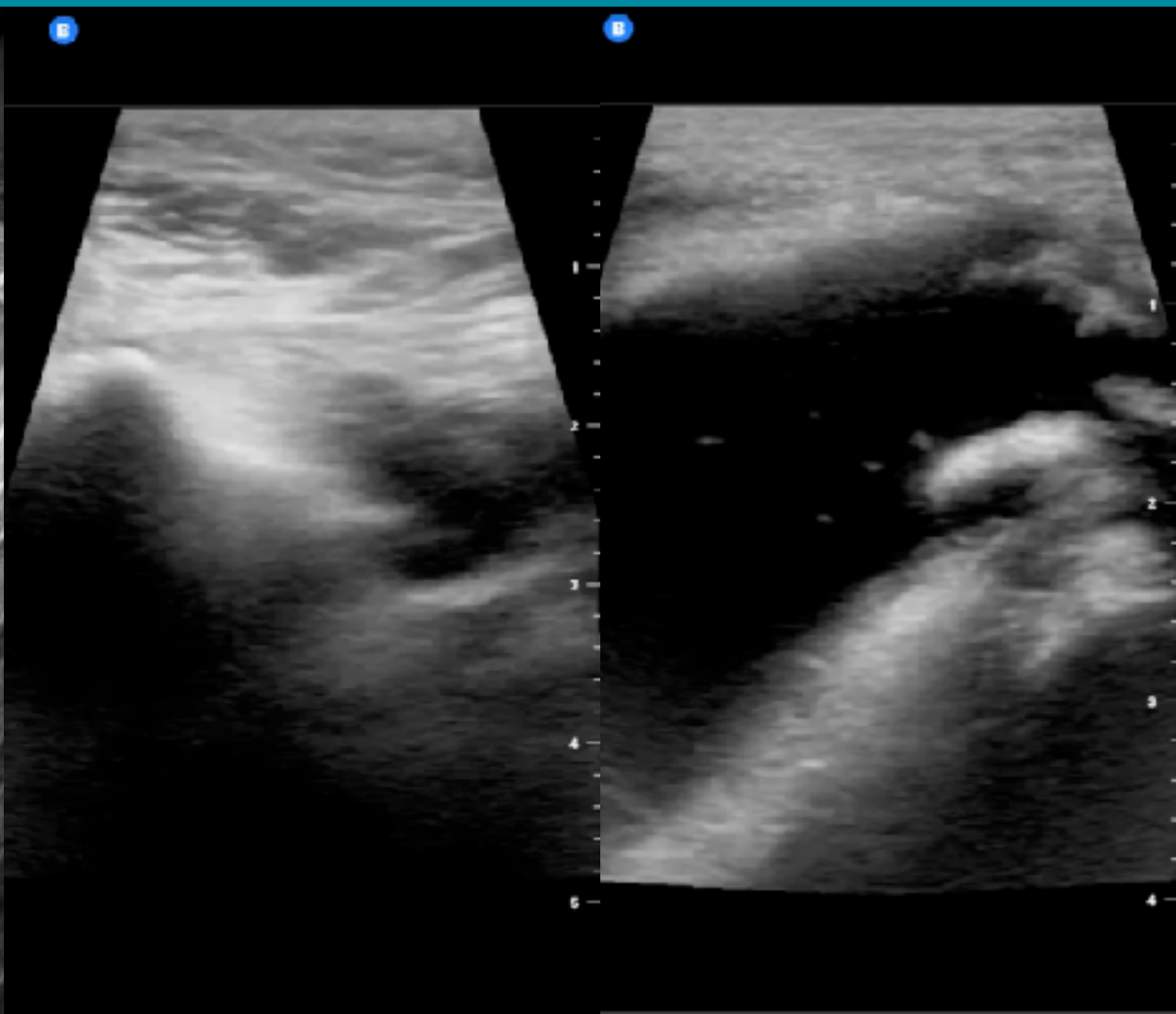
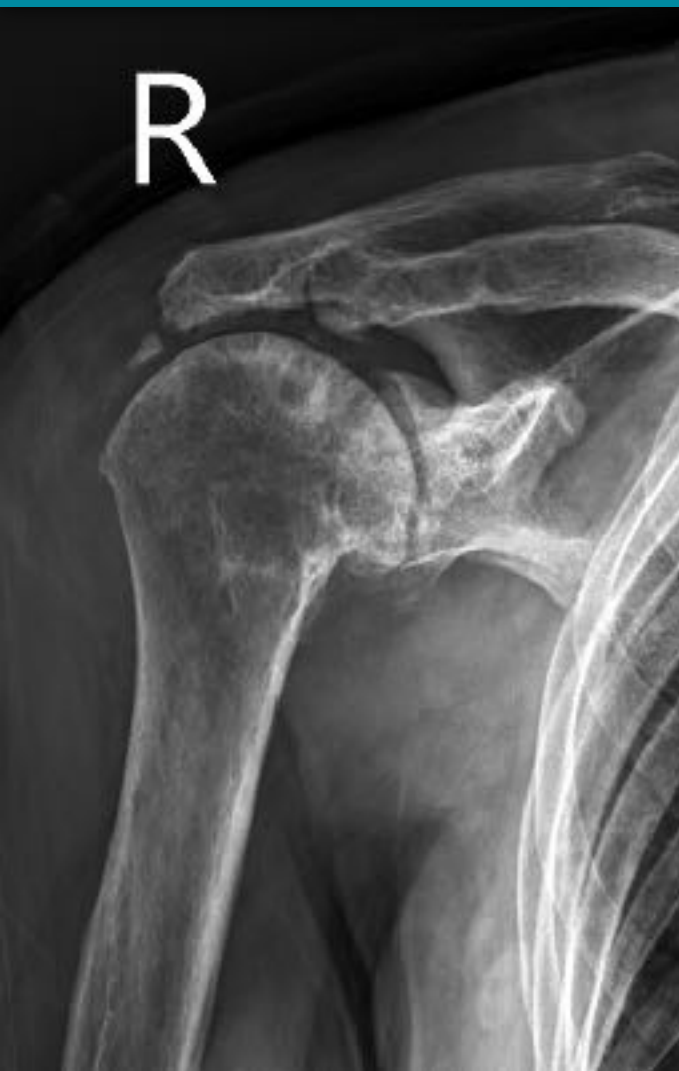


42M, 昨晚開始右肩痛，無法舉起

Subacromial-Subdeltoid bursitis



93F, 原本躺著孫子要扶起來，
不慎拉傷右肩，昨天右肩痛，右手無法上舉



Point-of-care ultrasound for the diagnosis of shoulder dislocation: A systematic review and meta-analysis

Michael Gottlieb, MD*, Dallas Holladay, DO, Gary D. Peksa, PharmD

Department of Emergency Medicine, Rush University Medical Center, Chicago, IL, United States of America

Study 7 ; Assessment 739 ; Dislocation 306

Table 1
Characteristics of the included studies.

Study	Study population	Country	Study location	Mean patient age	Male patients (%)	Shoulder dislocations (%)	Ultrasound transducer	Ultrasound technique	Operator experience
Bianchi 1994	10	United States	ND	35.5 years	ND	2 (20%)	Linear	Posterior	ND
Abbasi 2013	142	Iran	ED	31.6 years	126 (91.3%)	71 (50%)	Linear	Anterior + lateral	Attending, resident
Ahmadi 2016	108	Iran	ED	30.1 years	91 (64.1%)	13 (12%)	Linear	Anterior + lateral	Attending
Akyol 2016	197	Turkey	ED	33.9 years	164 (80.6%)	99 (50%)	Linear	Posterior	Attending
Lahham 2016	84	United States	ED	45 years	52 (62%)	19 (22.6%)	Linear	Posterior	Student
Seyedhosseini 2017	163	Iran	ED	35.9 years	140 (83.3%)	79 (48.5%)	Curvilinear	Posterior	Attending, resident
Secko 2018	35	United States	ED	ND	ND	23 (66%)	Linear or curvilinear	Posterior	Attending

ND, not described; ED, emergency department.

