

Role of POCUS for Vascular Emergencies in ER



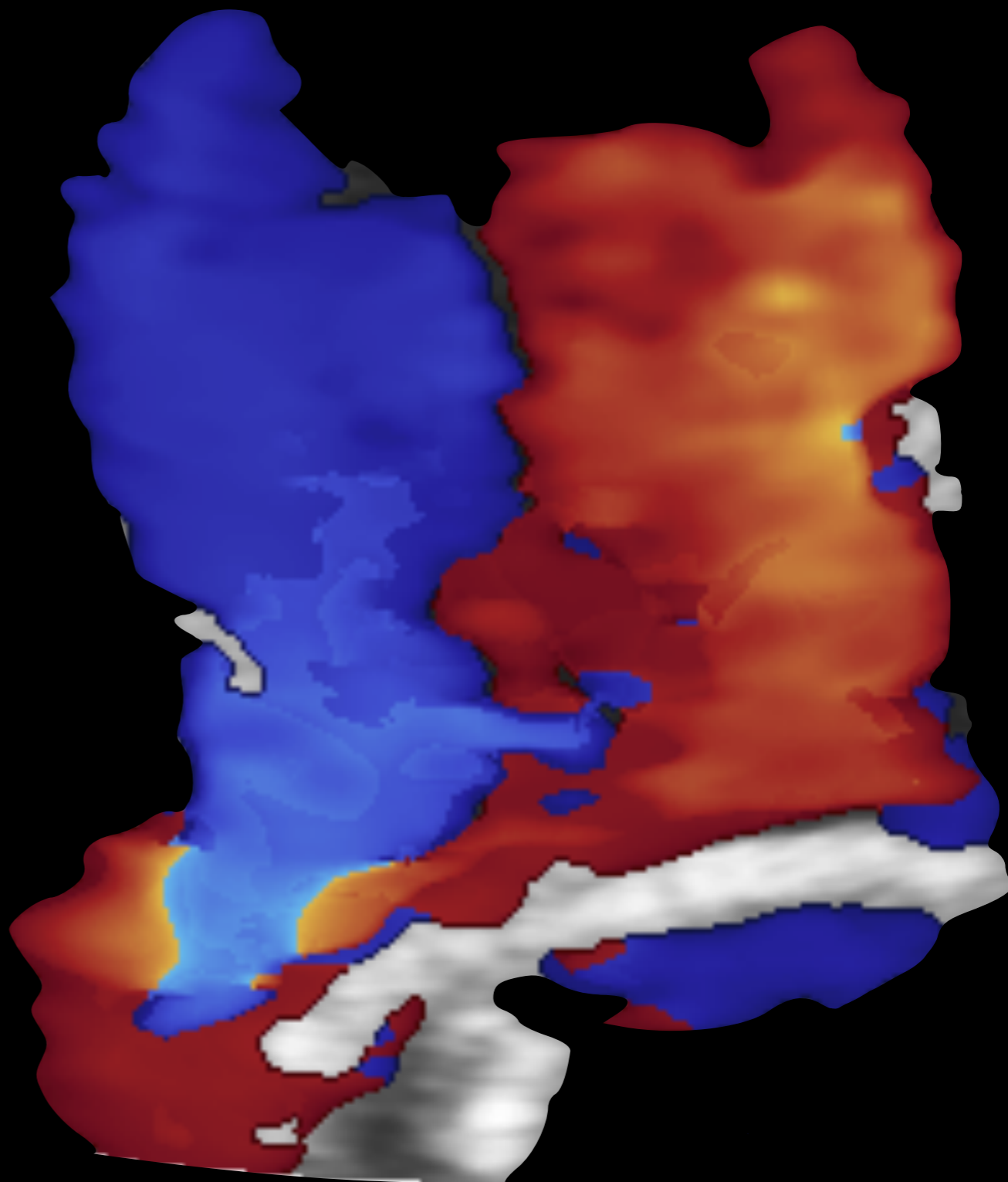
Chen, Kuo-Chih

Chief

Department of Emergency & Critical Care Medicine
