

POCUS for ECD & SGB

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POCUSacademy.com



Find CCA

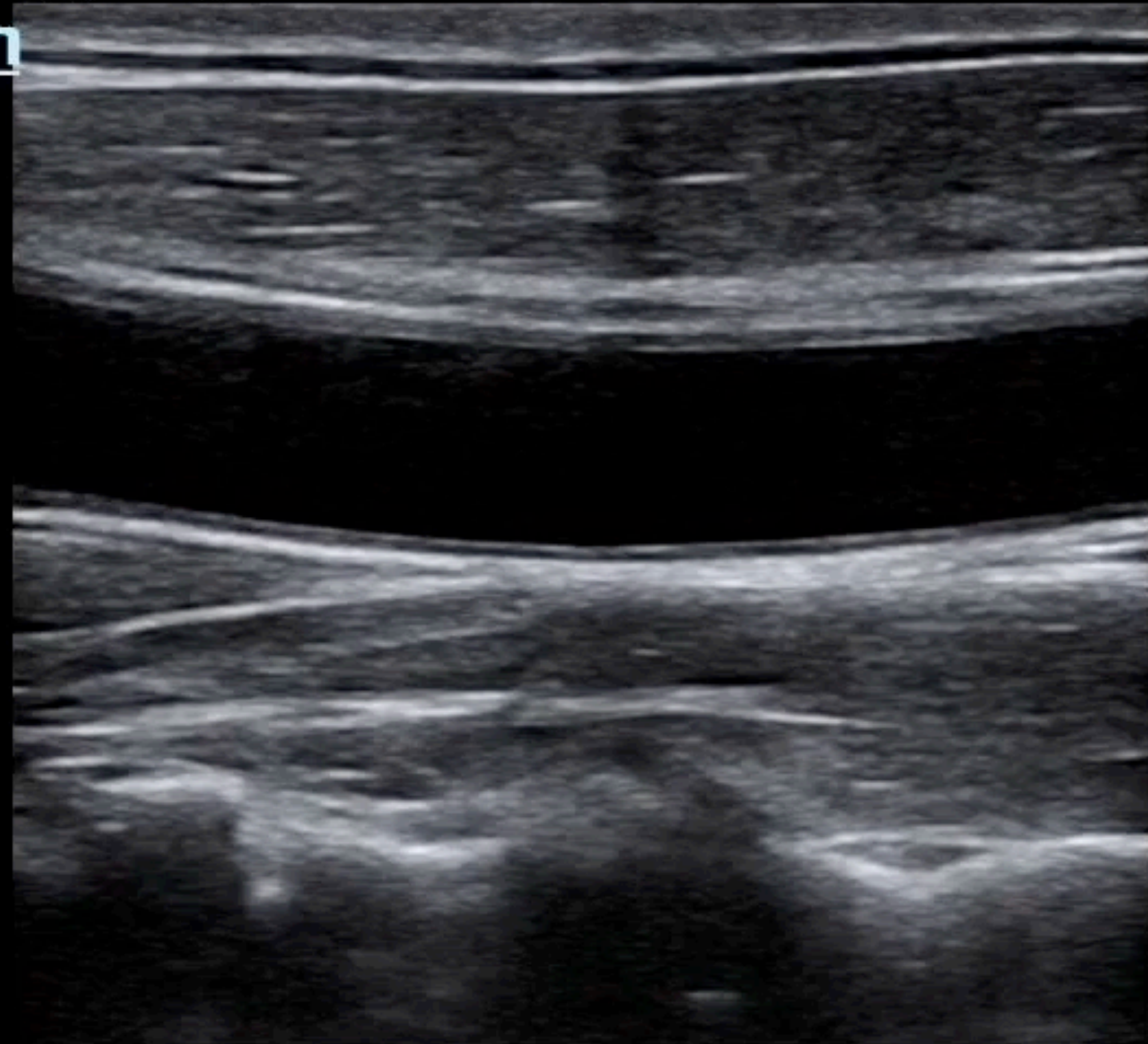
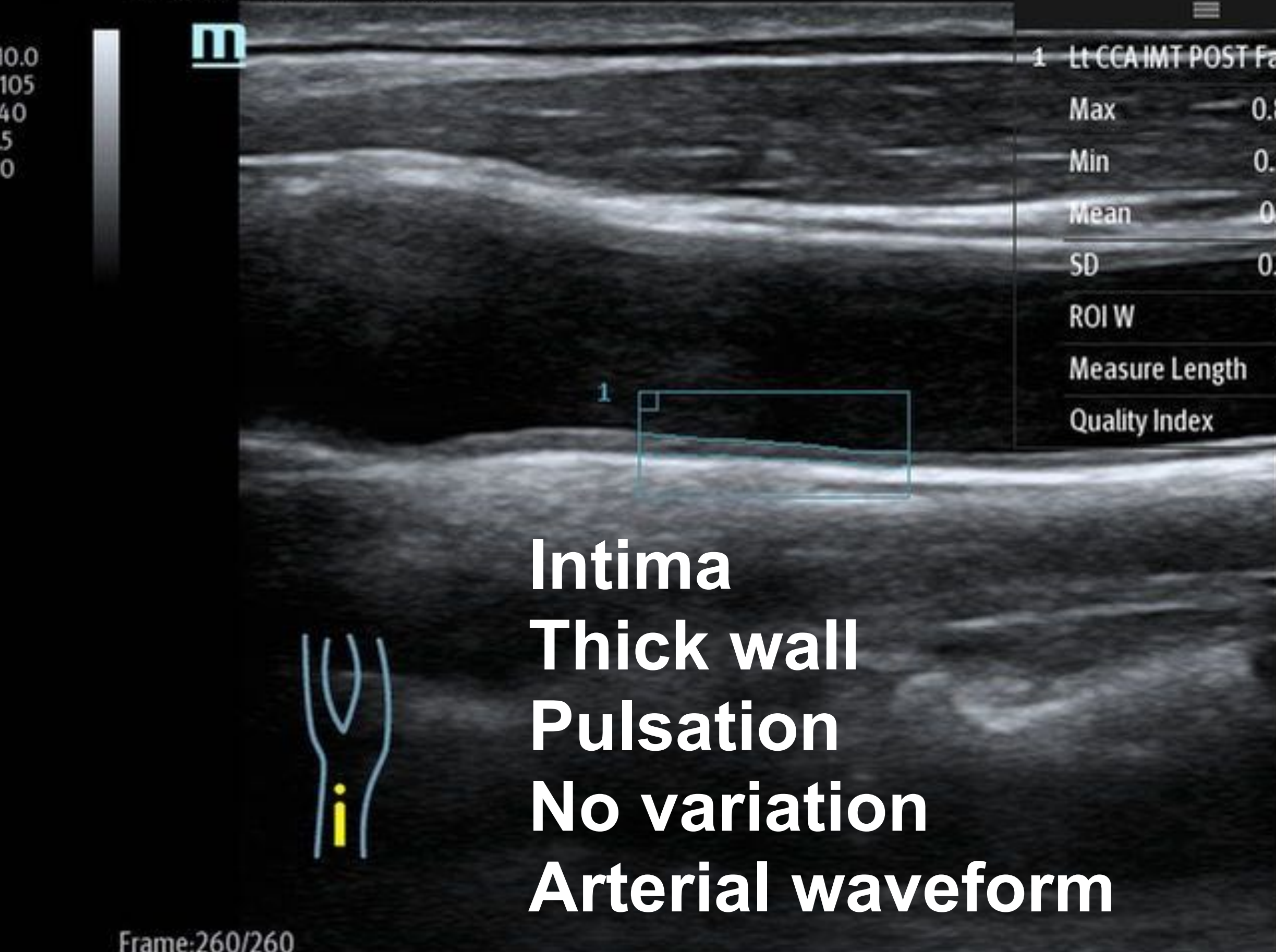
7 ACE

CHEN 24-11-2022
13556011 Carotid 15:36:20

13556011 23-11-2022
Carotid 14:09:50

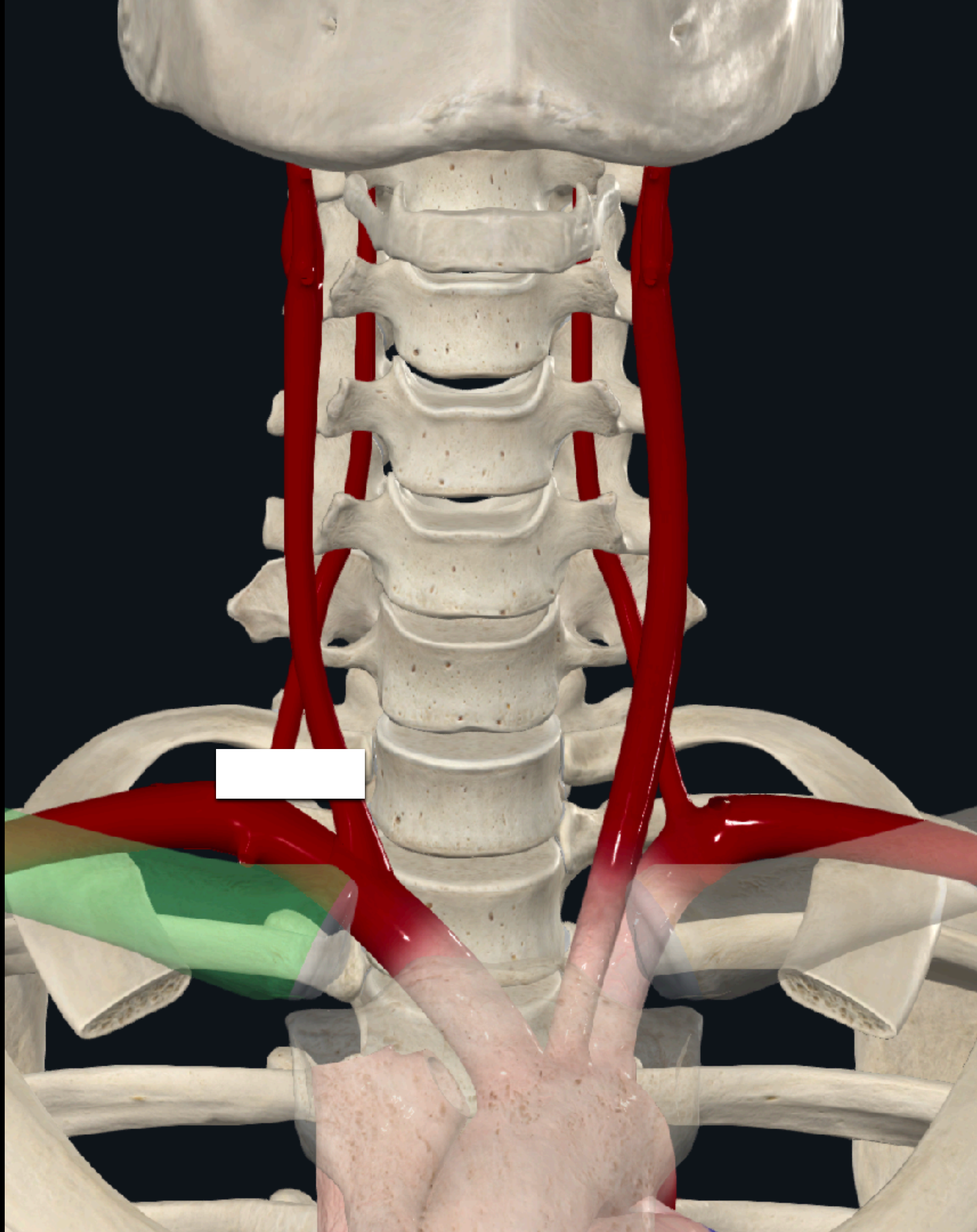
L12-4s AP 96.6% MI135 TIS 0.2

AP 96.6% MI135 TIS 0.2

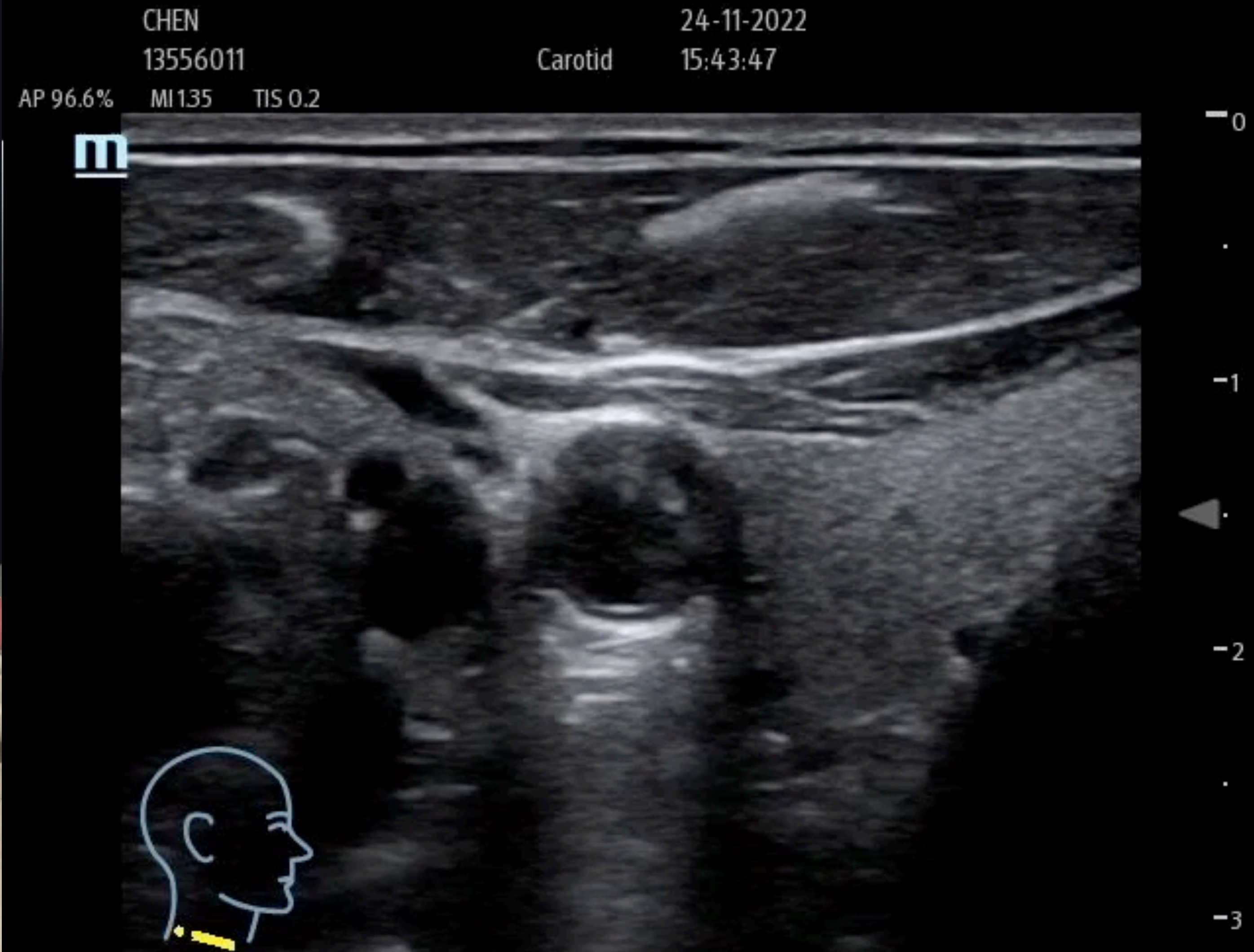


Intima
Thick wall
Pulsation
No variation
Arterial waveform





Preset: carotid
Probe: linear
Position: transverse on medial clavicle

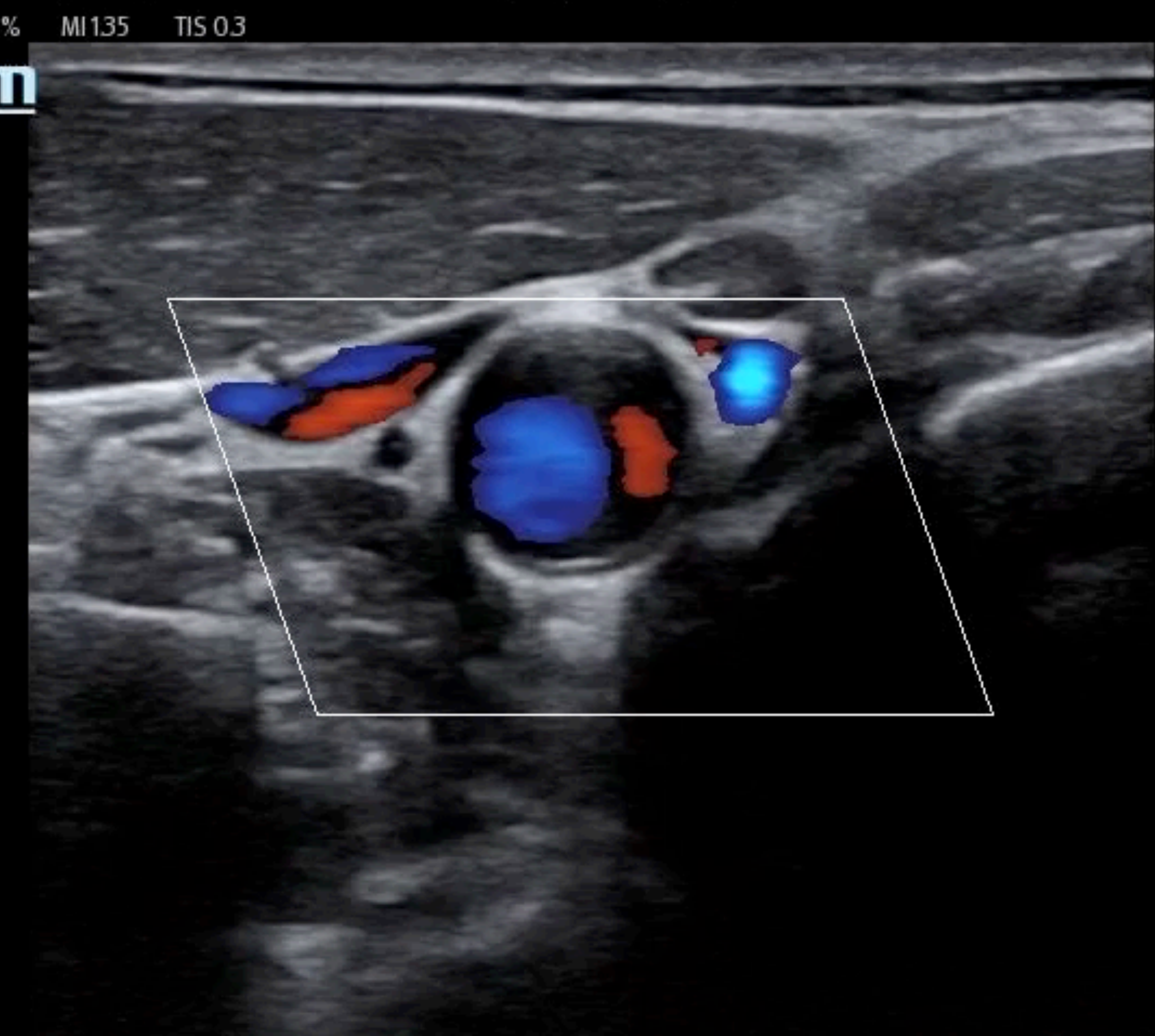


CCA to ICA (post) & ECA (ant)



CHEN 24-11-2022
13556011 Carotid 15:27:21

CHEN 24-11-2022
13556011 Carotid 15:27:08



m

%

MI135 TIS 0.3

MI135 TIS 0.2

0
-1
-2
-3

0
-1
-2
-3

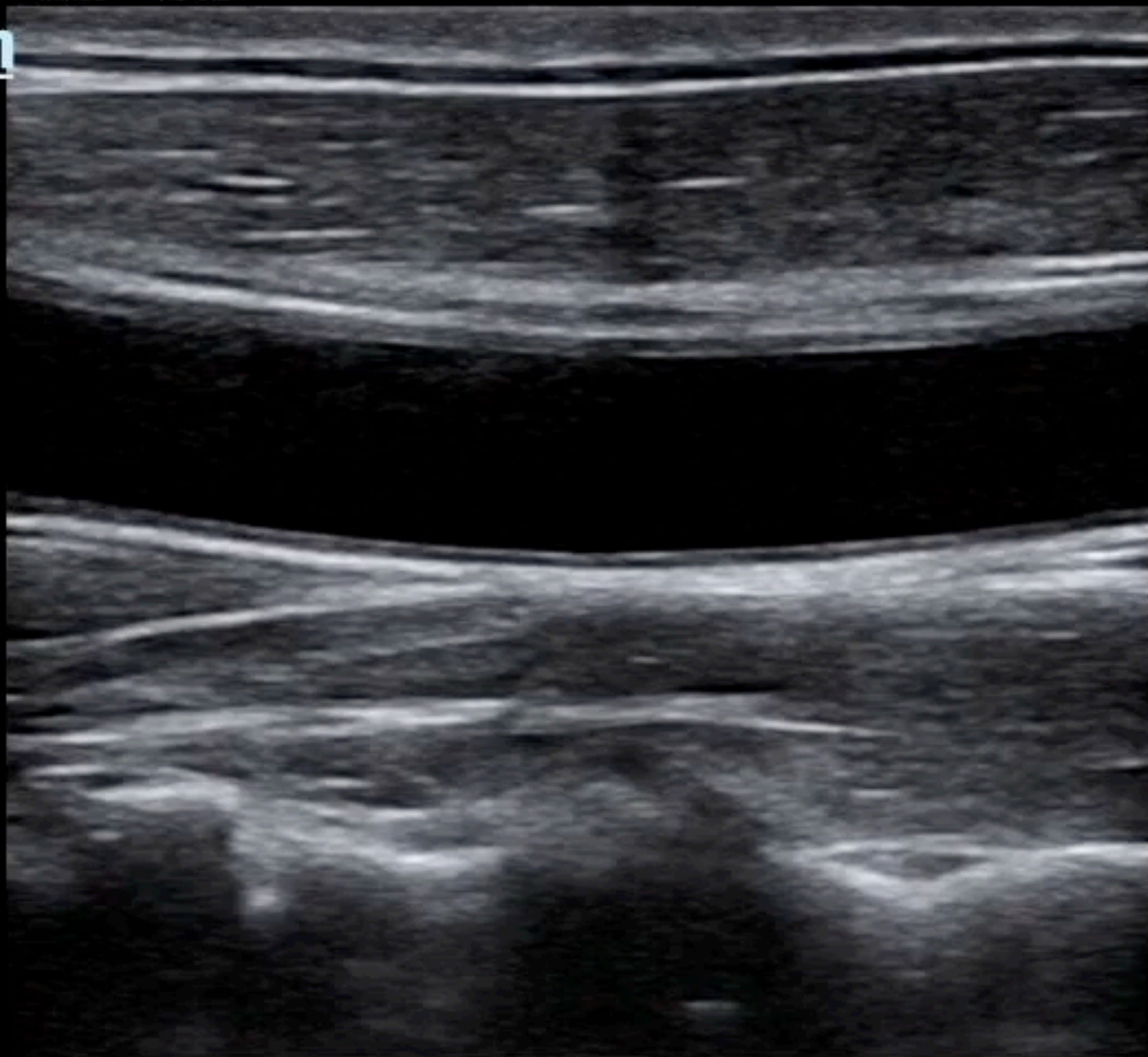
23-11-2022

13556011

Carotid

14:09:50

AP 96.6% MI135 TIS 0.2



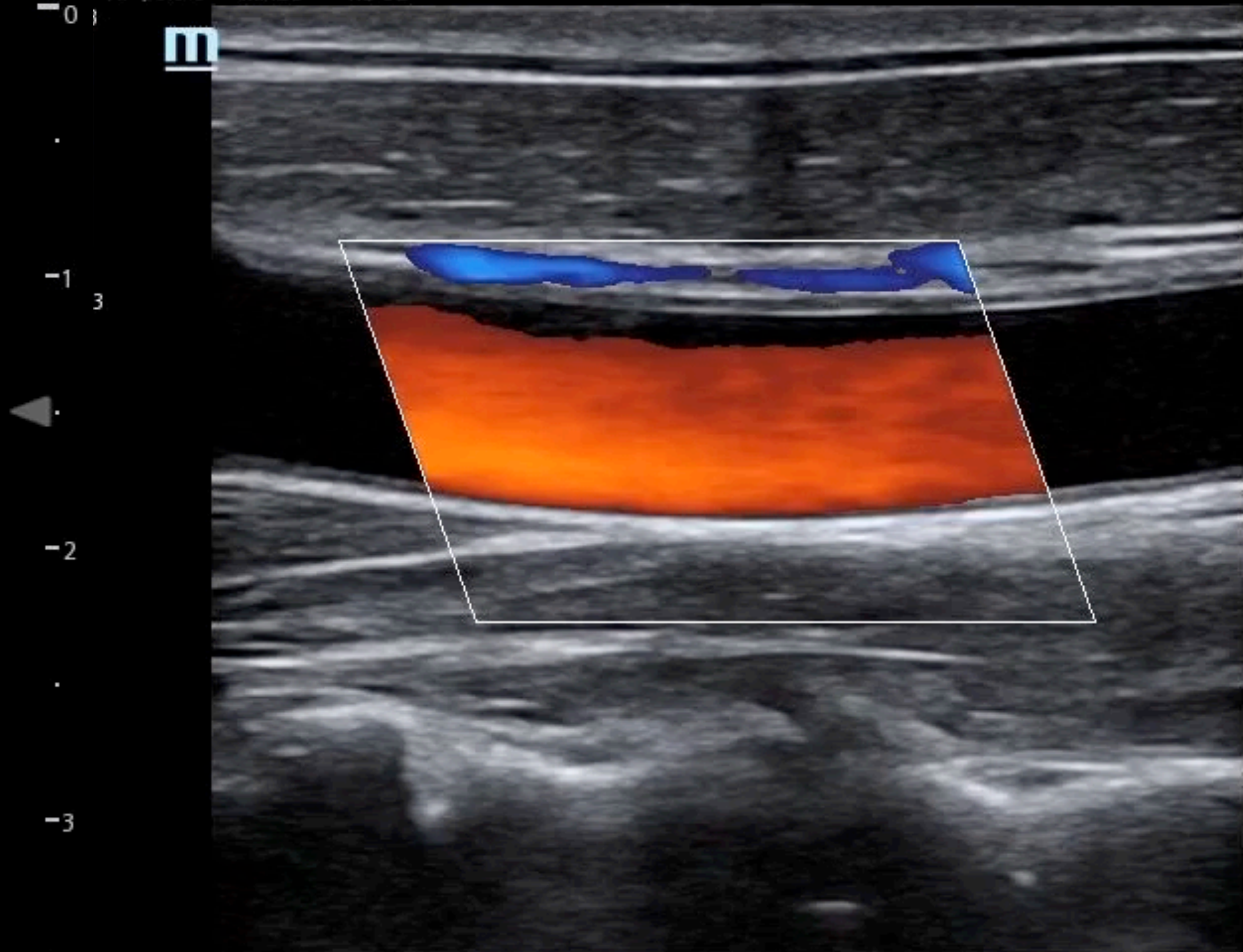
23-11-2022

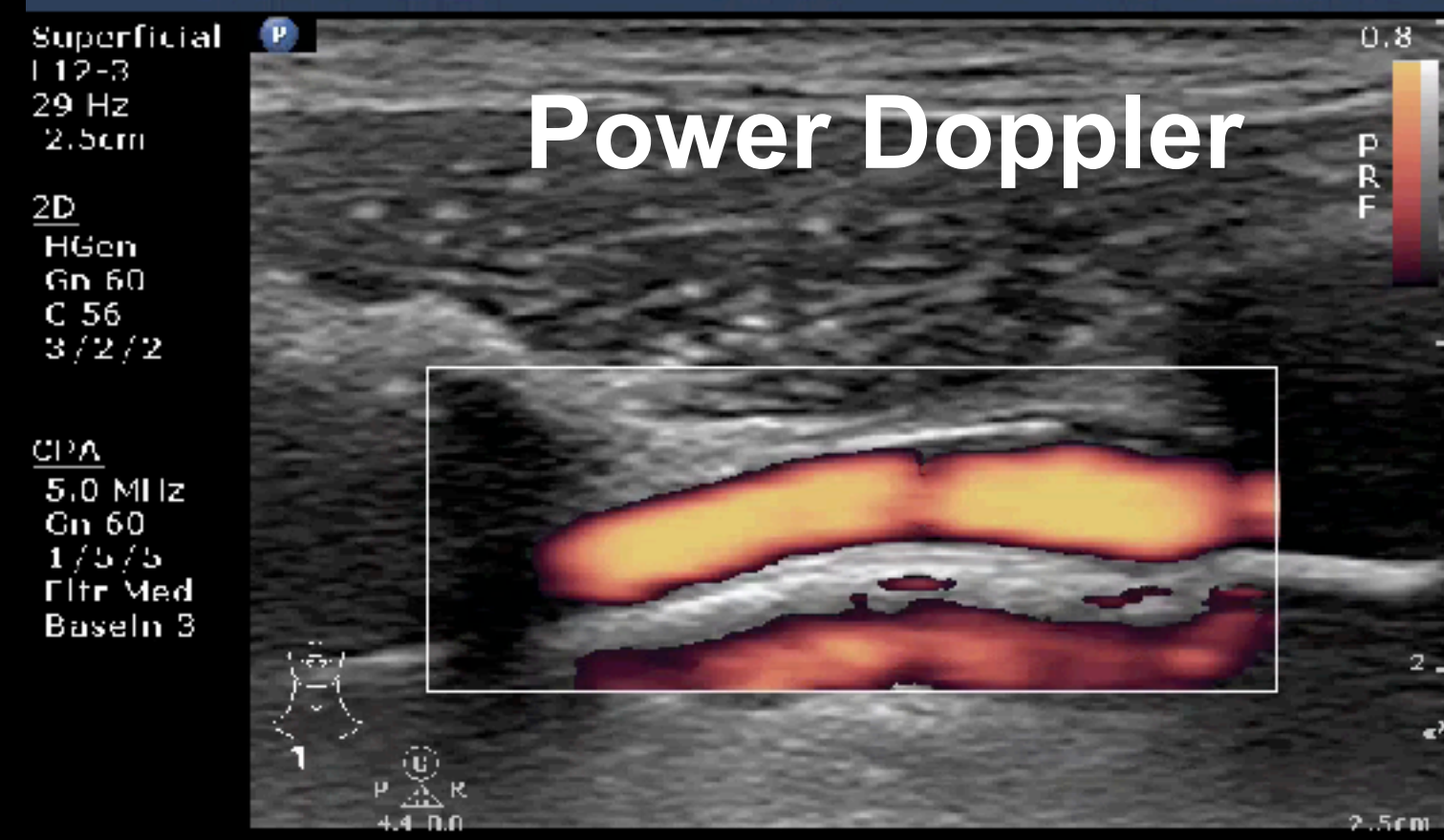
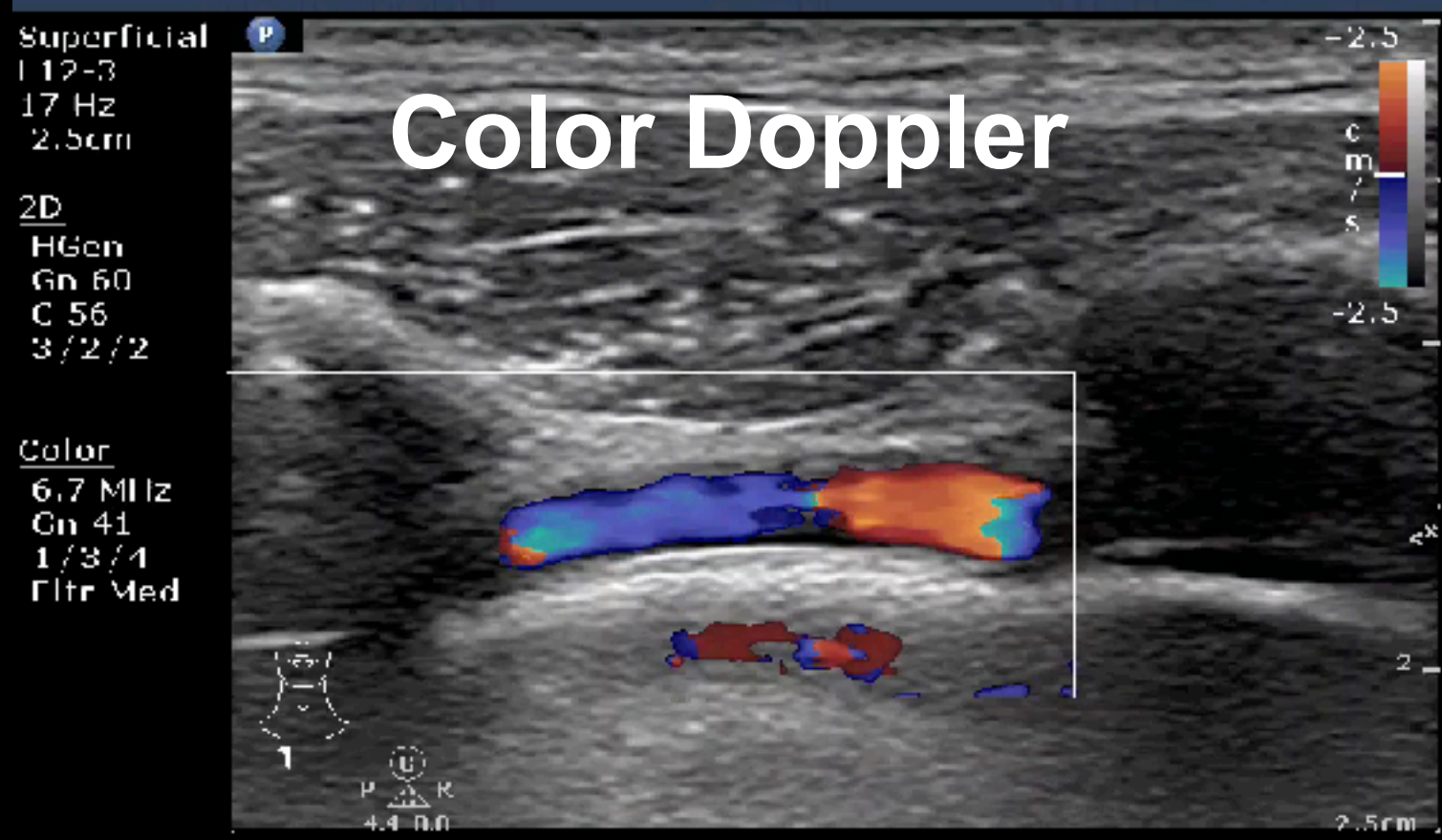
13556011

Carotid

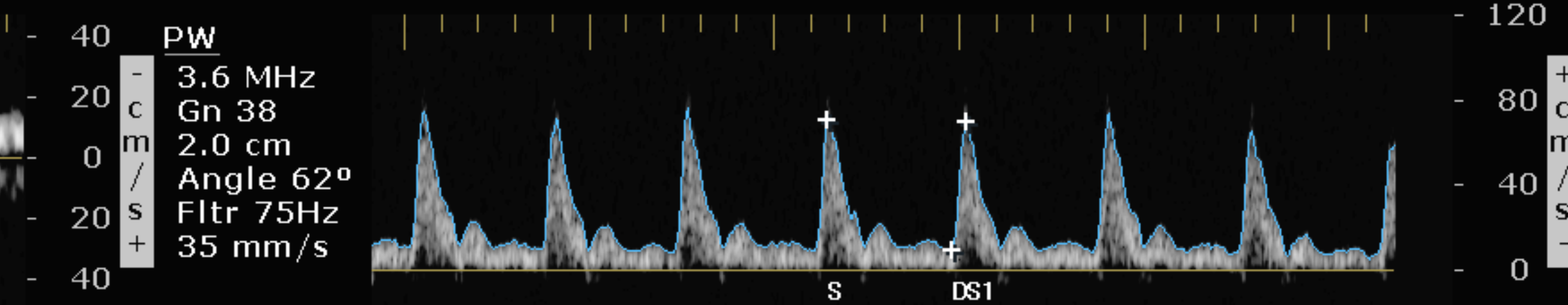
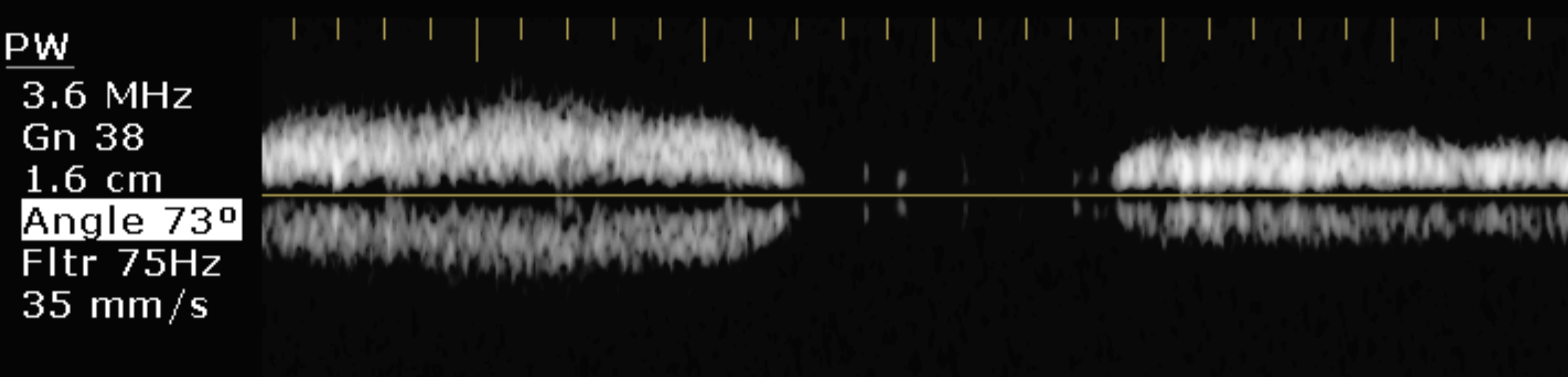
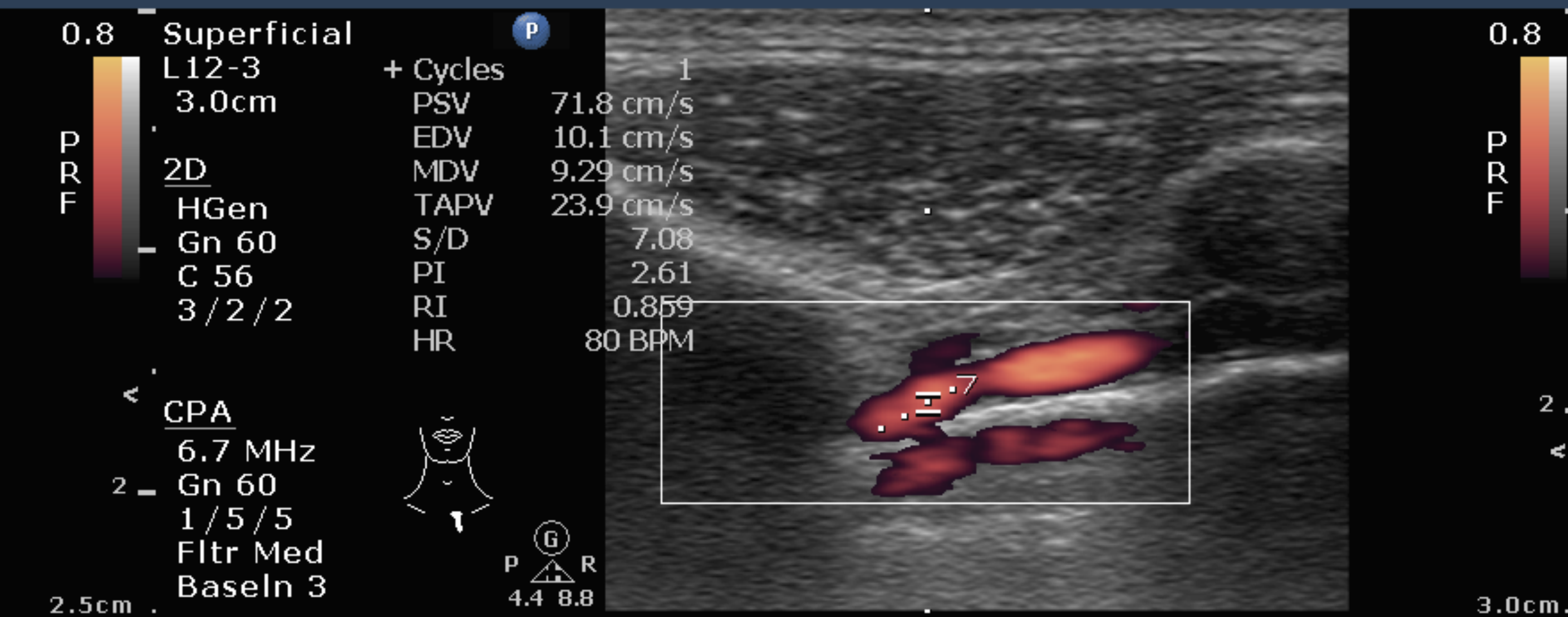
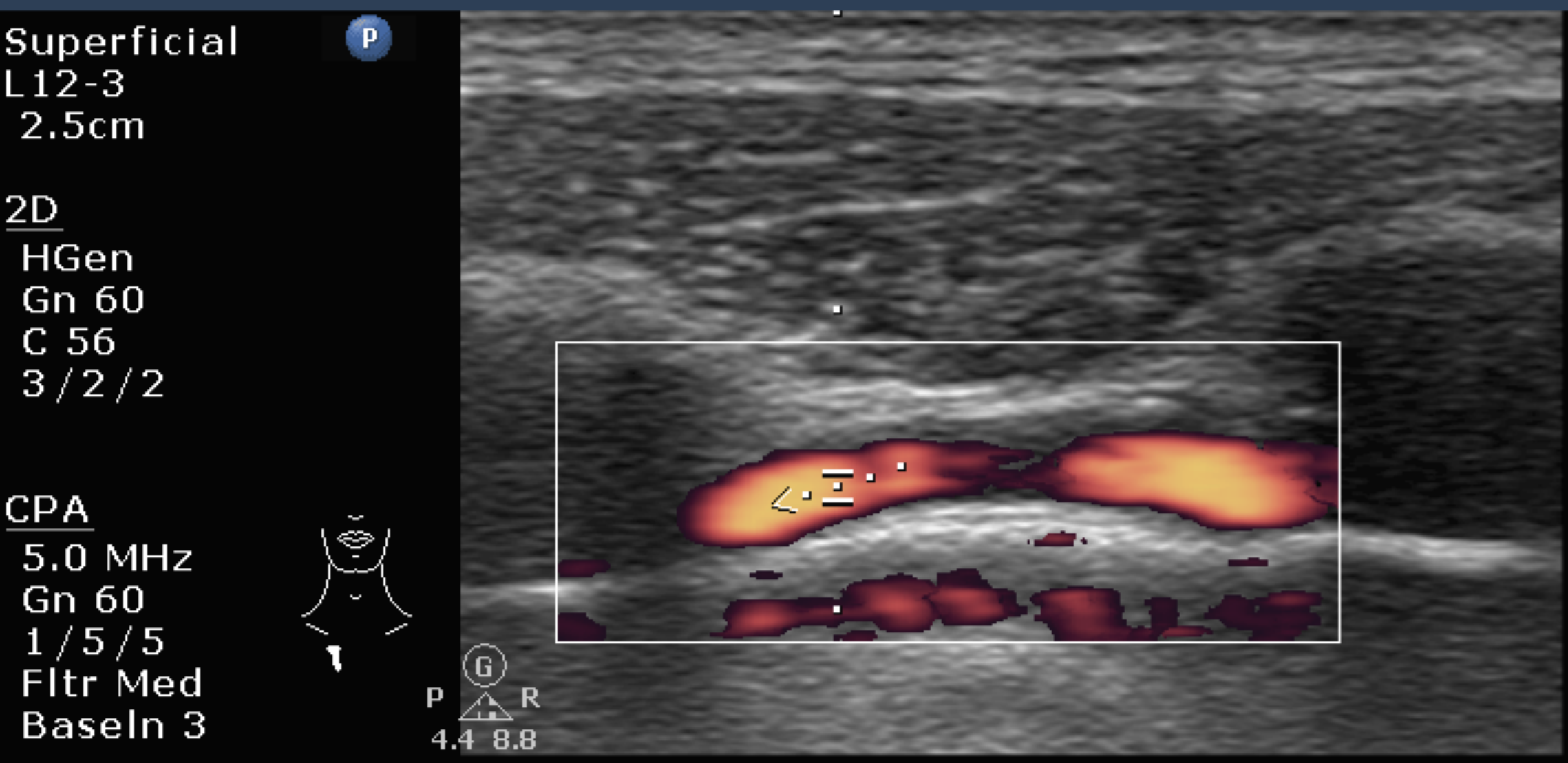
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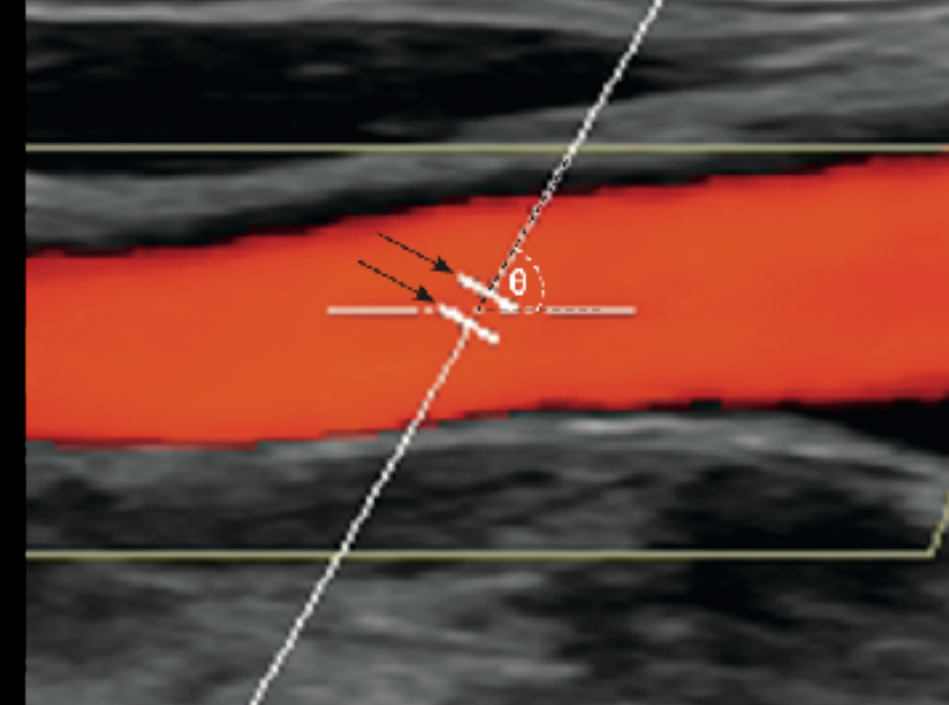
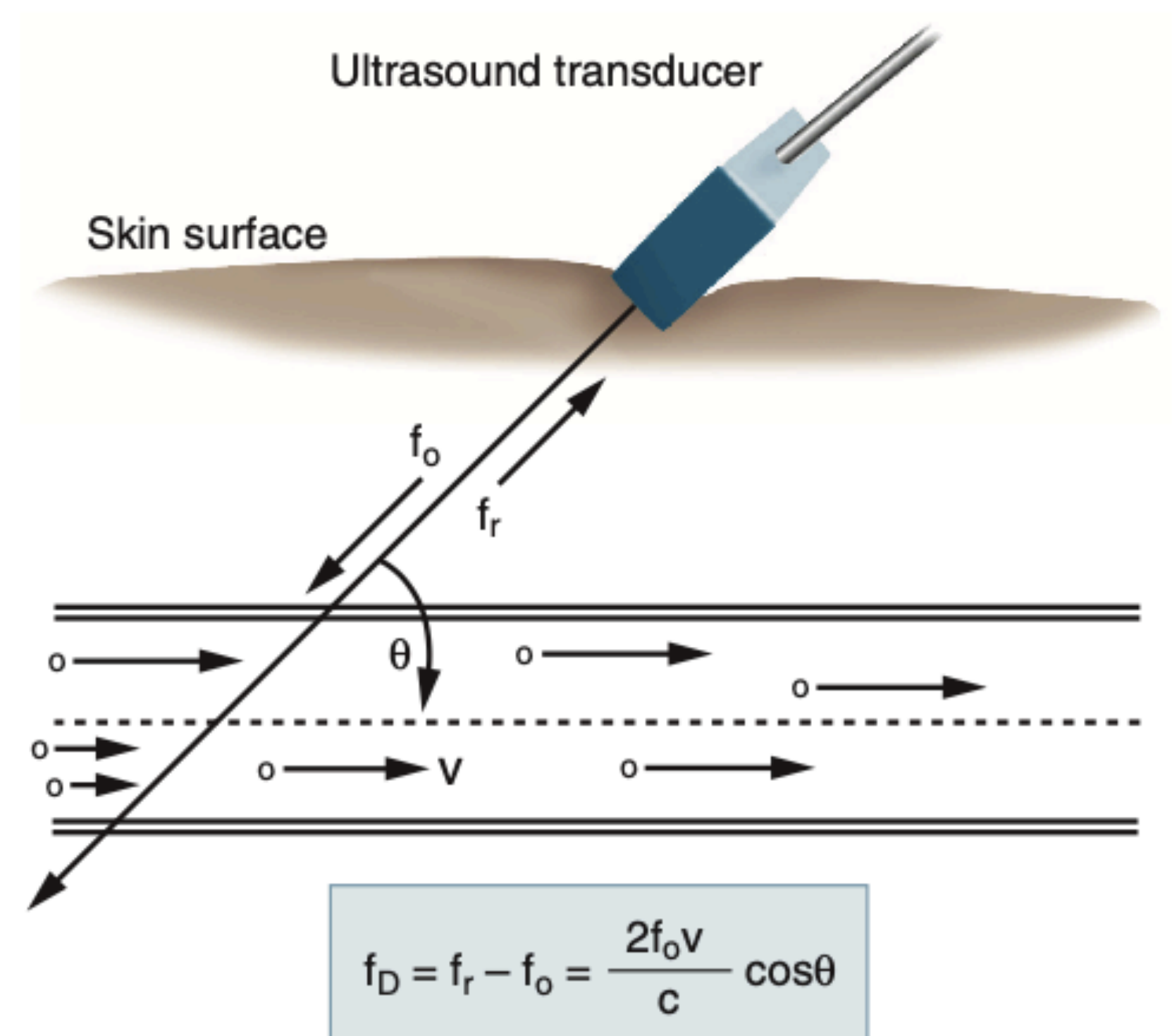
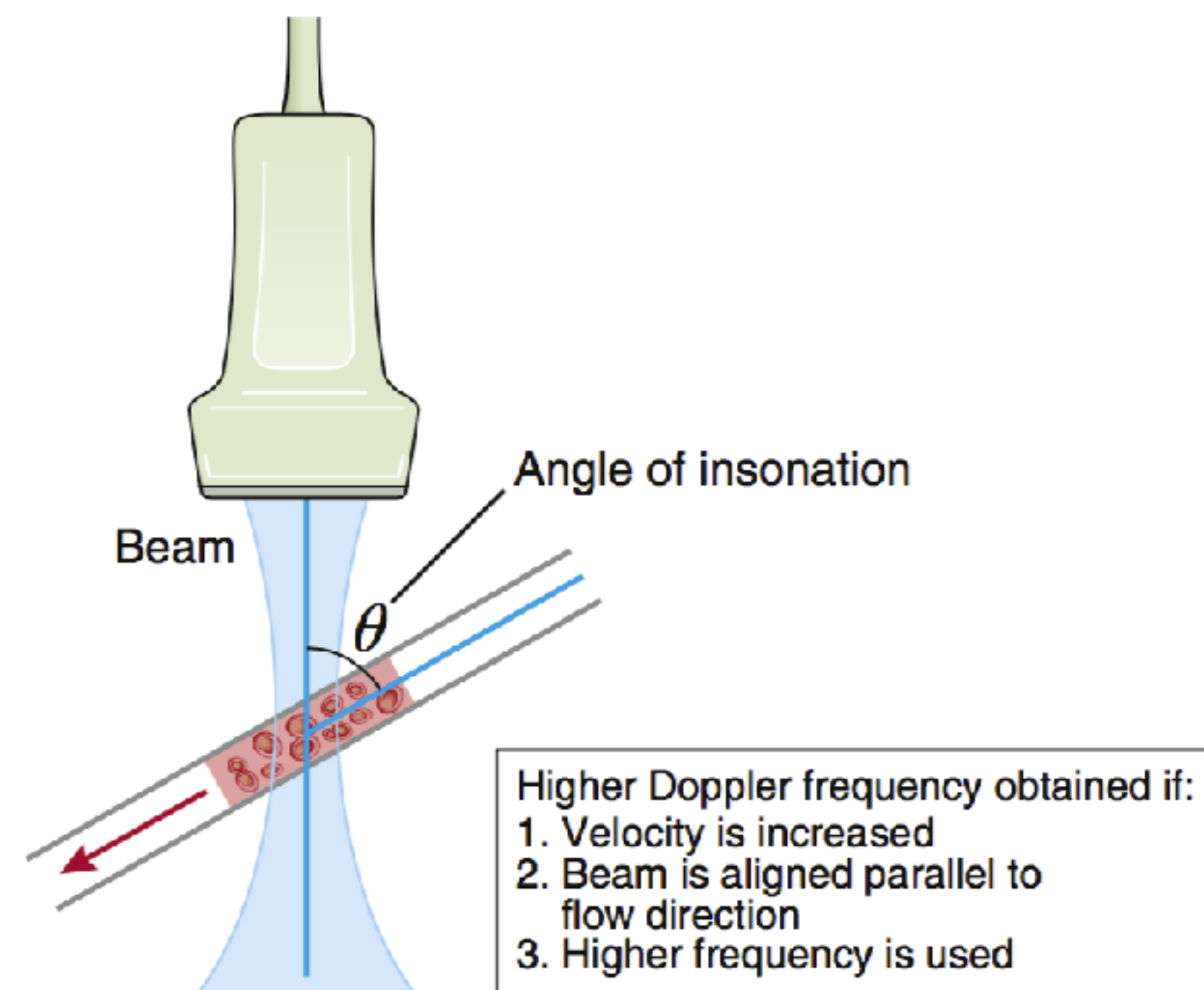
AP 96.6% MI135 TIS 0.3





Spectral analysis



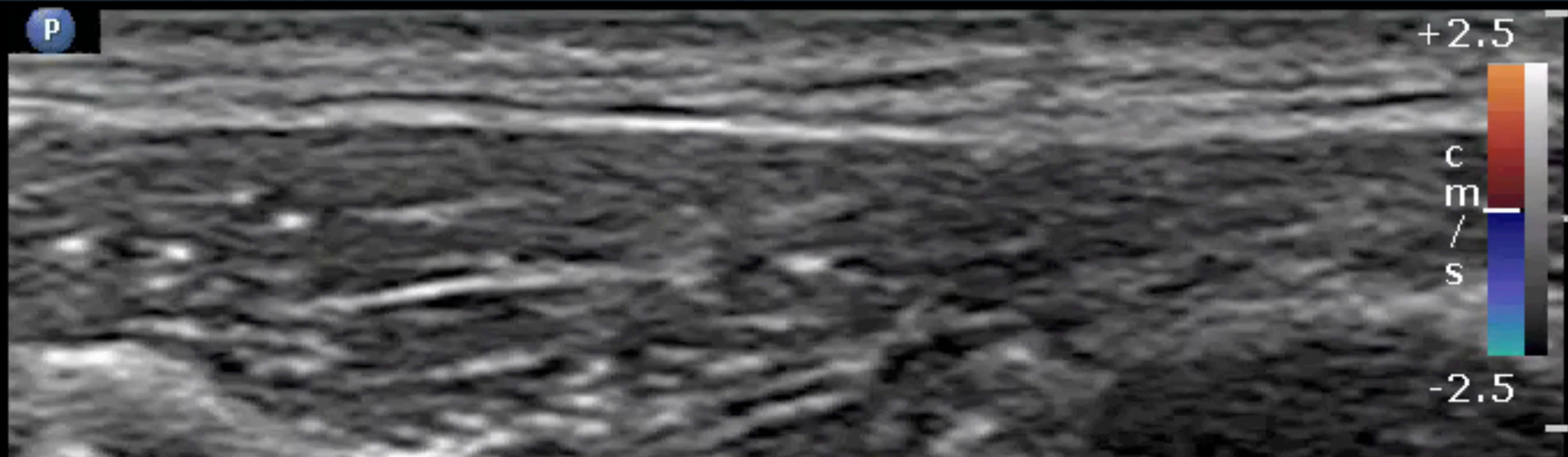


30 ~ 60°

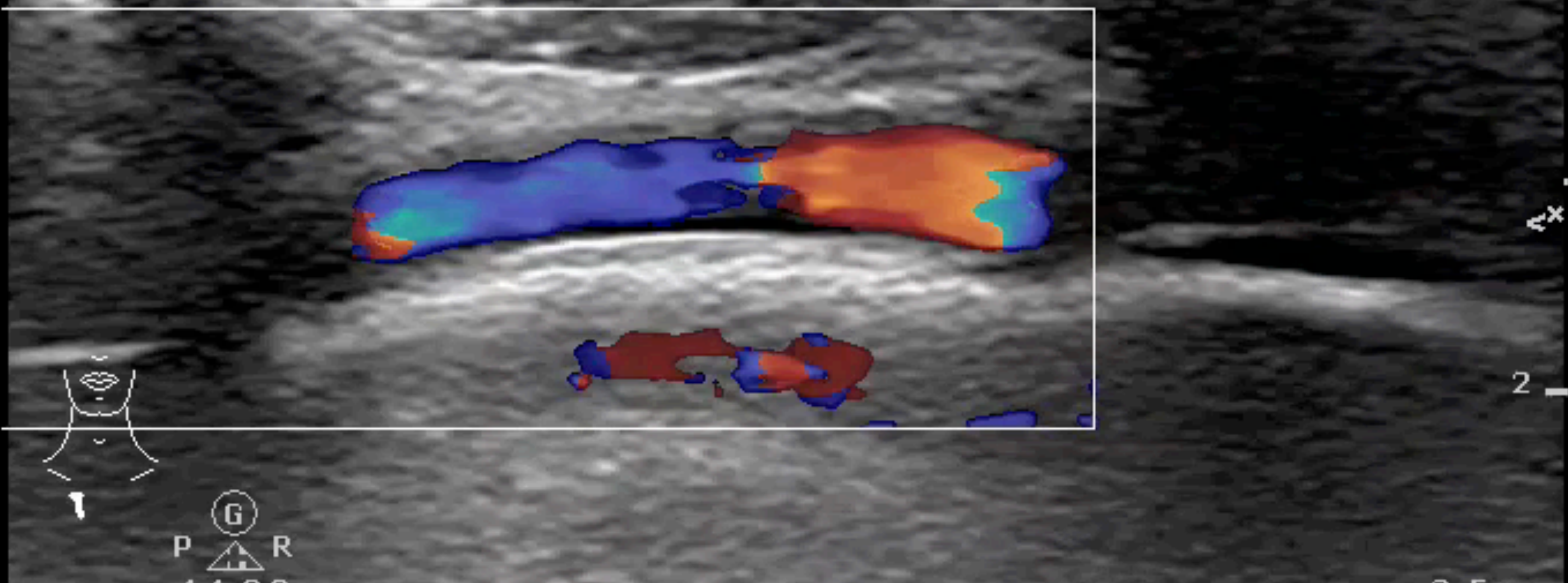
PHILIPS TemporaryID-20160915152824 MI 1.1 9/15/2016
 16-09-15-152824 SKH ER TIS 0.6 3:36:48 PM

Superficial
 L12-3
 17 Hz
 2.5cm

2D
 HGen
 Gn 60
 C 56
 3/2/2



Color
 6.7 MHz
 Gn 41
 1/3/4
 Fitr Med



L12-4s

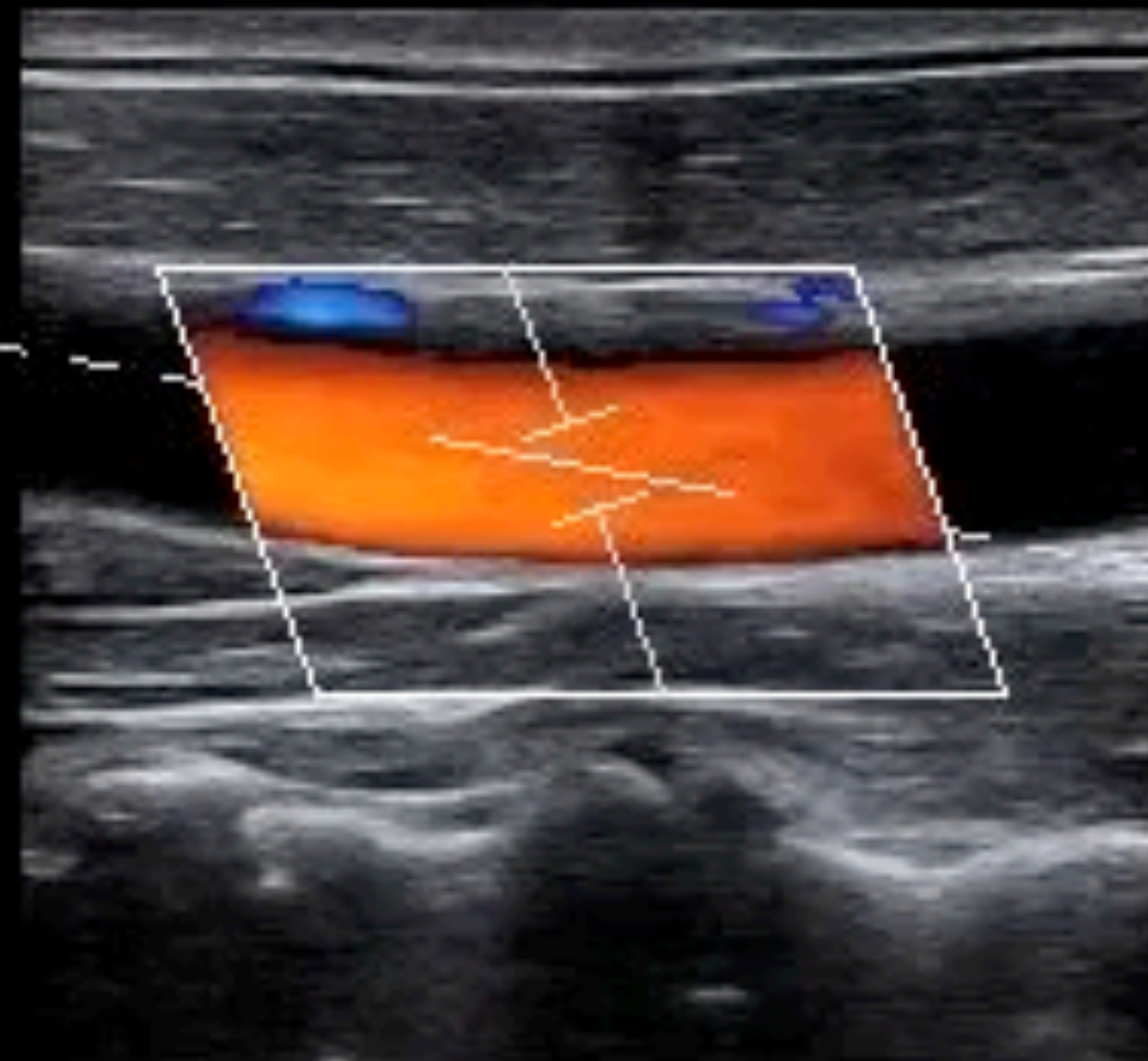
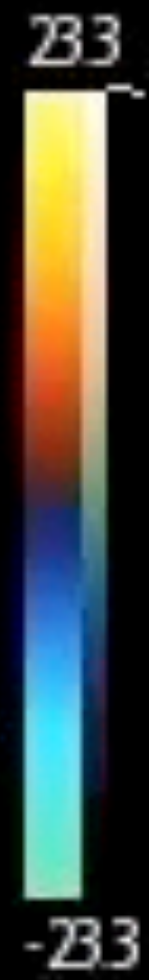
AP 96.6%