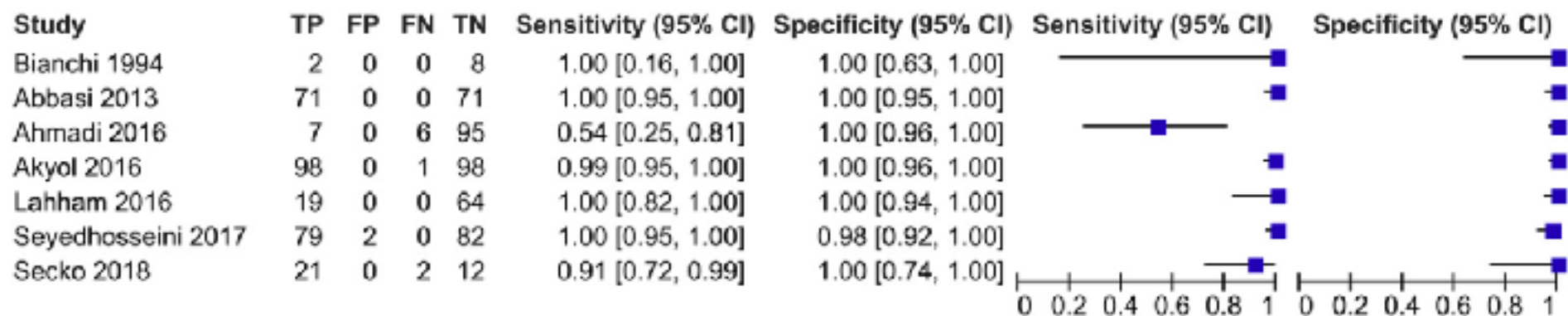
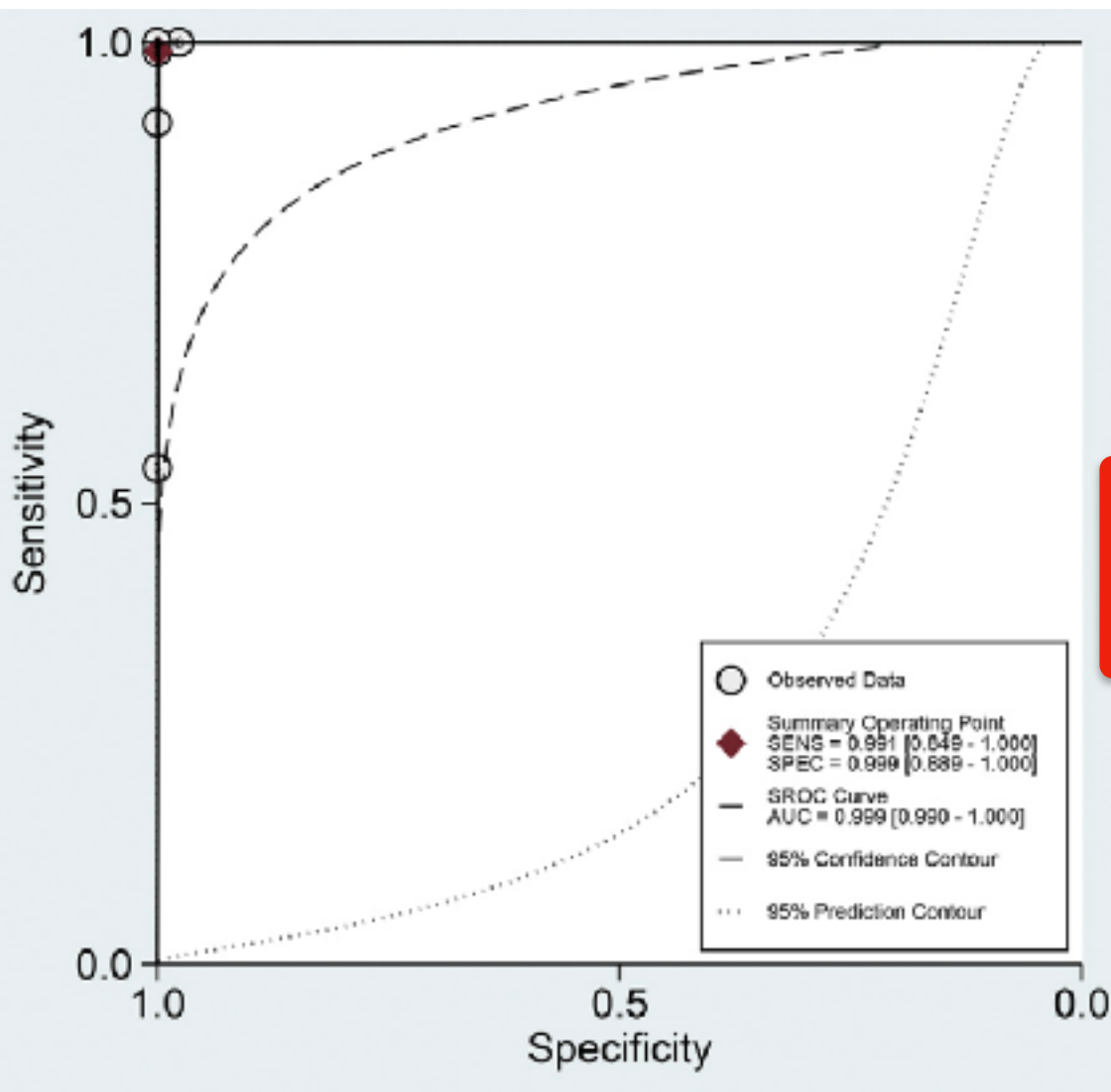


Fig. 2. Forest diagram of the overall sensitivity and specificity of ultrasound for identifying shoulder dislocations.

Point-of-care ultrasound for the diagnosis of shoulder dislocation: A systematic review and meta-analysis

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Department of Emergency Medicine, Rush University Medical Center, Chicago, IL, United States of America



Sensitivity 99.1%

Specificity 99.9%

LR+ 796.2

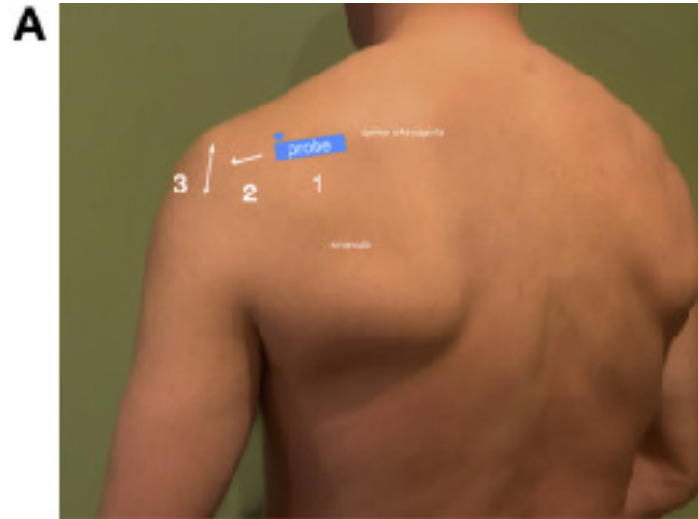
LR- 0.01

AJEM 2019;37:757-761

Musculoskeletal Ultrasonography to Diagnose Dislocated Shoulders: A Prospective Cohort

Michael A. Secko, MD, RDMS*; Lindsay Reardon, MD; Michael Gottlieb, MD; Eric J. Morley, MD; Mathew R. Lohse, MD; Henry C. Thode, Jr, PhD; Adam J. Singer, MD

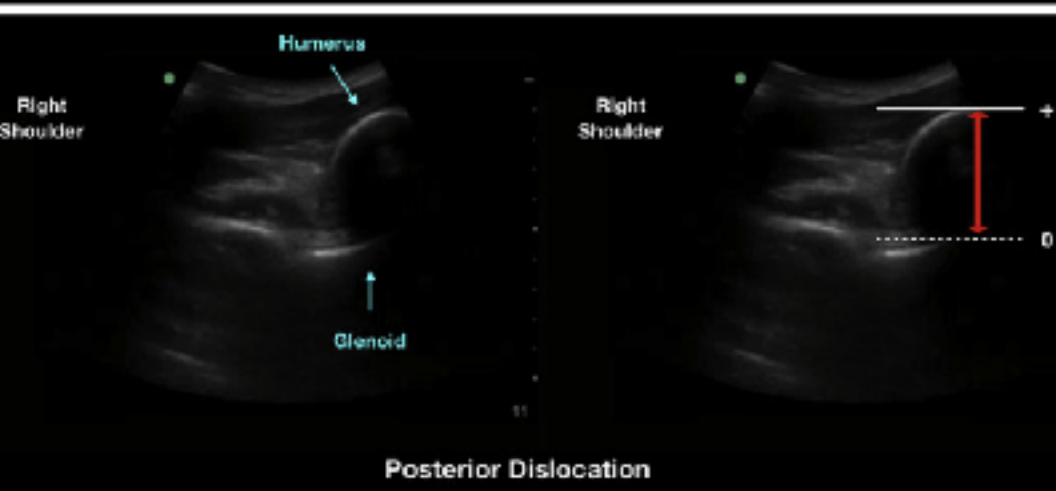
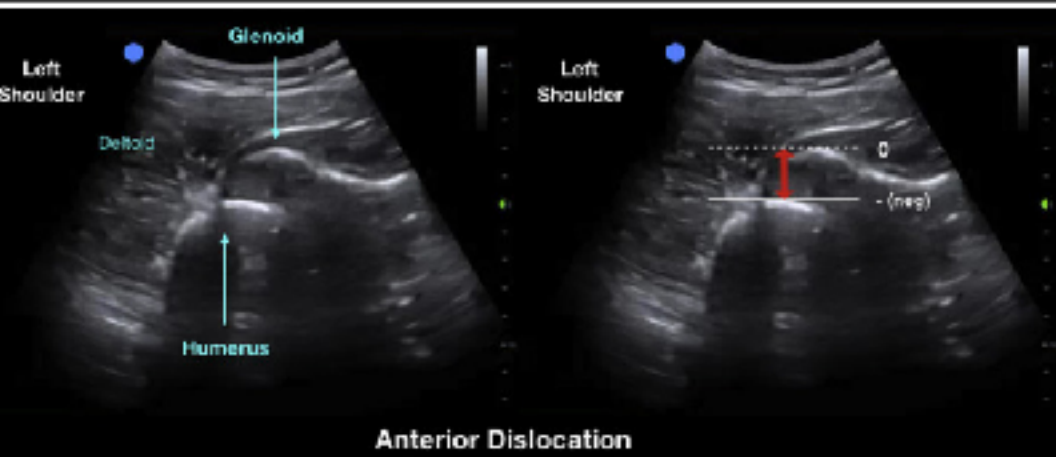
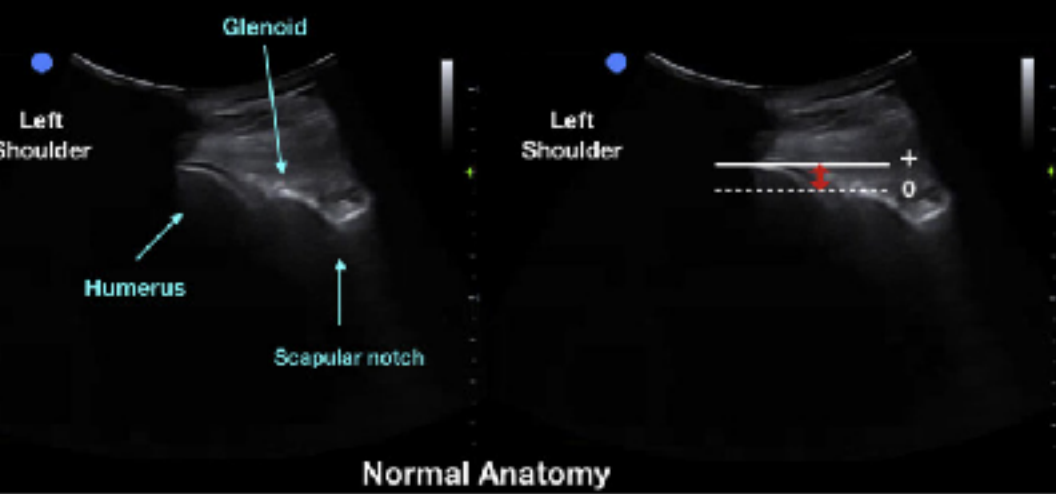
Multicenter
Prospective
Observational



