

US-CAB



Dept of EM, FEMH
亞東急診 POCUS TEAM





POCUS在急救目標



尋找可逆的原因

肺栓塞



低血容



可逆的原因
C.A.U.S.E.

心包膜填塞

Resuscitation 2008



可逆的原因 C.A.U.S.E.

Resuscitation 2008

POCUS in Resuscitation



尋找可逆的原因



預測預後 Prediction

1988 in ED



22
PEA



19 (86%)
心臟跳動

After 2000 in ED



169
OHCA



136 (80%)
沒有跳動



死亡
(136)

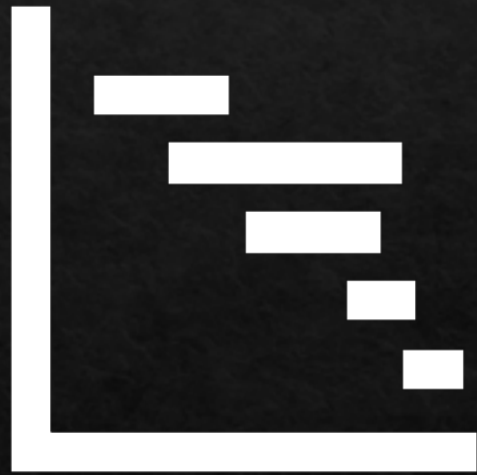
自發性心臟跳動

ROSC

| Sen | Spec | LR+ | LR- | AUC |
|-----|------|-----|------|------|
| 95% | 80% | 4.8 | 0.06 | 0.93 |

存活至住院

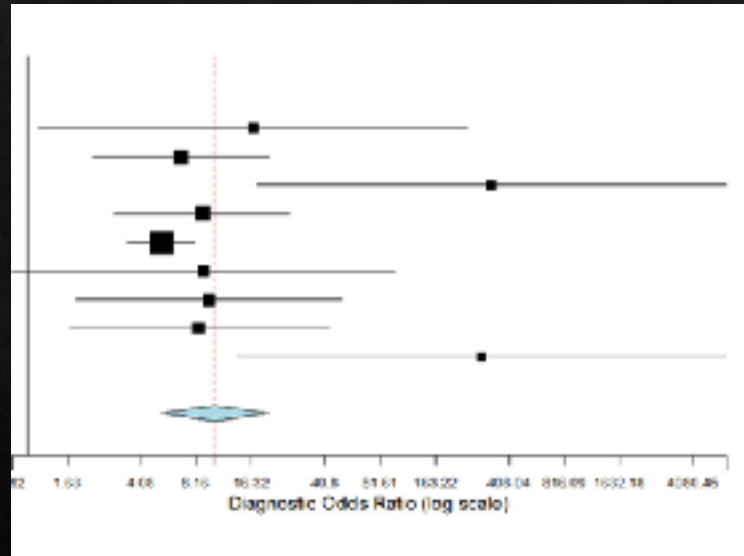
| Sen | Spec | LR+ | LR- | AUC |
|-----|------|-----|------|------|
| 90% | 78% | 4.1 | 0.13 | 0.92 |



15 studies
Meta-analysis

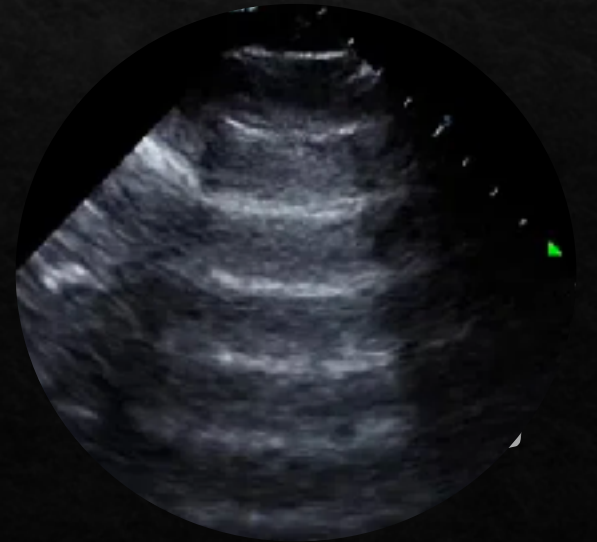
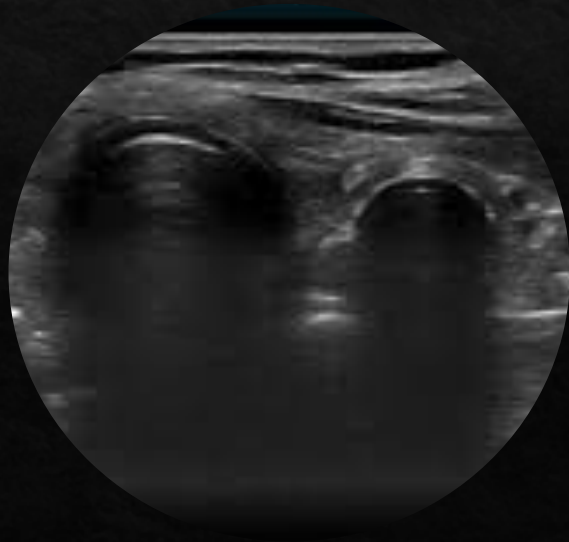
自發性心臟跳動

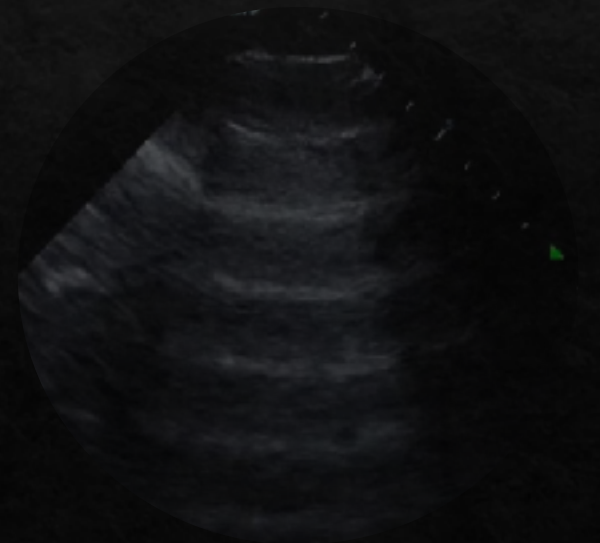
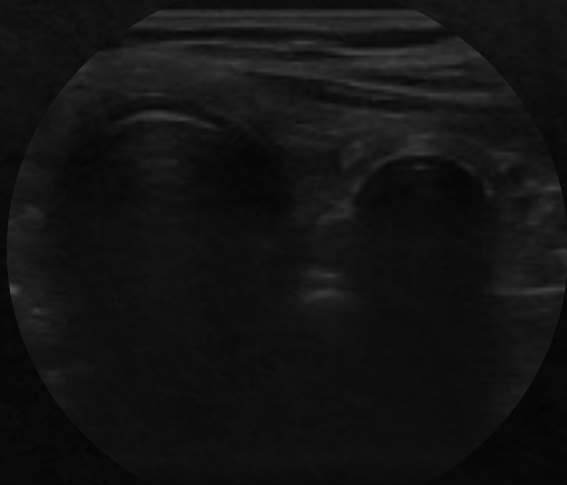
非創傷非電擊



1486 patients
Meta-analysis

| | Odd Ratio |
|---------------------------------|--------------------------|
| ROSC | 16.9 (6.18–46.21) |
| Survival to Admission | 10.3 (5.32–19.98) |
| Survival to Discharge | 8.0 (3.01–21.39) |



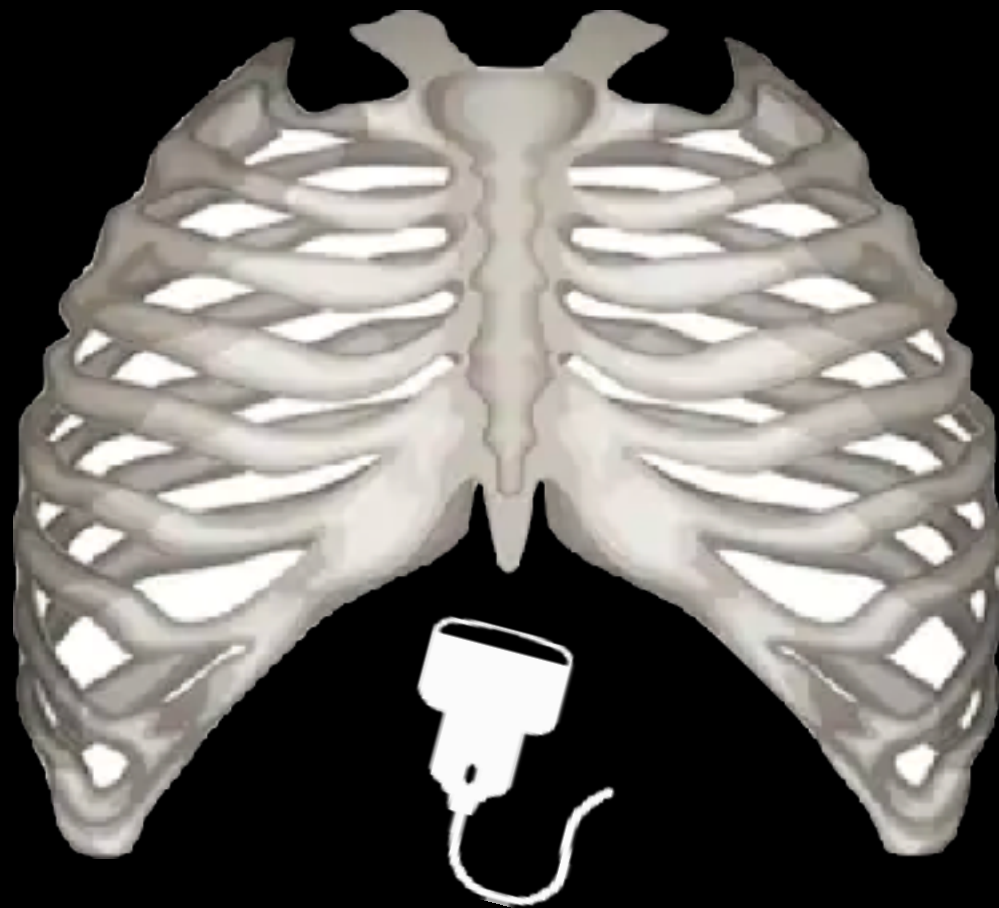


心臟



✓心包膜積水

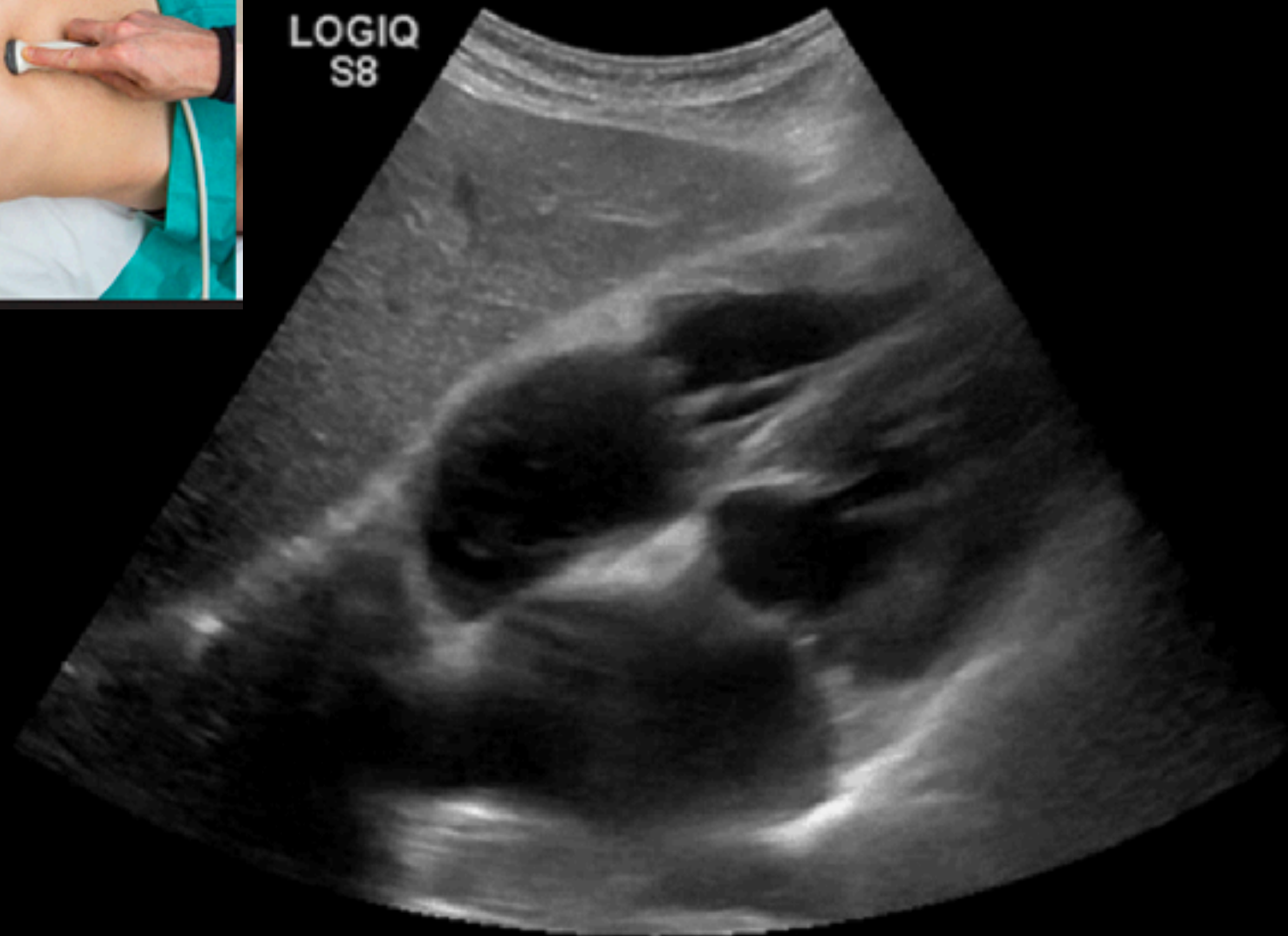
✓心臟跳動



劍突下掃描
Subxiphoid view



LOGIQ
S8

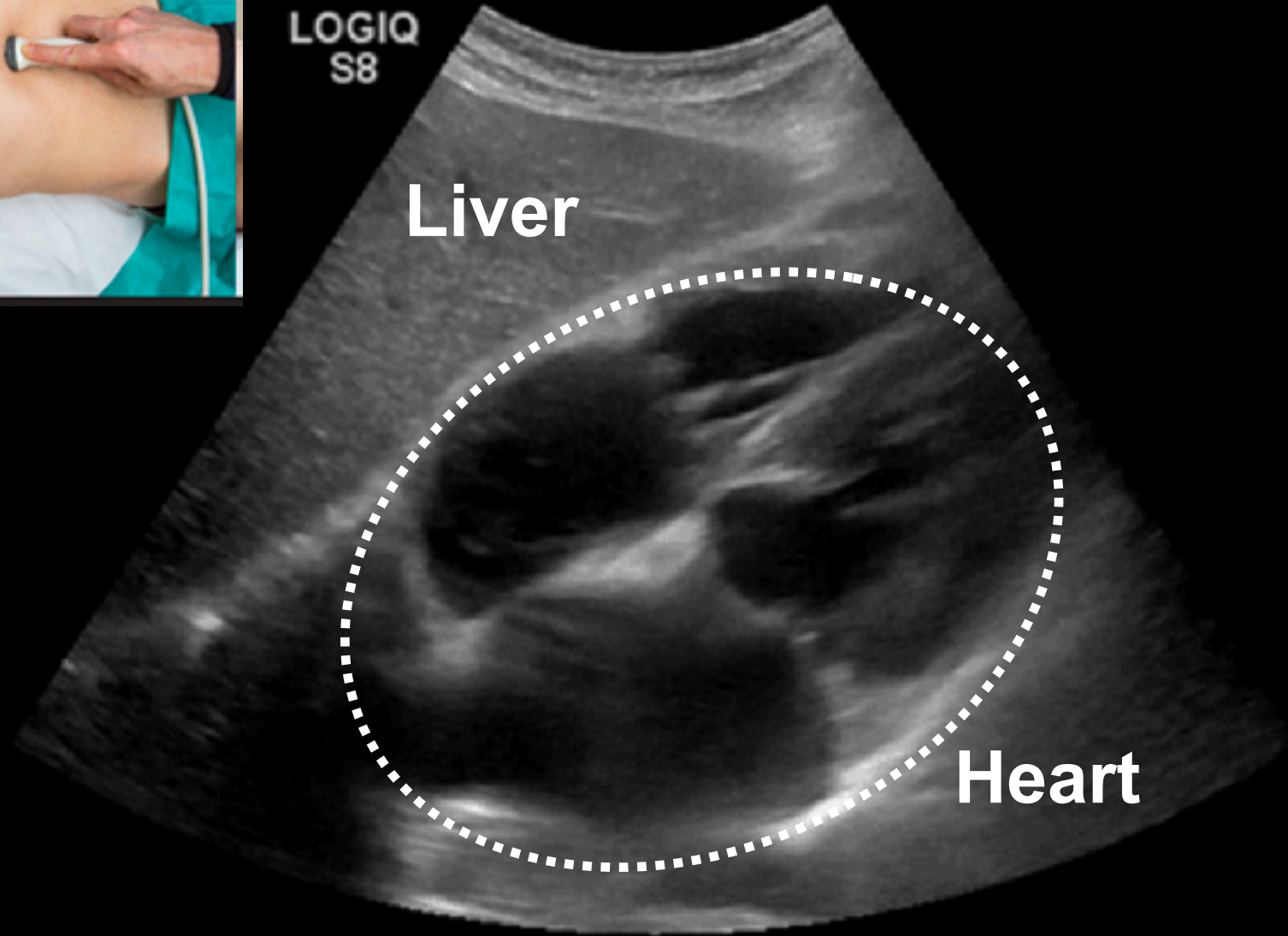




LOGIQ
S8

Liver

Heart



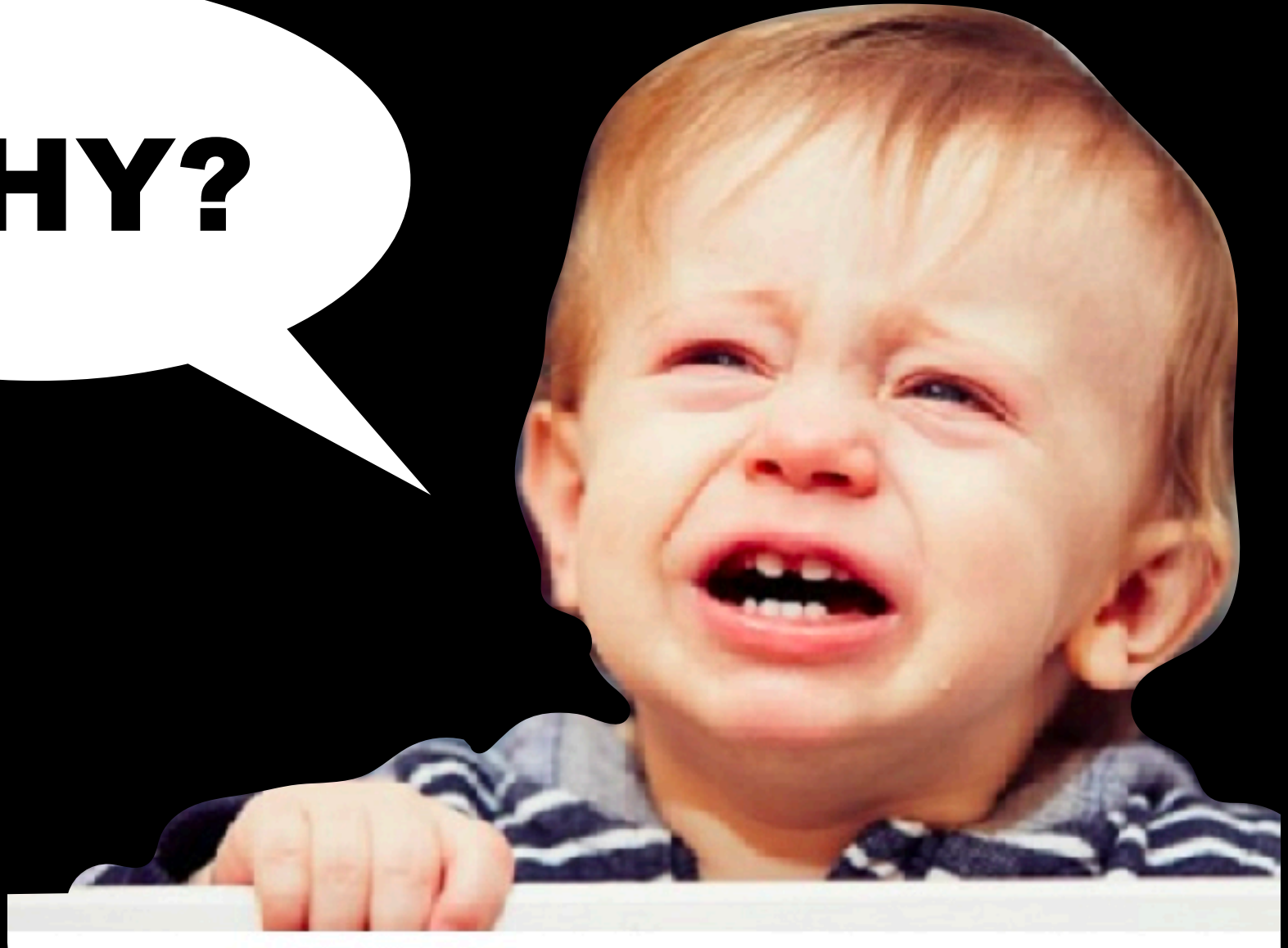
學長掃的



我掃的



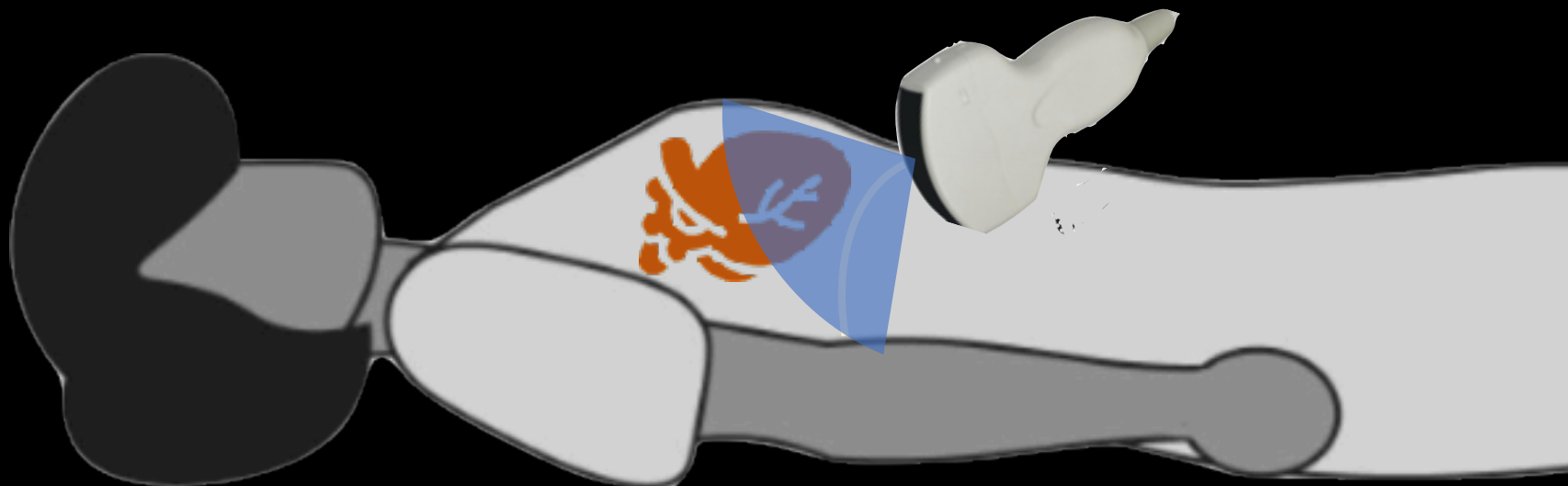
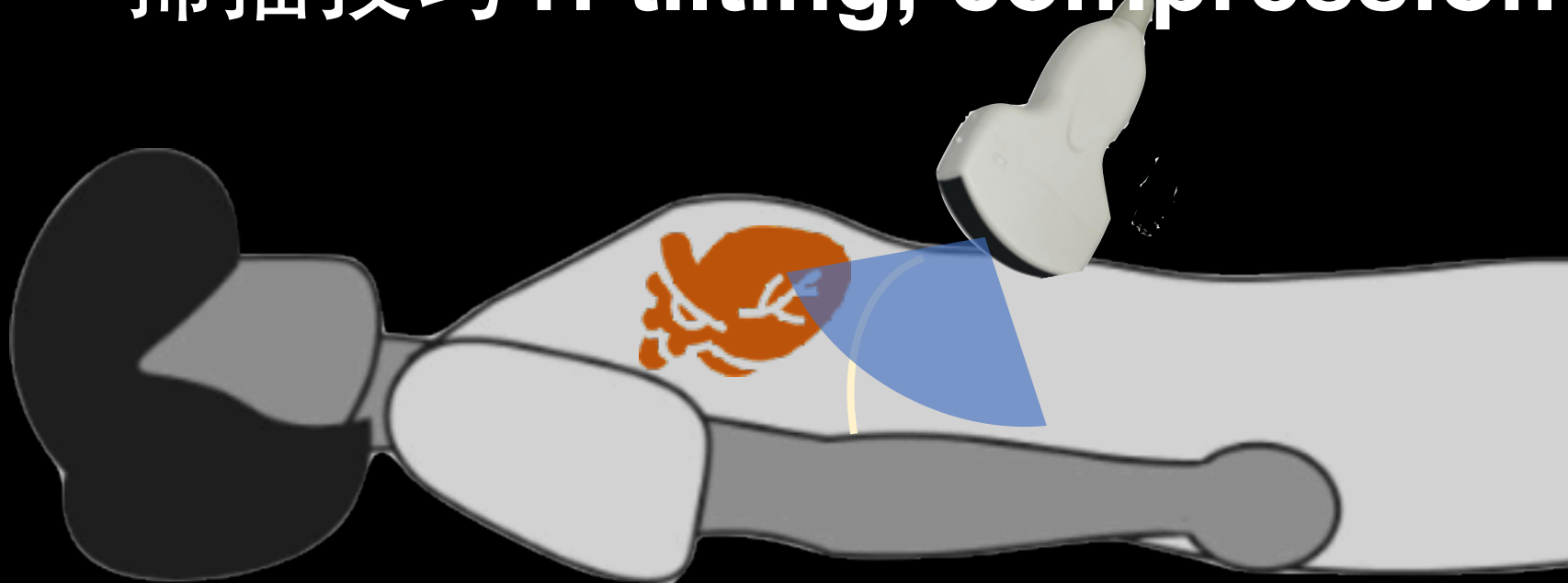
WHY?