MI 0.27

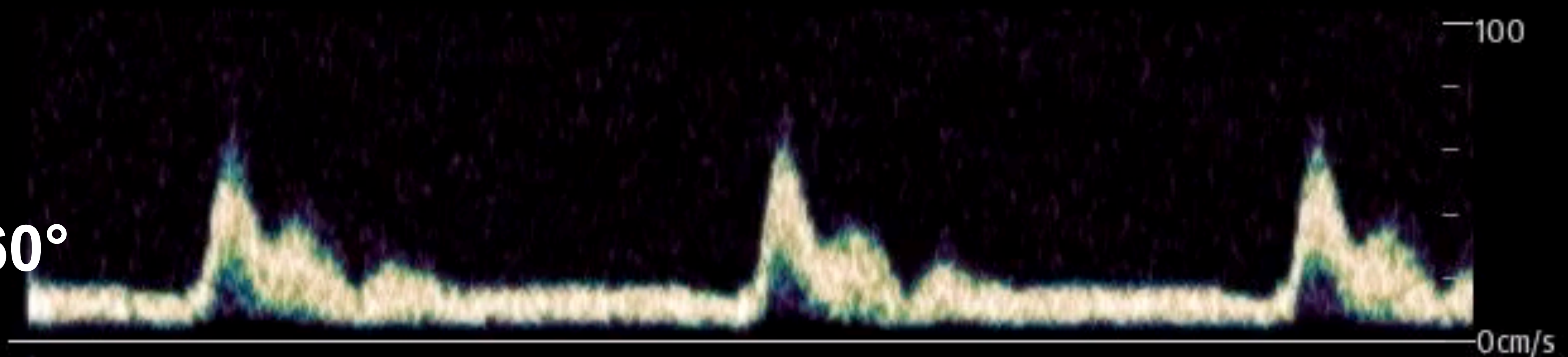
TIS 0.0

B
 FH10.0
 DR 105
 FR 22
 D 35
 G 50

C
 F5.0 /G 50
 WF 497
 PRF 3.0k



PW
 F5.0 /G 50
 WF 569
 SVD 15.2
 SV 3.0
 PRF 6.9k
 Angle -59°

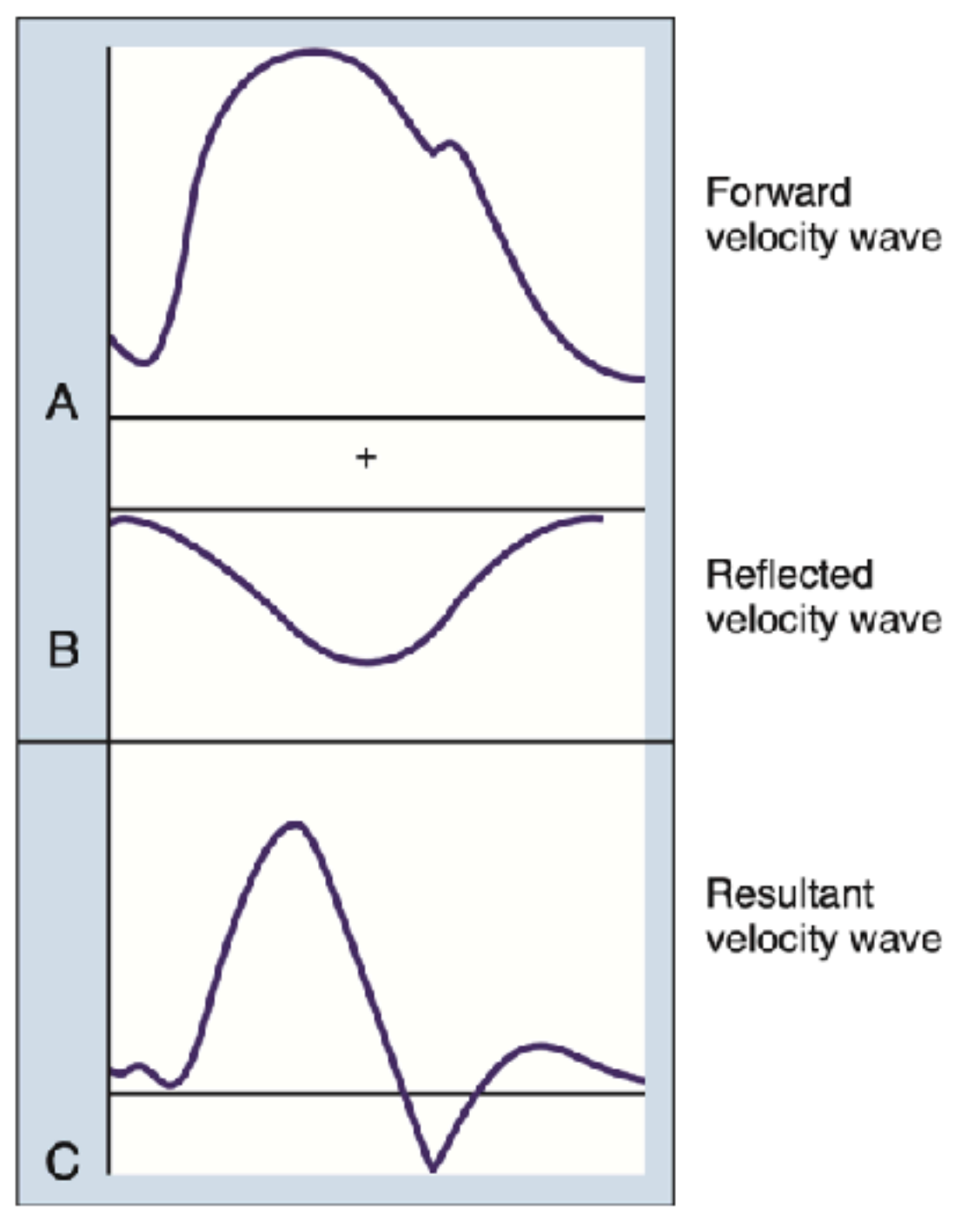
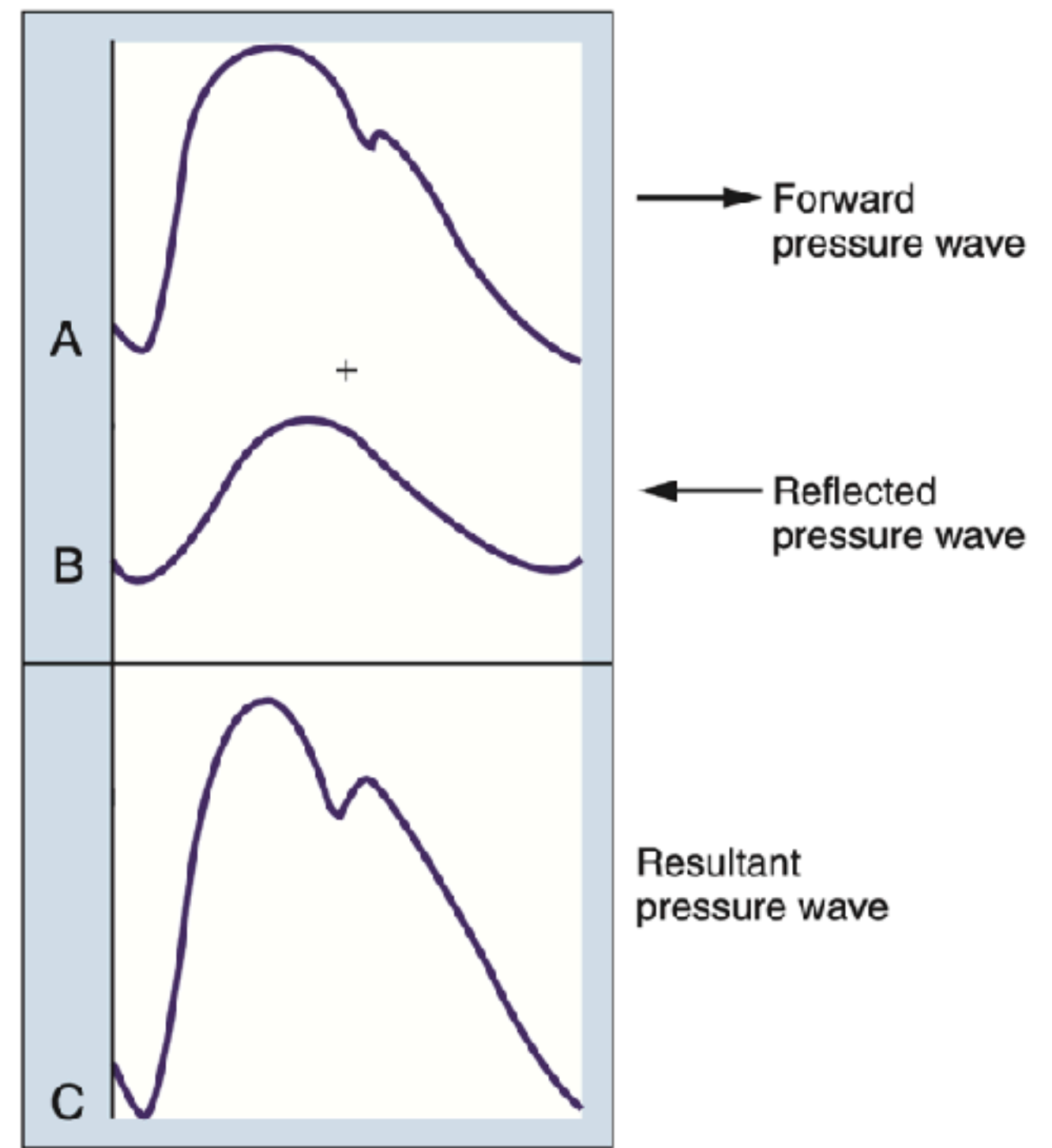
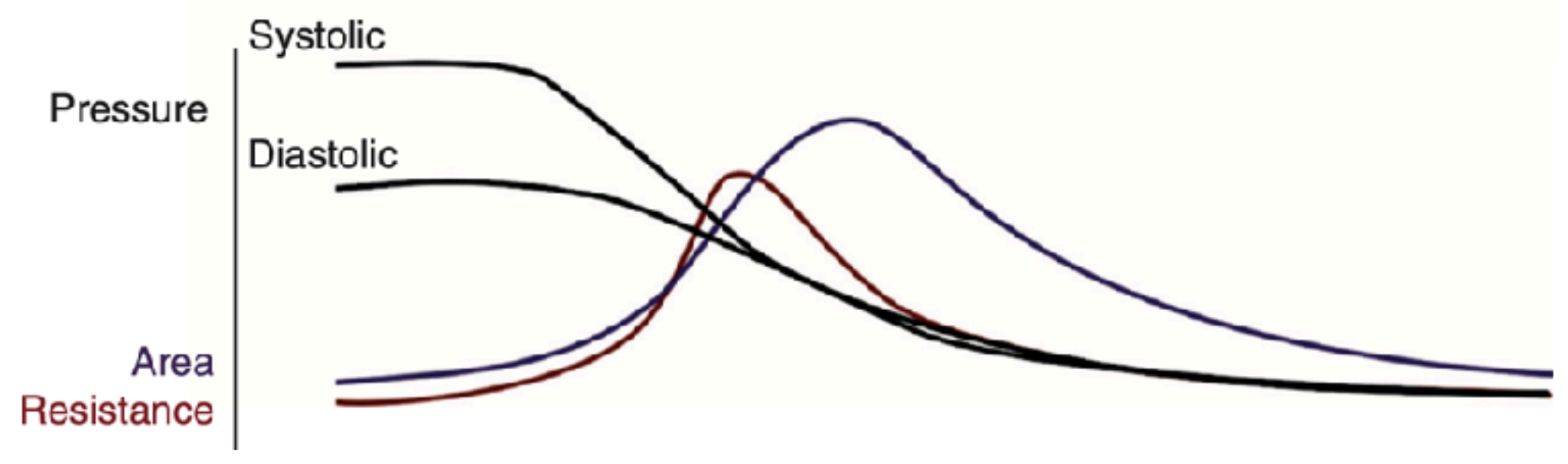
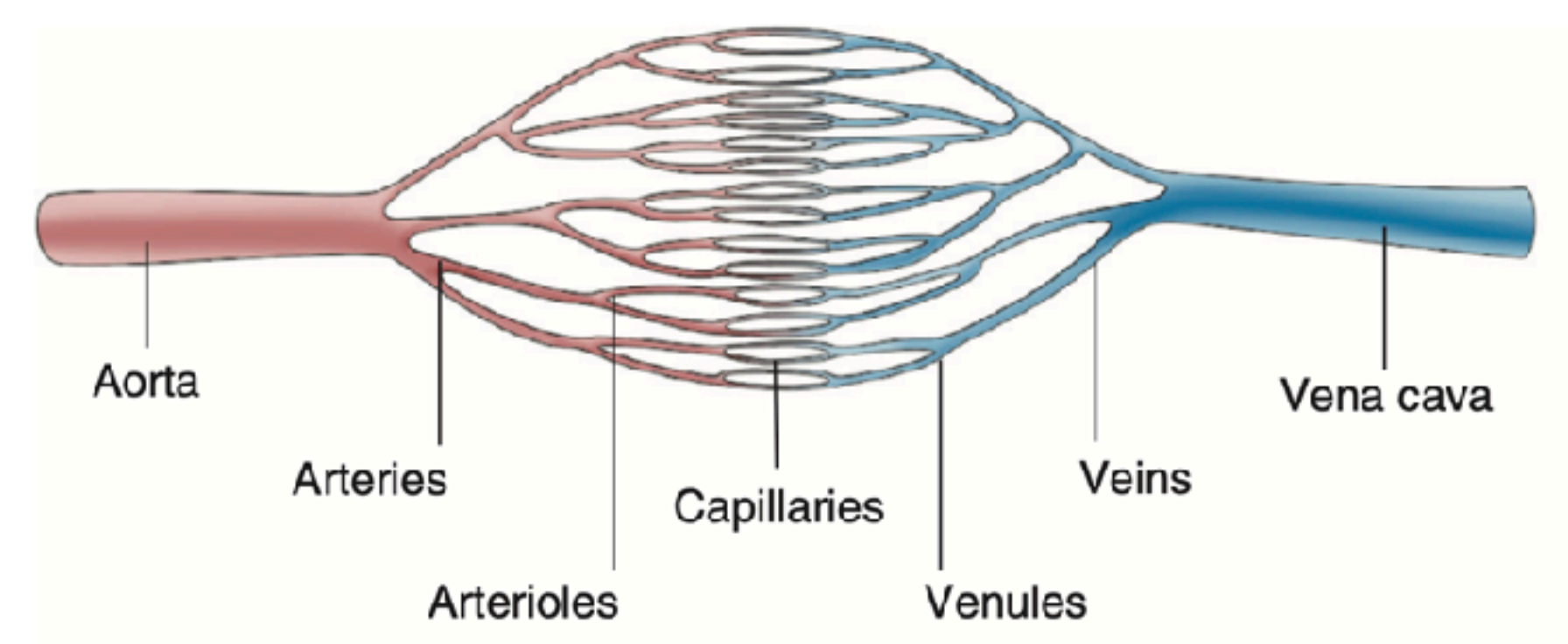
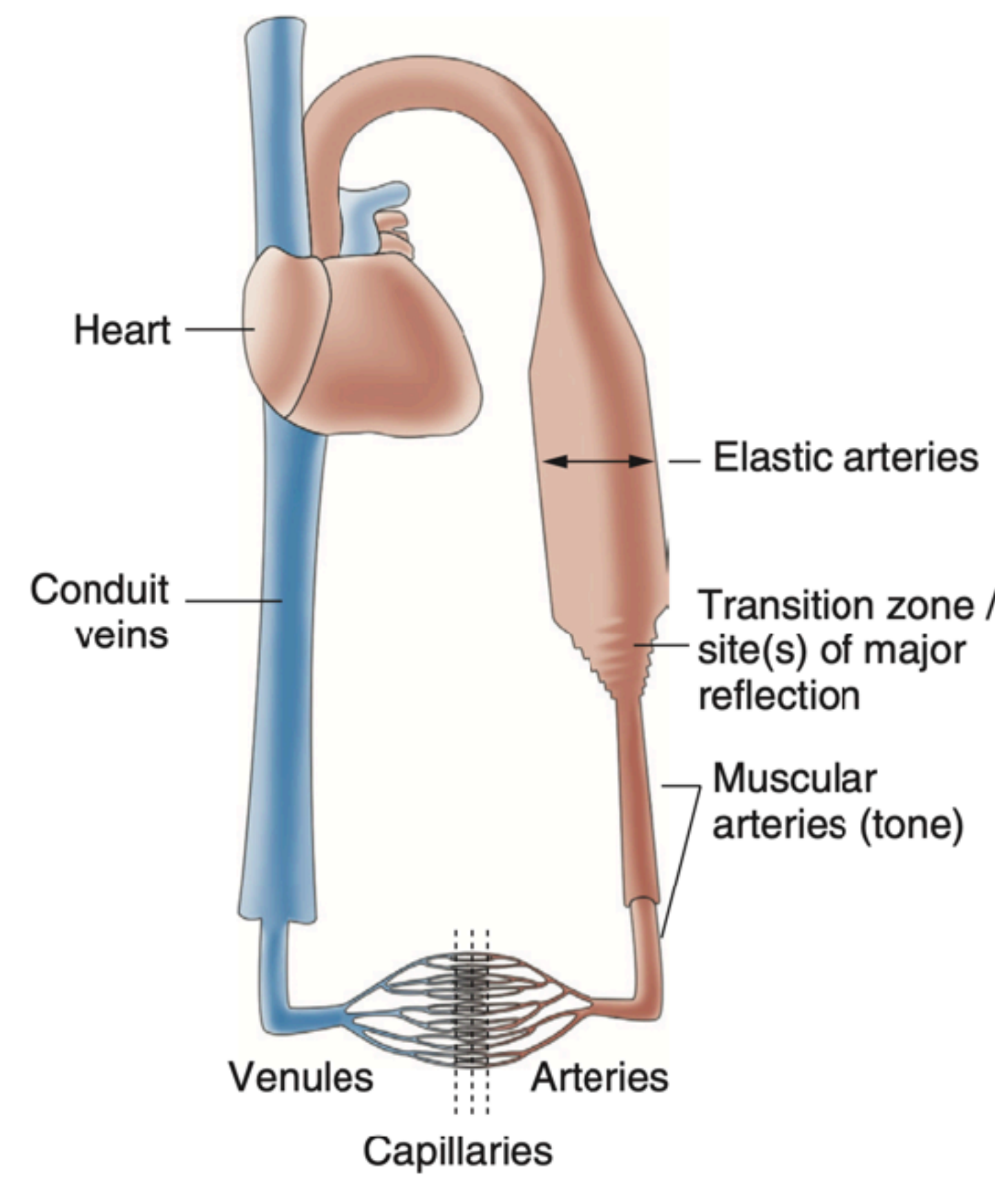


Angle < 60°

iNeedle

iTouch

CCA with PW

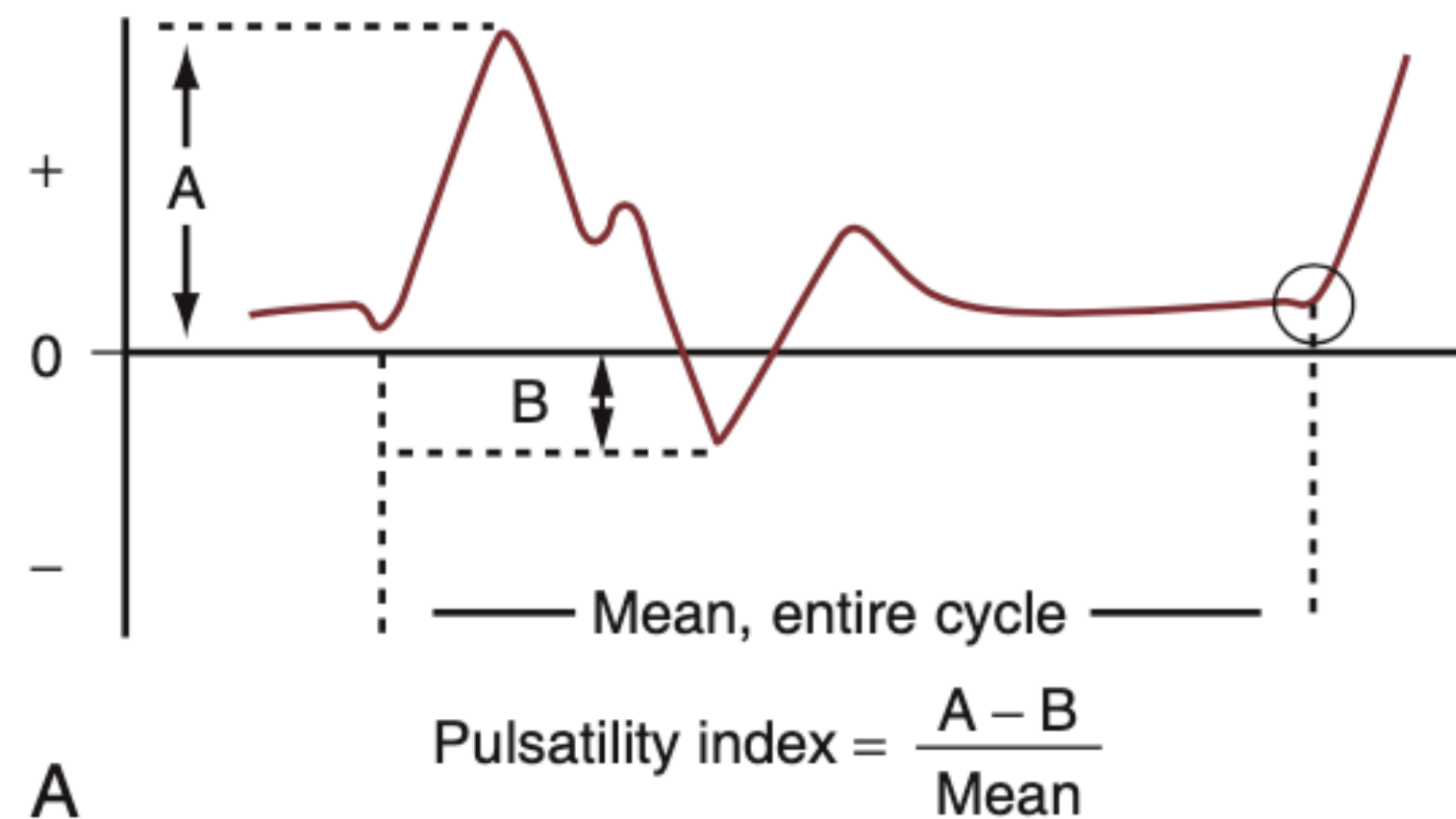


Pulsatility Measurement

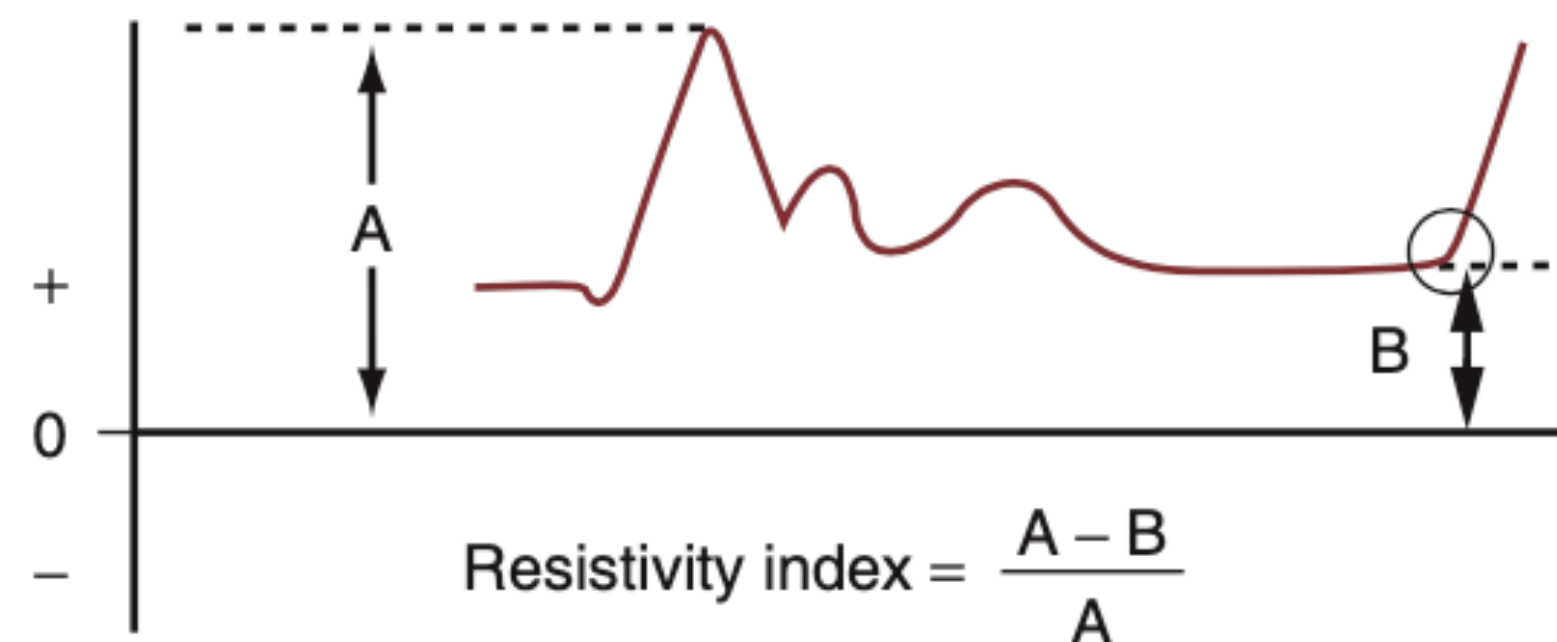
正常波形分析

生理狀態變異

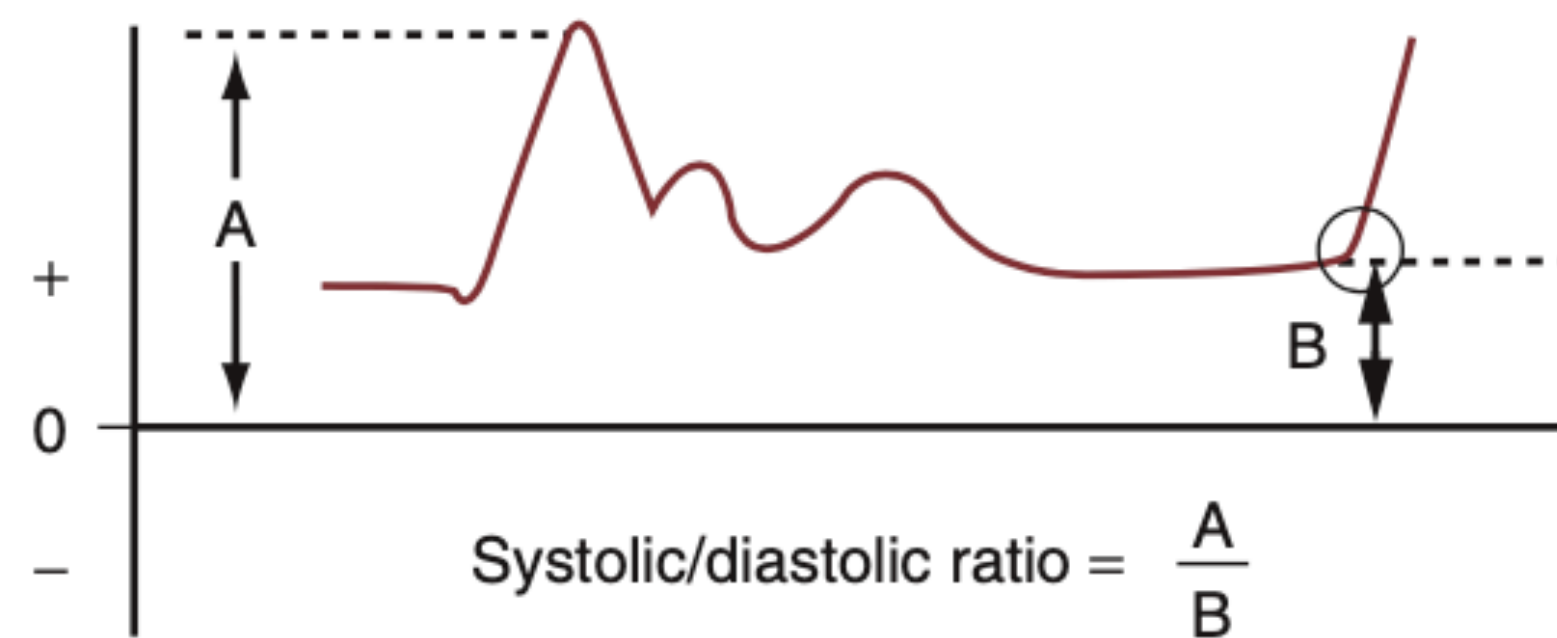
心臟功能影響



A

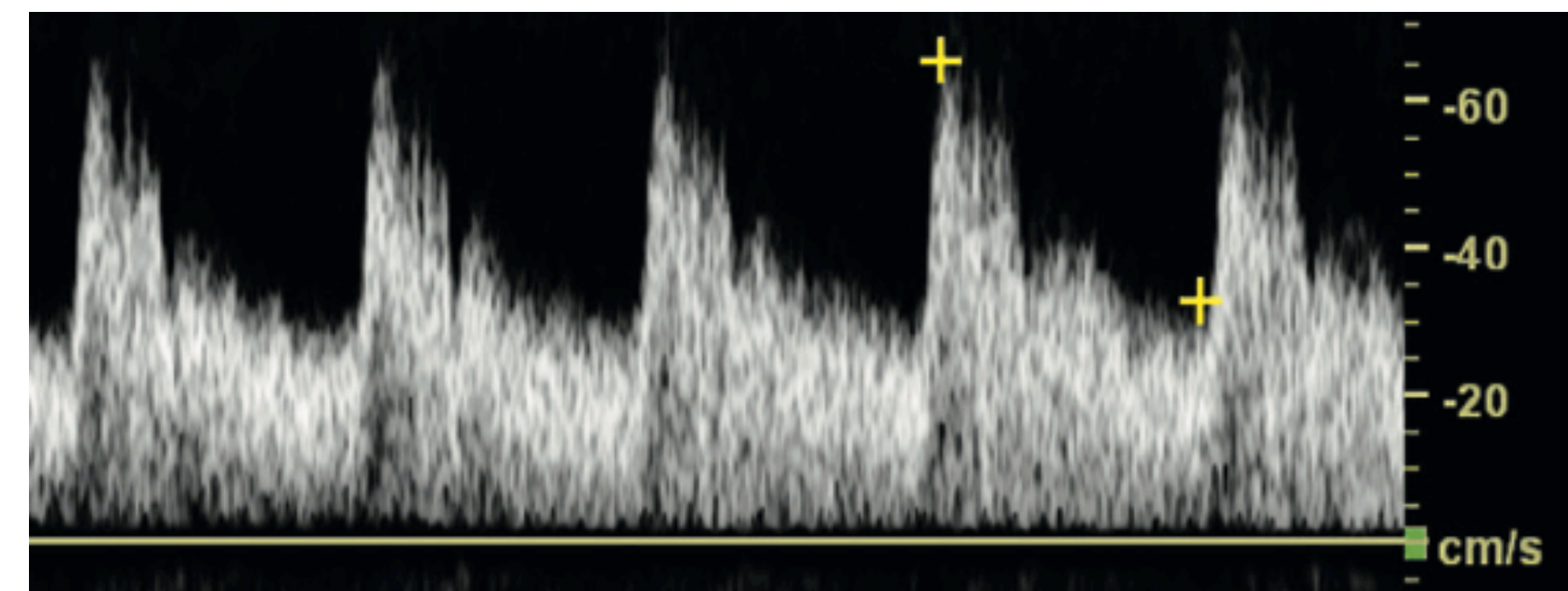


B



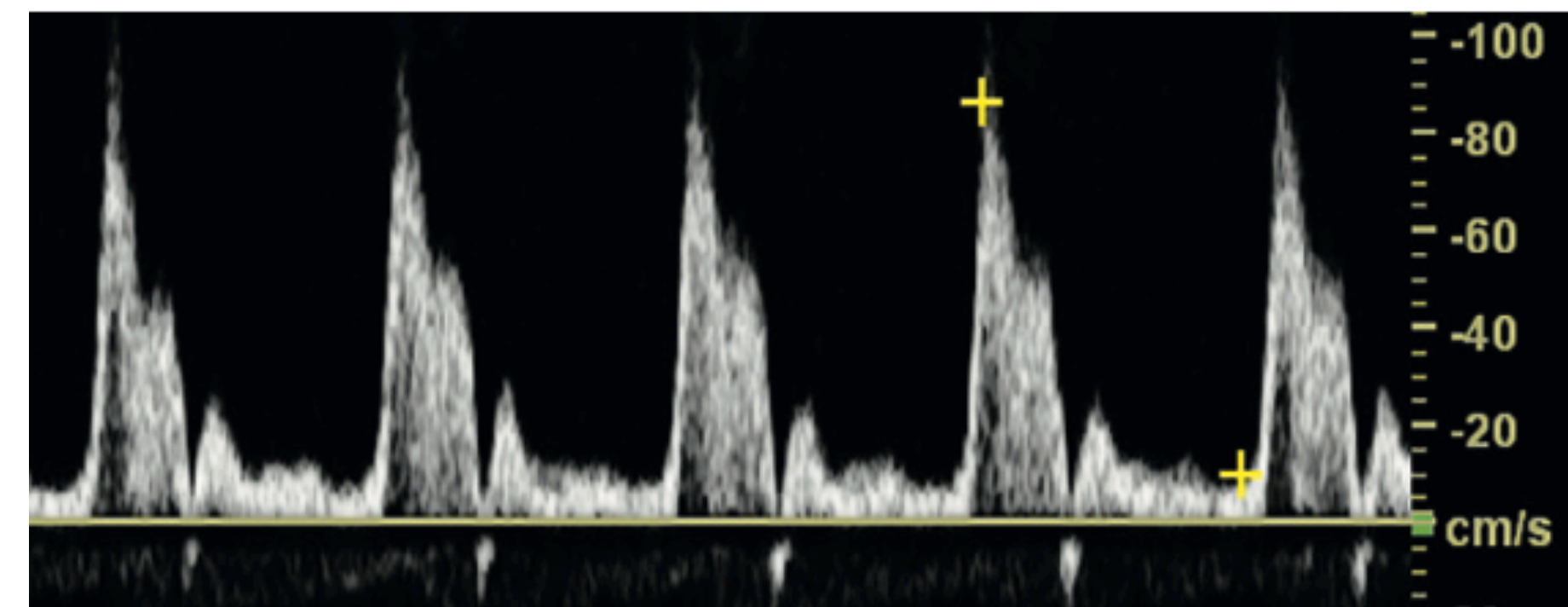
C

低



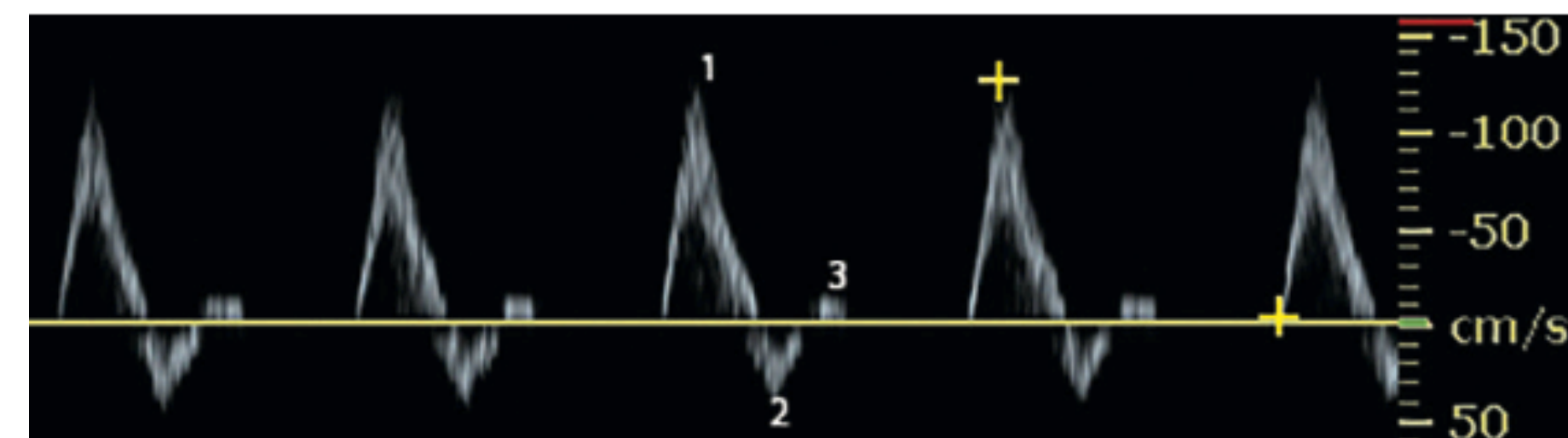
A

中



B

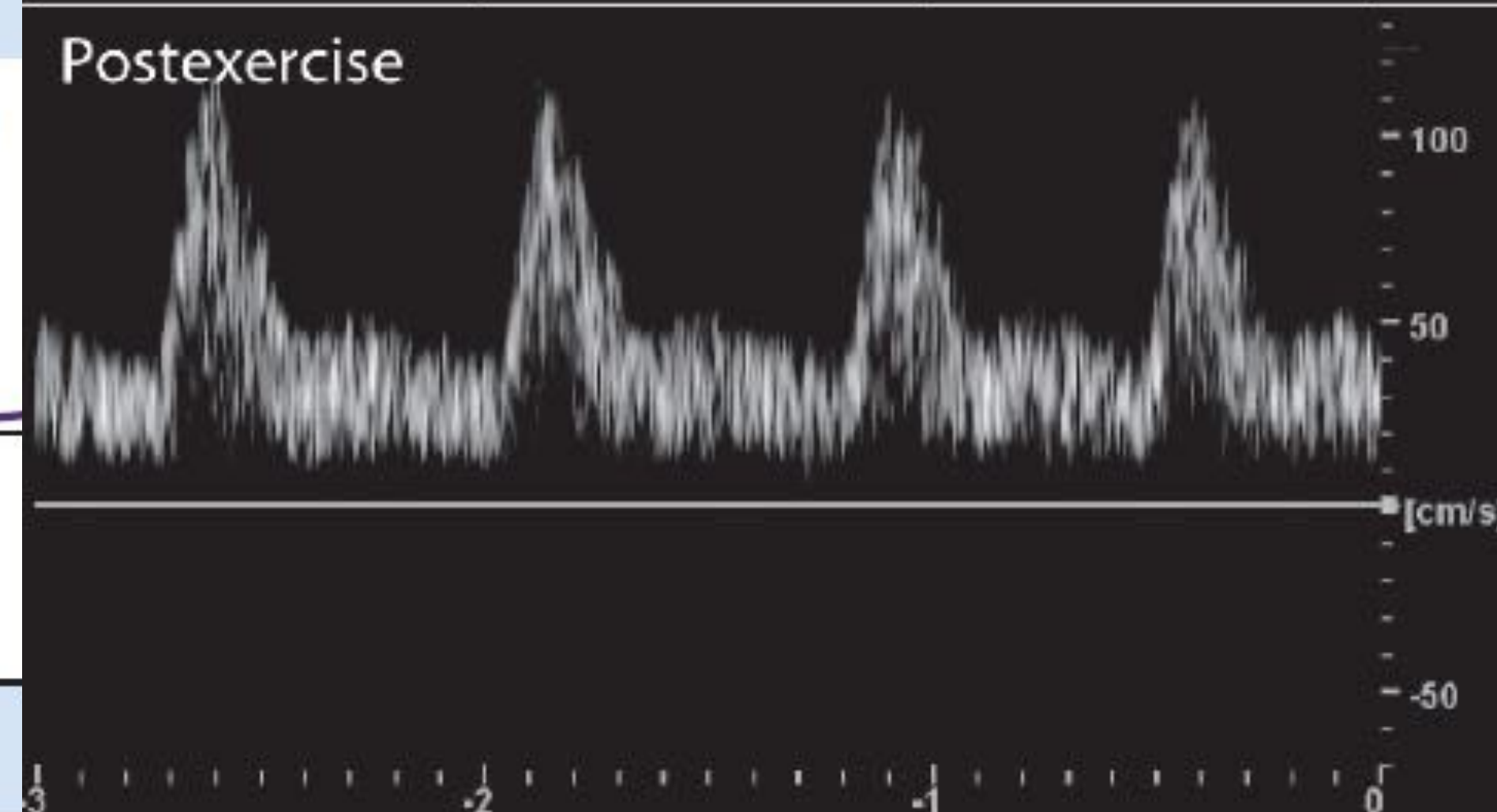
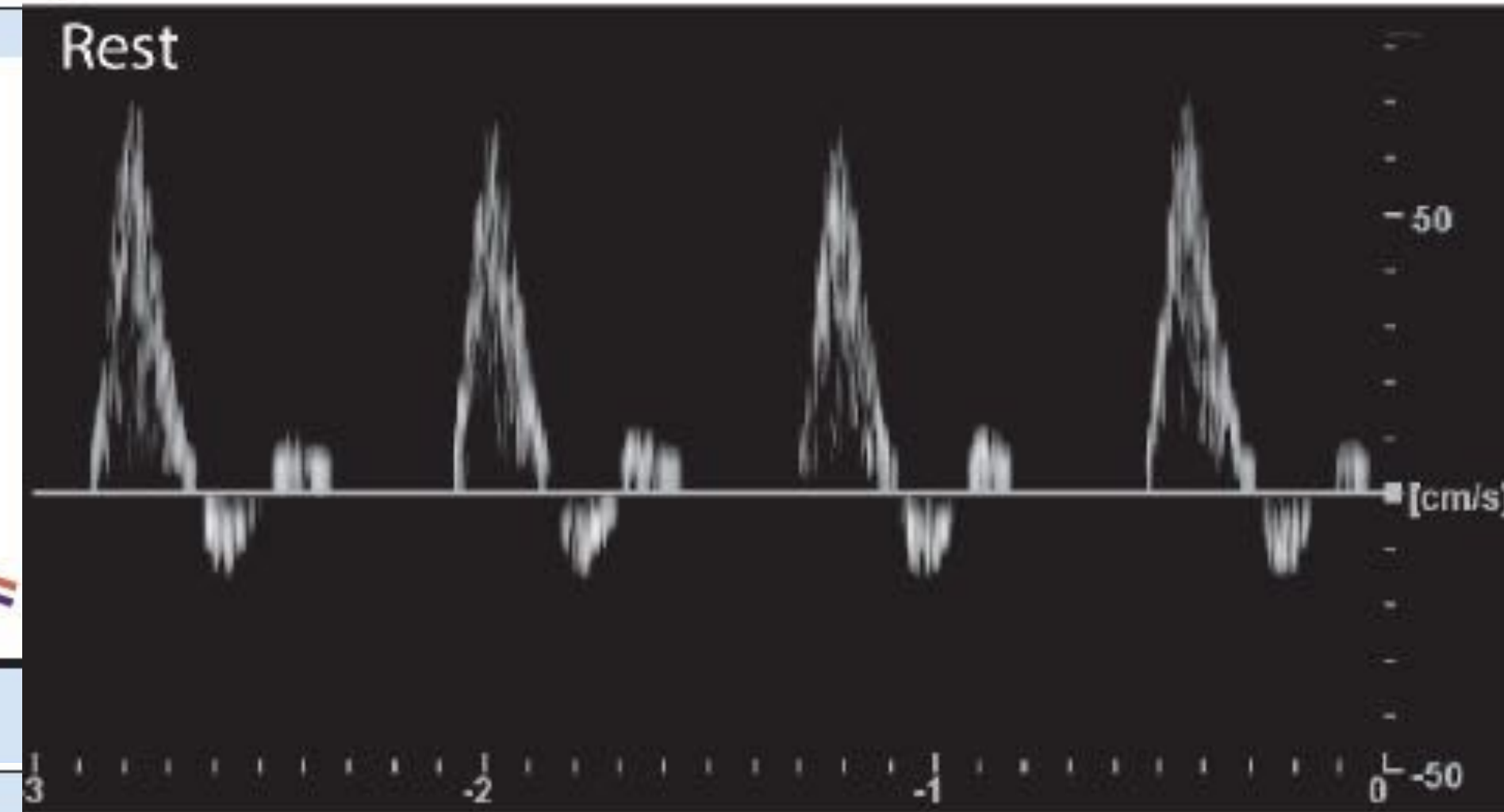
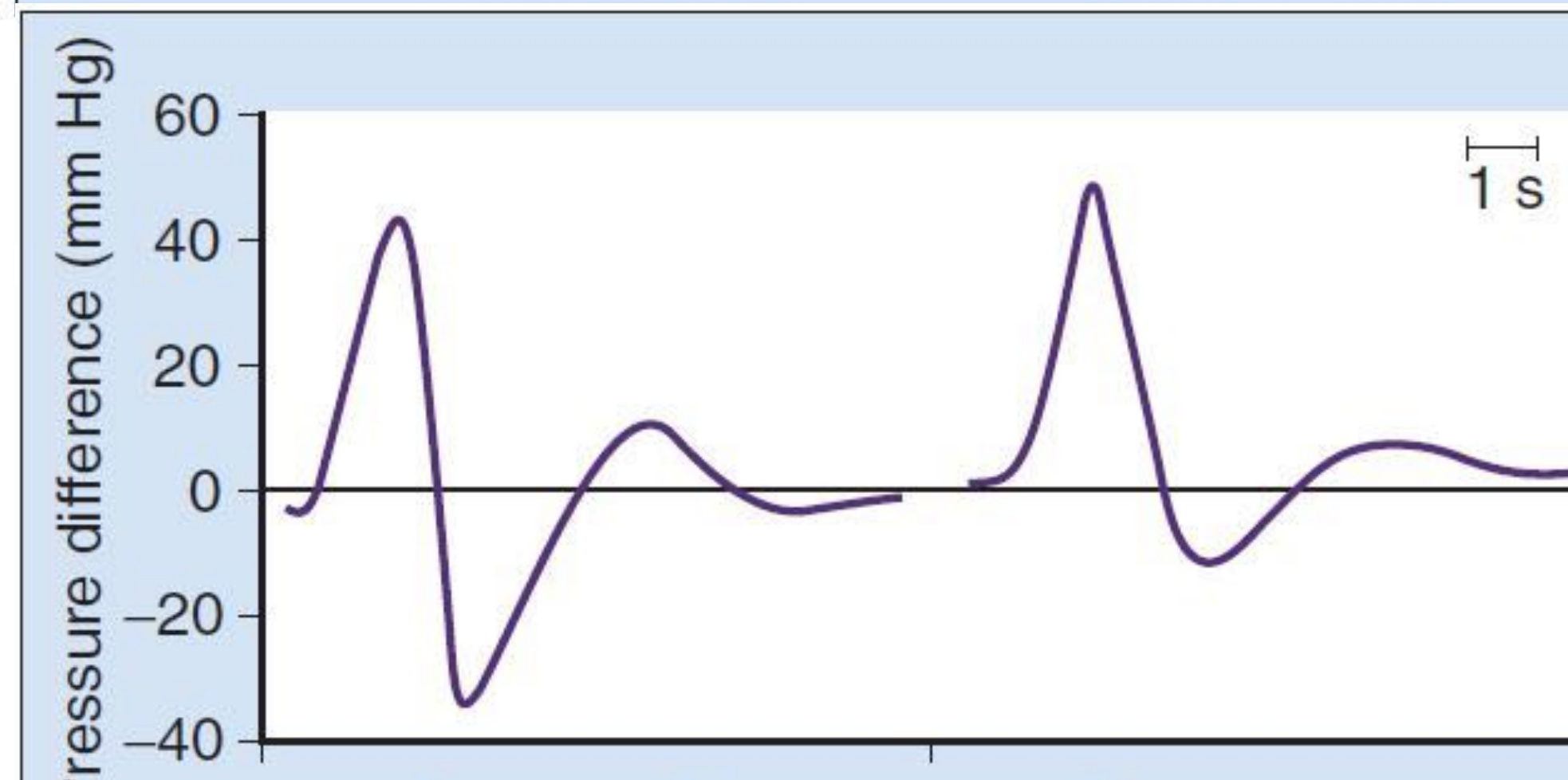
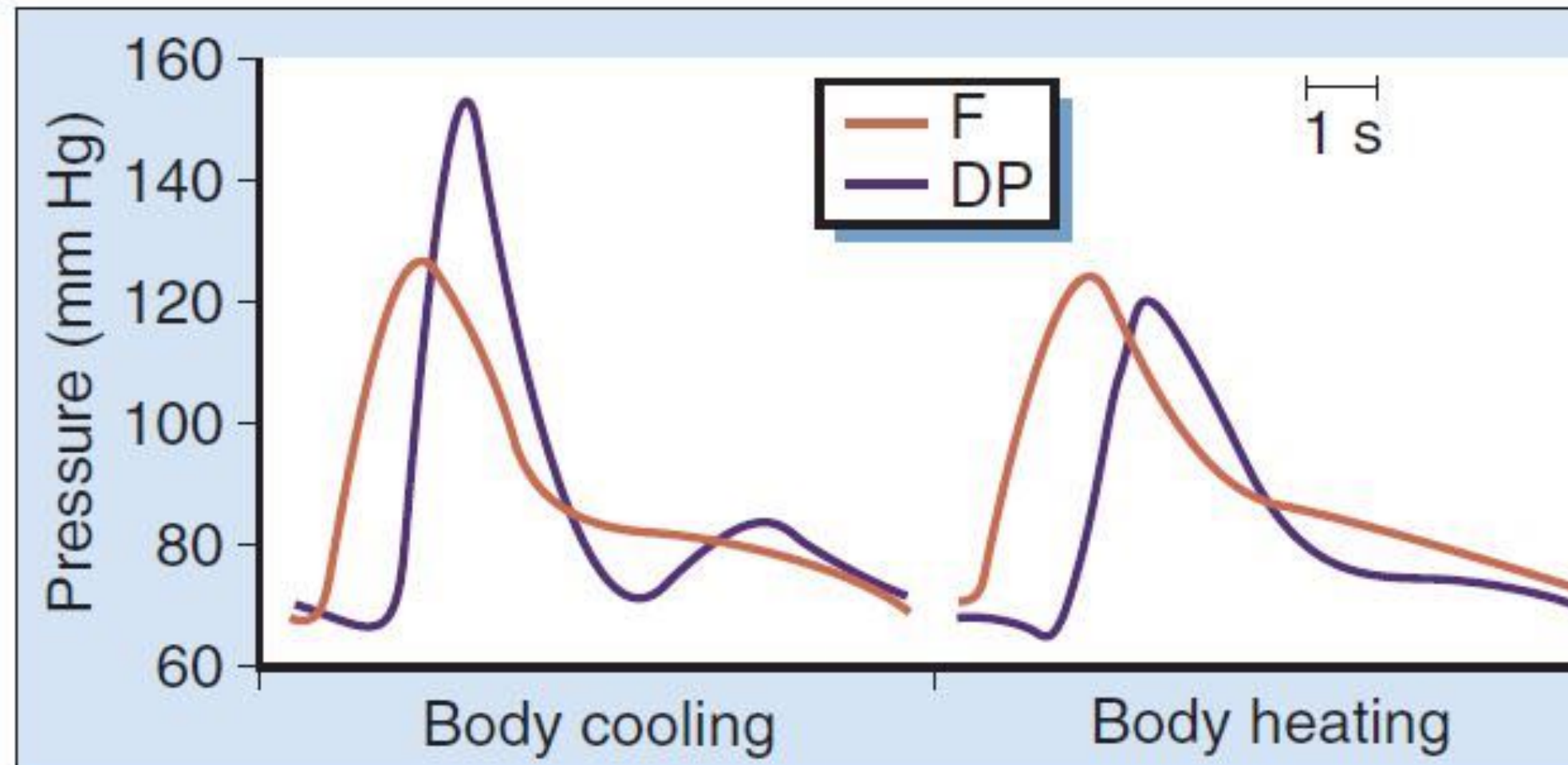
高



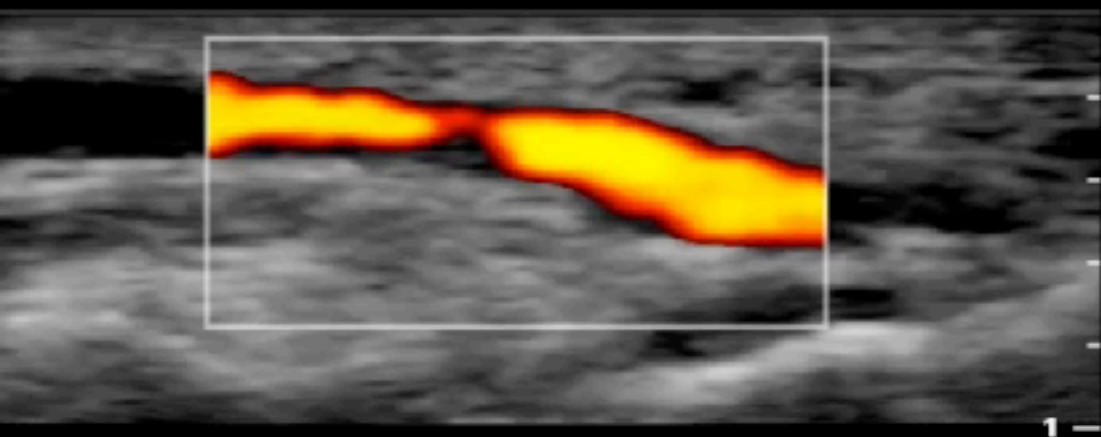
C

生理狀態的影響

溫度上升，阻力下降，血流增加

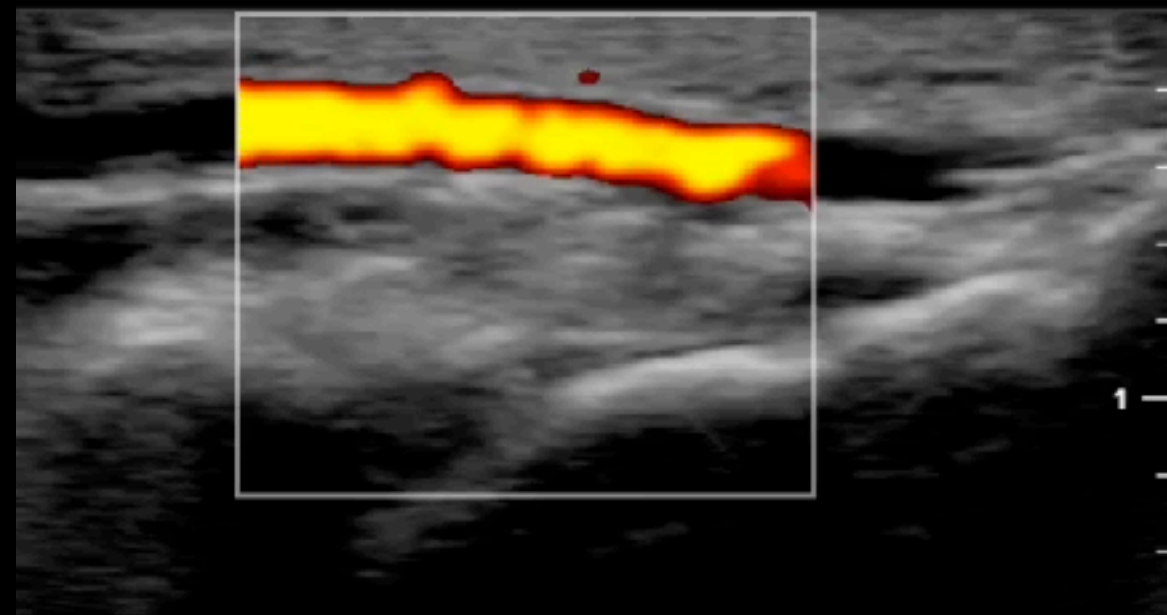
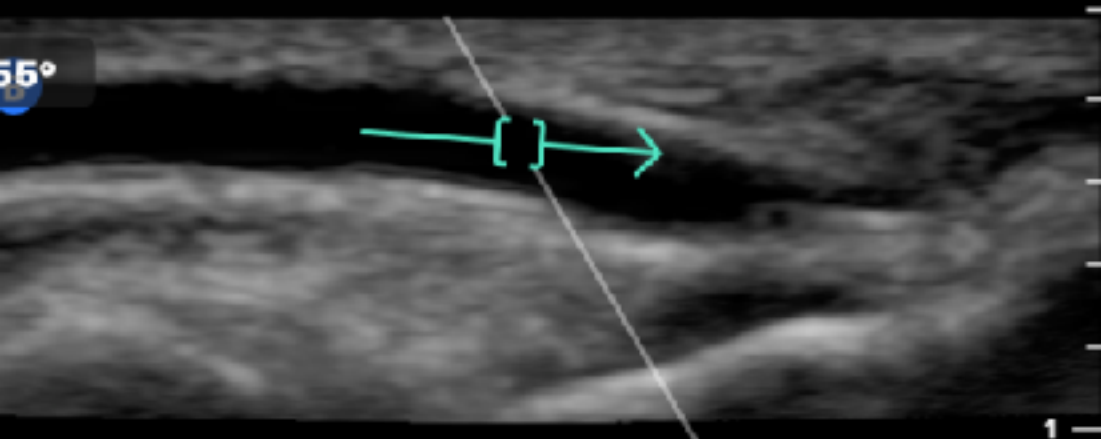
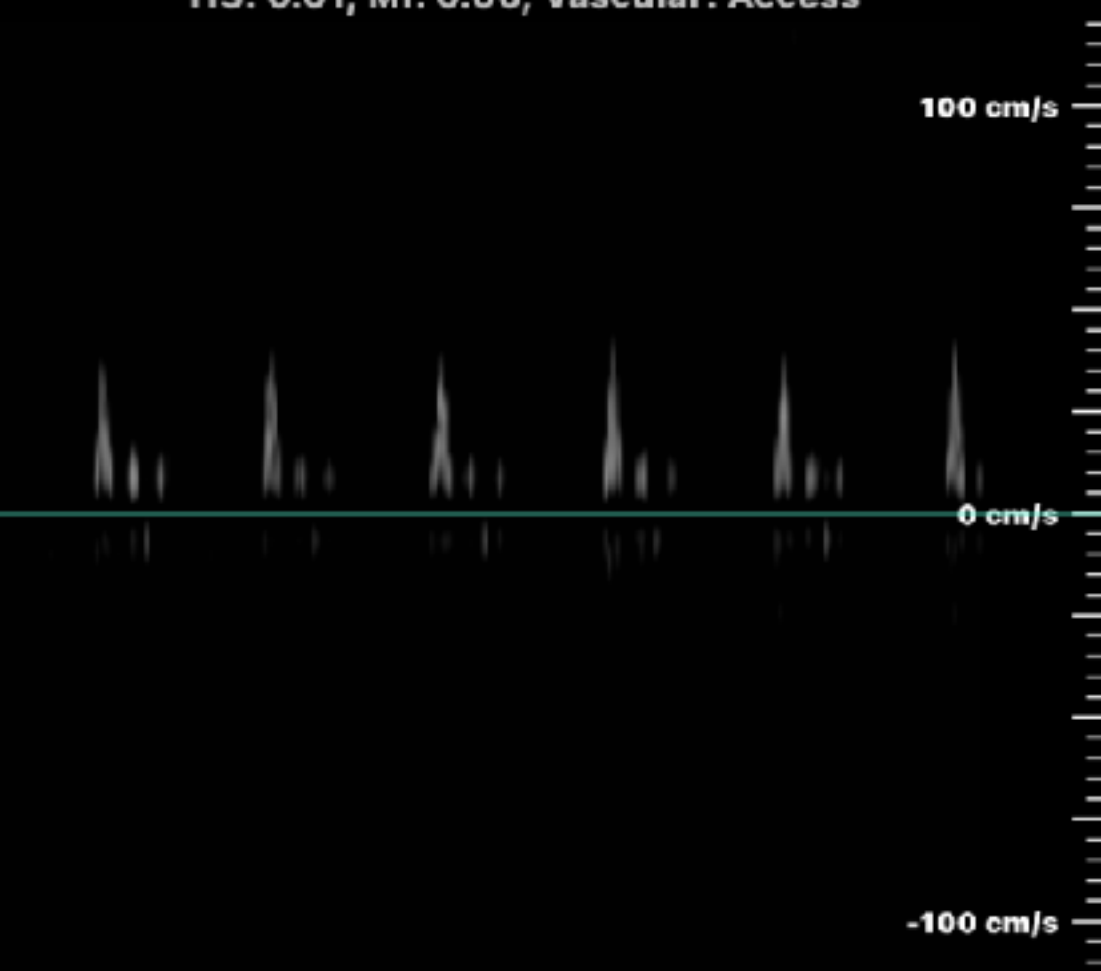


RA

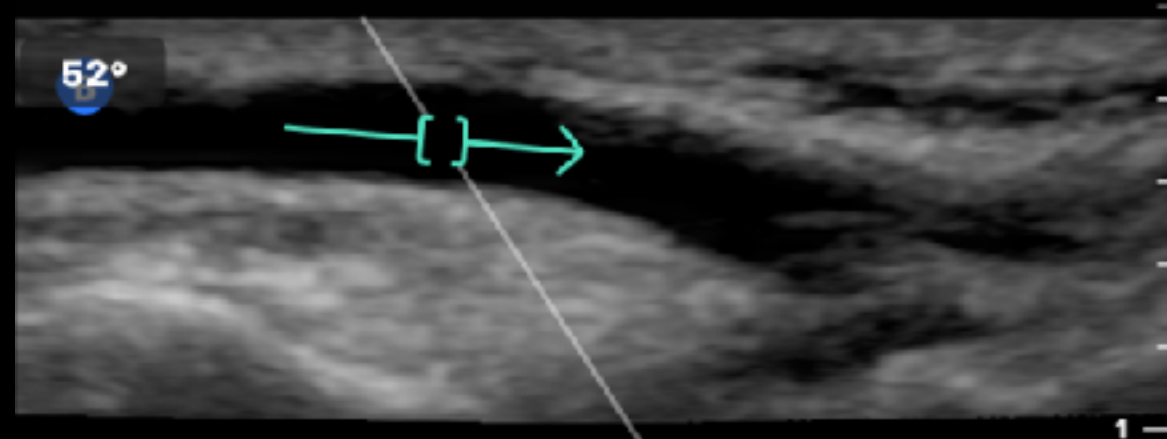
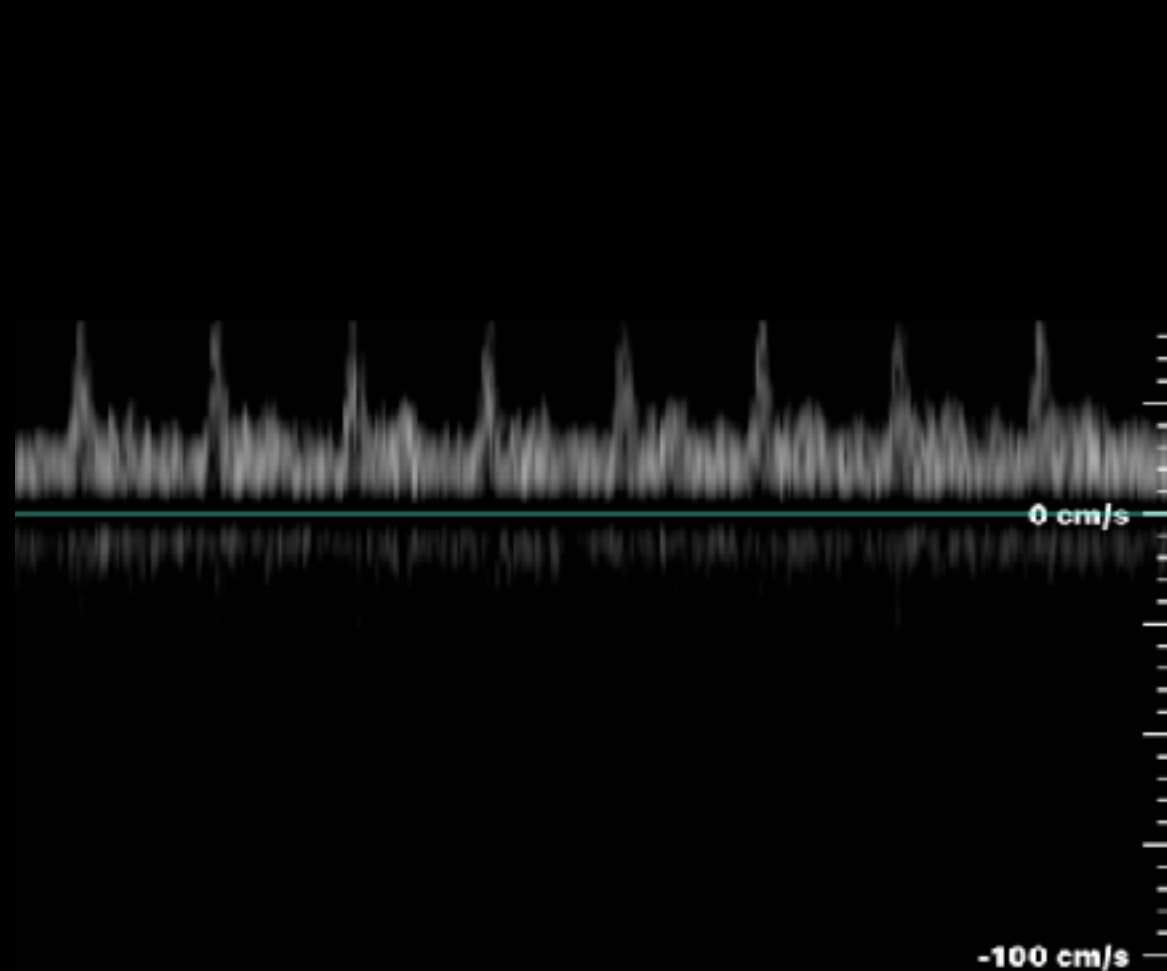