West Garden Hospital, Taiwan

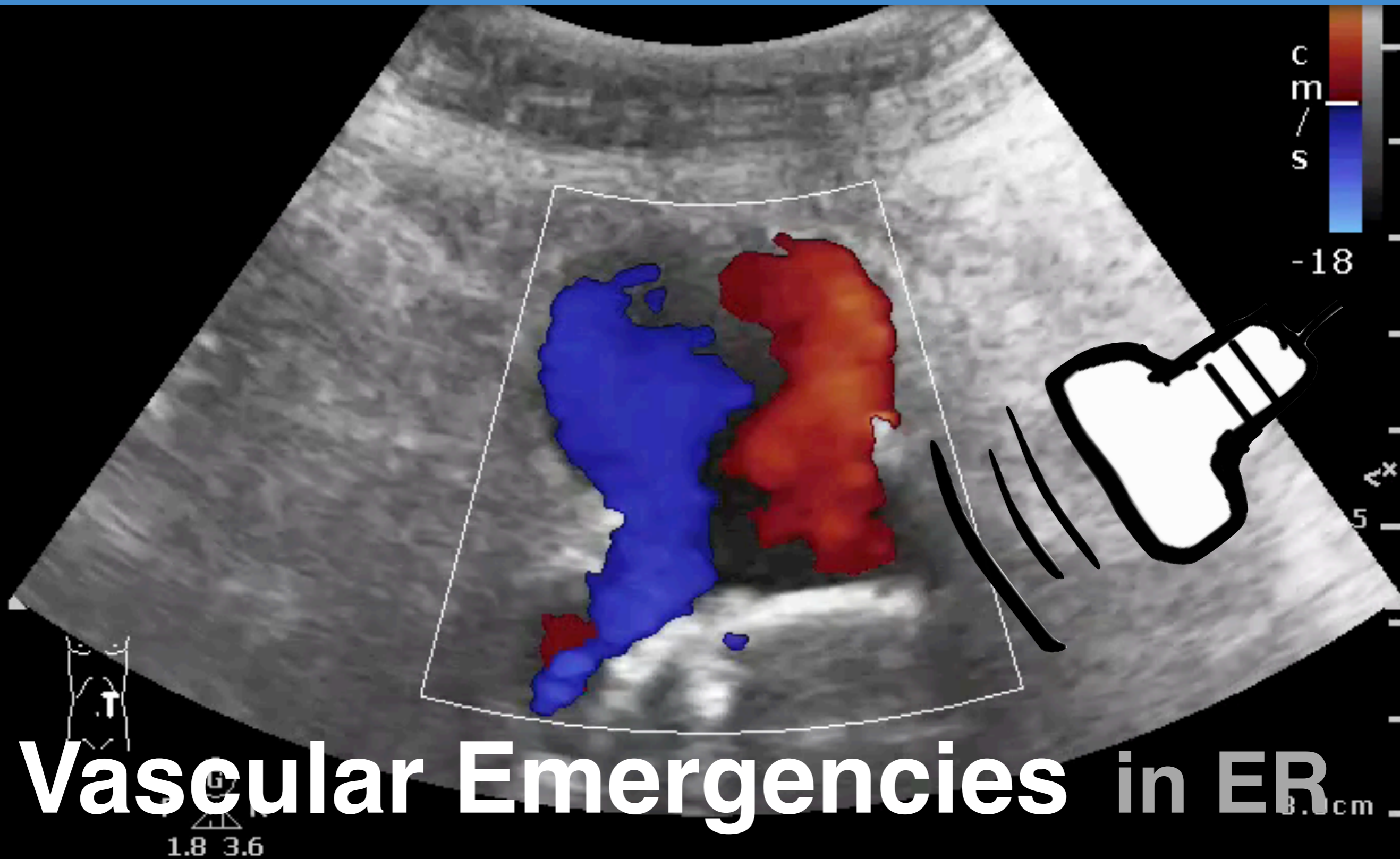
Conflict of Interest None



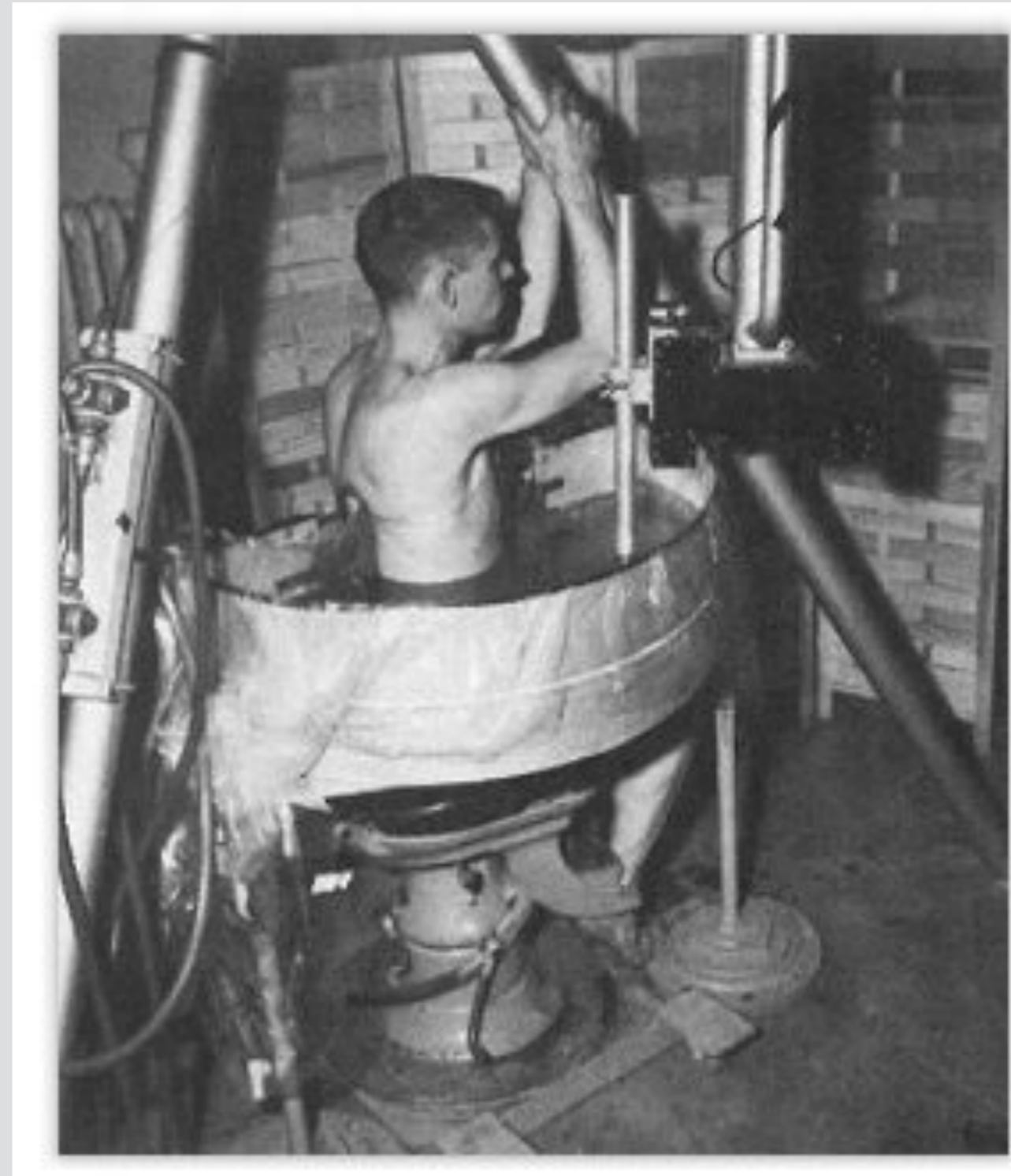
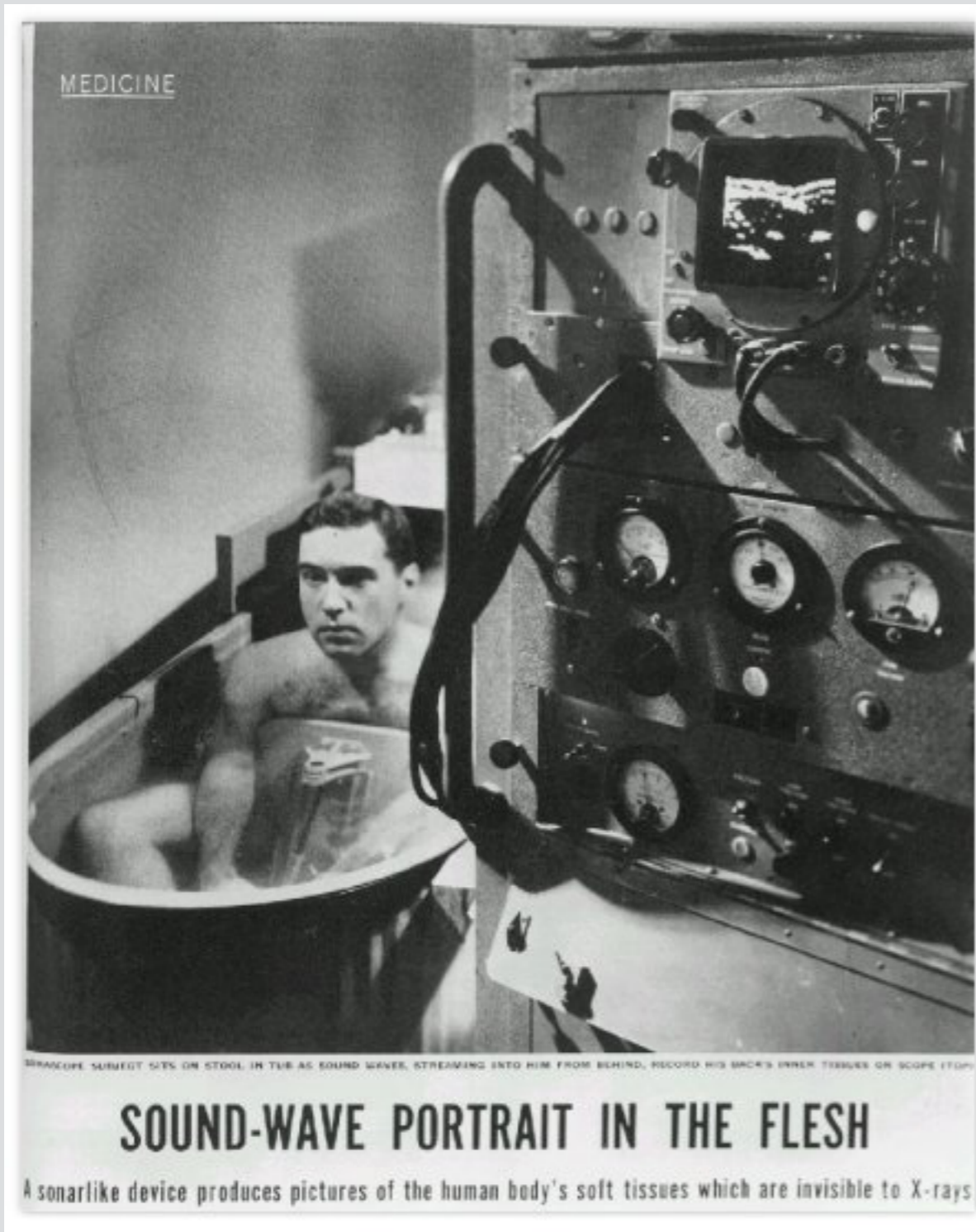