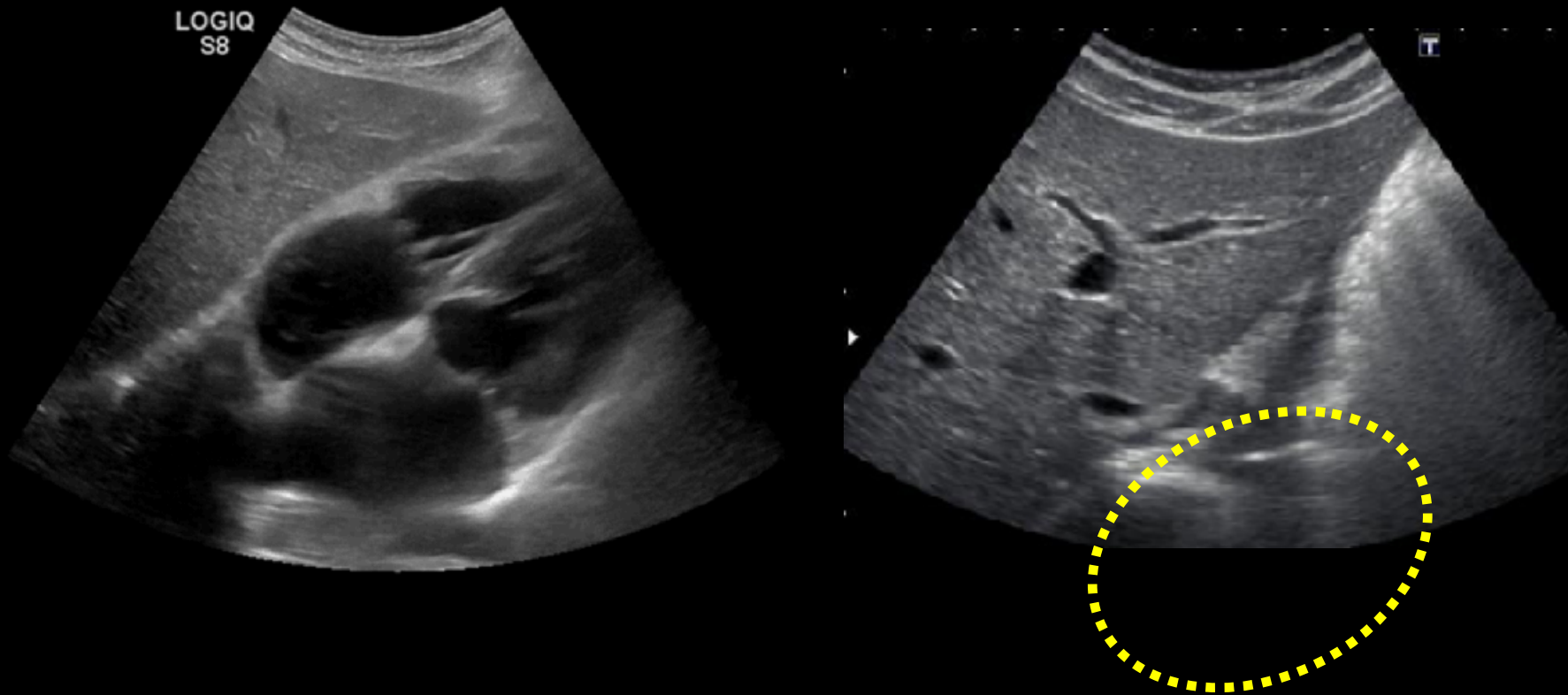
掃描技巧1: tilting, compression

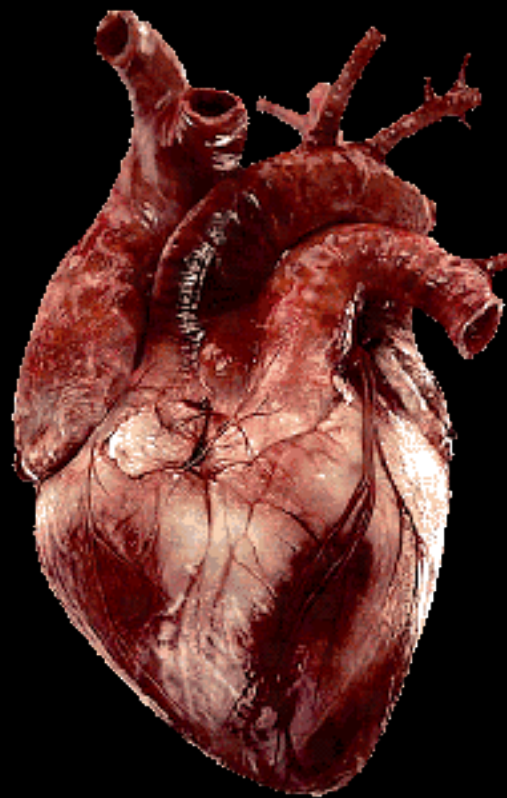


掃描技巧1: tilting, compression

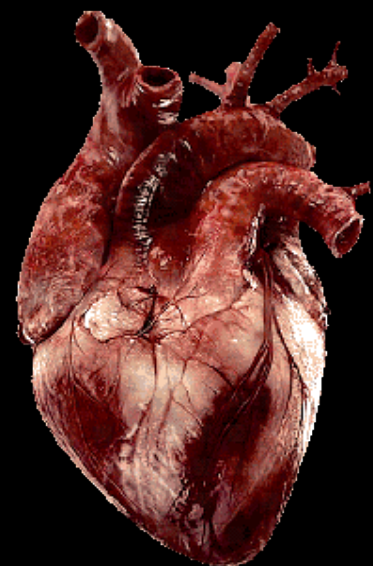


掃描技巧2: 深度要夠深, 以肝臟為媒介





預測預後 Prediction

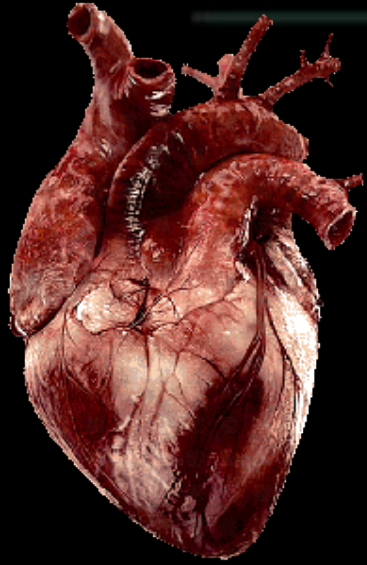


Adult
PA 4-2
MI 1.6
TIS 1.1

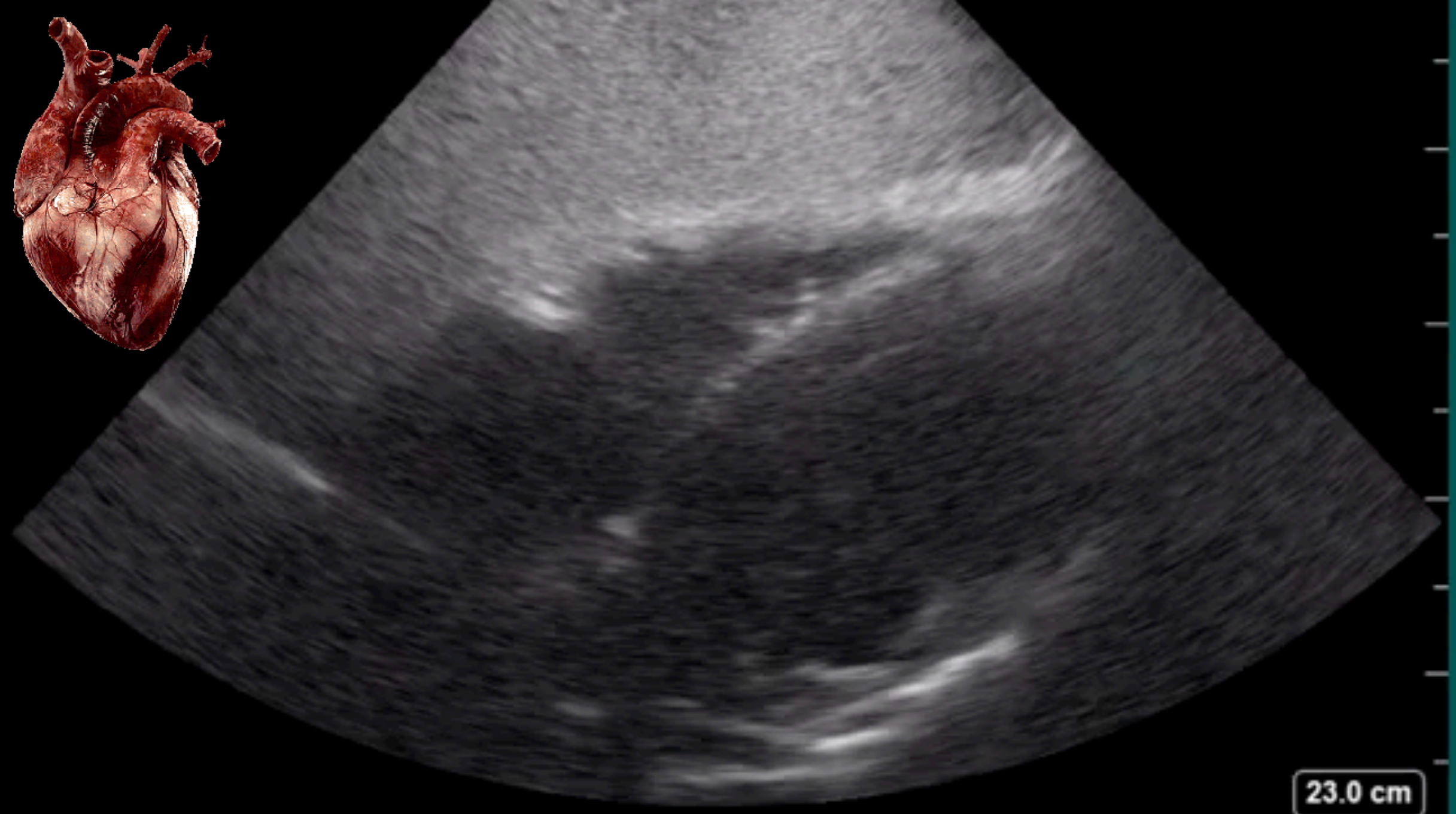
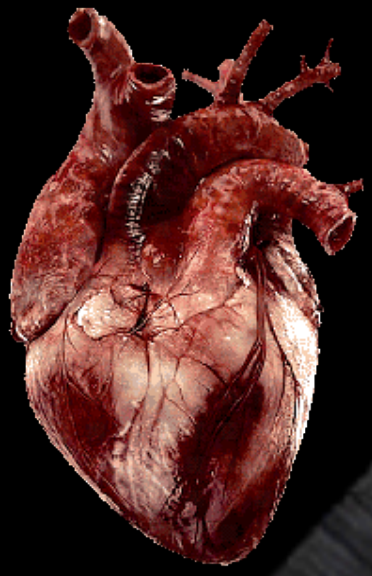
F3 Gn 50
232dB/C5
K/2/0

51Hz 21cm

T
P R
2.0 4.0

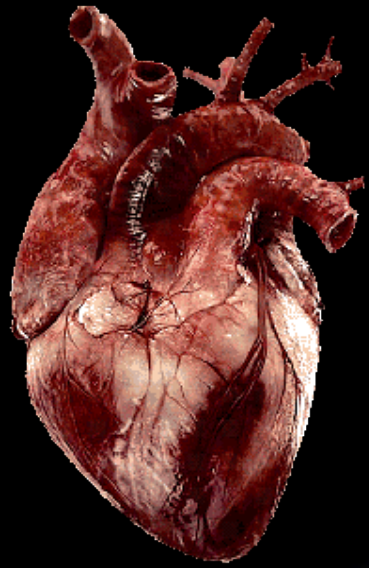


Abdominal
C6 2CH4MHz
DR10W1P0
G70E27007%
M1.2 T90.3
16.0 cm
127.7 Hz
2510



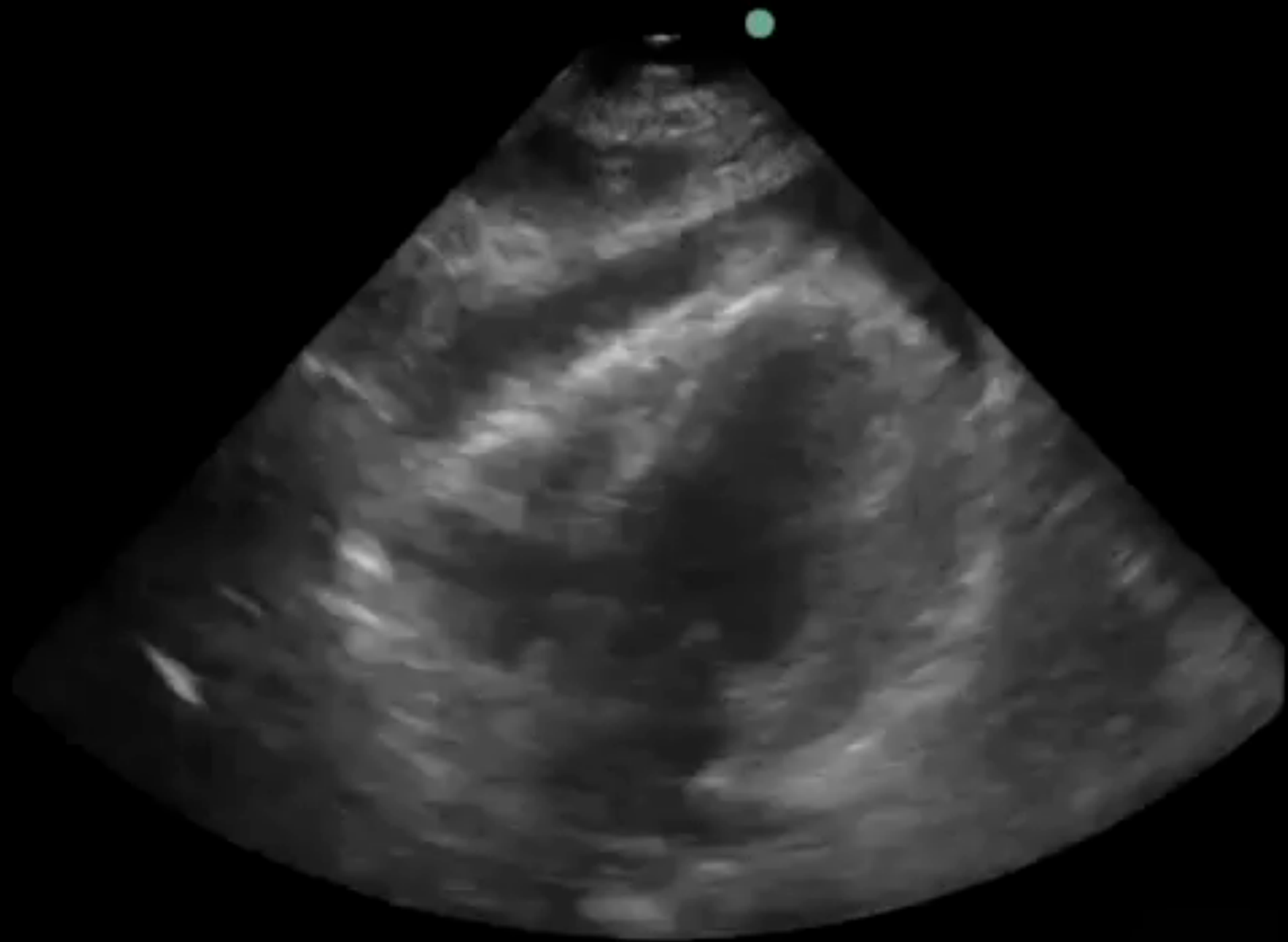
23.0 cm

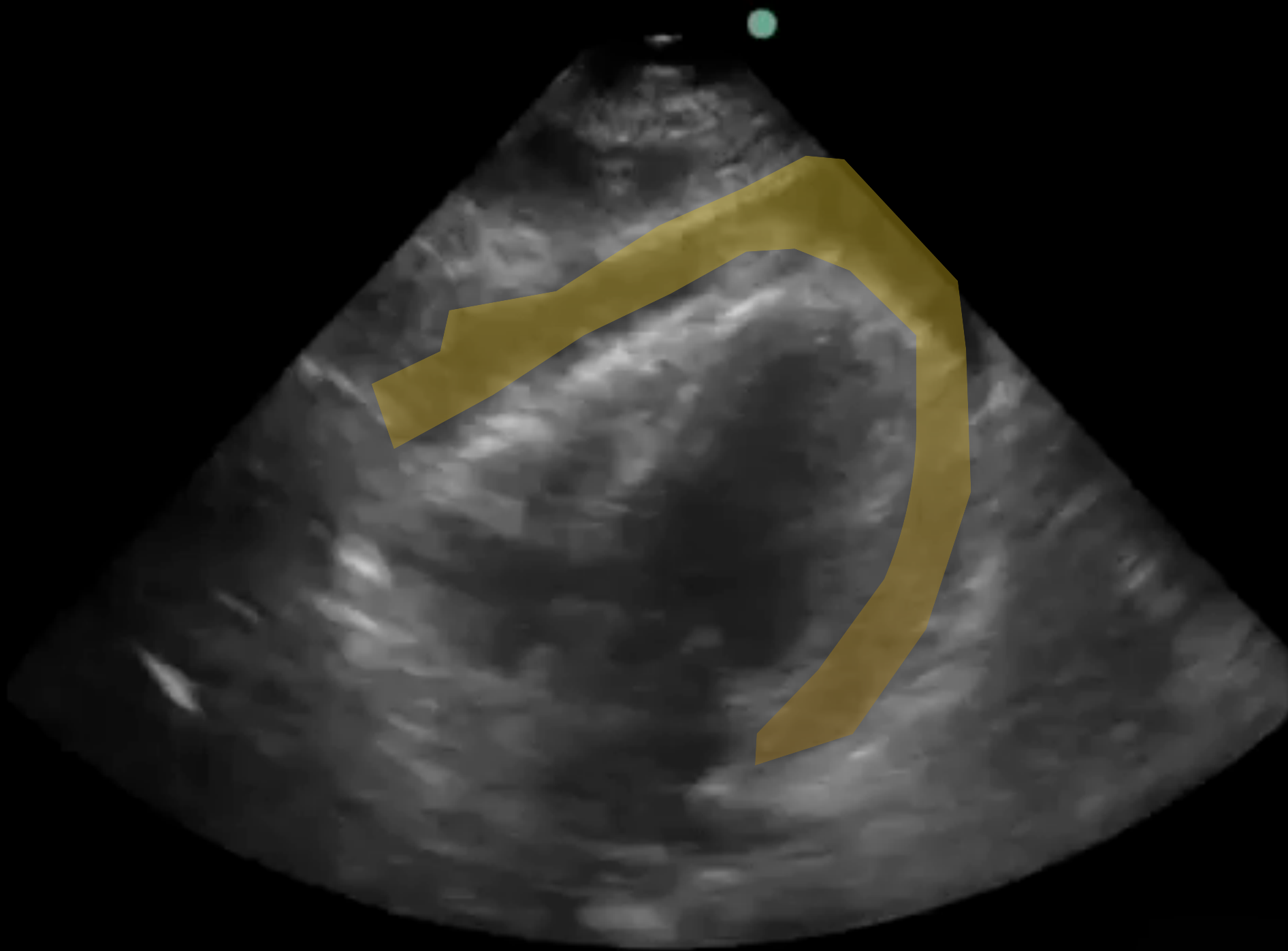
2D G: 76

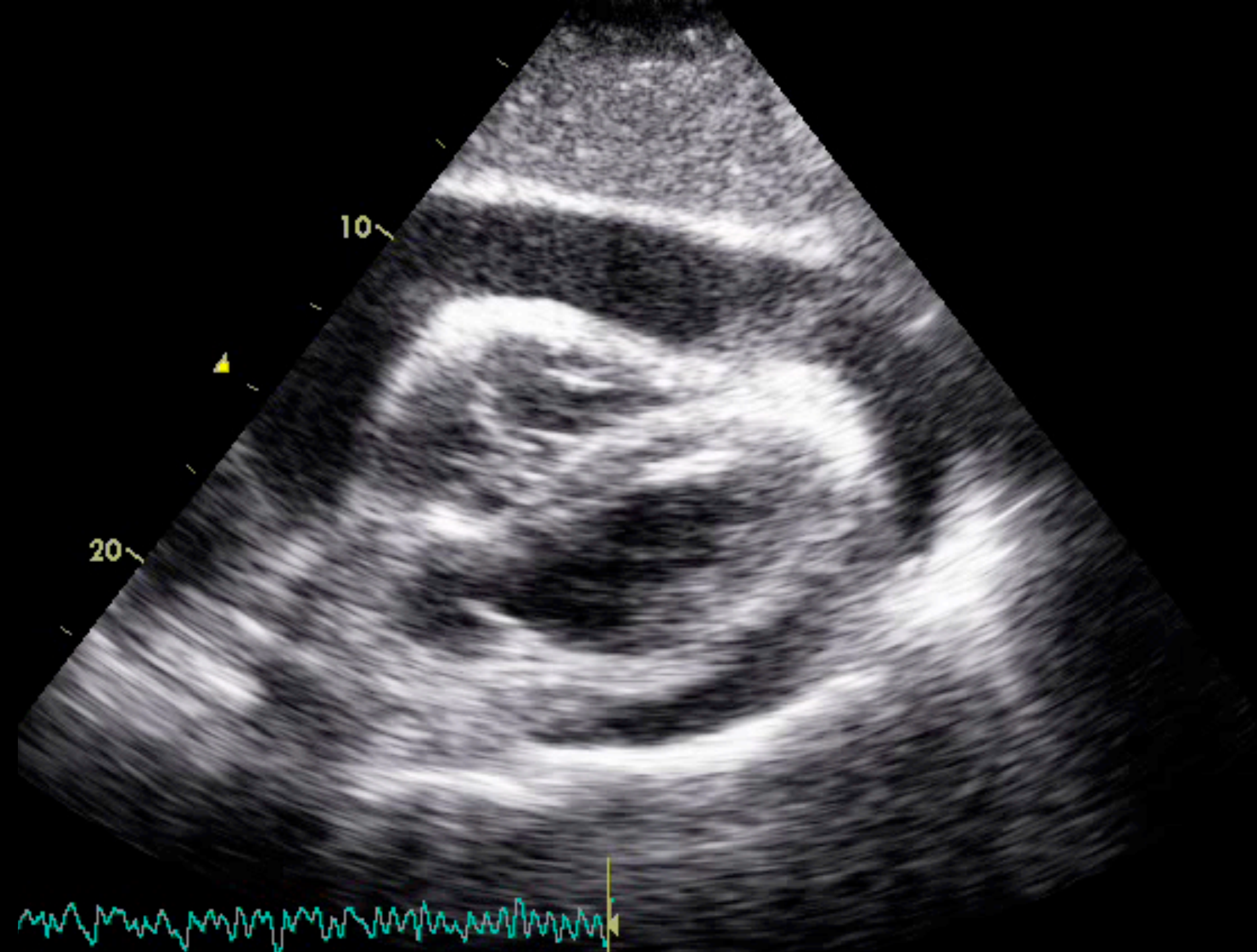


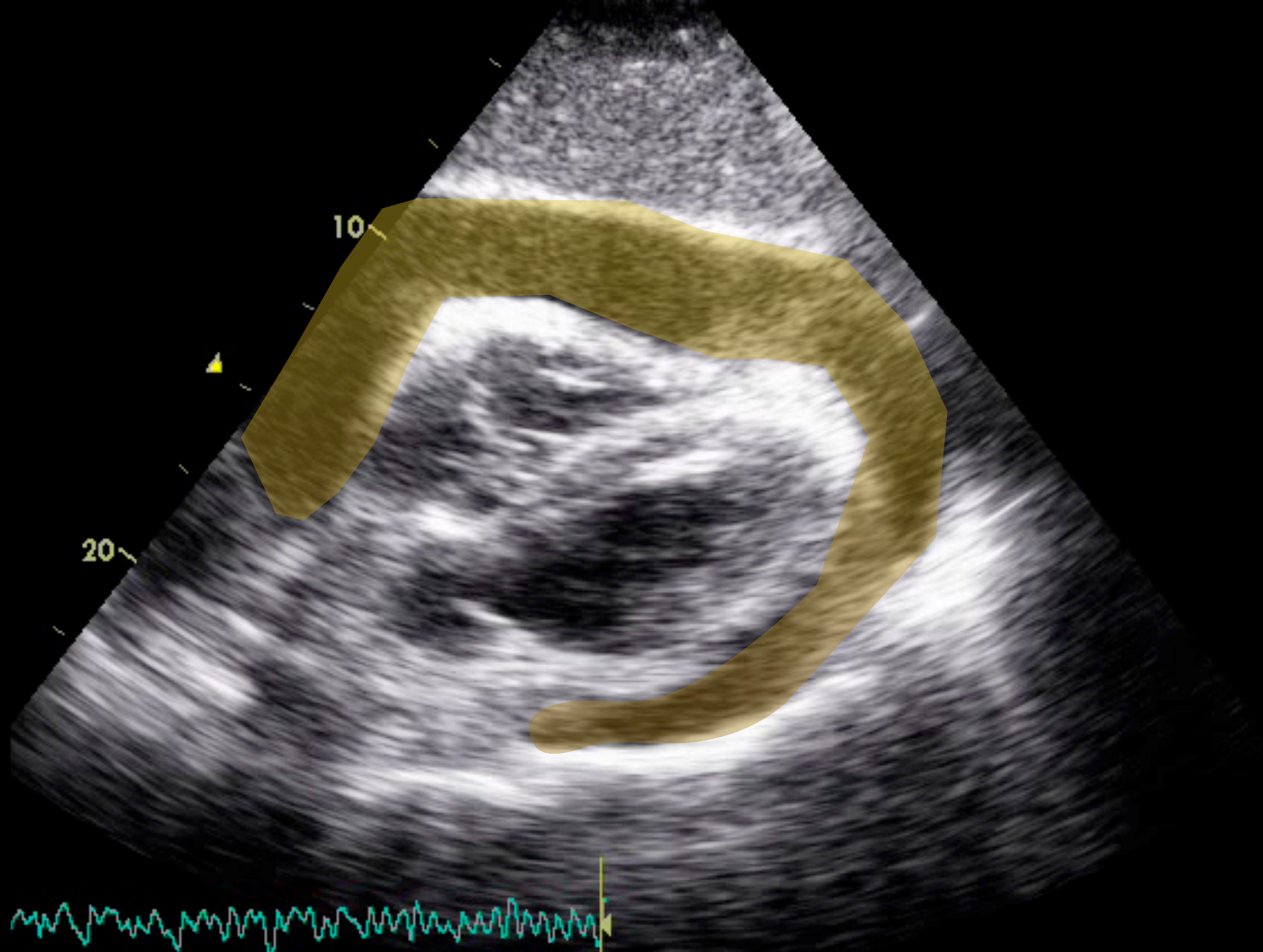
15.0 cm











超音波迴音 (echogenicity)