At rest

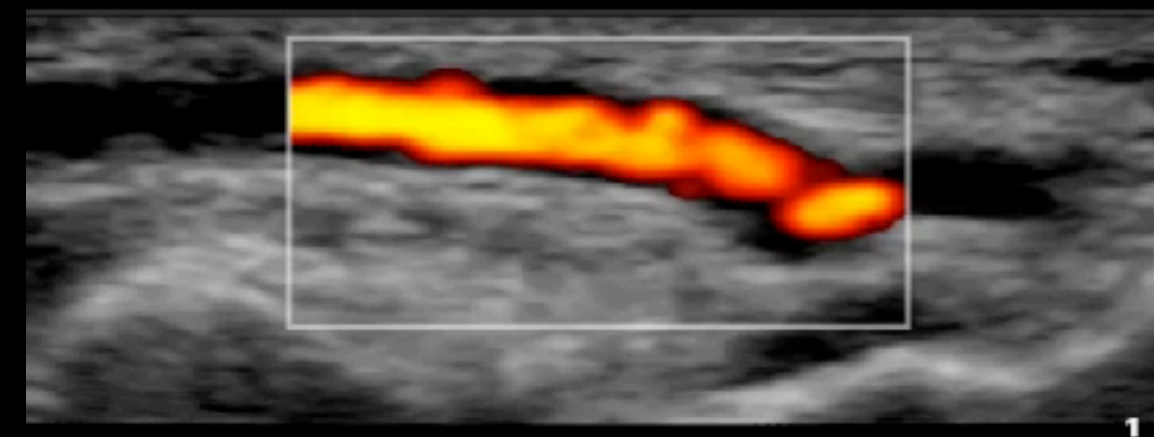
TIS: 0.01, MI: 0.06, Vascular: Access



Run 6K

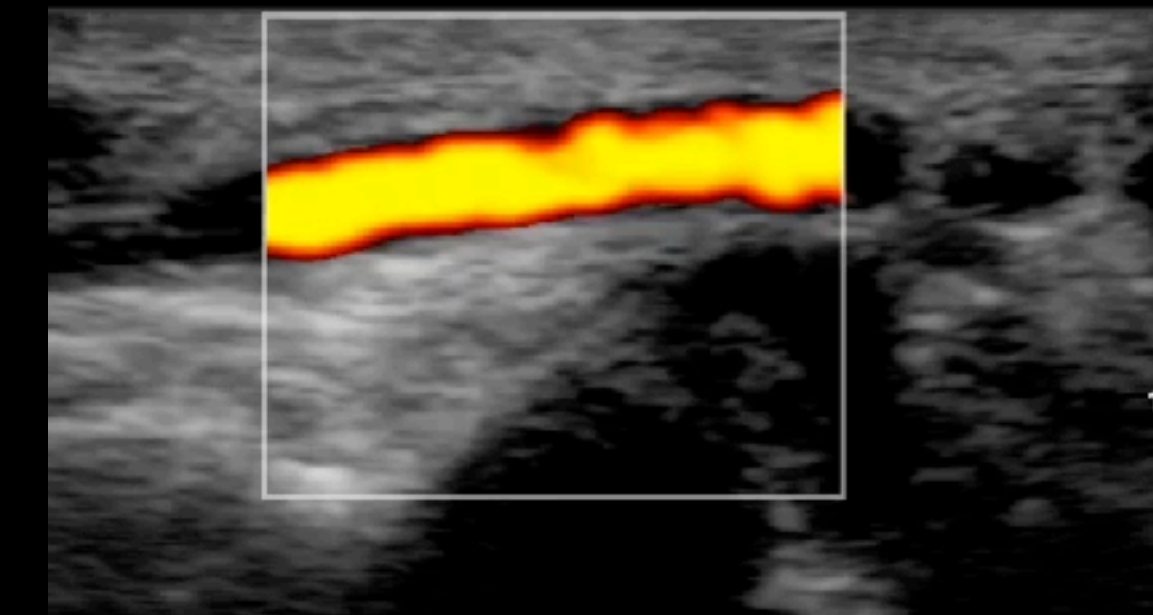
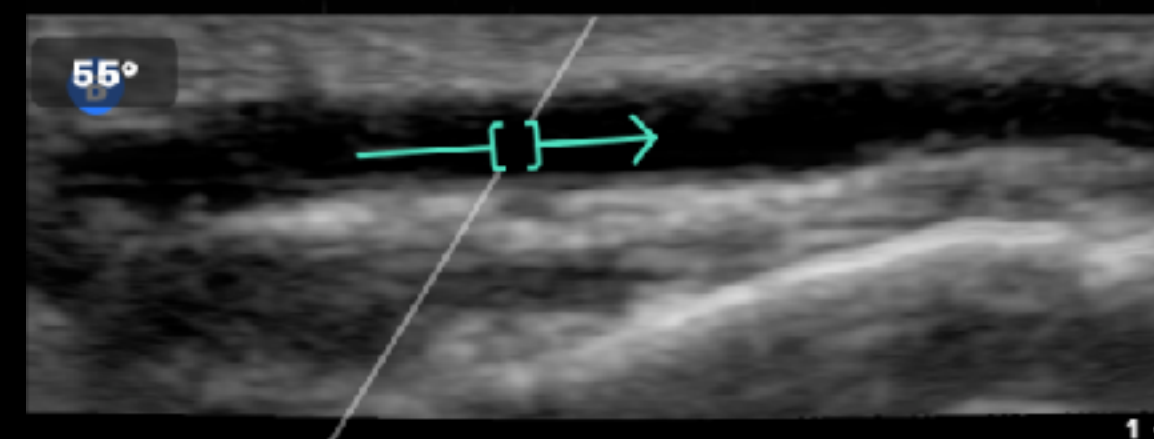
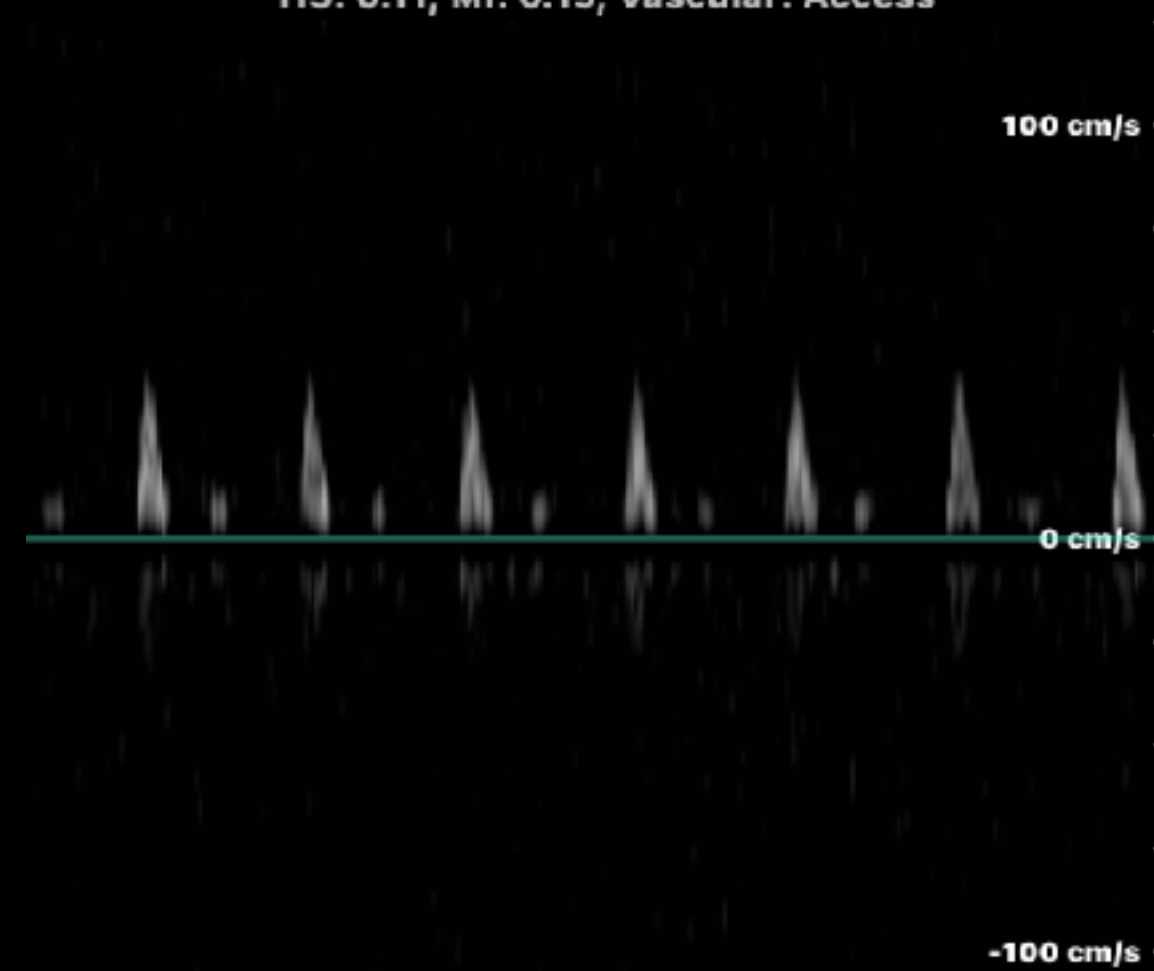


DPA



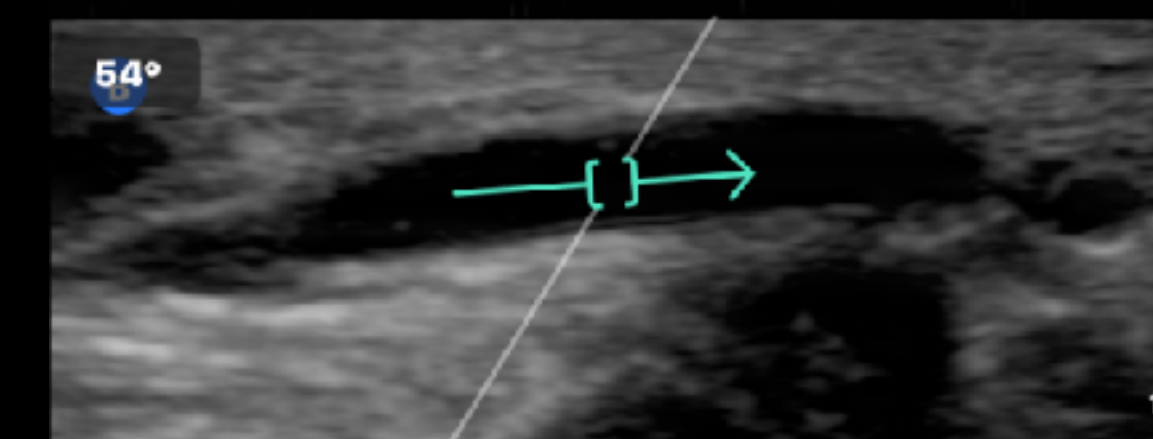
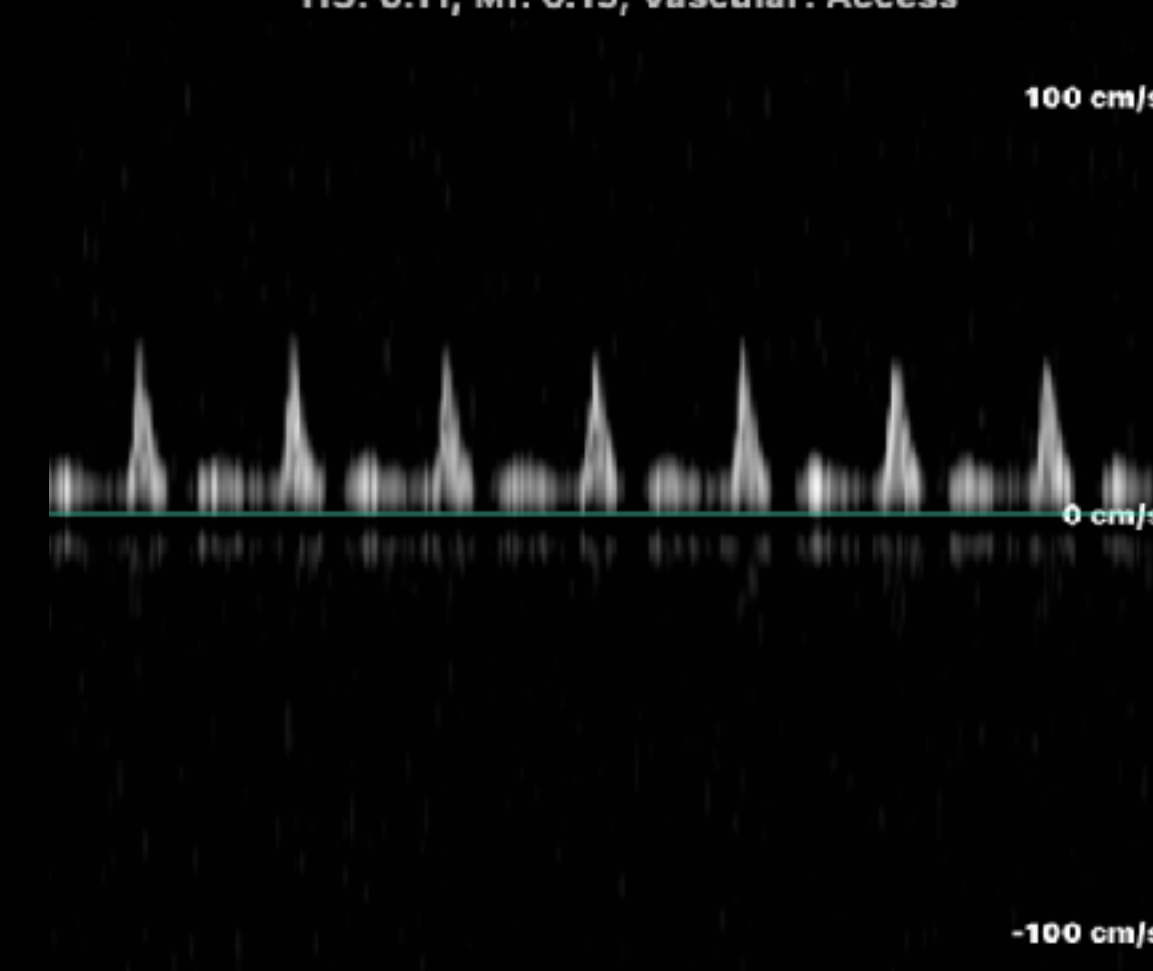
At rest

TIS: 0.11, MI: 0.19, Vascular: Access



Run 6K

TIS: 0.11, MI: 0.19, Vascular: Access



RESISTANCE INDEX (阻力係數)

TE7 ACE

23-11-2022

13556011

Carotid

14:10:13

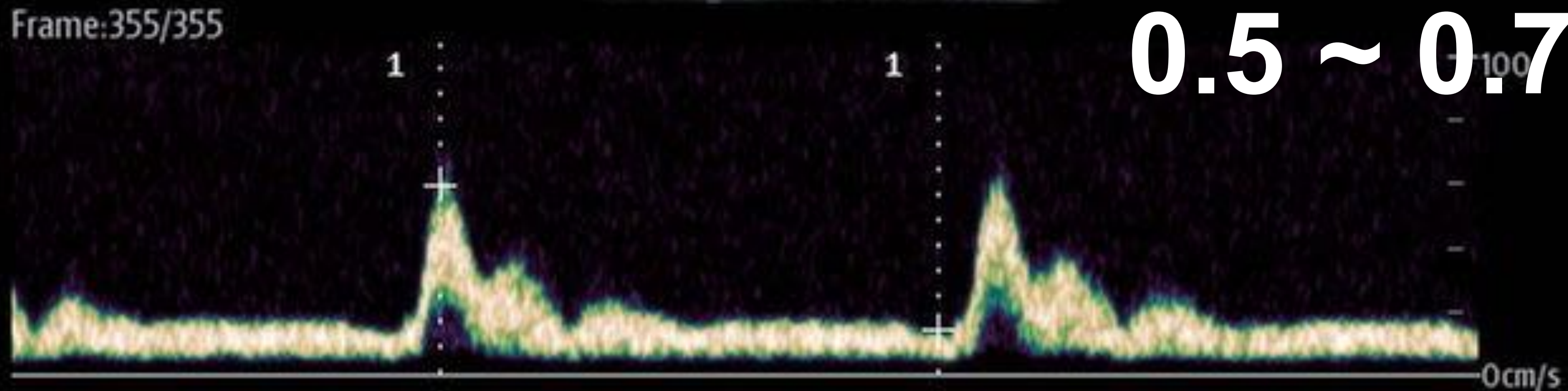
L12-4s AP 96.6% MI 0.27 TIS 0.0

B
FH10.0
DR 105
FR 22
D 3.5
G 50
C
F5.0 /G 50
WF 497
PRF 3.0k
PW
F5.0 /G 50
WF 569
SVD 15.2
SV 3.0
PRF 6.9k
Angle -59°



1	Lt Prox CCA PS	59.21 cm/s
	Lt Prox CCA ED	14.21 cm/s
	Lt Prox CCA RI	0.76

PS-ED/PS
0.5 ~ 0.7



CCA FLOW

TE7 ACE

23-11-2022

13556011

Carotid

14:13:31

L12-4s AP 96.6% MI 0.34 TIS 0.0

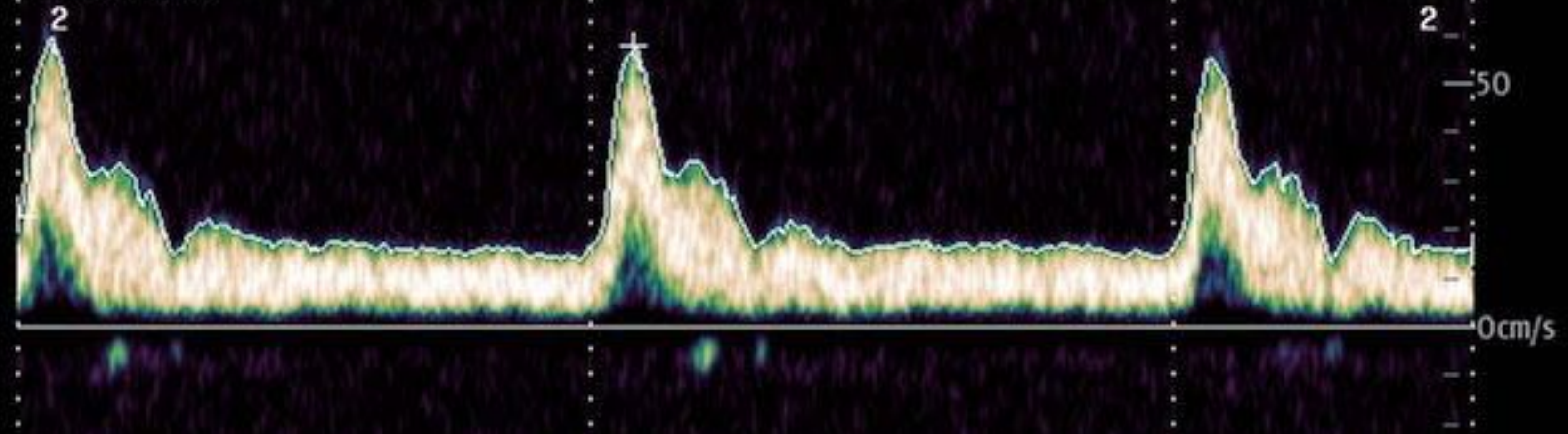
B
FH10.0
DR 105
FR 40
D 3.5
G 50
PW
F5.0 /G 50
WF360
SVD 153
SV 3.0
PRF 4.4k
Angle -60°

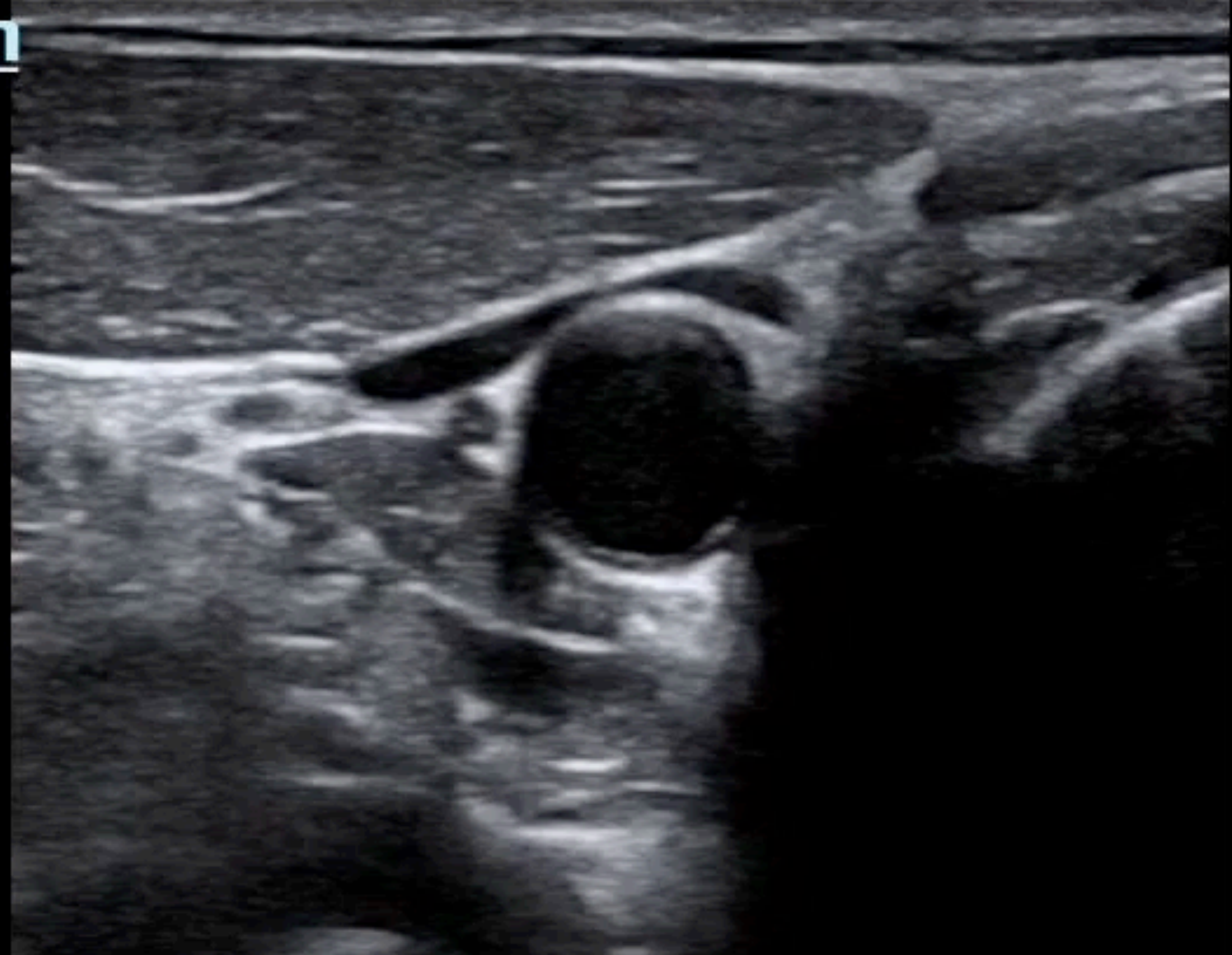
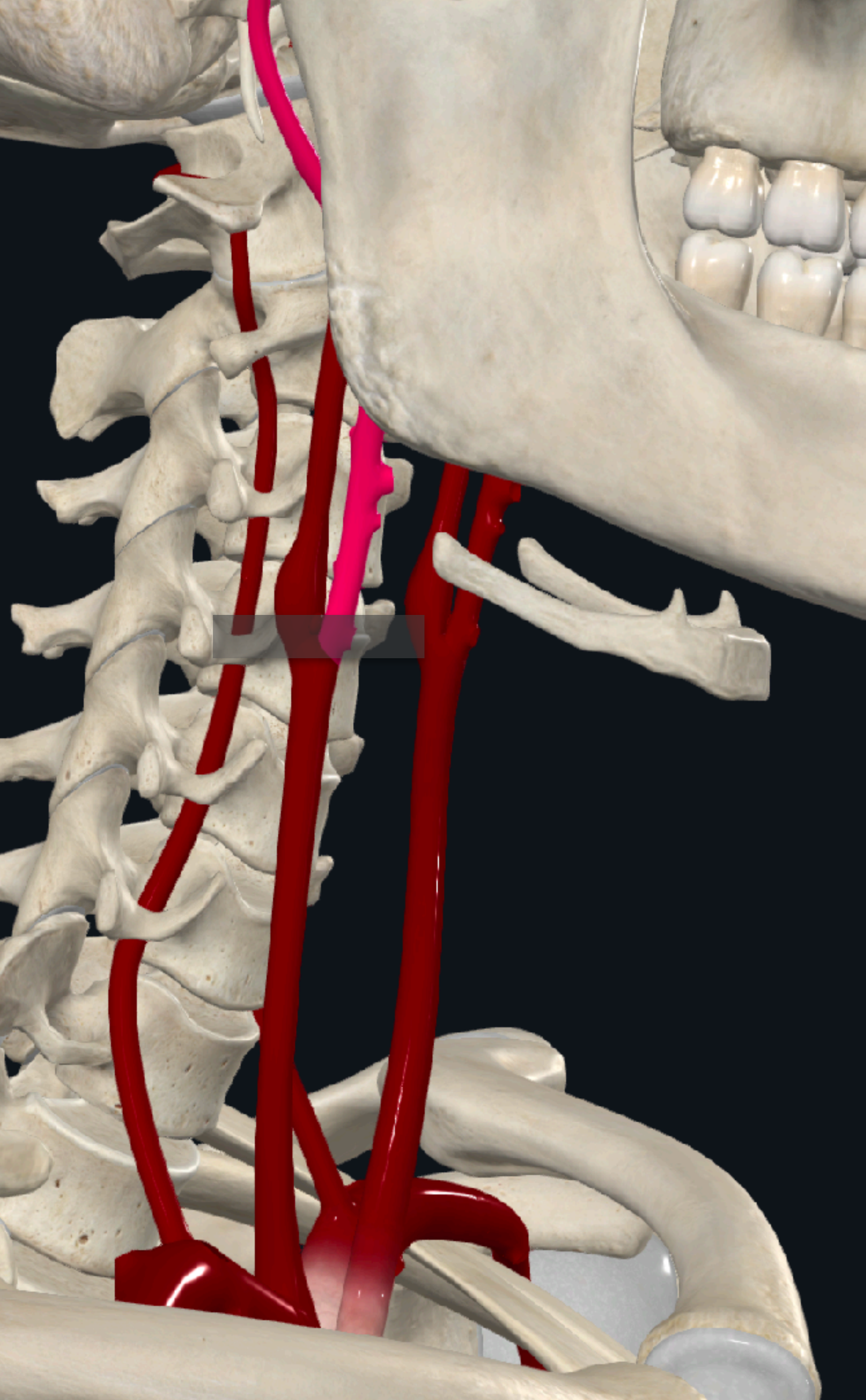


Frame: 561/561

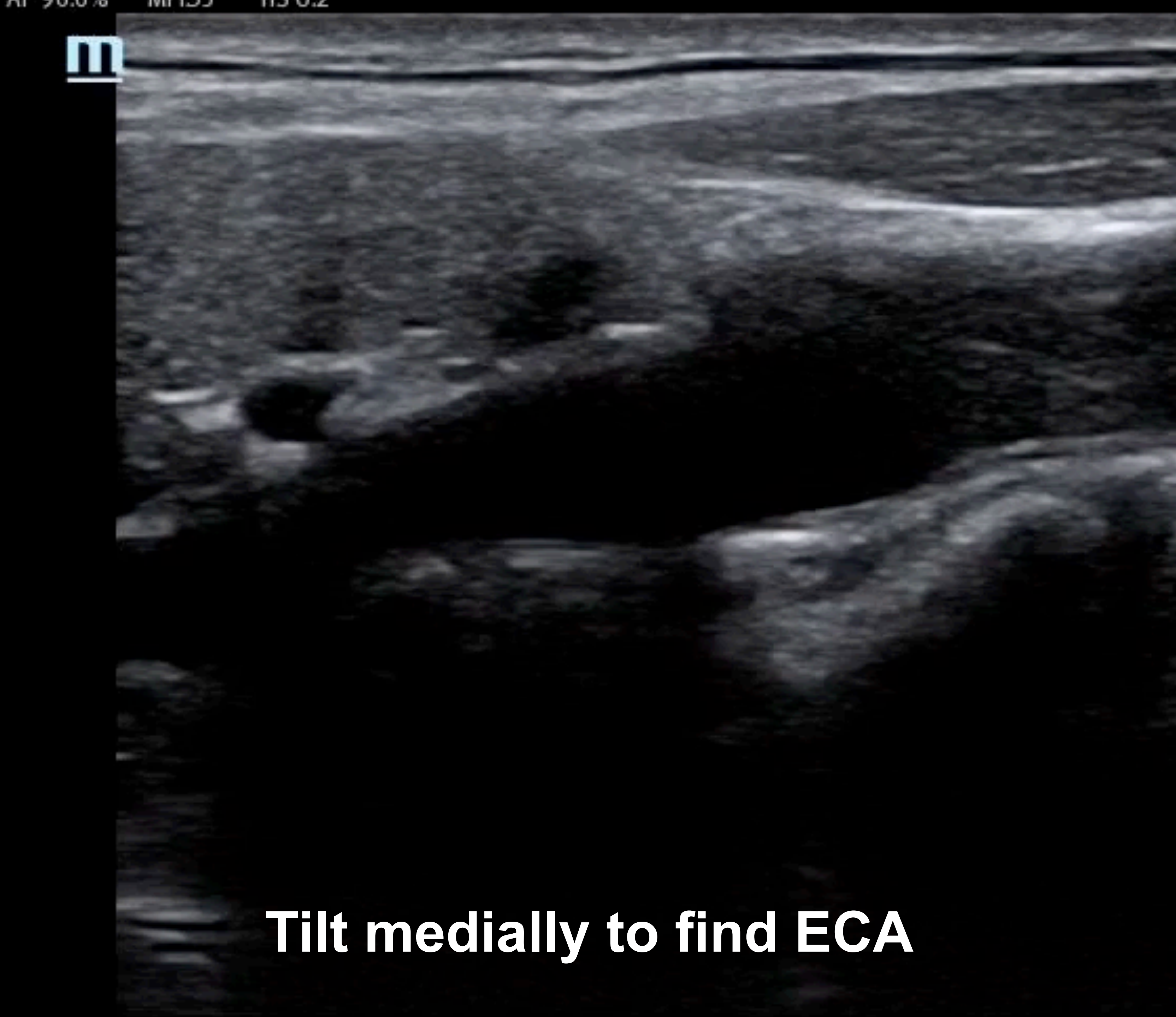
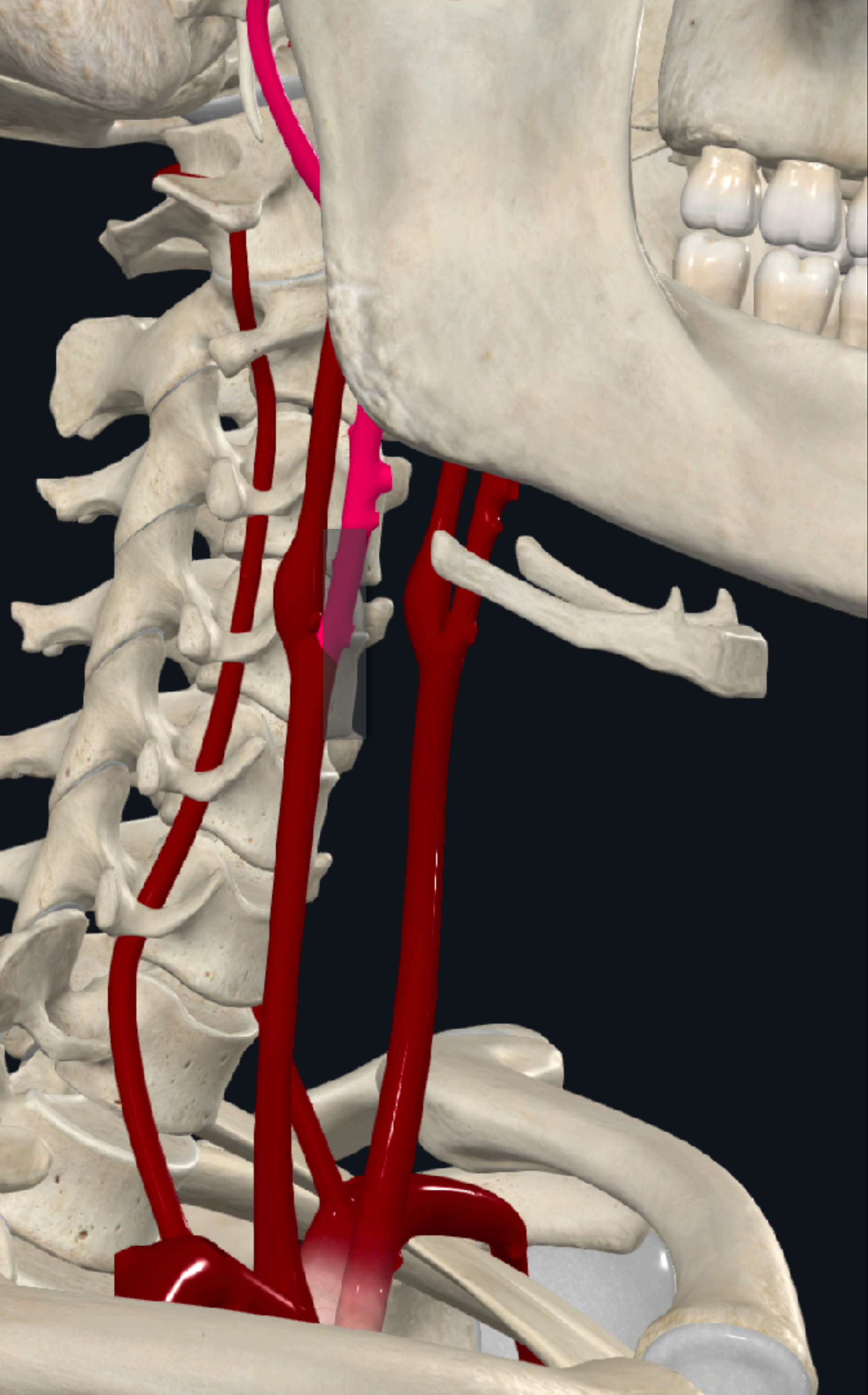


1	Vas Diam	0.66 cm
	Vas Area	0.35 cm ²
2	TAMAX	22.04 cm/s
	Vol Flow(TAMAX)	458.1 ml/min

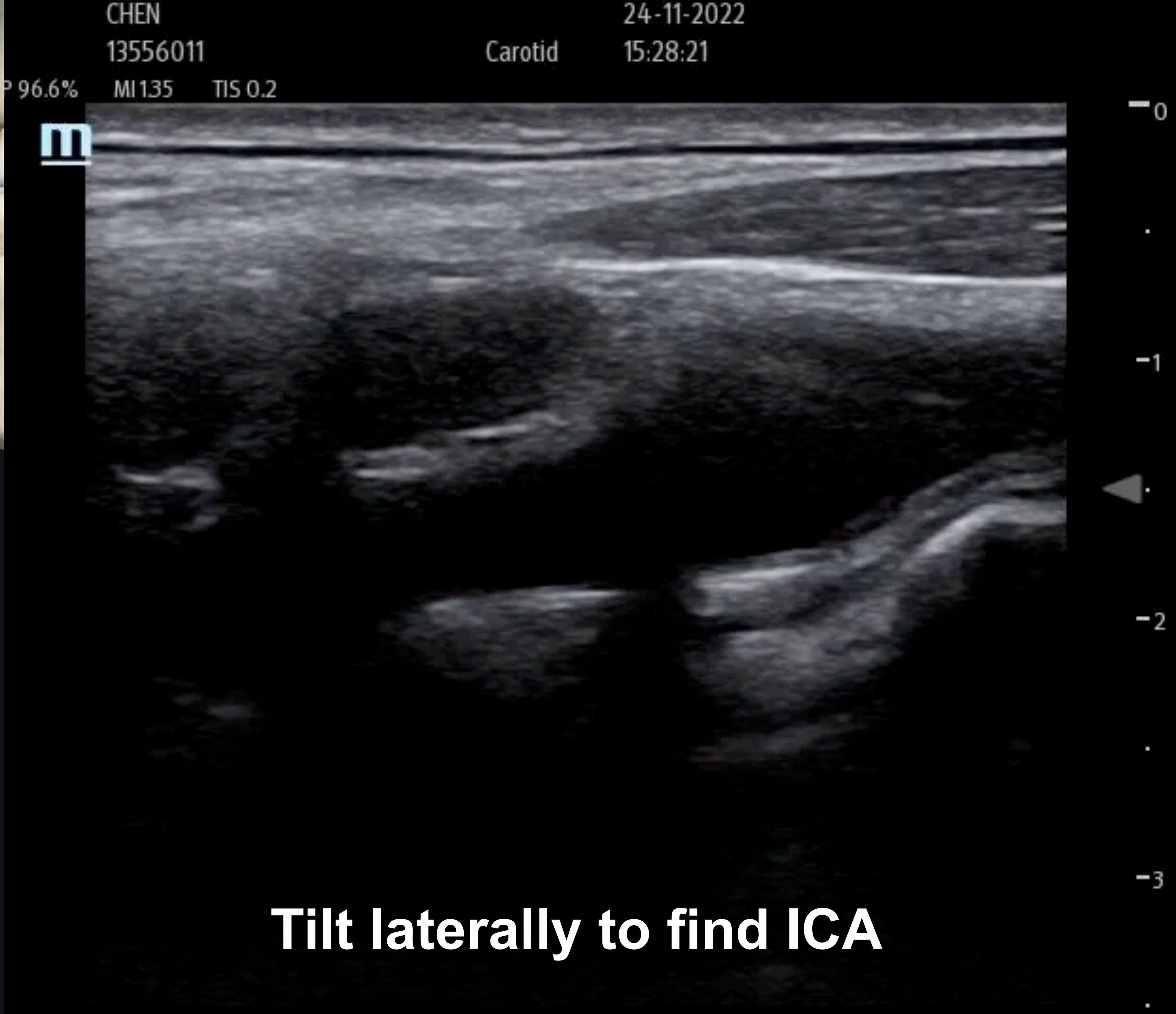
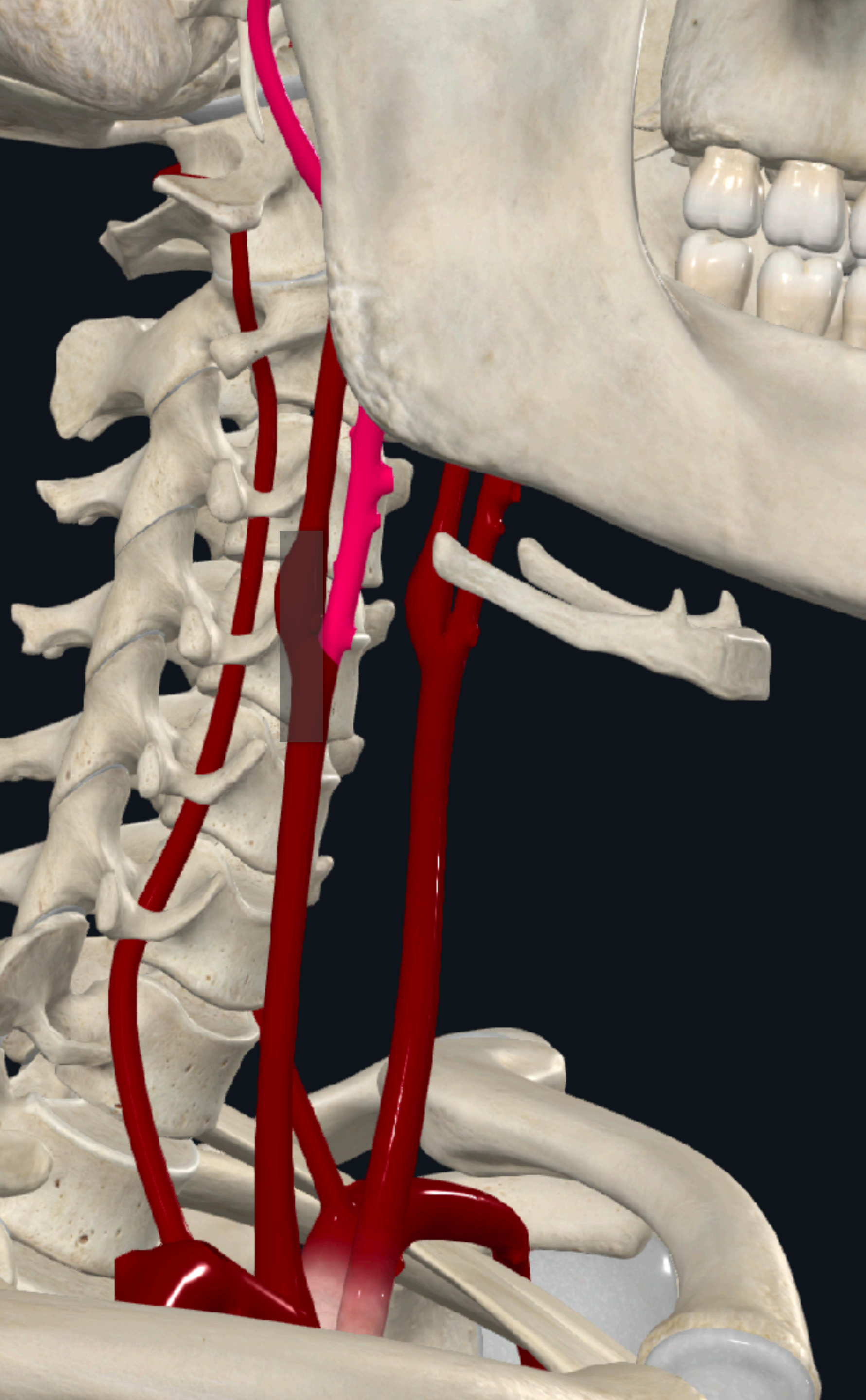




CCA to ICA (post) & ECA (ant)



Tilt medially to find ECA



CHEN
13556011

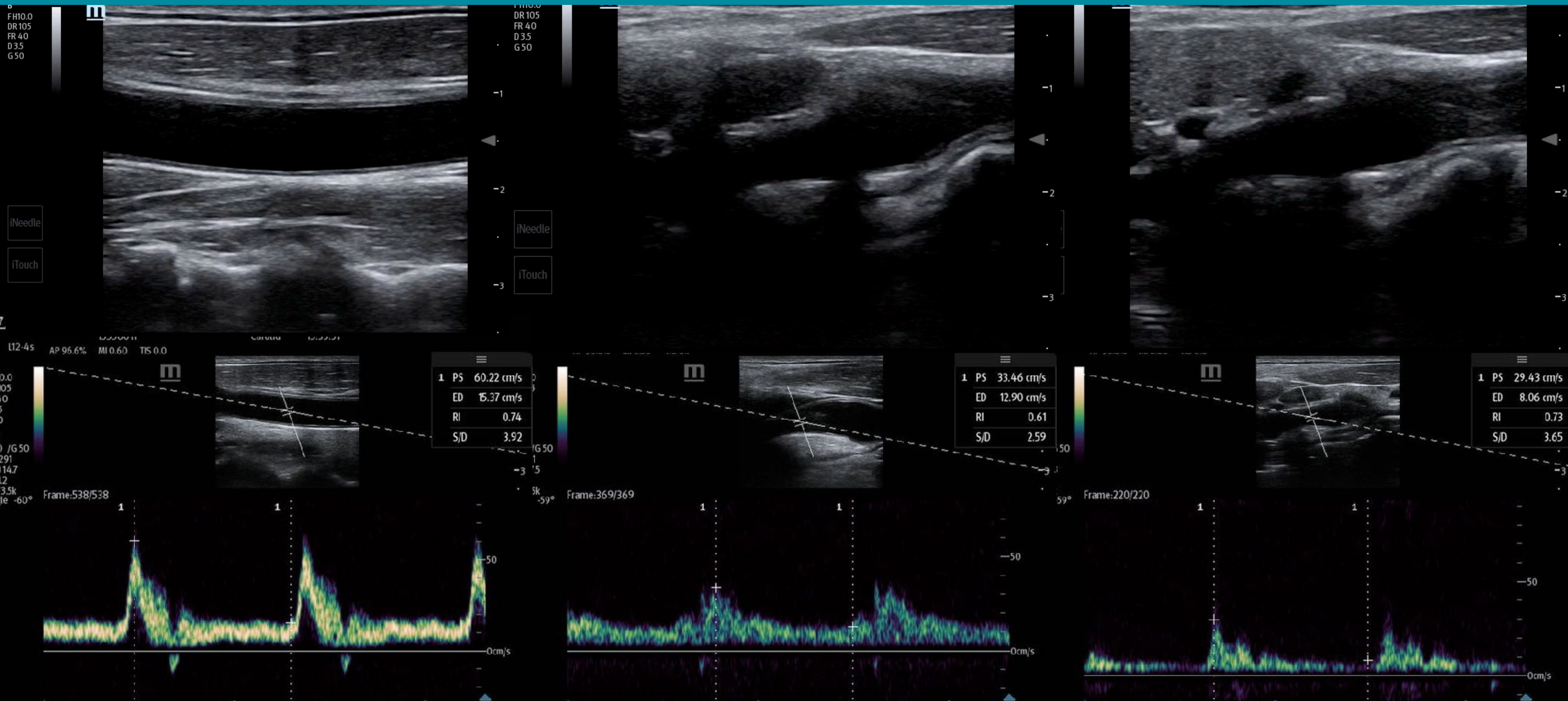
Carotid

24-11-2022
15:28:21

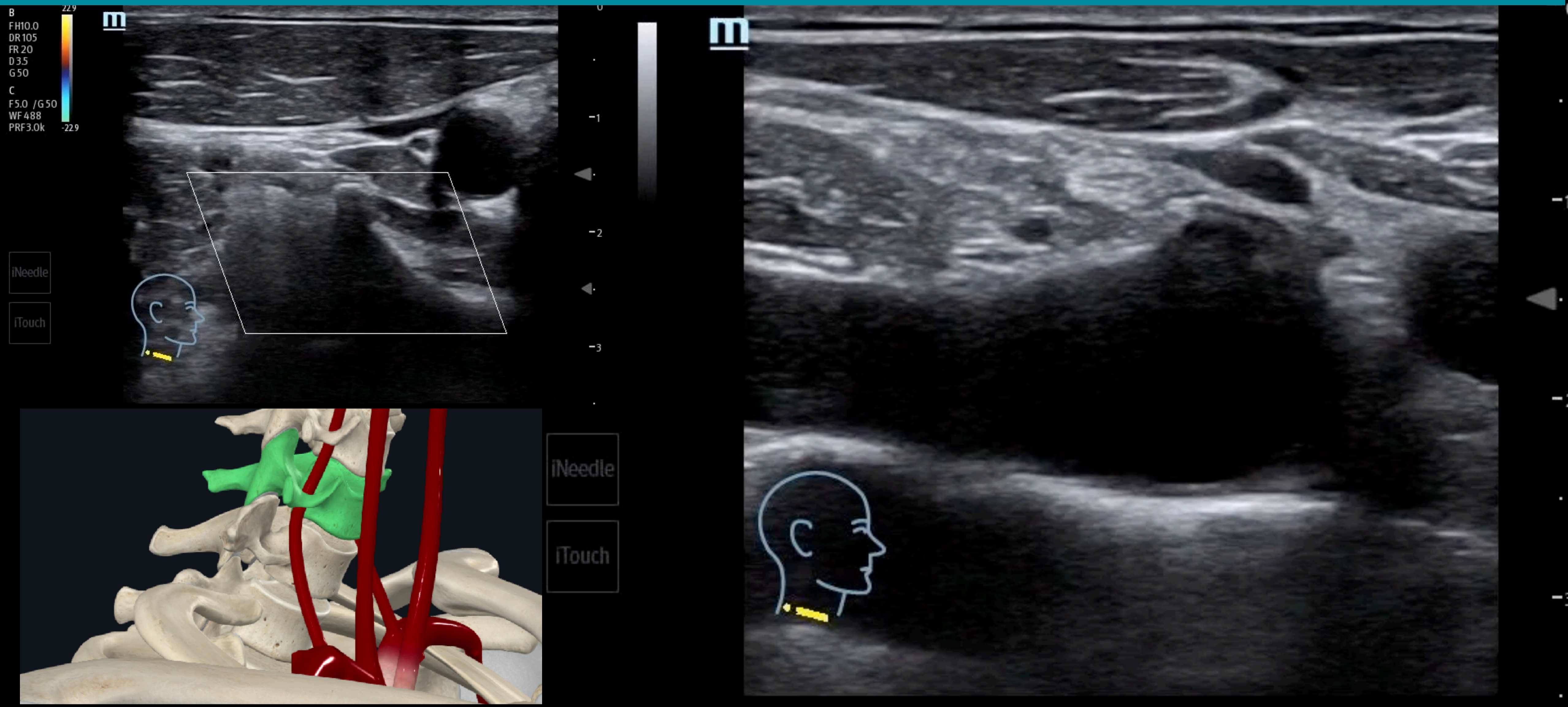
P 96.6% MI 135 TIS 0.2

Tilt laterally to find ICA

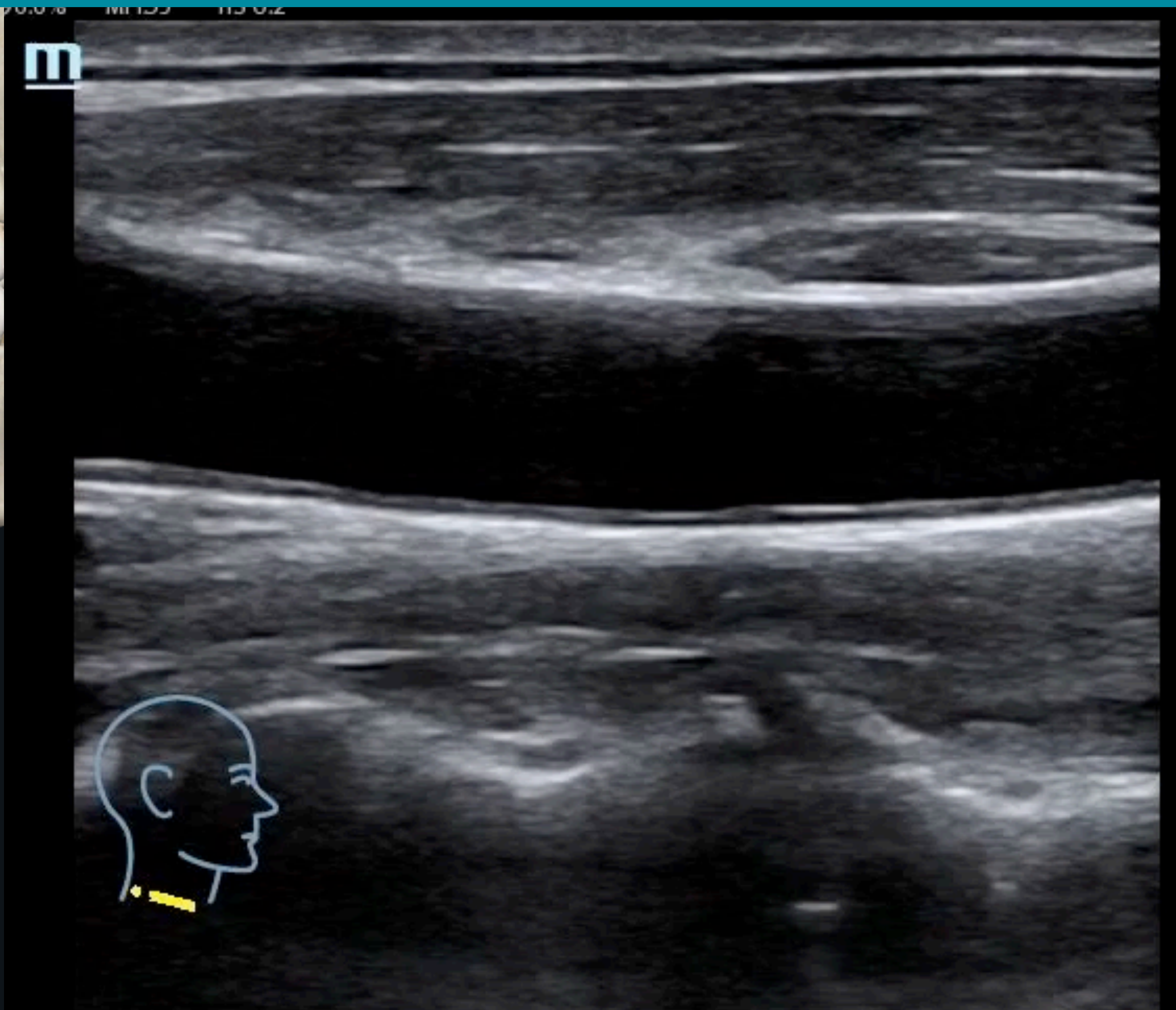
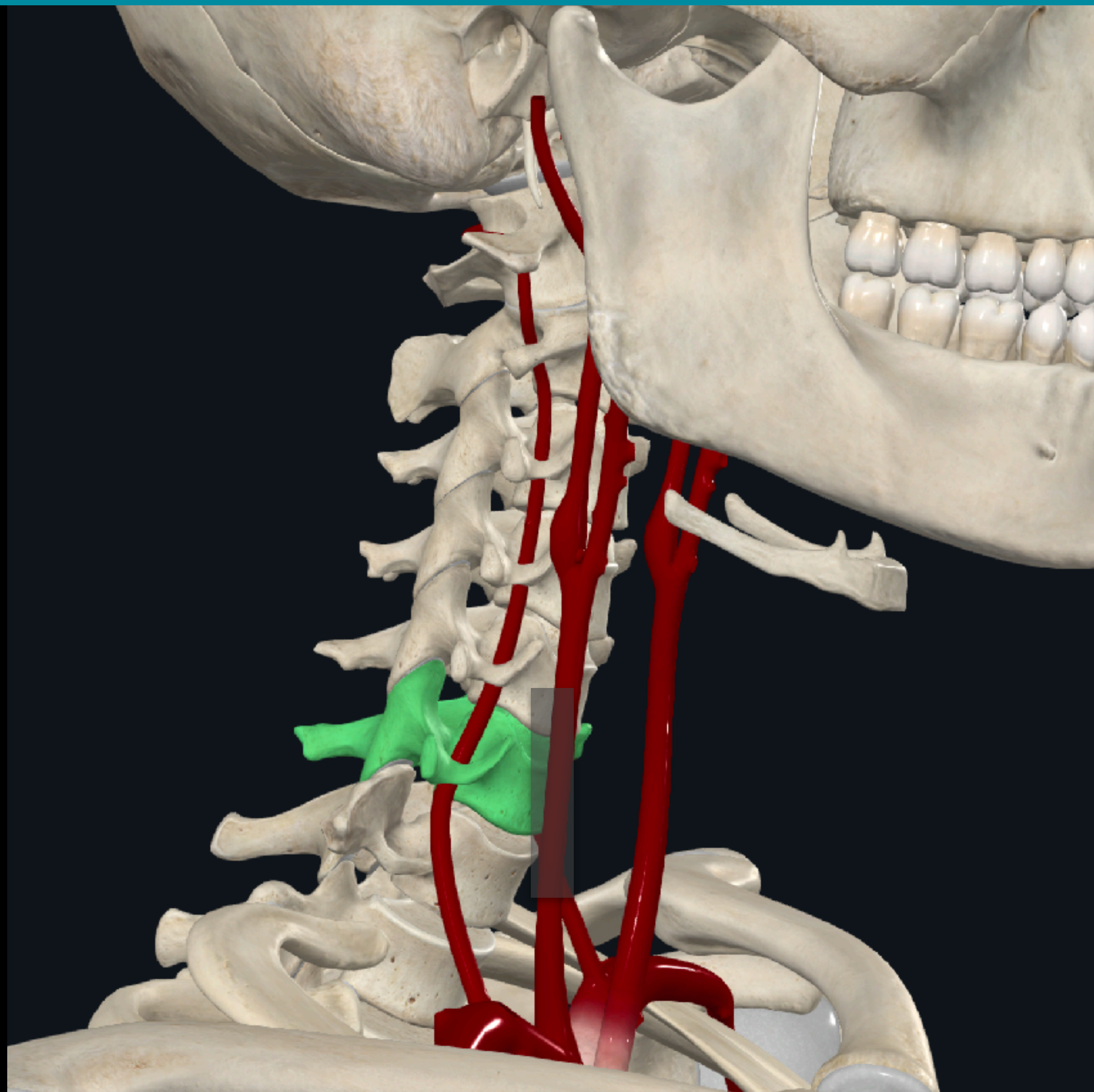
CCA - ICA - ECA



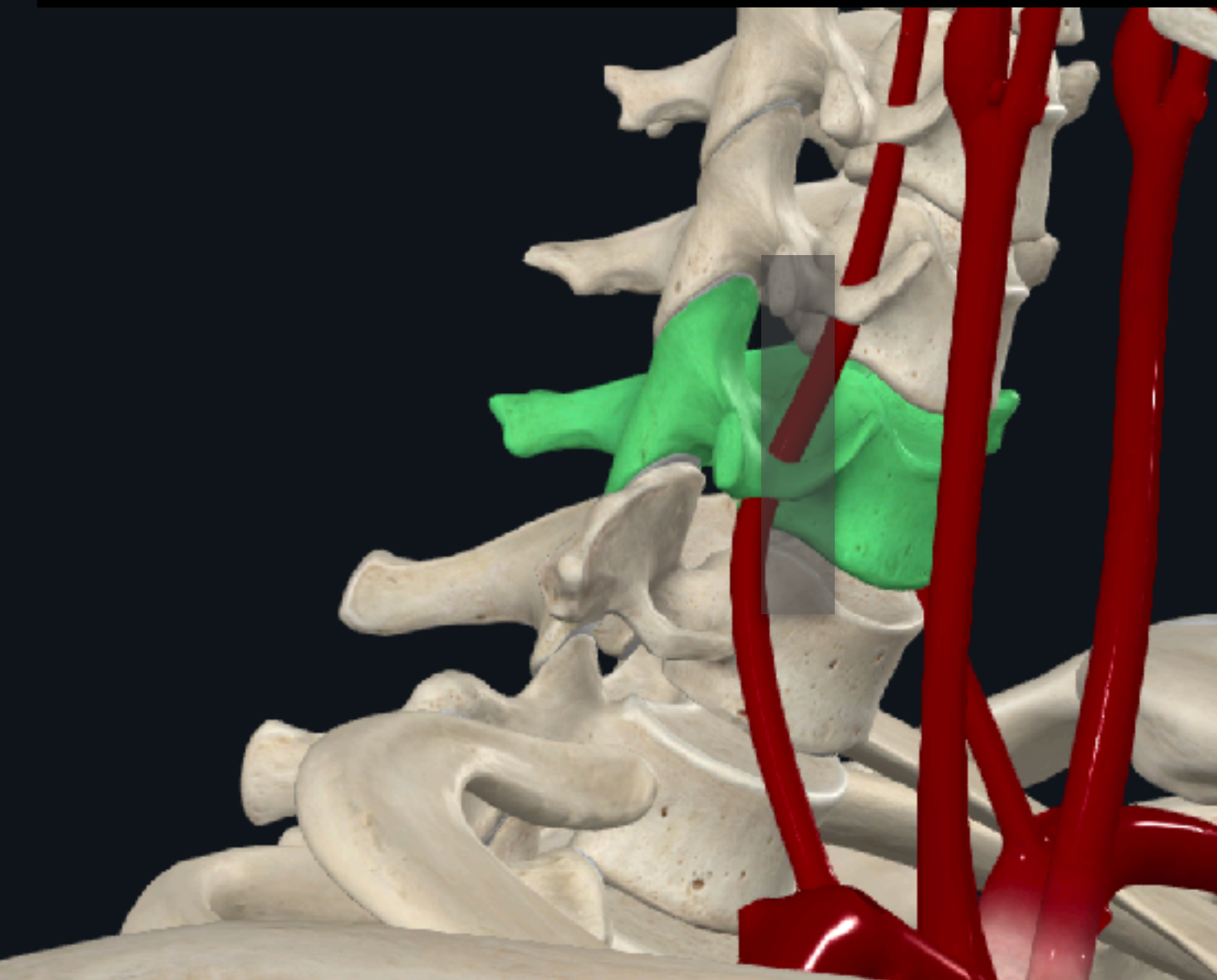
VA (FROM SUBCLAVIAN A)



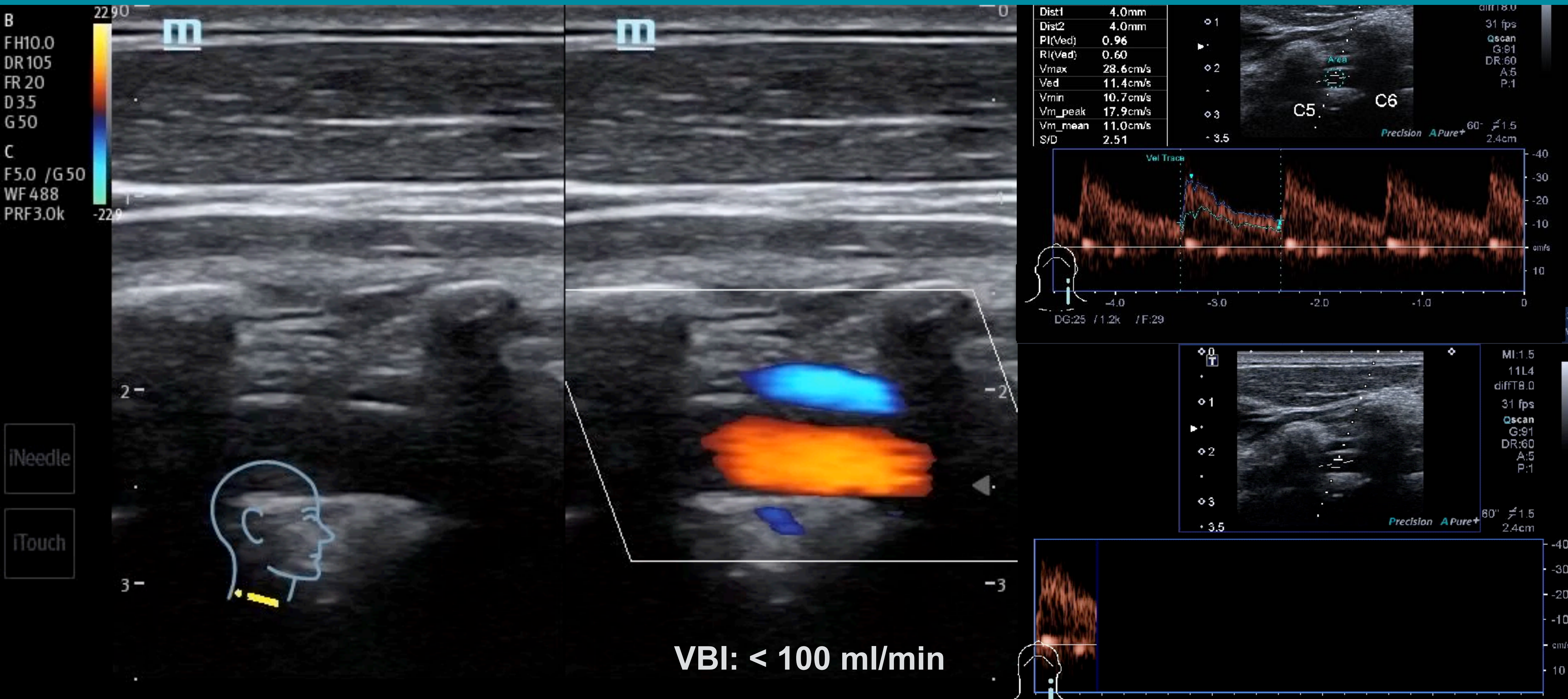
CCA TO VA (TILT):建議的手法



VA (C6)