65 patients

B





Sensitivity 100%

Specificity 100%

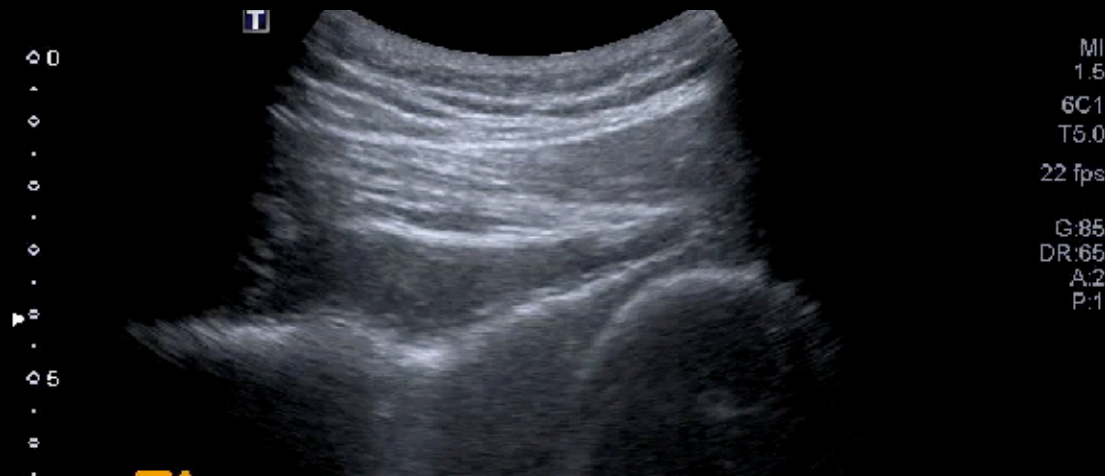
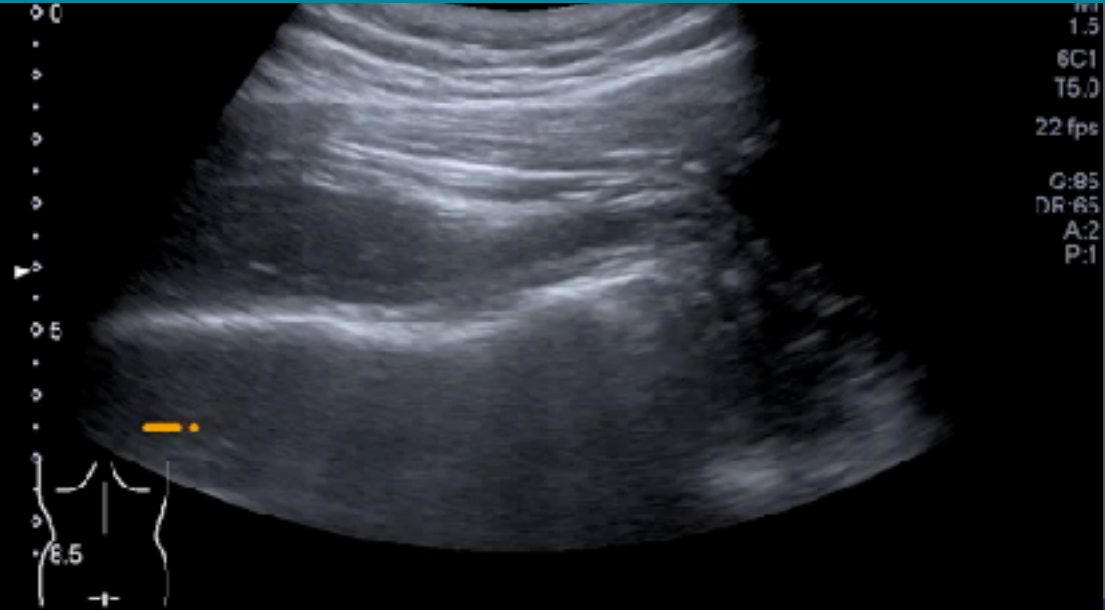
Median 19s

GH(d-A) -1.83cm

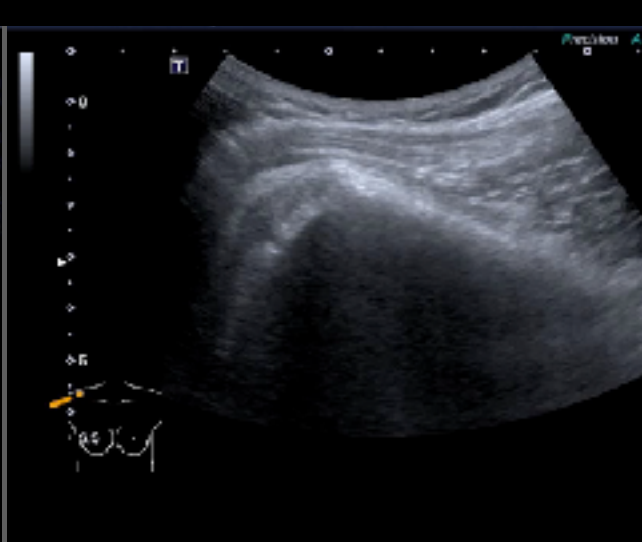
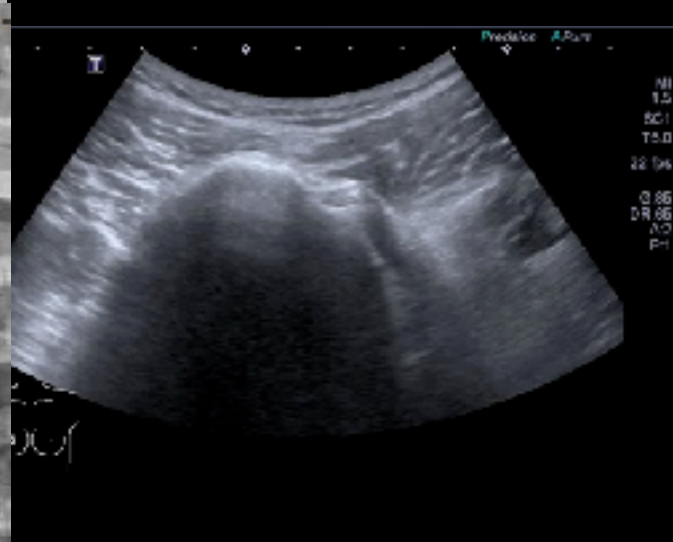
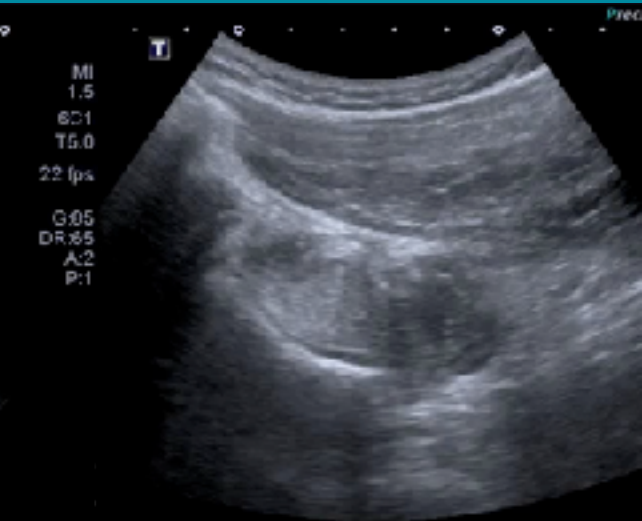
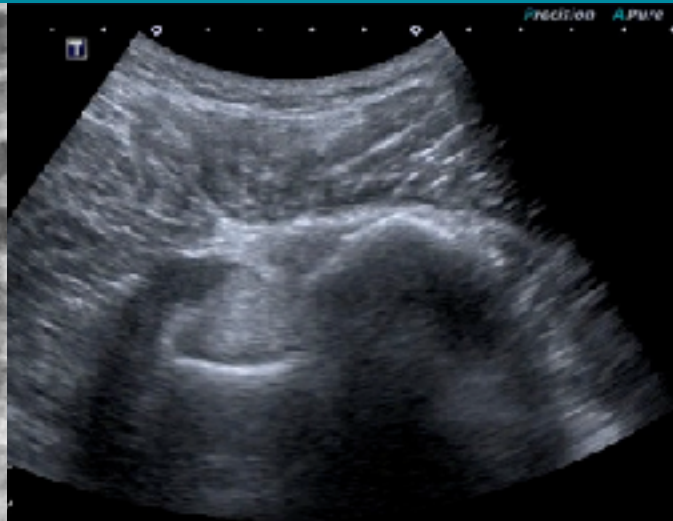
GH(d-N) 0.22cm