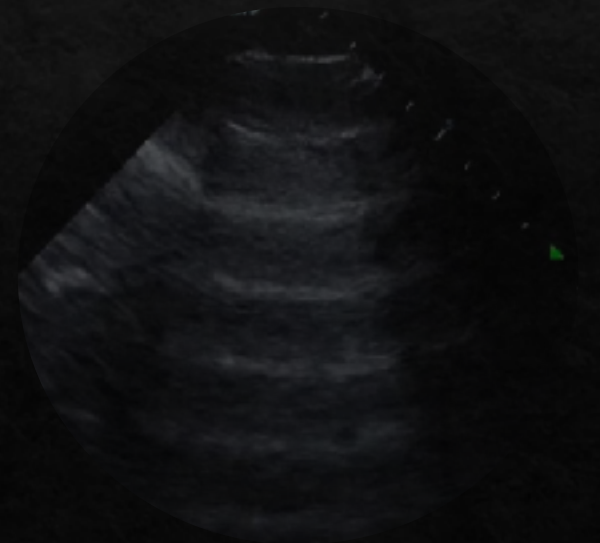
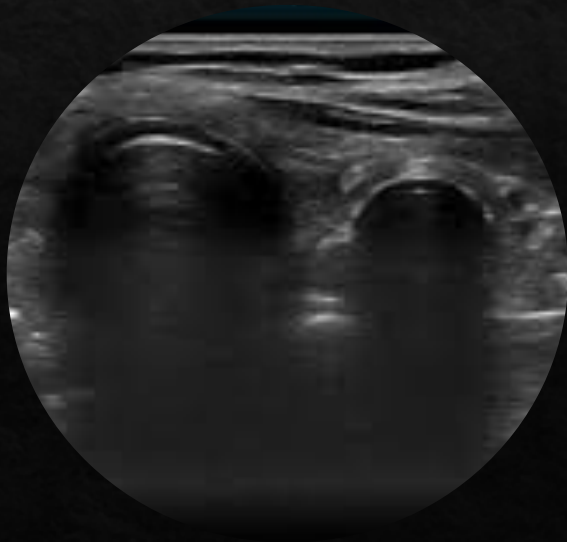
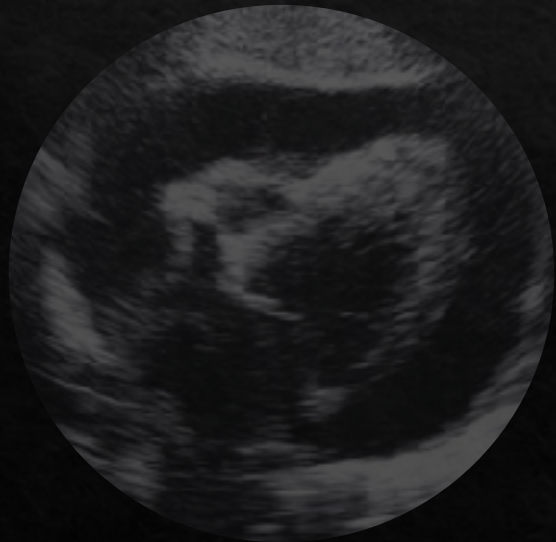
水



血











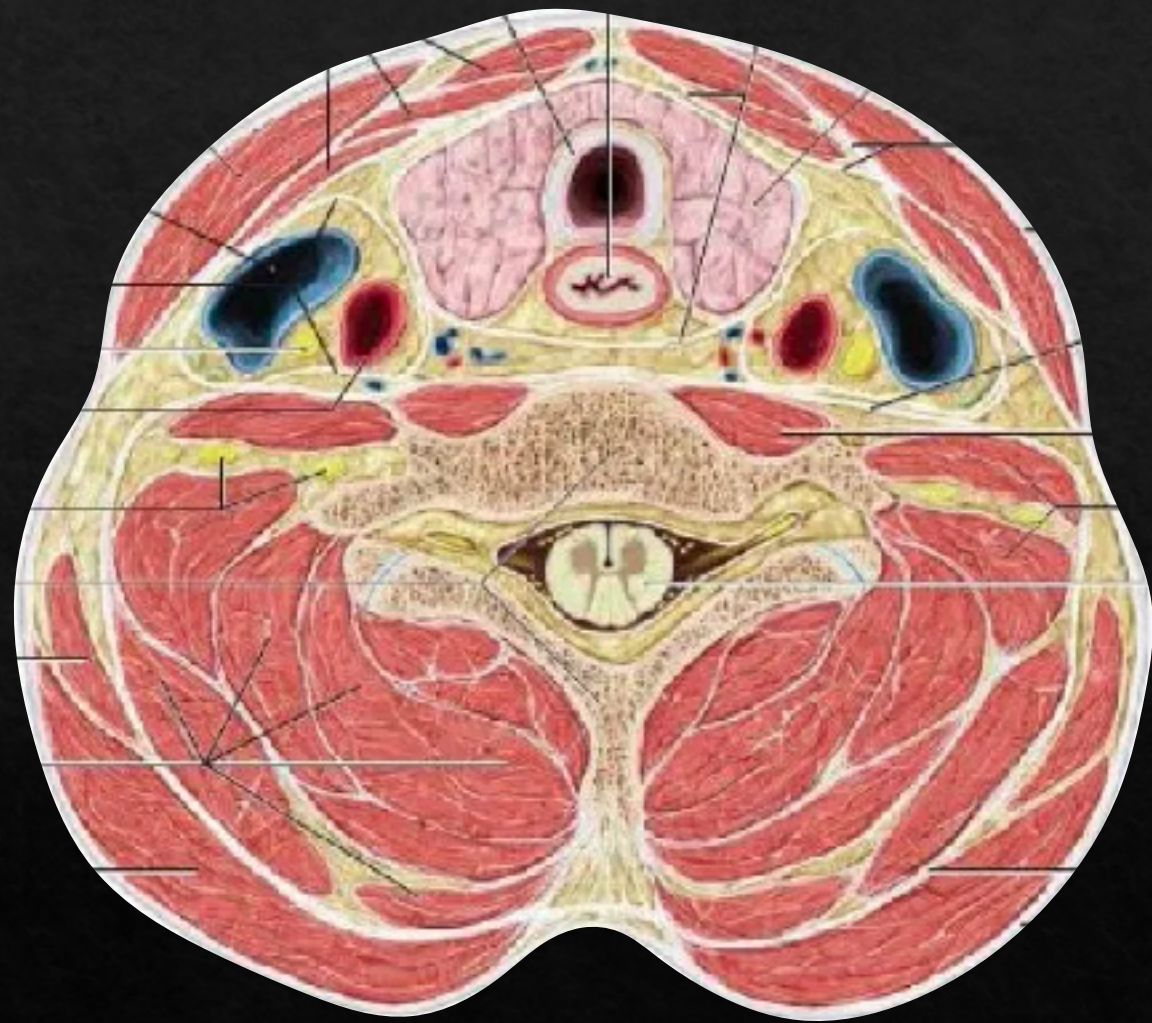
ETCO₂ -- Class I



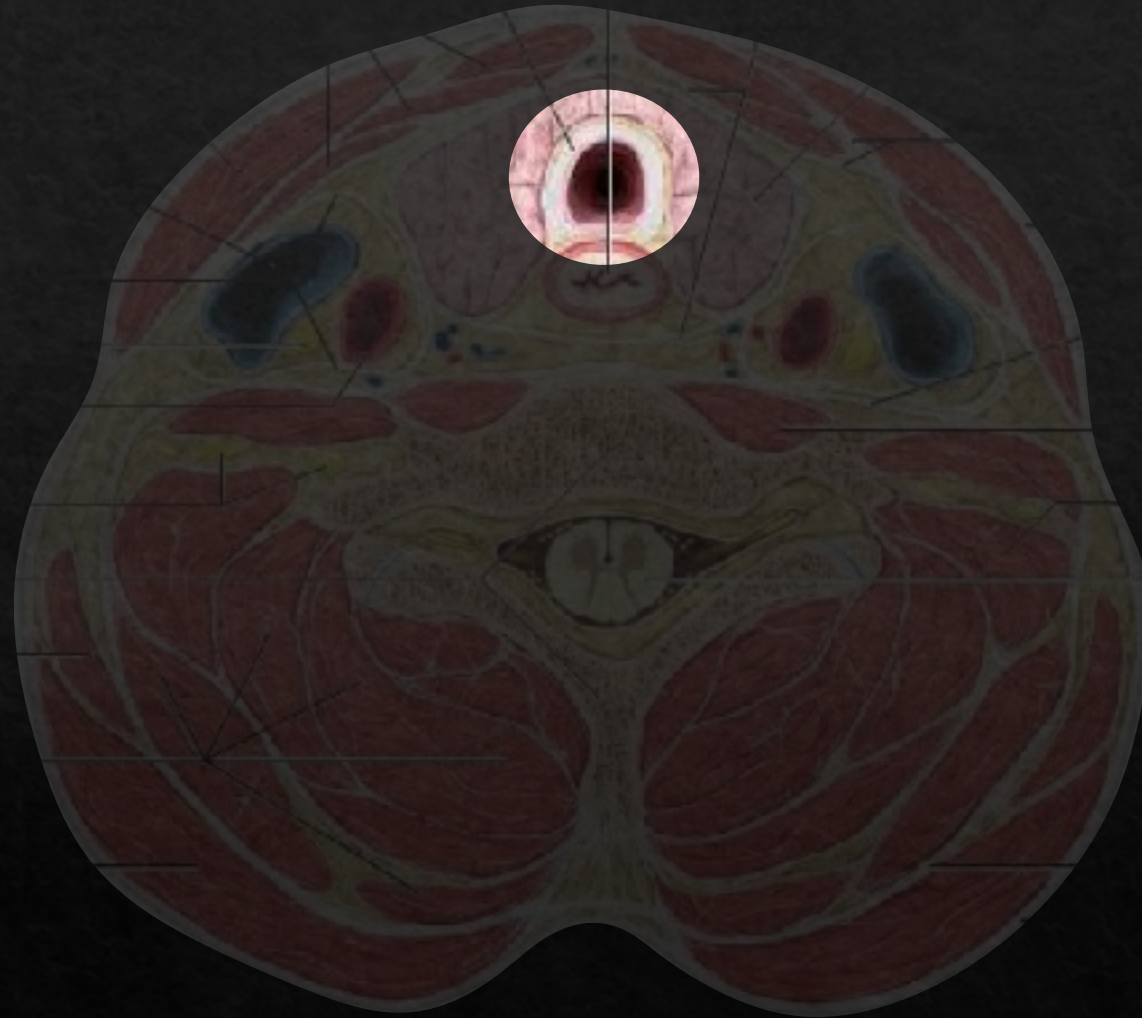
Sono -- Class IIa



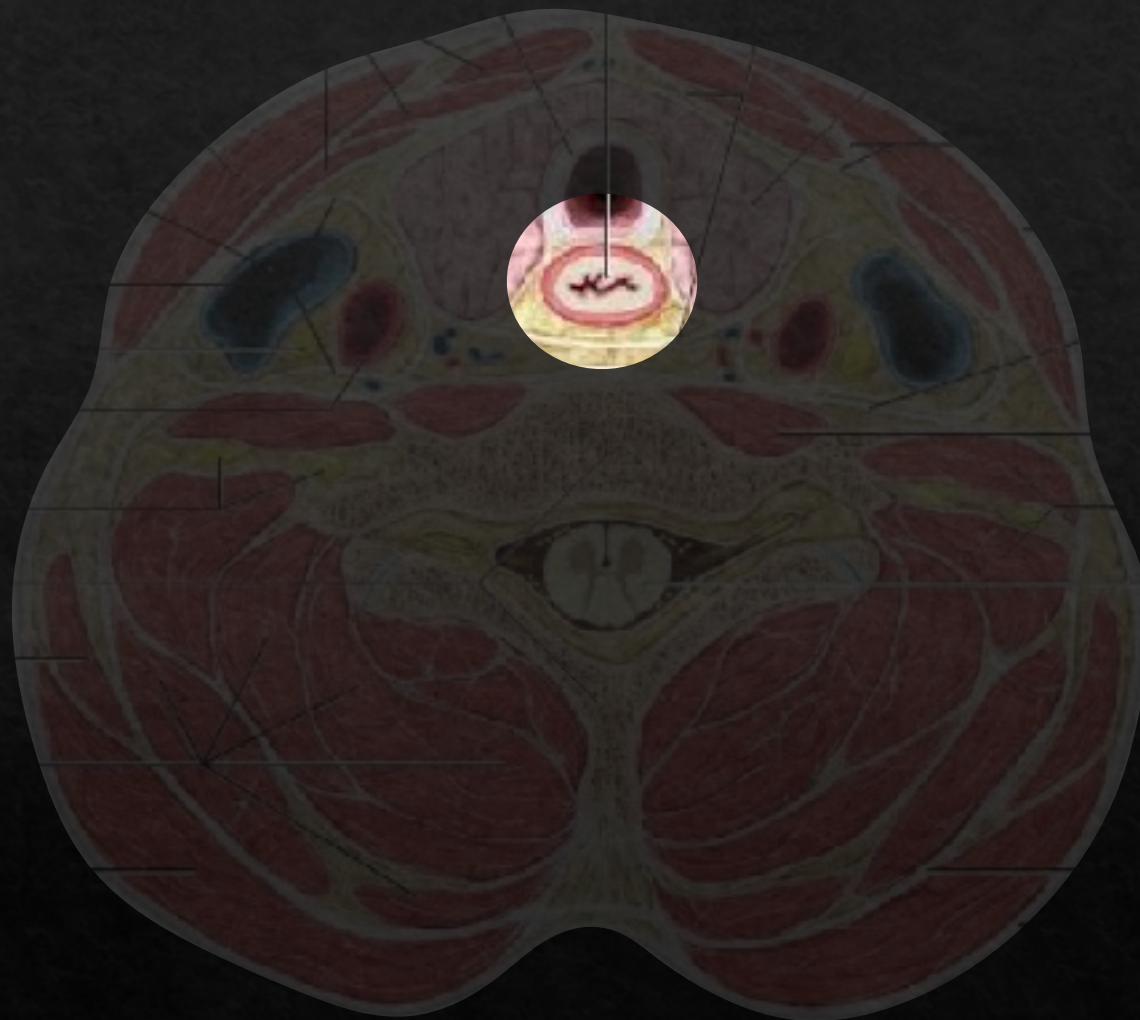
✓ 食道插管

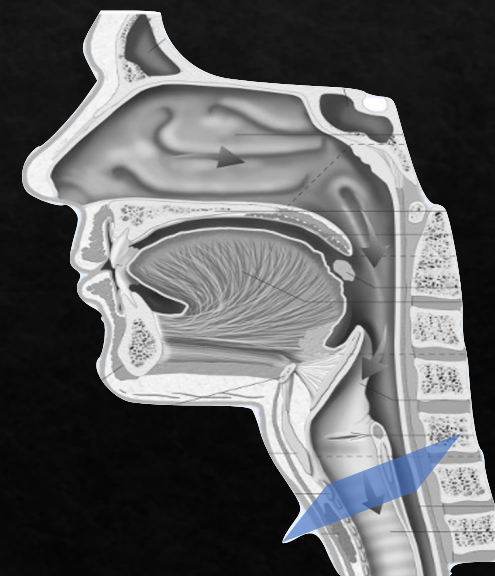
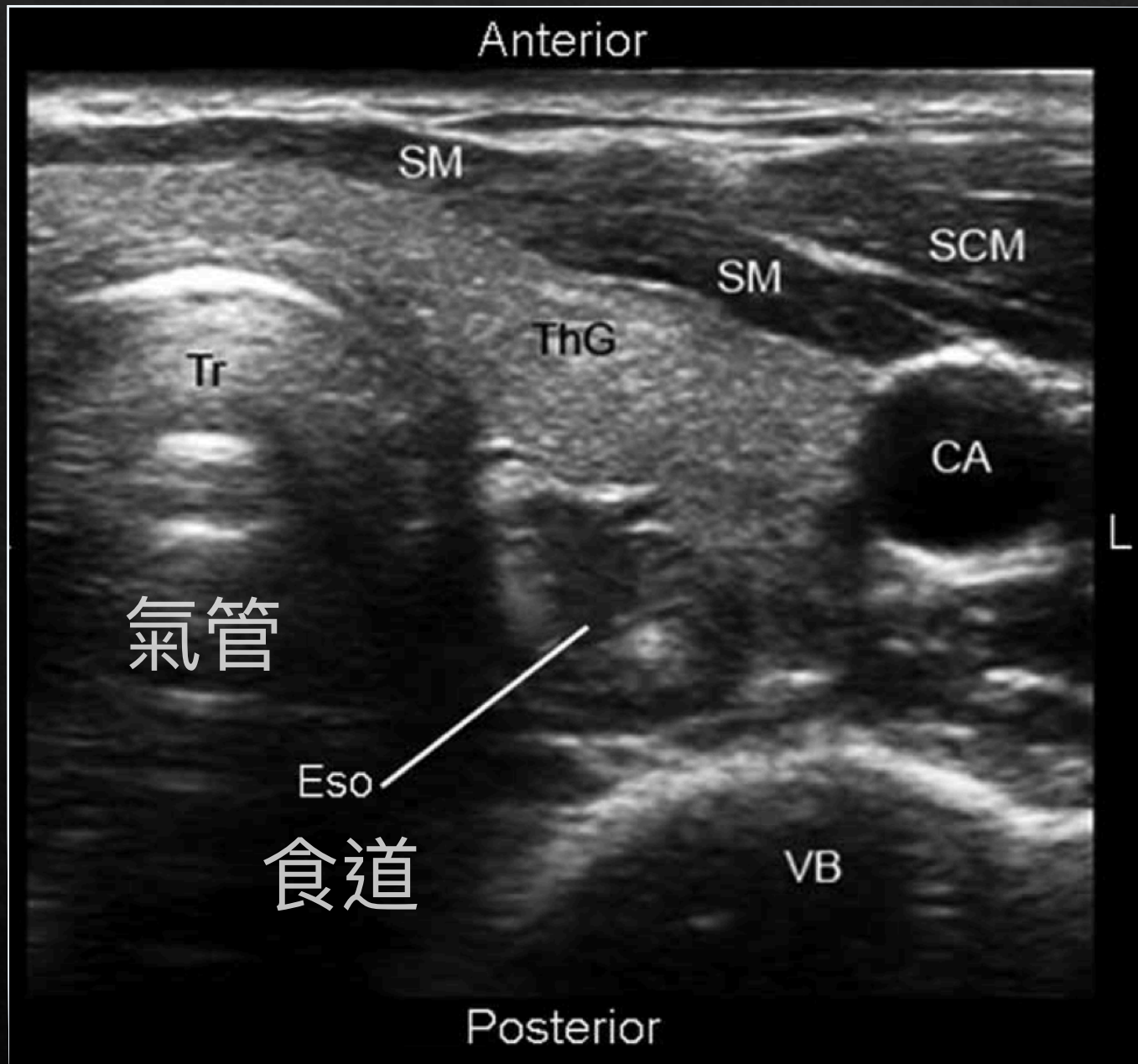


氣管



食道







0.83

TIB:

0.08

Res

MHz

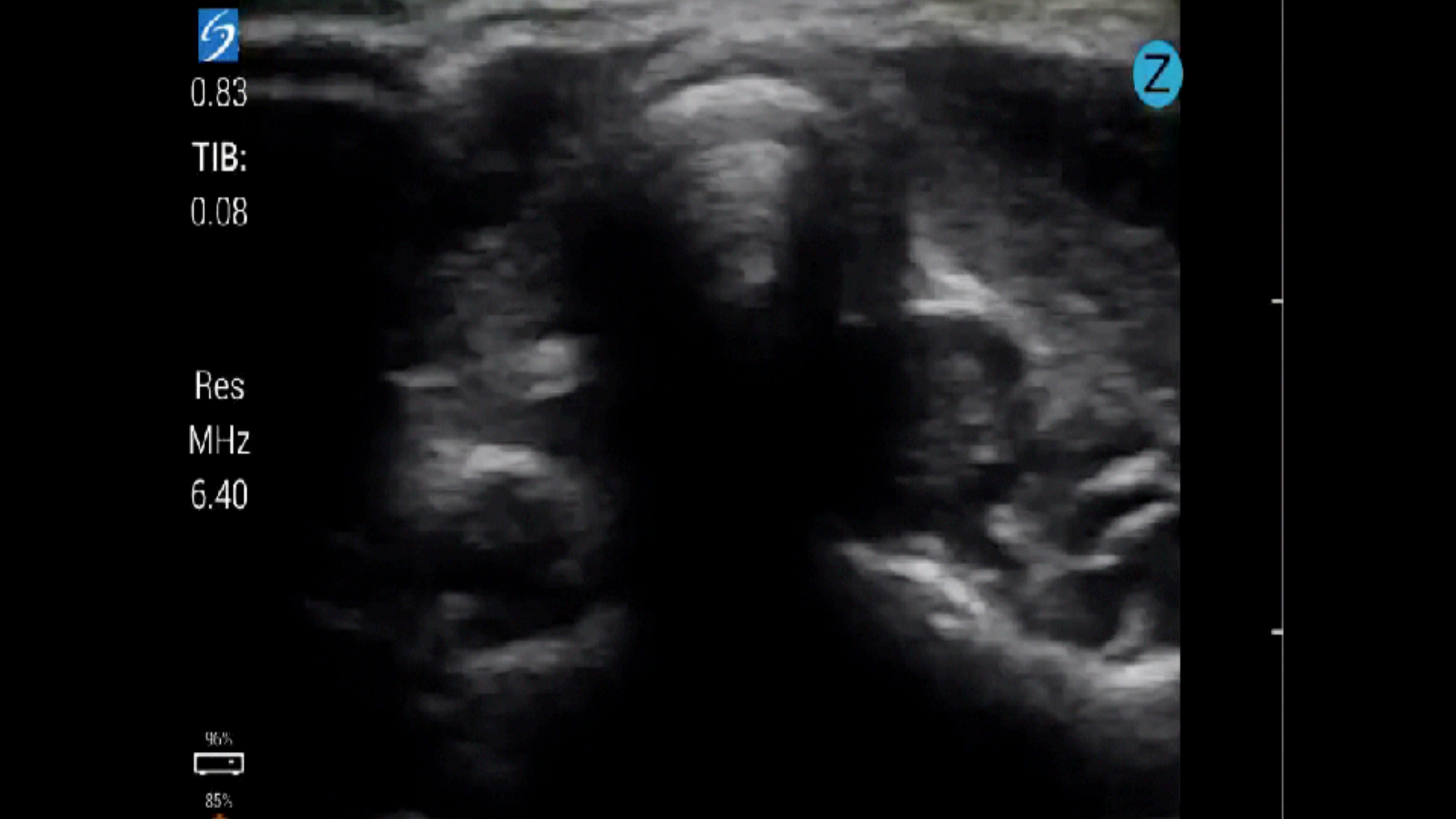
6.40

96%

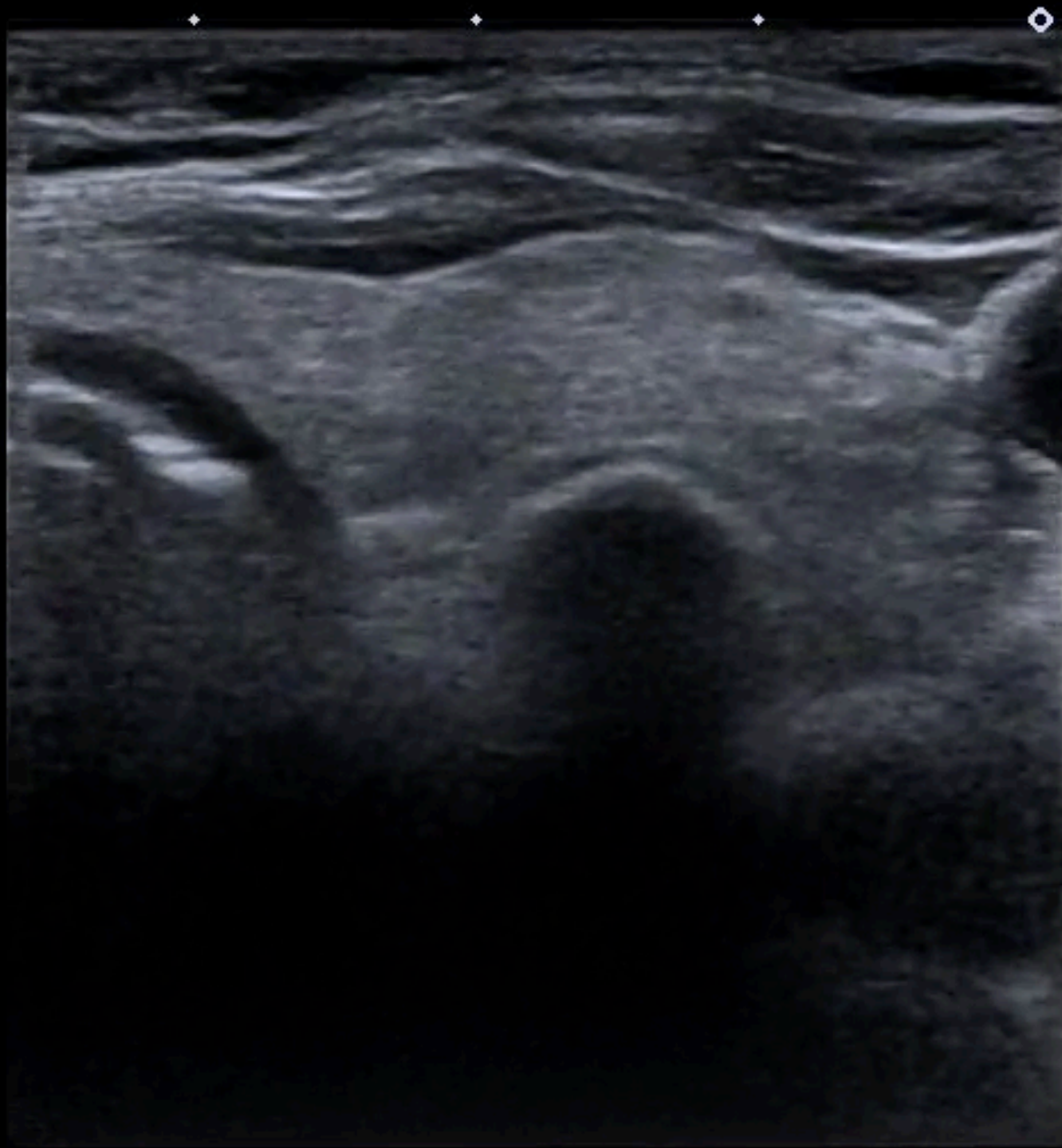


85%

Z

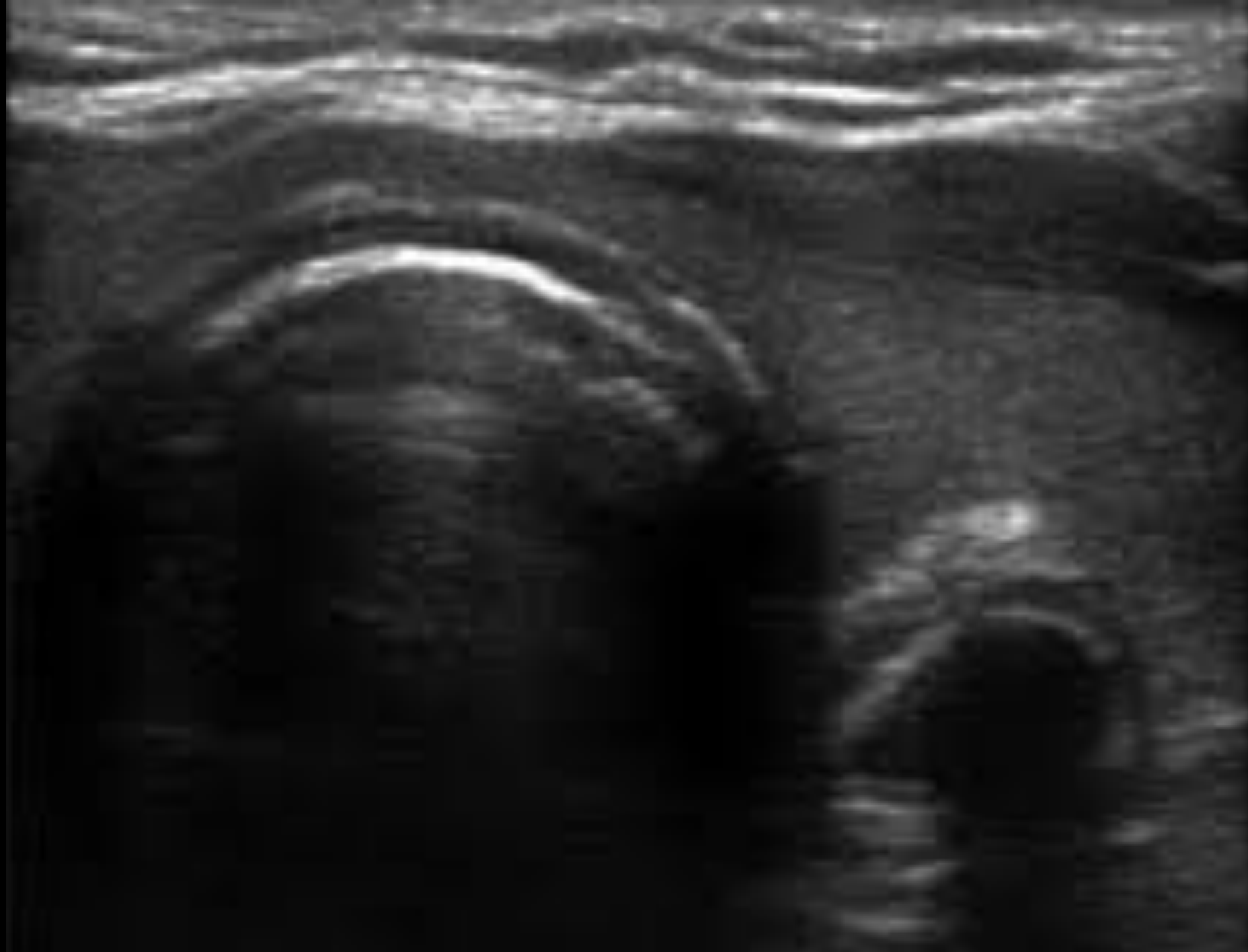


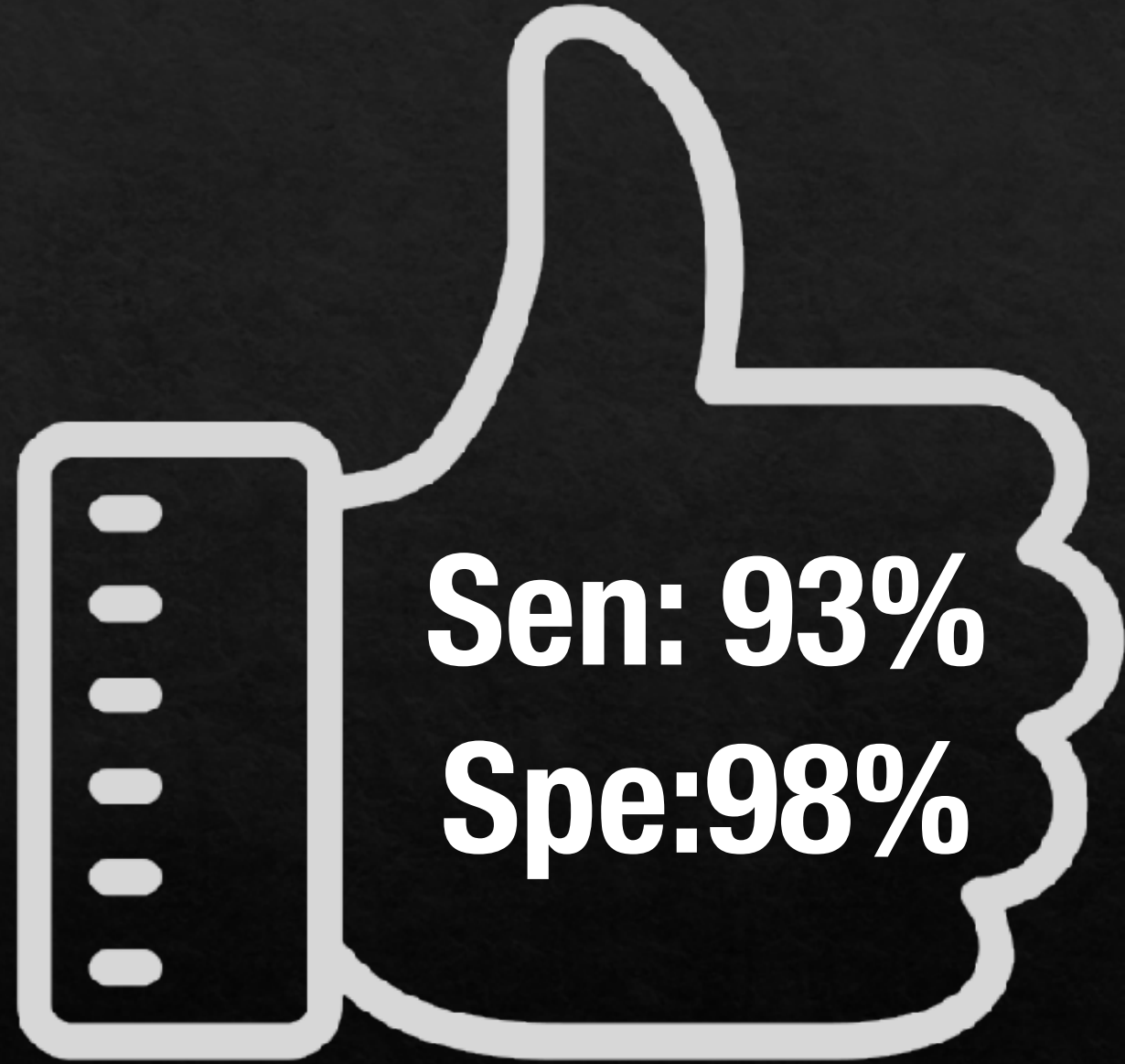
0
1
2
3
4



T

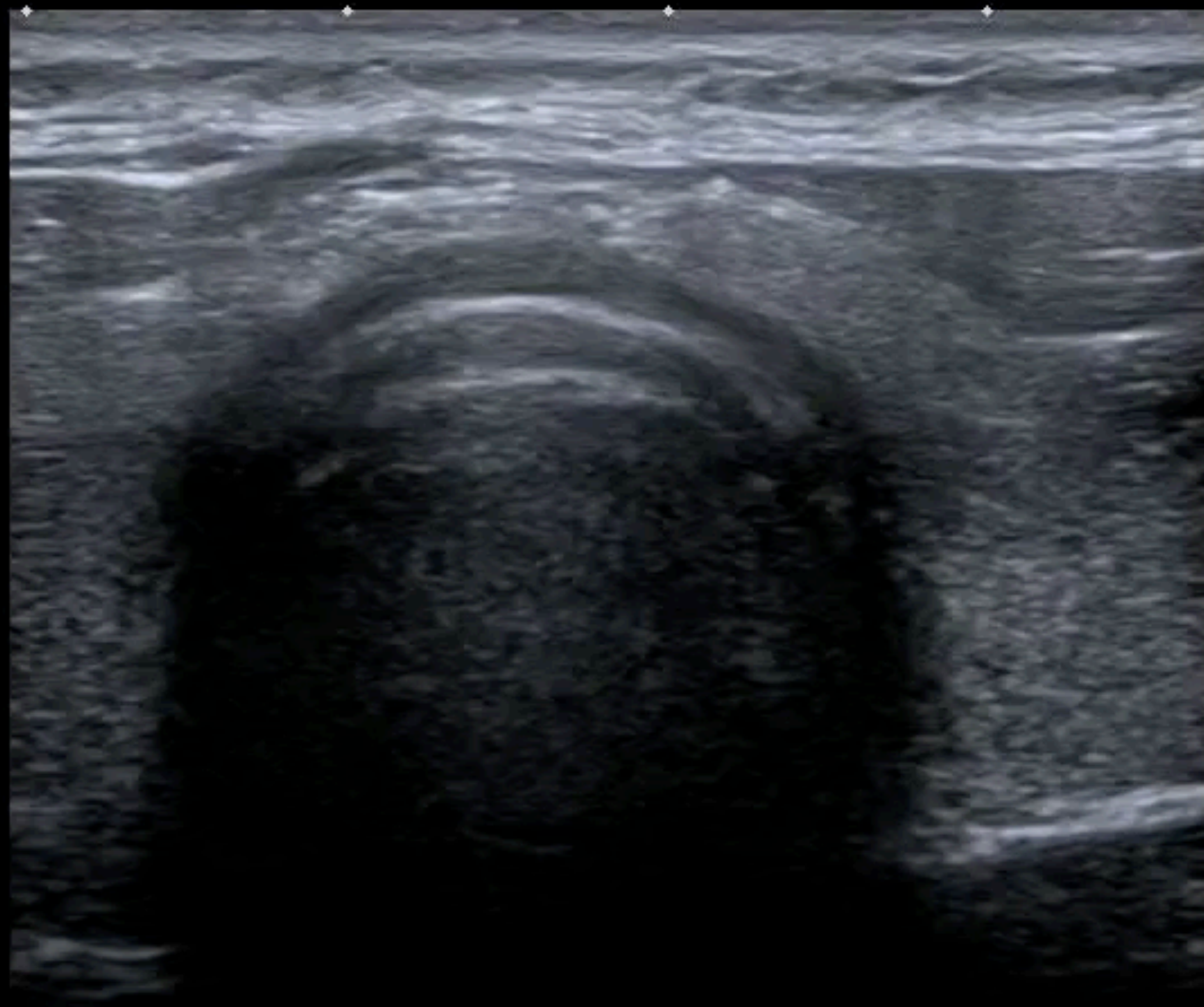
M
1.5
11L4
diffT9.0
29 fps
G:85
DR:70
A:5
P:3





0

T

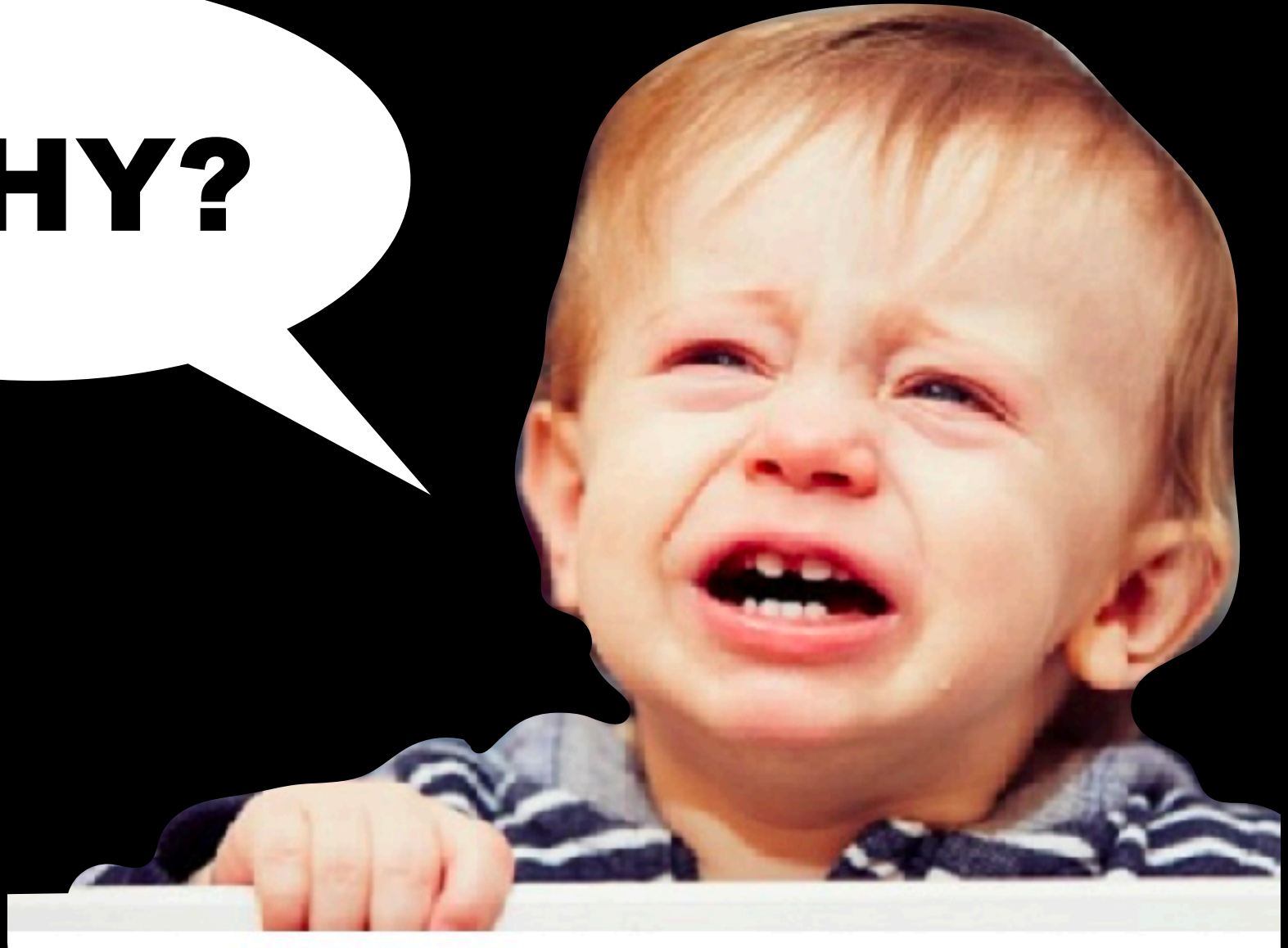


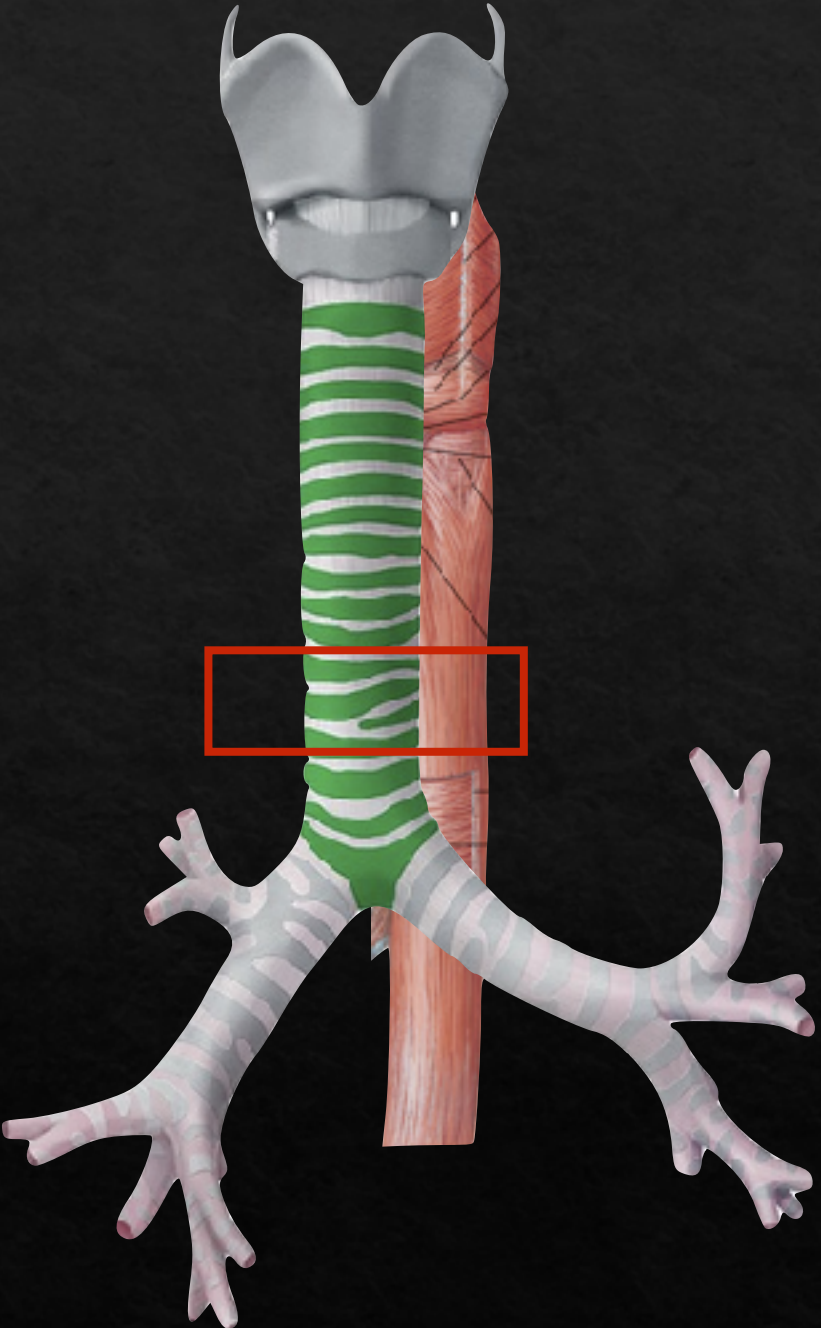
1

2

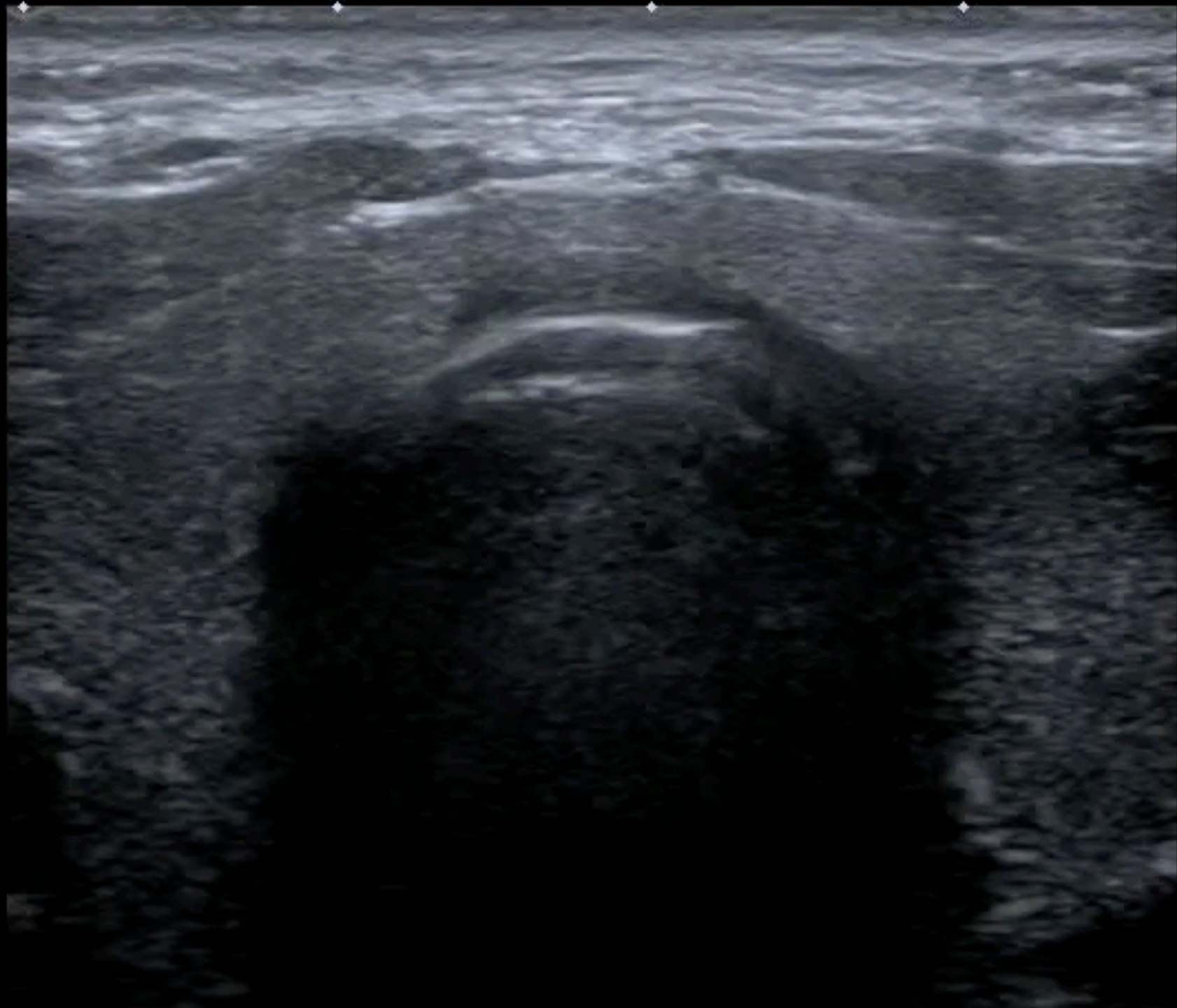
3

WHY?



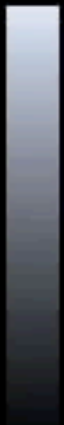


0
+
◇
+
◇ 1
+
◇
+
◇ 2
+
◇
+
◇ 3

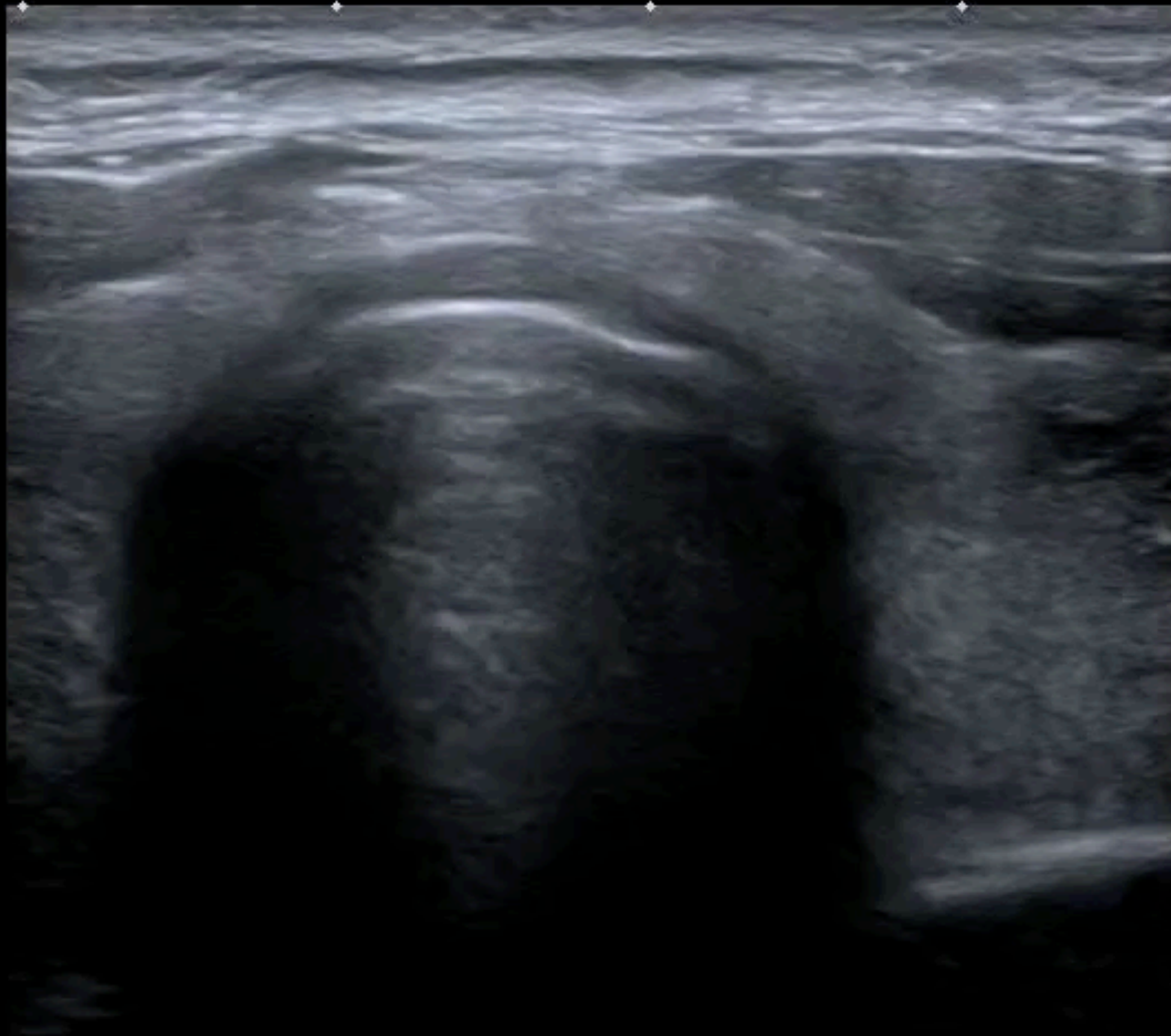


T

壓

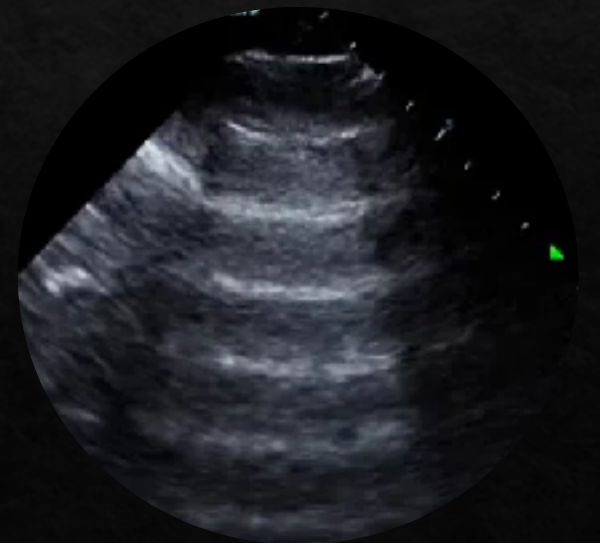
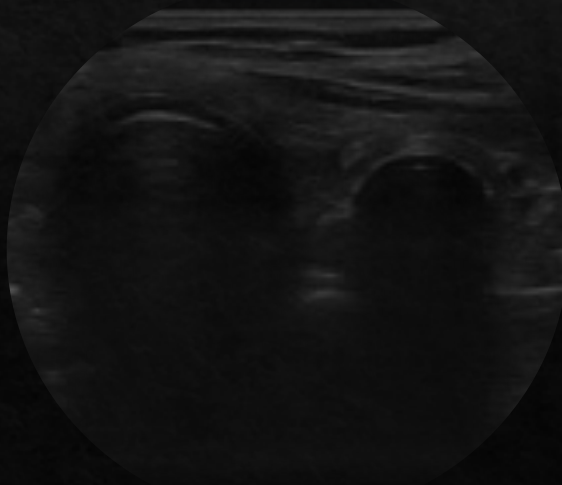
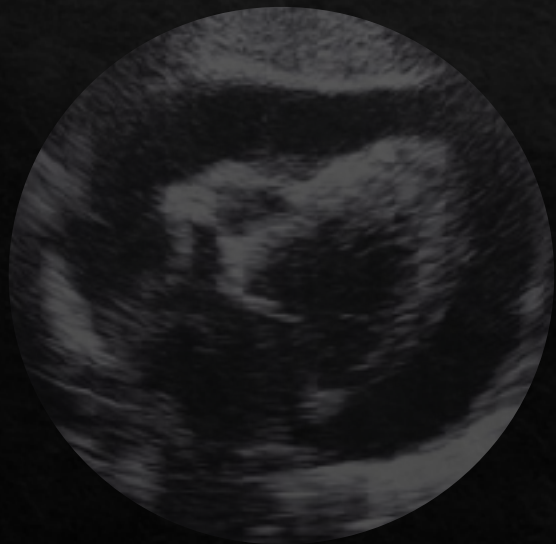


0
.
1
.
2
.
3
.