VA & FLOW



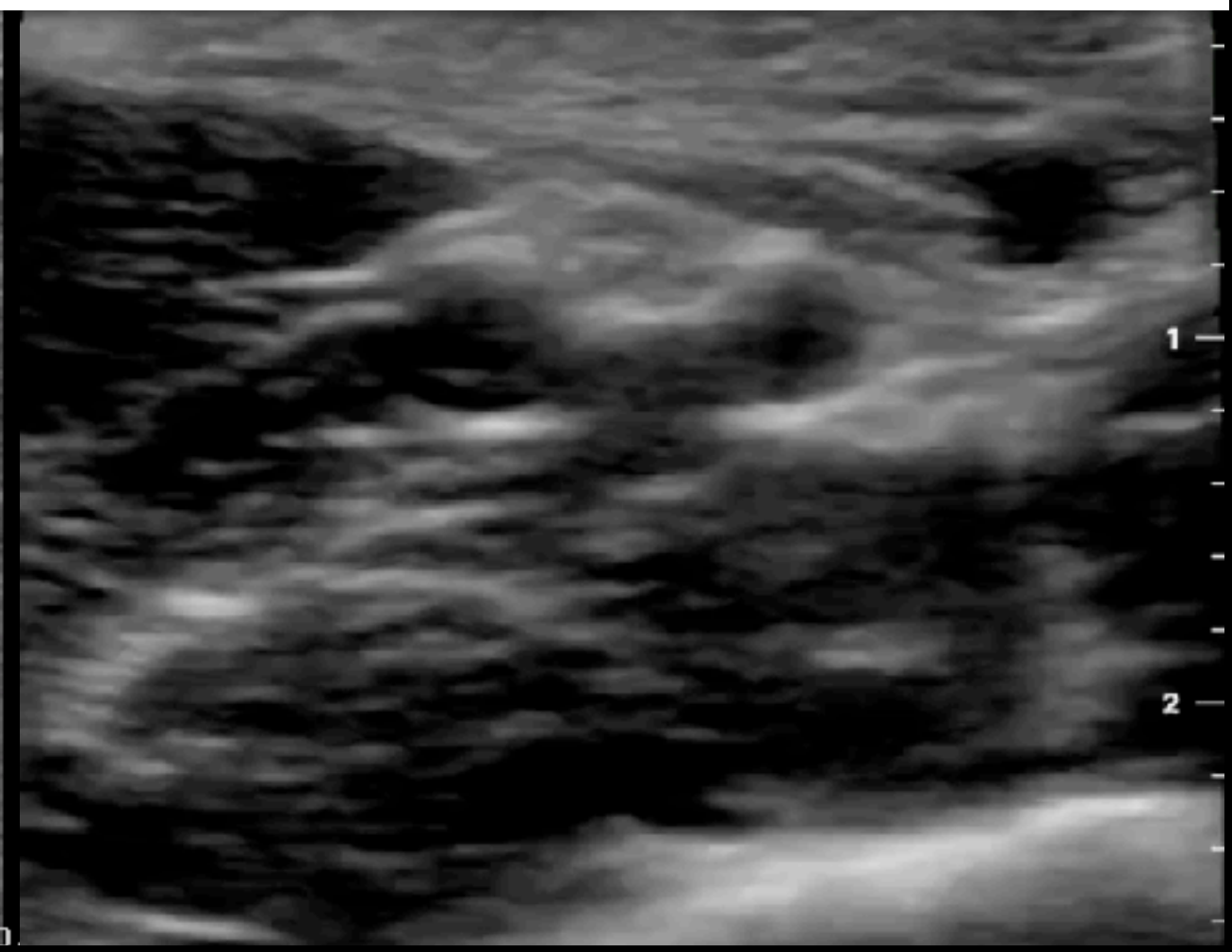
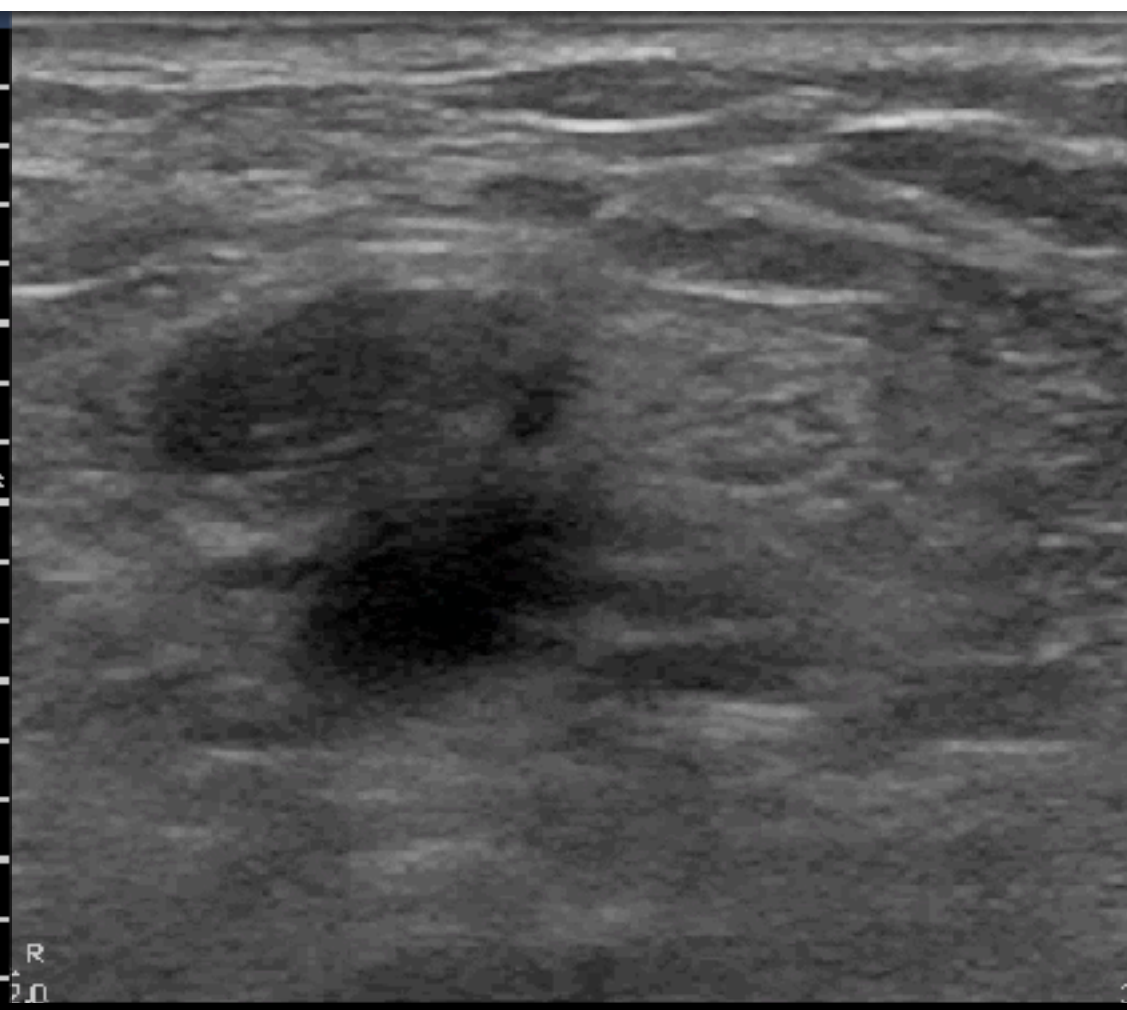
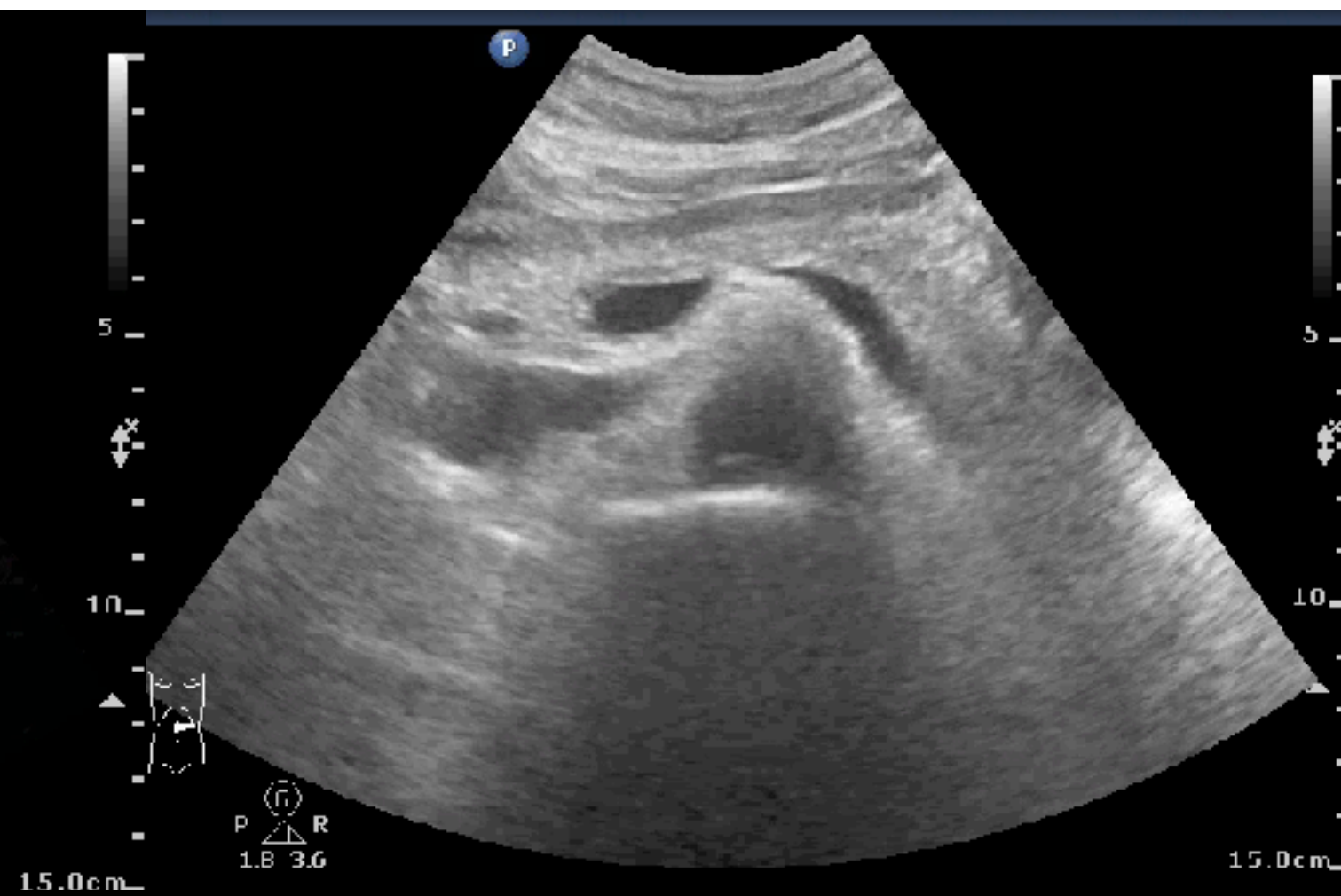
Vascular POCUS

AAA

AD

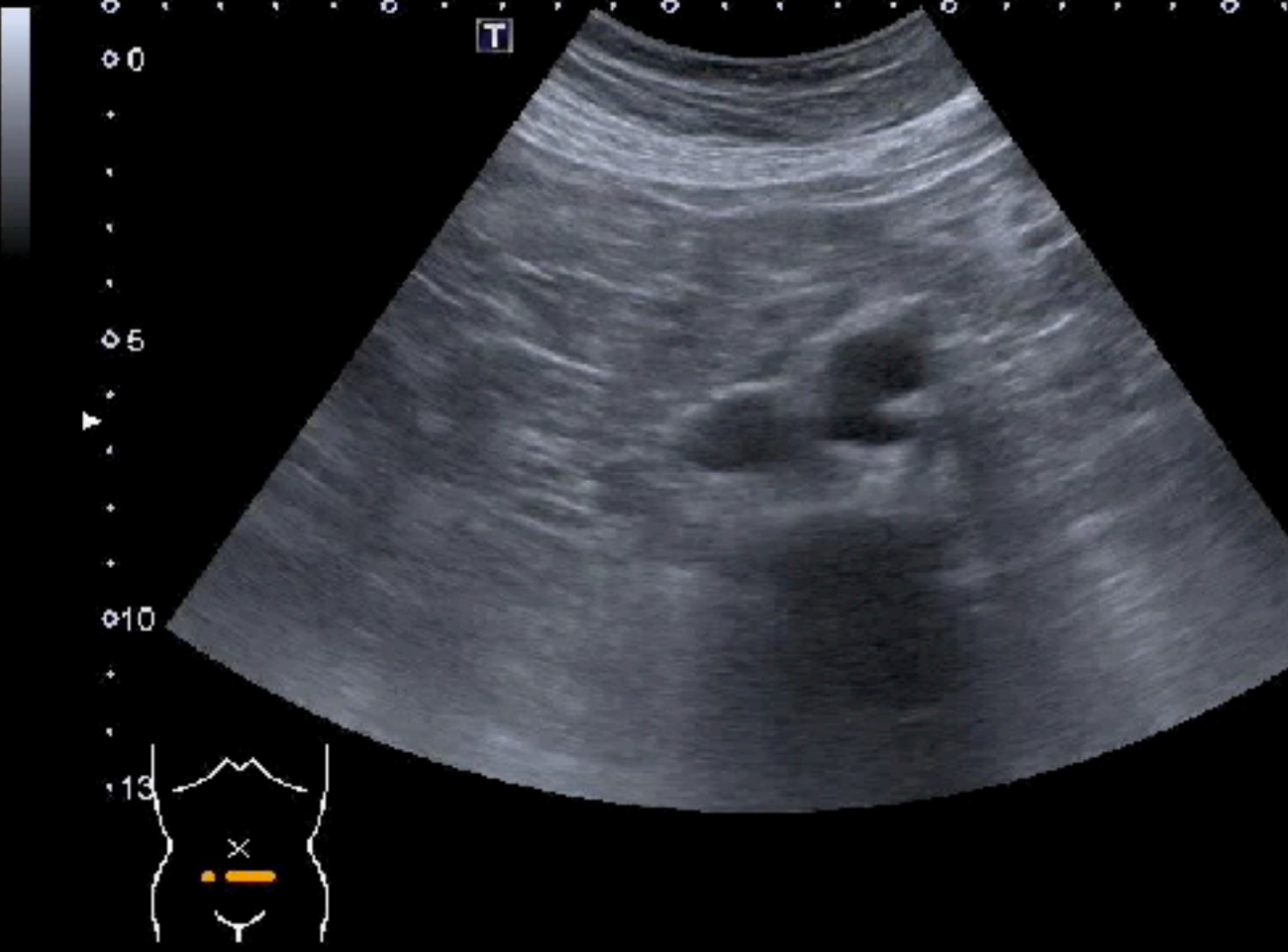
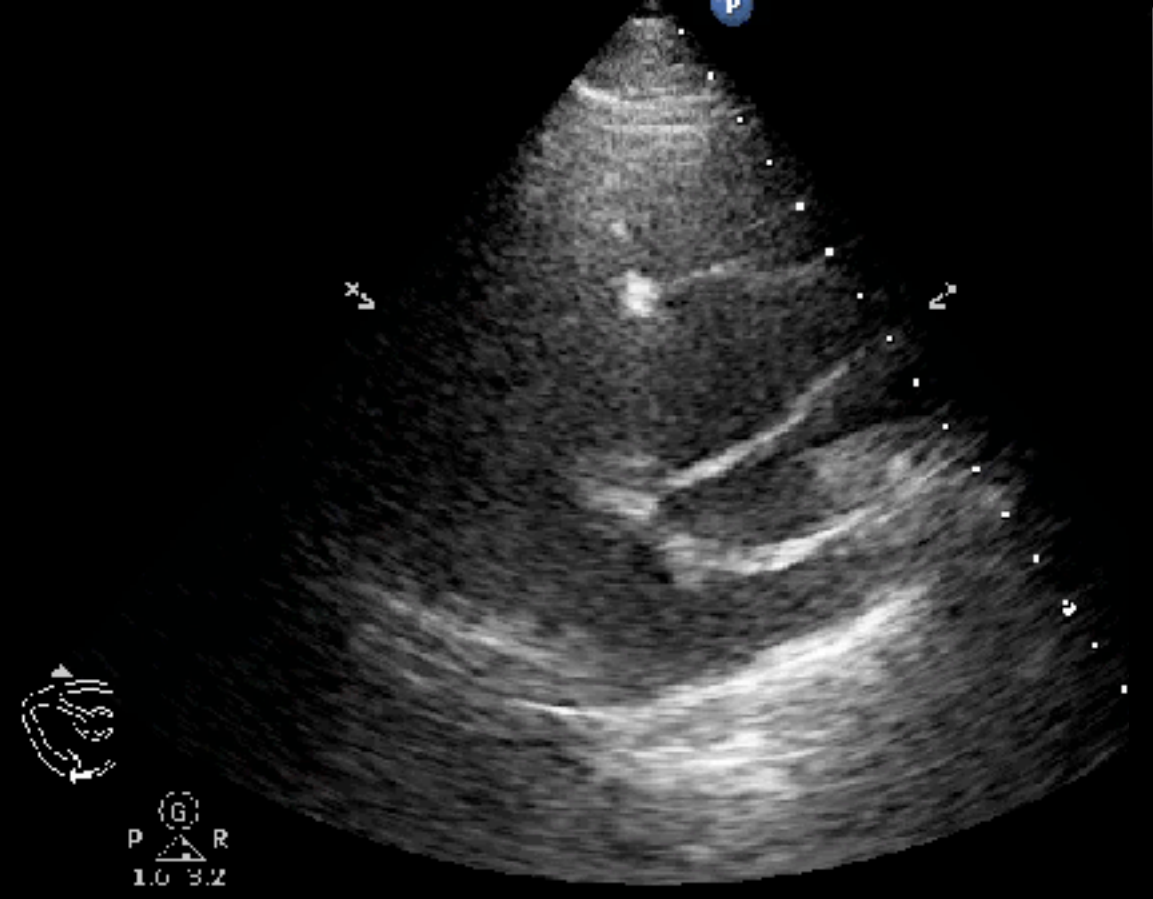
DVT

Line



Adult Echo
S5-1
31 Hz
17.0cm

2D
HGen
Cn 72
C 50
3/2/0

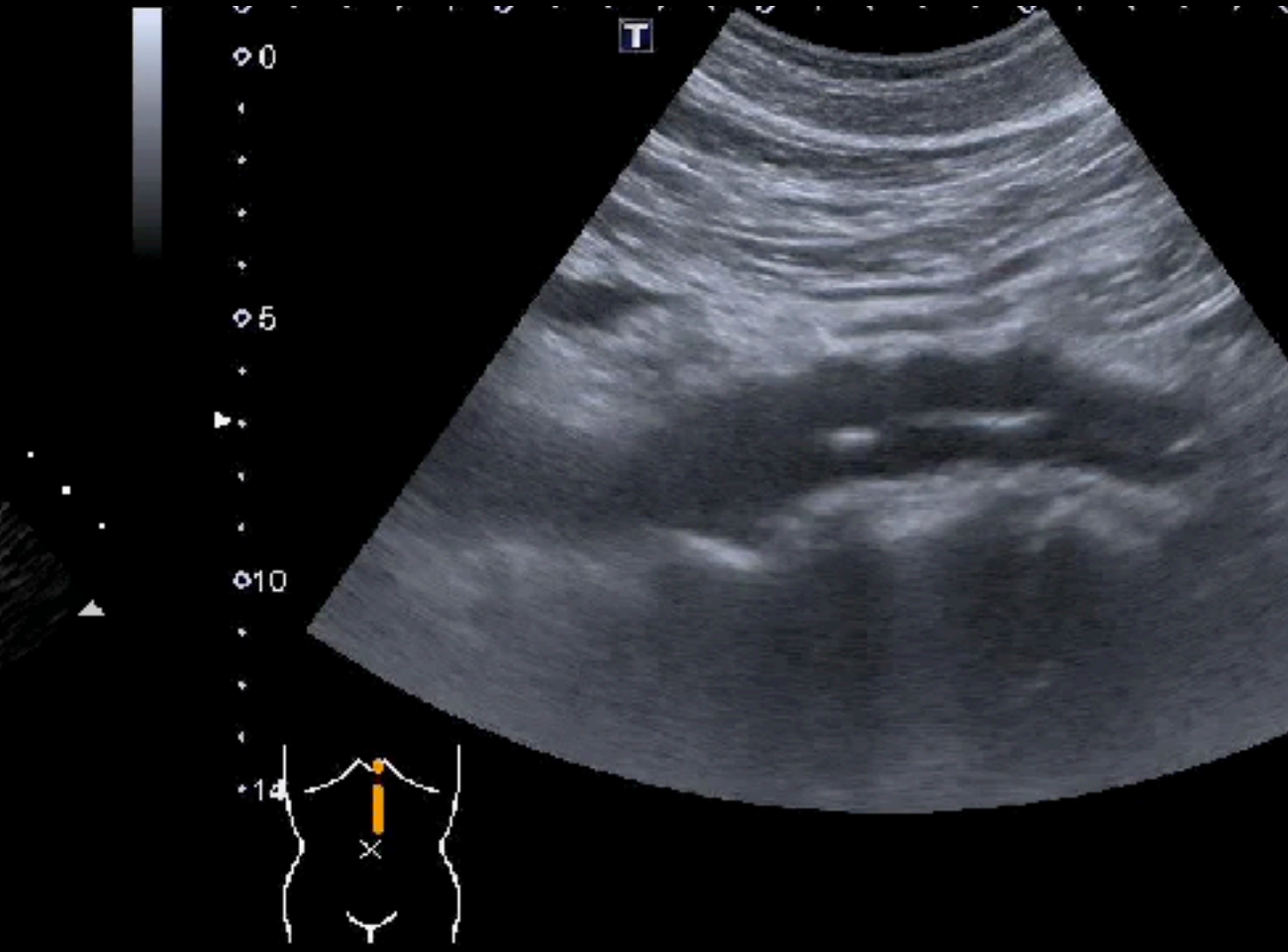
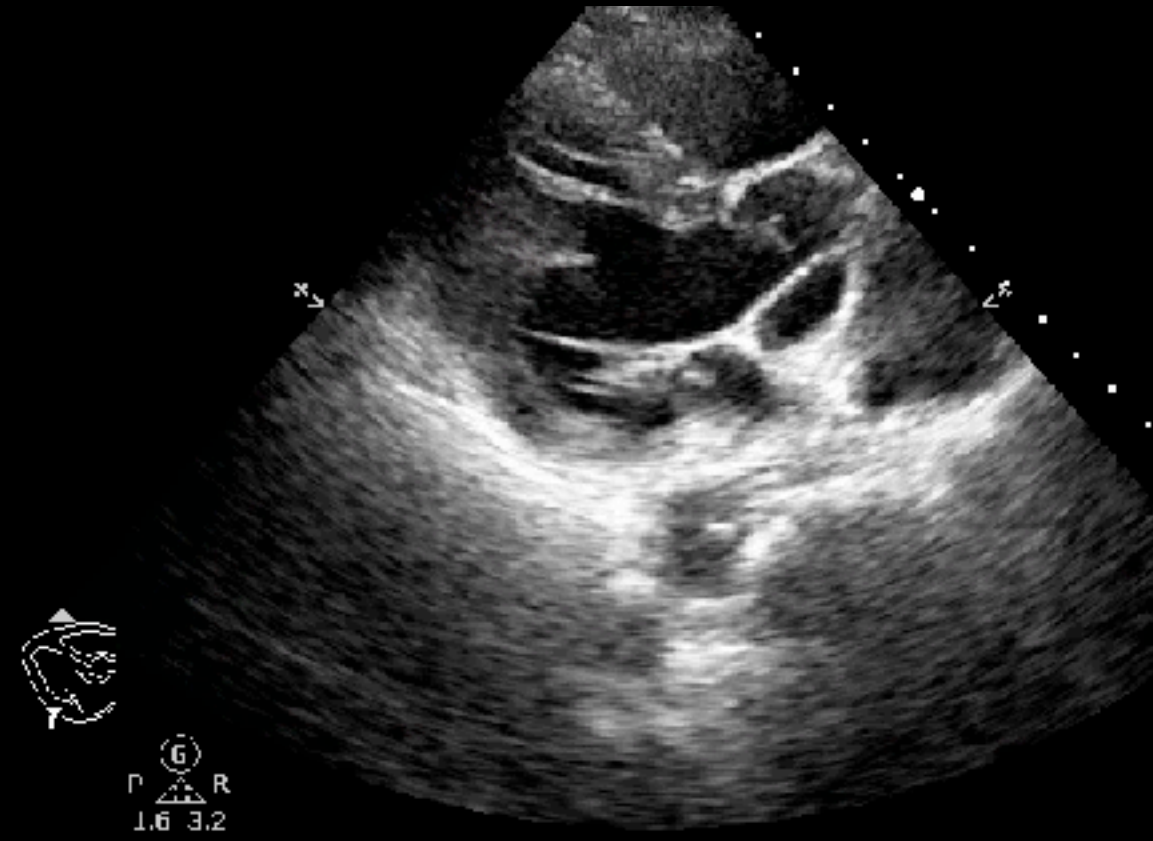


2D
Res
Cn 60
C 56
3/2/1

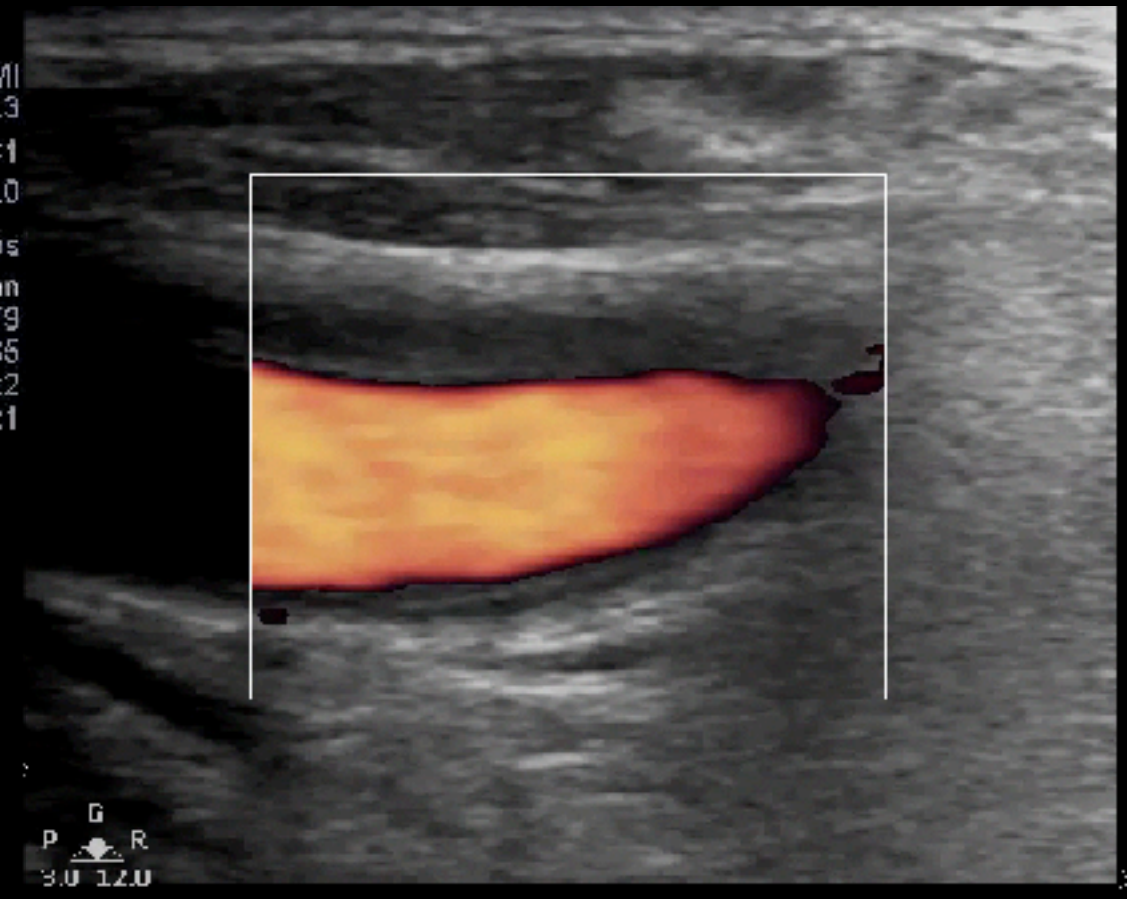


30 Hz
18.0cm

2D
HGen
Cn 34
C 50
3/2/0

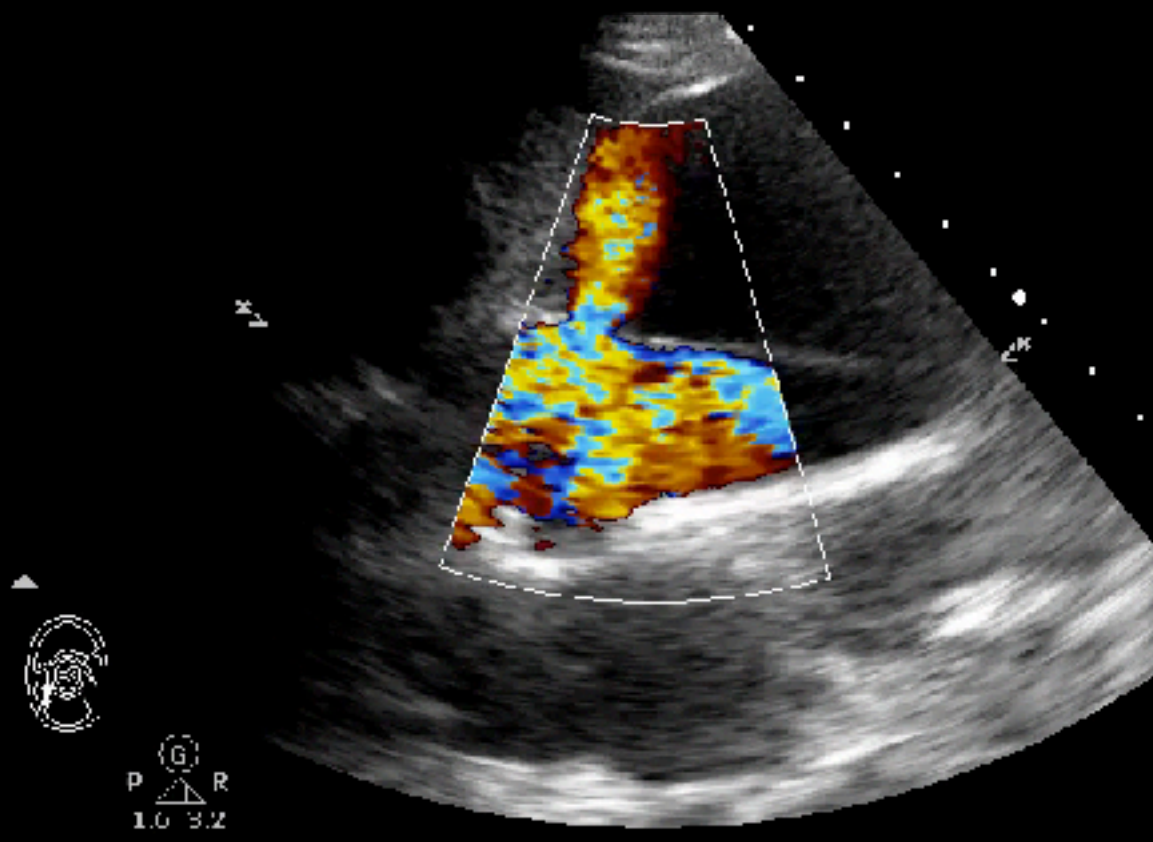


MI
1.3
6C1
T5.0
18 fps
Qscan
G:79
DR:65
A:2
P:1

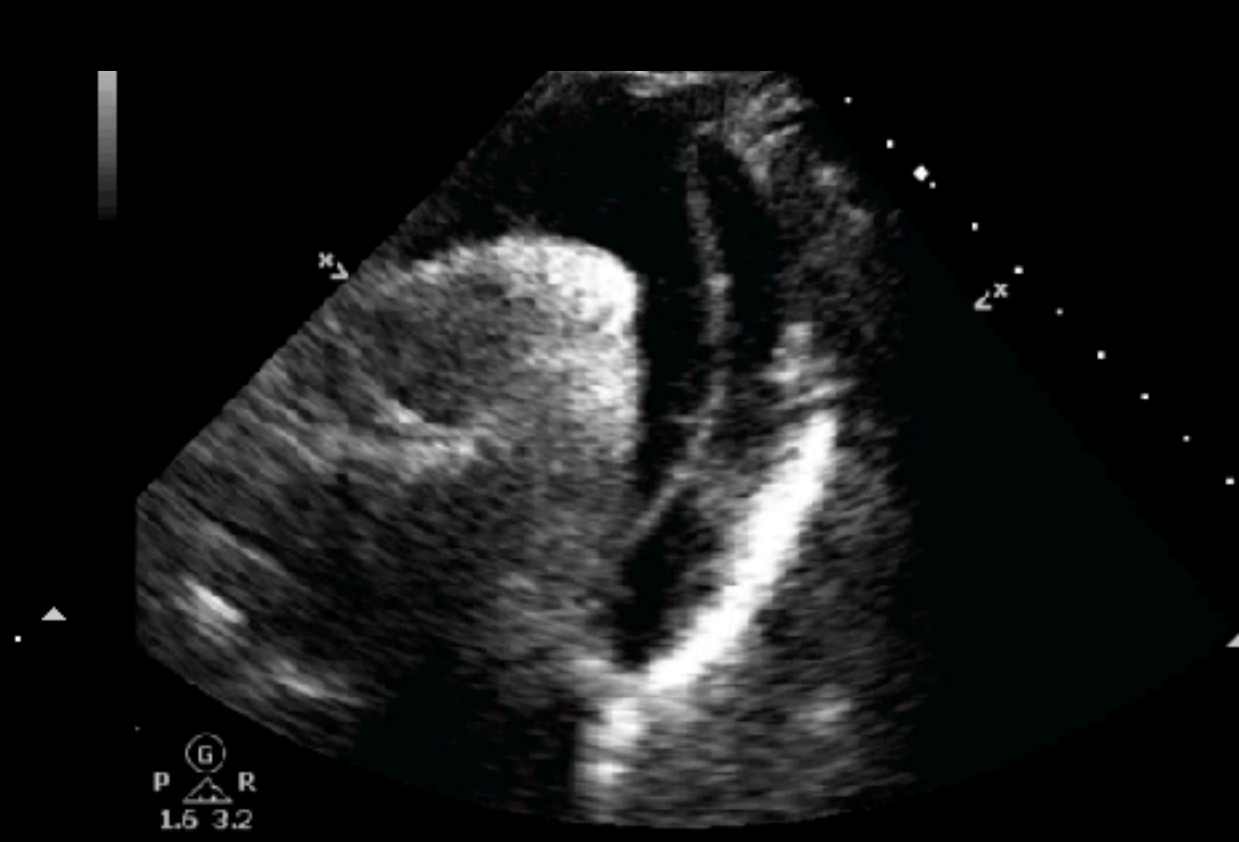
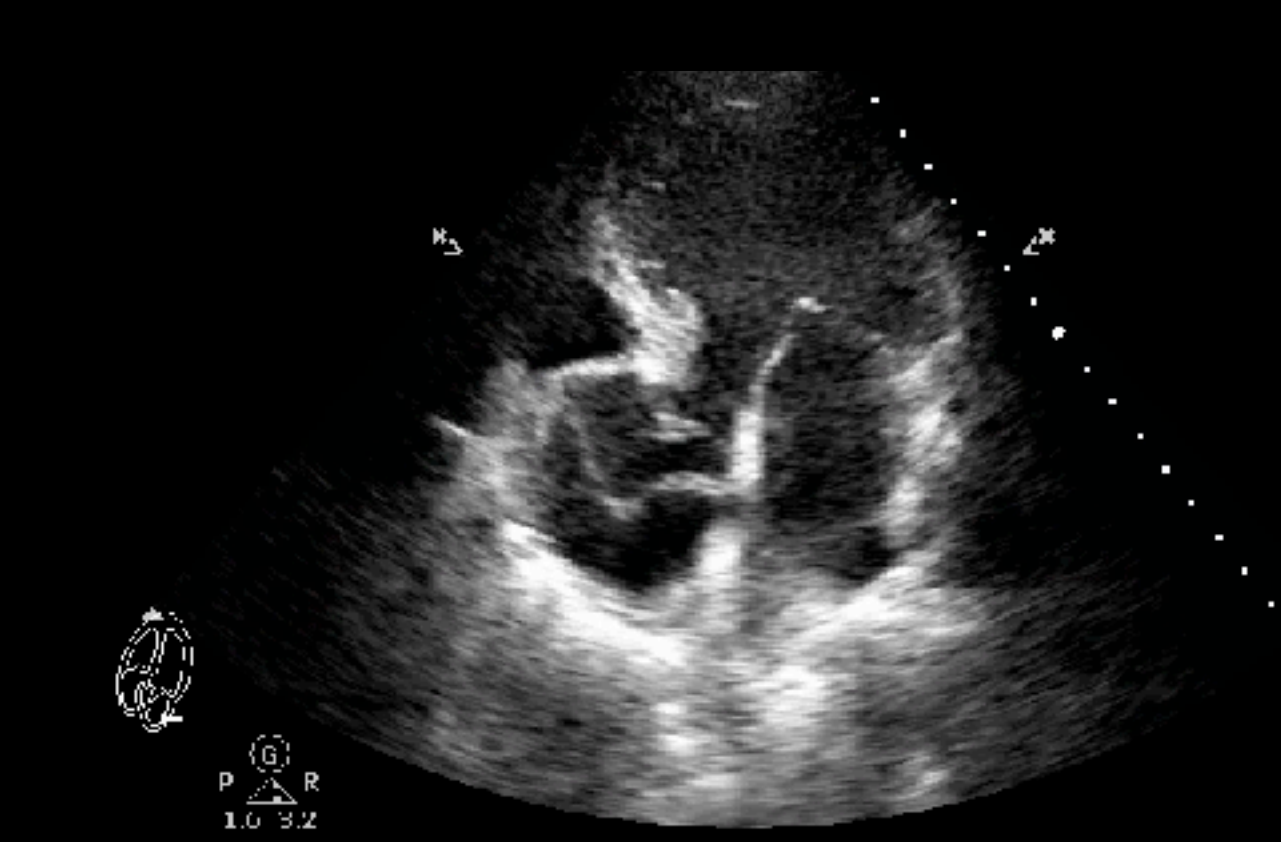


21 Hz
13.0cm

2D
HGen
Cn 65
C 50
3/2/0

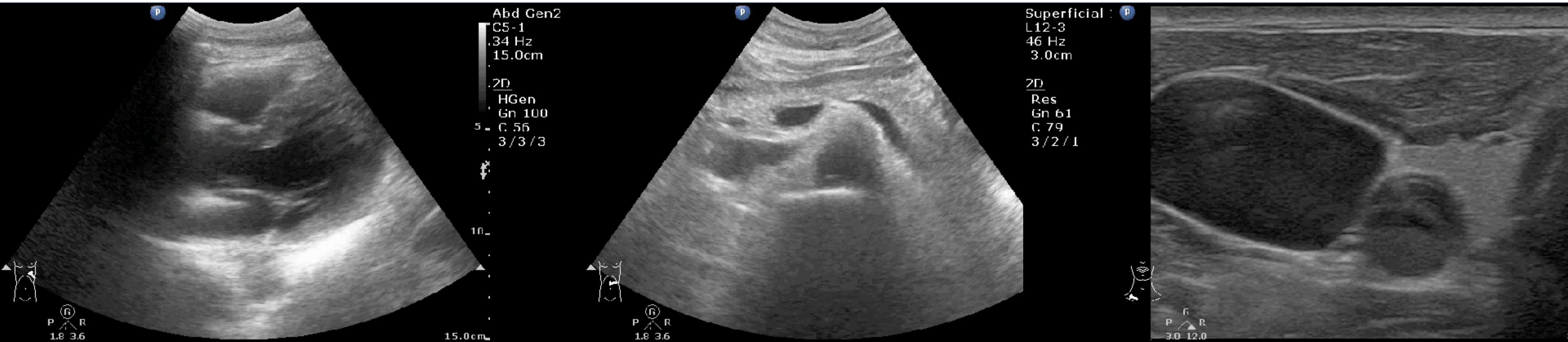


cm
s
2D
HGen
Cn 72
C 50
3/2/0



懷疑AD時的POCUS:PAC

CTA仍是最重要的檢查



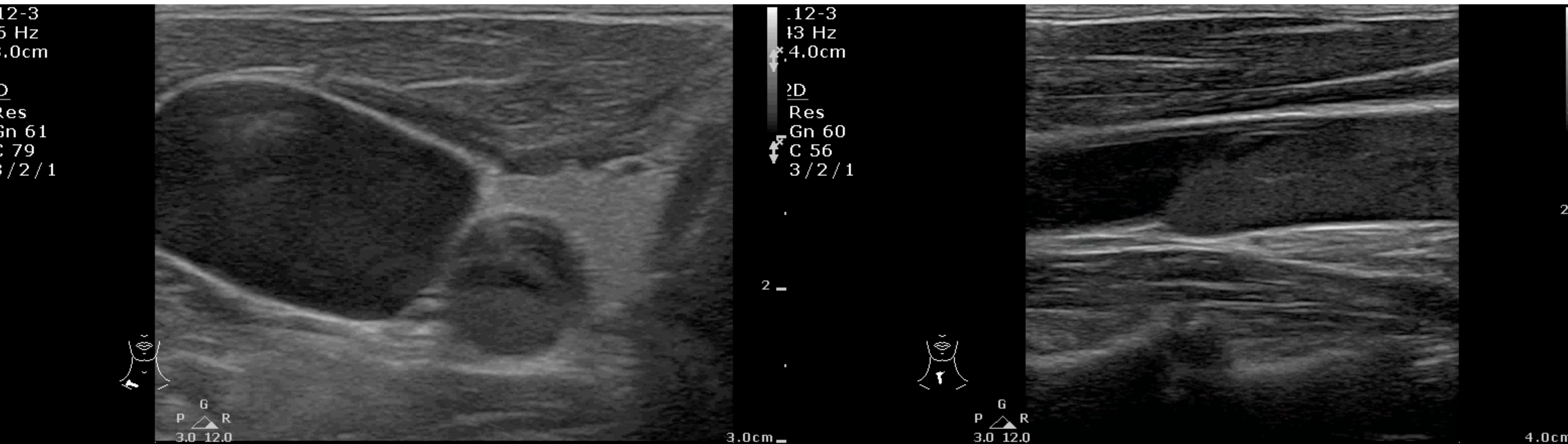
Pericardium

ABD Aorta

CCA

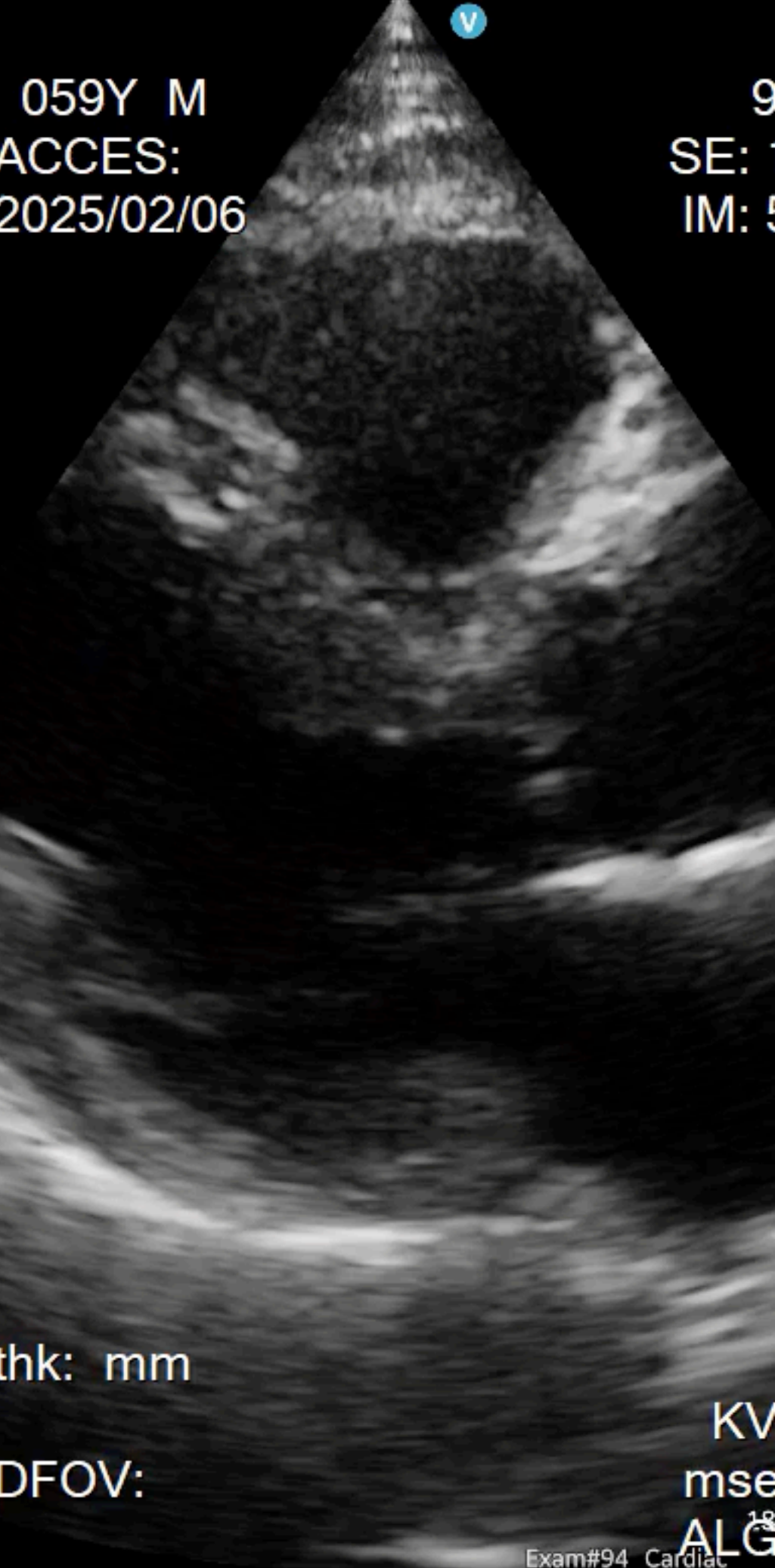
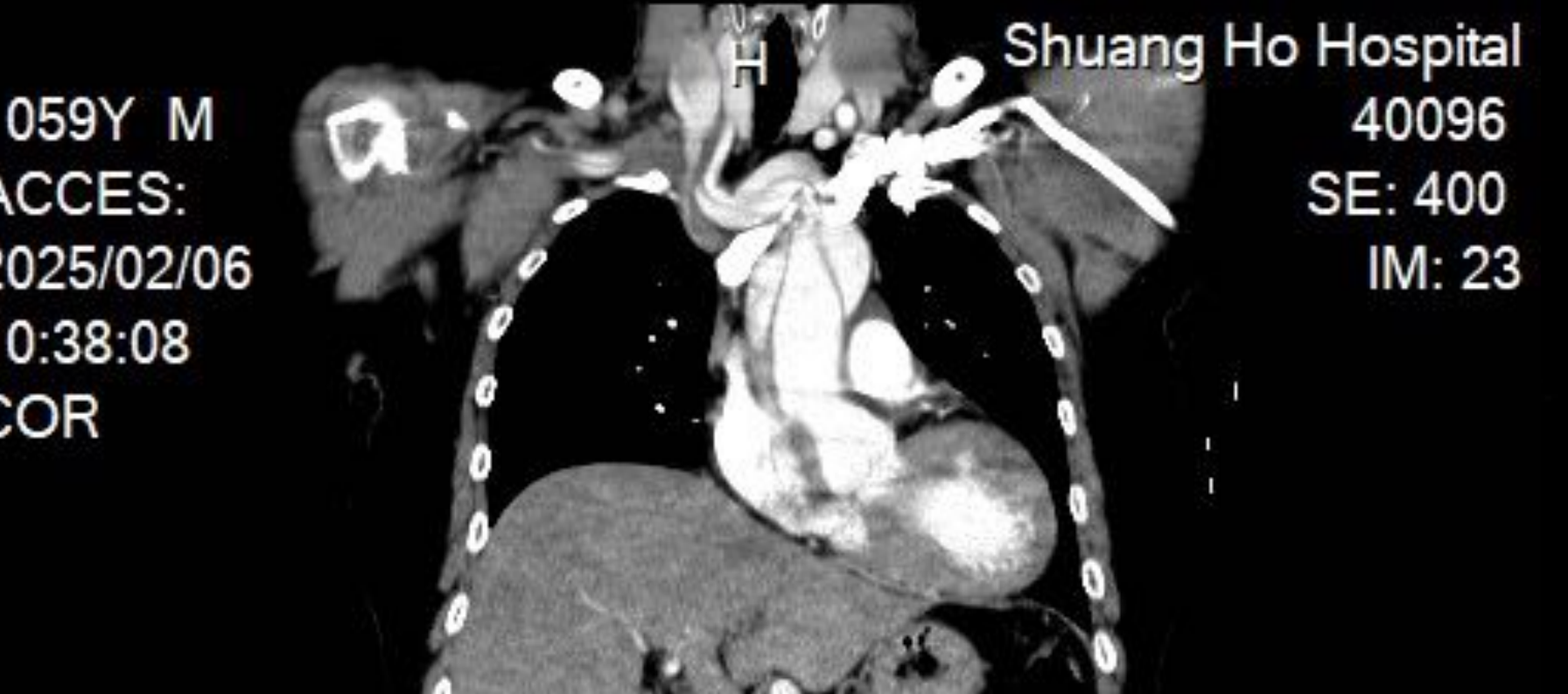
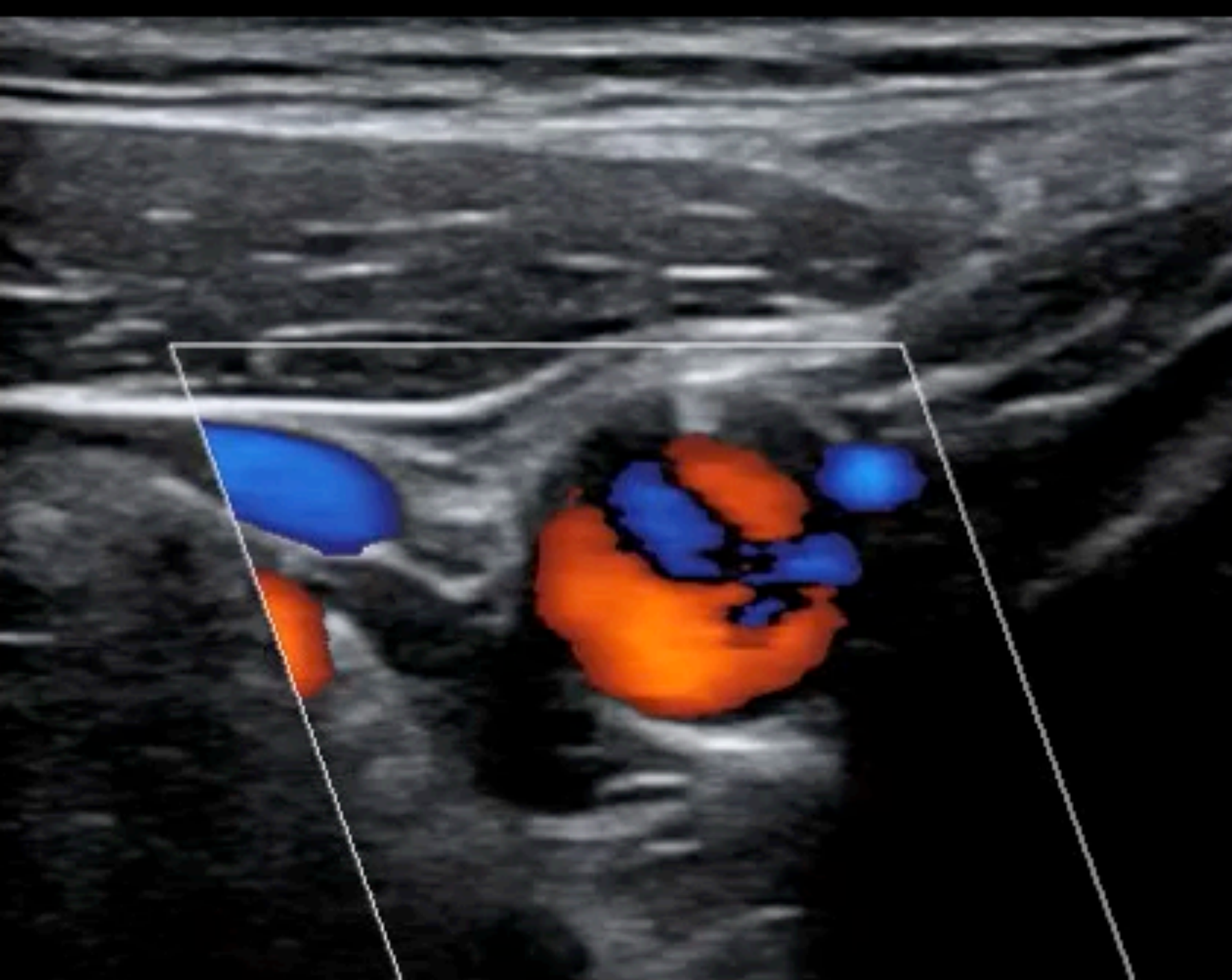
Acute stroke prior to tPA

Bil CCA是最重要的檢查

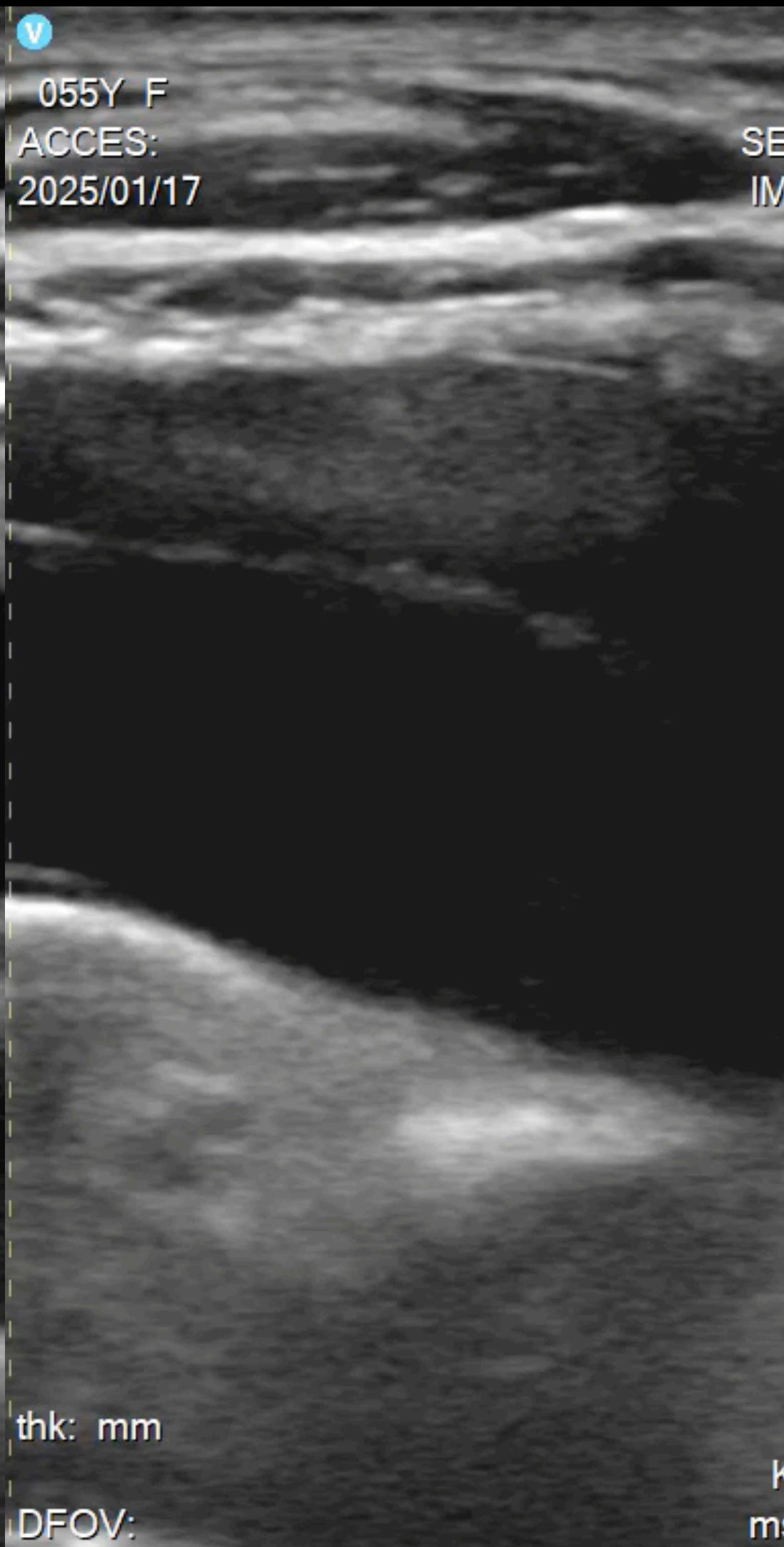
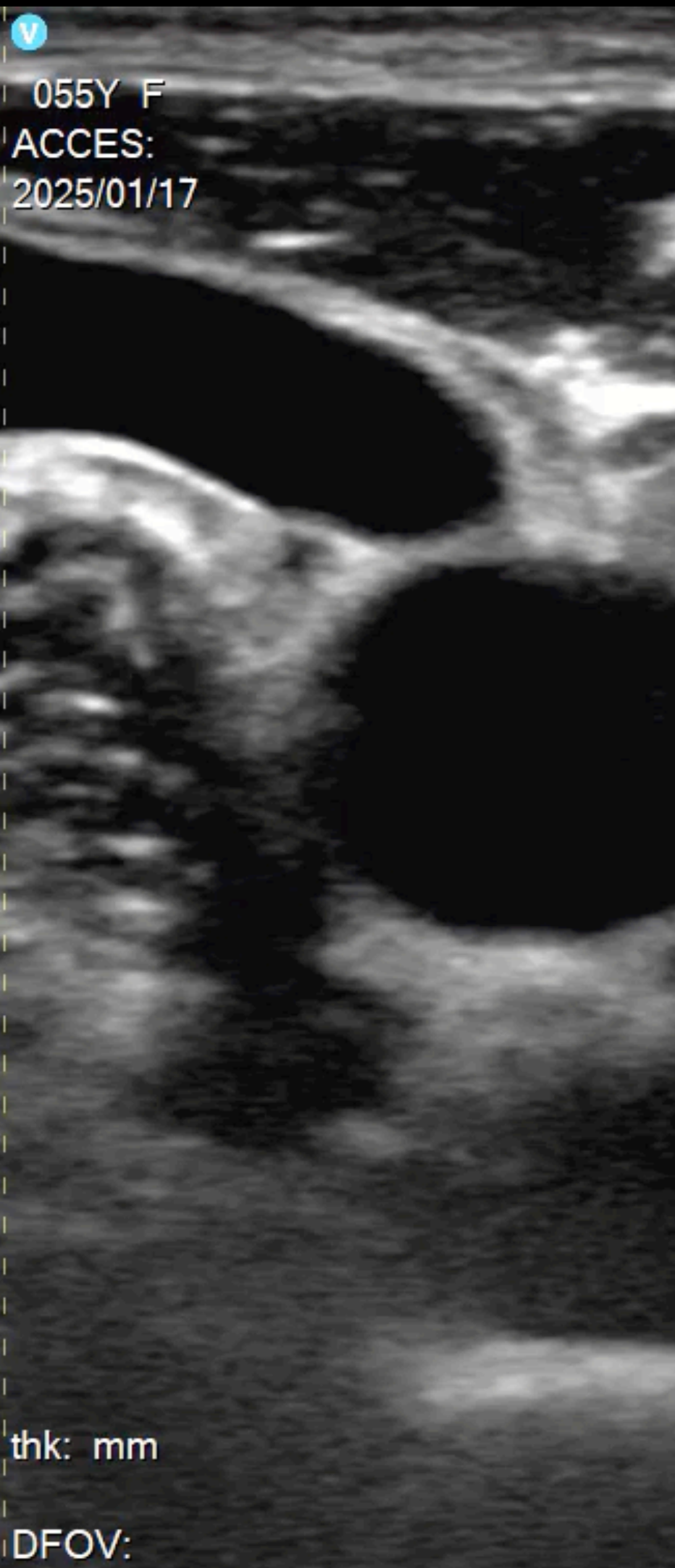
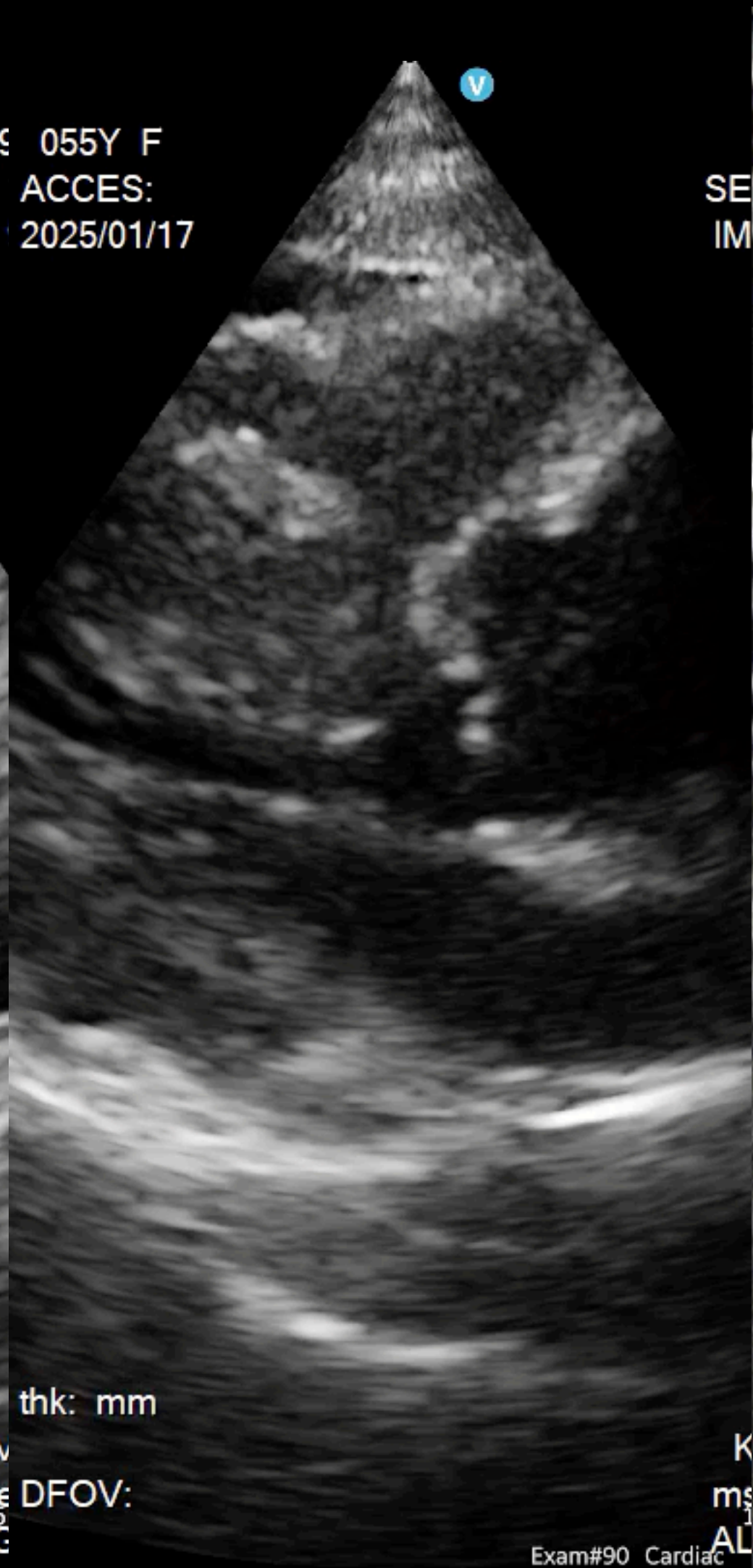
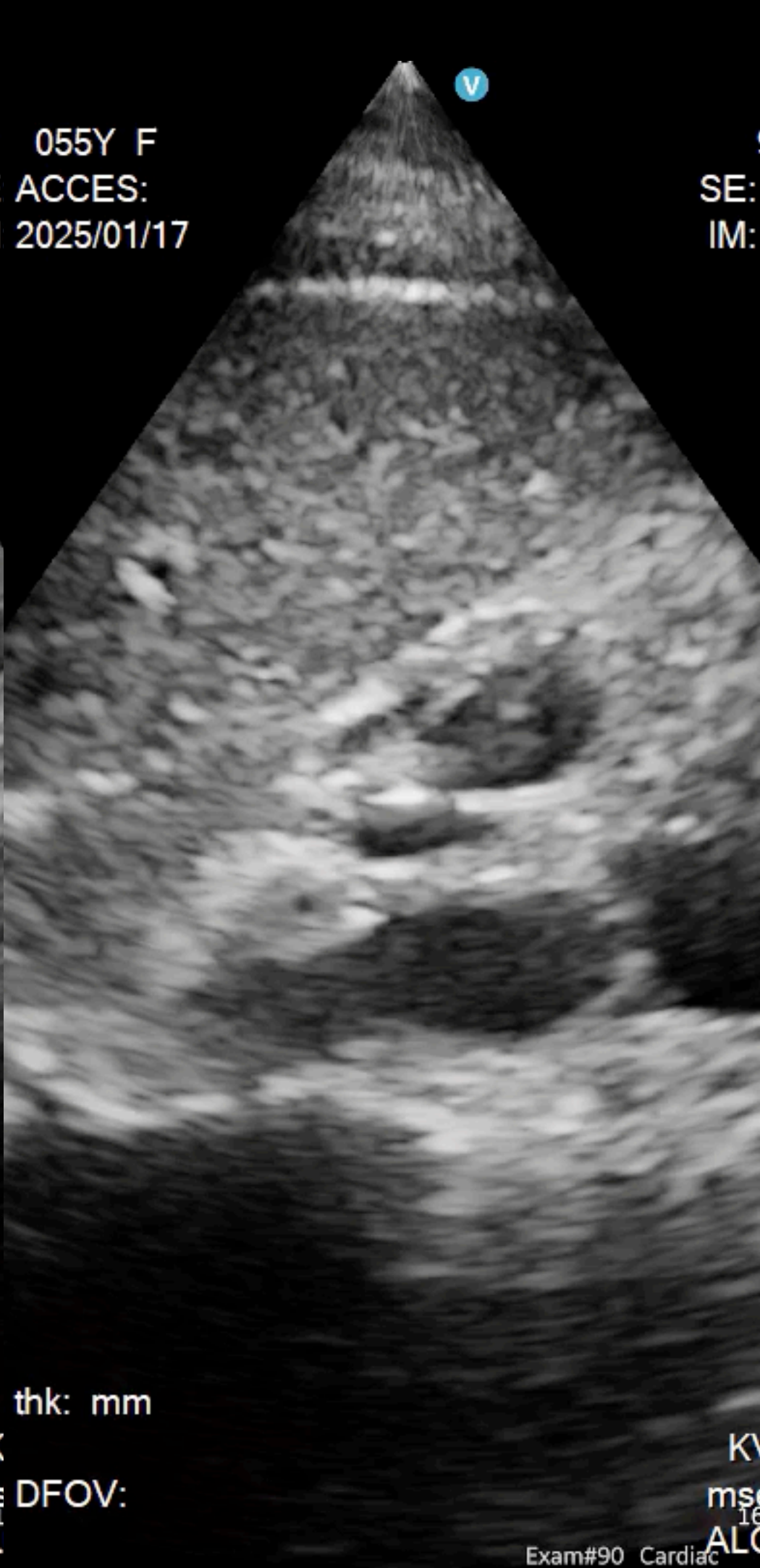