Visualist

Transform EM Practice



1954

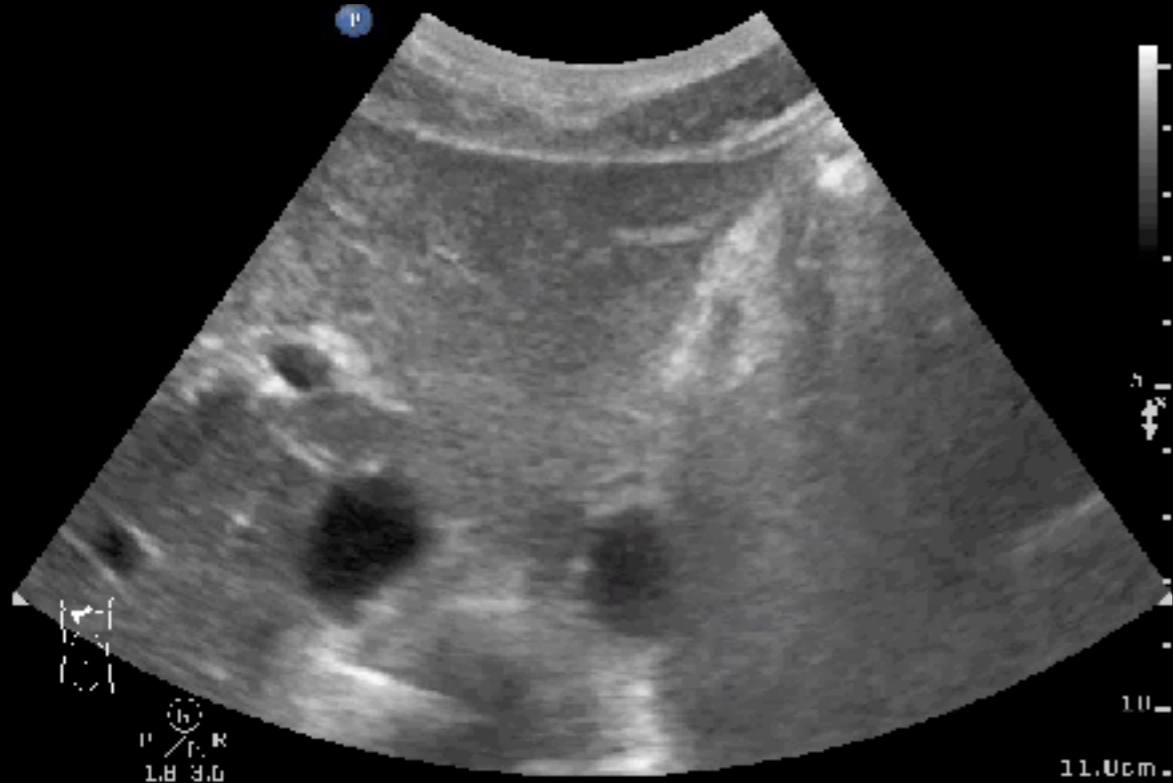






Disruptive Innovation

Abd Gen
0.5 1
42 Hz
11.0cm
2D
11Gen
Gn 100
0:56
3/3/3



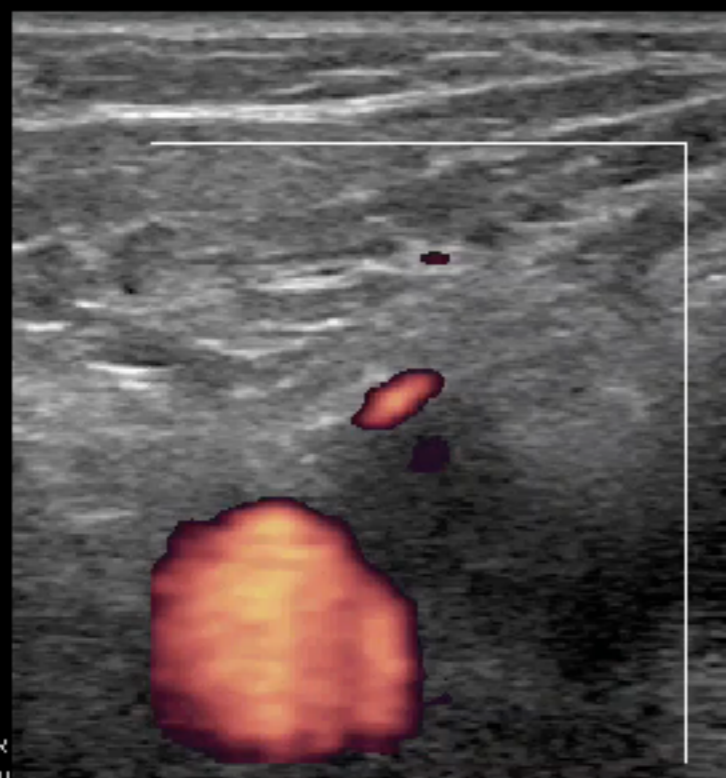
Abd Gen
0.5 1
42 Hz
11.0cm
2D
11Gen
Gn 100
0:56
3/3/3



Superficial
L12-3
24 Hz
4.0cm

2D
Res
Lin 76
F: 56
3/2/2

CPA
5.0 MHz
Lin 60
1/5/5
Fltr Med
Baseln 3



H
P R
3.0 12.0

0.8 Adult Echo
SS 1
31 Hz
17.0cm

2D
11Gen
Lin 50
F: 50
3/2/0

2
4.0cm

4.0cm



H
P R
1.0 3.2



Abd Gen
05 1
42 Hz
11.0cm

2D
II Gen
Lin 100
1:56
3/3/3



1.8 3.0

11.0cm

Abd Gen
05 1
36 Hz
14.0cm

2D
II Gen
Lin 61
1:56
3/3/3



1.8 3.0

14.0cm

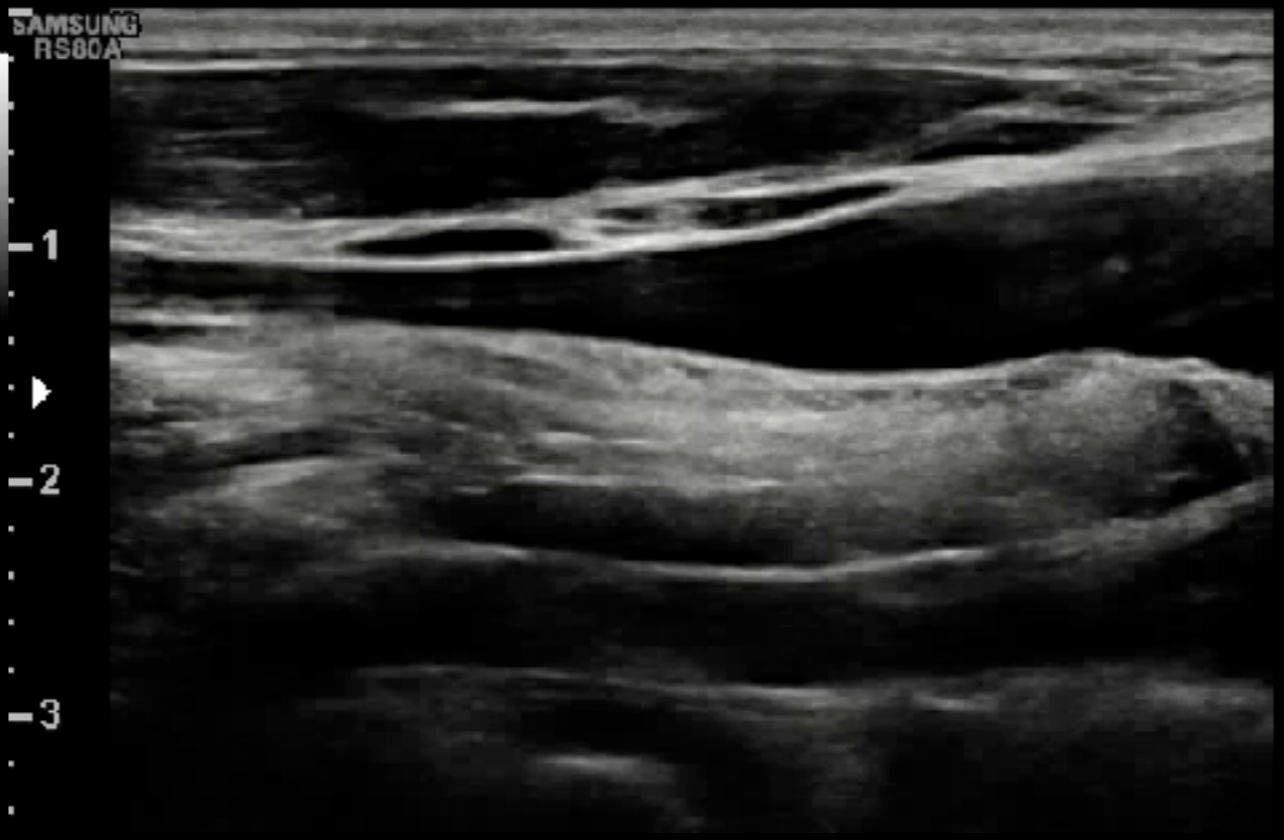
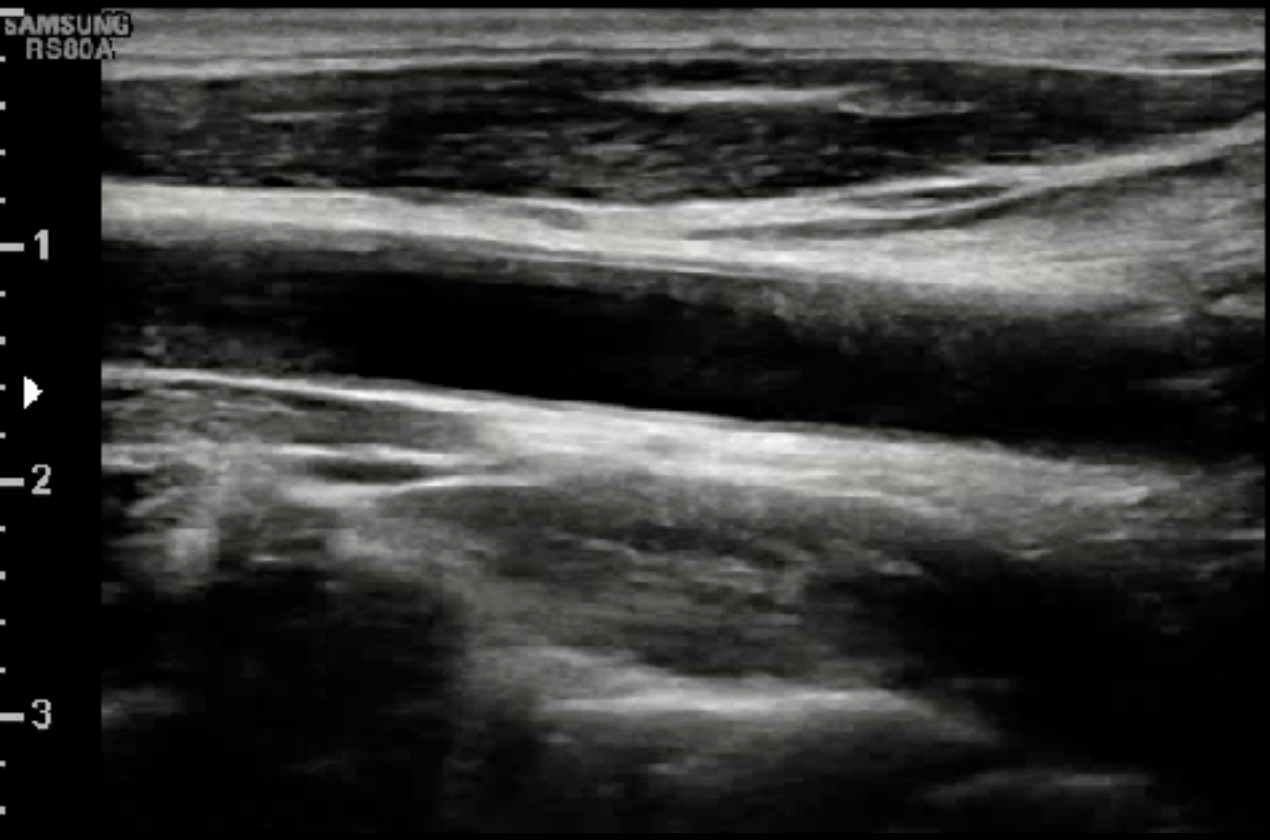
L3-12A / SmallParts / FPS40 / MID.96 / Ts0.1 / 01-09-2010 10:32:33 AM