GH(d-P) 3.3cm

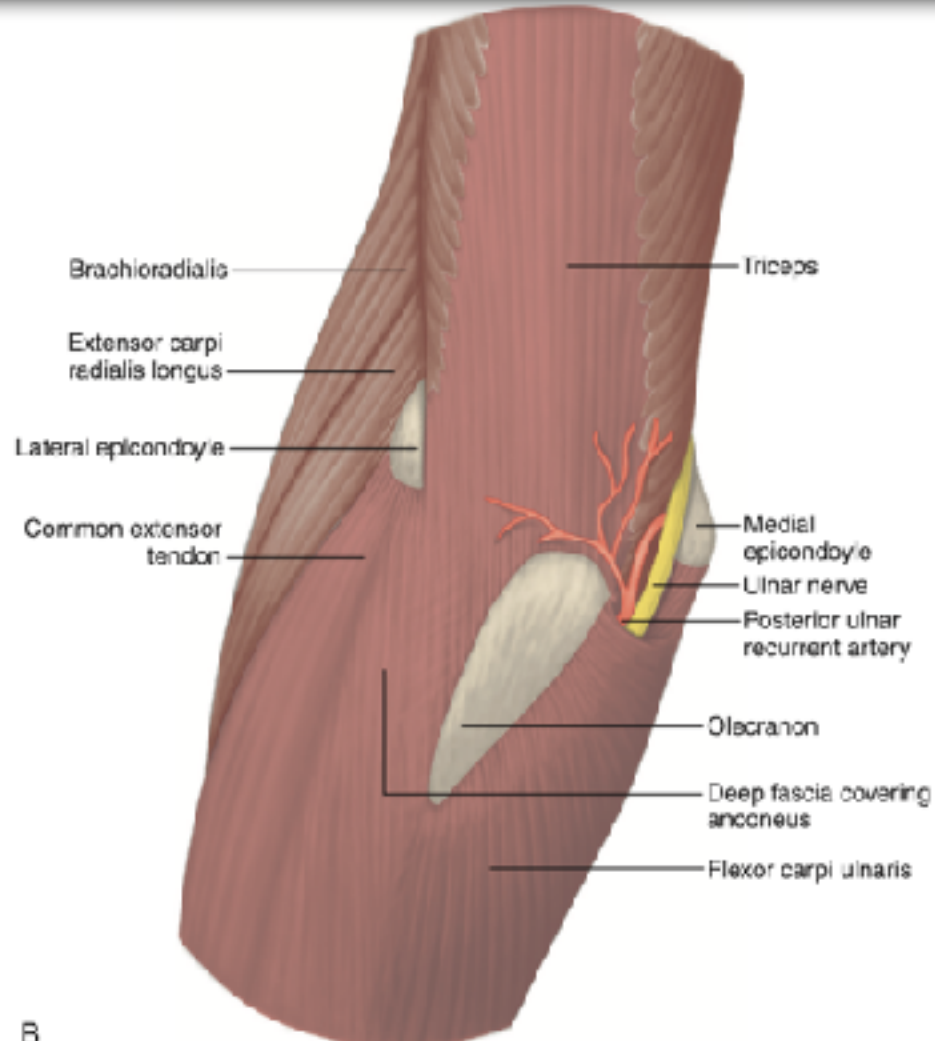
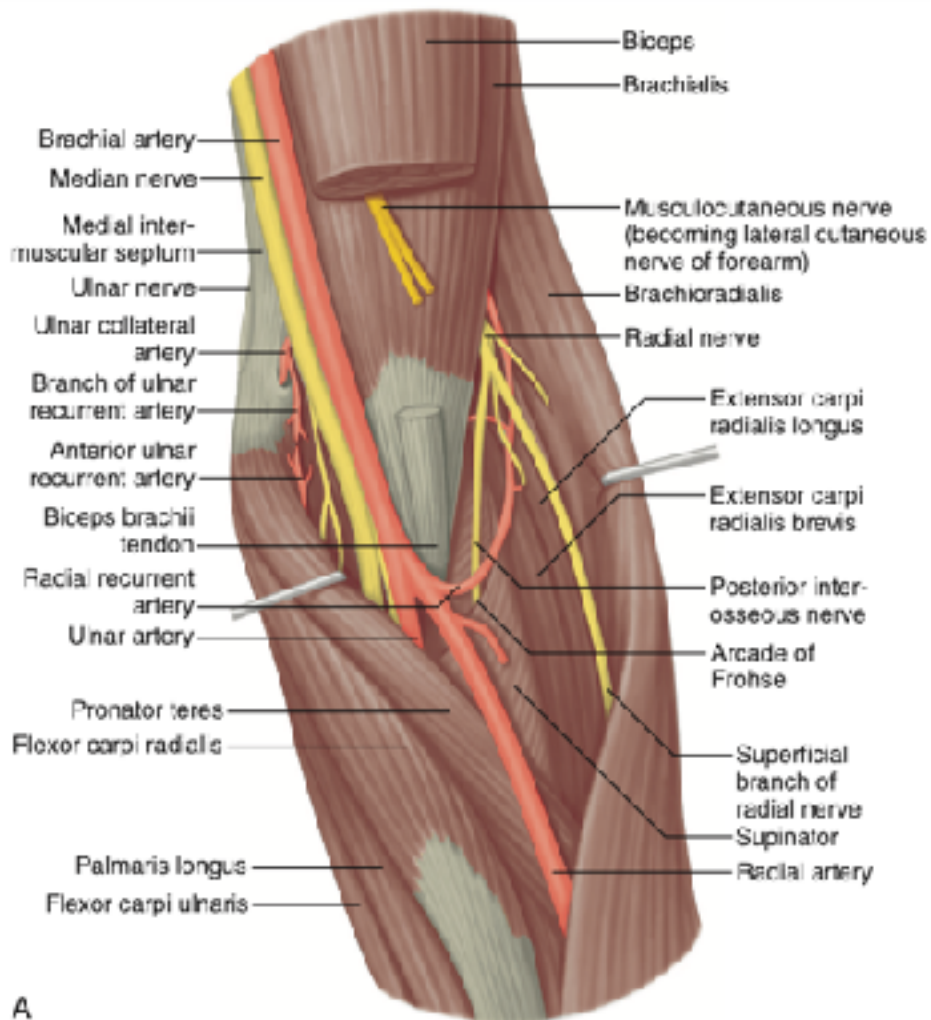
M/20, 工作時從階梯滑下用手去抓致右肩脫位



Anterior approach for dislocation & reduction



Elbow anatomy



Anterior Elbow

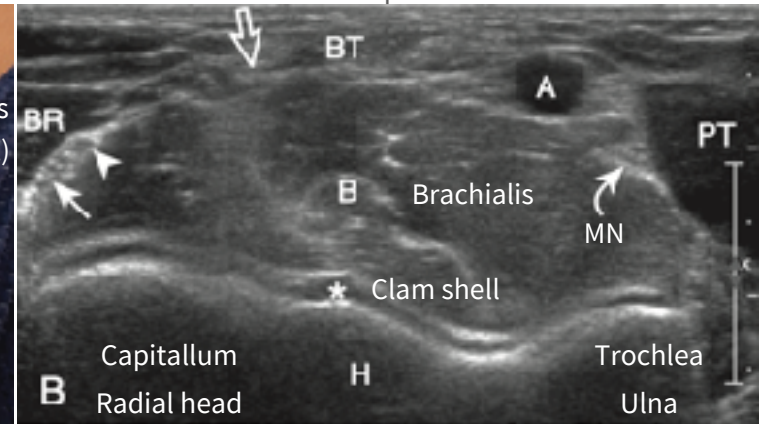


Lateral antebrachial cutaneous nerve

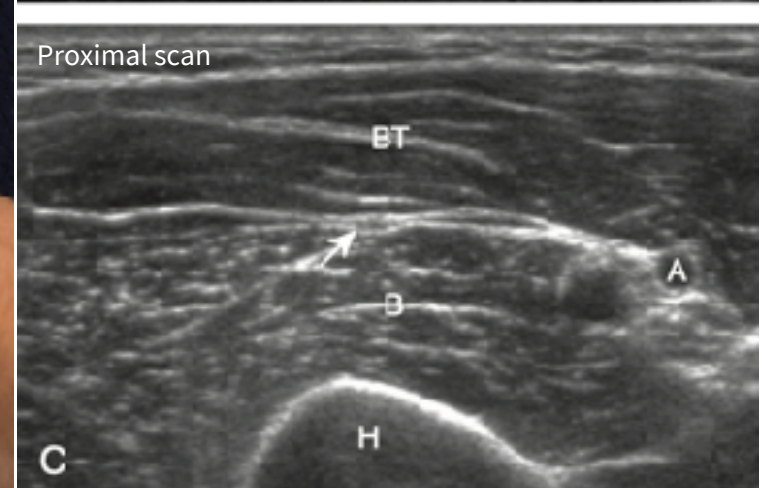
Biceps brachii

Pronator Teres

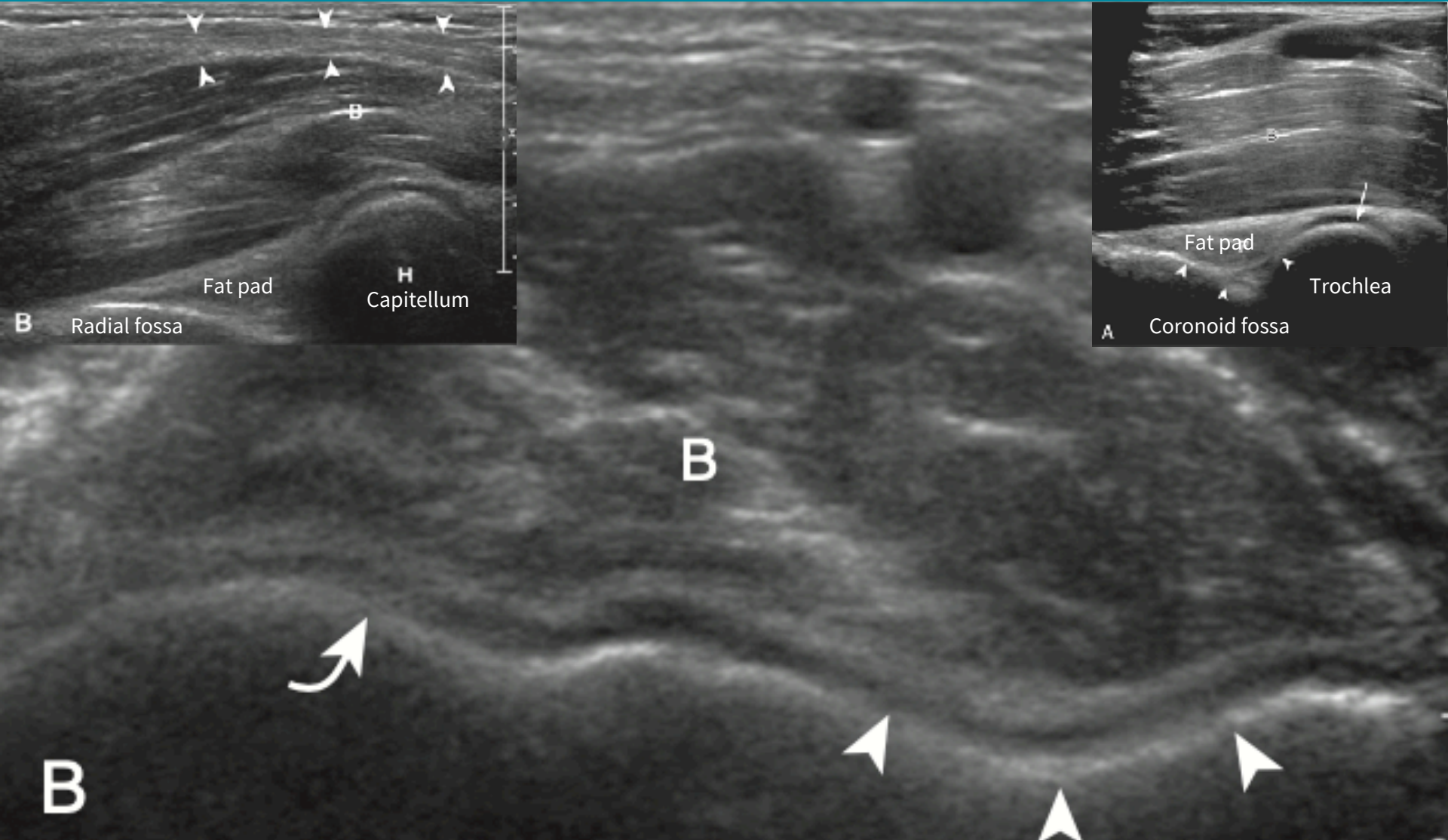
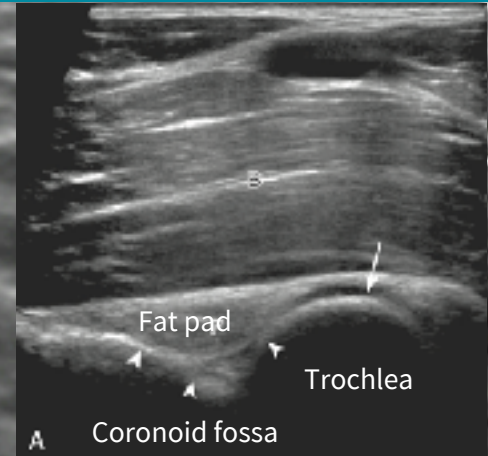
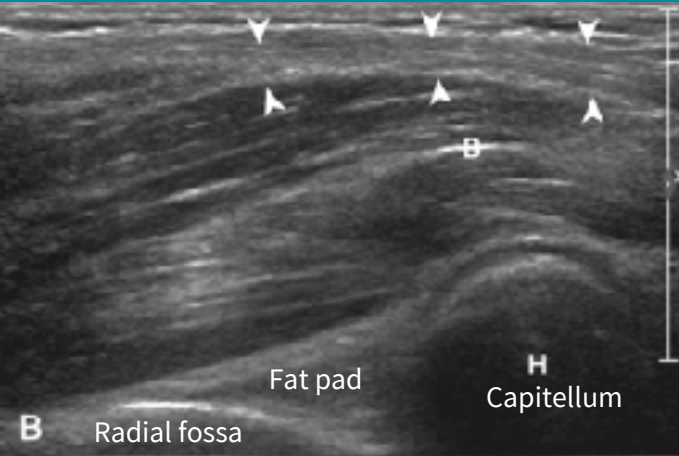
Brachioradialis
RN (superficial)
RN (deep)