Occlusion or Flap ==> CTA來排除AD

59M, back pain, cold sweating & L leg numbness



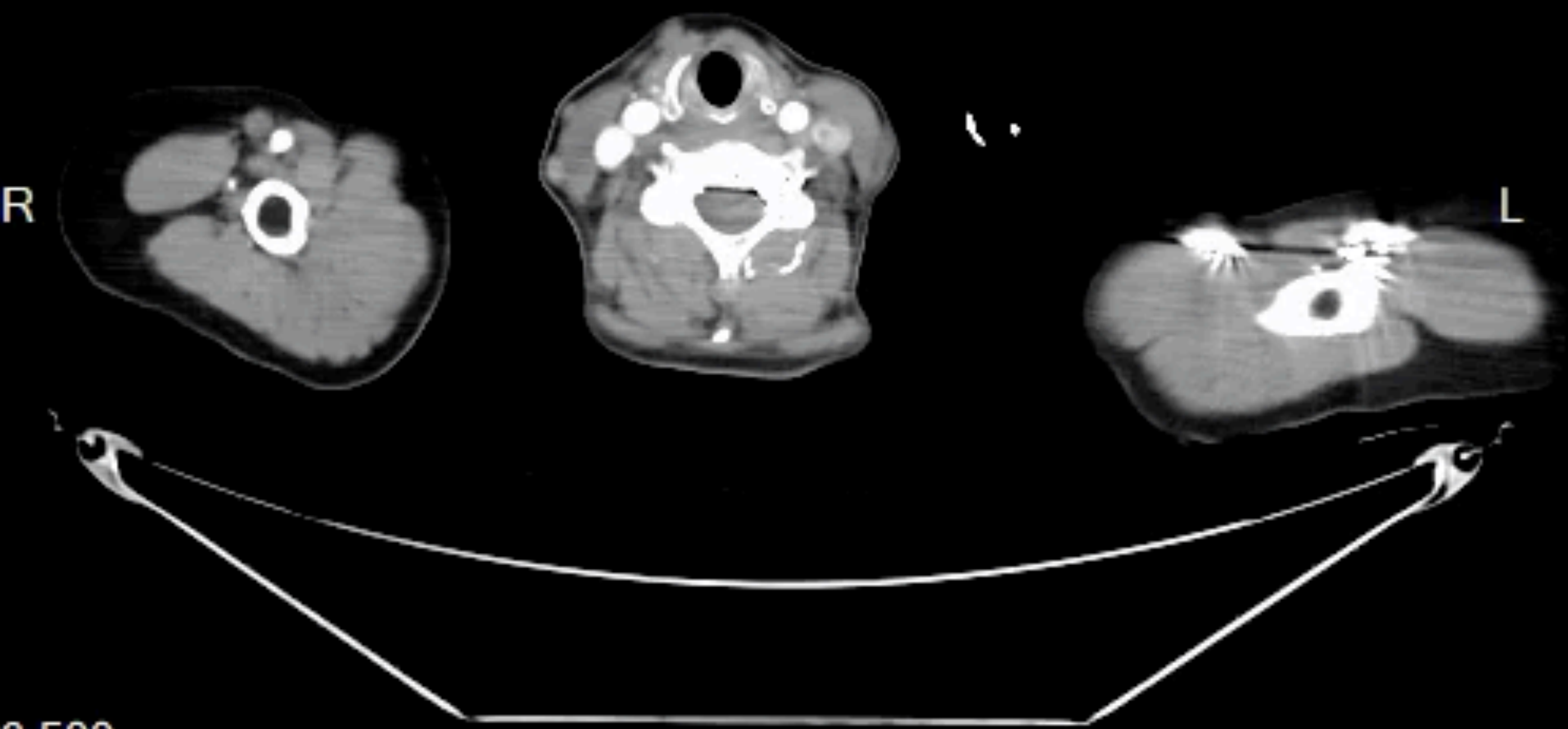
55F, 早上洗澡洗到一半，全身無力



055Y F
ACCES:
025/01/17
5:21:18
CTA

A

Shuang Ho Hospital
38339
SE: 3
IM: 1



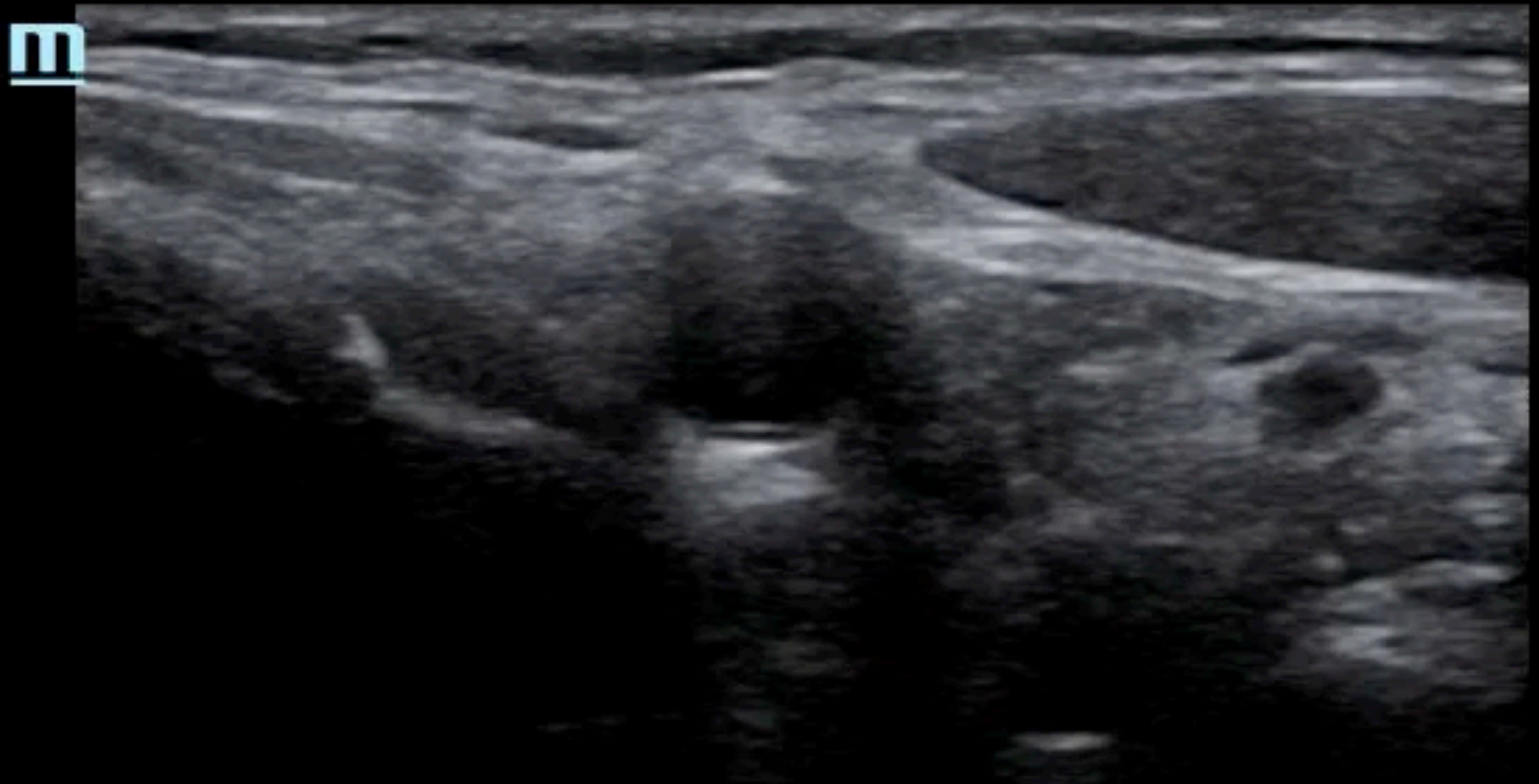
3.500
nk: 5.000000 mm
VC:45 ,WW:350
FOV: 483.000000
orta CTA (-C,+C)

P

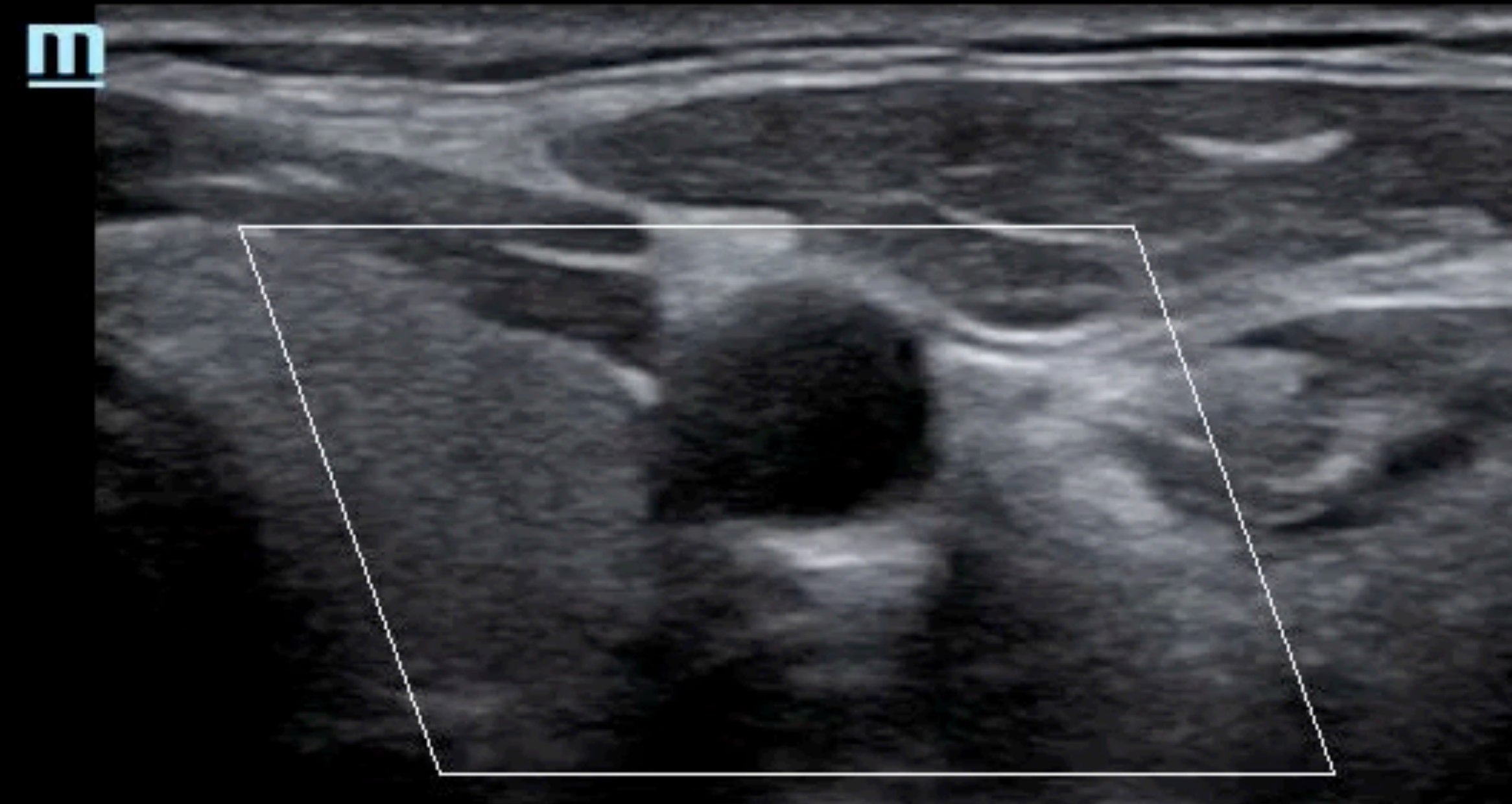
KV: 120
500 msec
ALG: STANDARD



37F, dysphagia & right side weakness (M/P 1/5)



IM: ↑



-1

-2

-3

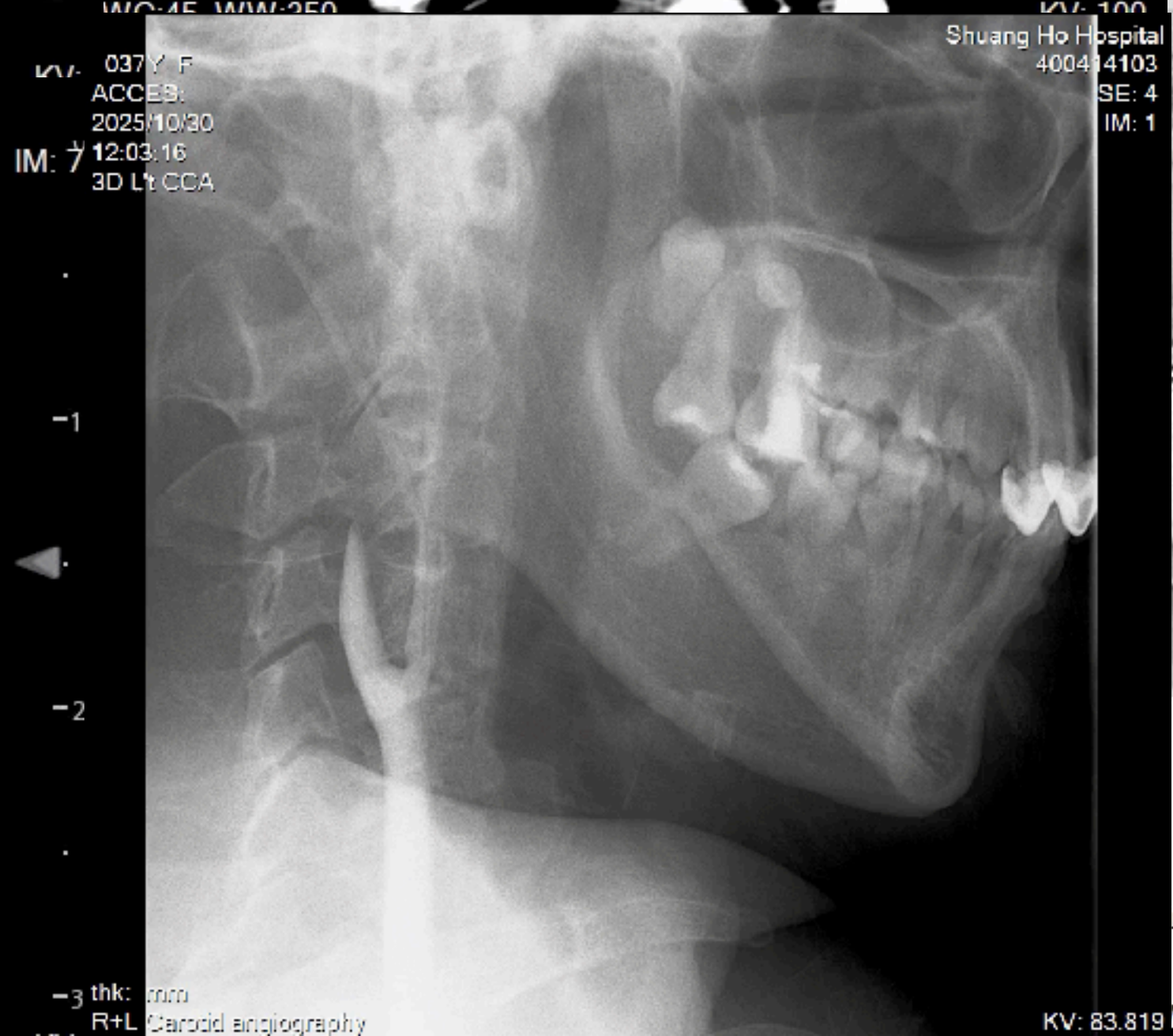
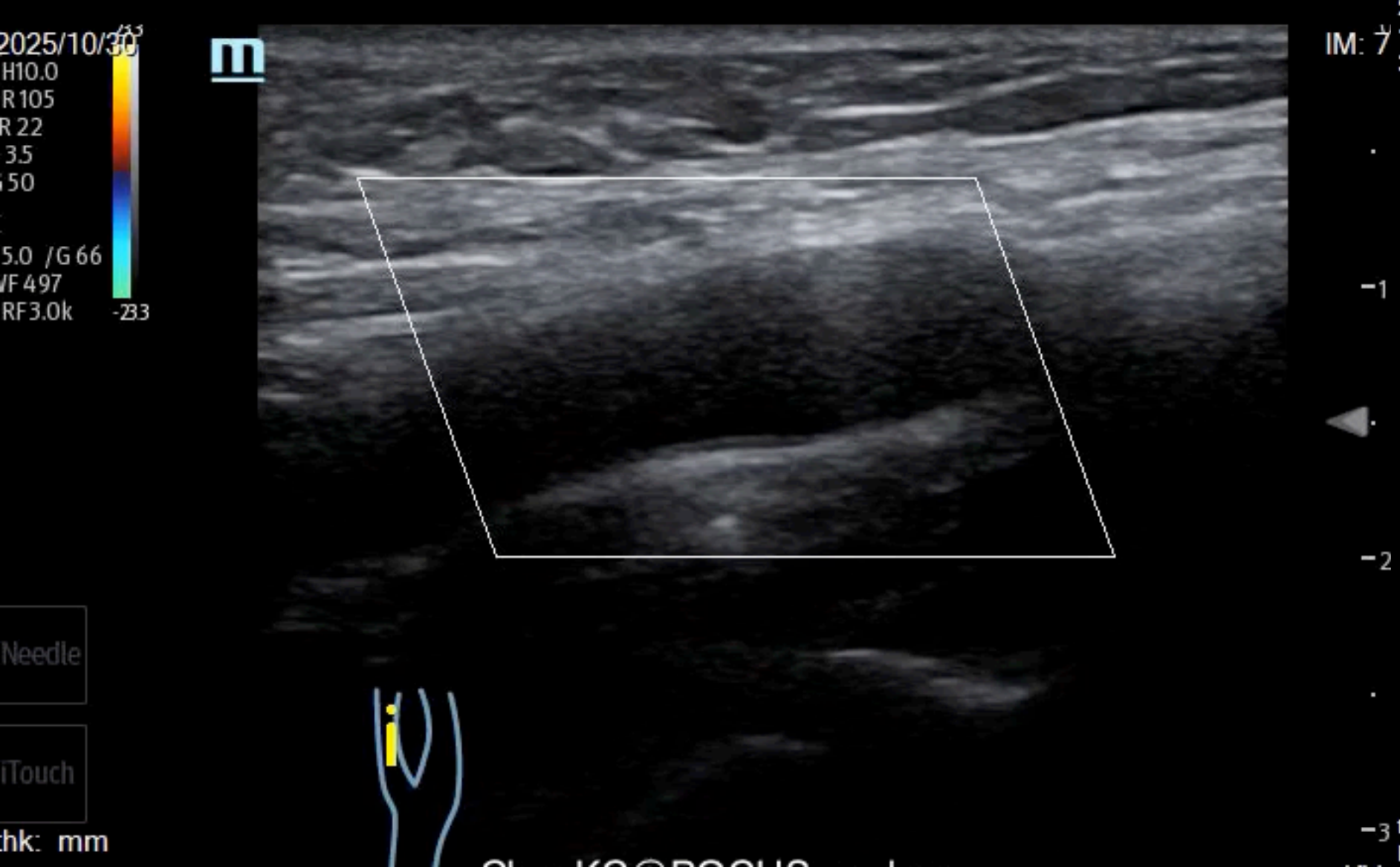
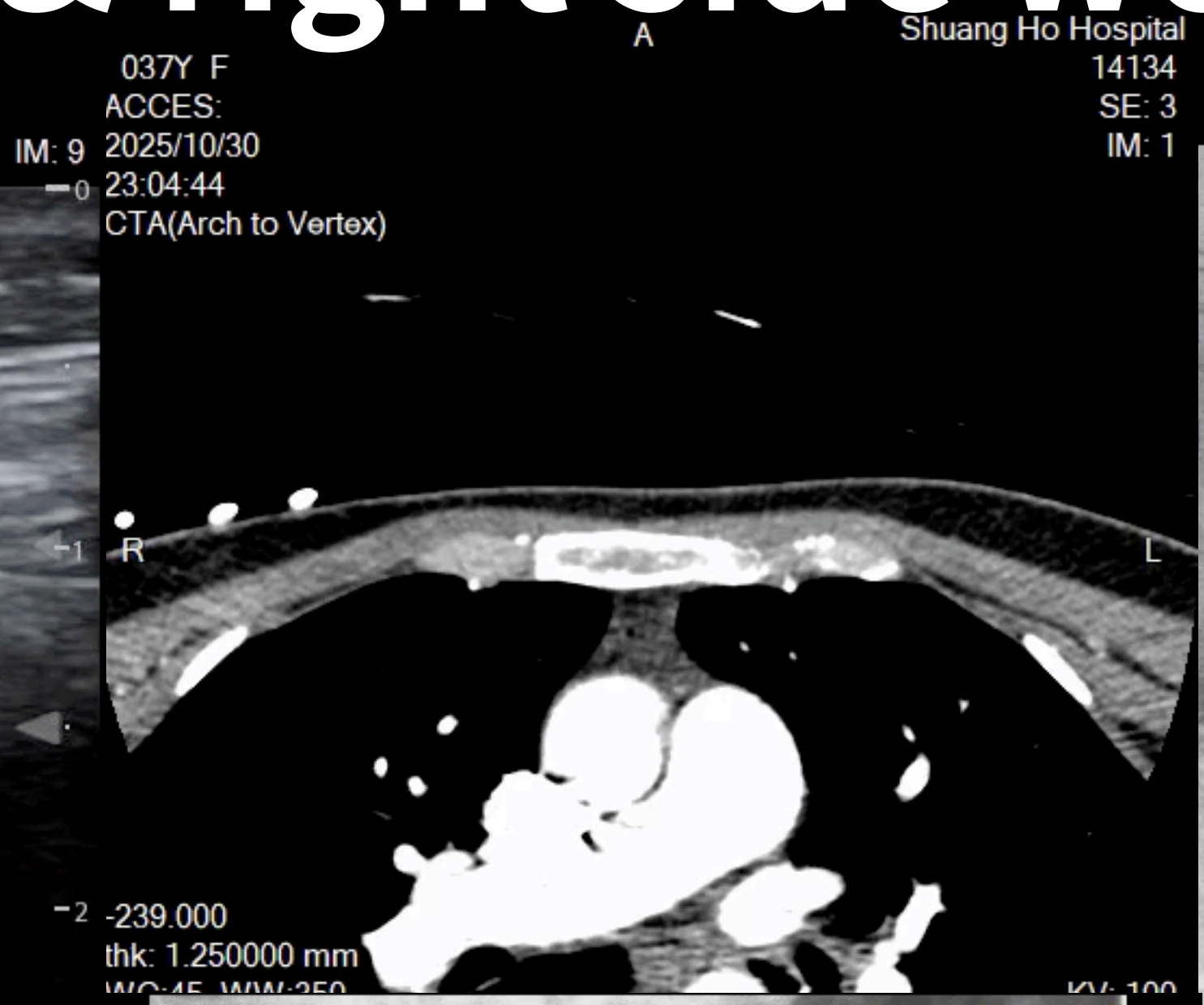
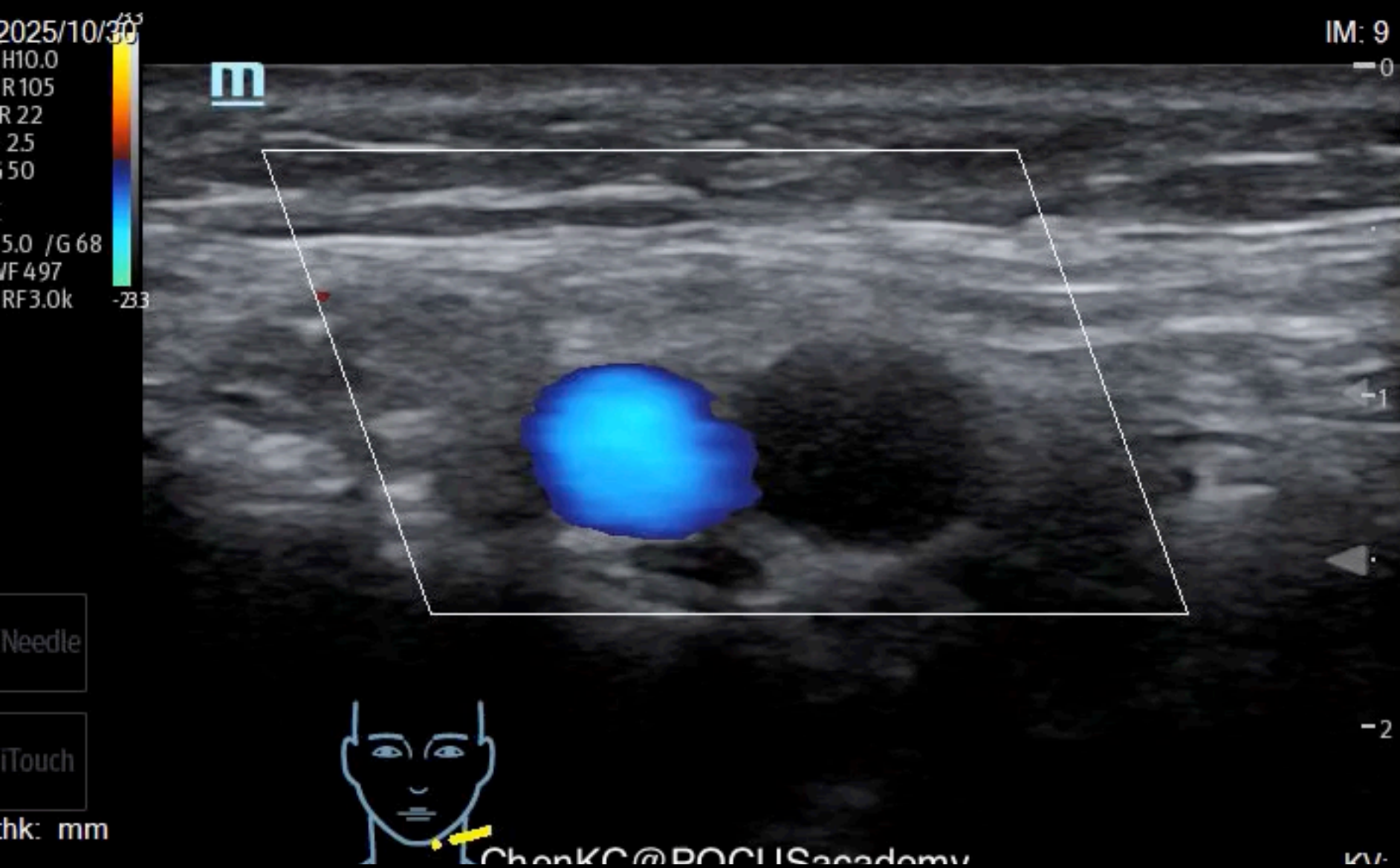
KV:
msec
ALG:

ChenKC@POCUSacademy

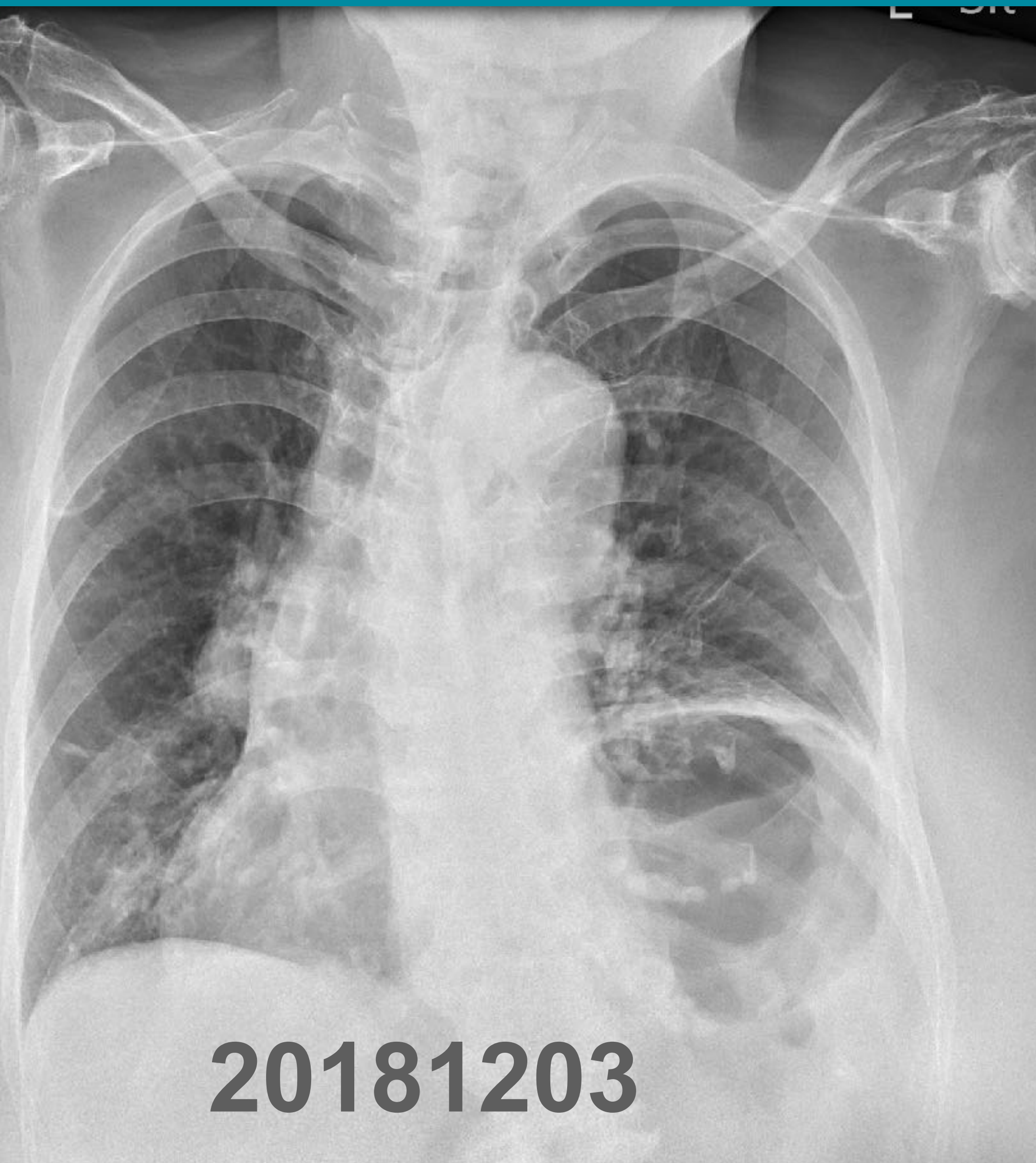


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37F, dysphagia & right side weakness (M/P 1/5)



85F, AMS, L weak, eye to R

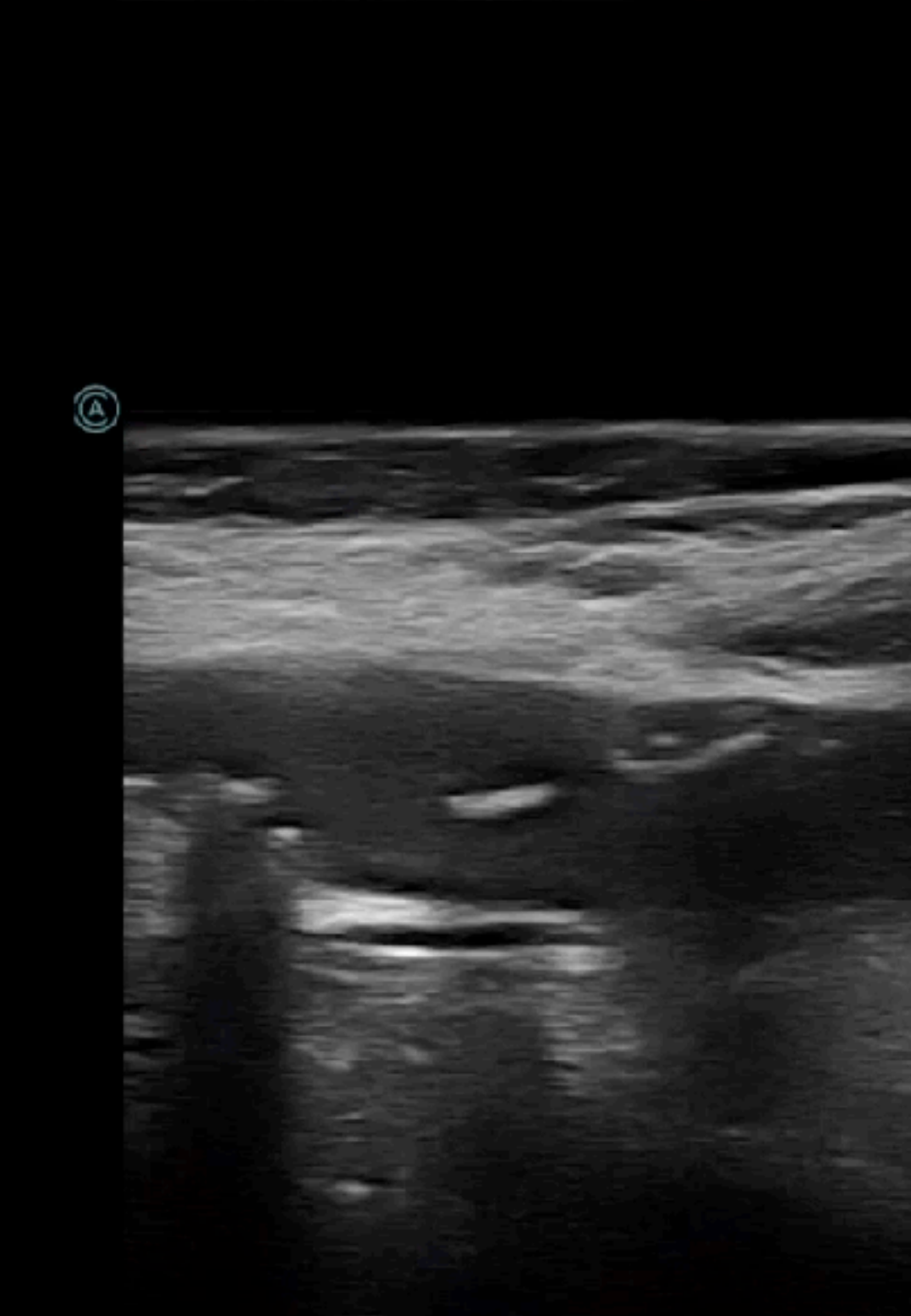
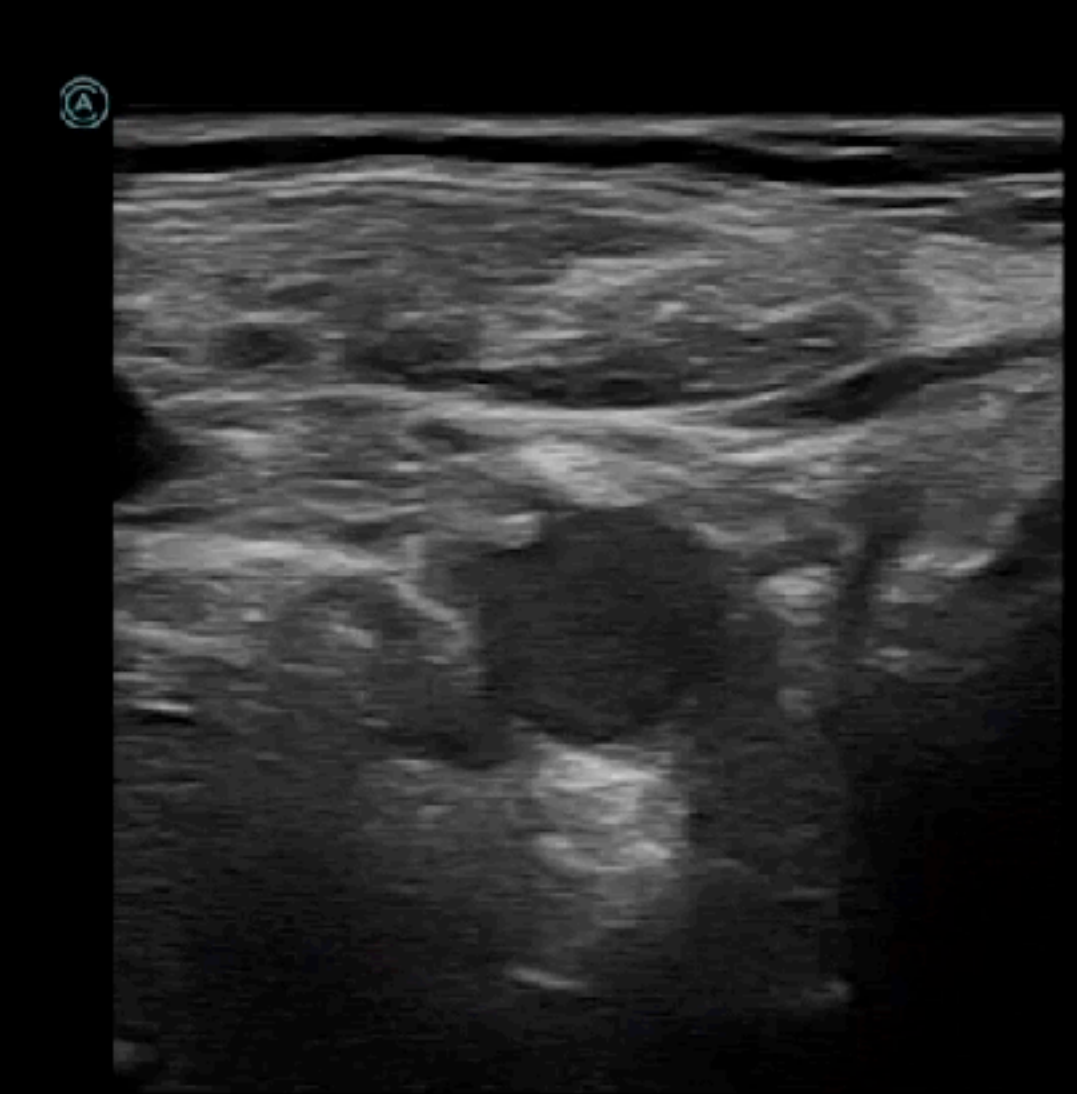
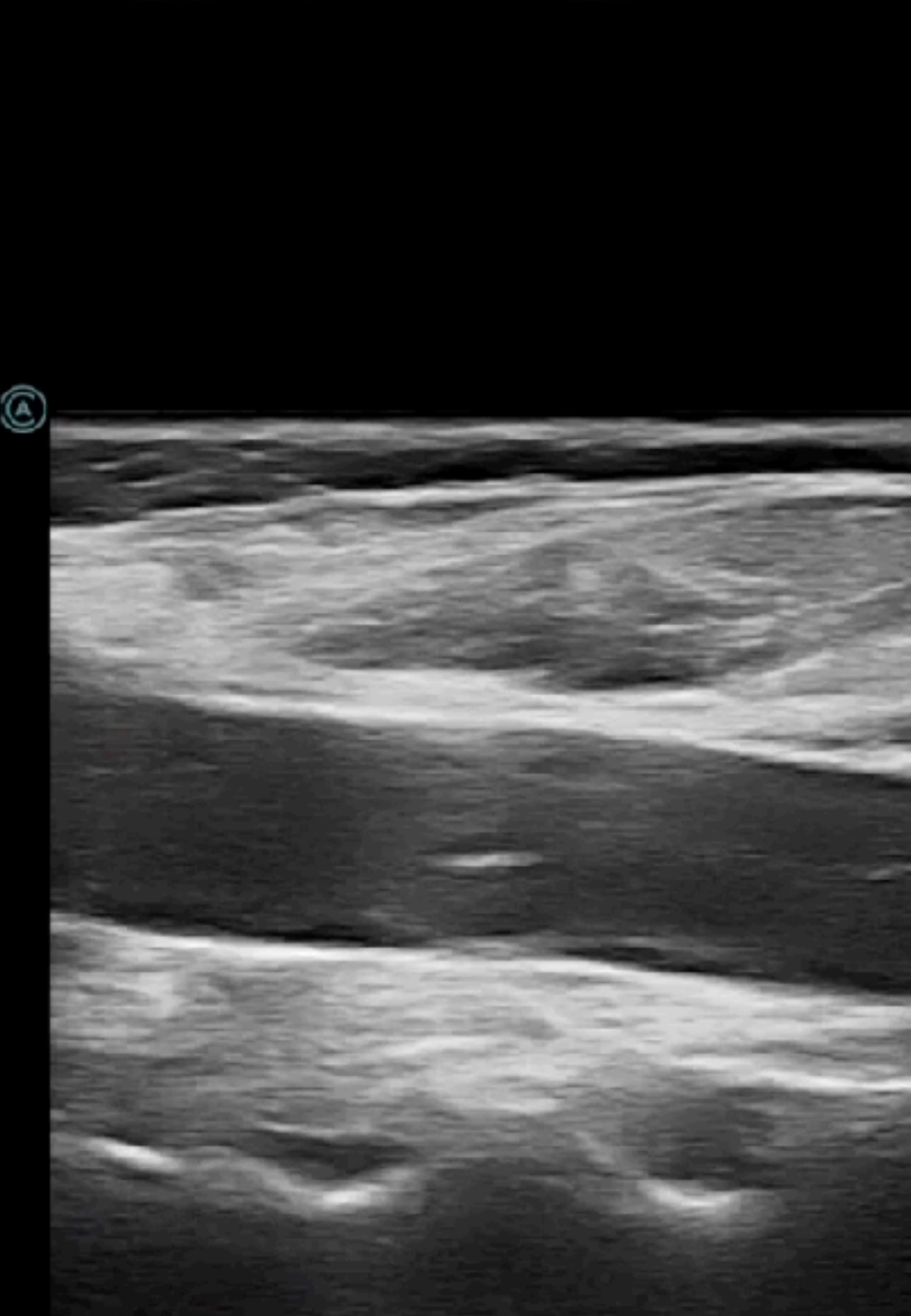
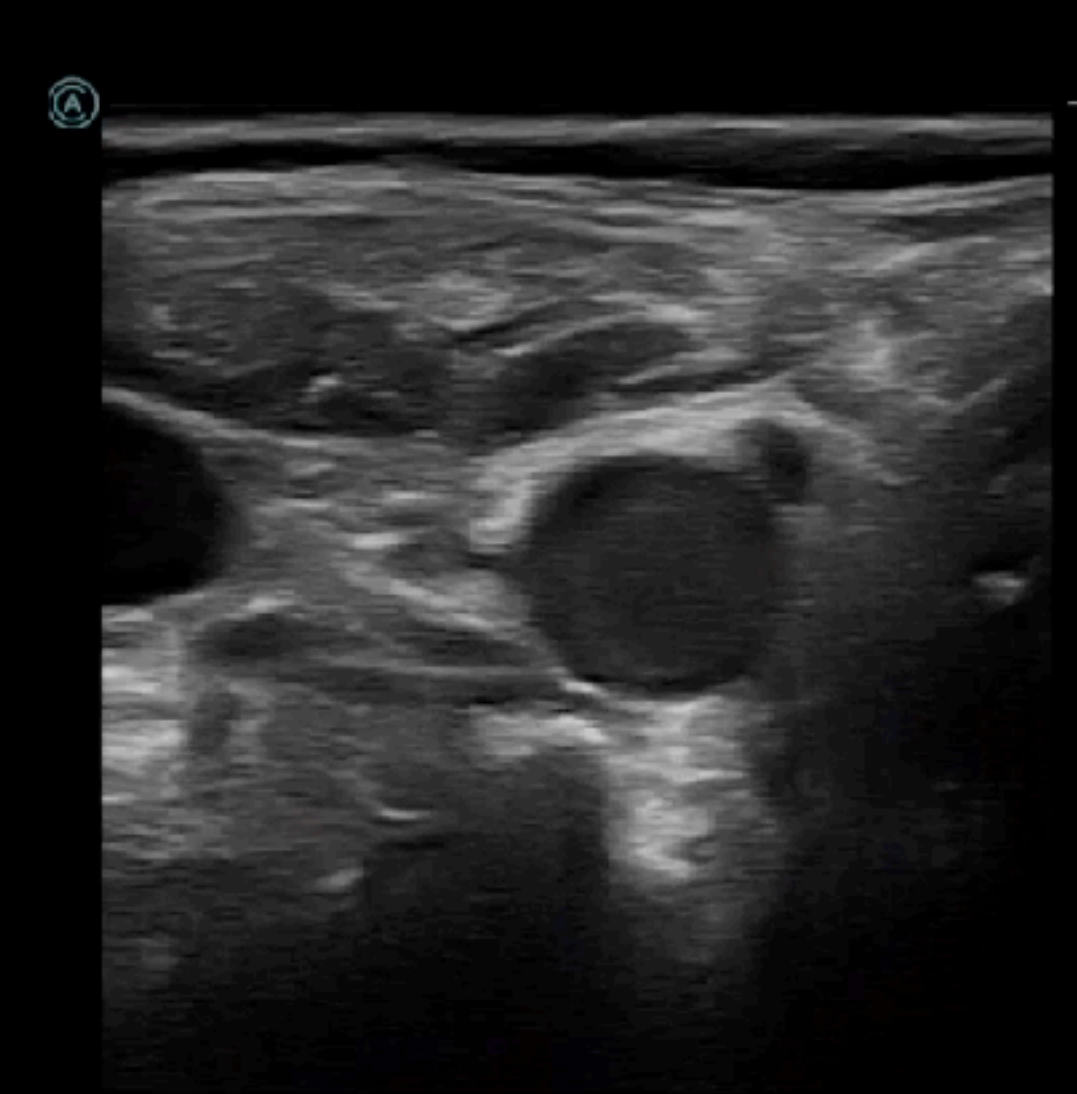
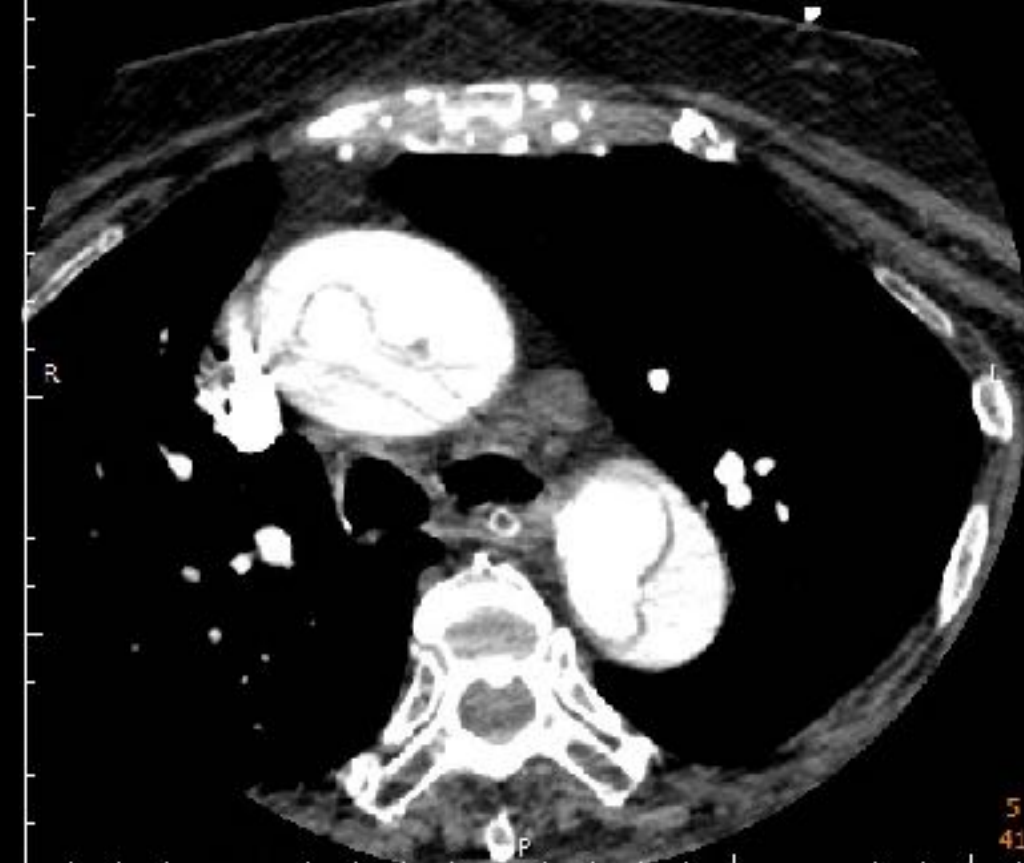


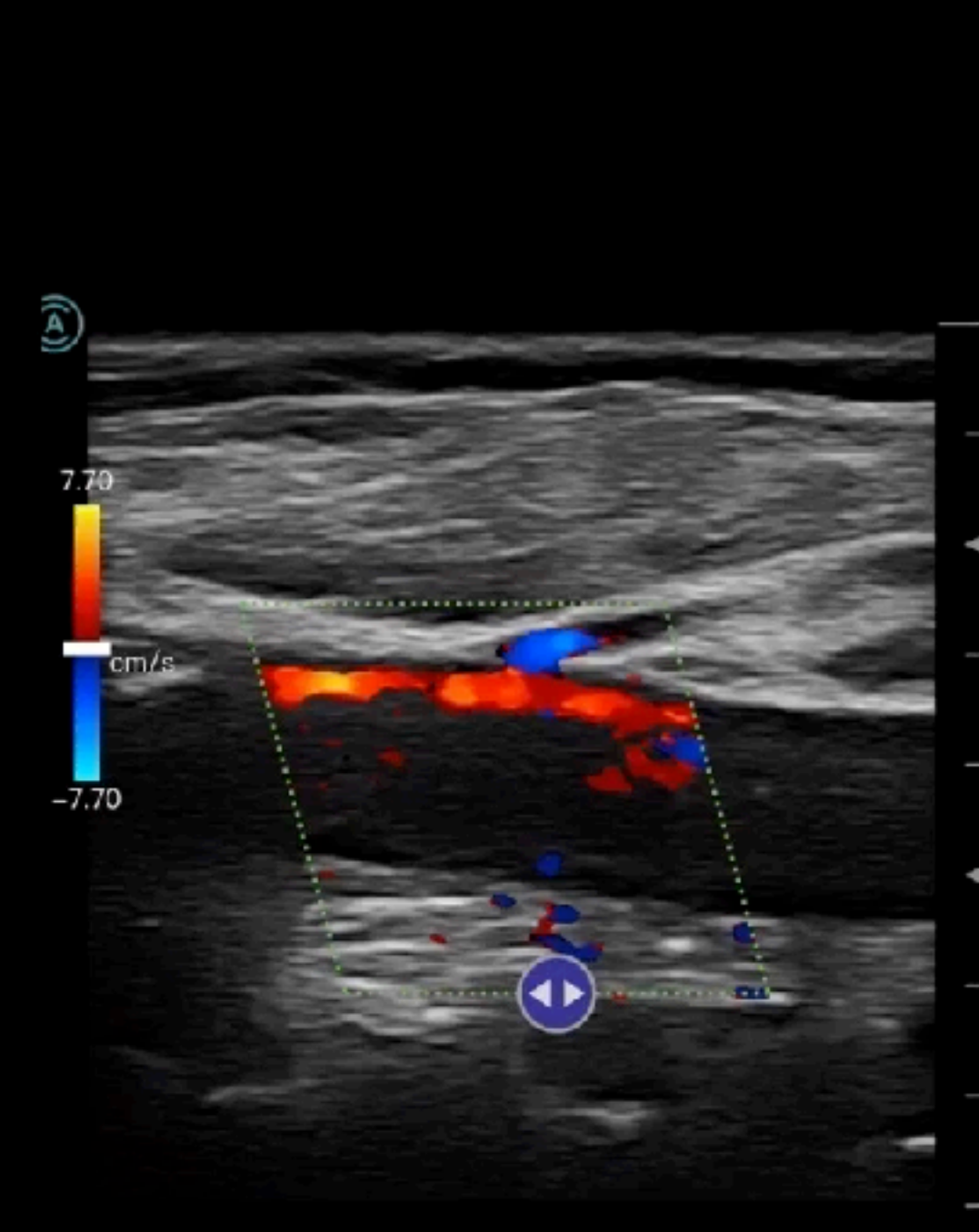
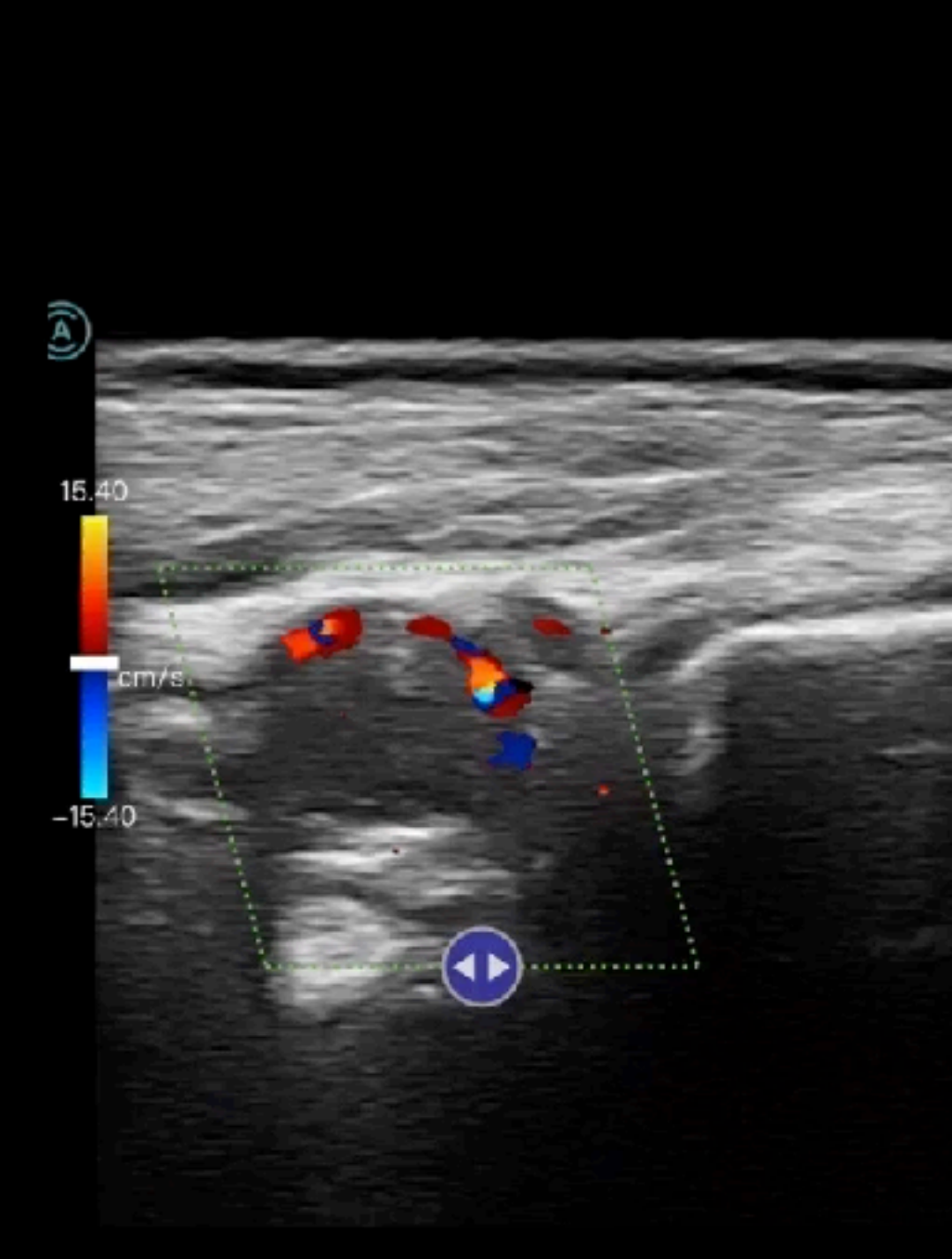
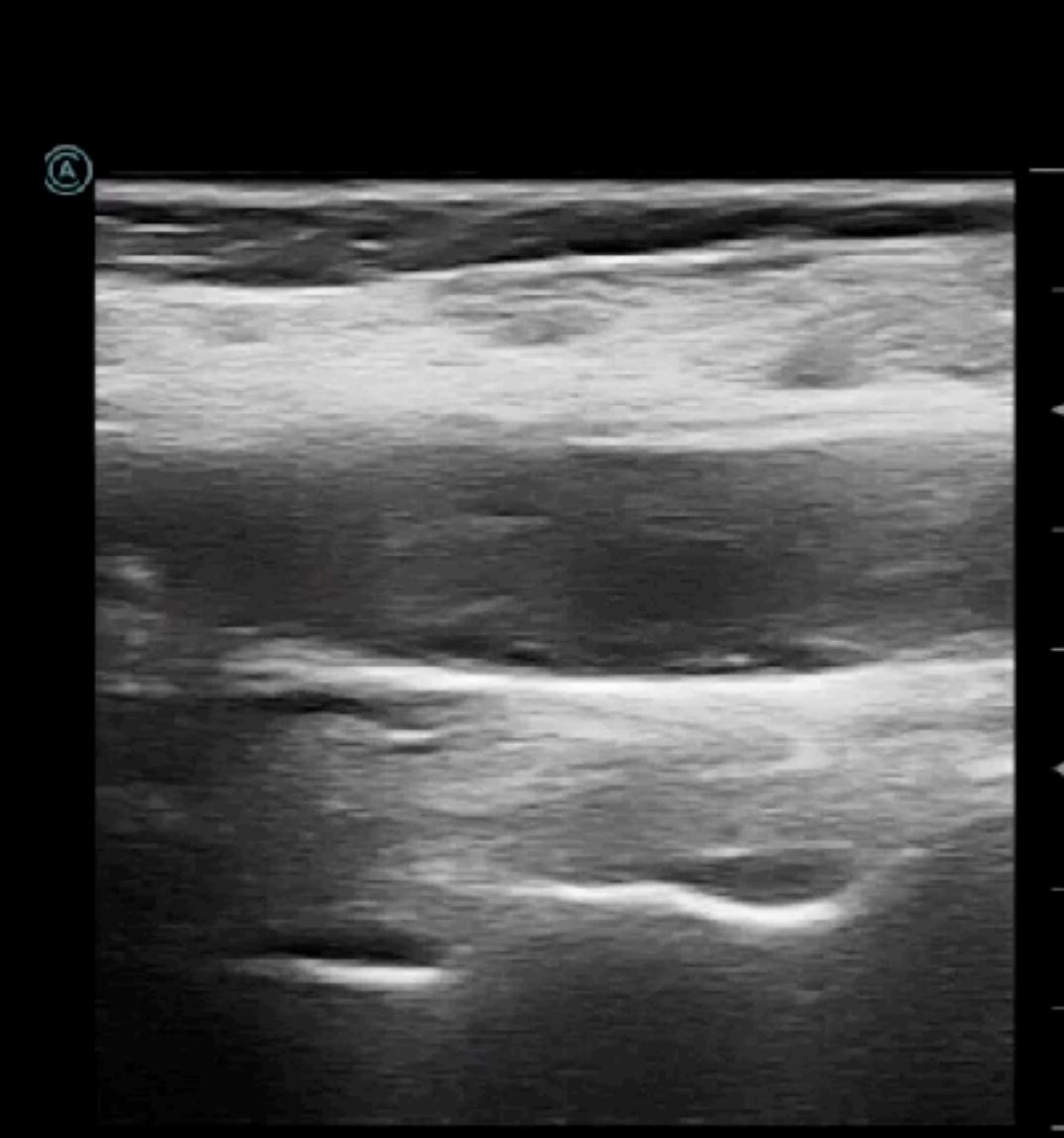
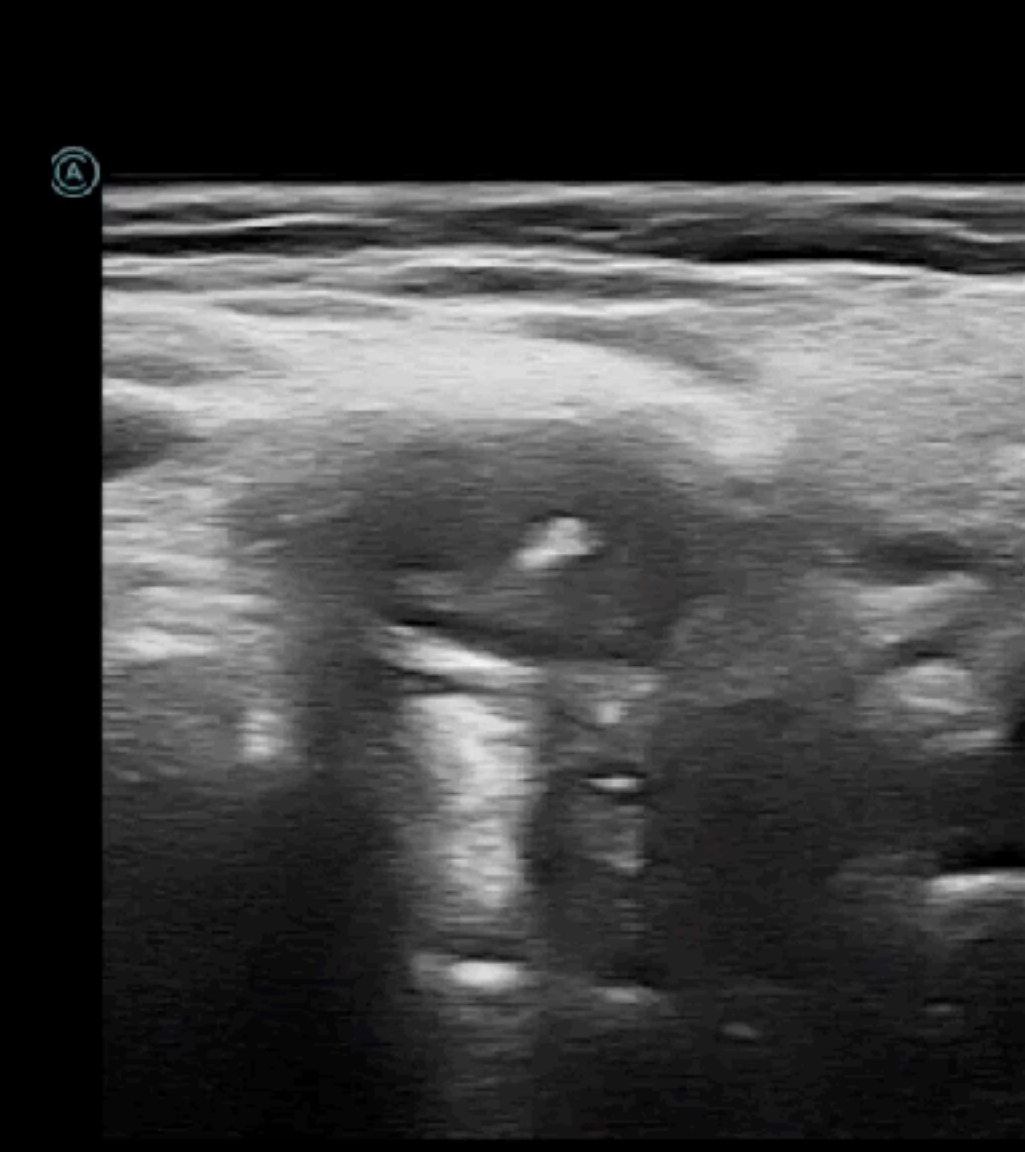
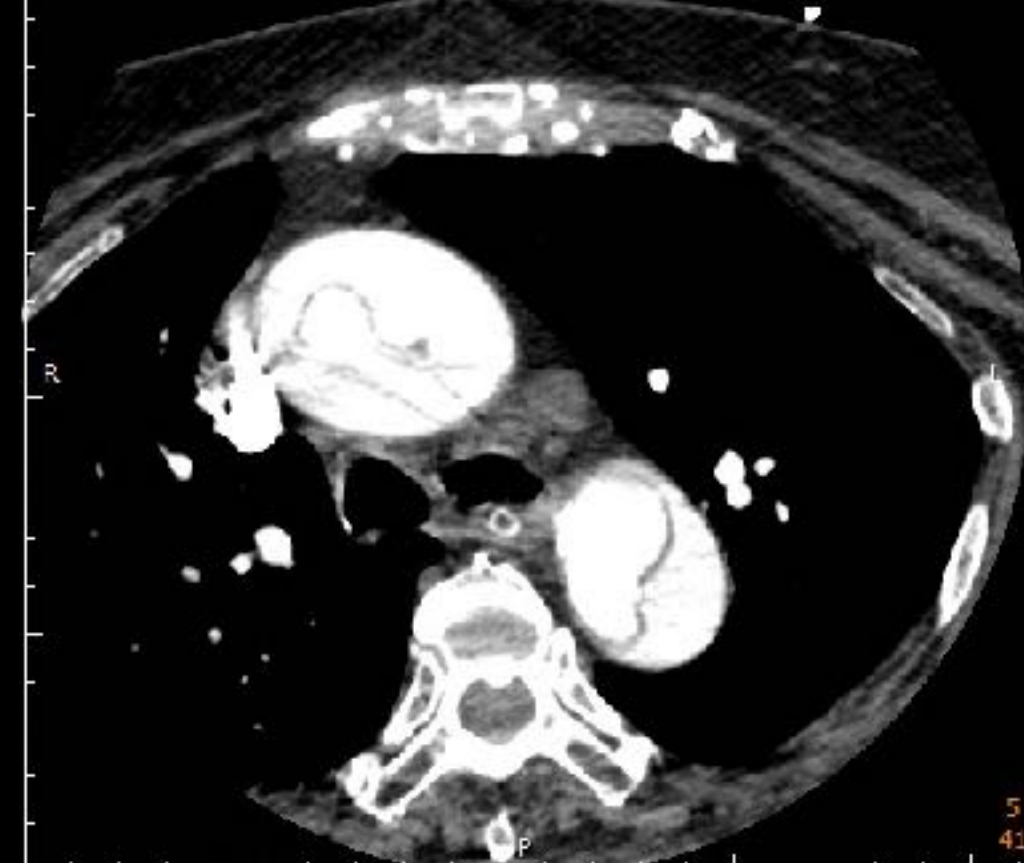
20181203