2D G53/DR53/FA4/P90/2.7/Frq Pen./3.5cm



L3-12A / SmallParts / FPS40 / MID.96 / Ts0.1 / 01-09-2010 10:32:51 AM

2D G53/DR53/FA4/P90/2.7/Frq Pen./3.5cm



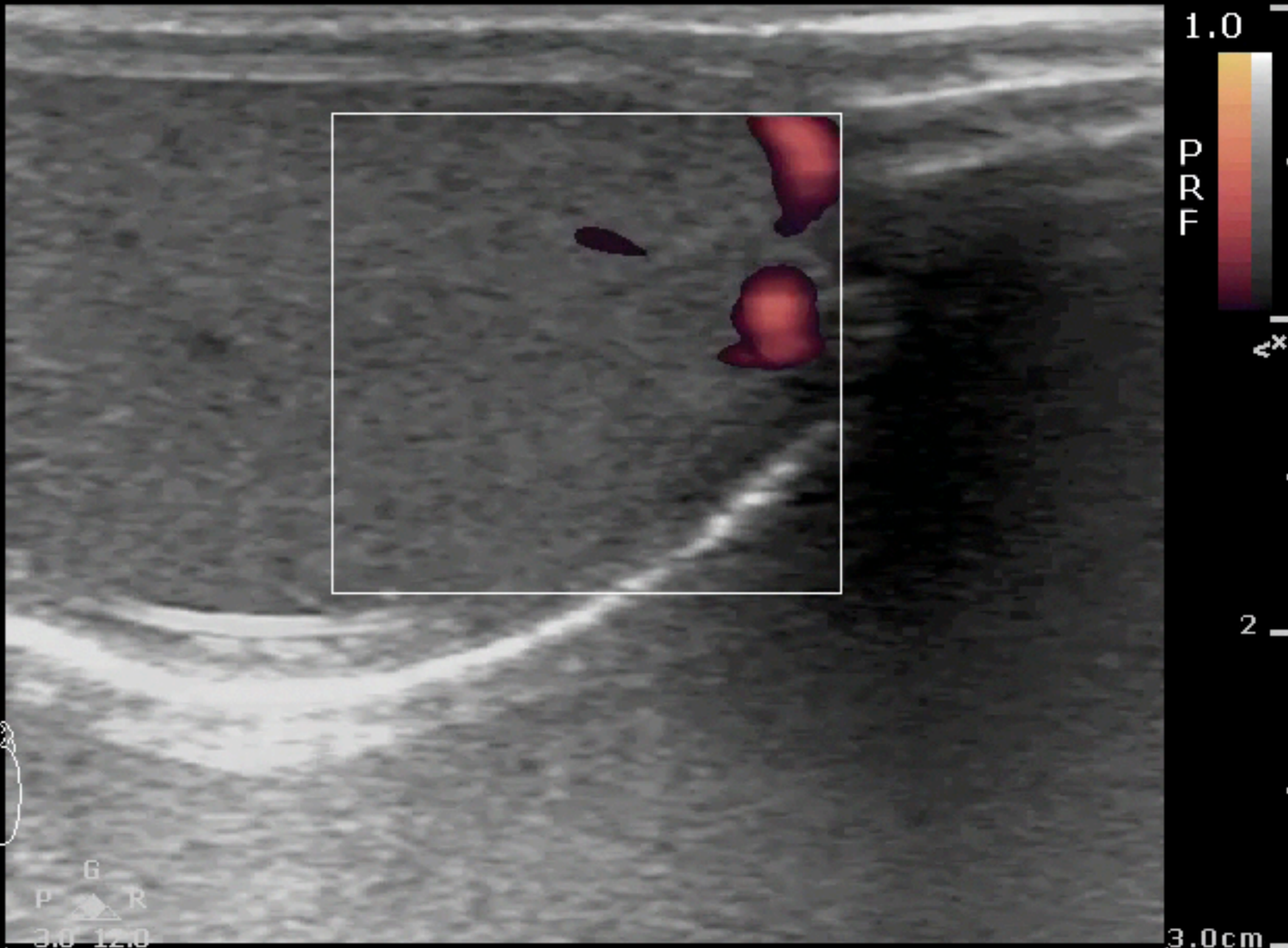
Power Doppler for Low flow

Superficial
L12-3
42 Hz
3.0cm

P

2D
Gen
Gn 100
C 52
4/3/2

CPA
5.0 MHz
Gn 57
1/5/4
Filtr Med