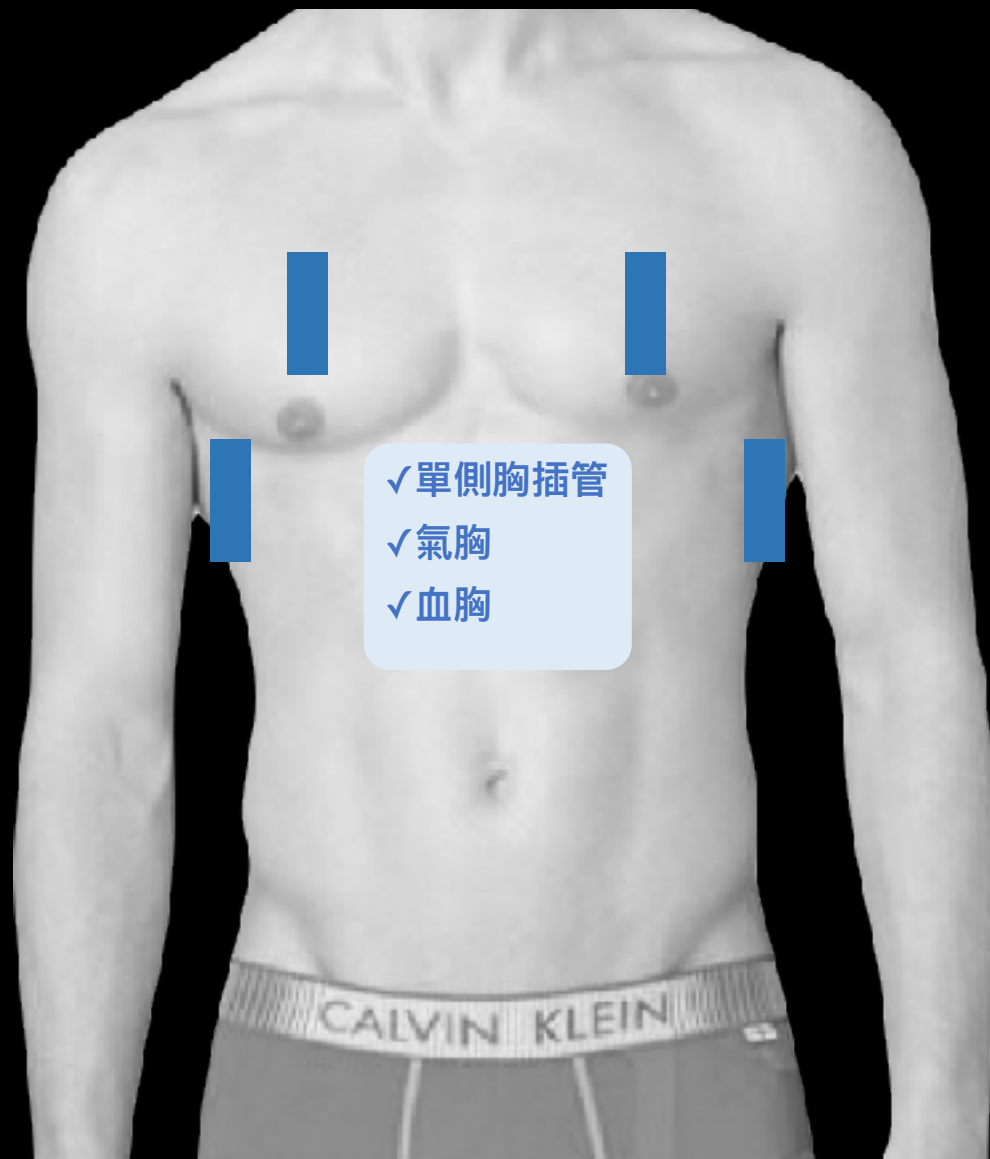


T

壓
+
移



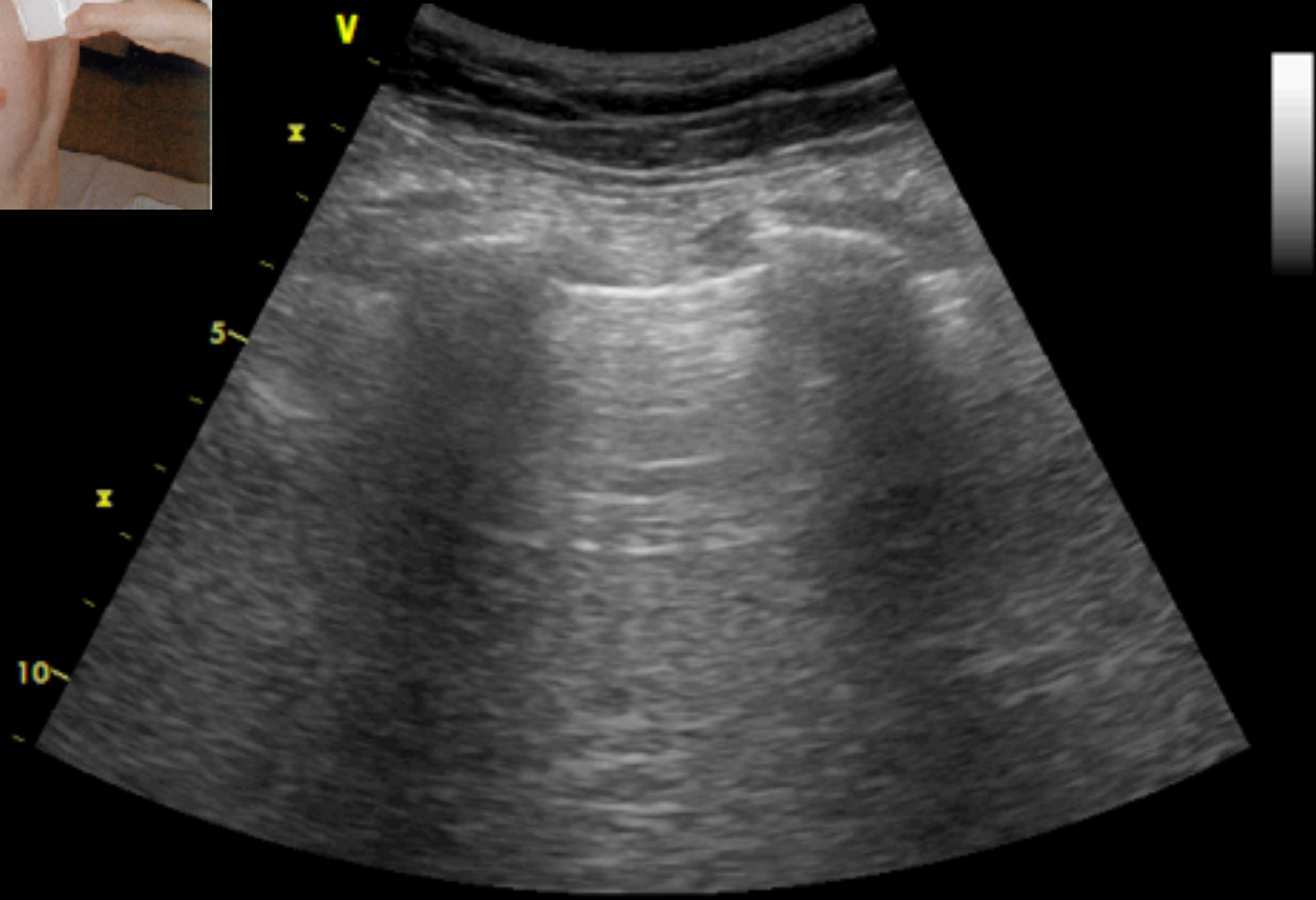
肋膜 Pleura

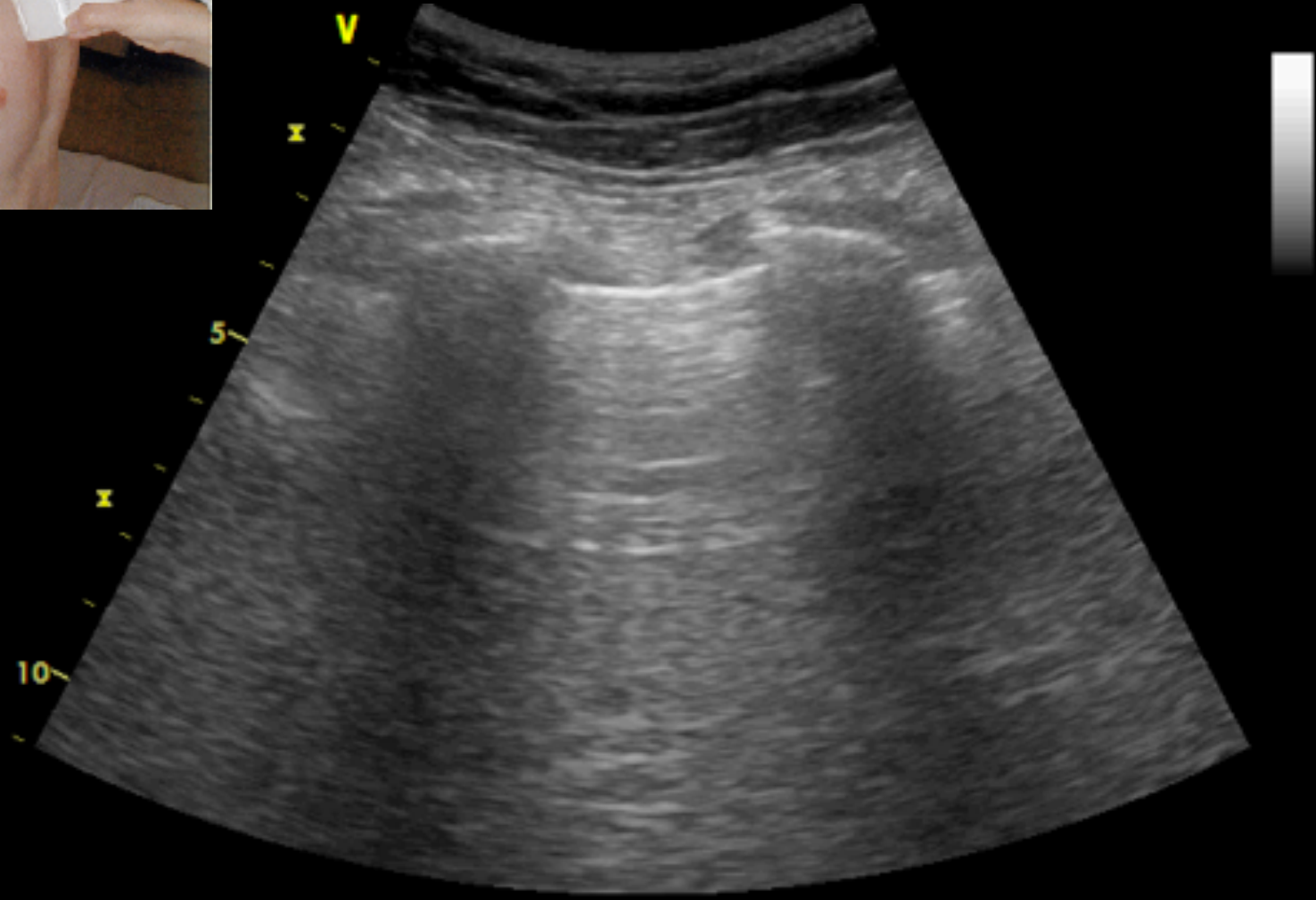


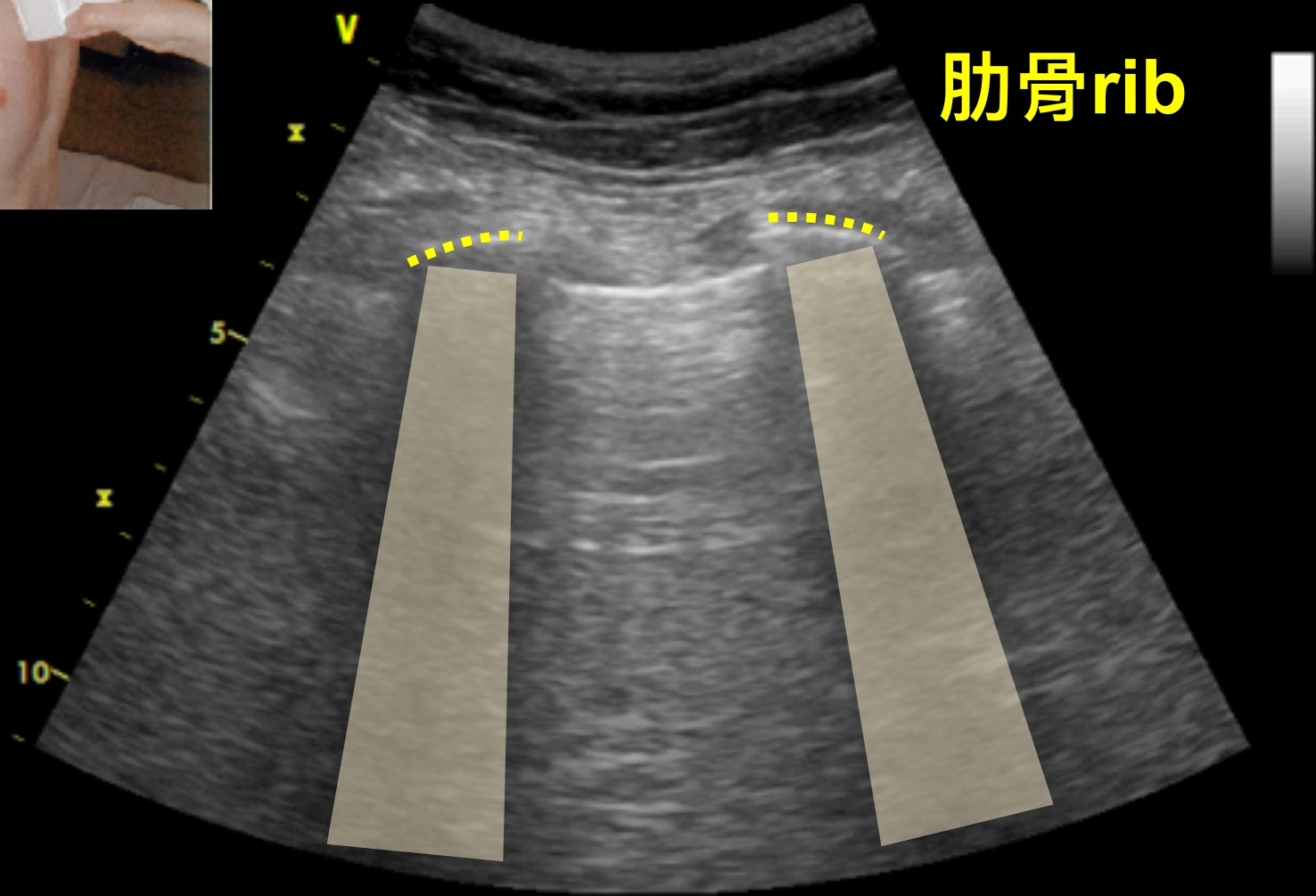
✓單側胸插管

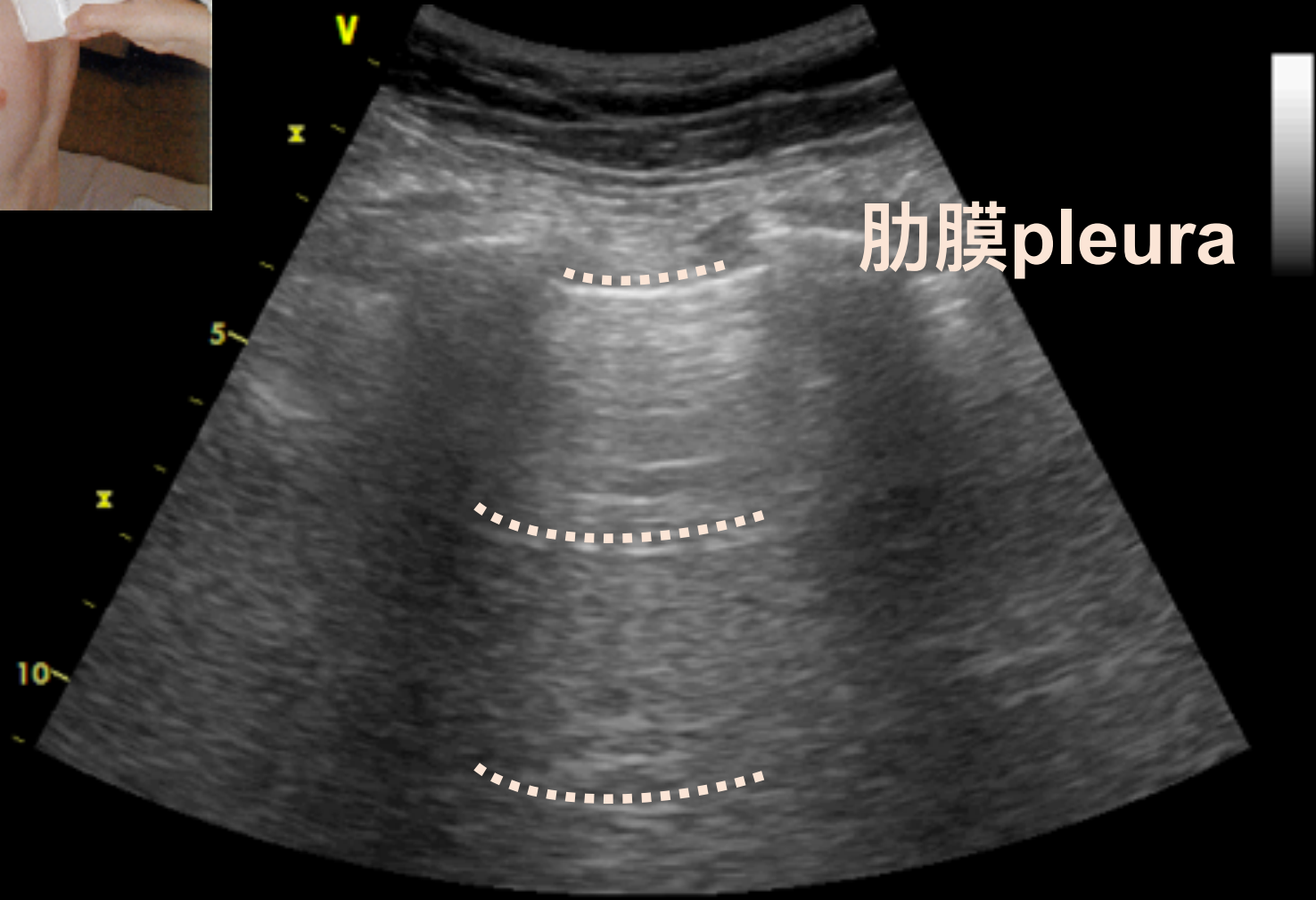
✓氣胸

✓血胸

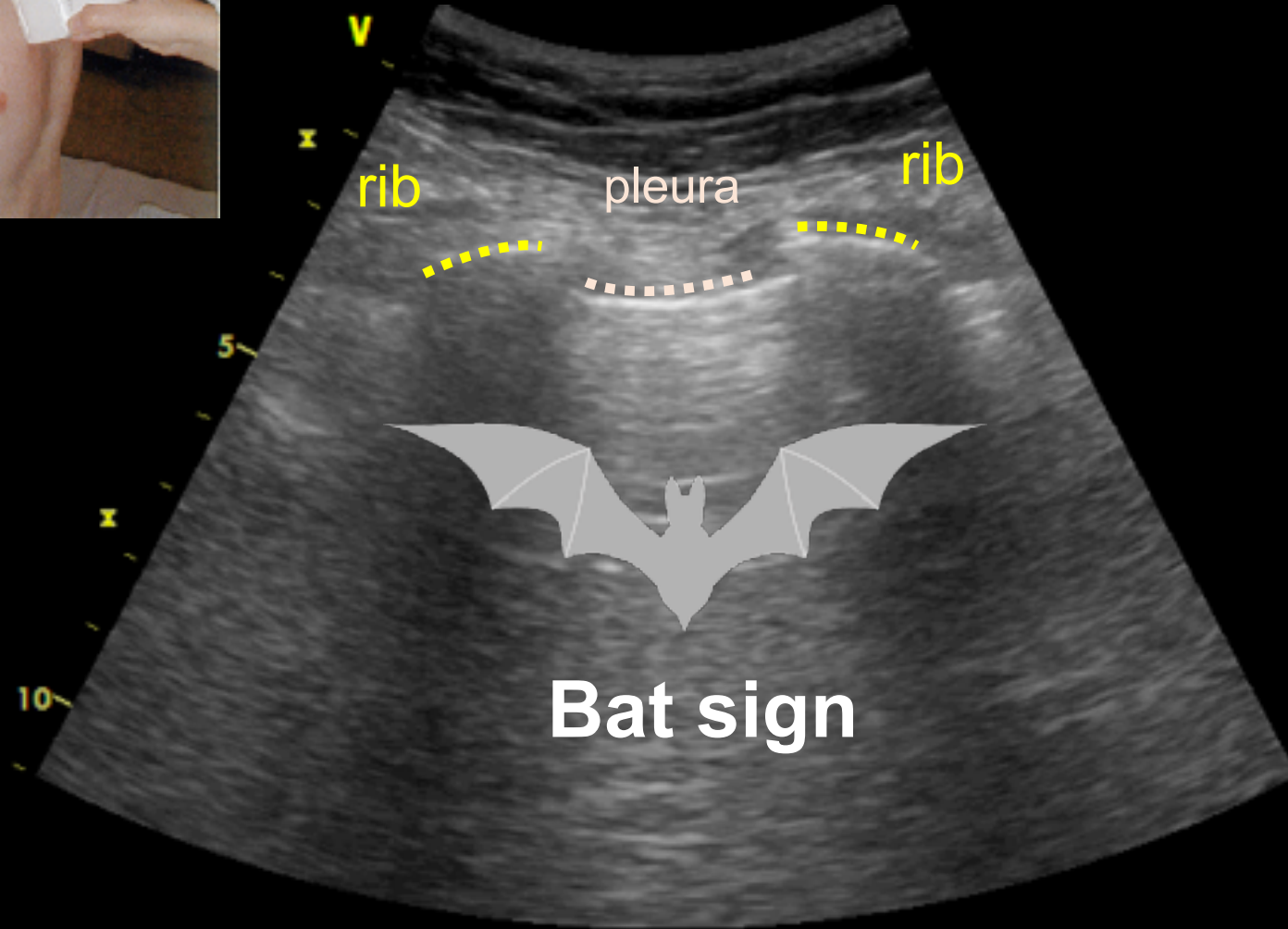








肋膜pleura





Precision

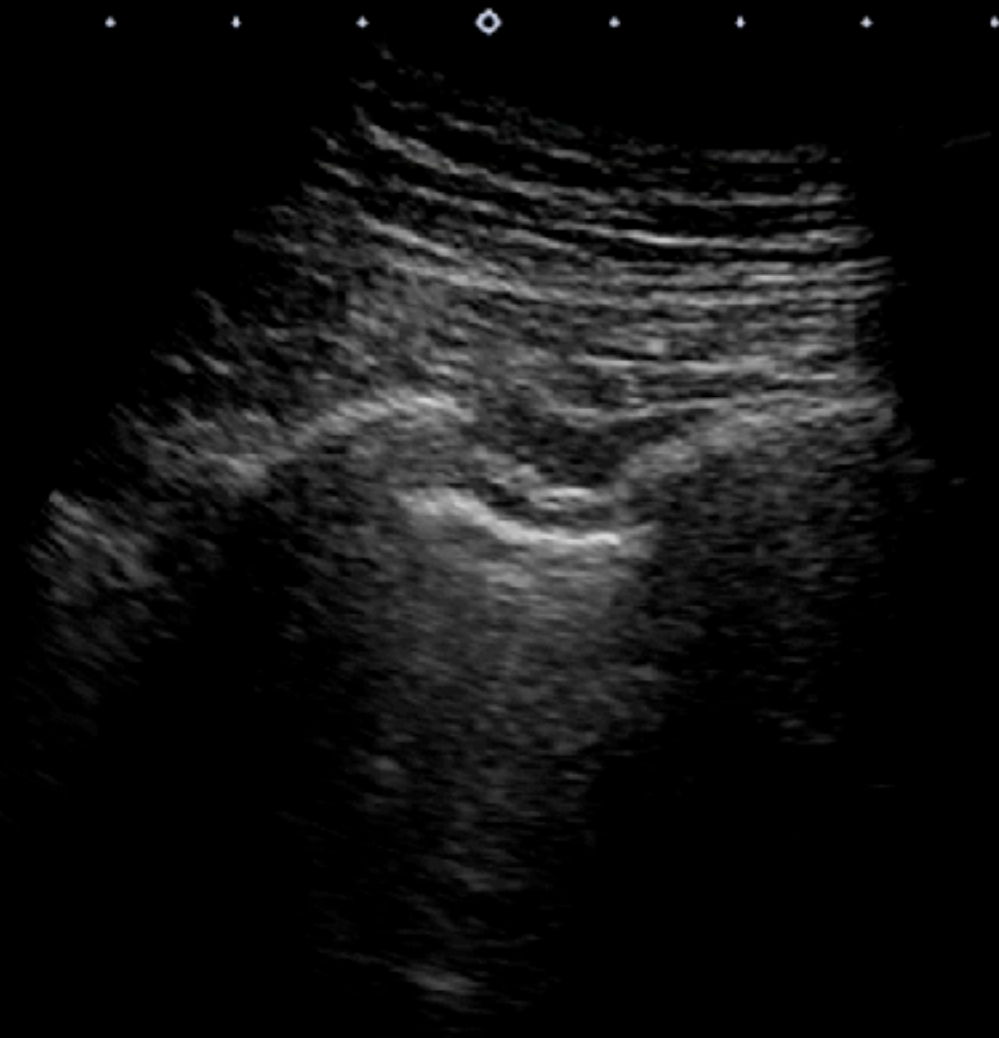
T

0

5

9

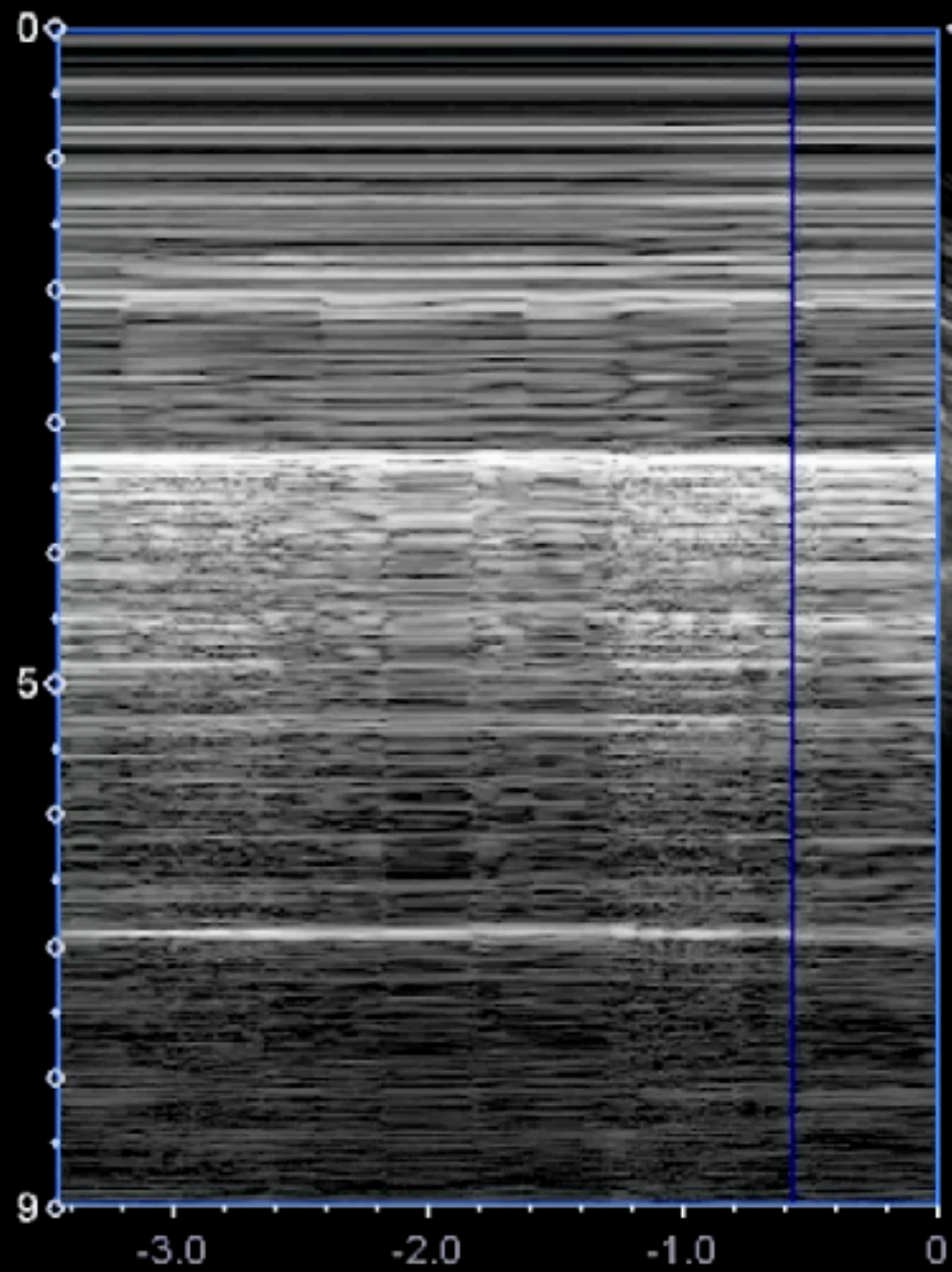
MI
1.5
6C1
T5.0
22 fps
G:69
DR:70
P:1



打開你的 M mode吧～

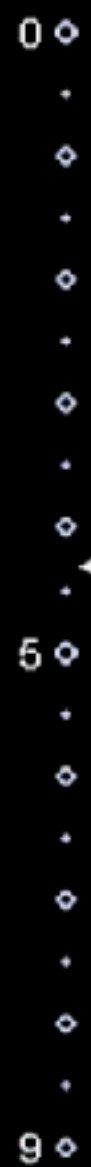


LIKE TO MOVE IT MOVE IT



MG:64 / MDR:55 / T5.0

Precision



MI
1.5
6C1
T5.0
18 fps
G:69
DR:70
P:1

D
C
2

S MB

L LUNG



VCR
L38



63%

MI

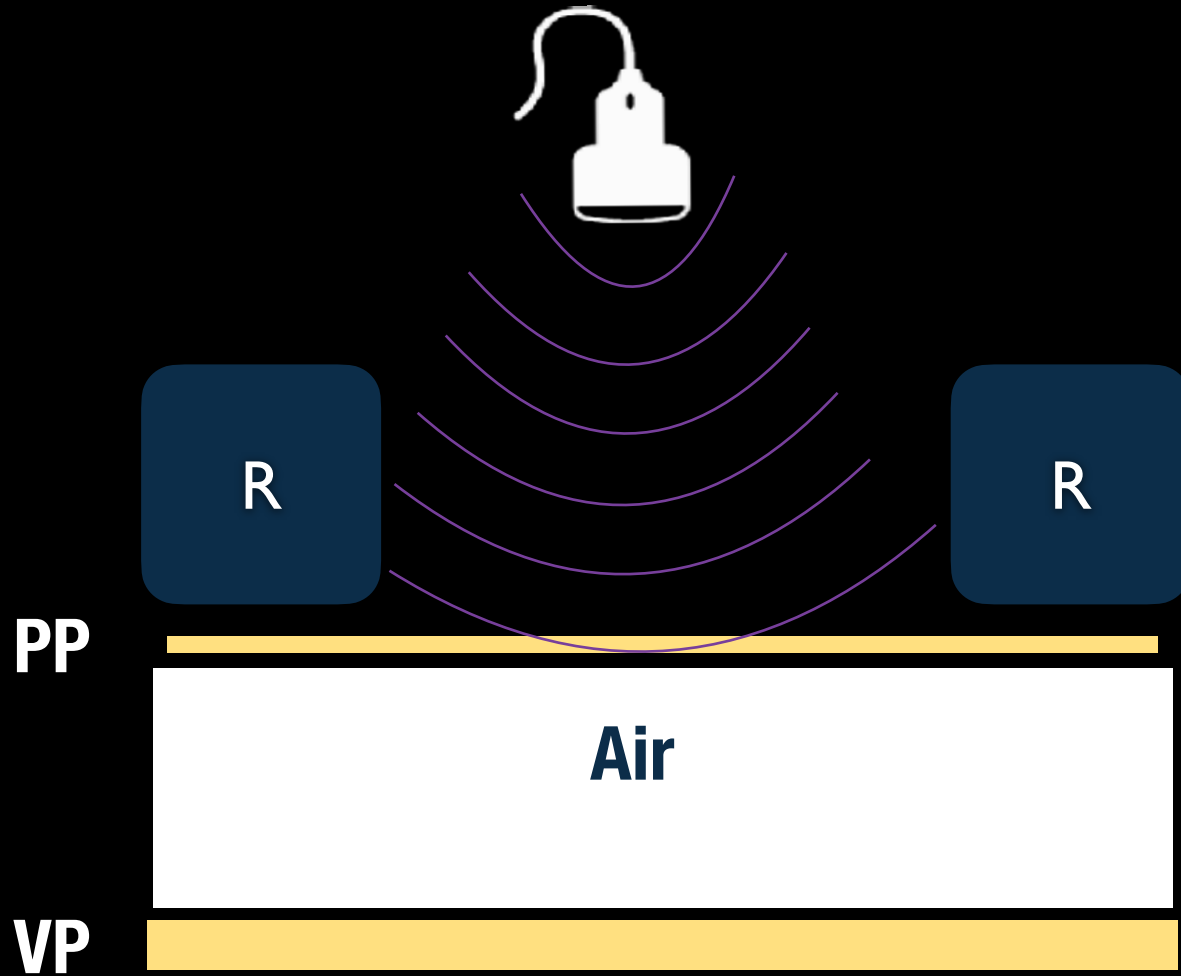
0.9

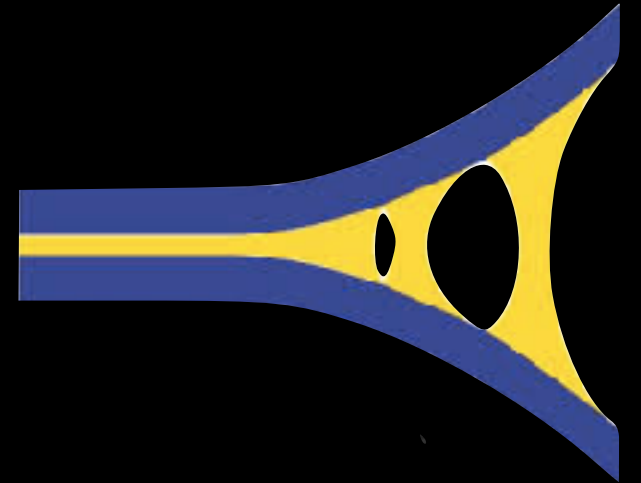
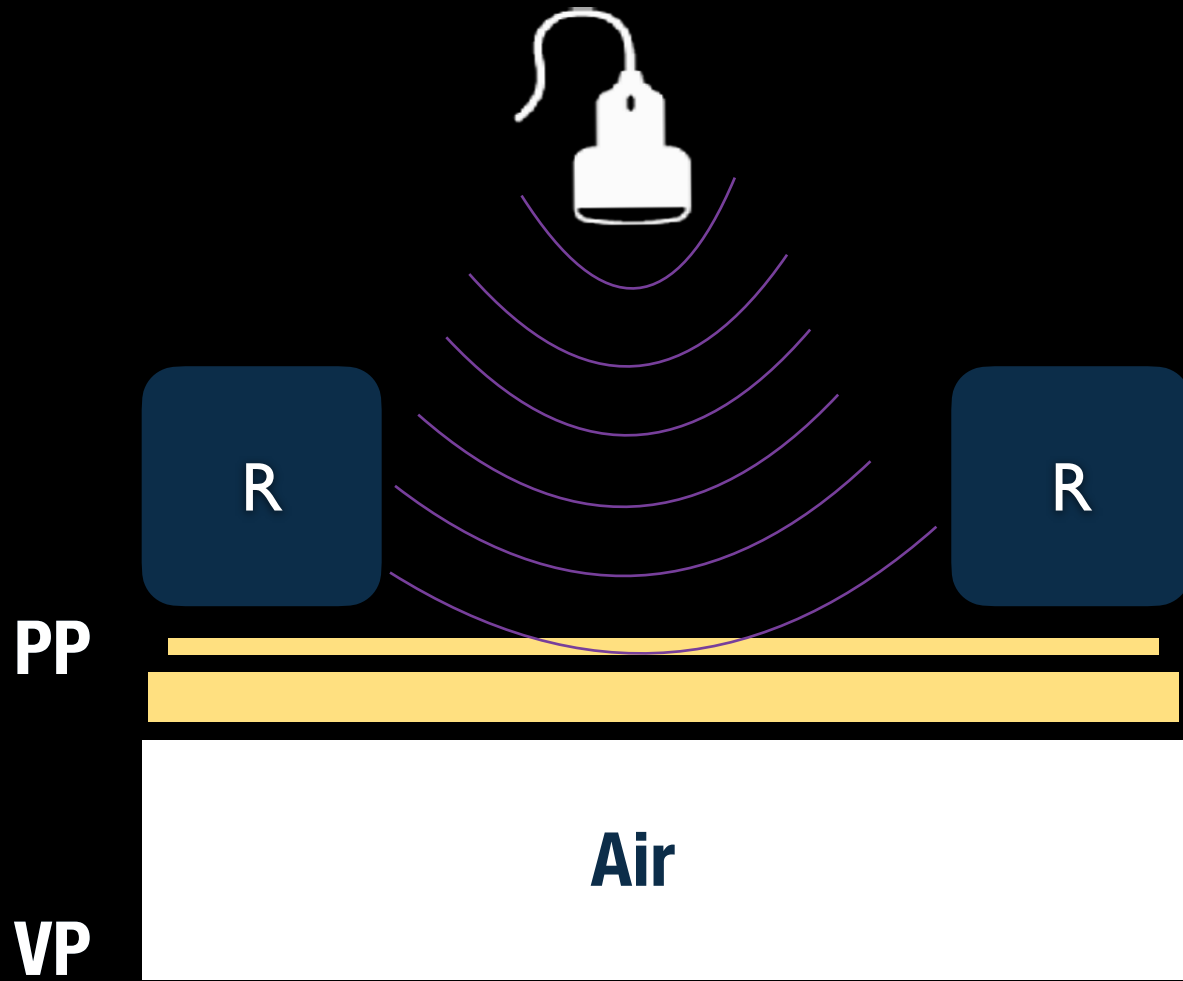
TIS