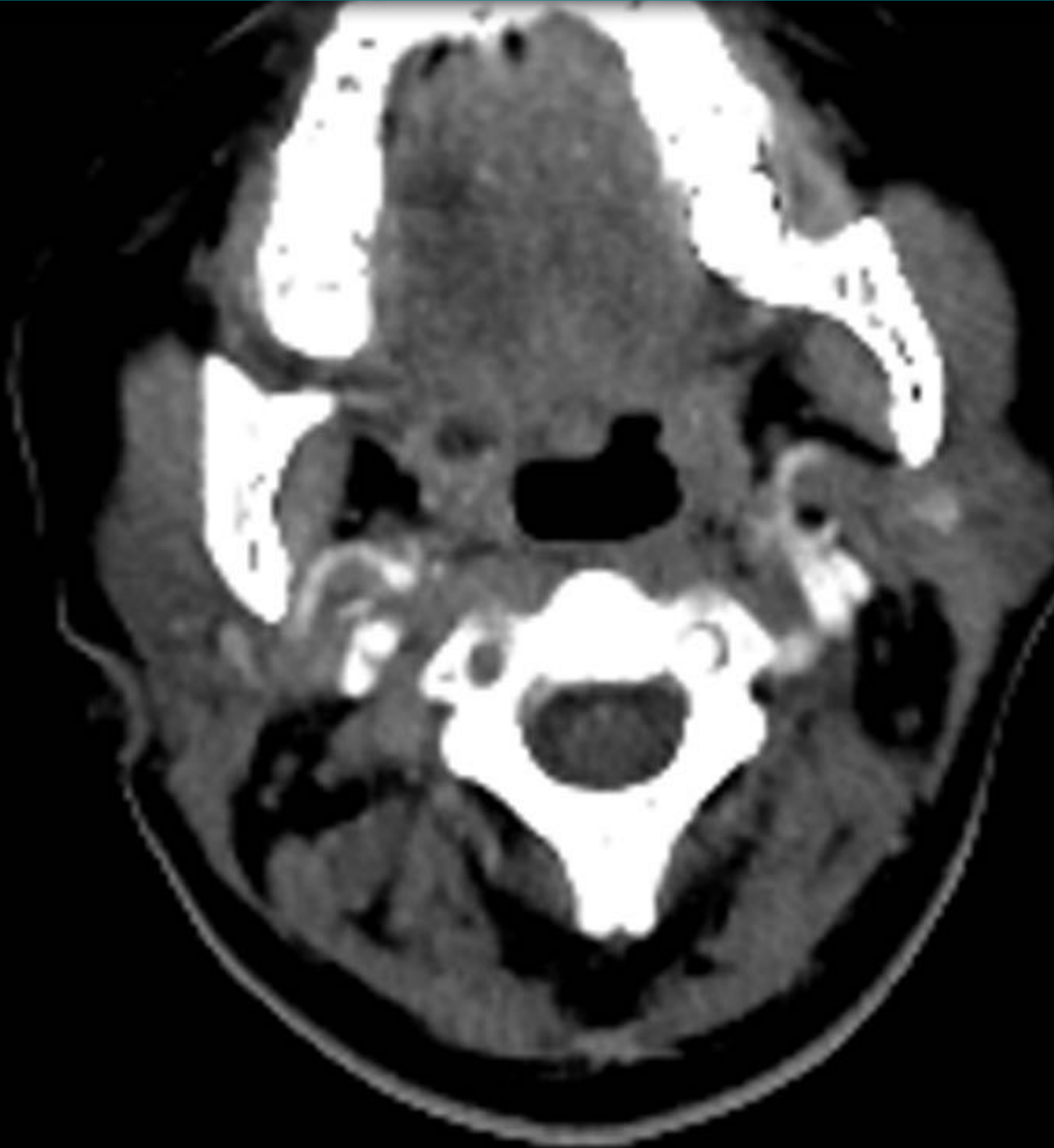
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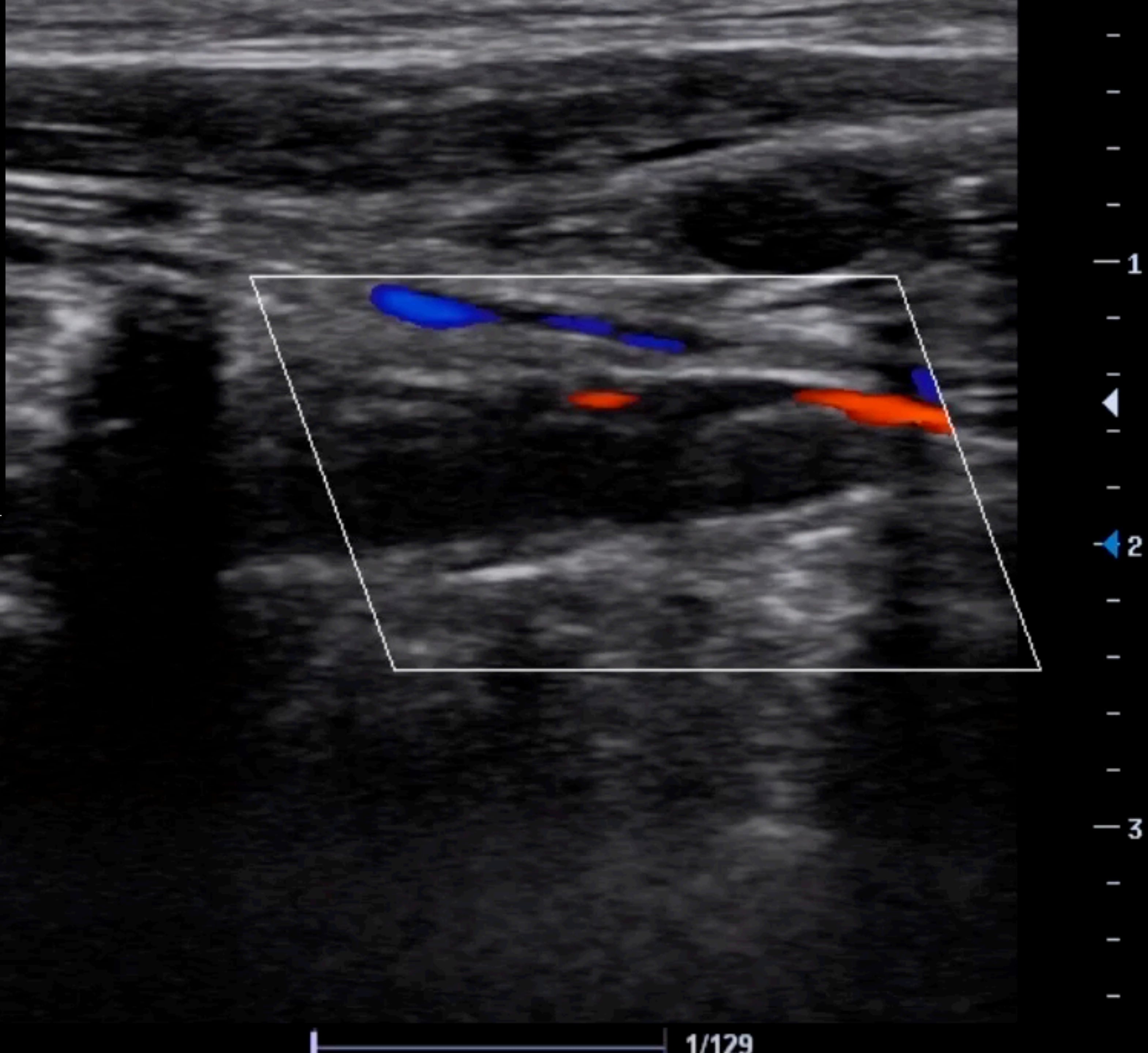
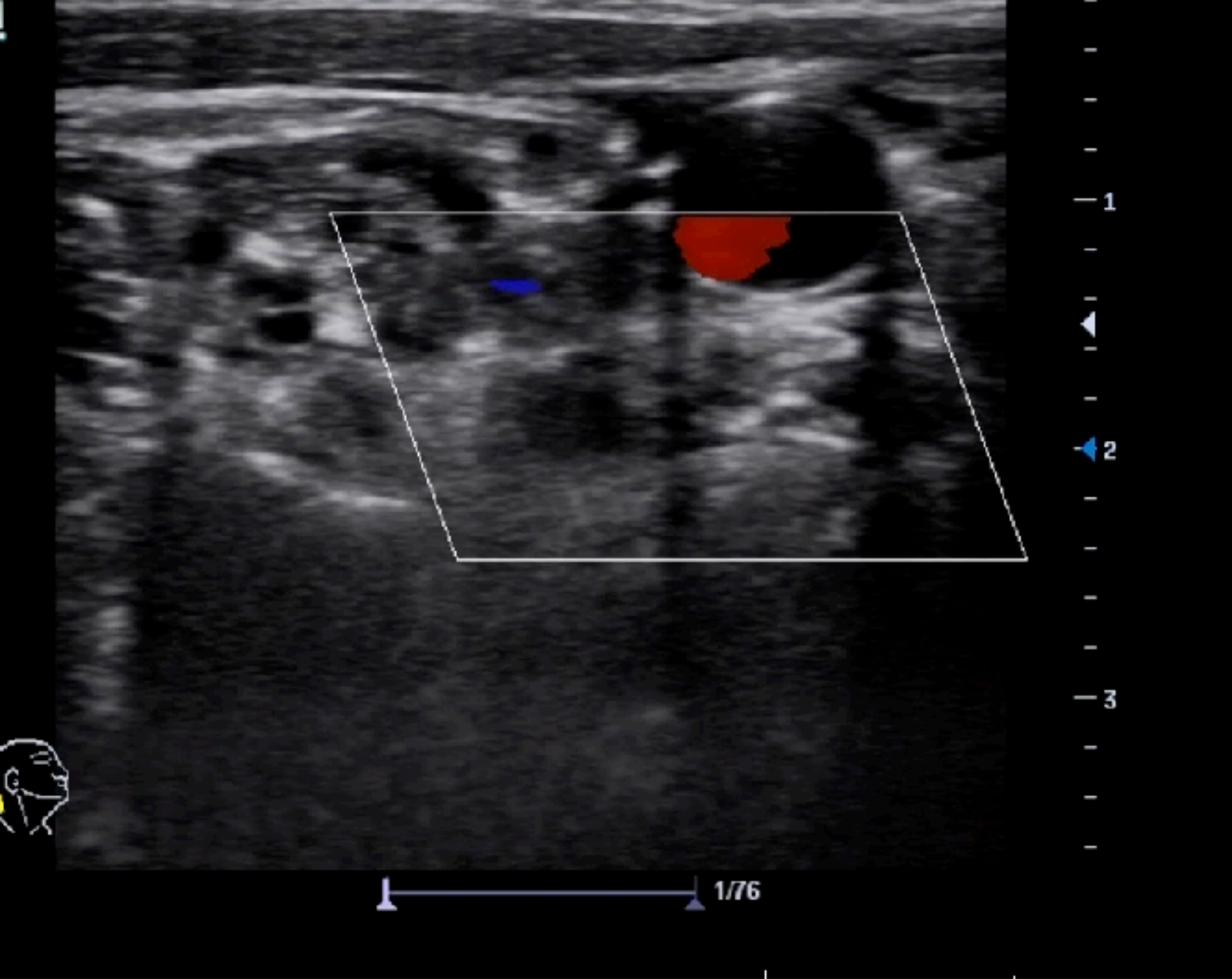




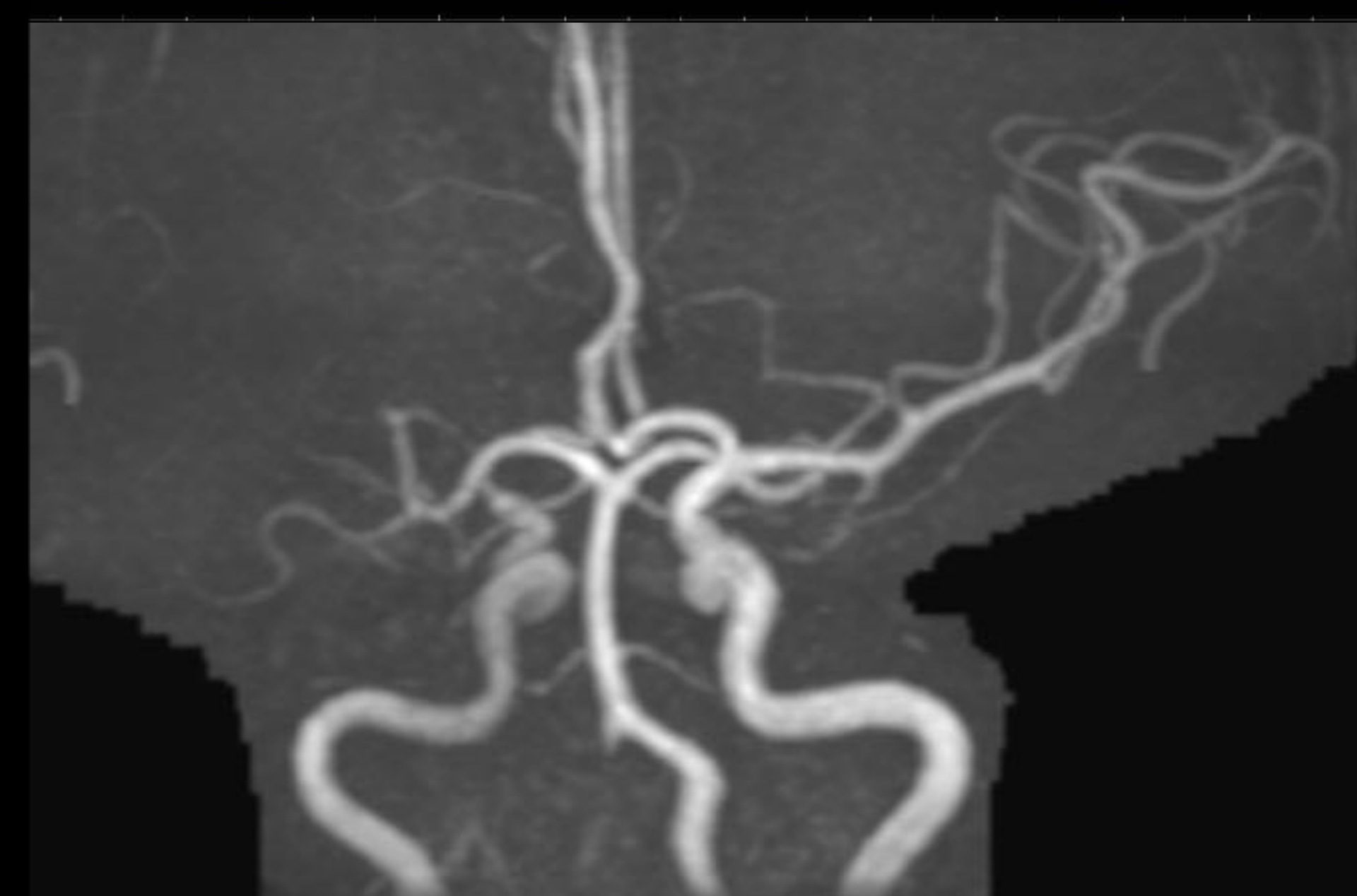
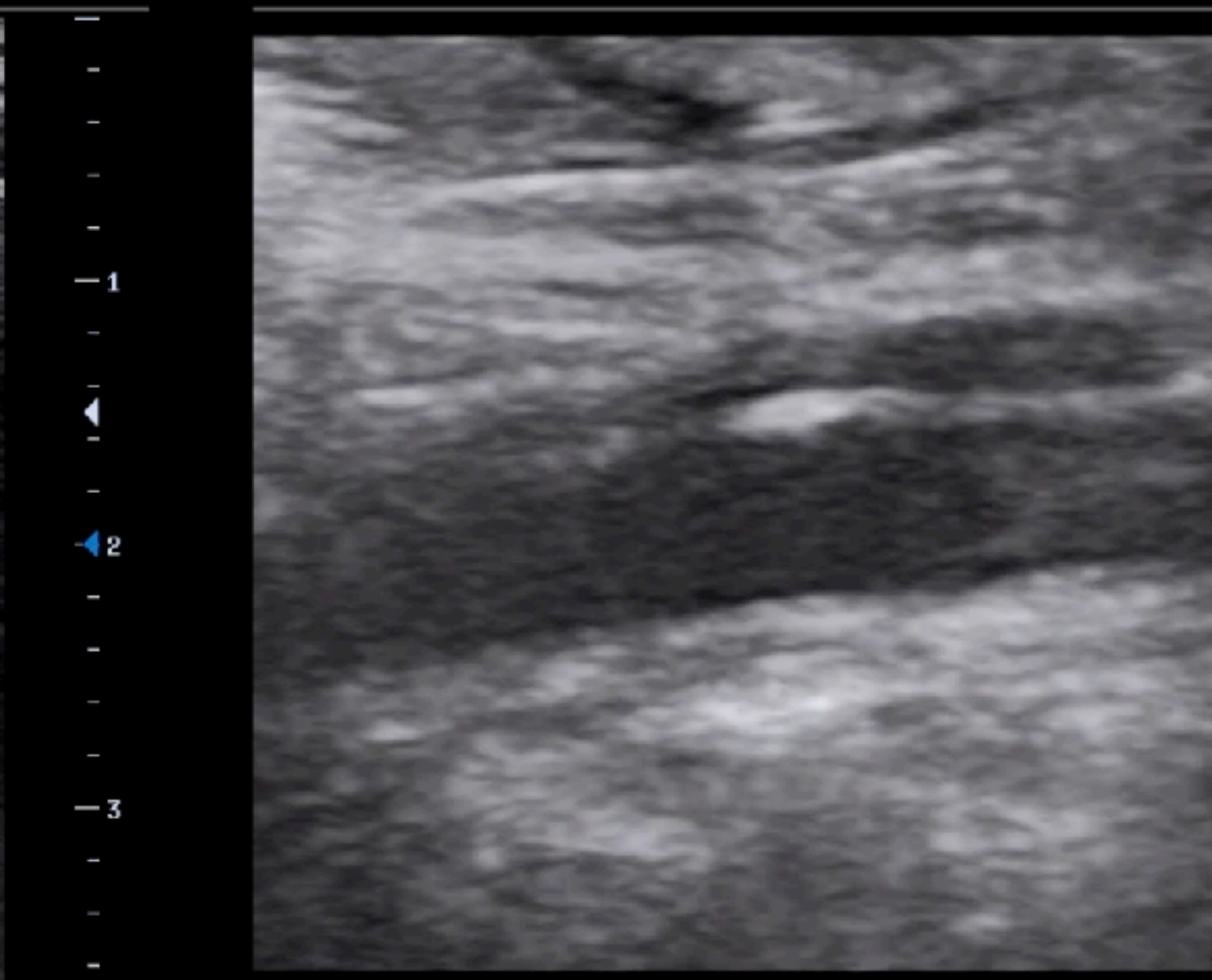
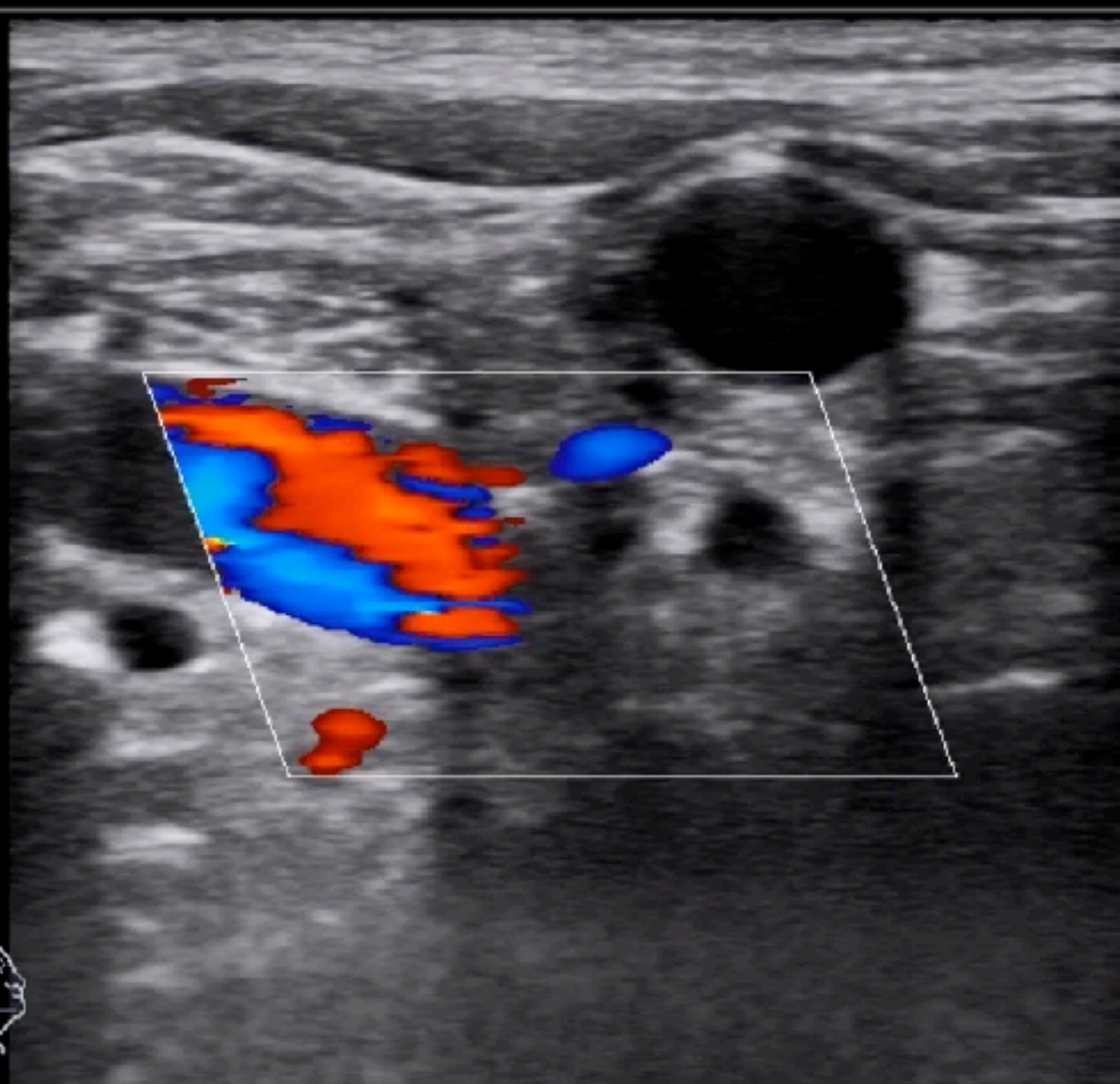
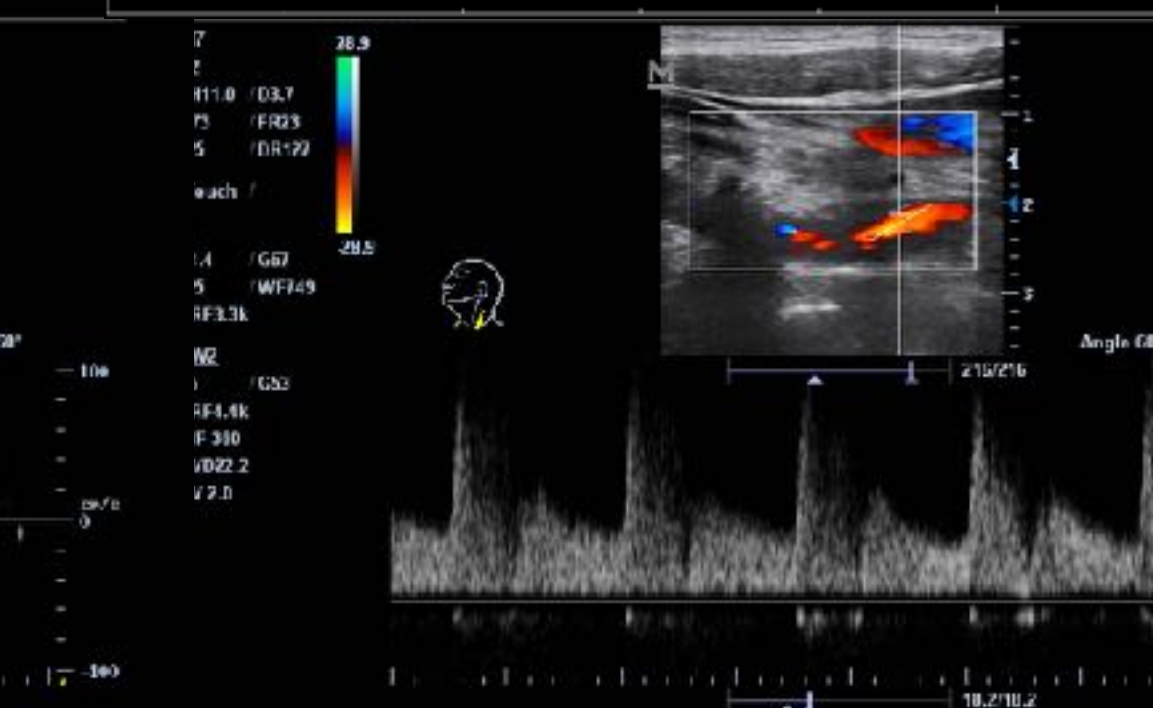
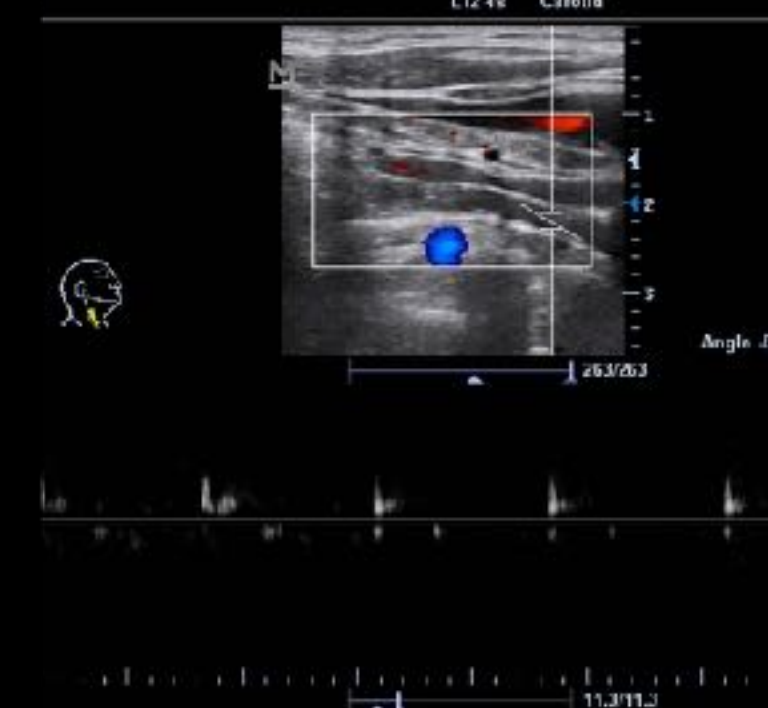
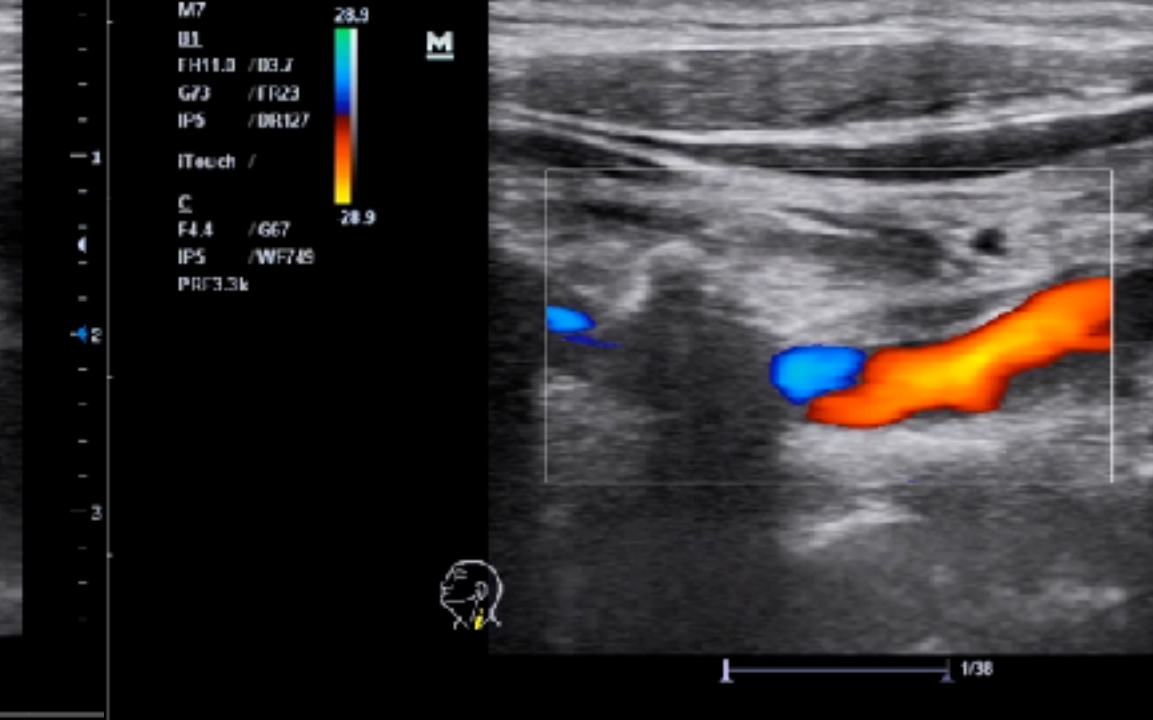
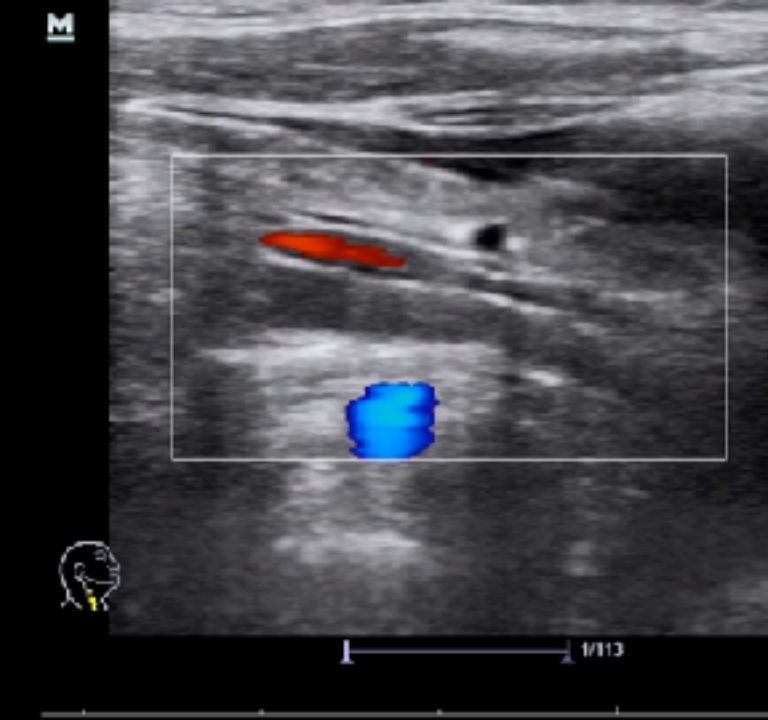
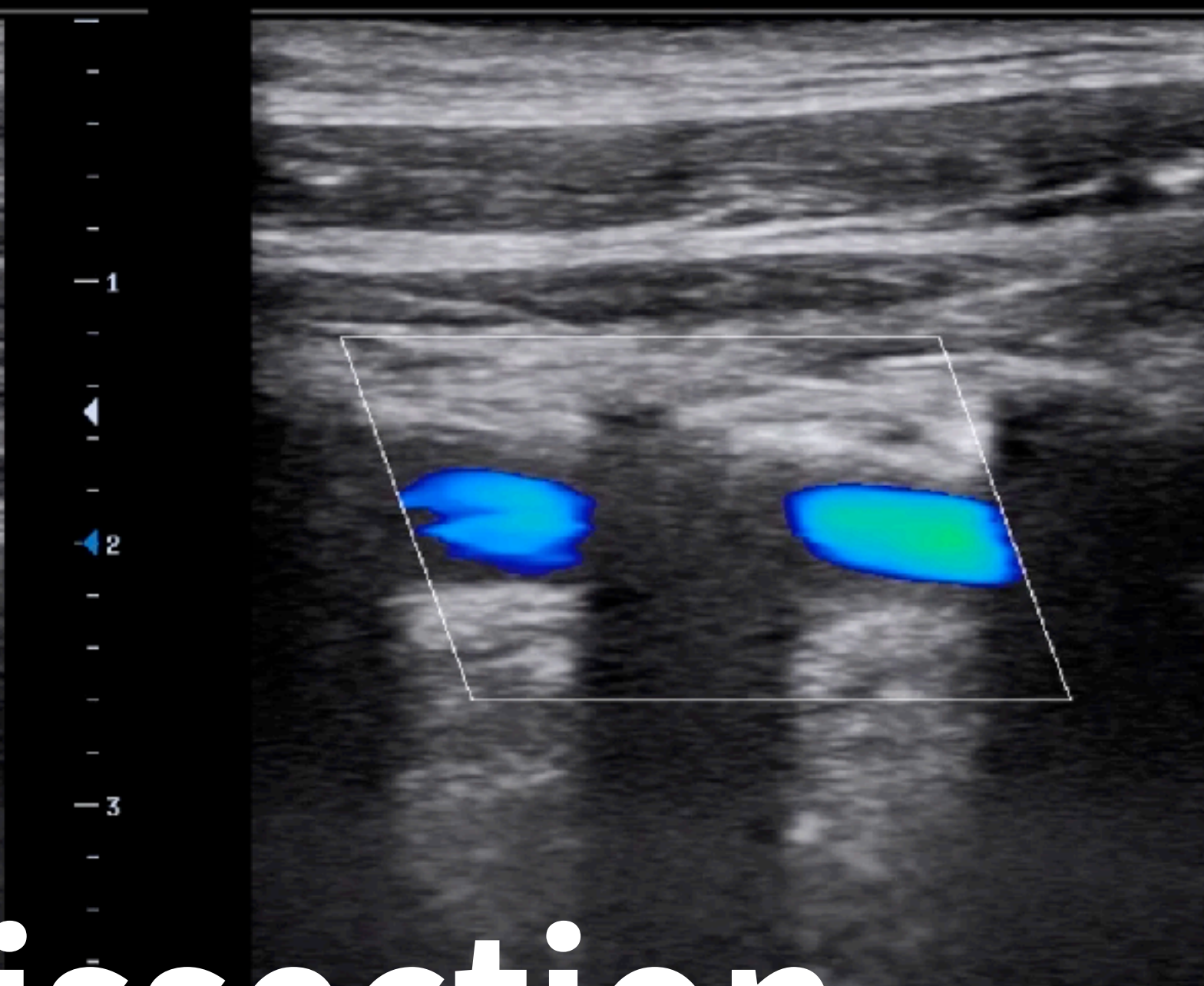
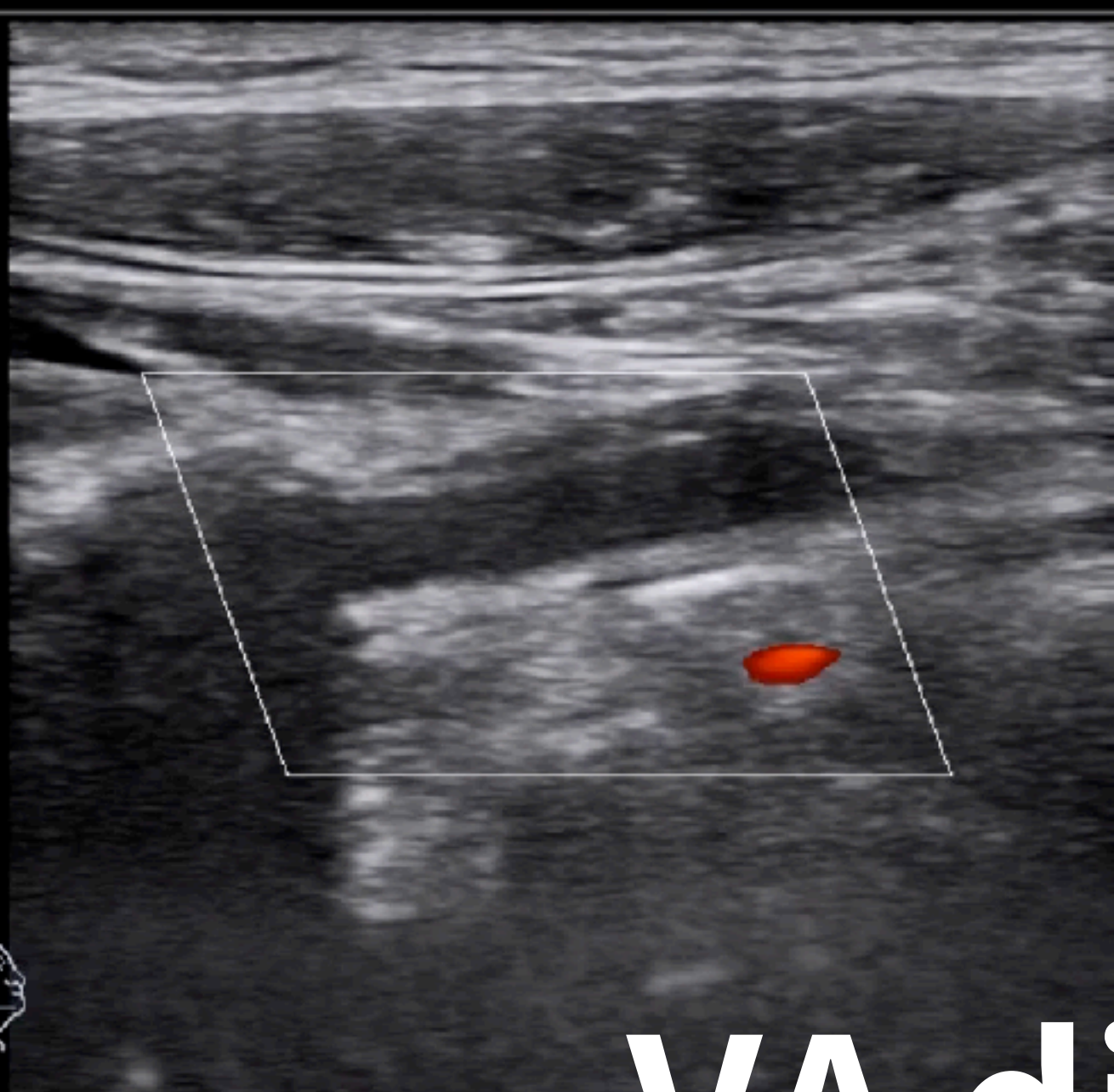


**44F, persistent dizziness
(L hand weak & neck pain 1d)**





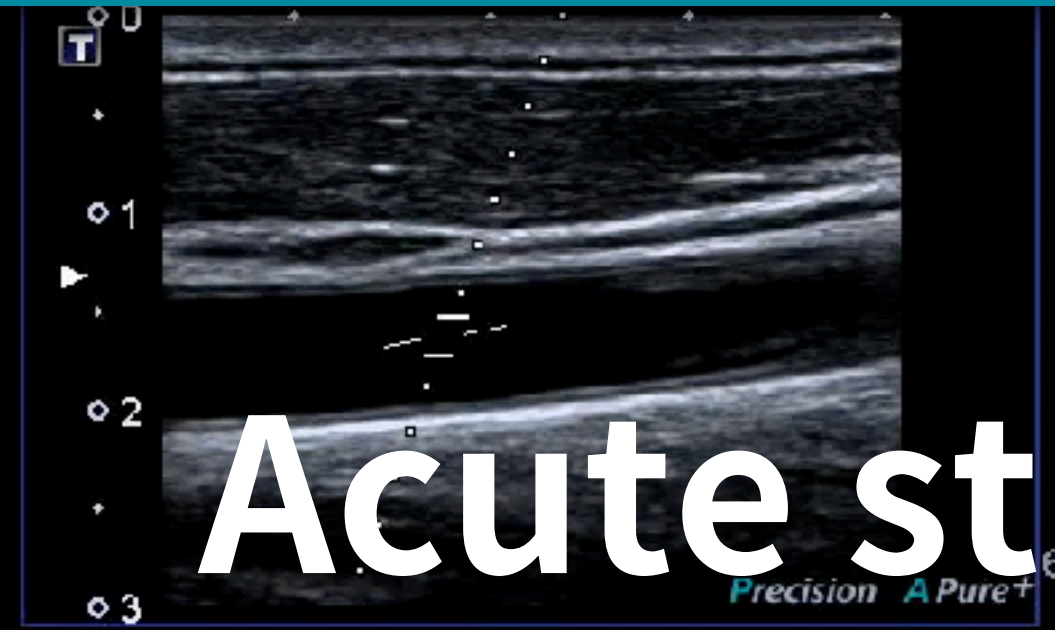
VA dissection



ECD in ER

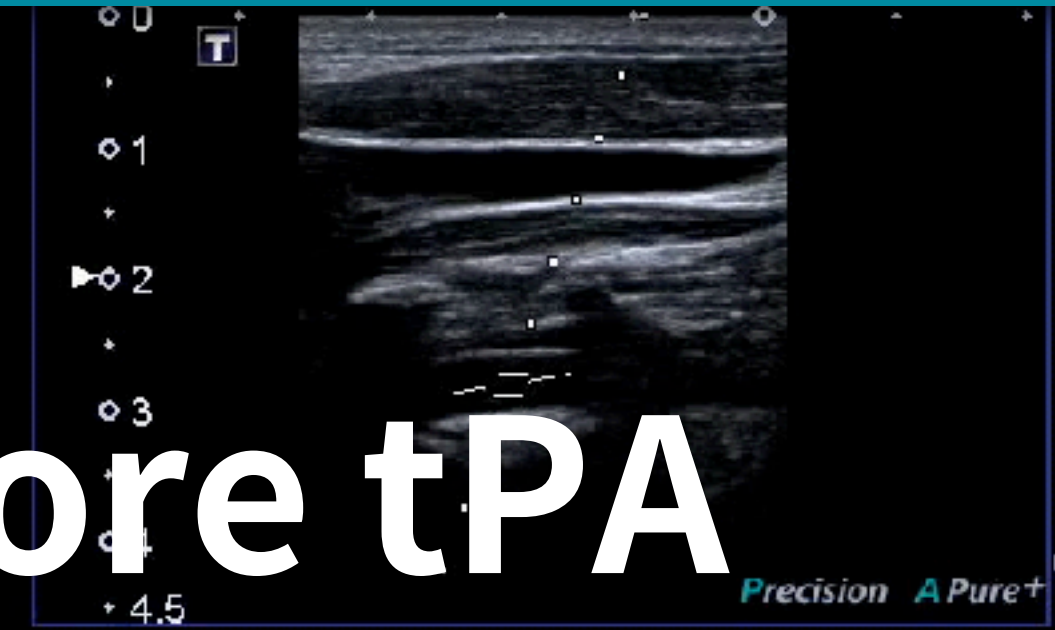
CCA

Vmax cm/s
Ved cm/s
PI
RI
S/D
Vmin cm/s
Vrn_peak cm/s
Vm_mean cm/s



VA

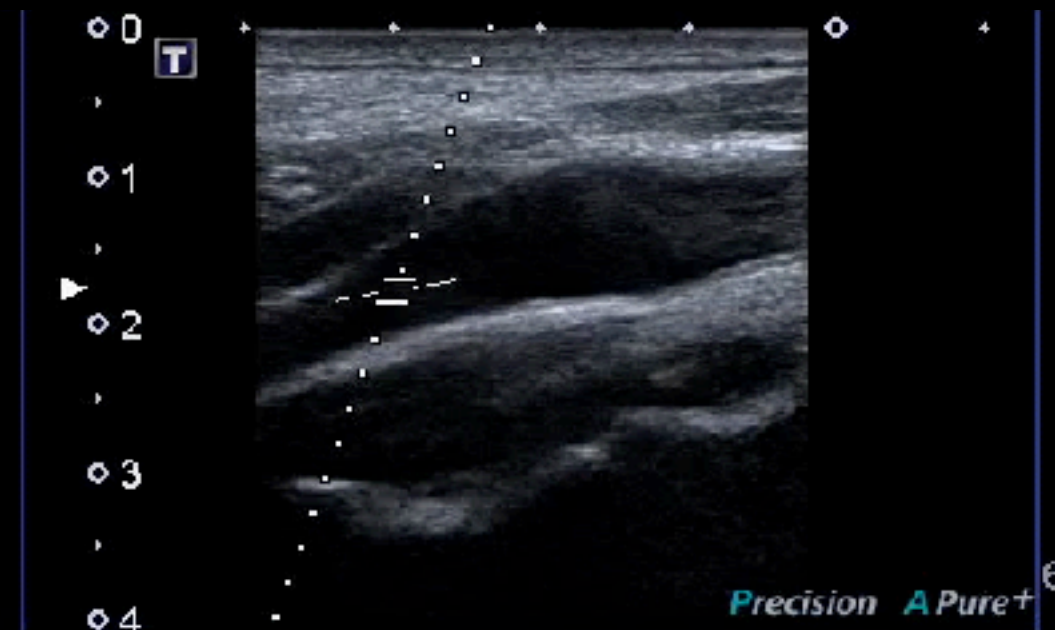
Vmax cm/s
Ved cm/s
PI
RI
S/D
Vmin cm/s
Vrn_peak cm/s
Vm_mean cm/s



Acute stroke before tPA
Suspect Aortic dissection
Suspect VBI

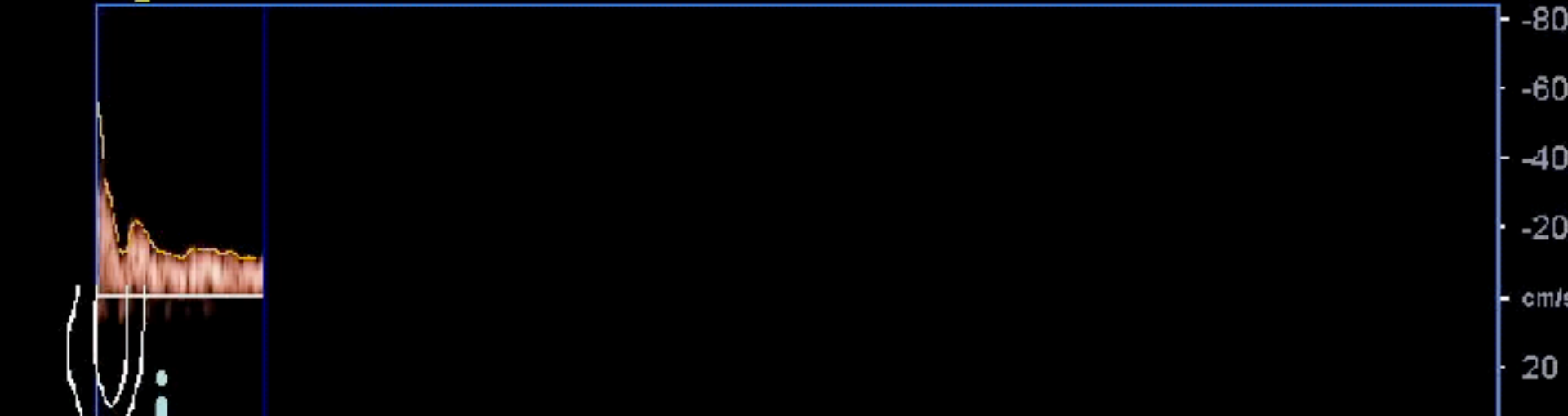
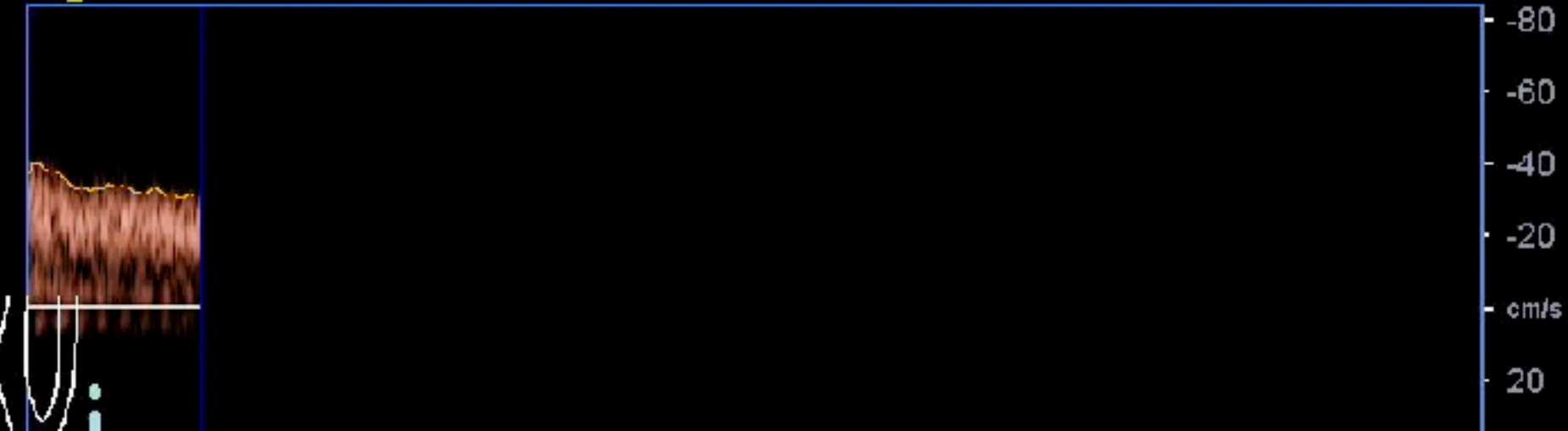
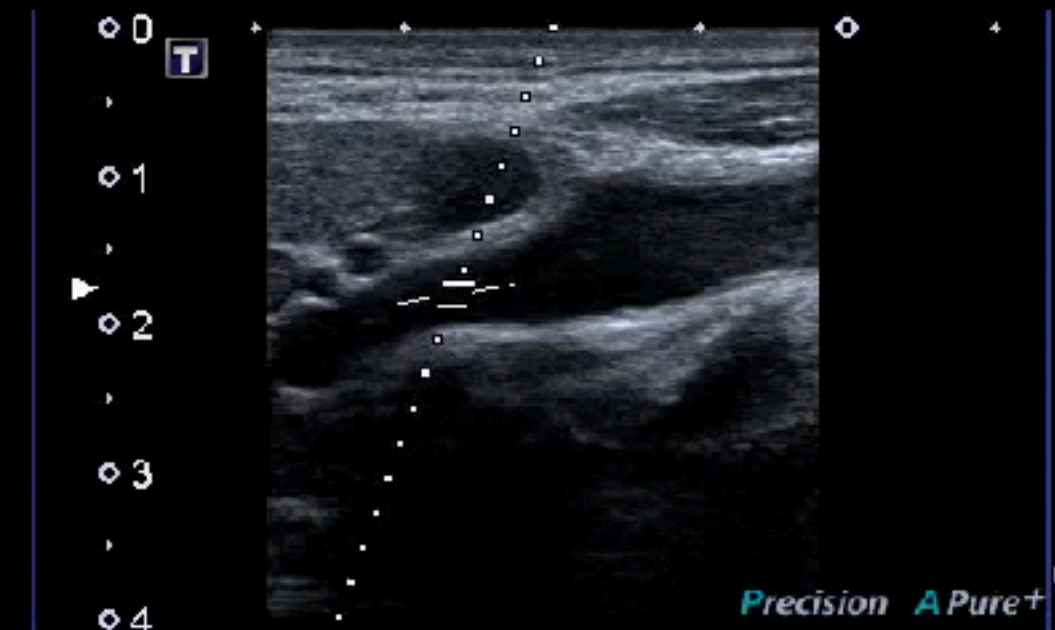
ICA