Baseln 3



1.0

PRF

0

2

3.0cm

Color Doppler for Directions

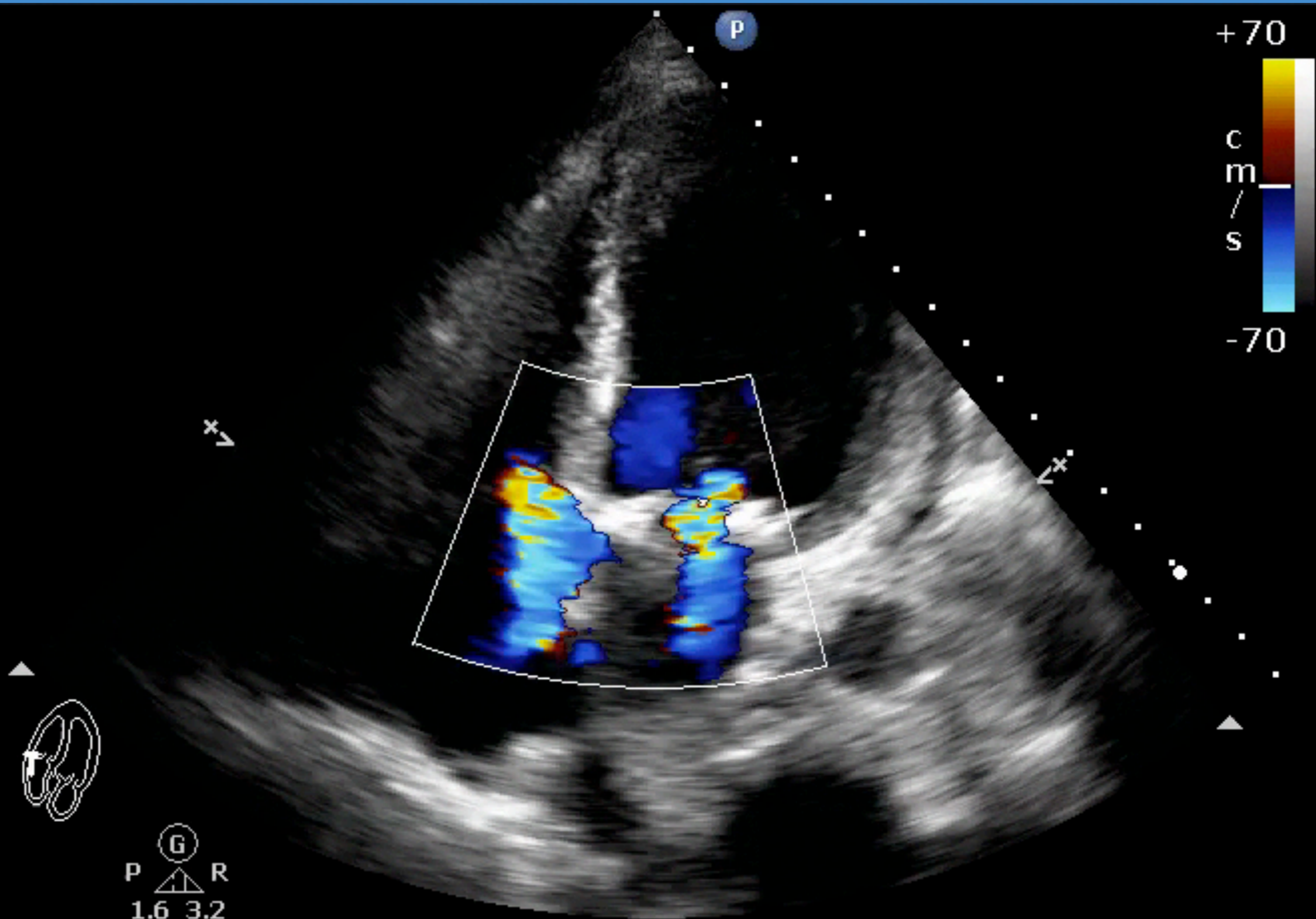
Adult Echo
S5-1
18 Hz
18.0cm

2D

HGen
Gn 34
C 50
3 / 2 / 0

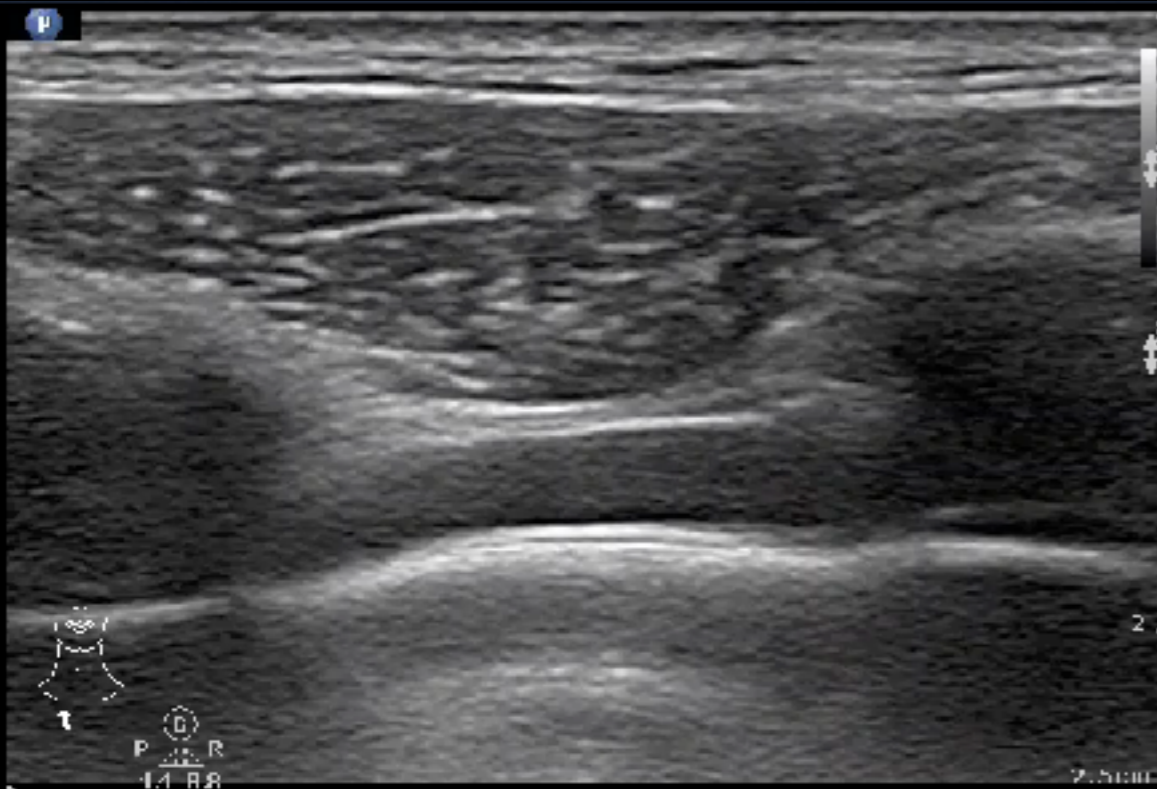
Color

2.5 MHz
Gn 60
4 / 5 / 0
Fltr High



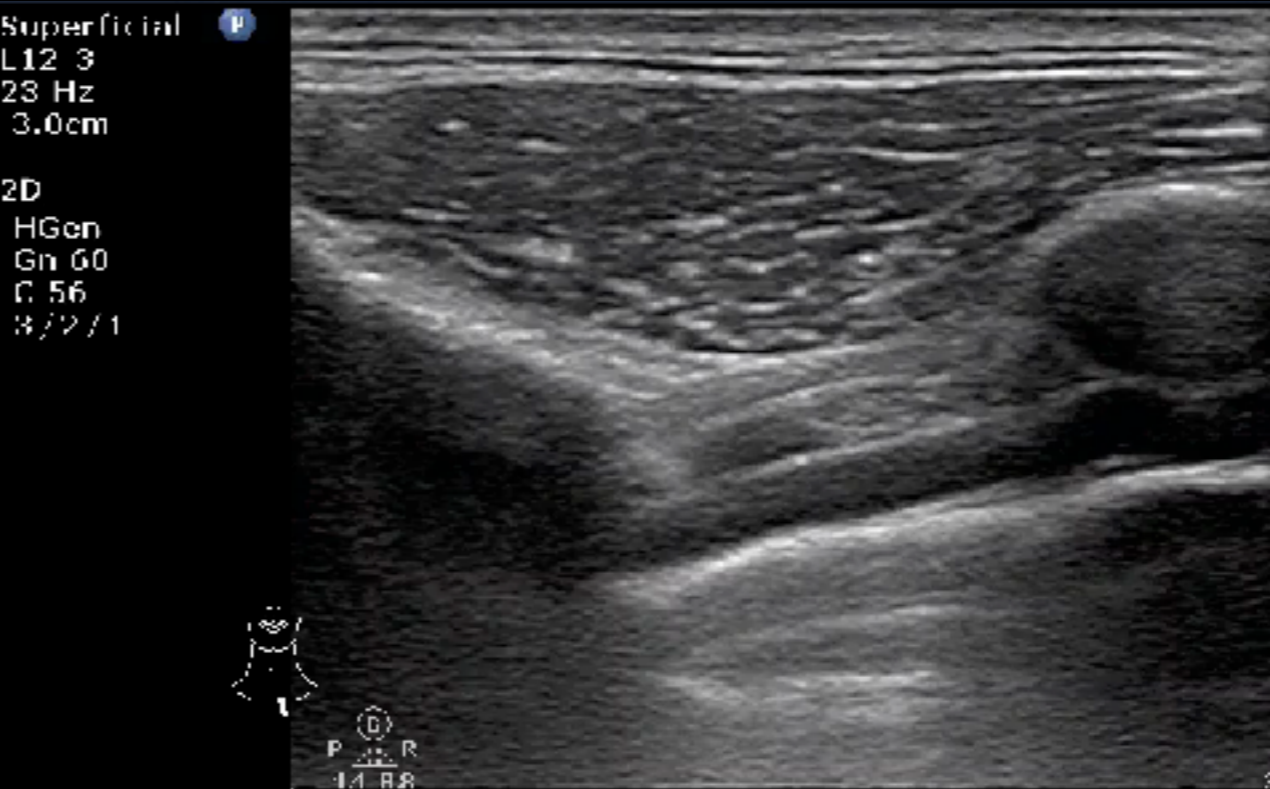
Superficial
L12 3