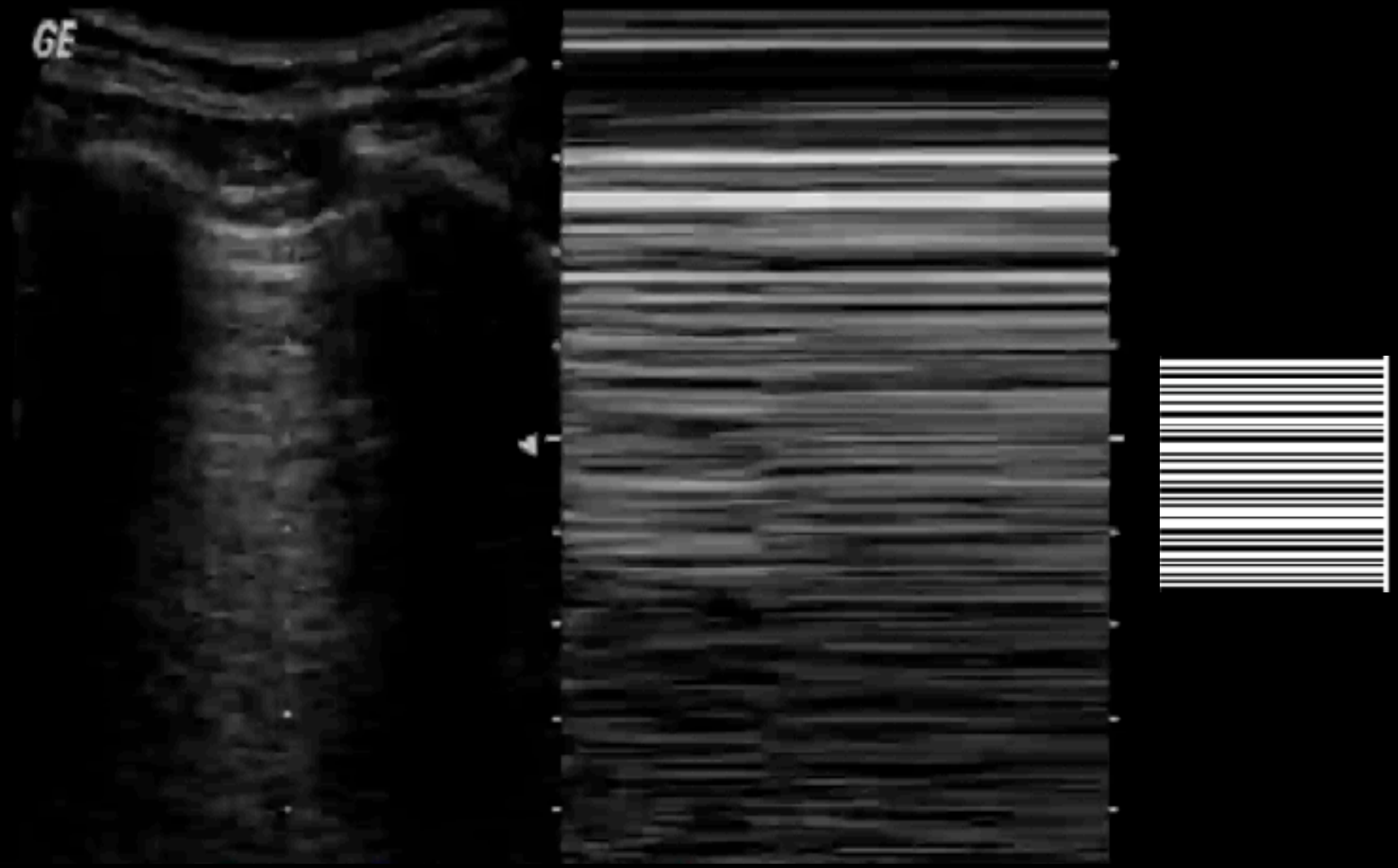
0.2



3.8



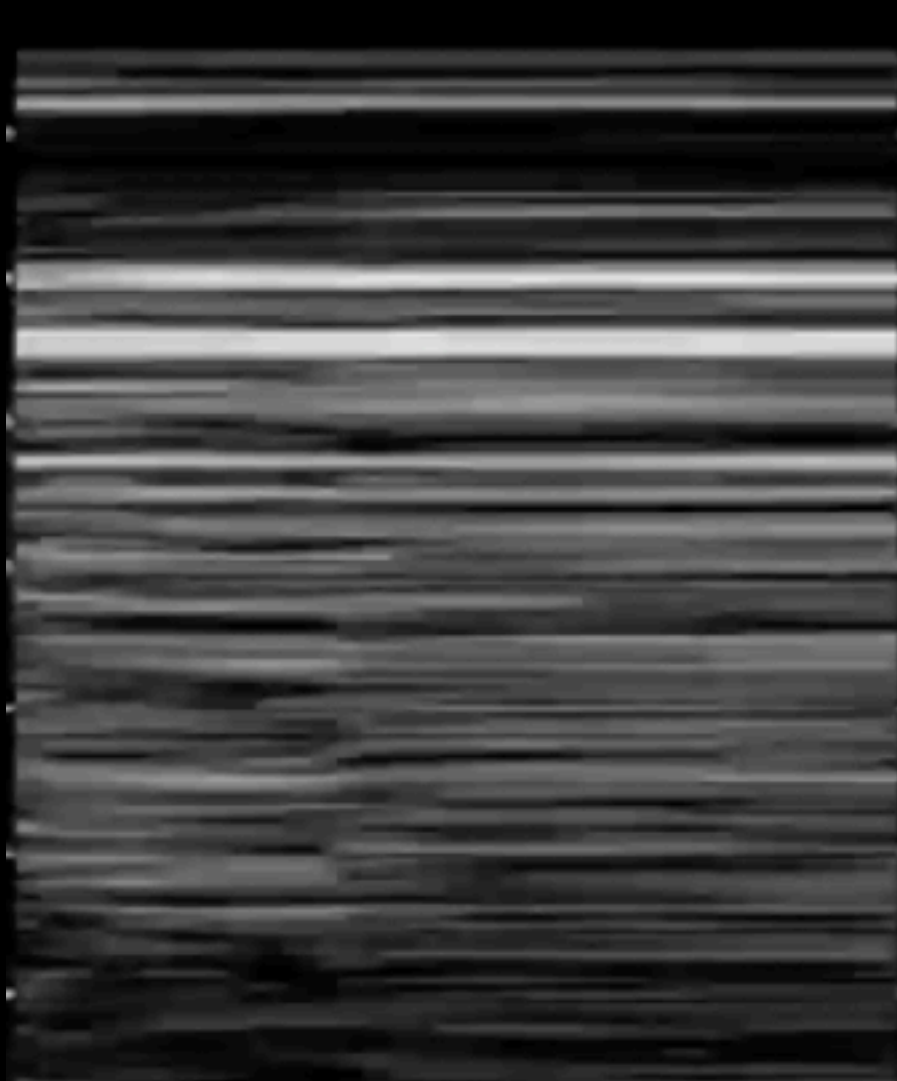




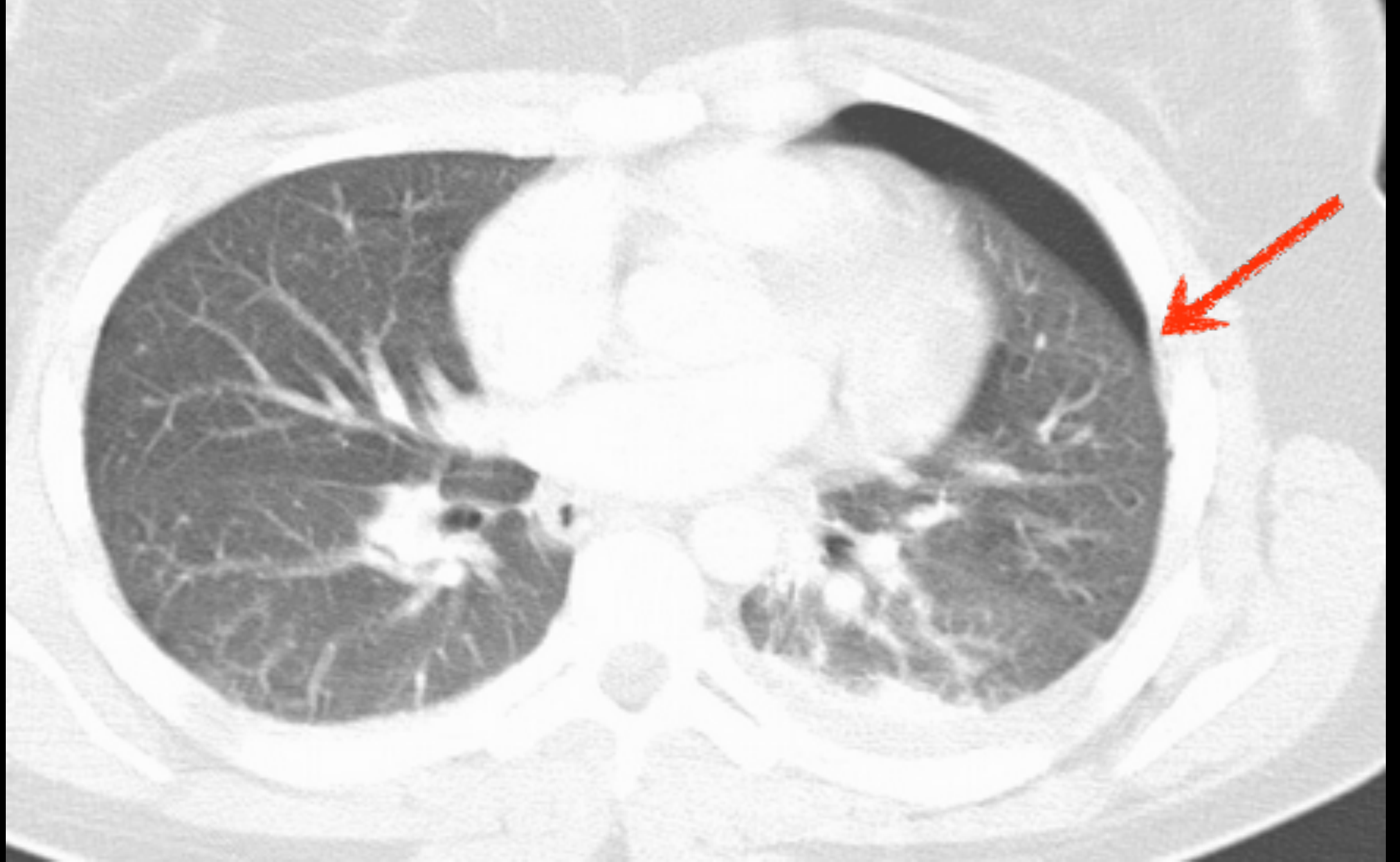
Barcode sign



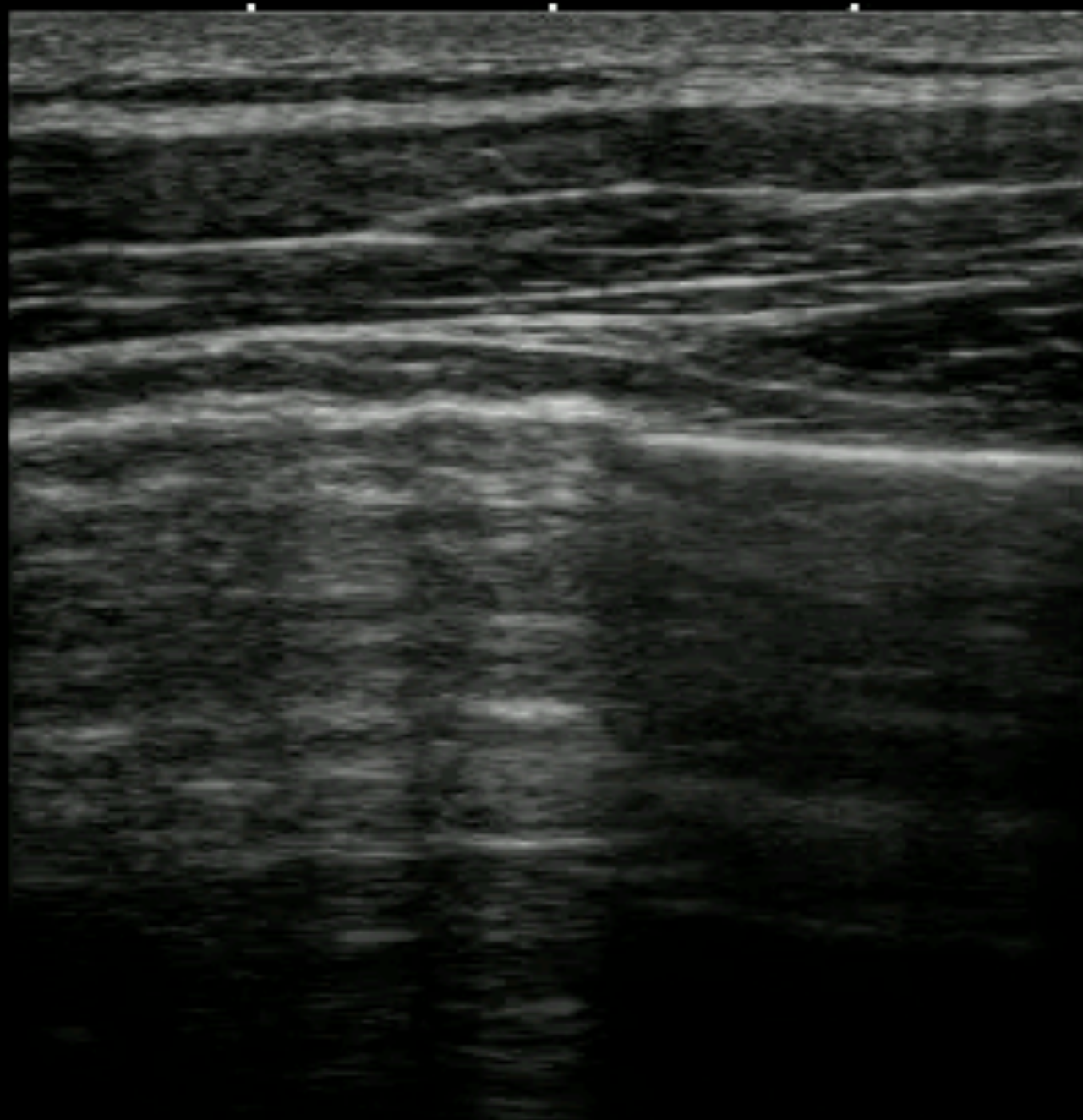
Seashore sign
正常



Barcode sign
氣胸



0 ◆

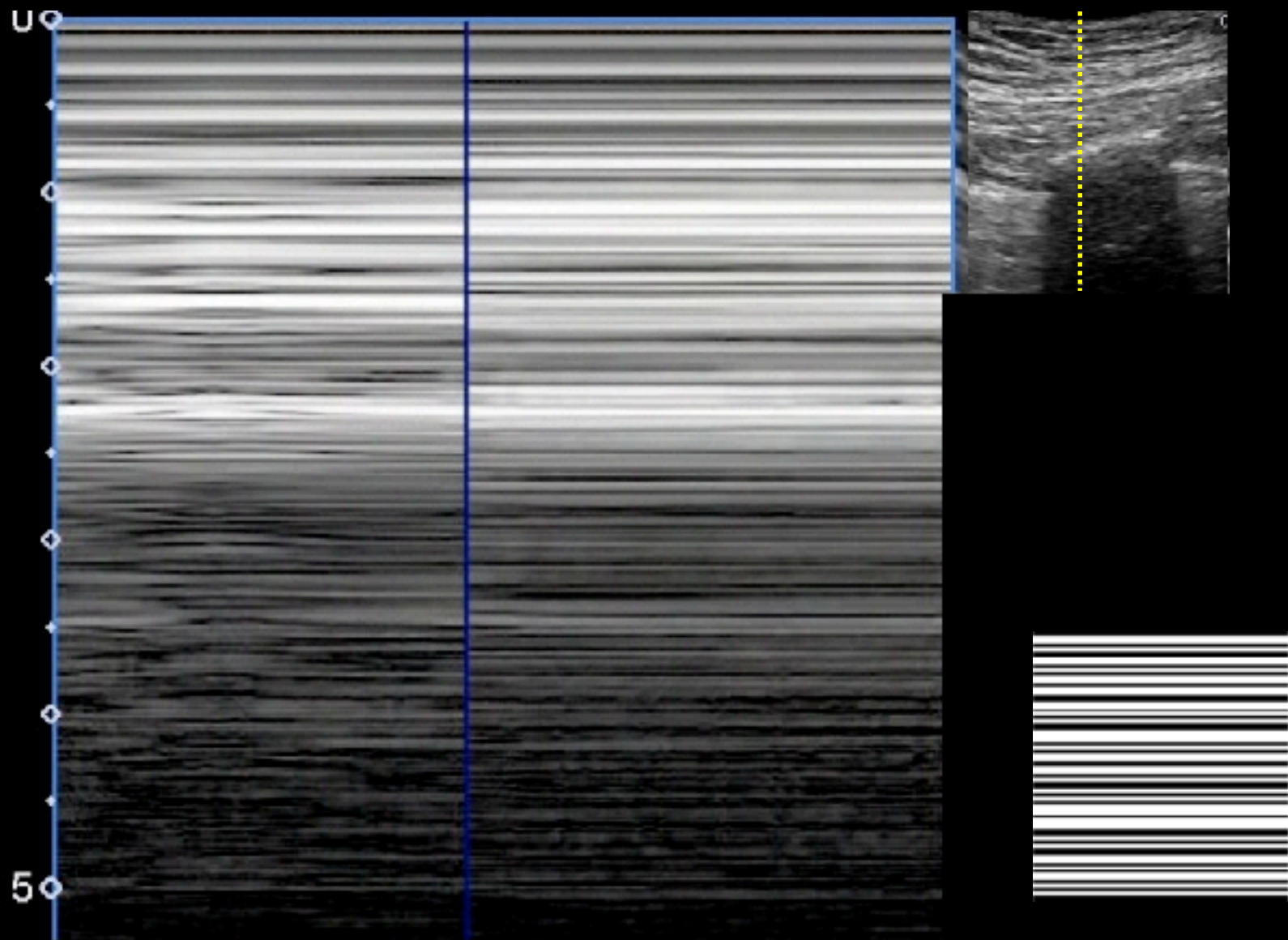


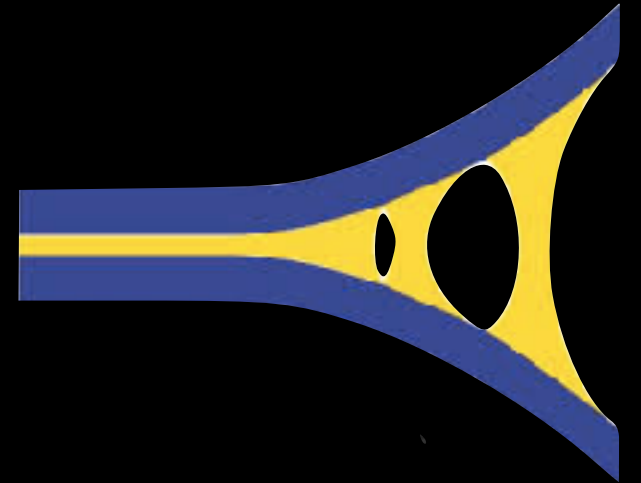
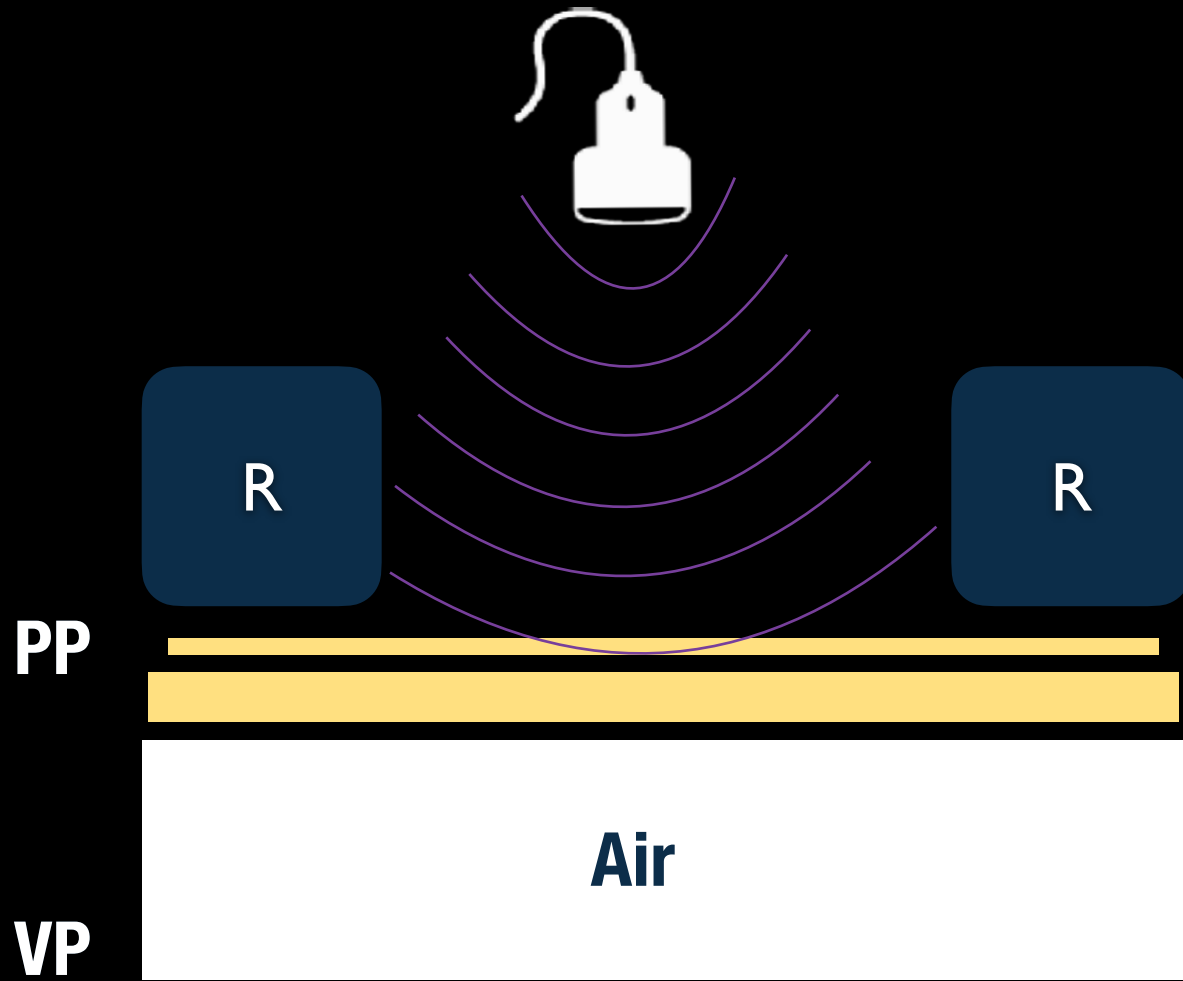
T