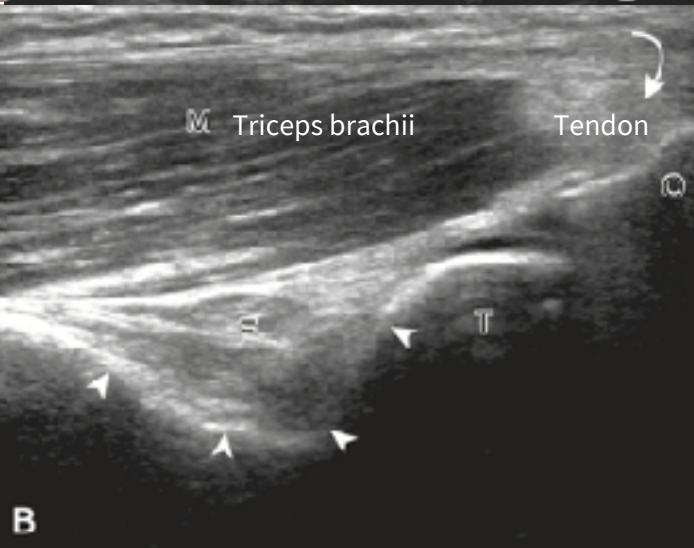
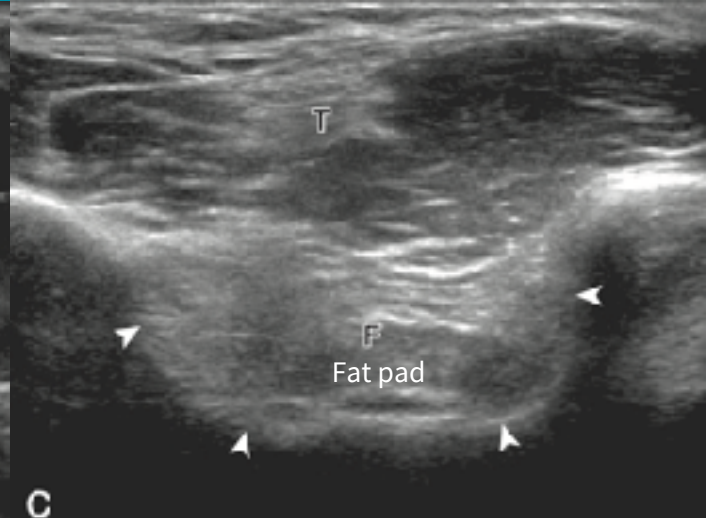
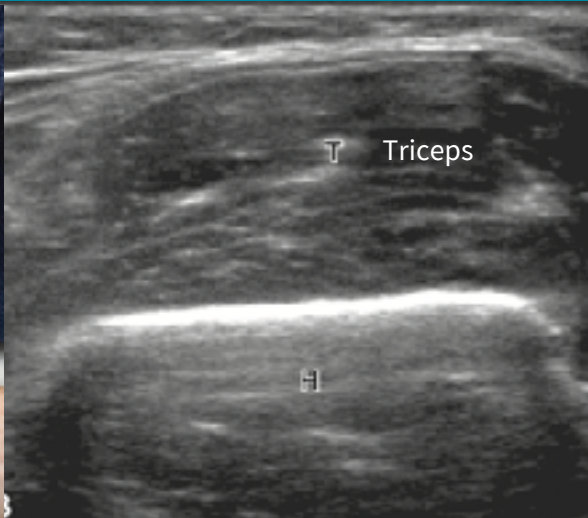
Proximal scan



Anterior joint recess

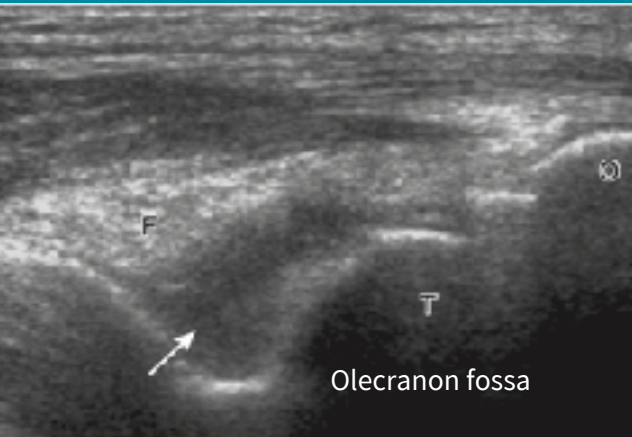


Posterior joint recess

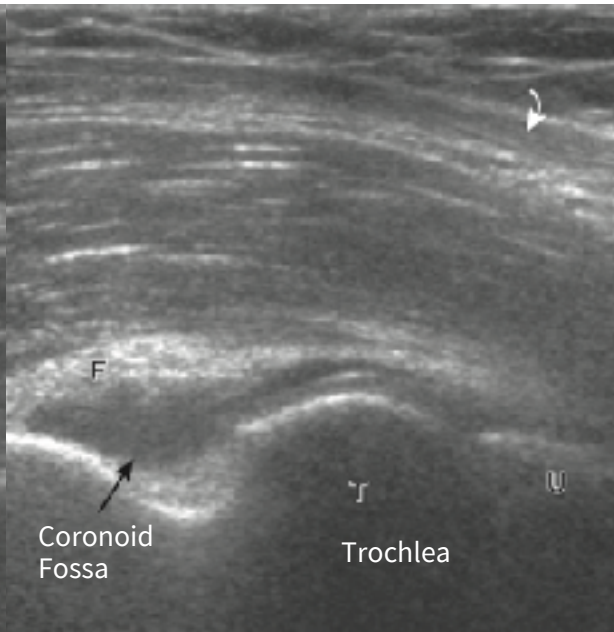
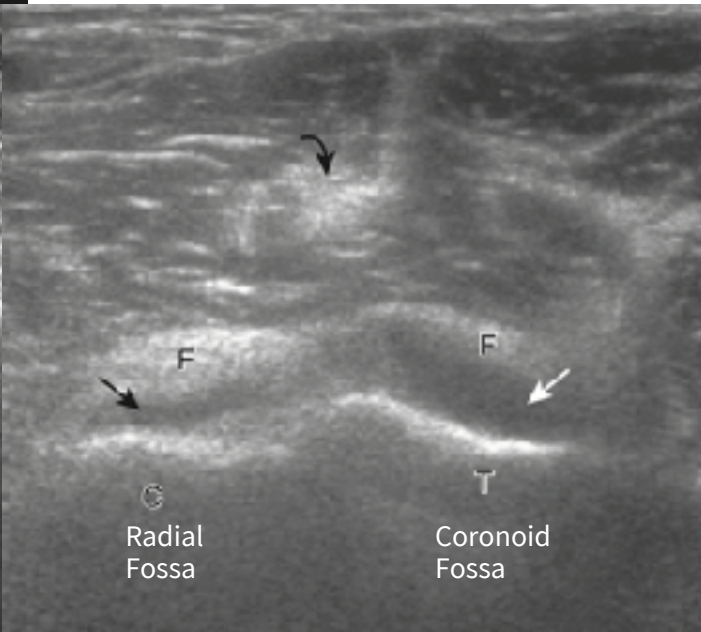
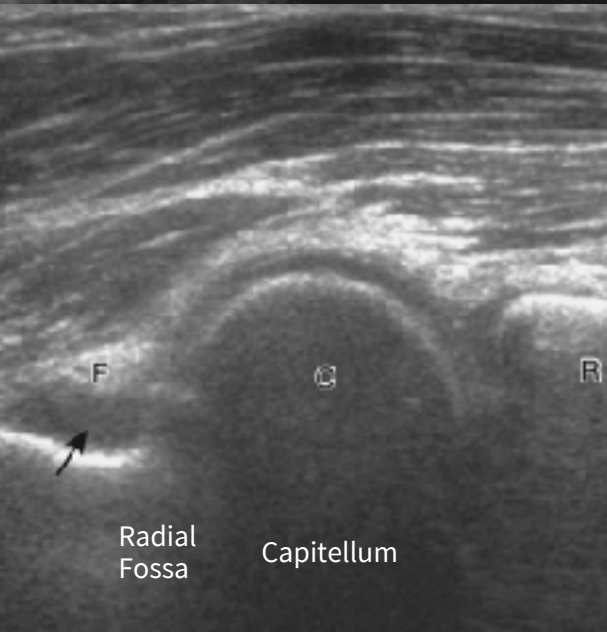