21 Hz
2.5cm

2D
HGen
Gn 60
C 56
3/2/1



Superficial
L12 3
23 Hz
3.0cm

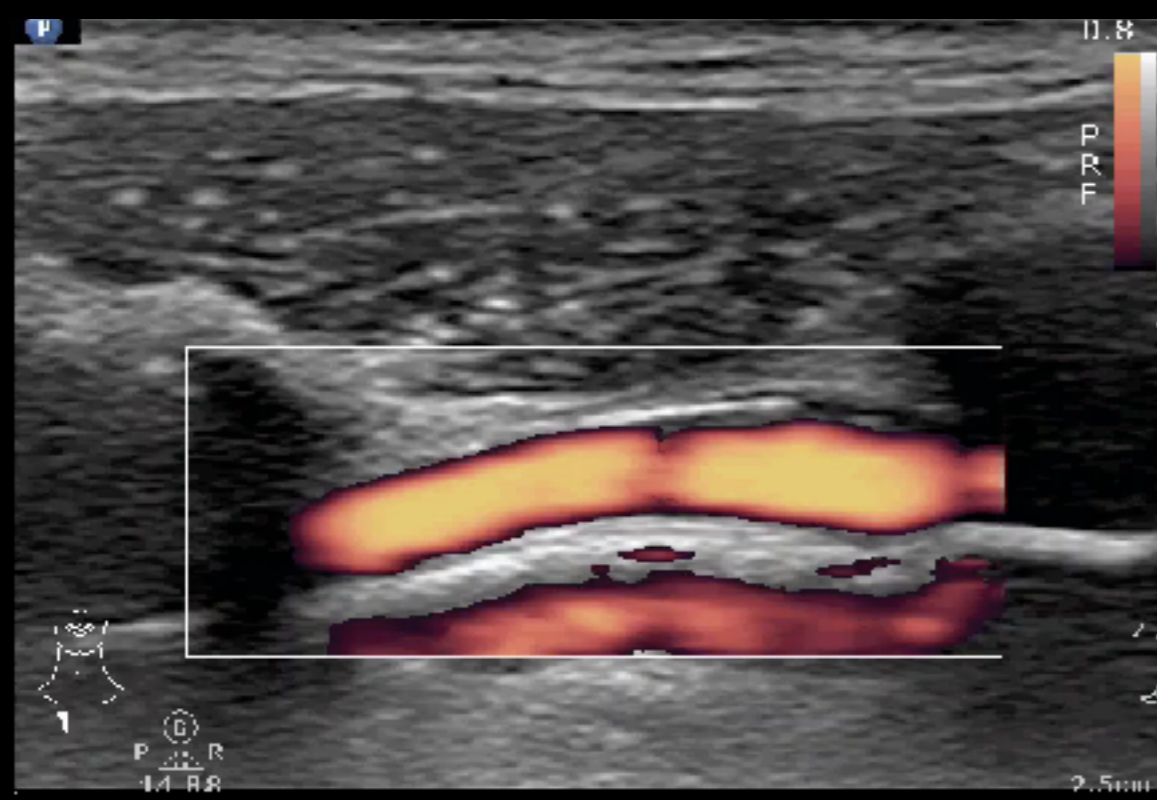
2D
HGen
Gn 60
C 56
3/2/1



Superficial
L12 3
20 Hz
2.5cm

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

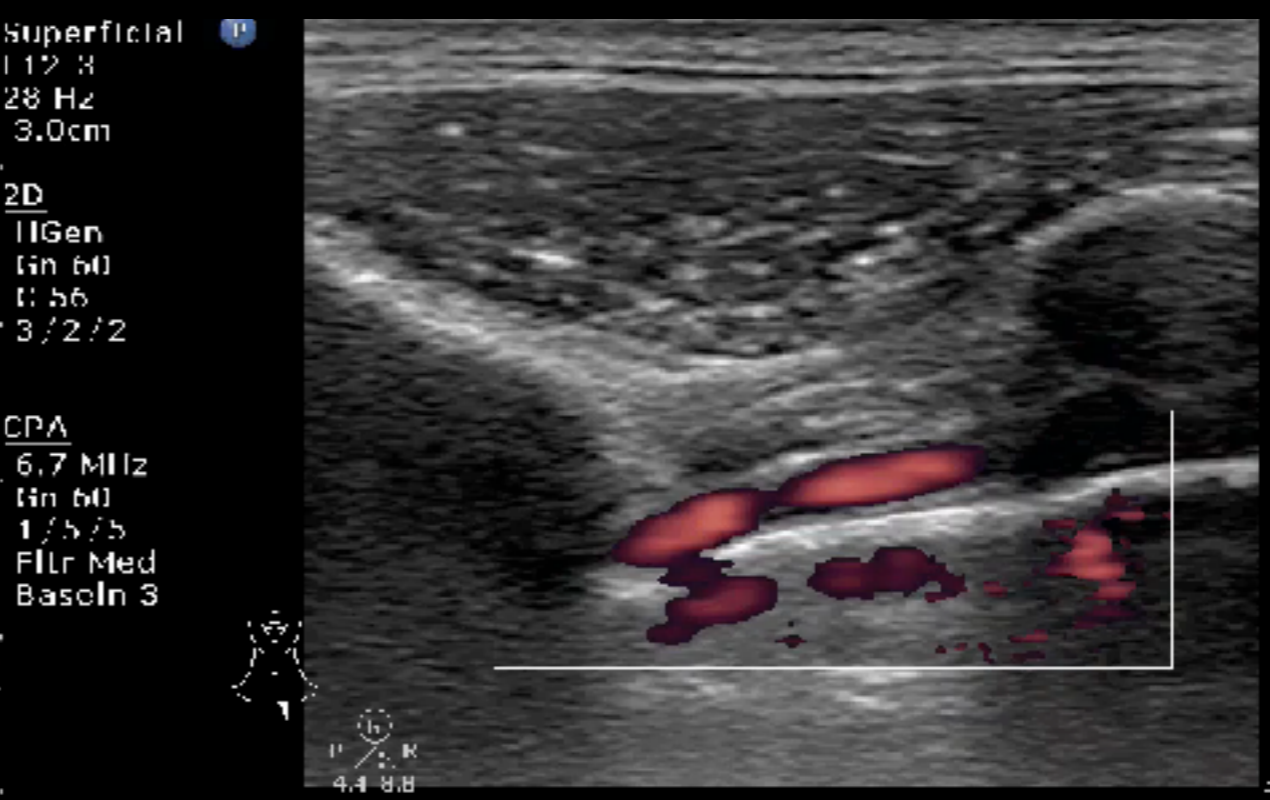
CPA
5.0 MHz
Gn 60
1/5/5
Filtr Med
Baseln 3