Vmax cm/s
Ved cm/s
PI
RI
S/D
Vmin cm/s
Vrn_peak cm/s
Vm_mean cm/s

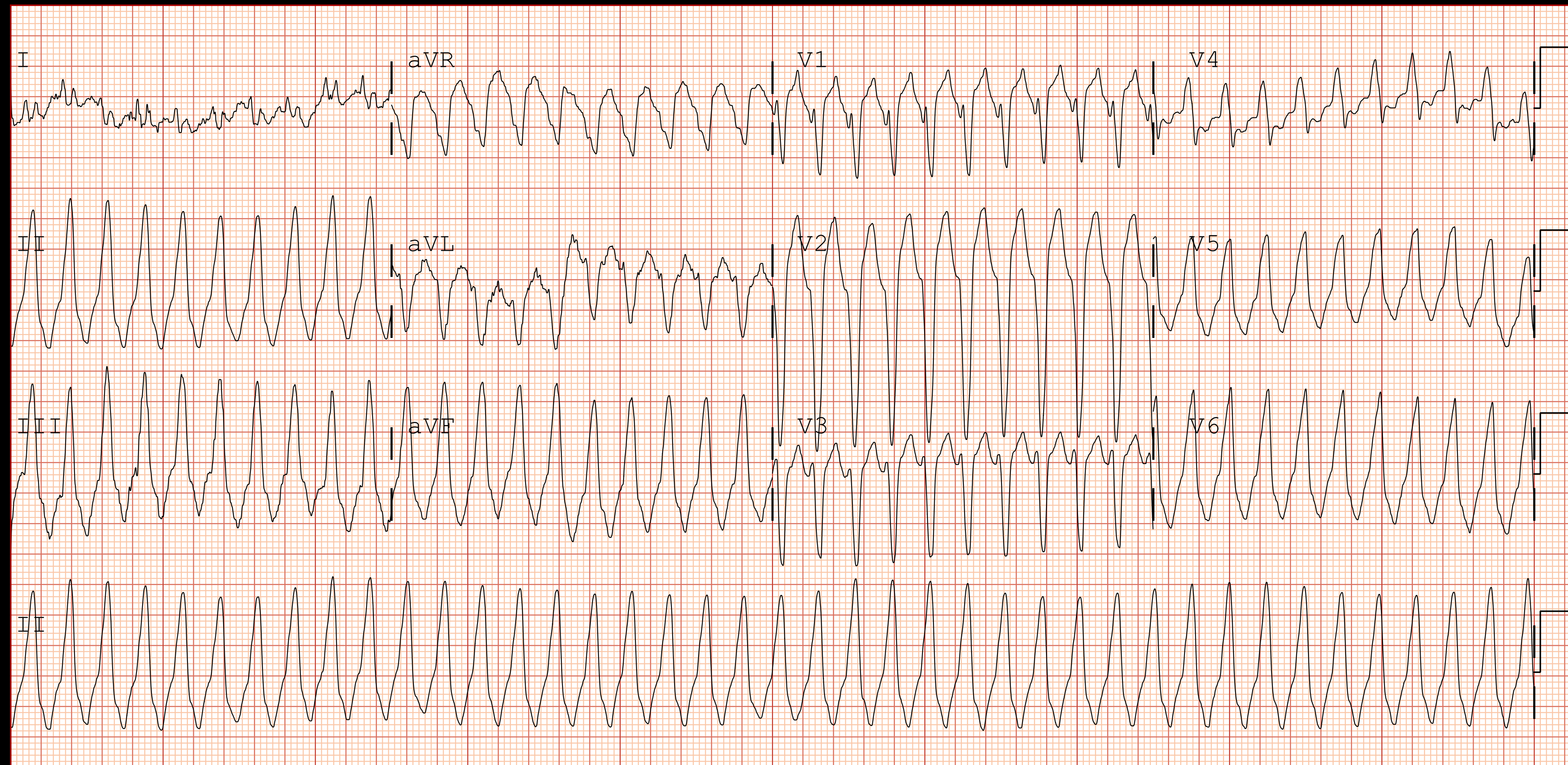


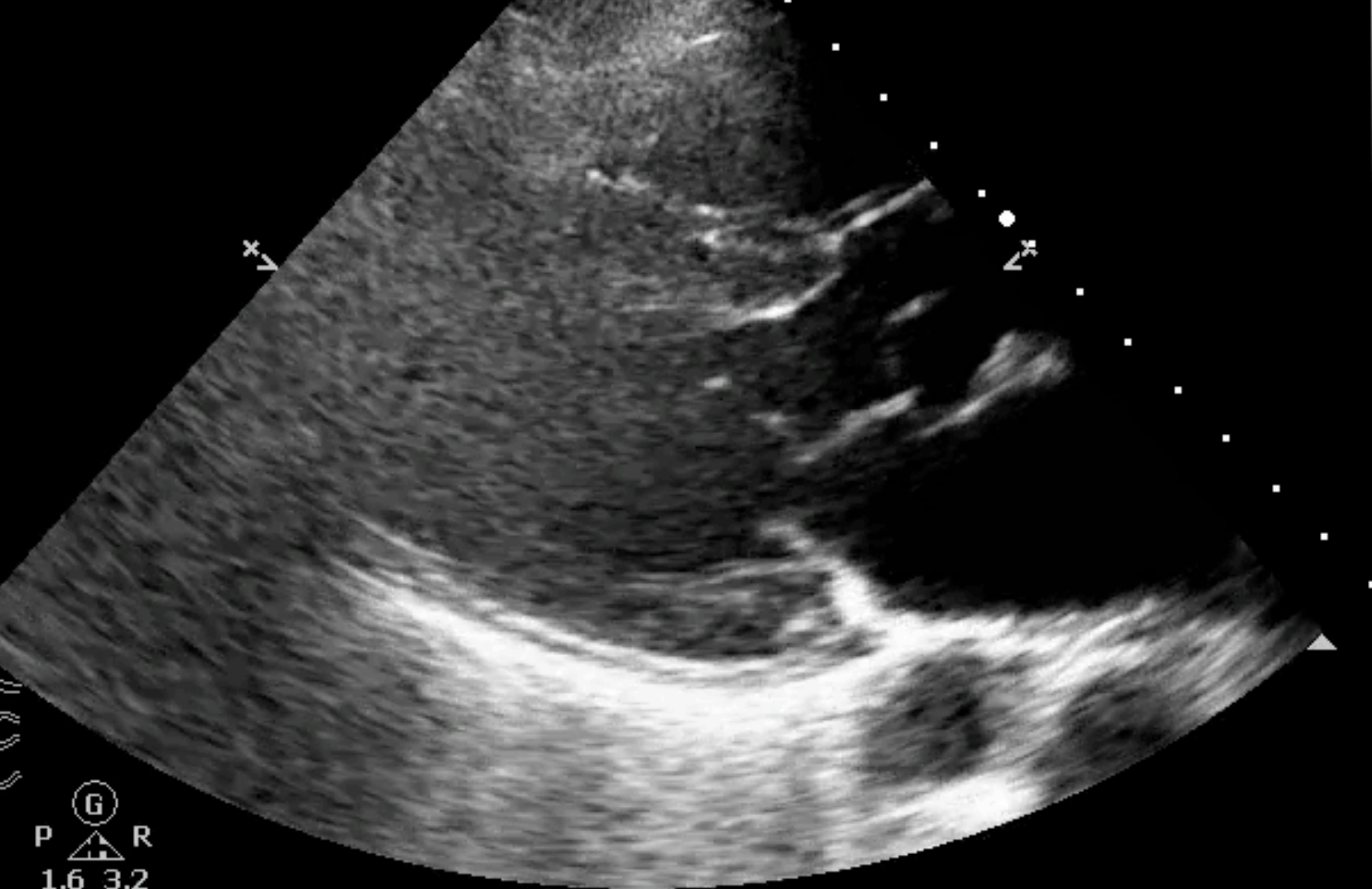
ECA

Vmax cm/s
Ved cm/s
PI
RI
S/D
Vmin cm/s
Vrn_peak cm/s
Vm_mean cm/s

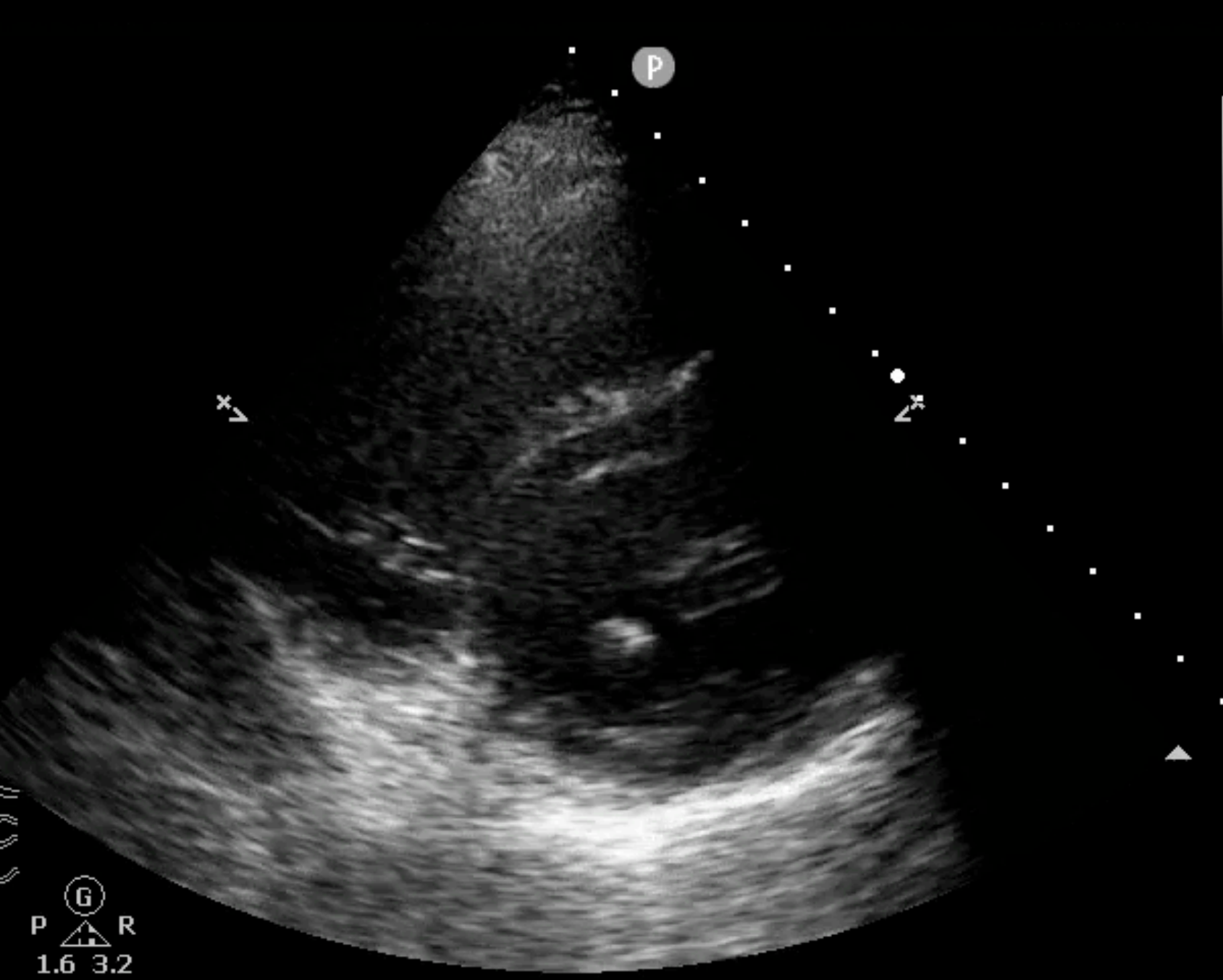


43F, palpitation & cold sweating





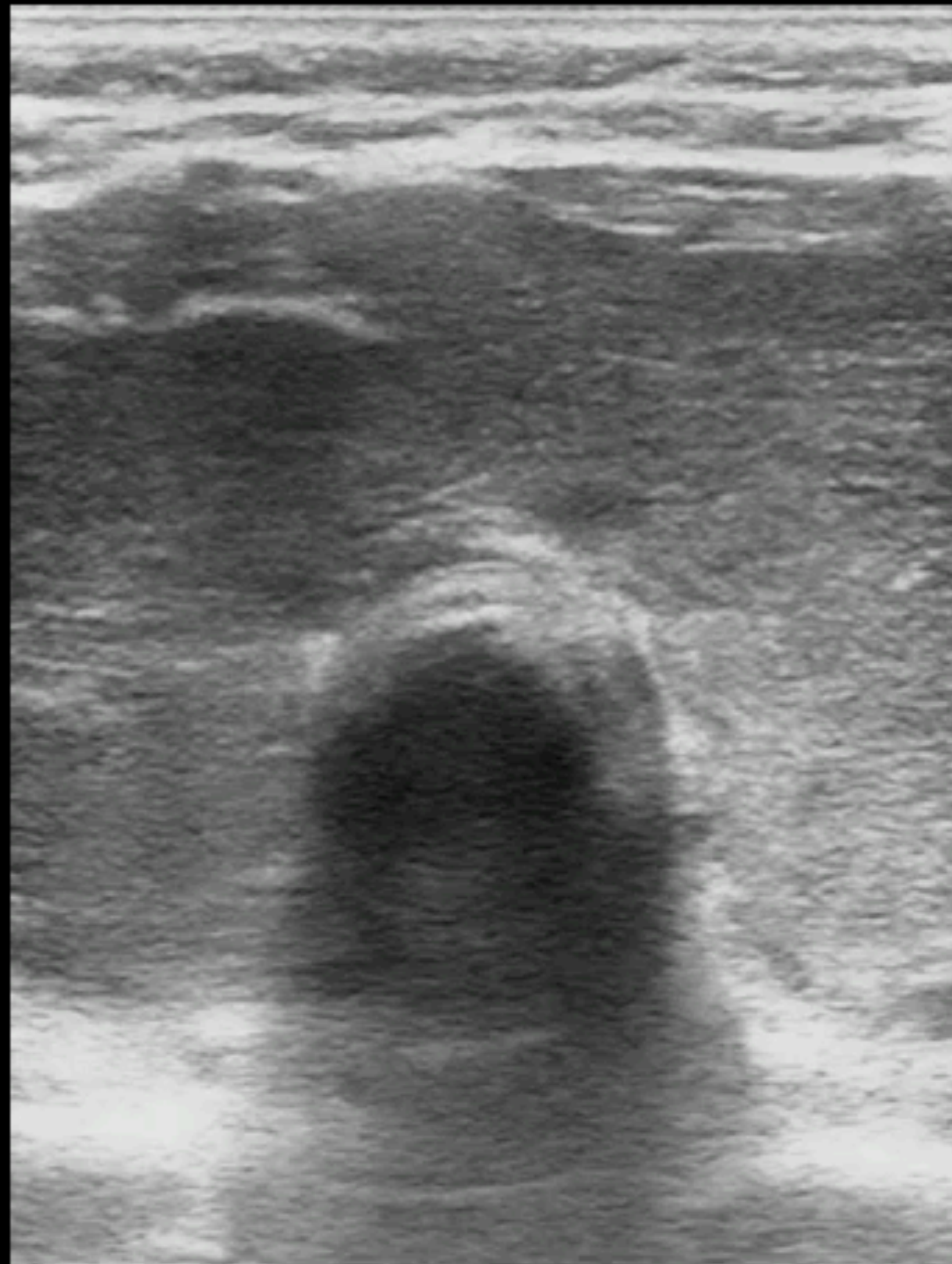
G
P R
1.6 3.2



G
P R
1.6 3.2

0210175652

SKH ER



MI 1.2

TIS 0.2

Arterial
L12-3
25 Hz
5.0cm

2D
HGen
Gn 100
C 41
3/3/2

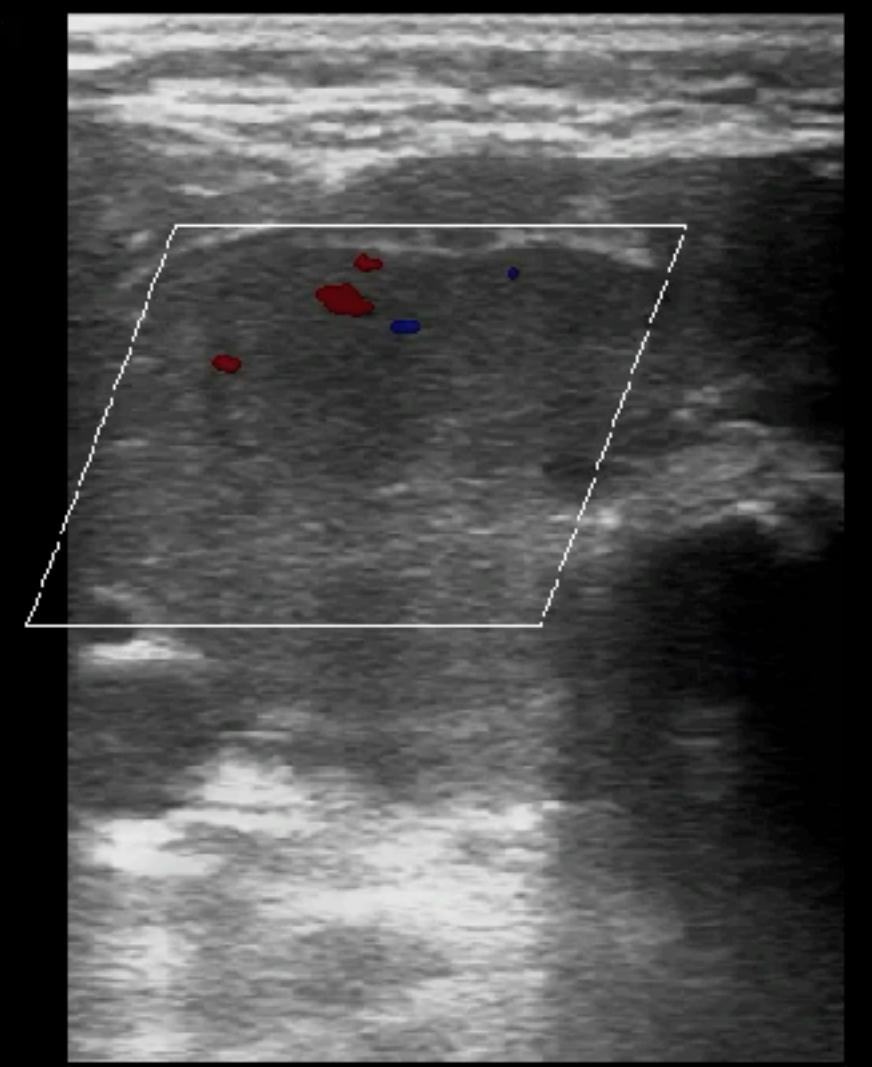
Color
5.0 MHz
Gn 55
3/7/4
Filtr Med



25-02-10-175652

SKH ER

TIS 0.5 5:50



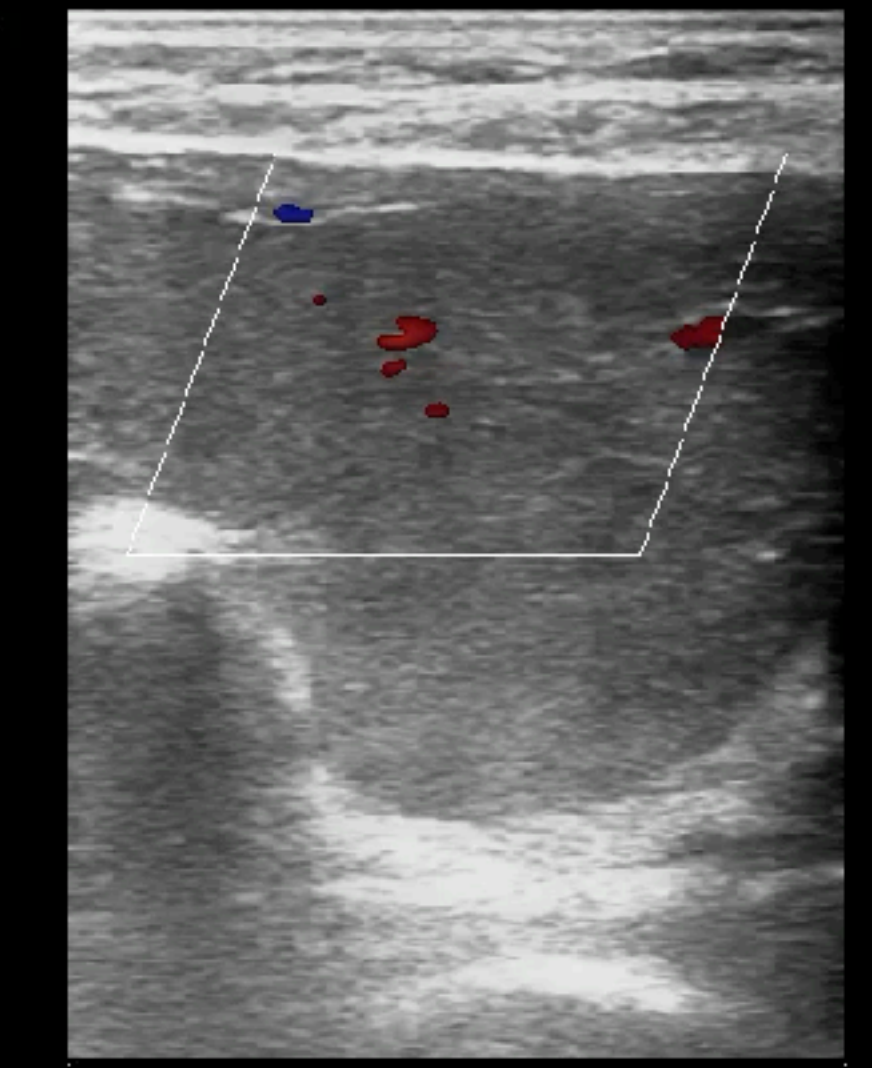
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25-02-10-175652

MI 1.3 2/1
TIS 0.5 5:50

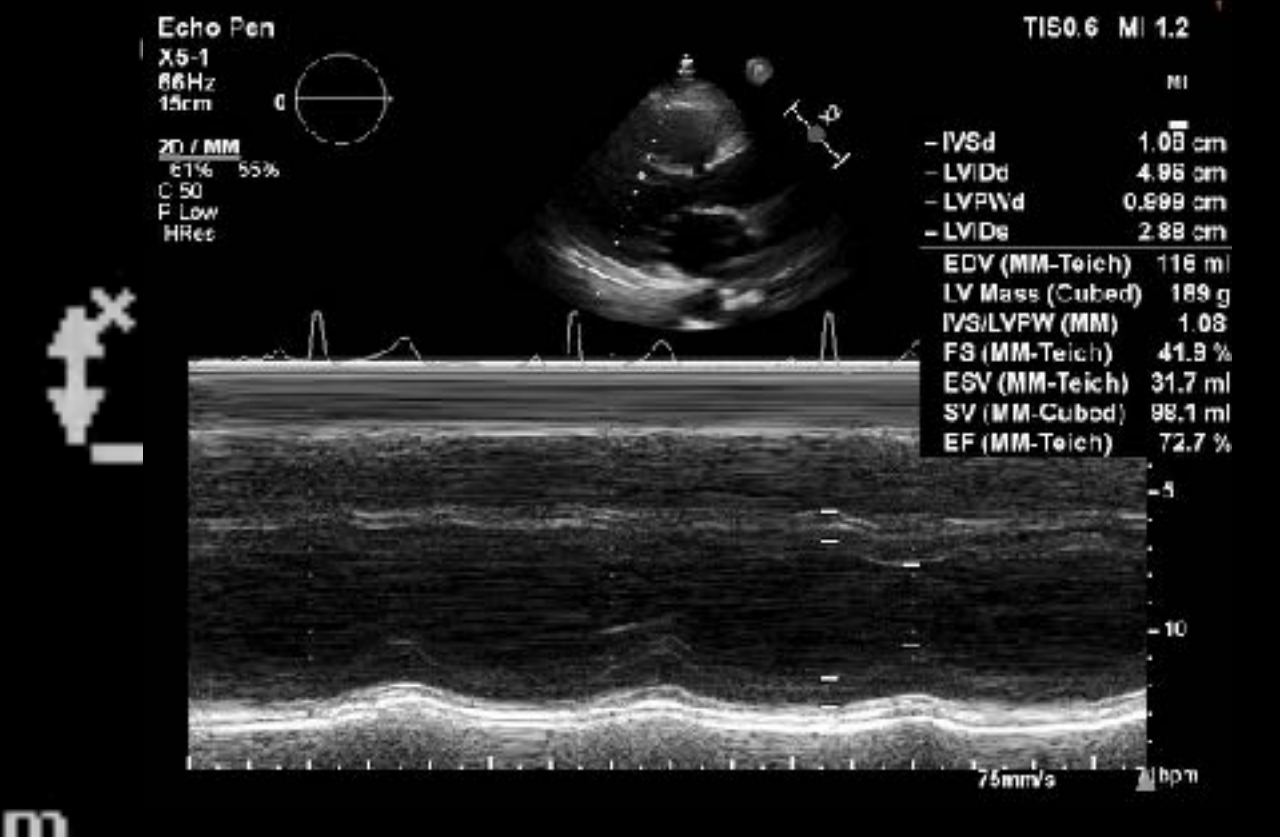
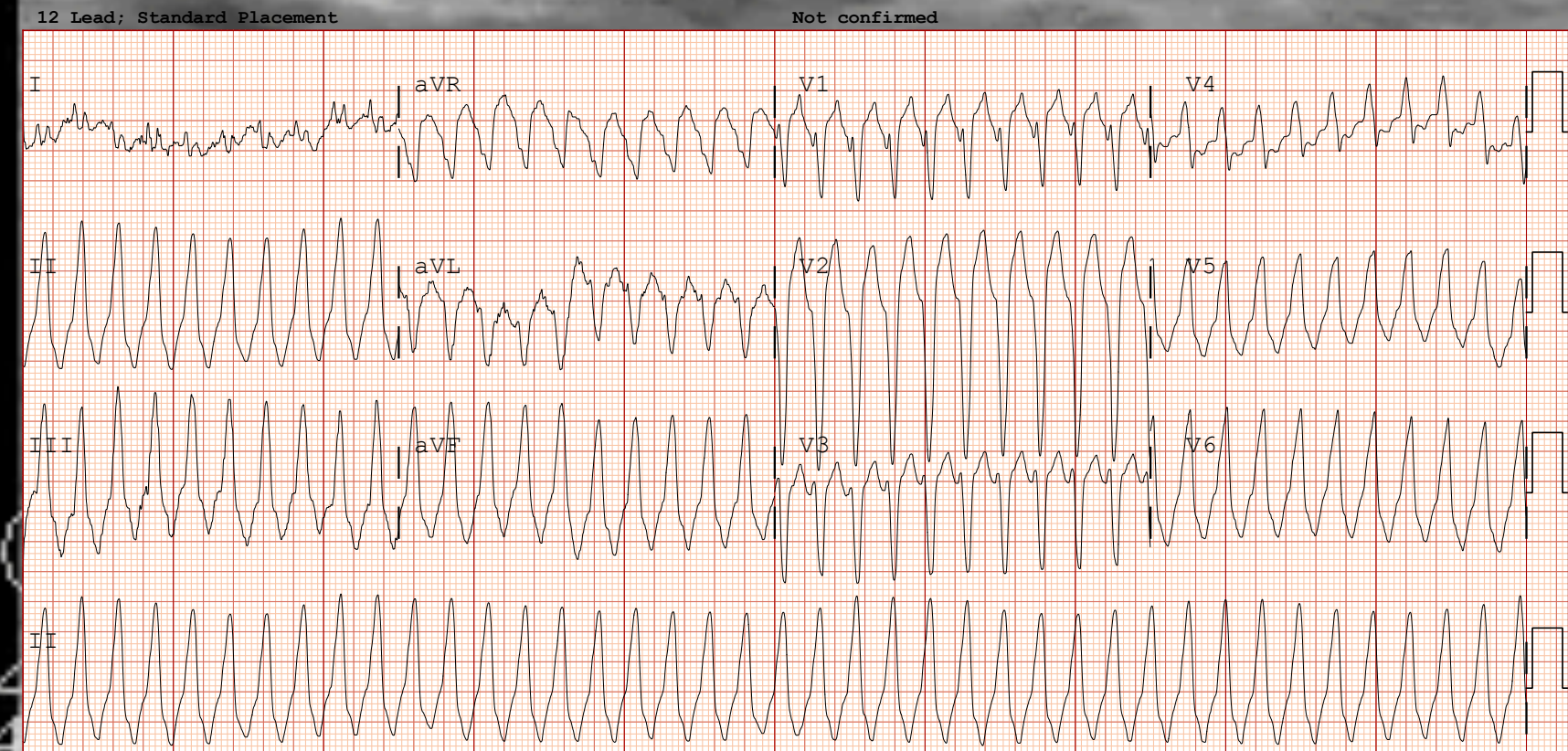
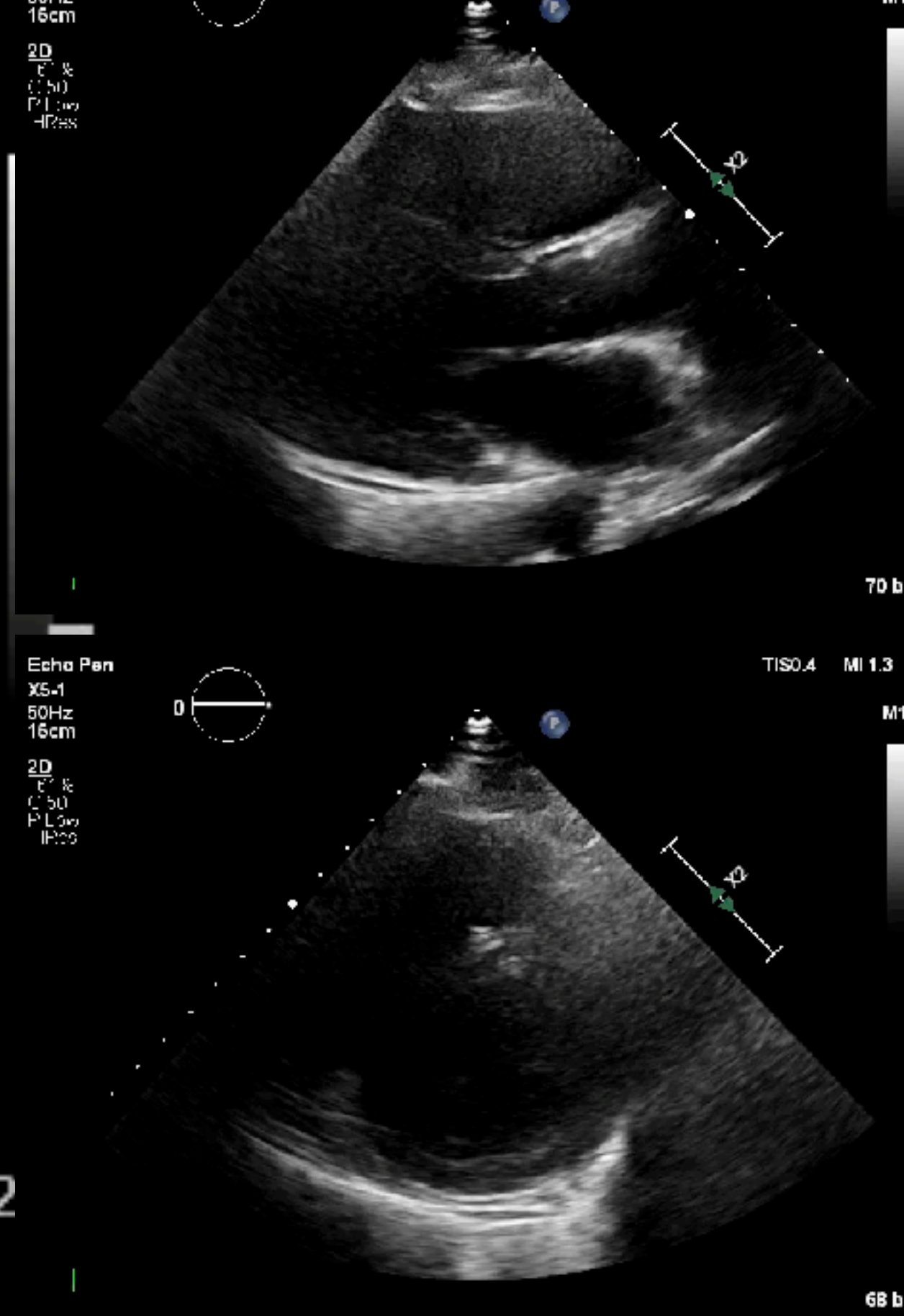
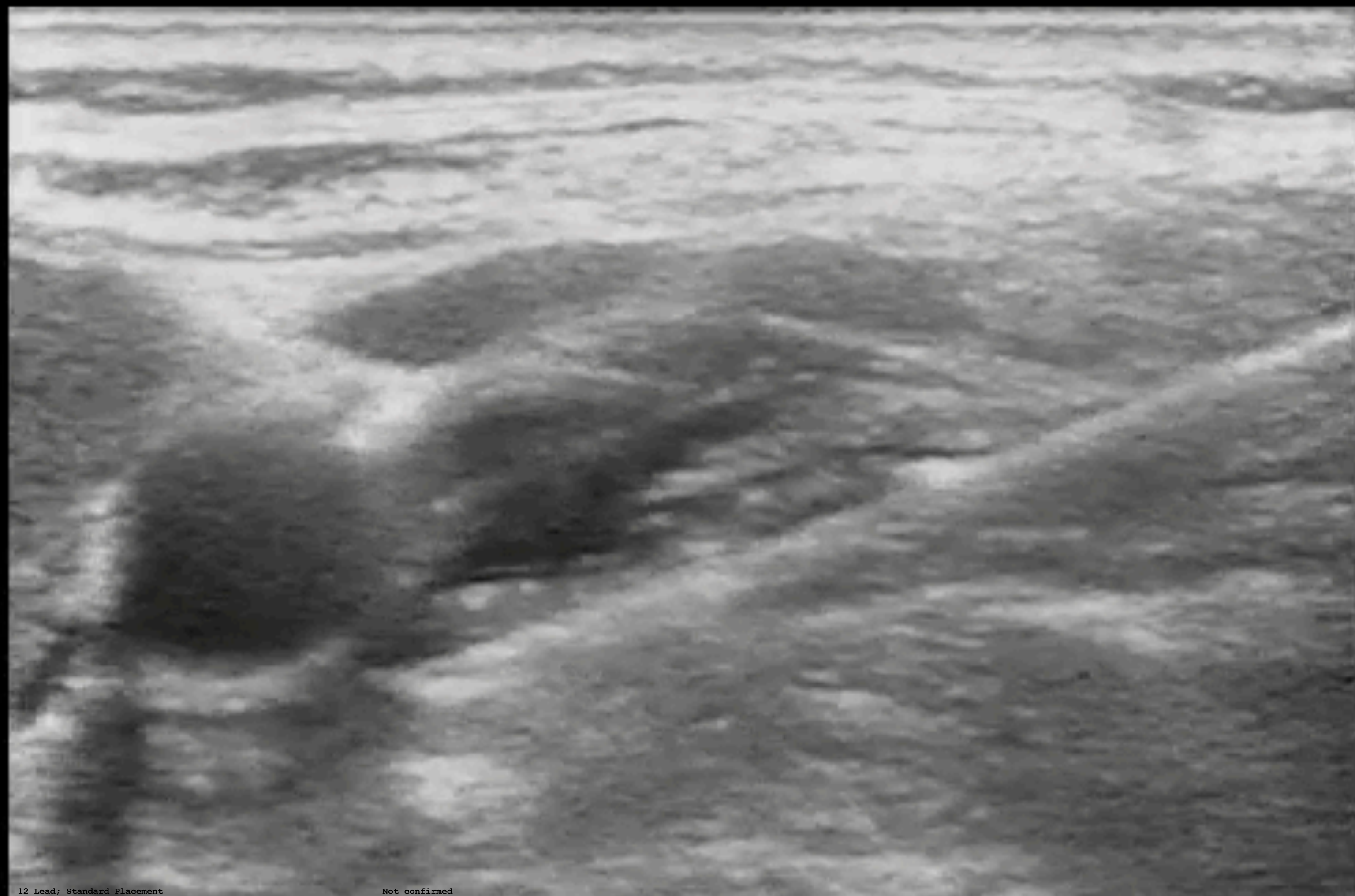
Arterial
L12-3
25 Hz
5.0cm

2D
HGen
Gn 100
C 41
3/3/2

Color
5.0 MHz
Gn 55
3/7/4
Filtr Med



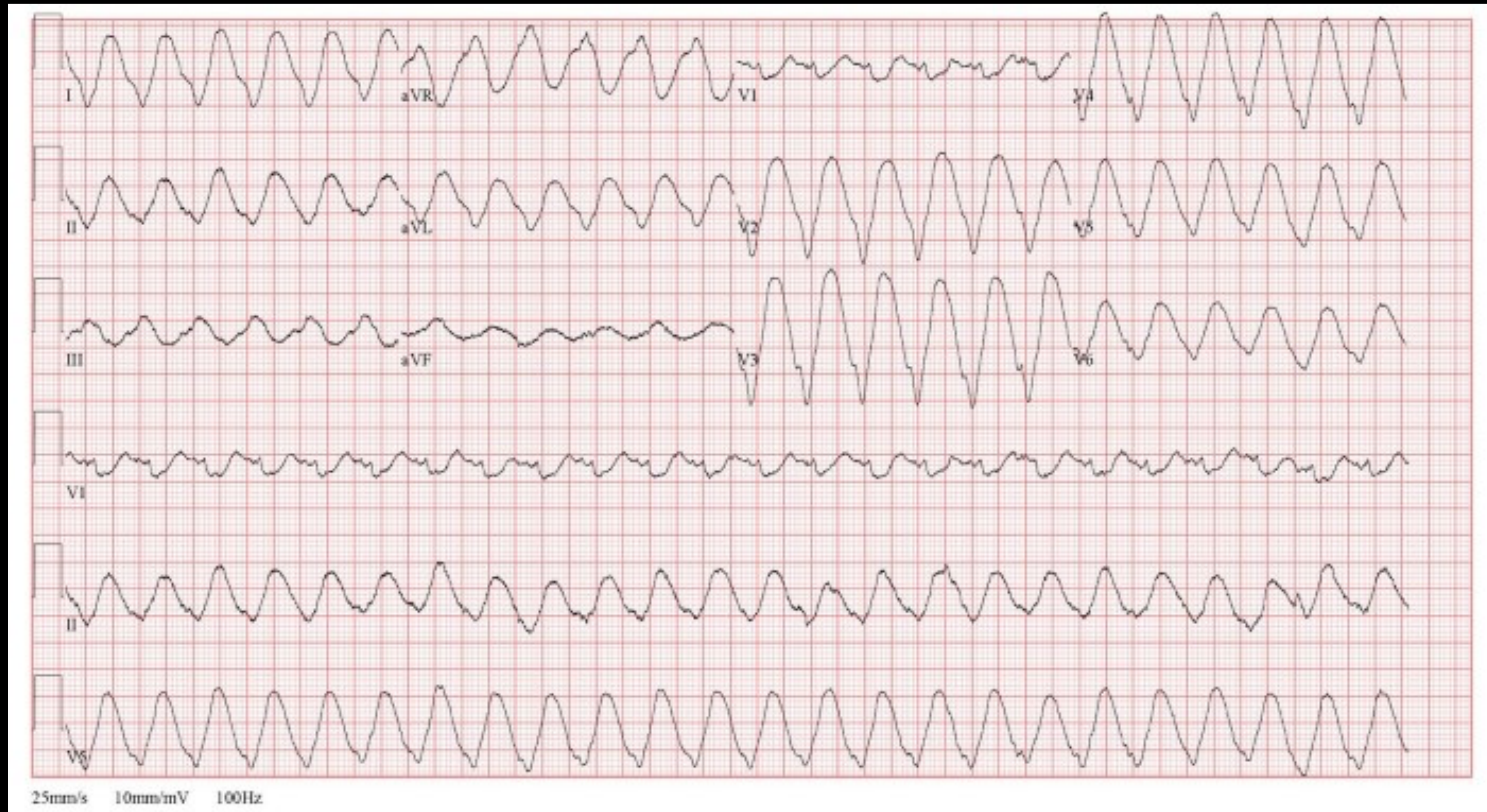
P



P 44

Electrical storm

≧ 3 ventricular arrhythmia within 24 hours



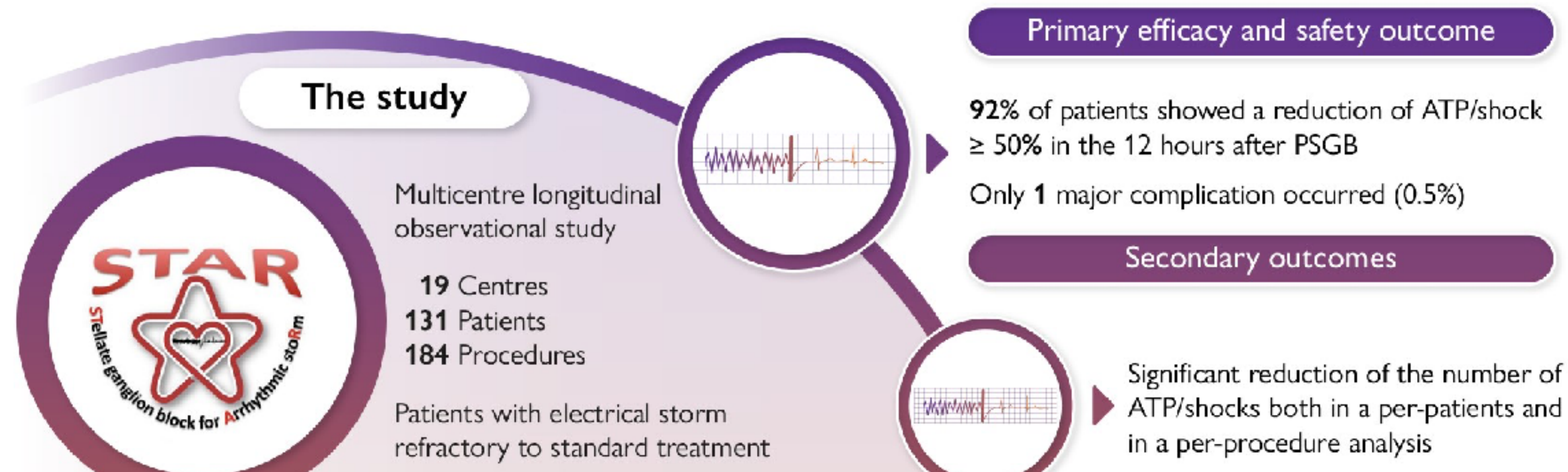
Electrical storm treatment by percutaneous stellate ganglion block: the STAR study

Key Finding

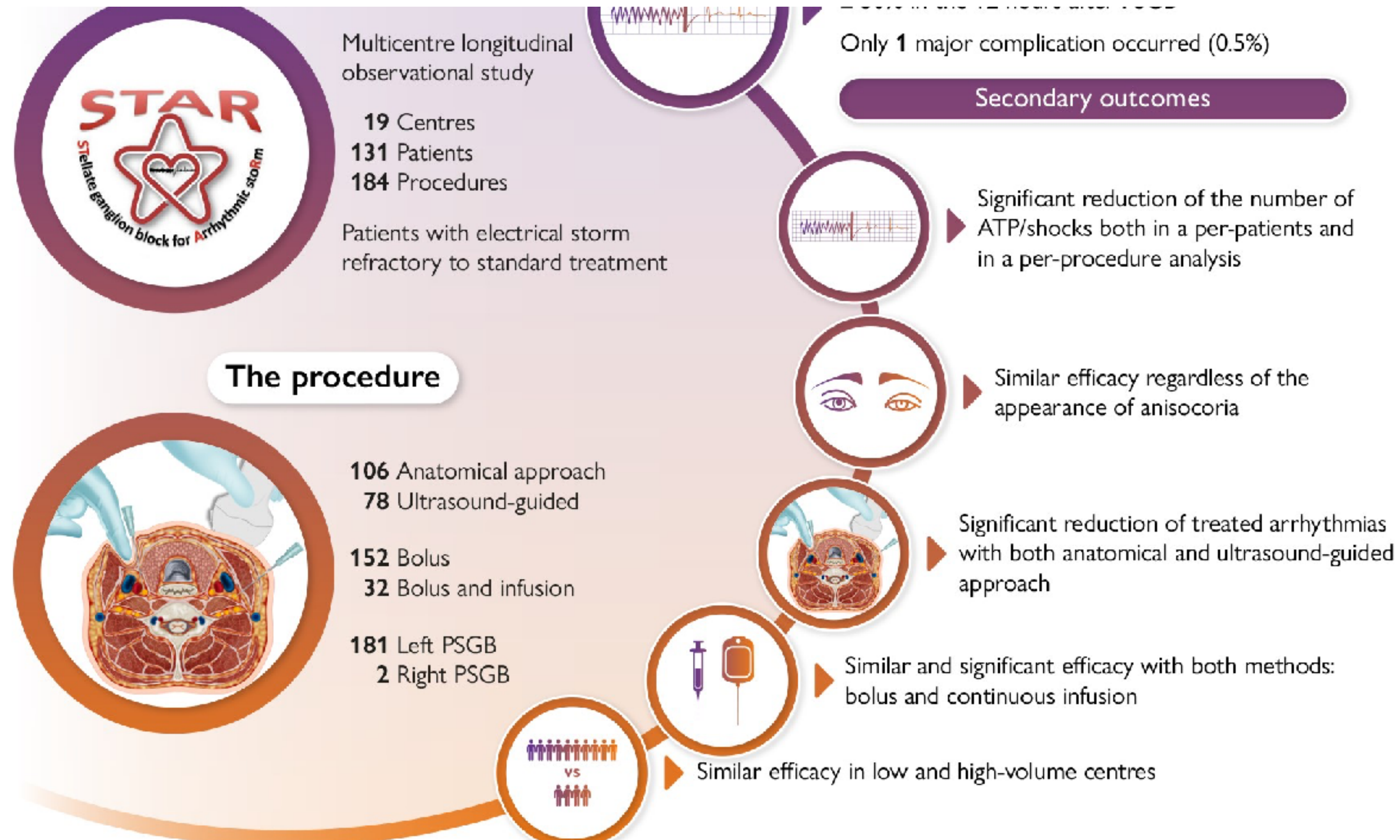
A total of 131 patients and 184 PSGBs were considered. A reduction of treated arrhythmias of at least 50% in the 12 hours after, compared with 12 h before PSGB, was seen in 92% of patients, with a 100% median reduction of ATP/shock. Only 1 major complication occurred (0.5%).

Take Home Message

PSGB is a safe and effective technique to treat refractory electrical storm and should be considered to stabilize patients unresponsive to first-line conventional treatments.



Electrical storm treatment by percutaneous stellate ganglion block: the STAR study



mostly exerts dose and rate infusion dependent antiadrenergic effects in the first hours, and may lead to severe hypotension. PLSGB has an excellent safety-efficacy profile and can be easily performed by trained cardiologists at bedside.

The role of antiarrhythmic drugs and stellate ganglion block in the acute management of electrical storm

Veronica Dusi ^{1,2†}, Filippo Angelini ^{1†}, Carol Gravinese ¹, Simone Frea ¹, and Gaetano Maria De Ferrari ^{1,2*}

¹Division of Cardiology, Cardiovascular and Thoracic Department, Città della Salute e della Scienza, Turin, Italy; and ²Department of Medical Sciences, University of Turin, Turin, Italy

KEYWORDS

Electrical storm;
Ventricular arrhythmias;
Antiarrhythmic drugs;
Percutaneous left stellate ganglion block;
Neuromodulation

Electrical storm (ES) is a life-threatening condition characterized by at least three separate episodes of ventricular arrhythmia (VAs) over 24 h, each one requiring intervention. Early recognition and prompt treatment are crucial to improving outcomes. In addition to identifying and correcting potential reversible causes, performing acute cardiac life support if required, and interrogating/reprogramming the implantable cardioverter defibrillator in present, the acute management of ES (within 12-24 h upon presentation) nowadays mostly relies on antiarrhythmic drugs and percutaneous left ganglion sympathetic block (PLSGB), that will be the focus of the present review. The choice of the drug should consider several factors, including the aetiology and mechanism of VAs, the underlying cardiac function, and the potential risk of adverse events. Intravenous amiodarone, the most used and recommended drug in the setting of high burden VAs and structural heart disorders, mostly exerts dose and rate infusion dependent antiadrenergic effects in the first hours, and may lead to severe hypotension. PLSGB has an excellent safety-efficacy profile and can be easily performed by trained cardiologists at bedside.

Intervention	INa peak			INaL	ICaL	Potassium					Receptors					Peak levels (min)	Inotropism	BP	Effects on ECG			
	Fast	Med	Slow			IKr	IKs	IK1	IK ACh	Ito	α1	α2	β1	β2	NPY				HR	PQ	QRS	JT
Oral Amiodarone	●			●	●	●	●			●	●	●	●	●			→	→	↓	↑	→	↑
Amiodarone IV (Bolus)	●			●	●	●	●			●	●	●	●	●		15-20	→	↓	→	↑	→	→
Lidocaine	●			●												1-5	→	→	→	→	→	↓
Procainamide IV		●				●										15-60	↓	→	→	↑	↑	↑
Nadolol																120-240	↓	↓	↓	↑	→	→
Propranolol Short-acting	●															60-240	↓	↓	↓	↑	→	↓
Metoprolol Short-acting																90-120	↓	↓	↓	↑	→	→
Metoprolol IV																5-15	↓	↓	↓	↑	→	→
Esmolol IV																1-5	↓	→	↓	↑	→	→
Landiolol IV																2-5	↓	→	↓	↑	→	→
PLSGB				↓	↓	↓										1-5	→	→	→	→	→	↓

● Low potency Antagonist ● Low potency Agonist ↑ Increases
 ● Medium potency Antagonist ● Medium potency Agonist ↓ Decreases
 ● High potency Antagonist ● High potency Agonist → No changes

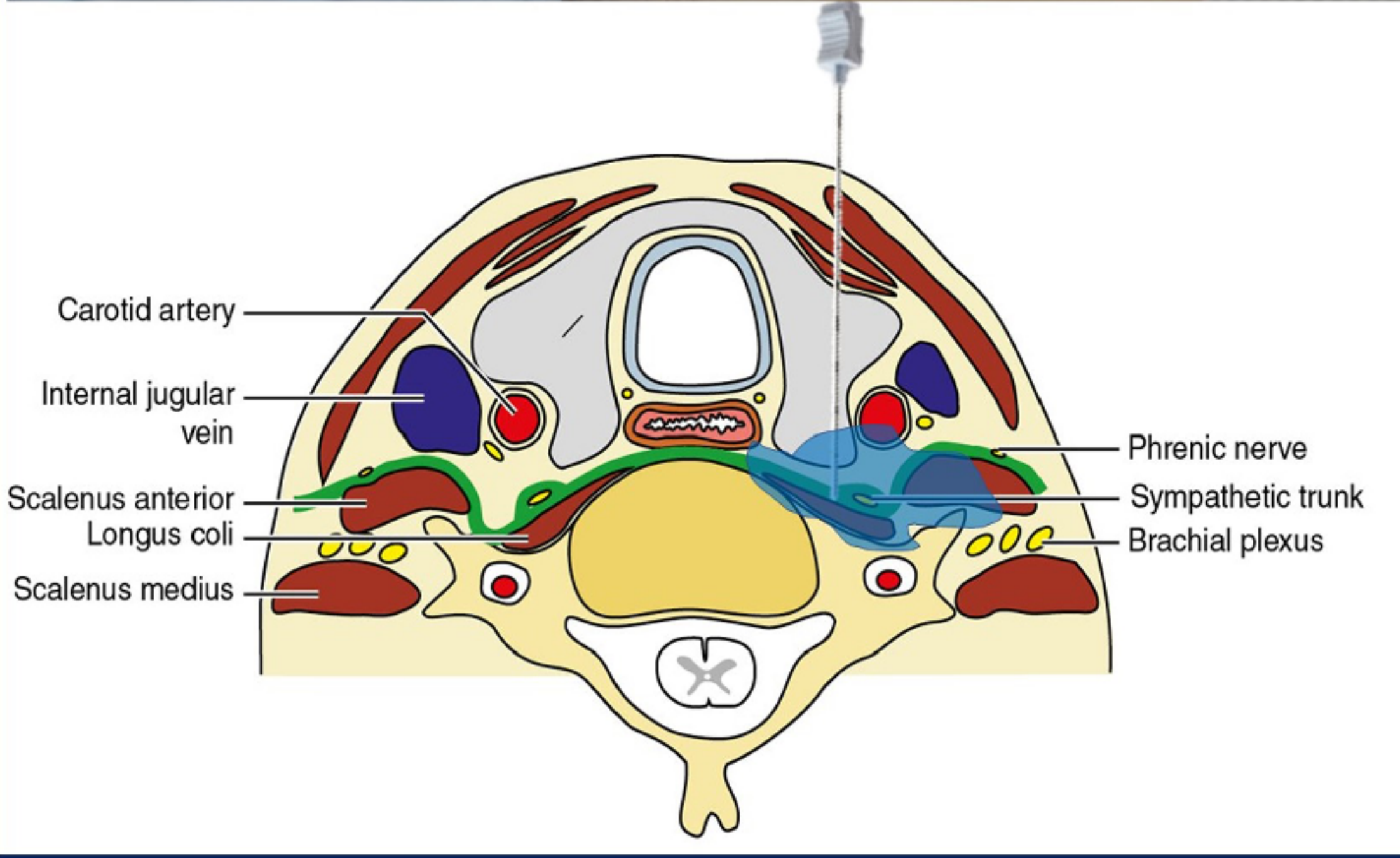
Figure 1 Main electrophysiological, clinical, and electrocardiographic effects of the antiarrhythmic drugs most used for the acute management of refractory VAs. BP, blood pressure; HR, heart rate.



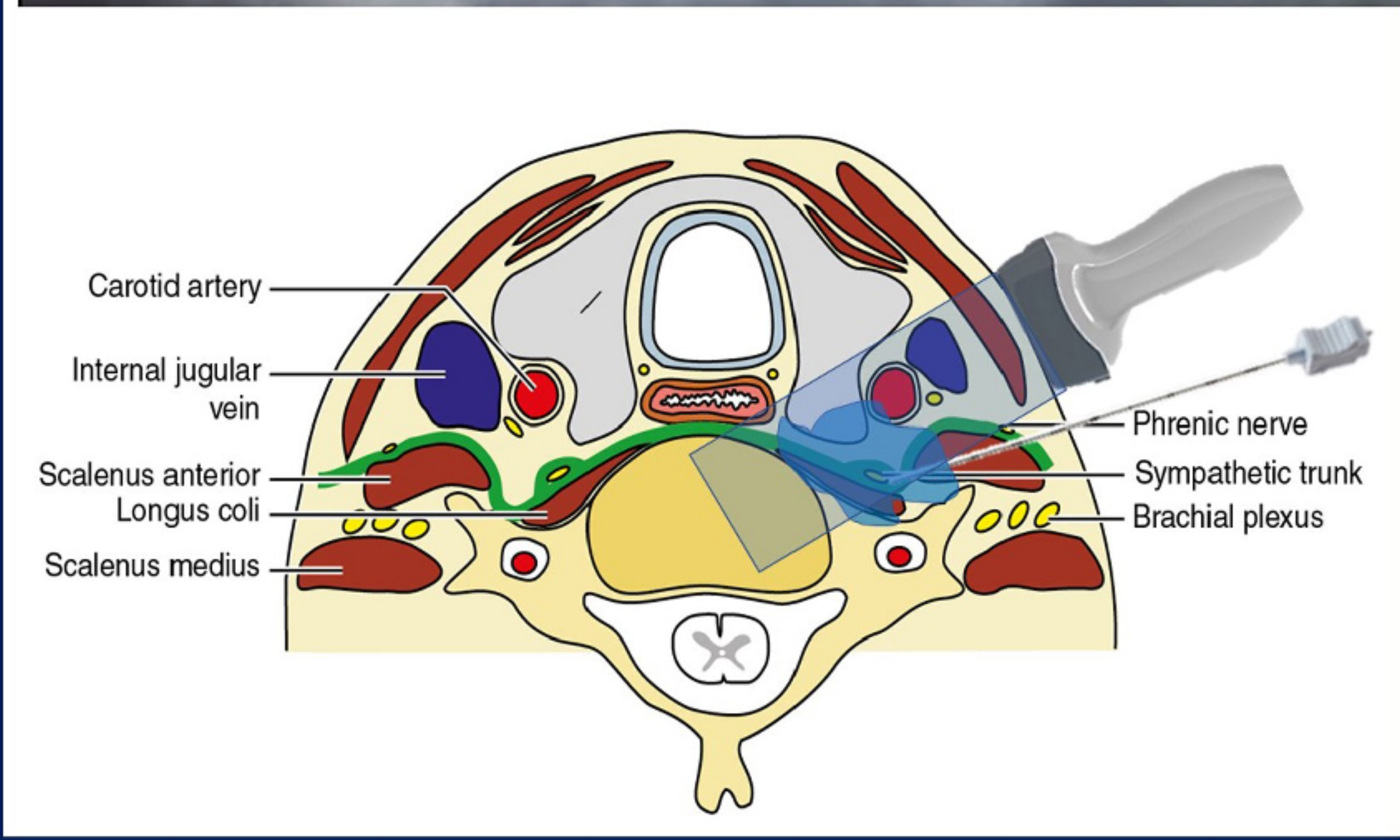
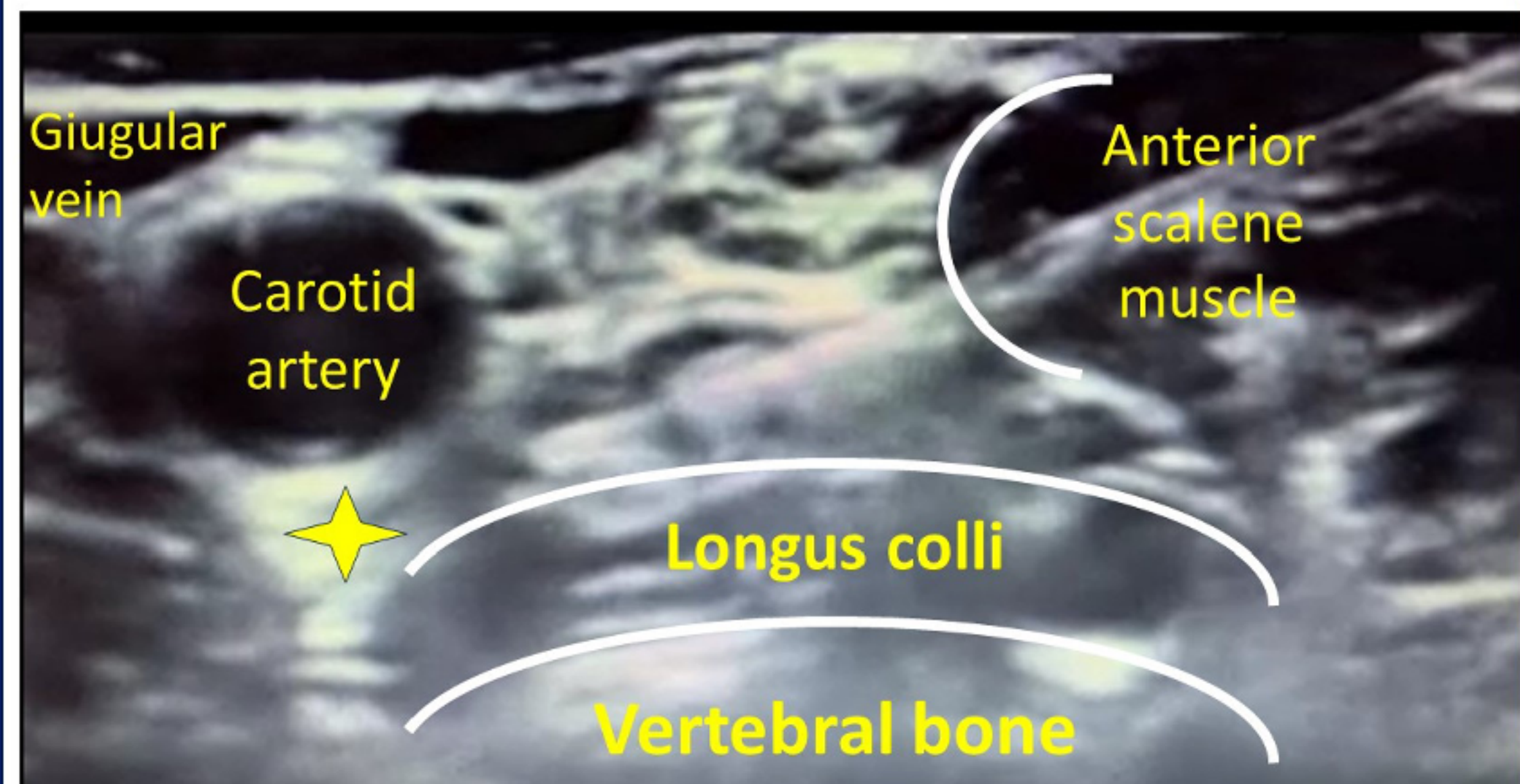
March 17, 2025

Riders on the Storm: Stellate Ganglion Block for Electrical Storm

Anterior paratracheal anatomical approach



Lateral ultrasound-guided approach





0 —
—
1 —
—
2 —
—
3 —

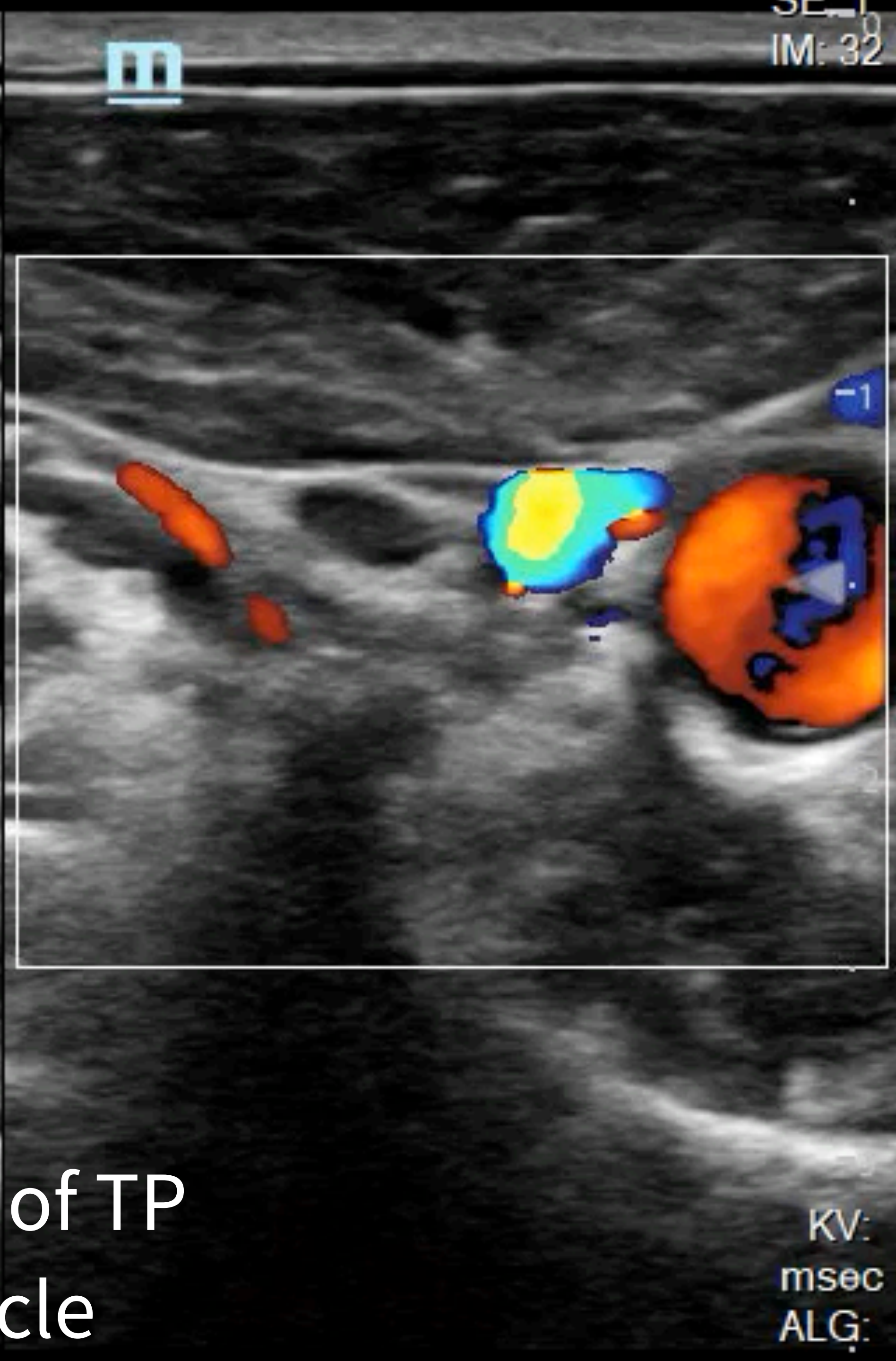
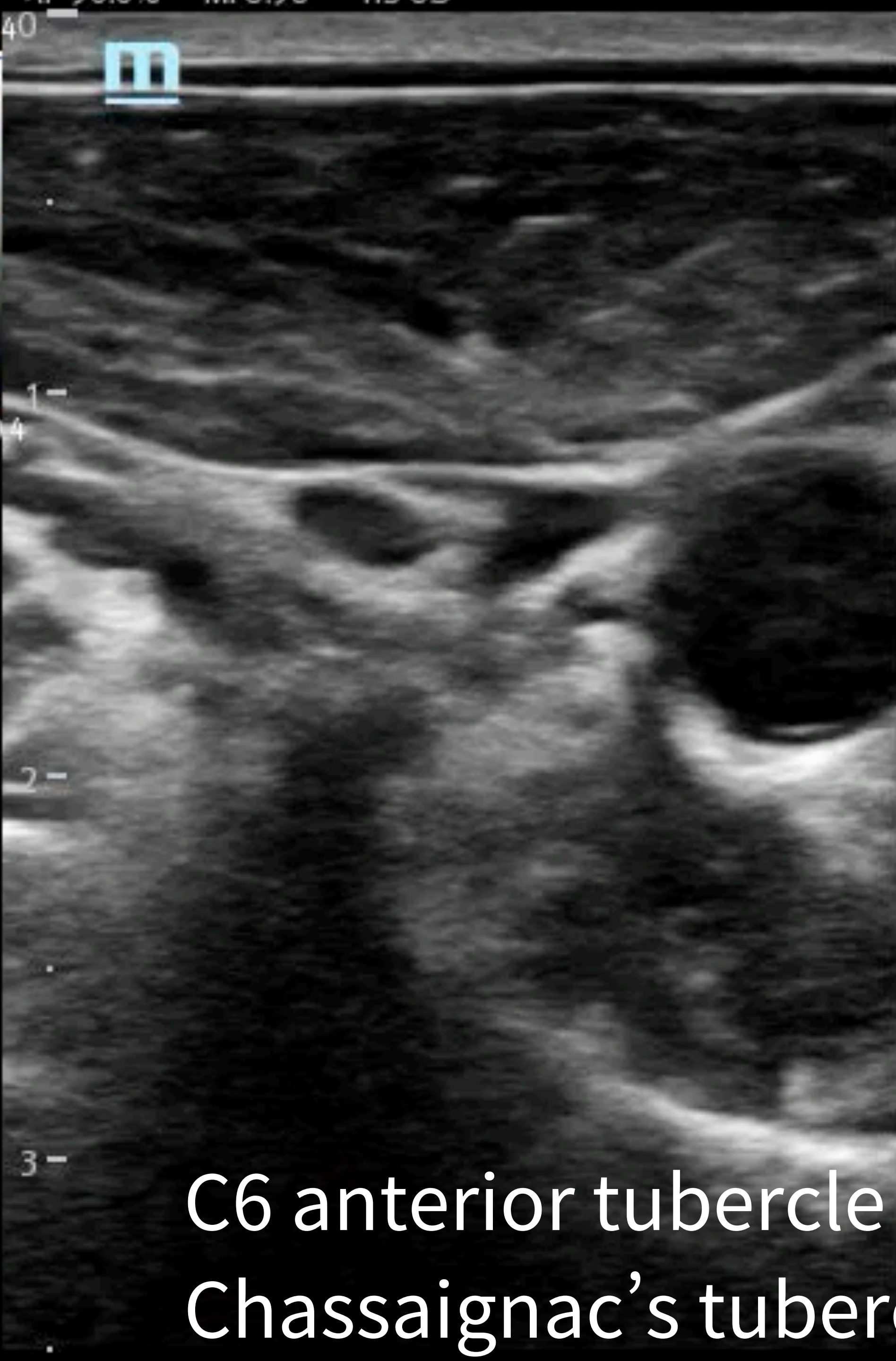
3.4 cm

L12-3
Nerve
MI: 1.5 TIS: 0.1

Find C6

2D: G: 63
Res DR: 0
MB
THI

ACCES.
2024/08/24
F 6.6~13.0
DR 115
FR 17
D 3.5
G 60
C
F 5.0 /G 30
WF 227
PRF 1.4k

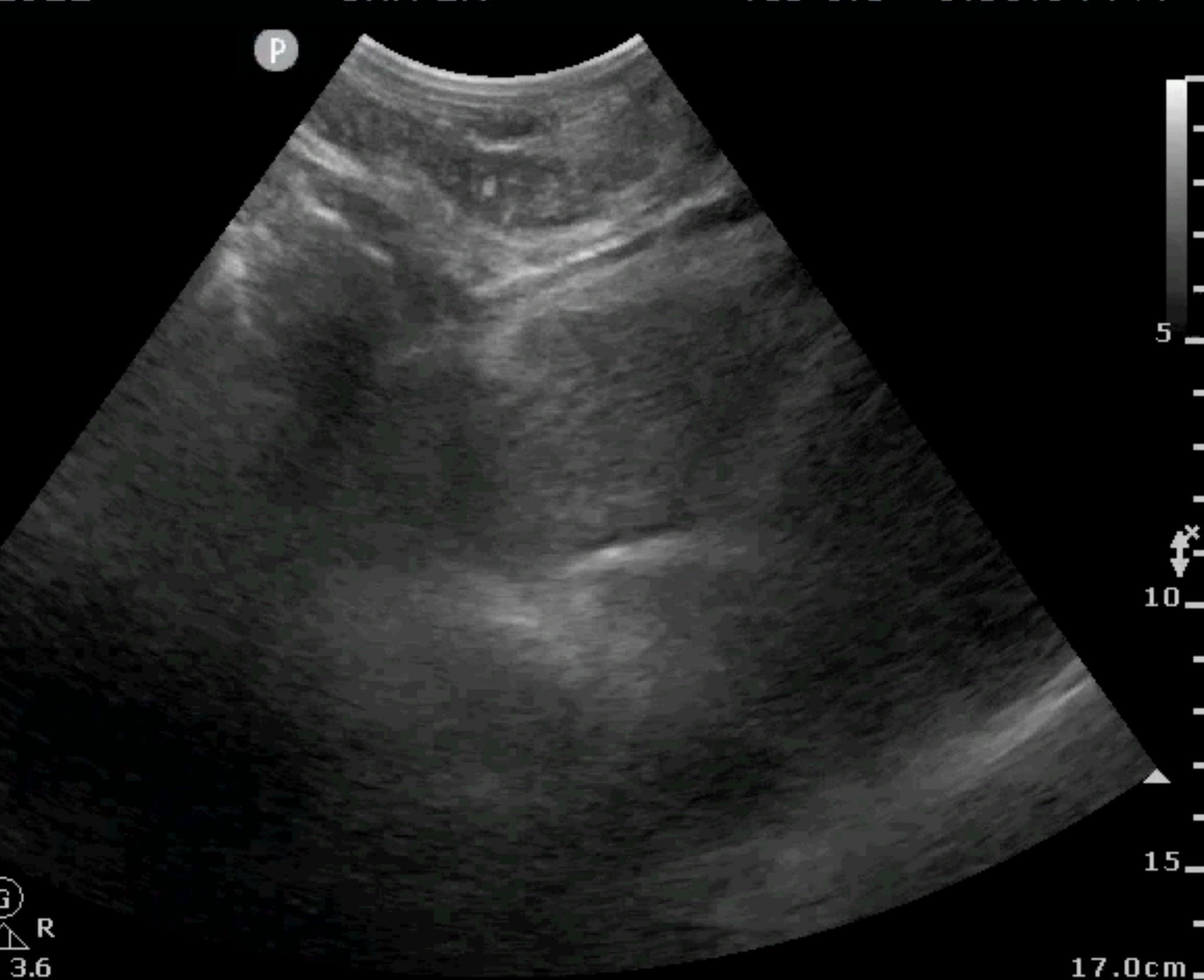
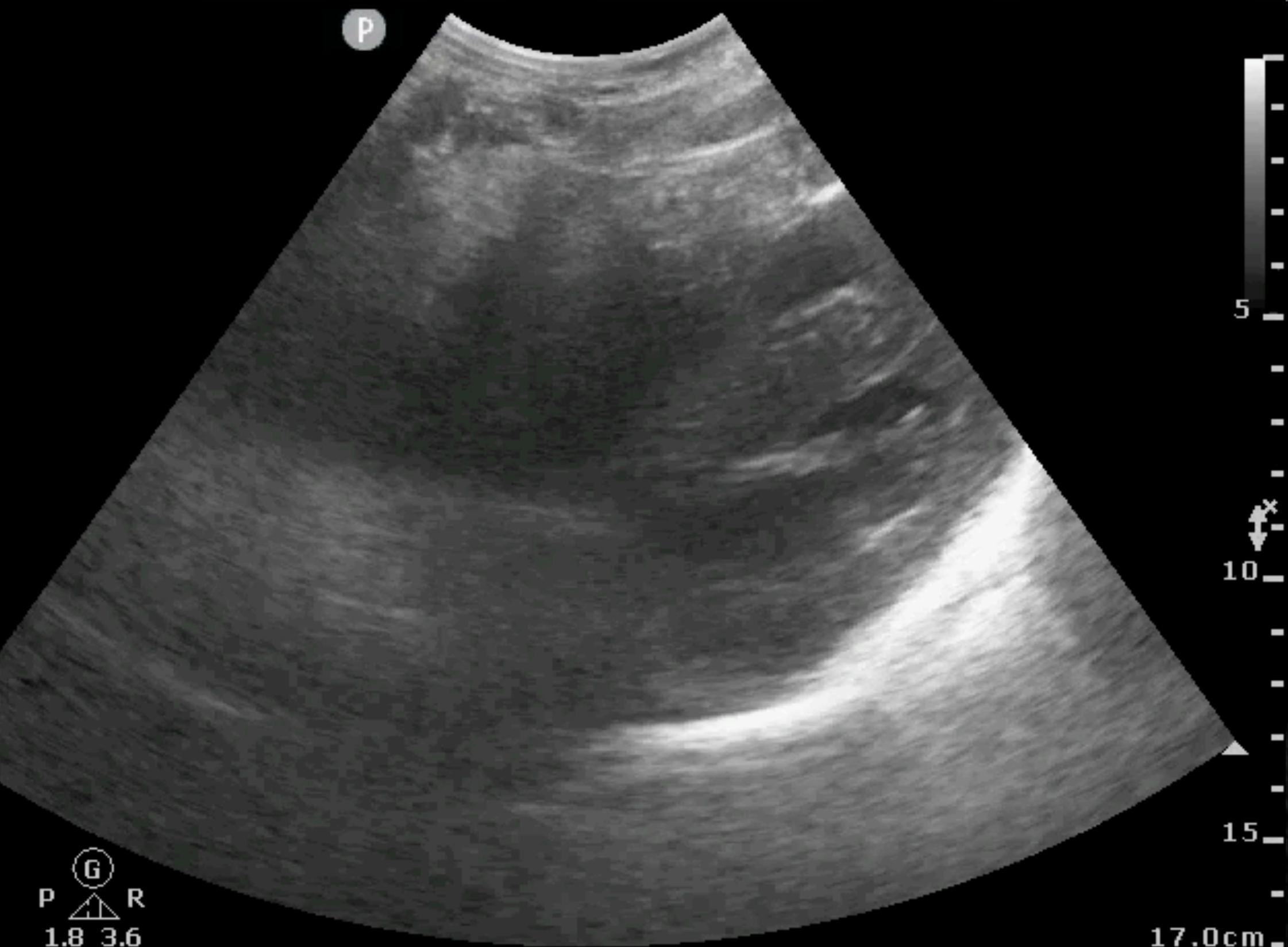