Olecranon fossa

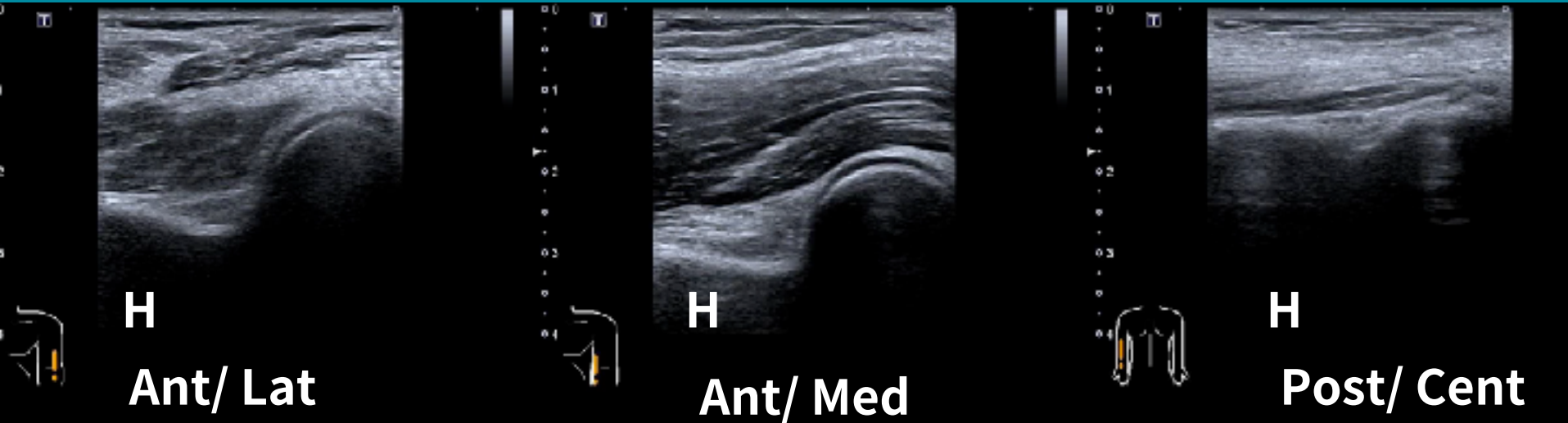
Elbow joint effusion



Elevated fat pad sign



Elbow Goal : Effusion



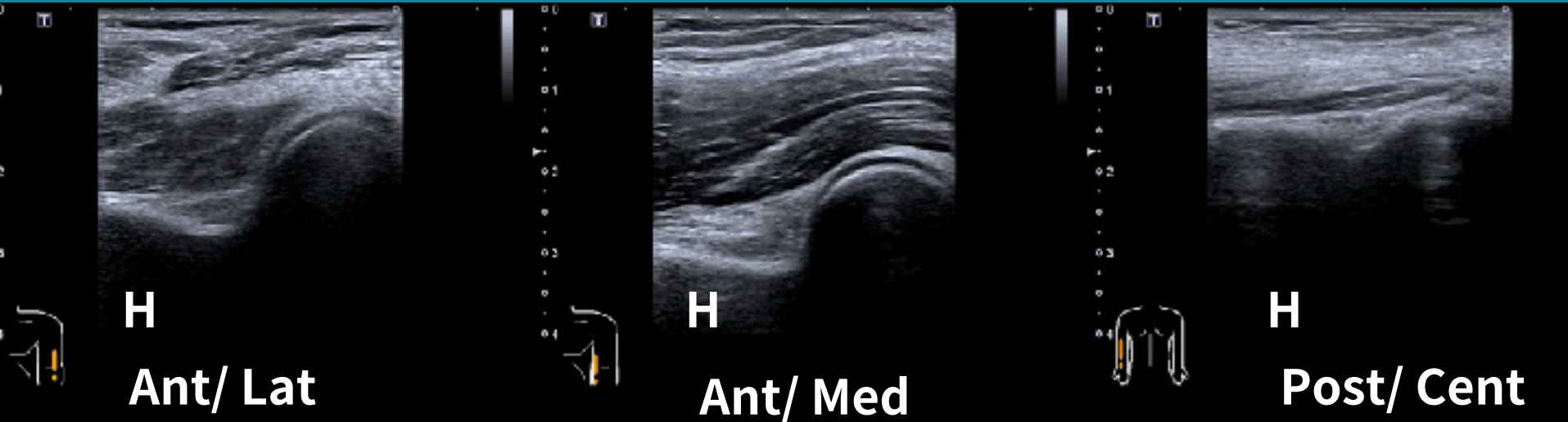
Radial fossa

Coronoid fossa

Olecranon fossa



Elbow effusion



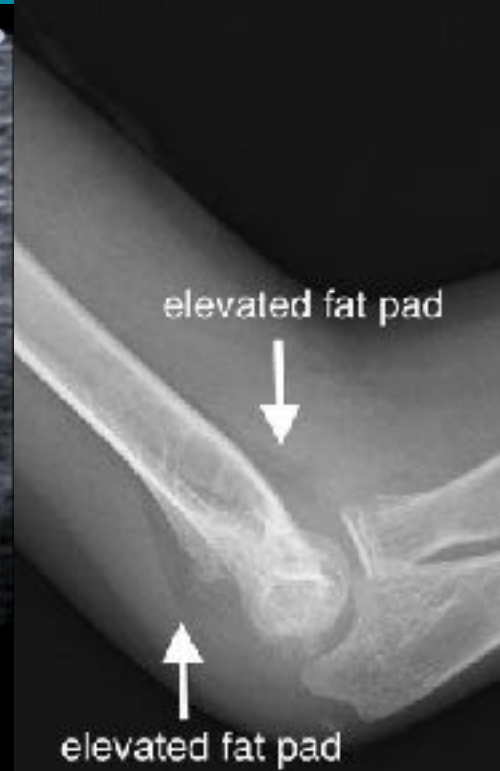
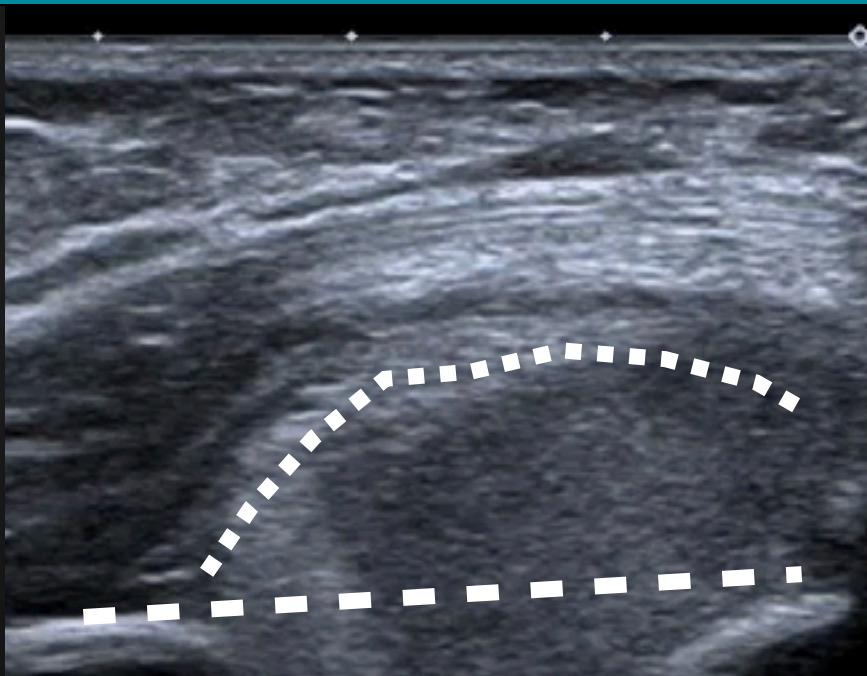
Radial fossa