Superficial
L12 3
28 Hz
3.0cm

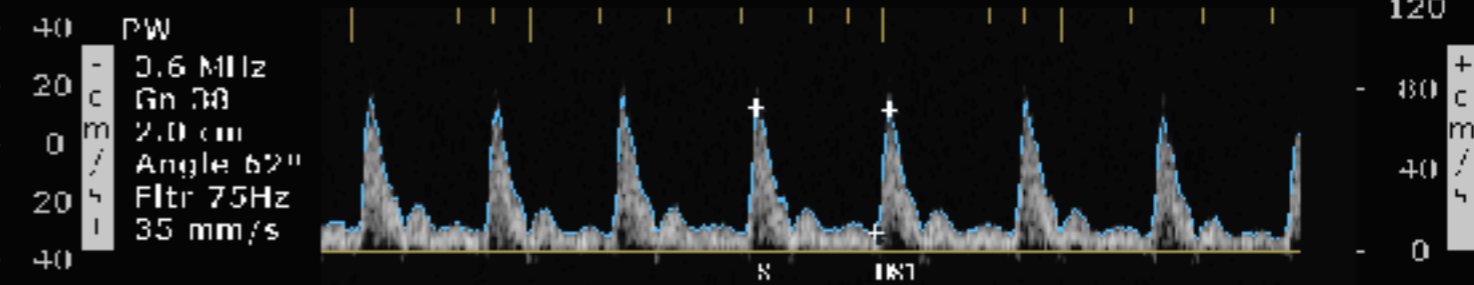
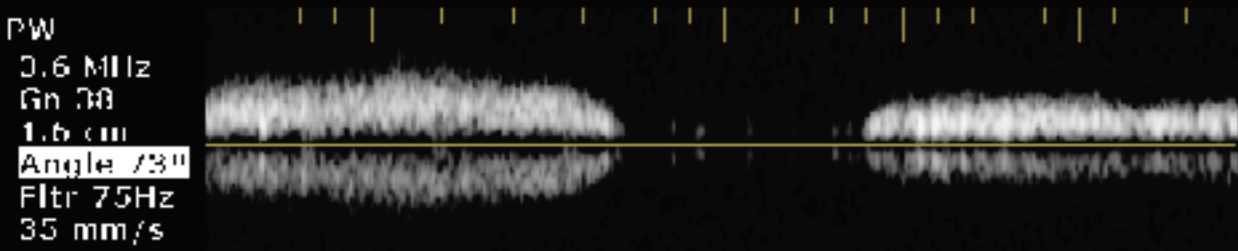
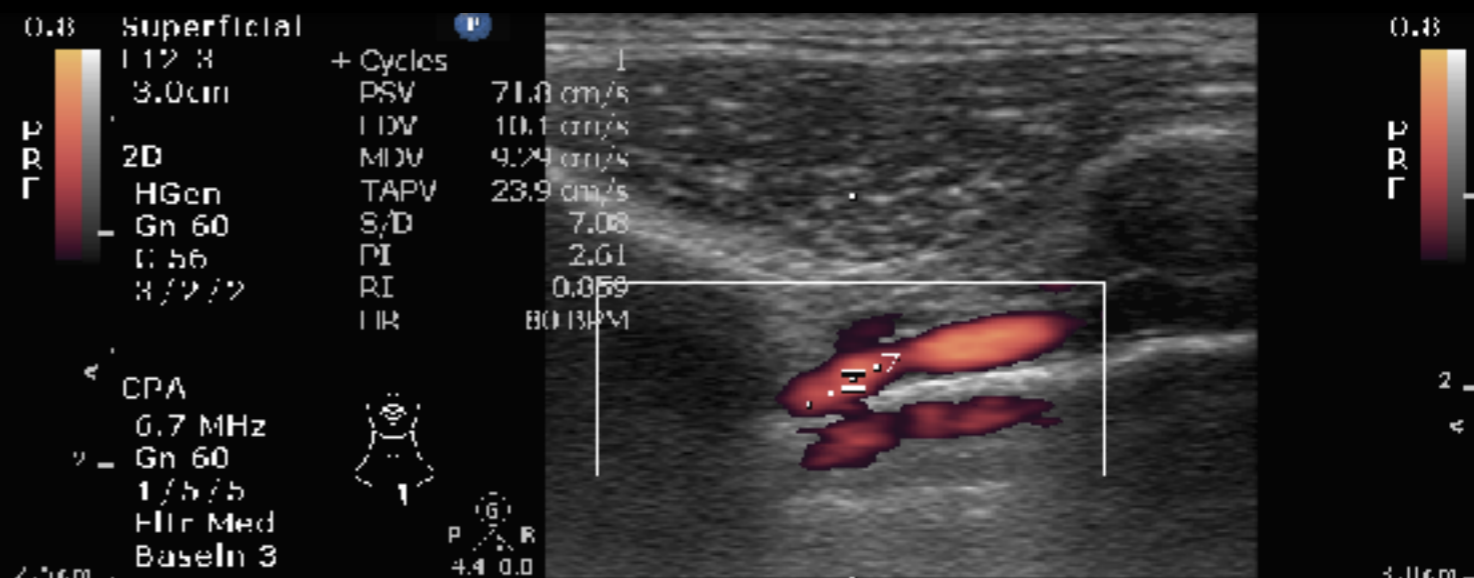
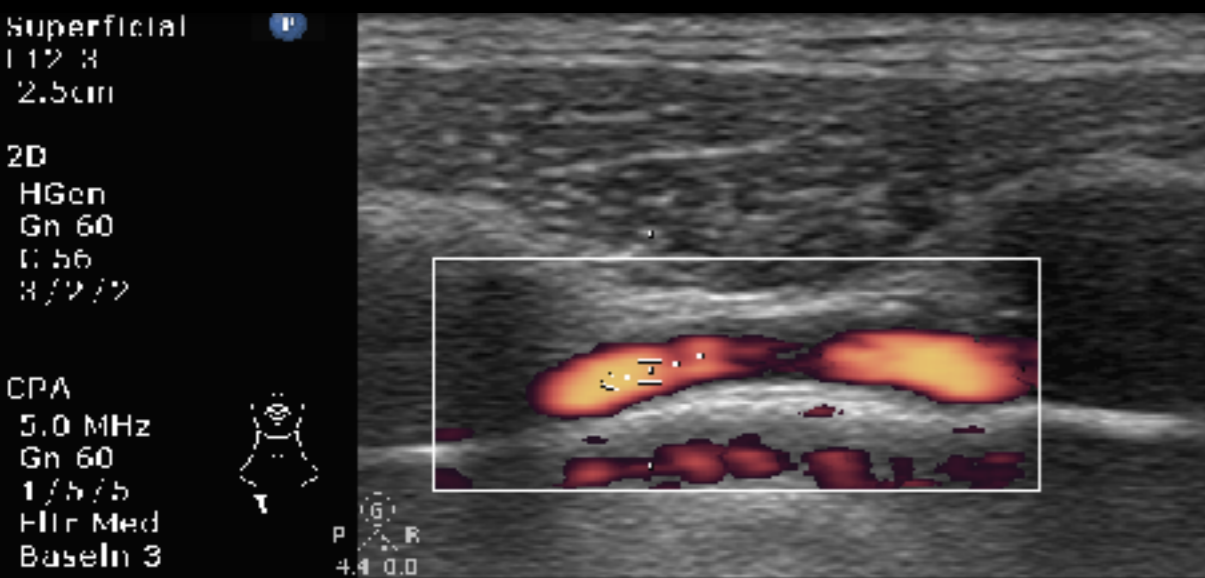
2D
HGen
Gn 60
C 56
3/2/2