P10
14L
14.
32fp
DR6
2D
9

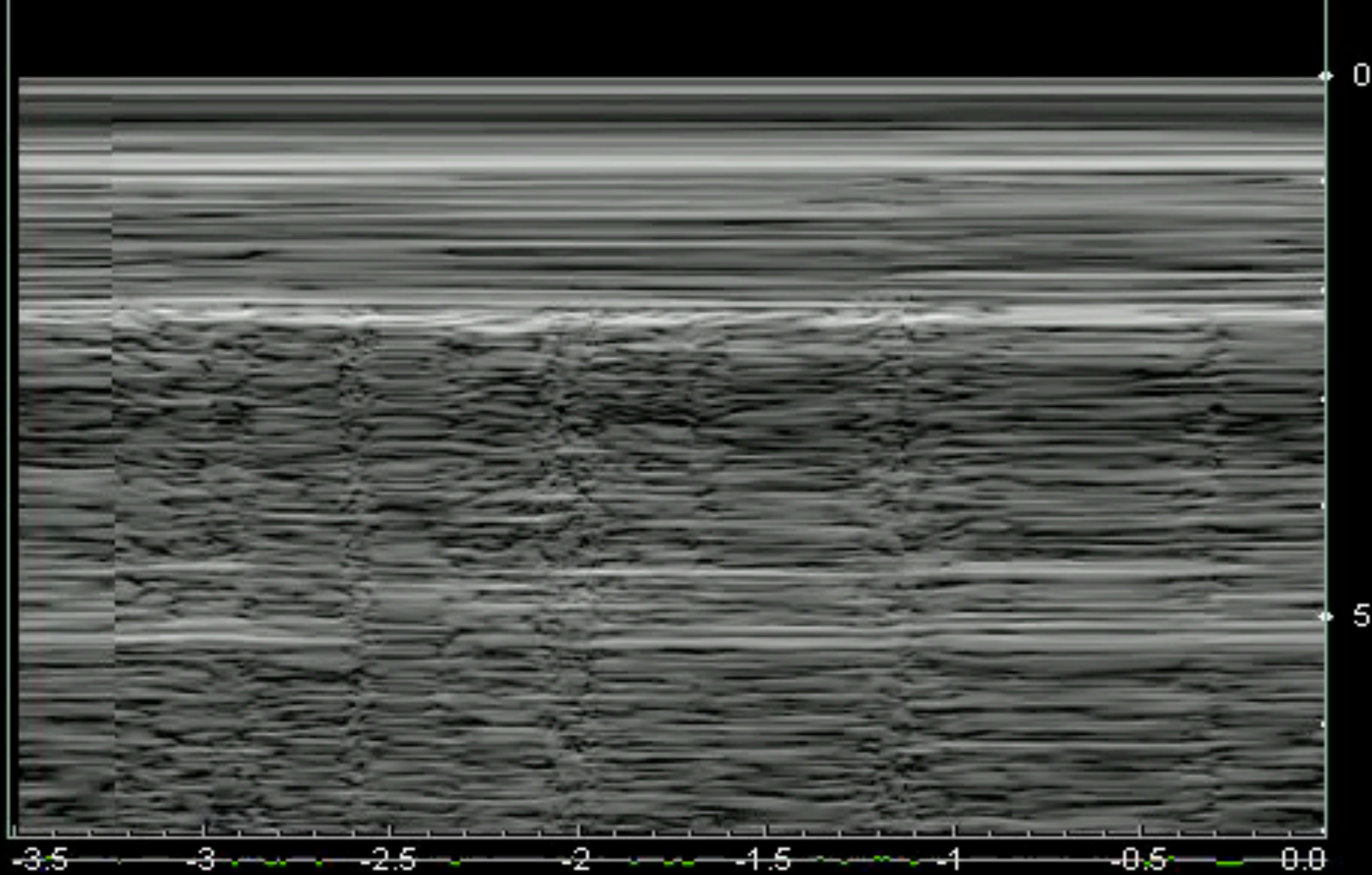
||
.4
S
.1
5

注意: M mode的位置

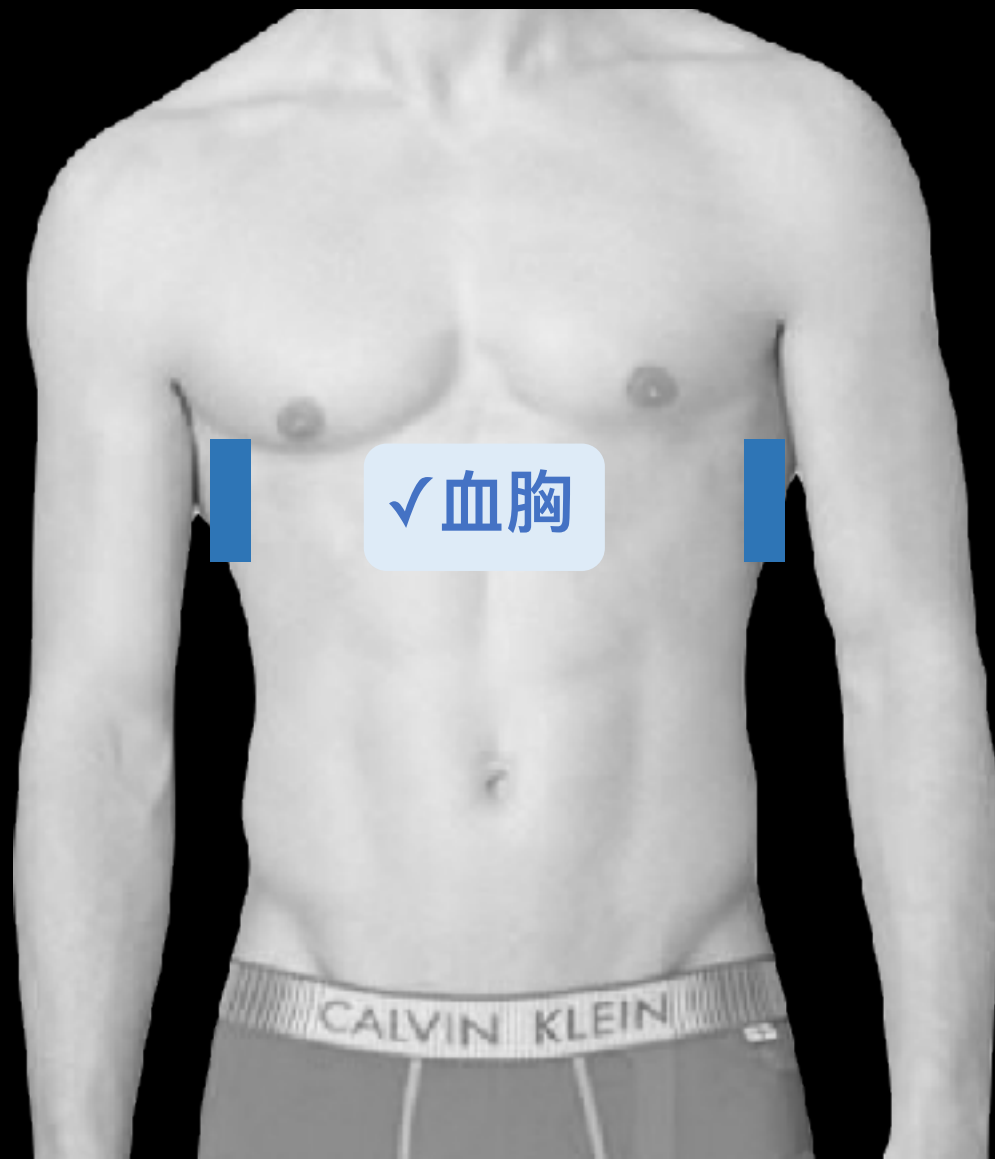




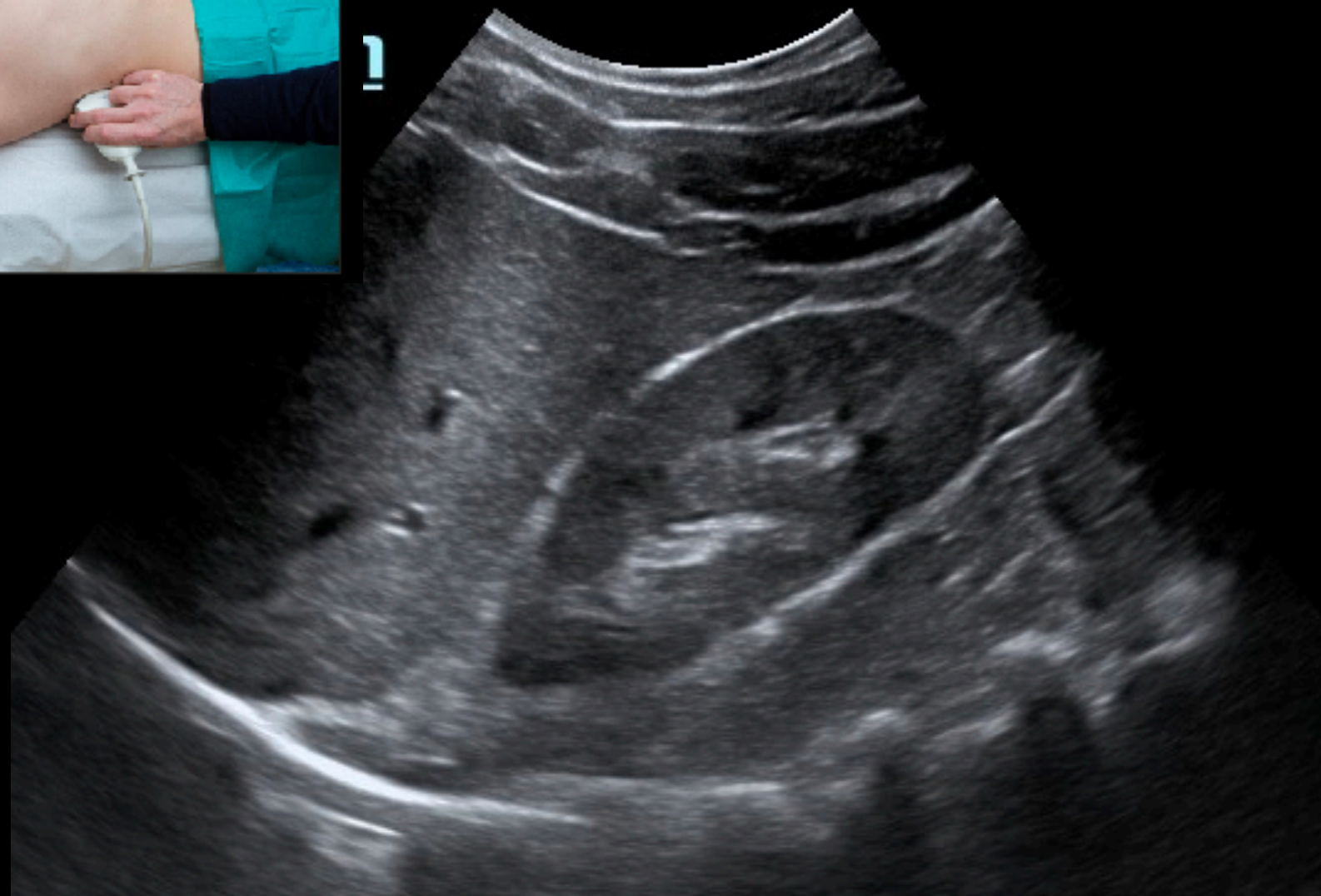
MI
0.7
TIS
0.1
TIB
0.3



肋膜 Pleura



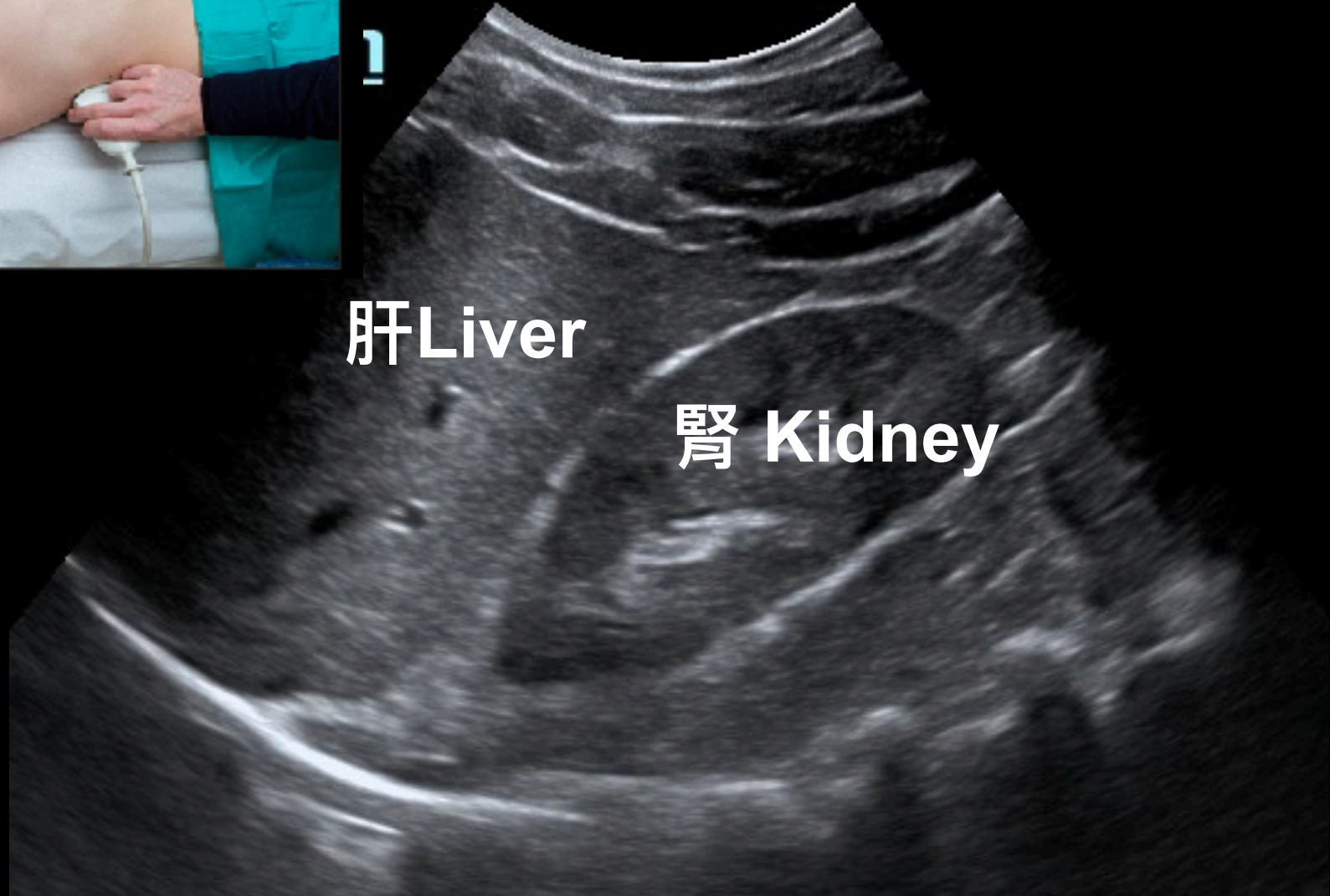
✓ 血胸

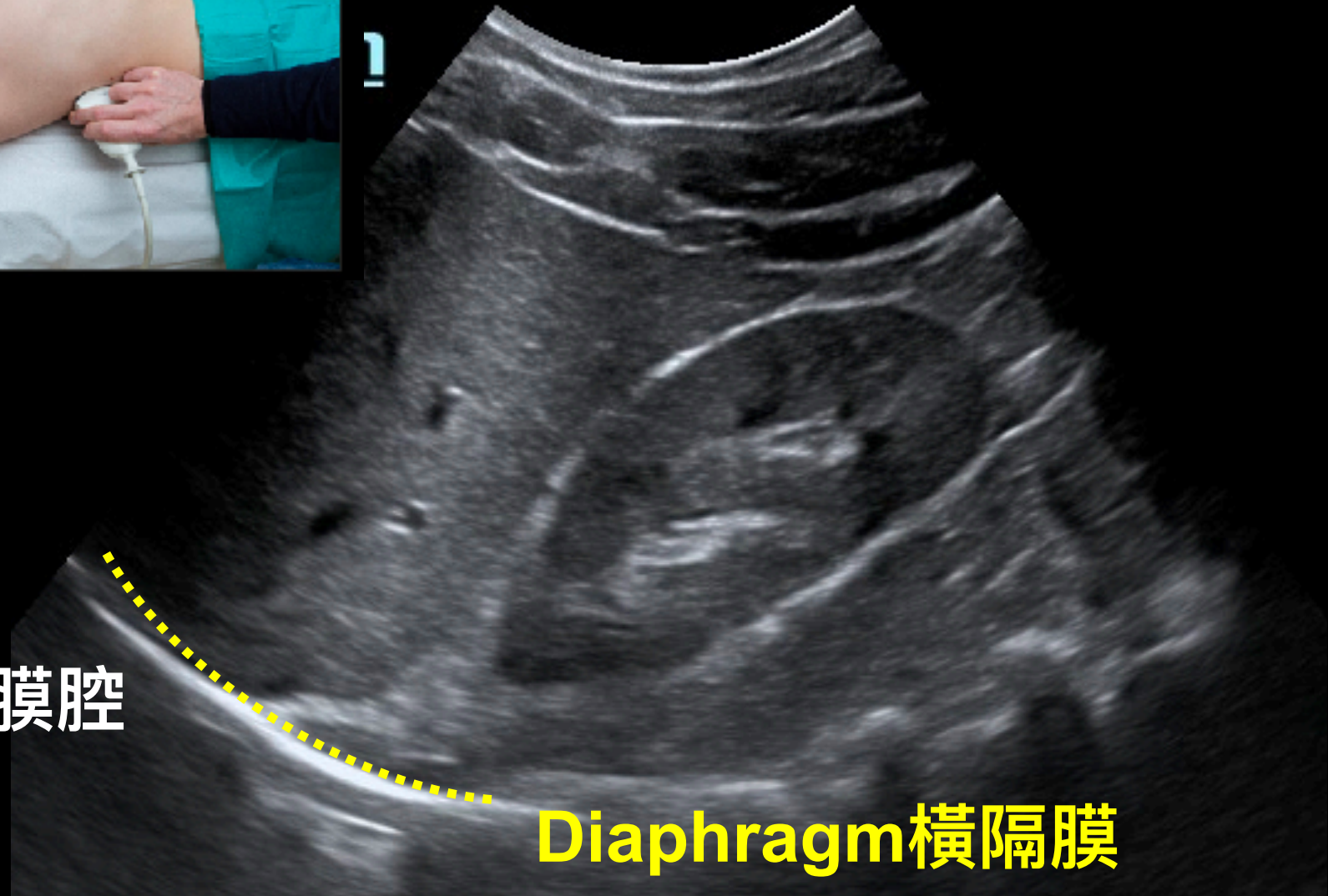




肝 Liver

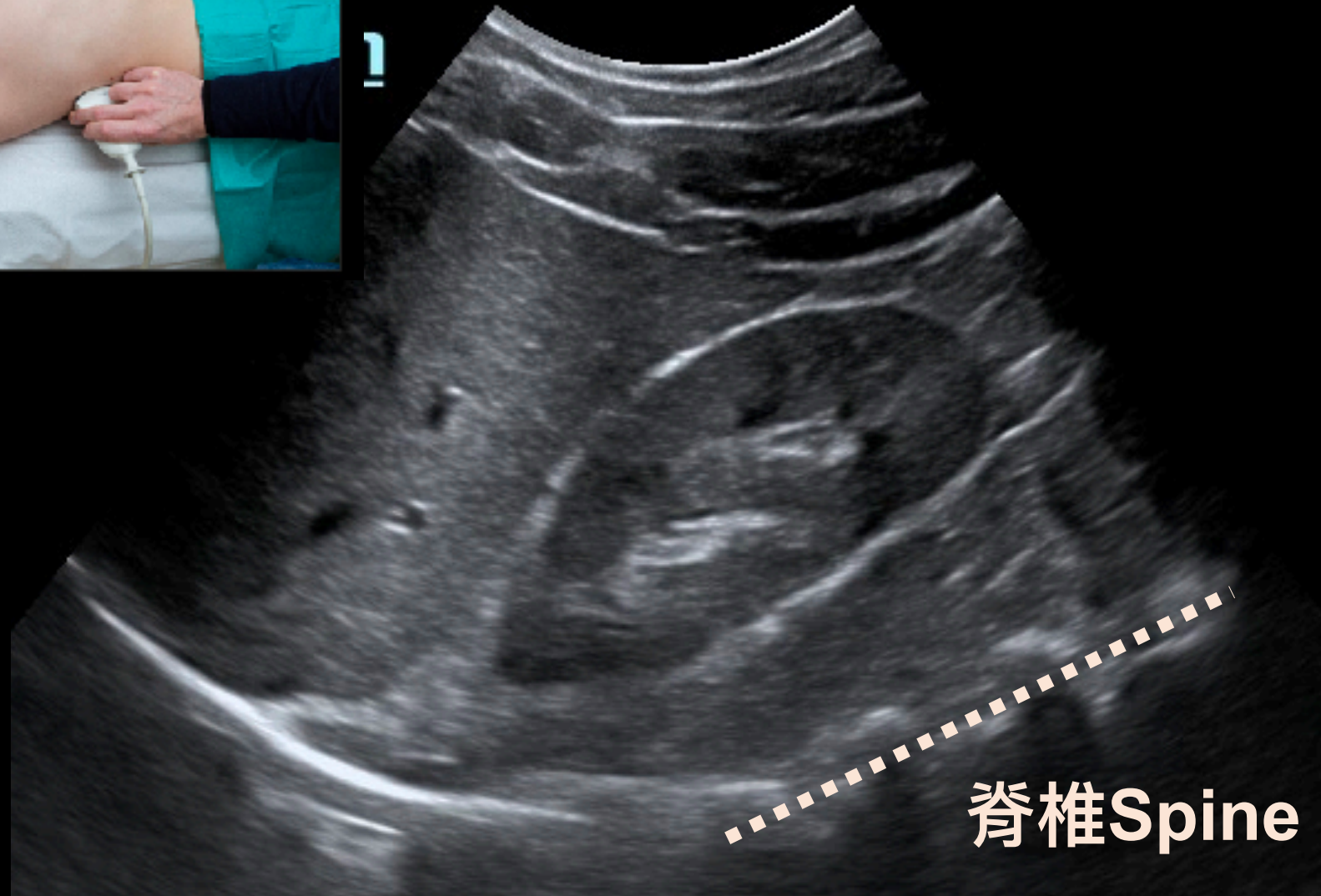
腎 Kidney





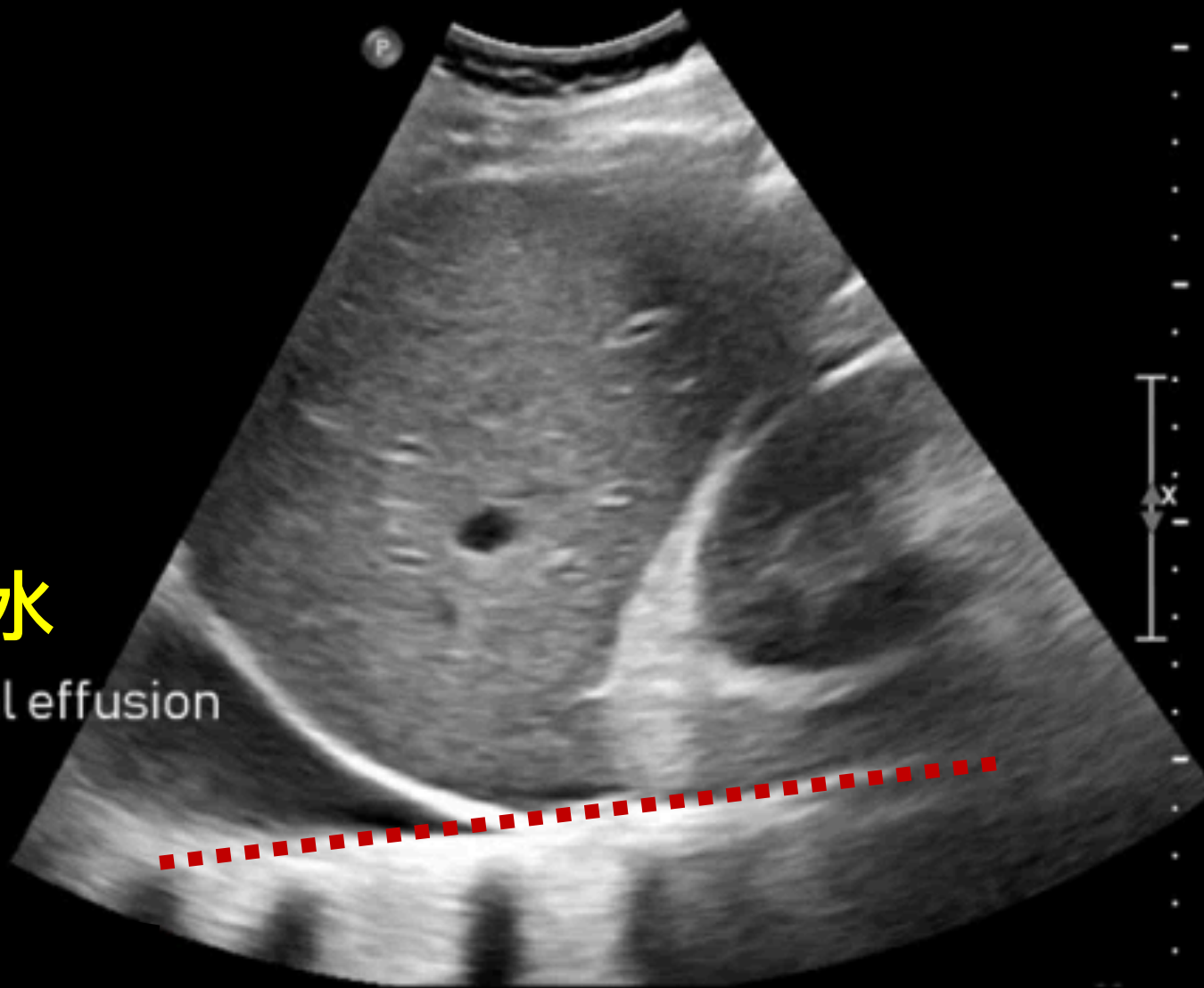
肋膜腔

Diaphragm 横隔膜



脊椎Spine

胸水
Pleural effusion



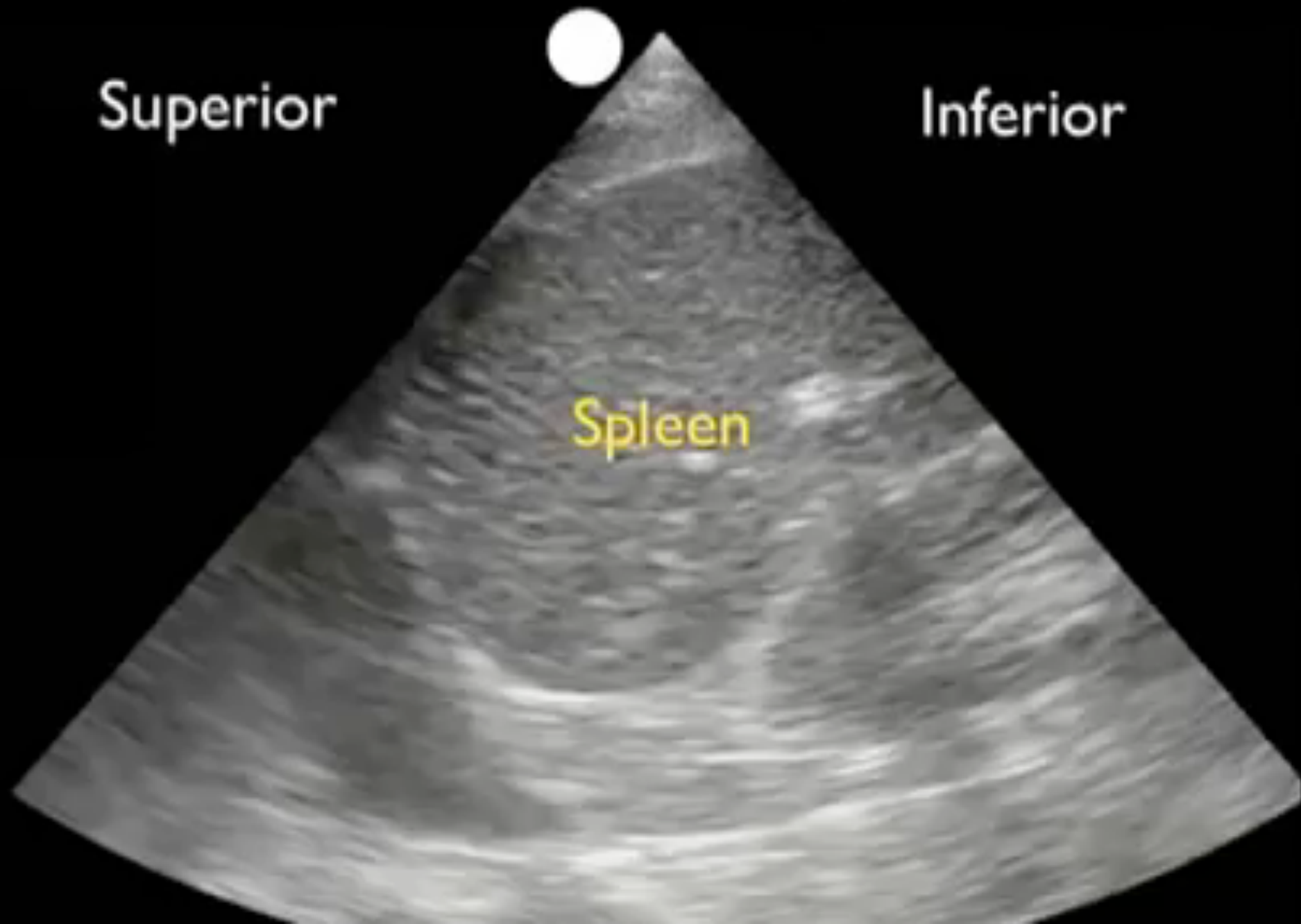
Continuous spine sign

Small Pleural Effusion

Superior

Inferior

Spleen





0
5
10
13



M
1.5
GC
diff 10.0
24 fps
G:97
DR:65
A:4
P:1

PHILIPS

MI 1.2

TIS 0.5

Cardiac
S4-2
30Hz
18.0cm

2D

HGen
Gn 57
50
4/2/0
75 mm/s



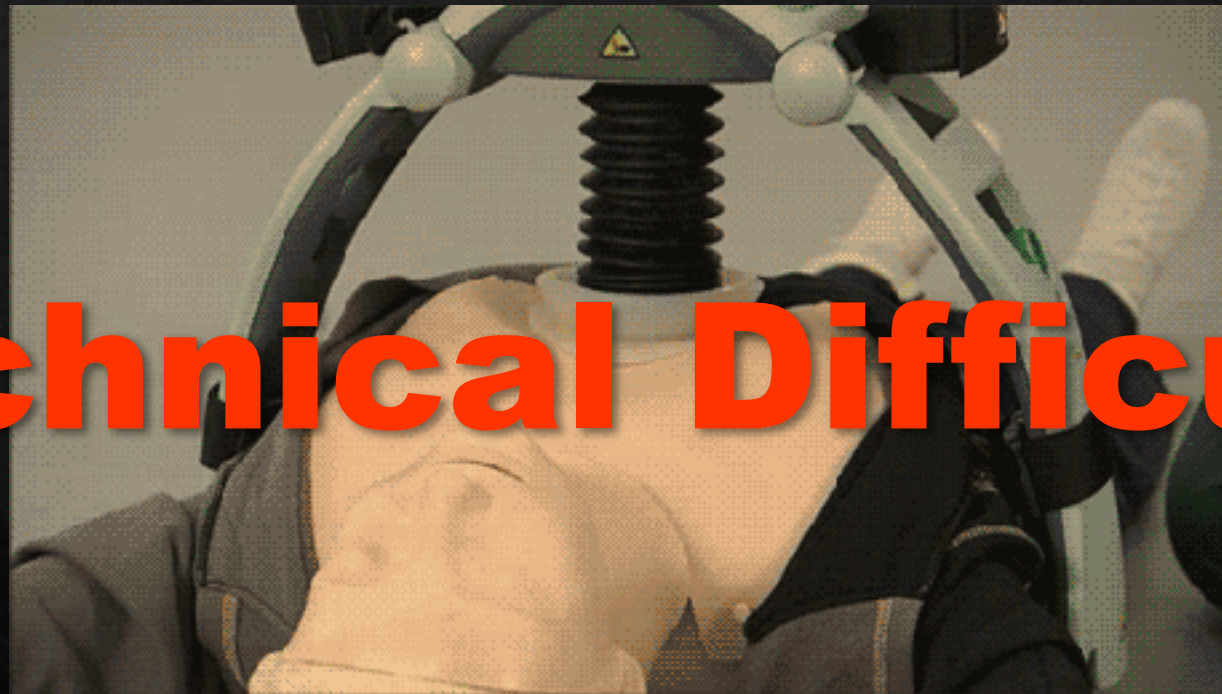
ⓐ
P △ R
1.6 3.2

POCUS 在急救

壞處？

TTE during CPR

Technical Difficulty



TEE → Shorter Pauses

| | Mean Pause Duration (s) |
|---------|-------------------------|
| TTE | 19 |
| TEE | 9 |
| No echo | 11 |

139 CPR Pauses for Analysis

31 (22%) TTE

42 (30%) TEE

66 (47%) Palpation

+8 (95%CI 4~11)

-2 (95%CI -6~2)

TEE ≤ No echo < TTE

超音波??



增加

CPR暫停 !!



Contents lists available at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



Clinical paper

Introduction of paramedic led Echo in Life Support into the pre-hospital environment: The PUCA study[☆]