Coronoid fossa

Olecranon fossa



Elevated fat pad sign



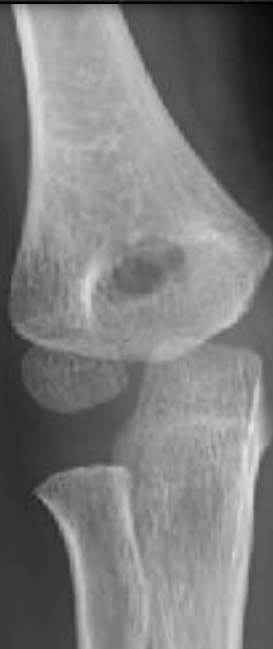
olecranon fossa

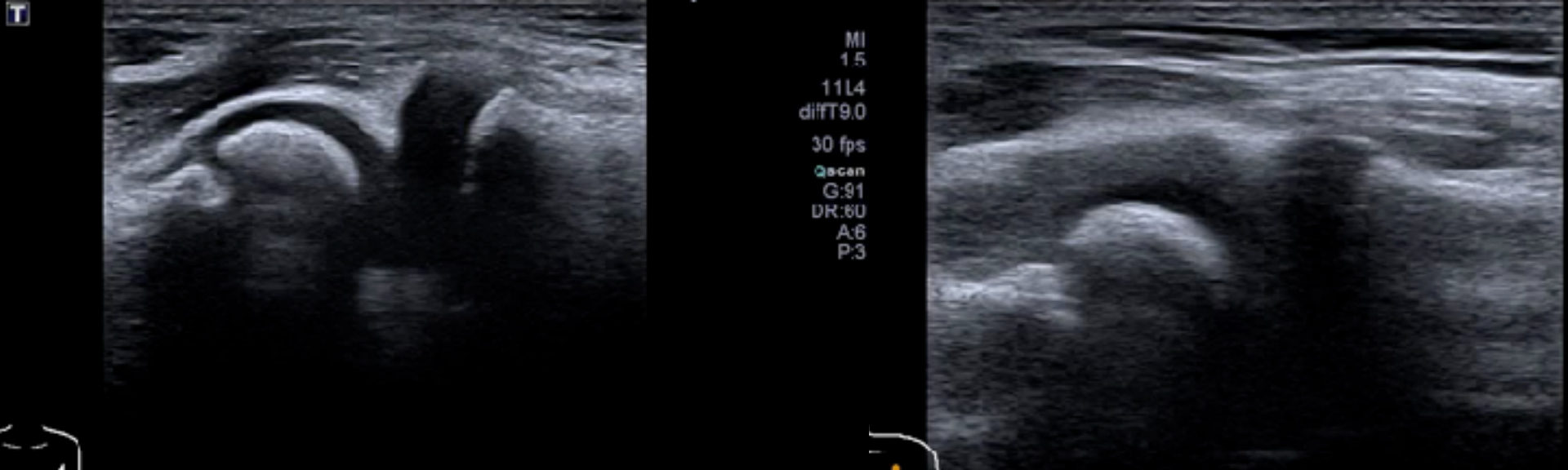


R

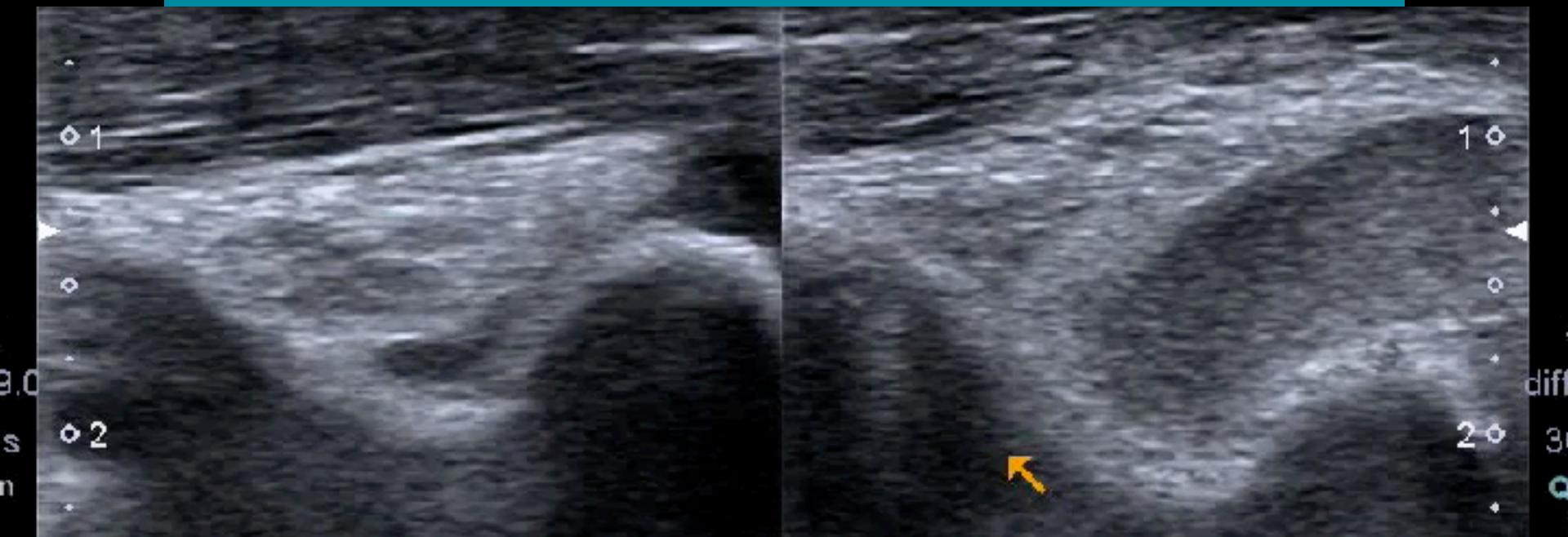
6歲男童，左肘受傷

L





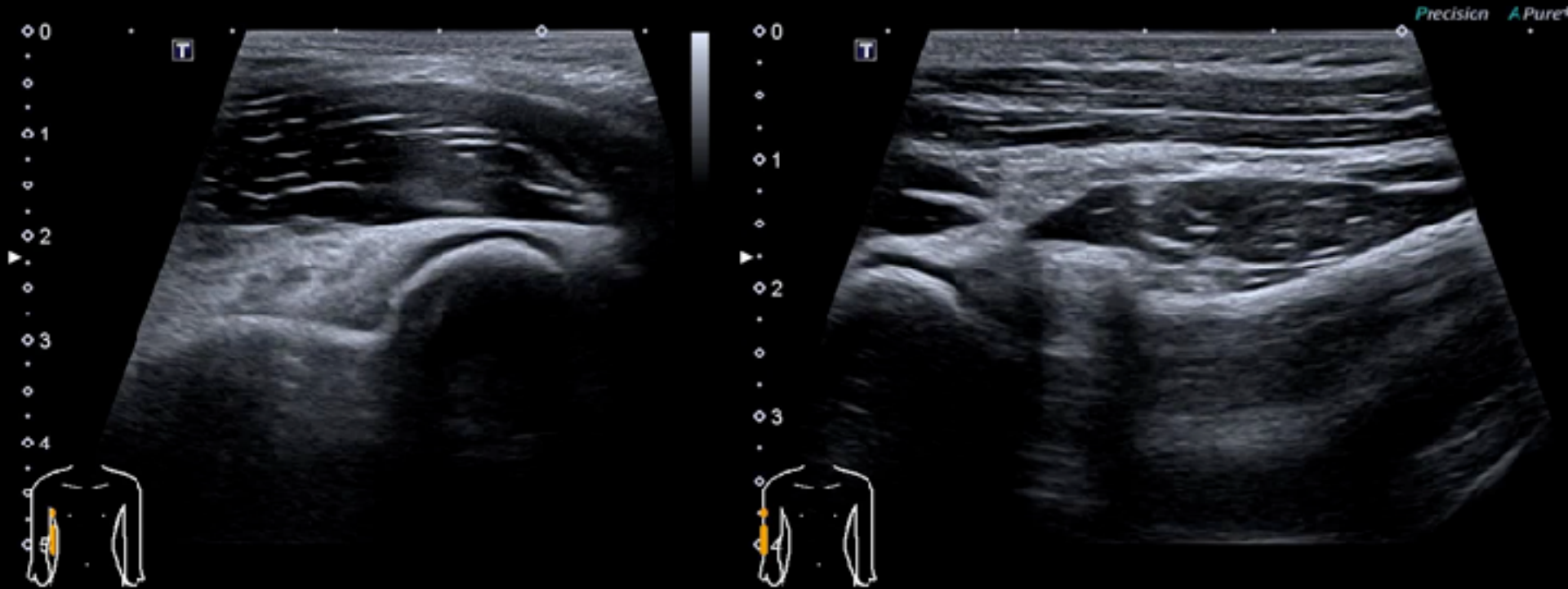
Hemarthrosis



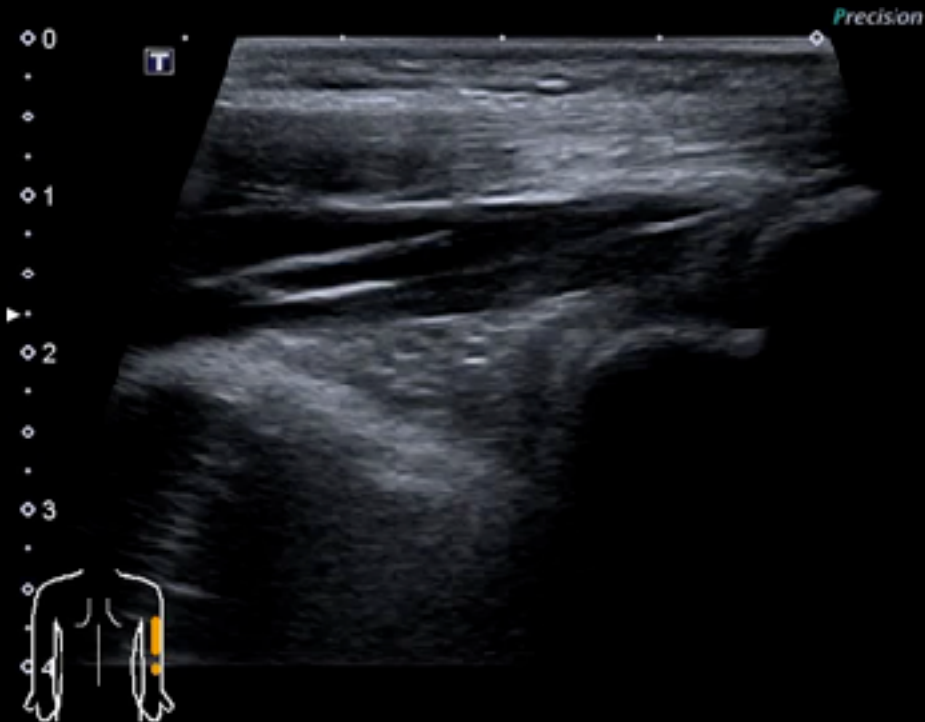
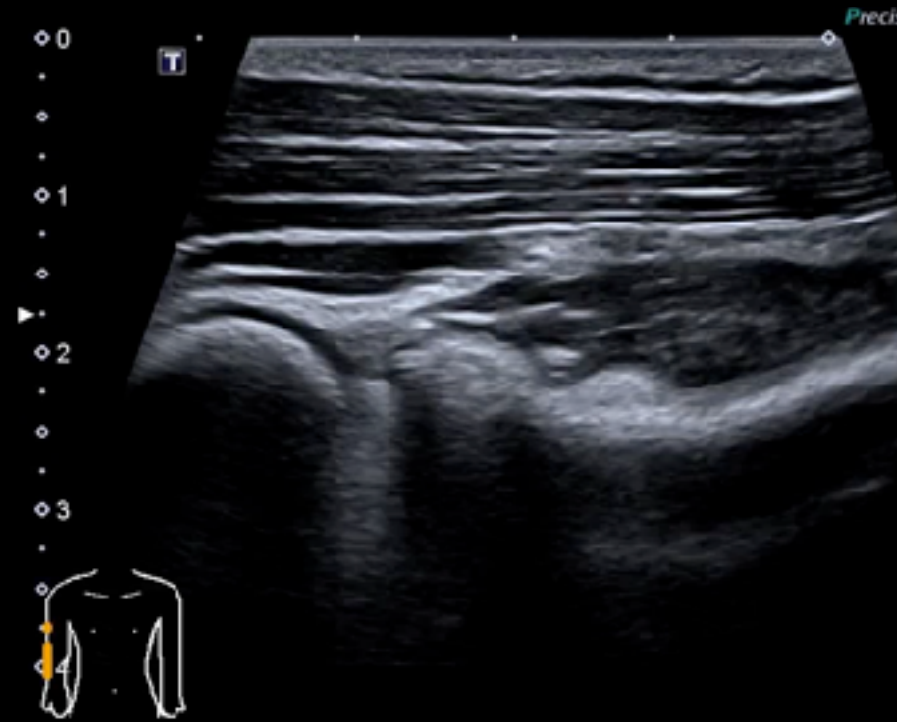
M/18, 機車車禍，致右手肘疼痛