SE 1
IM: 32

iNeedle
iTouch
thk: mm
DFOV:

C6 anterior tubercle of TP
Chassaignac's tubercle

KV:
msec
ALG:



68M, witnessed arrest

TemporaryID-20240318182922

4-03-18-182922

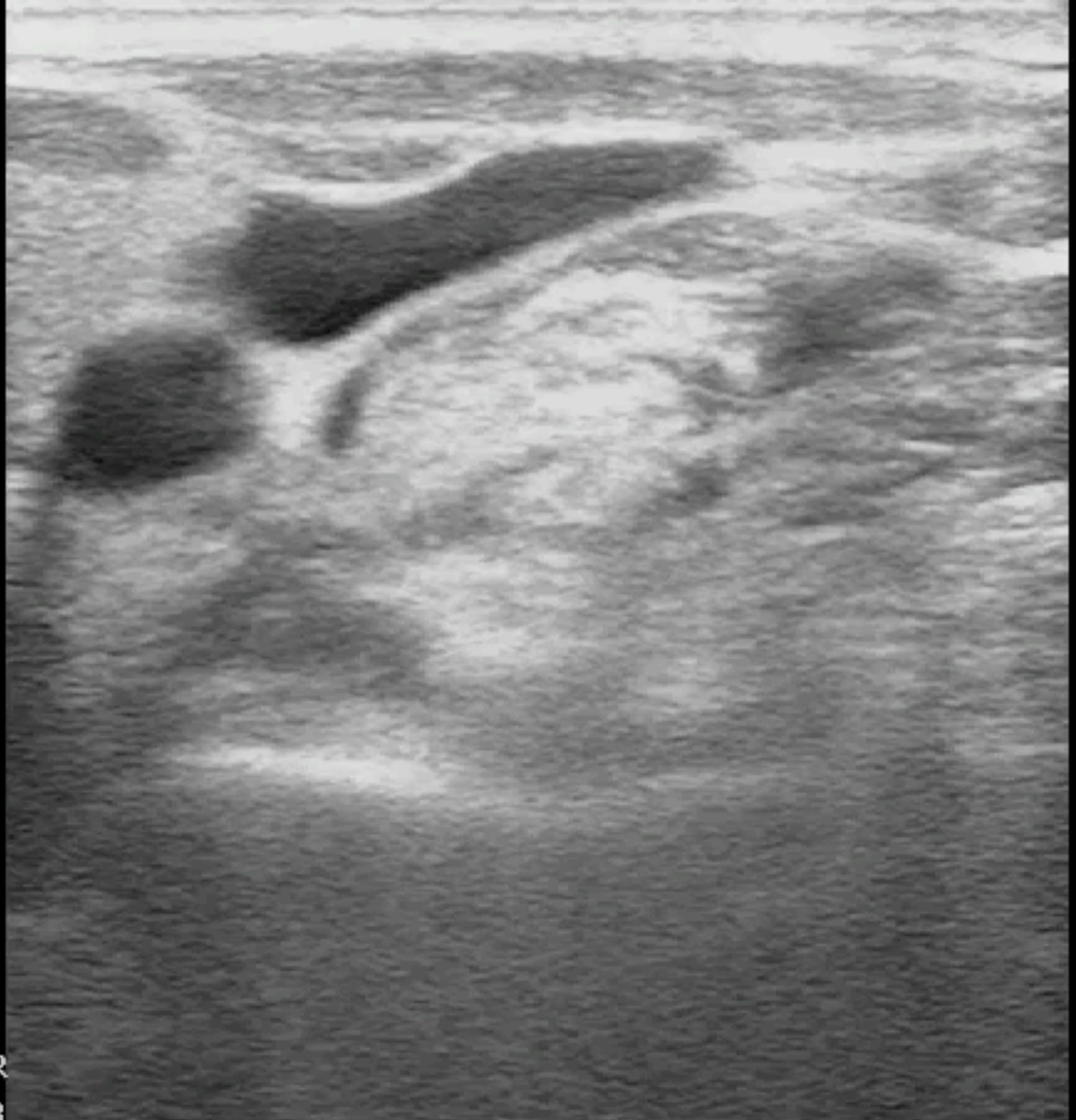
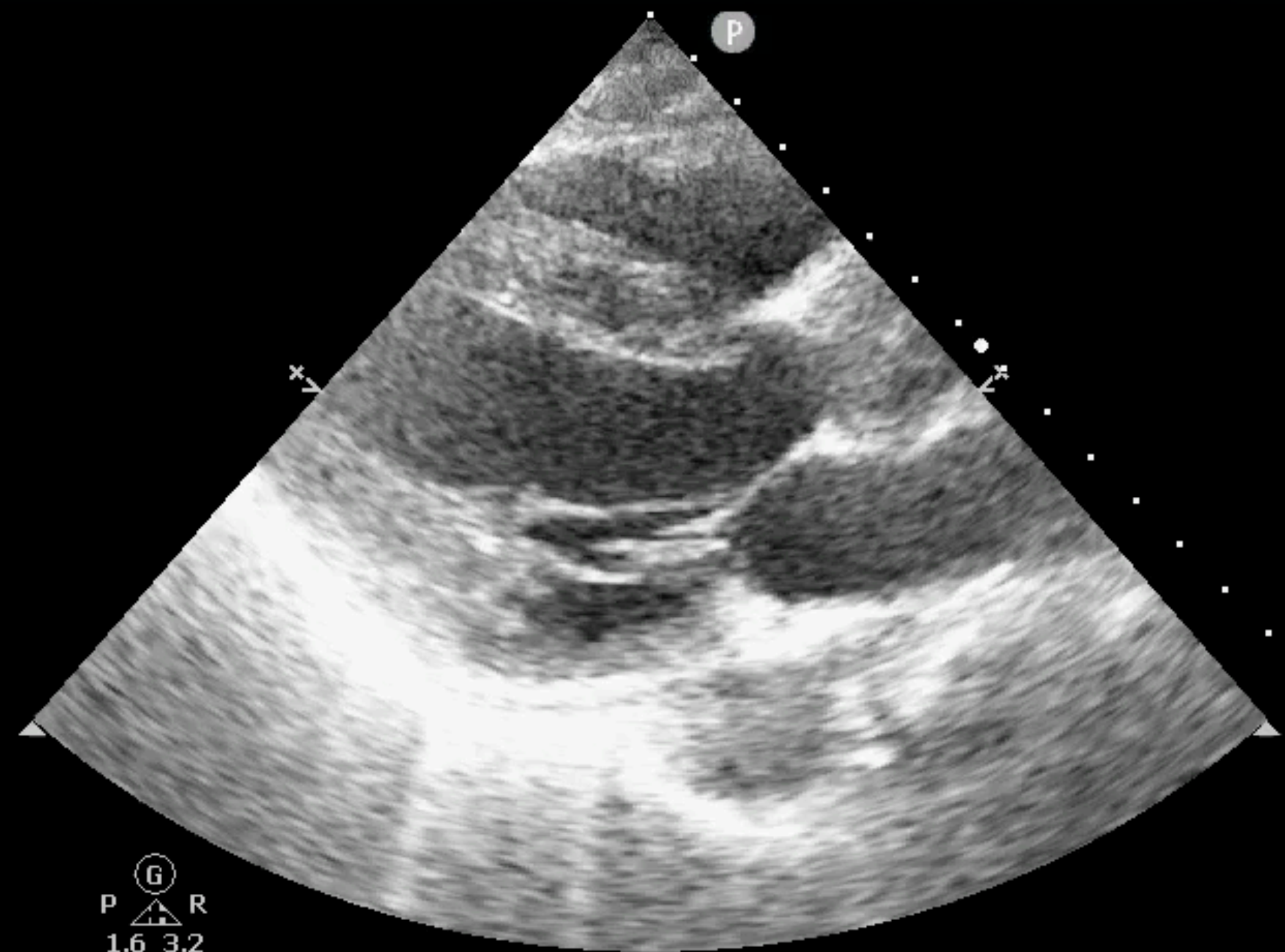
SKH ER

MI 1.3

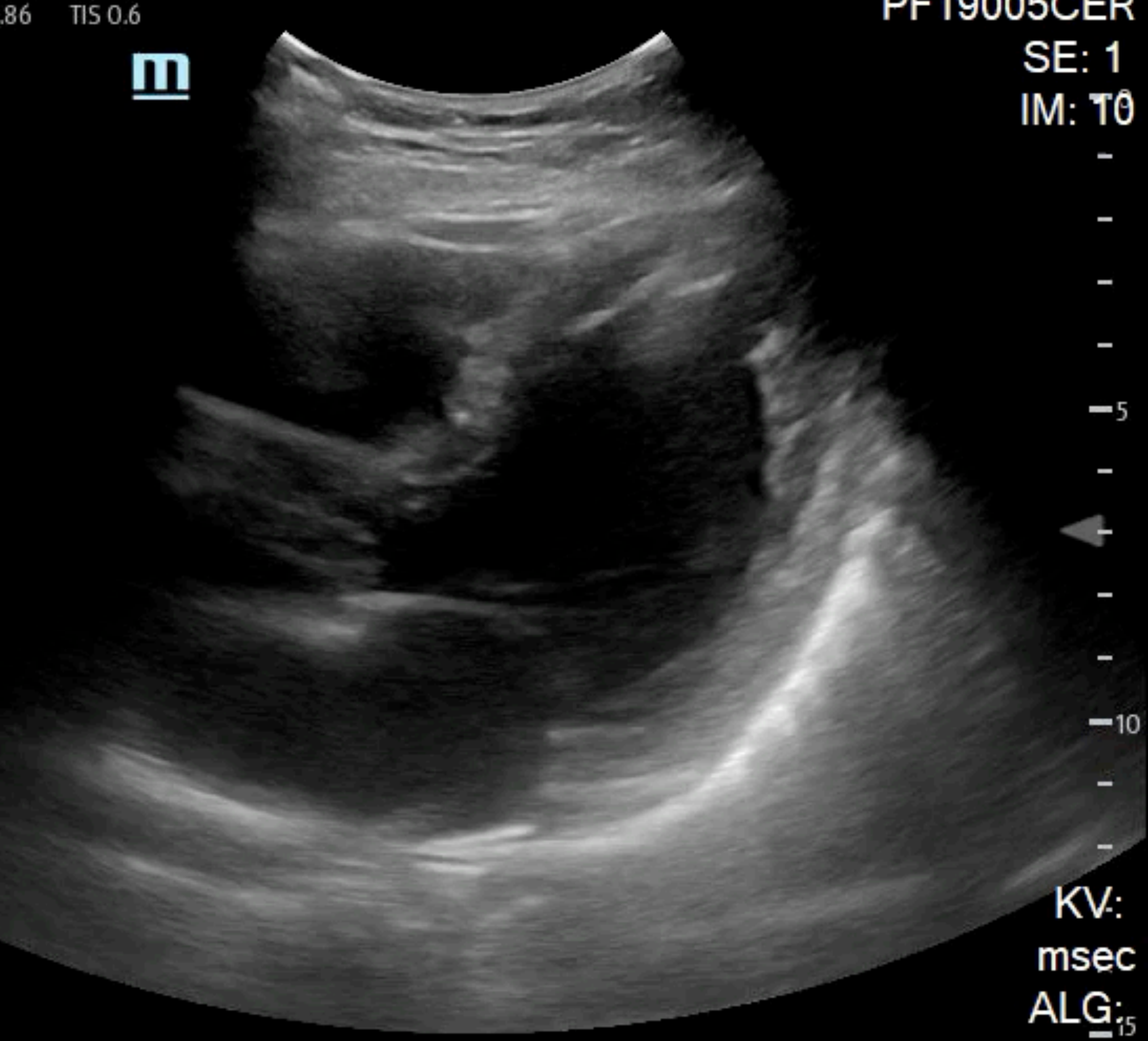
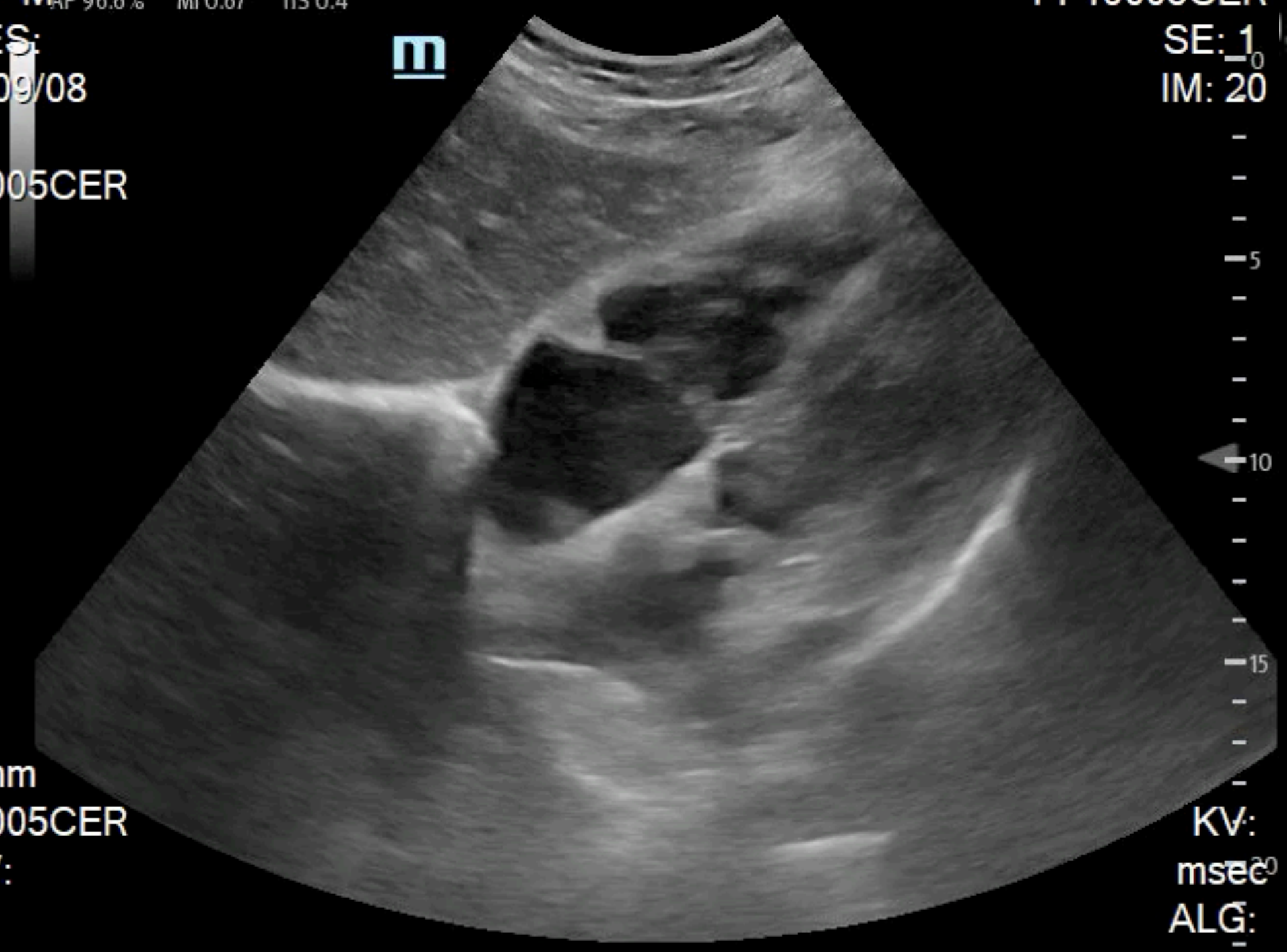
3/18/2024

TIS 0.5

6:41:46 PM



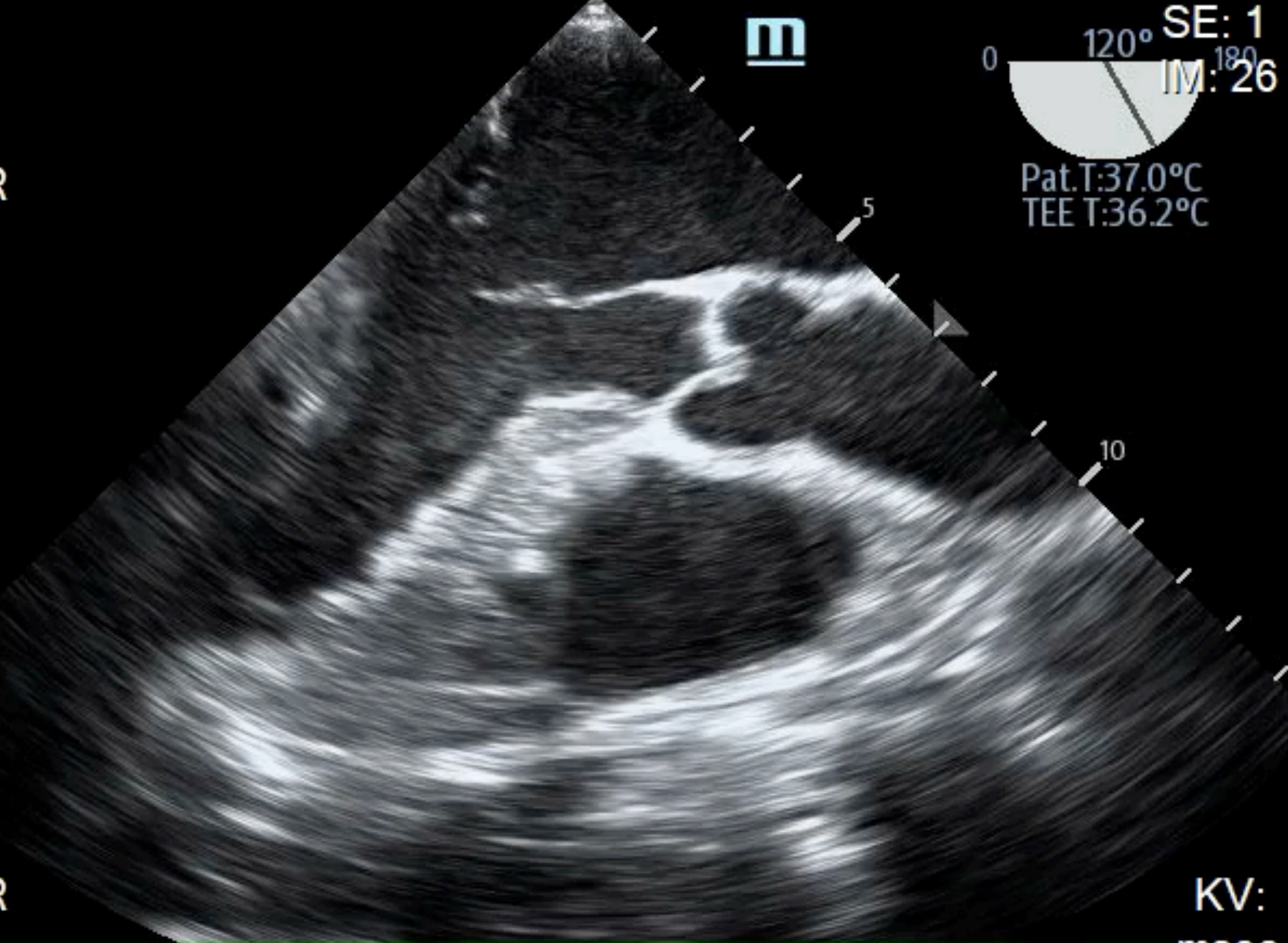
P  R
44 88



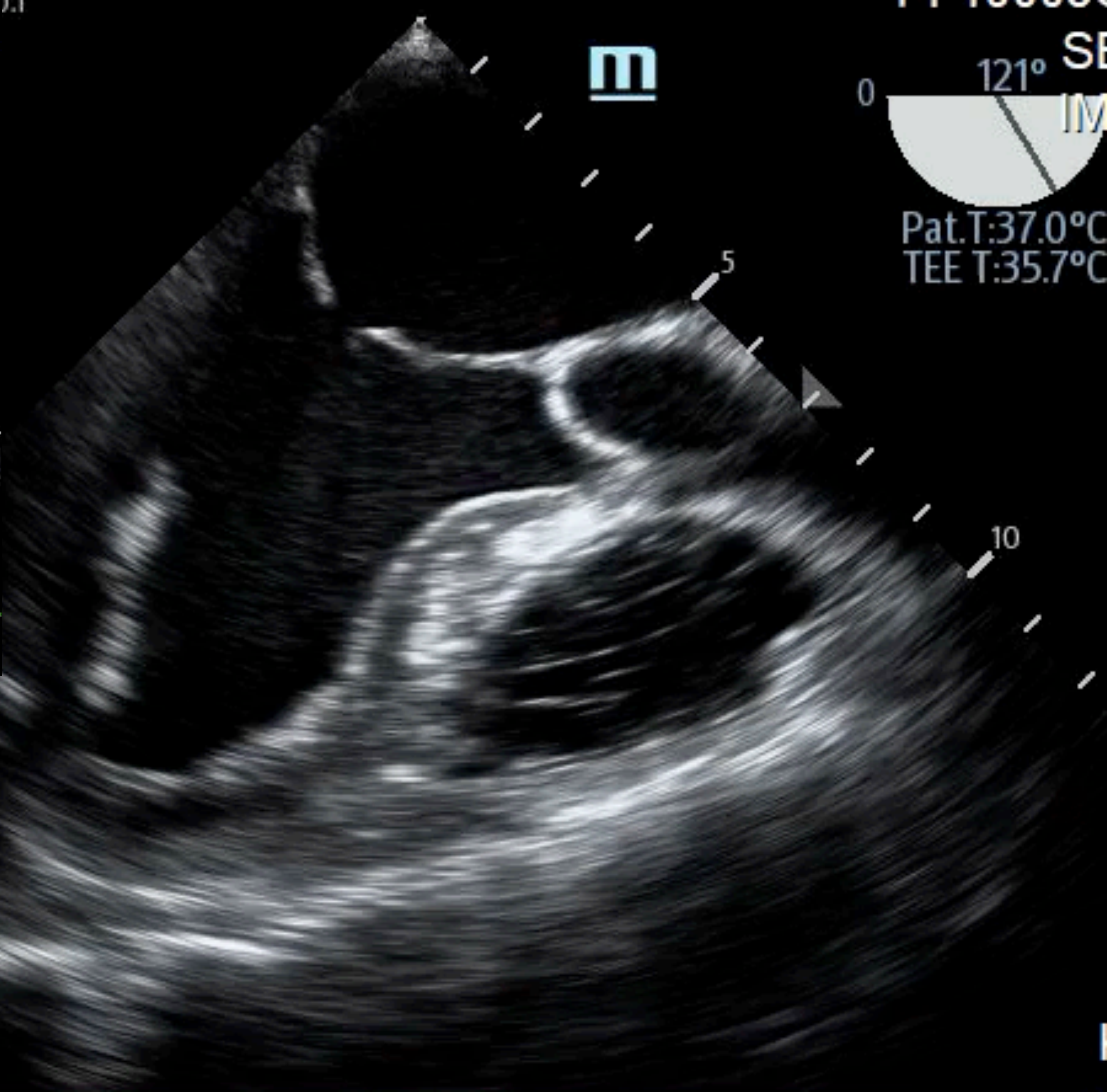
73M, profound shock

iNeedle
iTouch
thk: mm
PF19005CER
DFOV:

KV:
msec
ALG: 15



SE: 1
IM: 26
Pat.T:37.0°C
TEE T:36.2°C



SE: 1
IM: 26
Pat.T:37.0°C
TEE T:35.7°C

KV:
msec
ALG:

Refractory VF

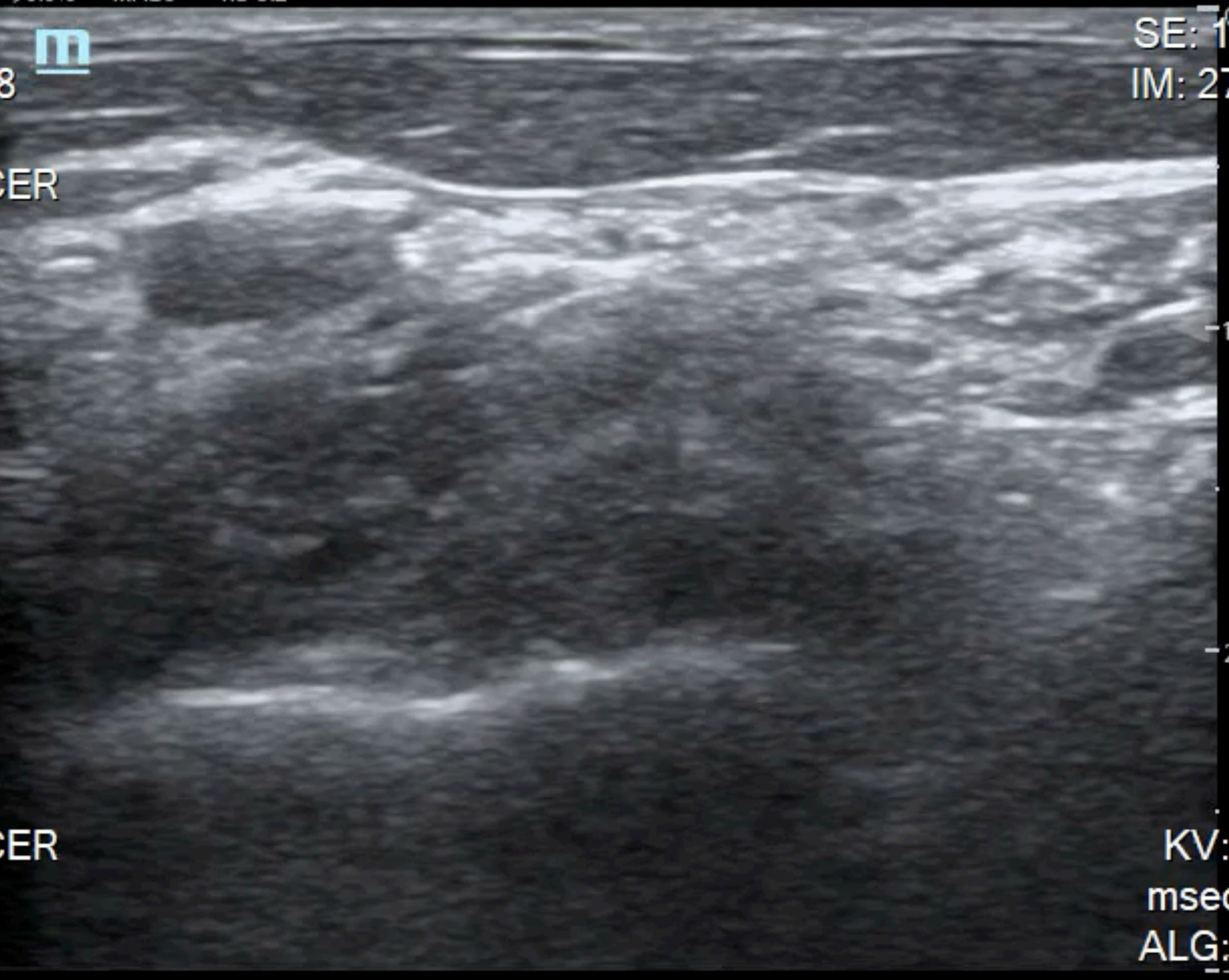
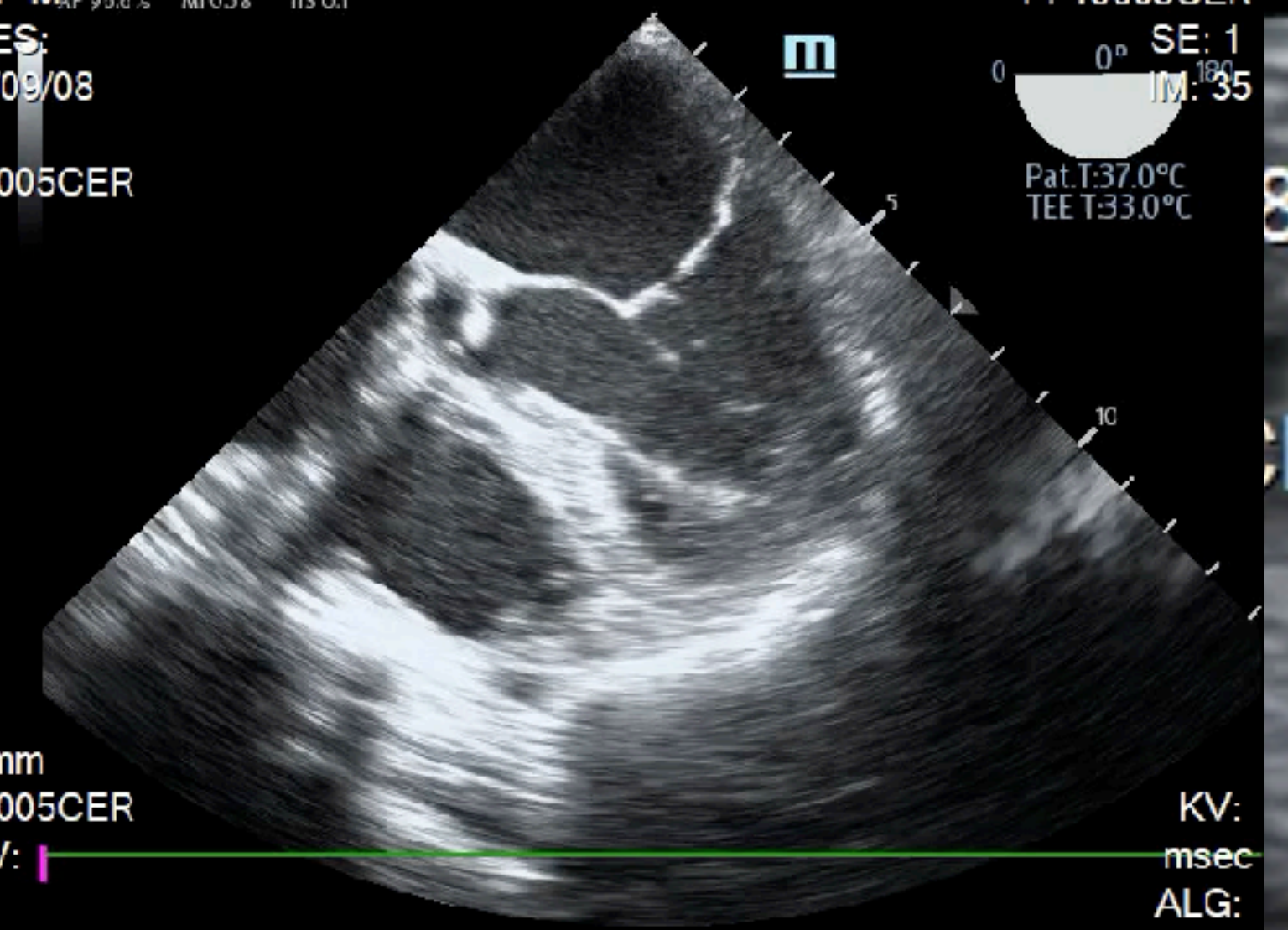
iNeedle

Touch

thk: mm

PF19005CER

REFV



iNeedle

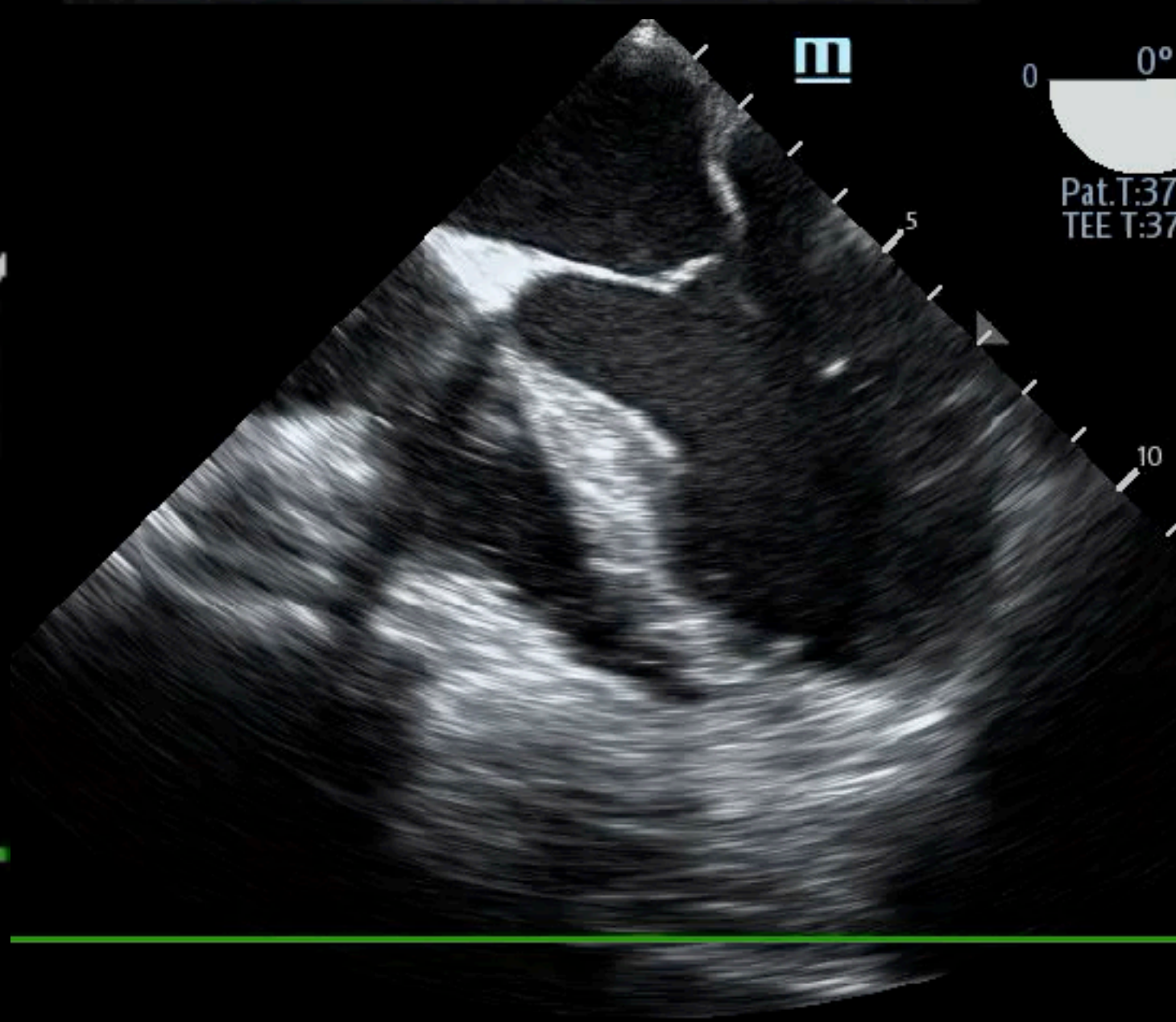
iTouch

thk: mm

PF19005CER

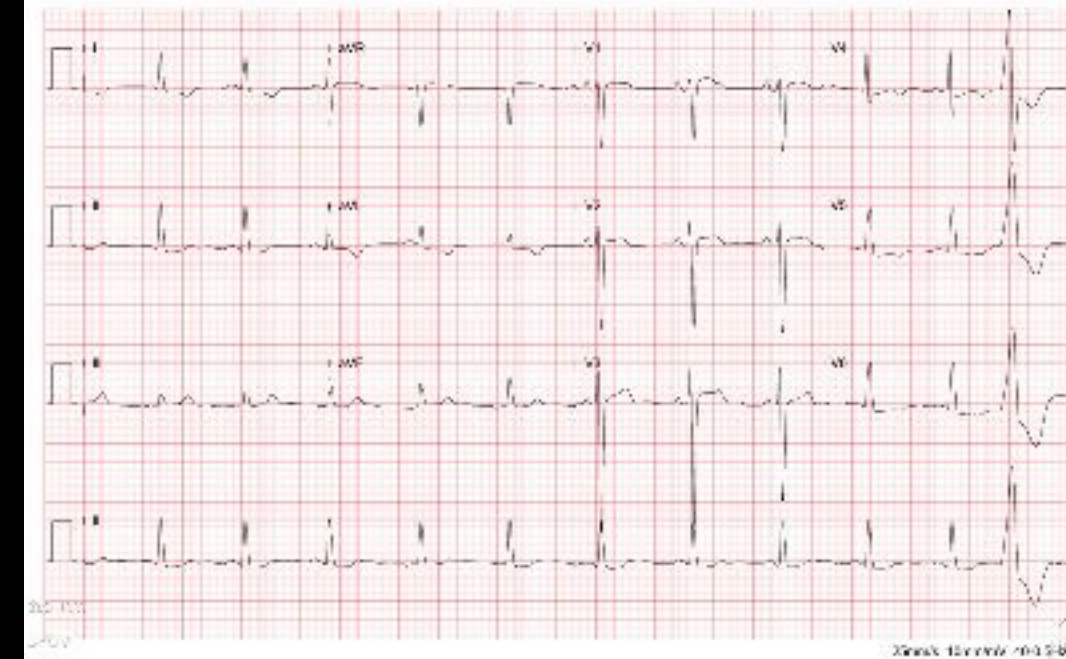
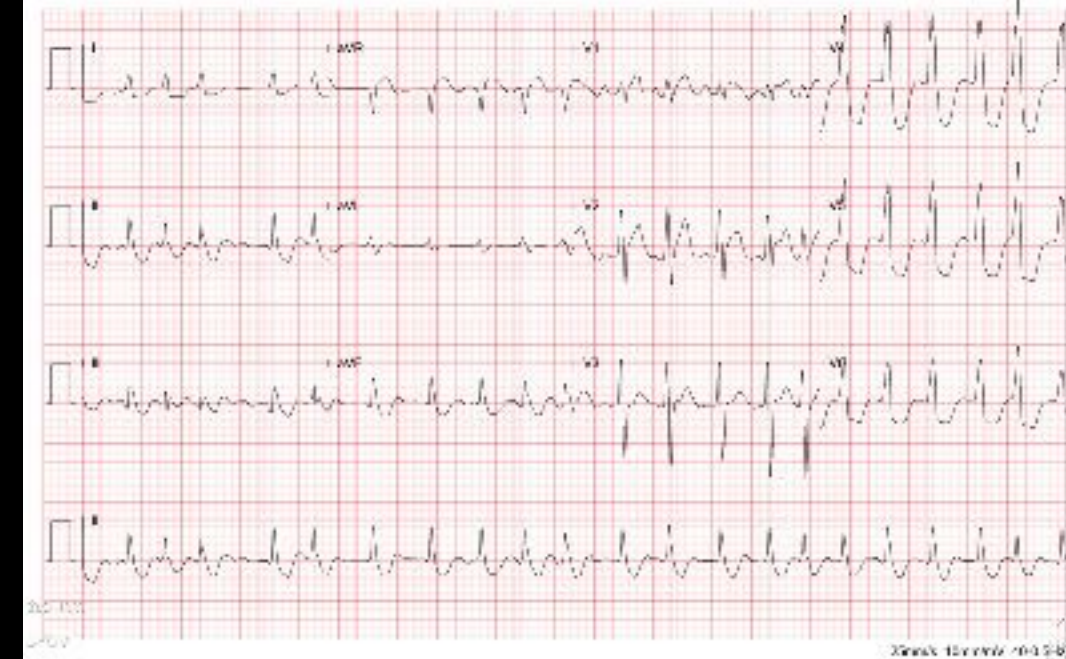
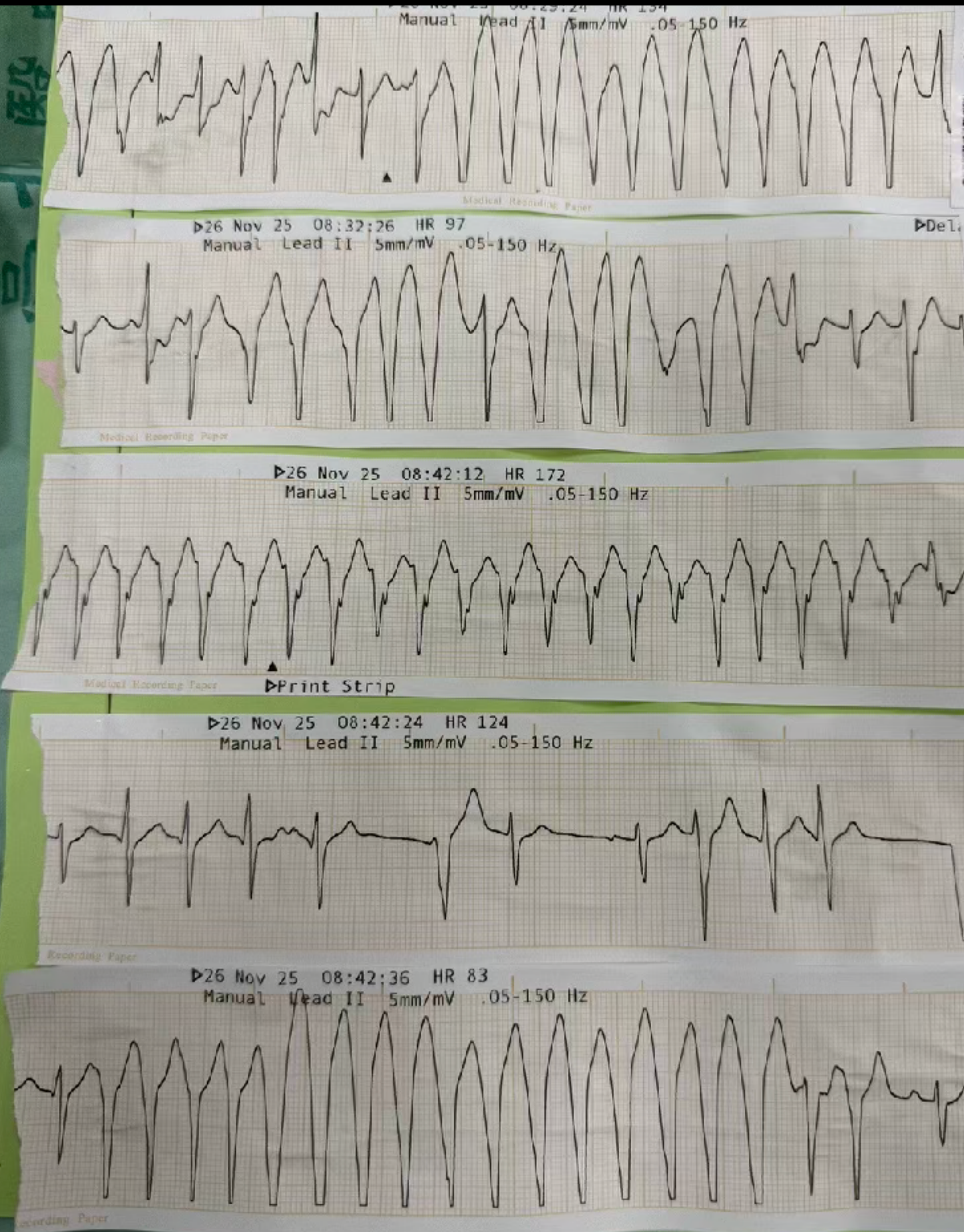
DFOV:

67M, collapsed in park



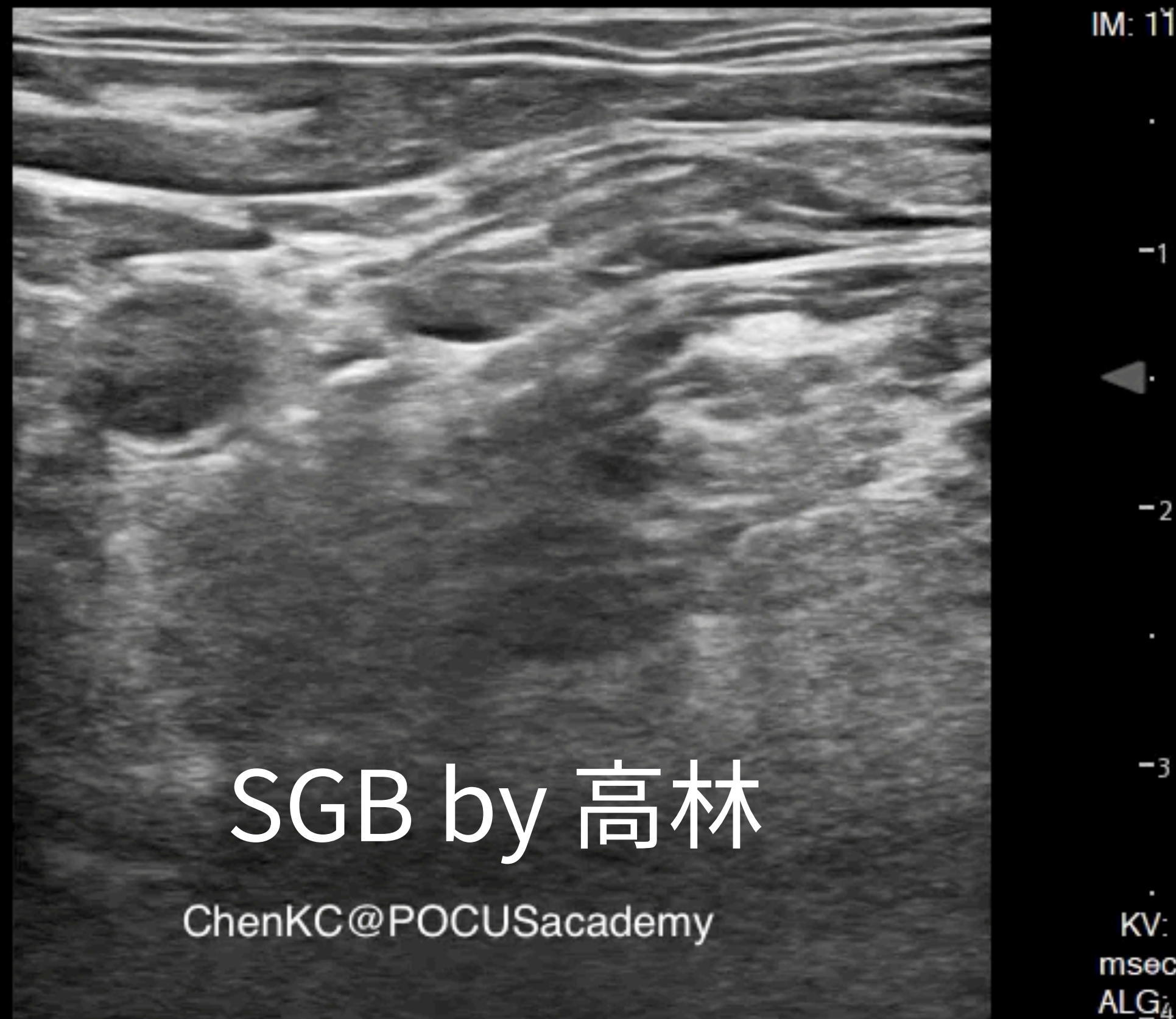
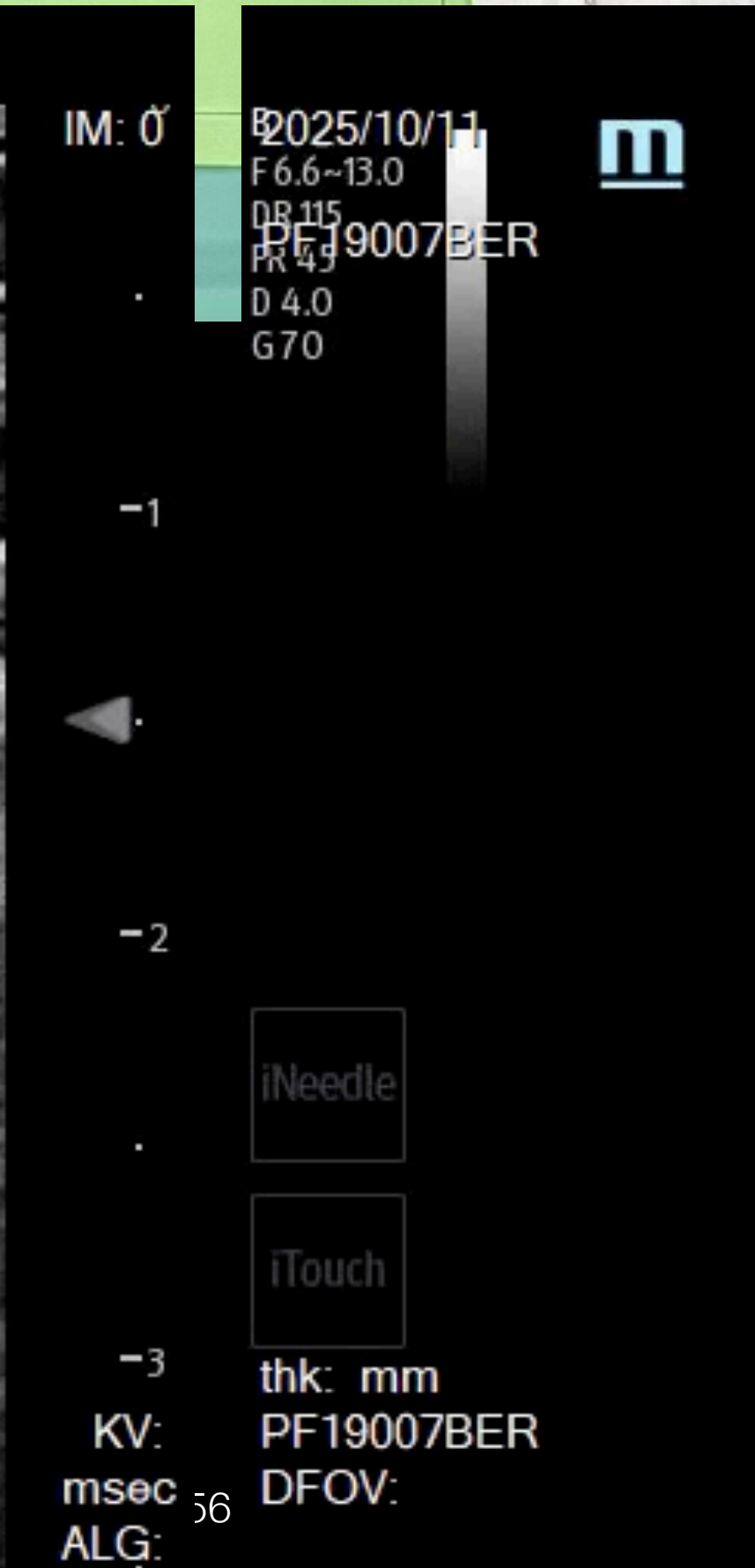
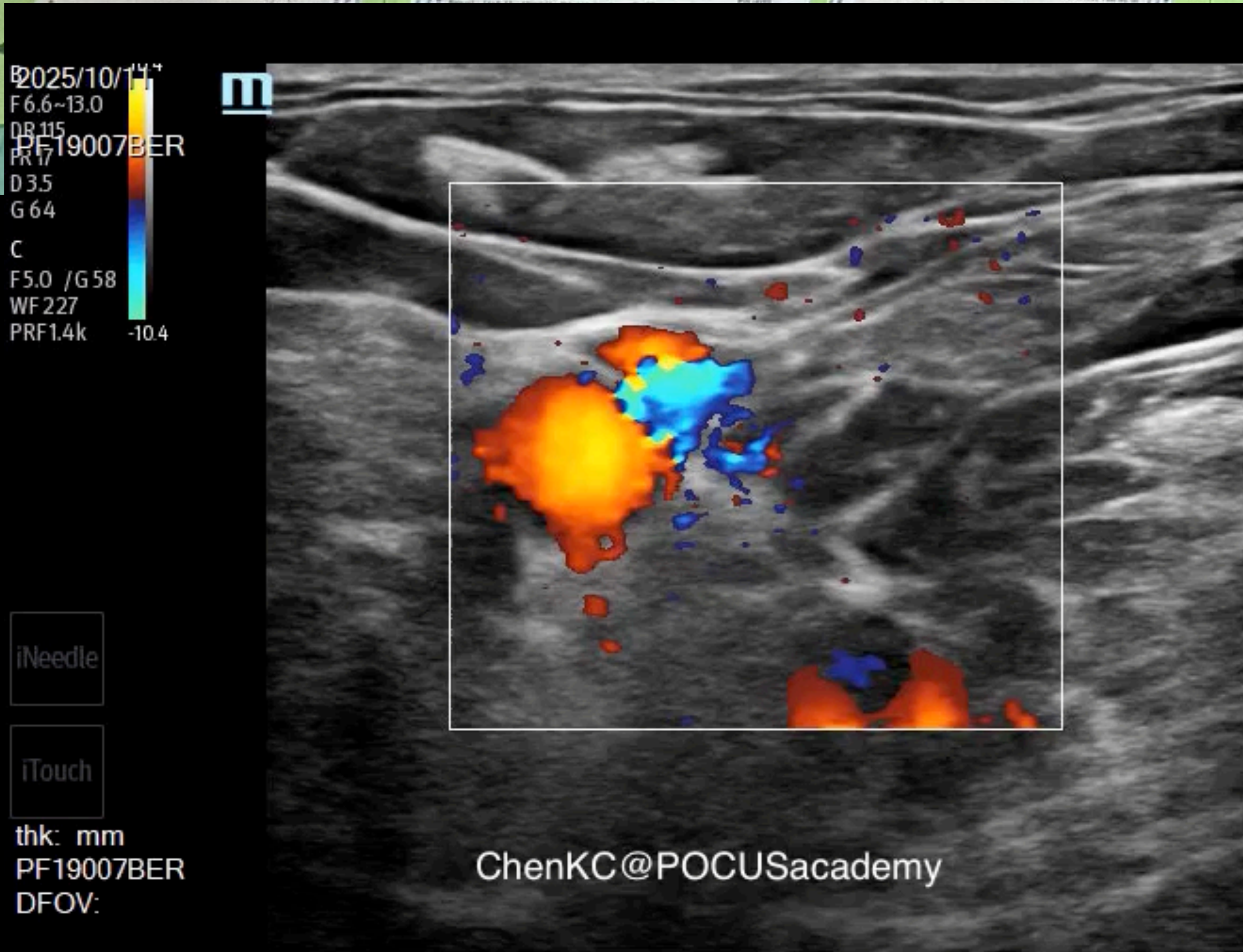
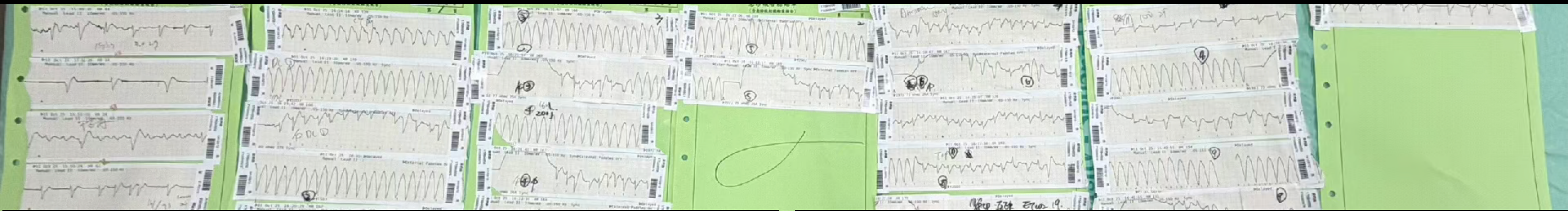
50M, collapsed at home

SGB by 亦彤



ChenKC@POCUSacademy

73M, OHCA, prehospital VF s/p shock * 2 then VT shock * 1



SGB by 高林

ChenKC@POCUSacademy



US-GUIDED STELLATE GANGLION BLOCK

INDICATIONS:

- Refractory Ventricular Arrhythmia
- Ventricular Electrical Storm
- ↳ ≥ 3 episodes of sustained VT, VF, or ICD shocks in 24 hours

THE BASICS:

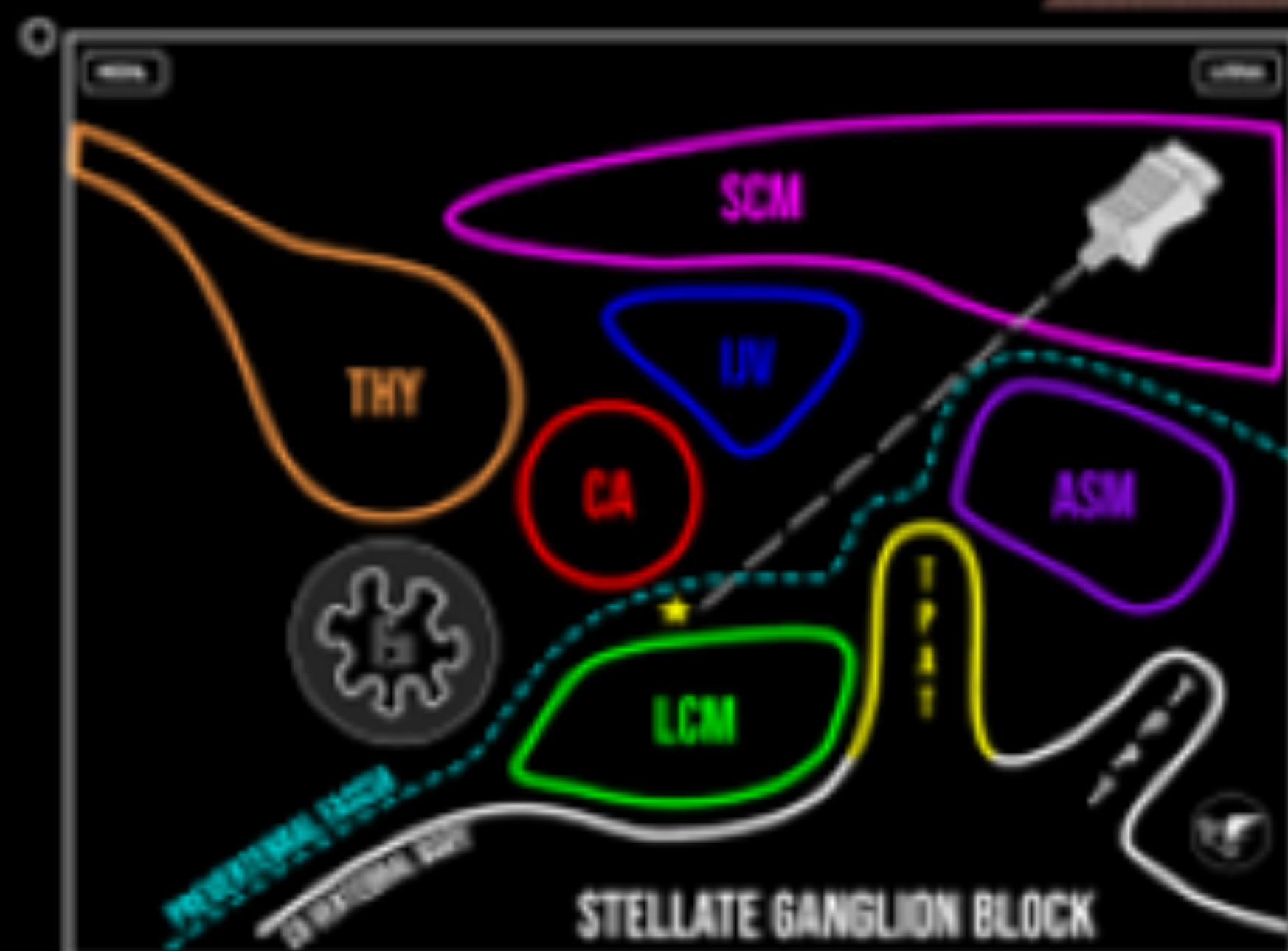
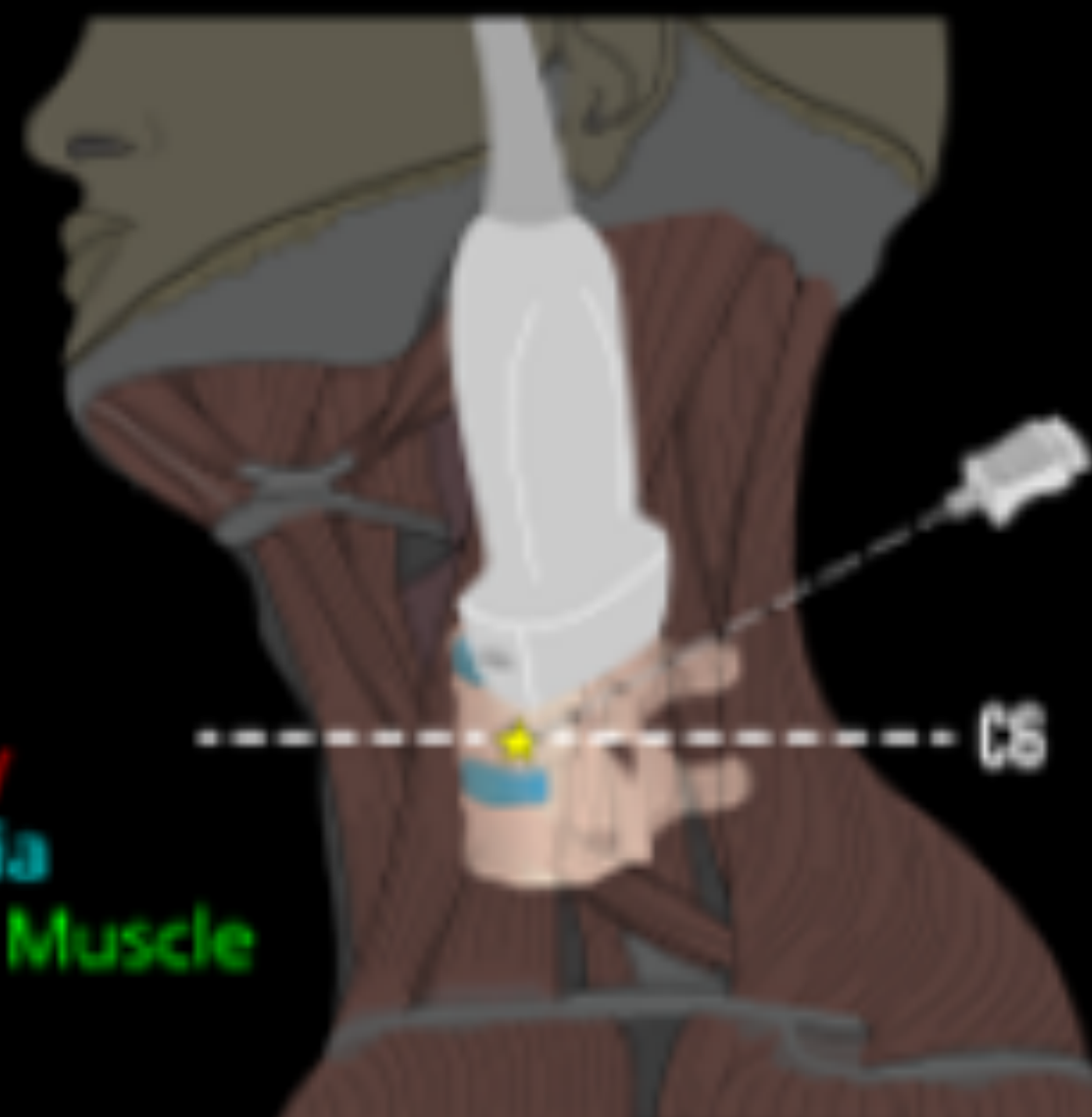
- Patient Position → Slight Neck Extension & Contralateral Rotation
- Left SGB >>> Right SGB
- 22 to 25G Needle
- ~10 mL of Local Anesthetic

TECHNIQUE:

1. Place Probe → Perpendicular to Tracheal Axis at Level of Cricoid Cartilage (~C6 Level)
2. Slide *Inferiorly* until Superior Aspect of Thyroid Gland is seen
3. Slide *Laterally* to visualize C6 TP Anterior Tubercle (TPAT)
4. Identify Key Landmarks: **C6 TPAT**, **LCM**, **CA**
5. Insert Needle → In-Plane, Lateral to Medial
↳ ★ Goal = Tip under the **Prevertebral Fascia** overlying the **LCM**

Stellate Ganglion location:

- **Medial to C6 TPAT**
- **Posterior to Carotid Artery**
- **Deep to Prevertebral Fascia**
- **Superficial to Longus Colli Muscle**



CLICK OR SCAN
FOR MORE