Matthew J. Reed^{a,b,c}, Louise Gibson^a, Alistair Dewar^{a,b}, Steven Short^b, Polly Black^a,

2016



Contents lists available at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



Clinical paper

Ultrasound use during cardiopulmonary resuscitation is associated with delays in chest compressions

Jelte A. Huis in 't Veld^a, Michael G. Allison^b, David S. Bostick^a, Kiandra R. Fisher^c, Olga G. Golubeva^d,

2017



Contents lists available at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



Short paper

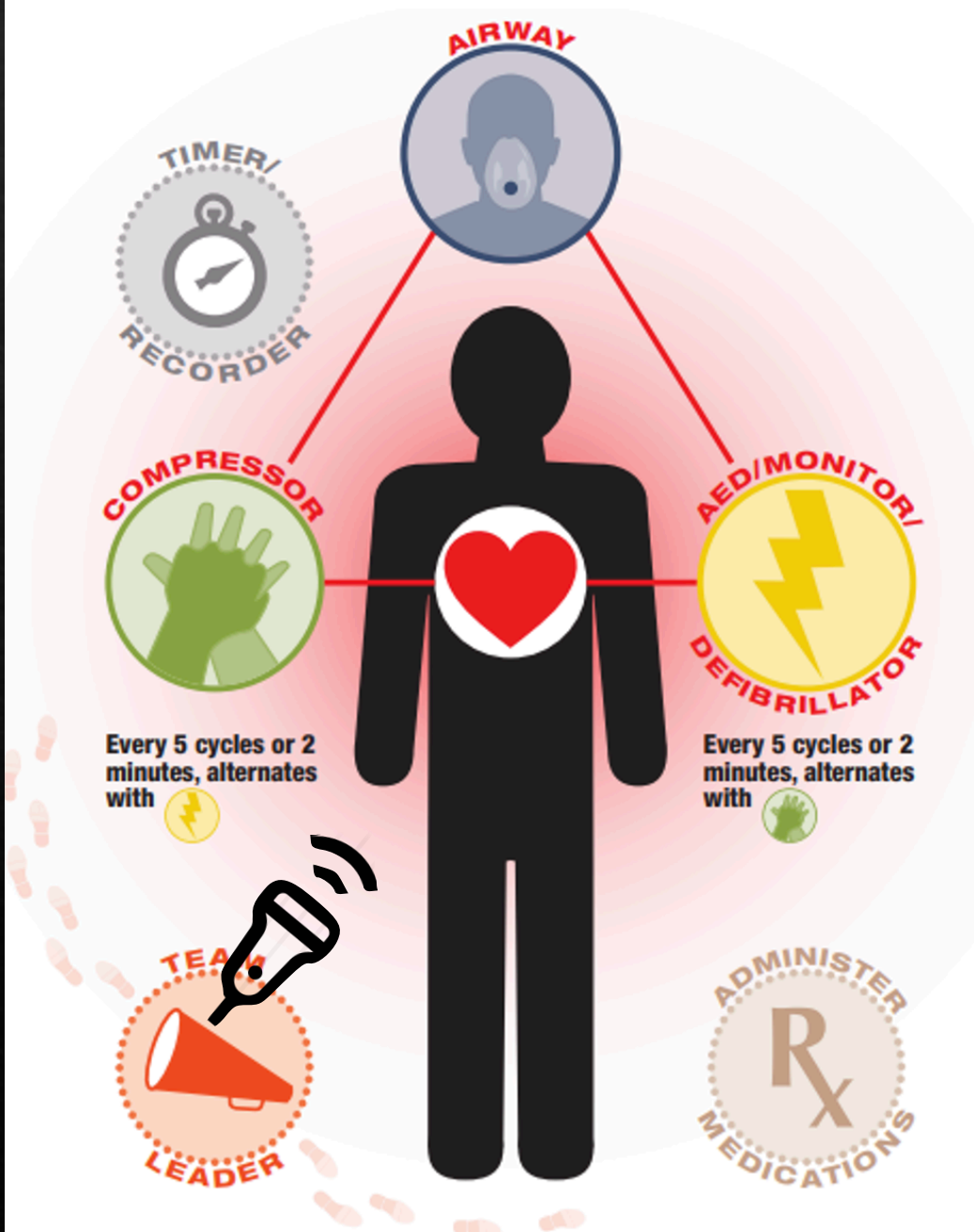
Point-of-care ultrasound use in patients with cardiac arrest is associated prolonged cardiopulmonary resuscitation pauses: A prospective cohort study

Eben J Clattenburg^{a,*}, Peter Wroe^a, Stephen Brown^b, Kevin Gardner^a, Lia Losonczy^a,
Amandeen Singh^a, Ann Mardorai^{a,b}

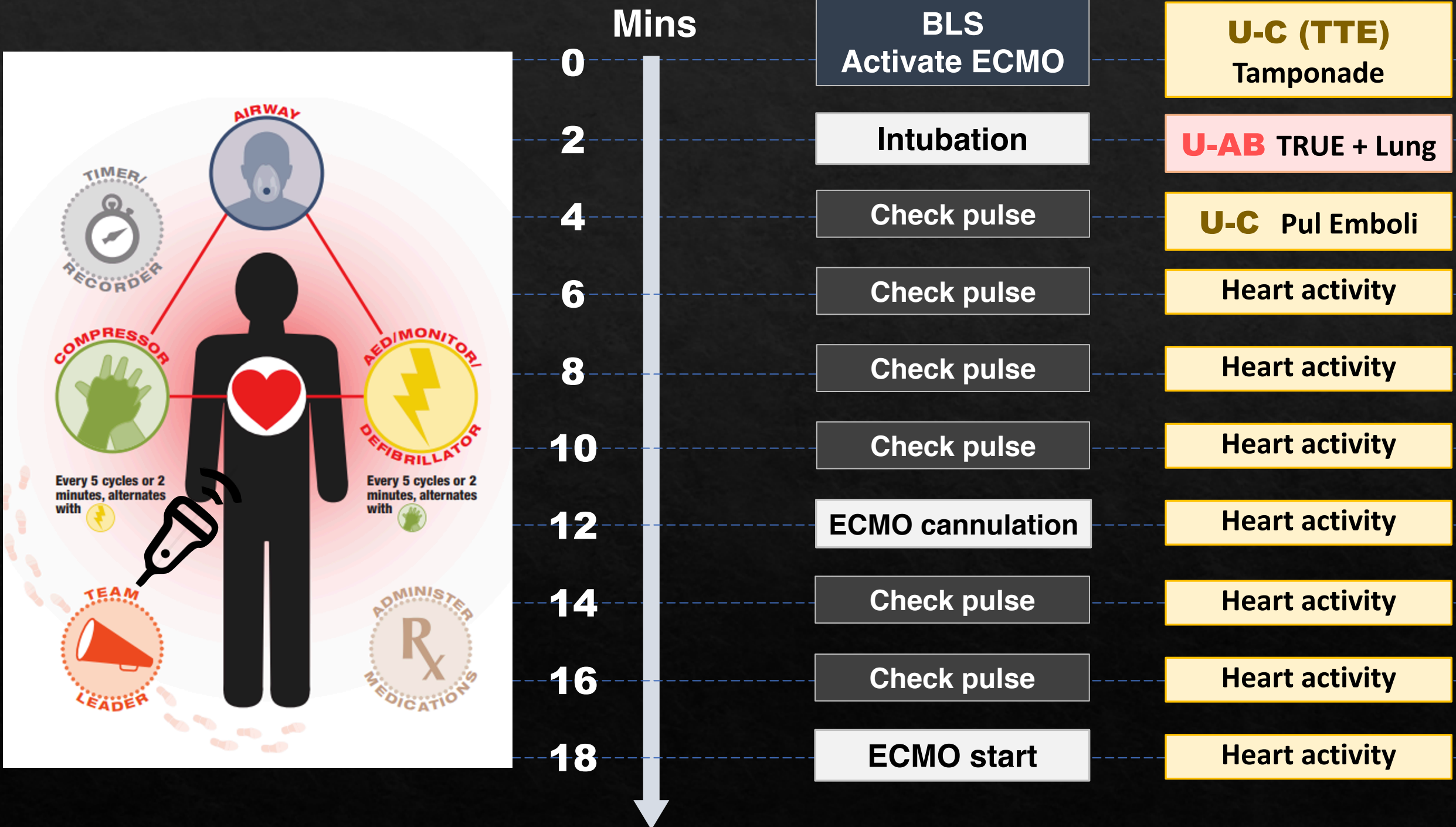
2018

有沒有刻意訓練？

快 **3.1** 秒



| Duration of Pulse Checks with POCUS (sec) | Pre | Post |
|---|------|------|
| | 19.8 | 15.8 |



Mins

0
2
4
6
8
10
12
14
16
18

BLS
Activate ECMO

U-C (TTE)
Tamponade

Intubation

U-AB TRUE + Lung

Check pulse

U-C Pul Emboli

Check pulse

Heart activity

Check pulse

Heart activity

Check pulse

Heart activity

ECMO cannulation

Heart activity

Check pulse

Heart activity

Check pulse

Heart activity

ECMO start

Heart activity