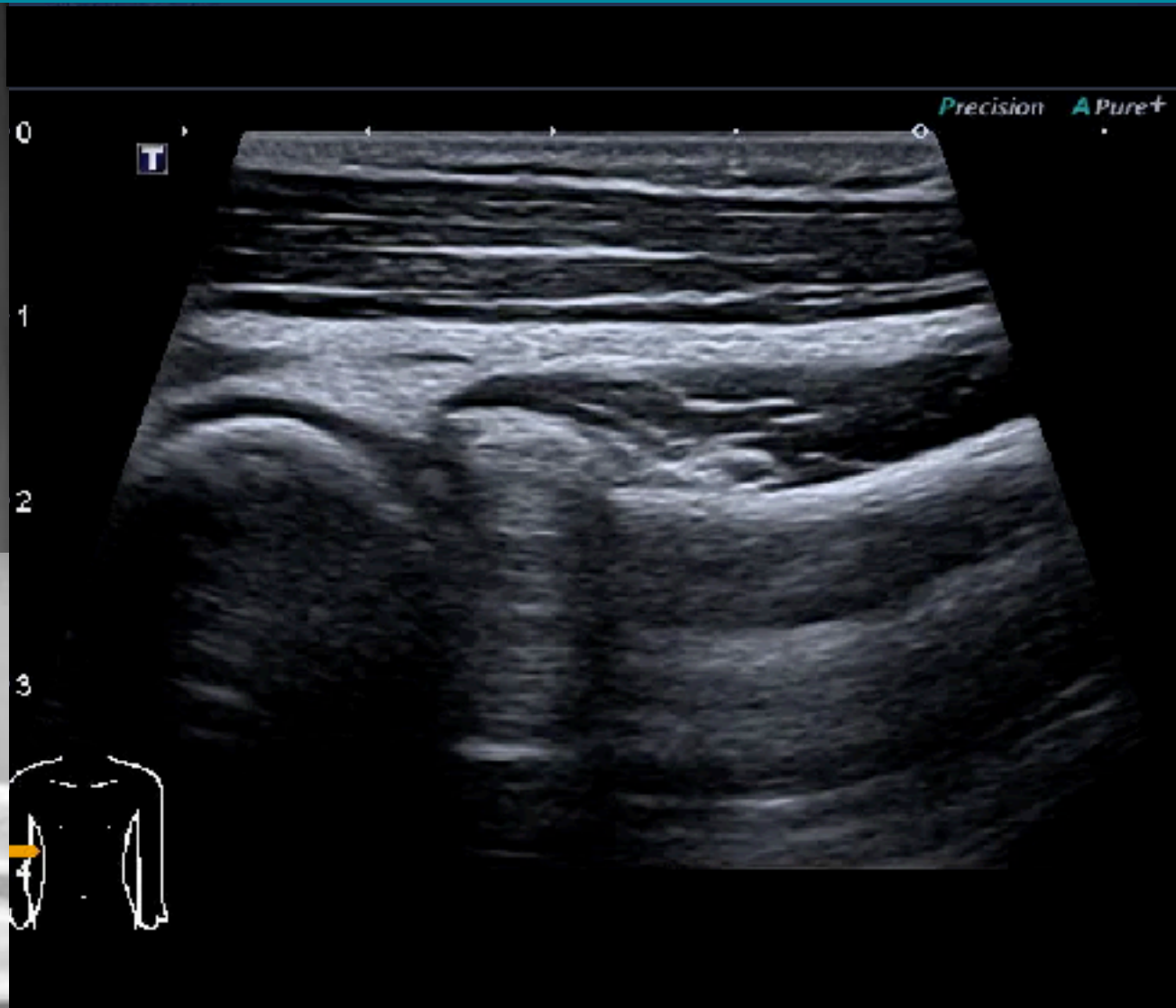
M/18, 機車車禍，致右手肘疼痛

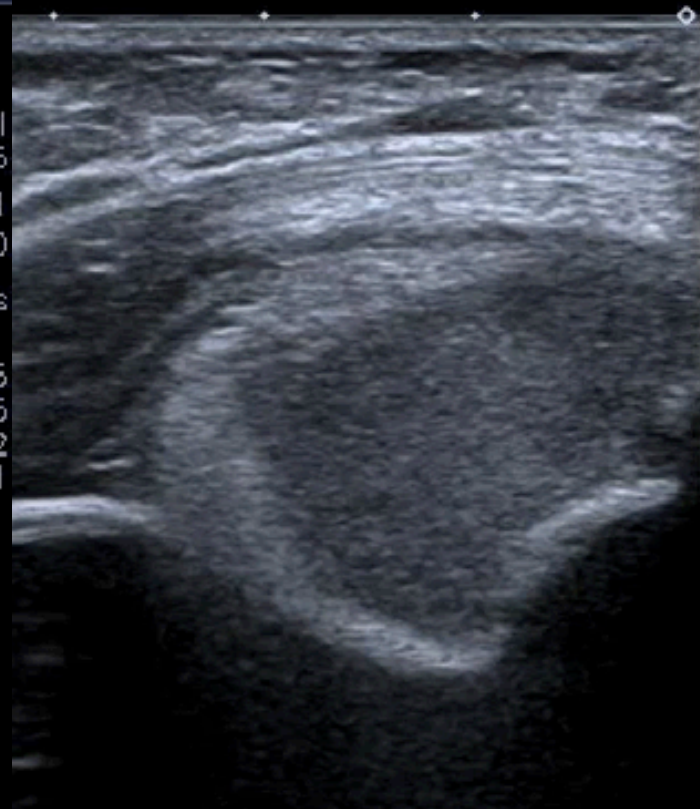
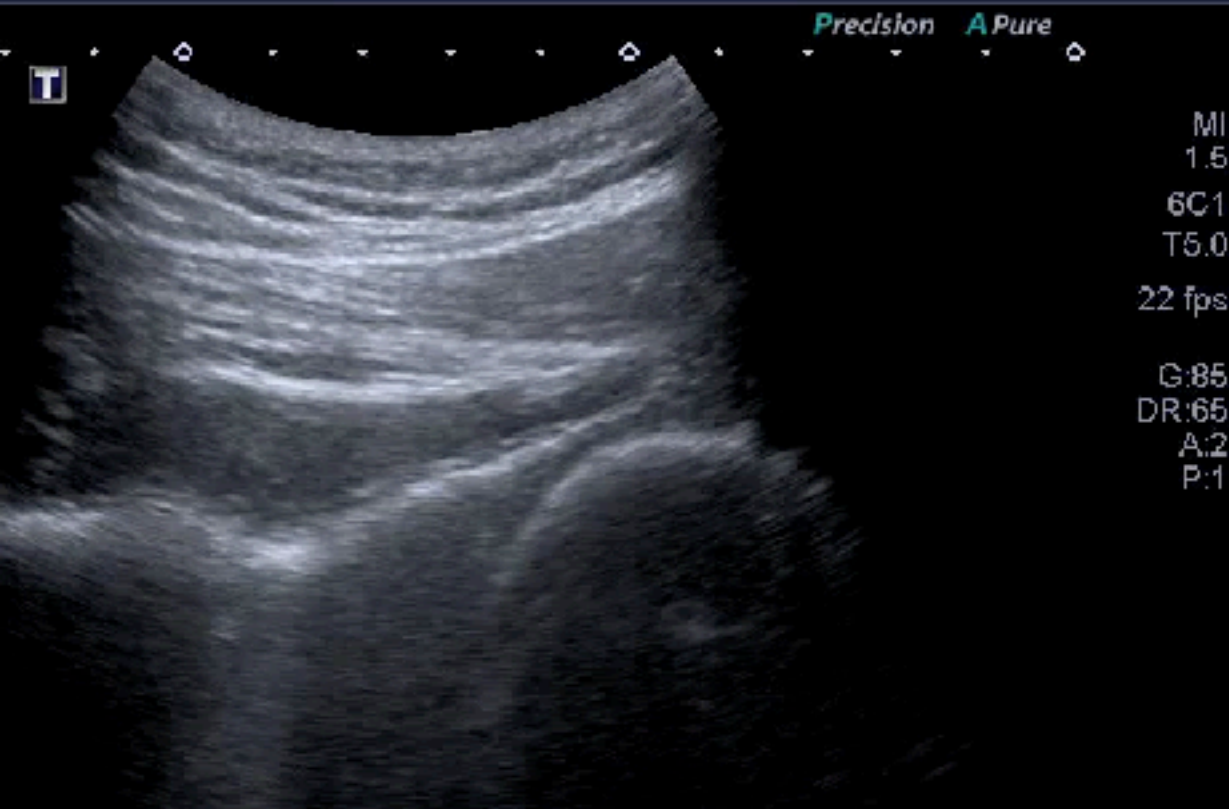


M/18, 機車車禍，致右手肘疼痛



Radial head fracture & Hemarthrosis





EFFUSION: ANT & POST APPROACH

SHOULDER

ELBOW