CPA
6.7 MHz
Gn 60
1/5/5
Filtr Med
Baseln 3

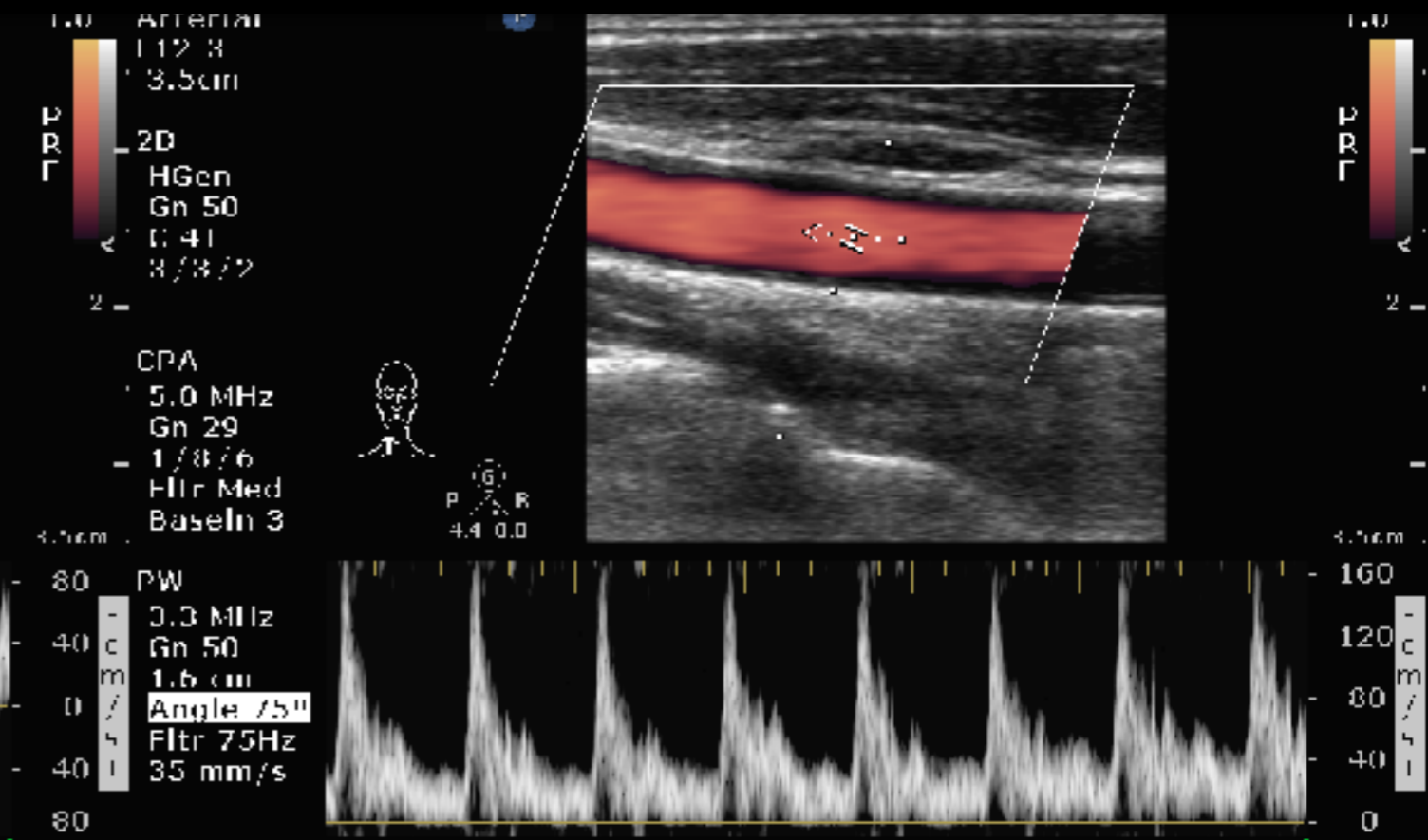
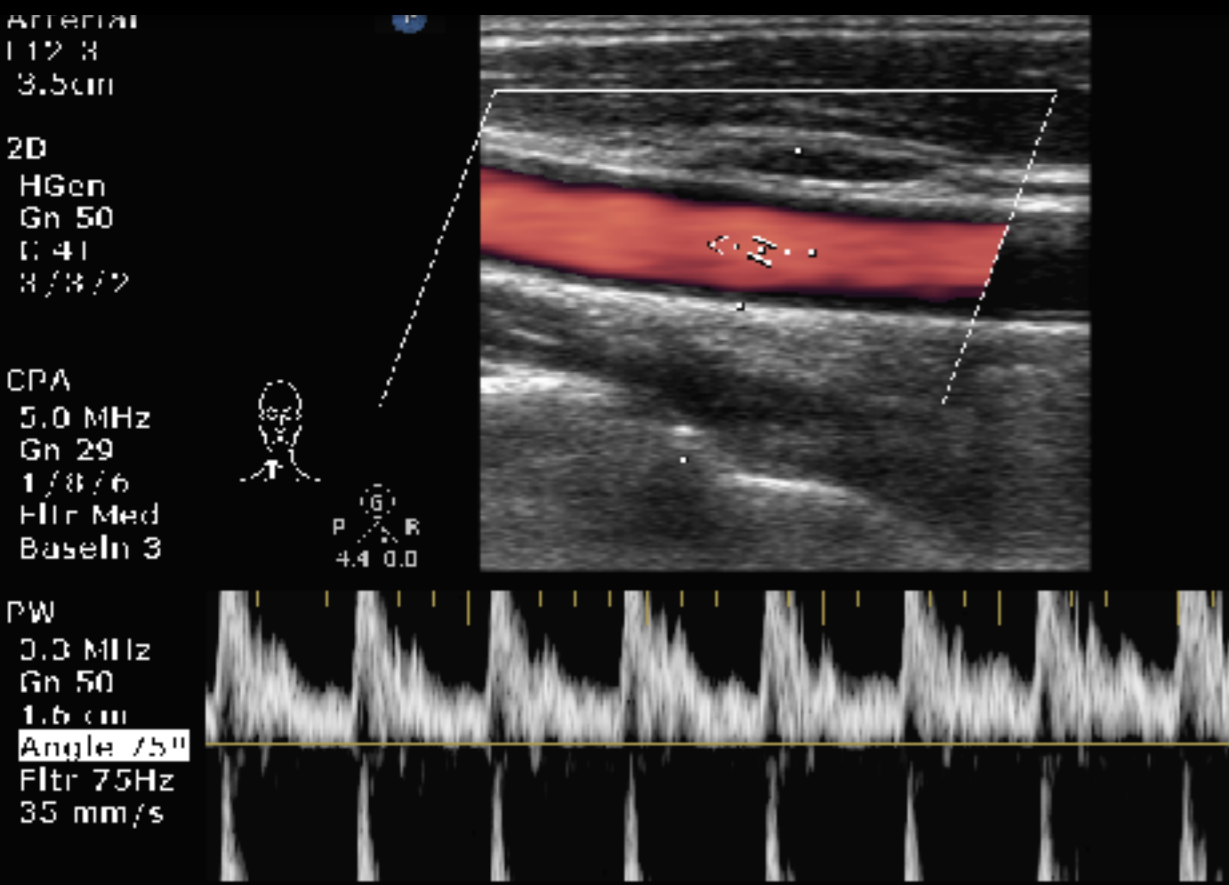


Vein

Artery

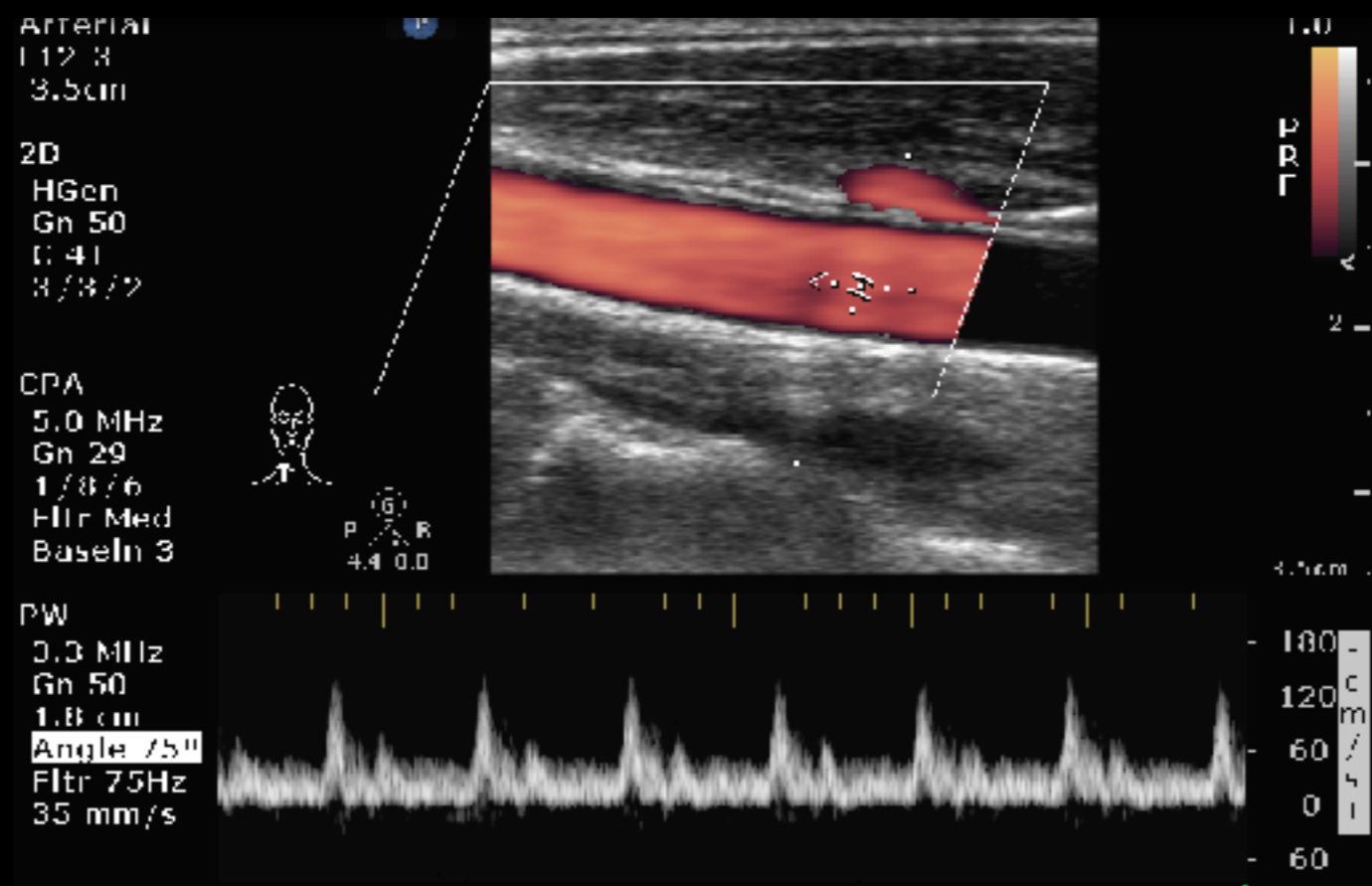


Spectral analysis



Aliasing

Scale

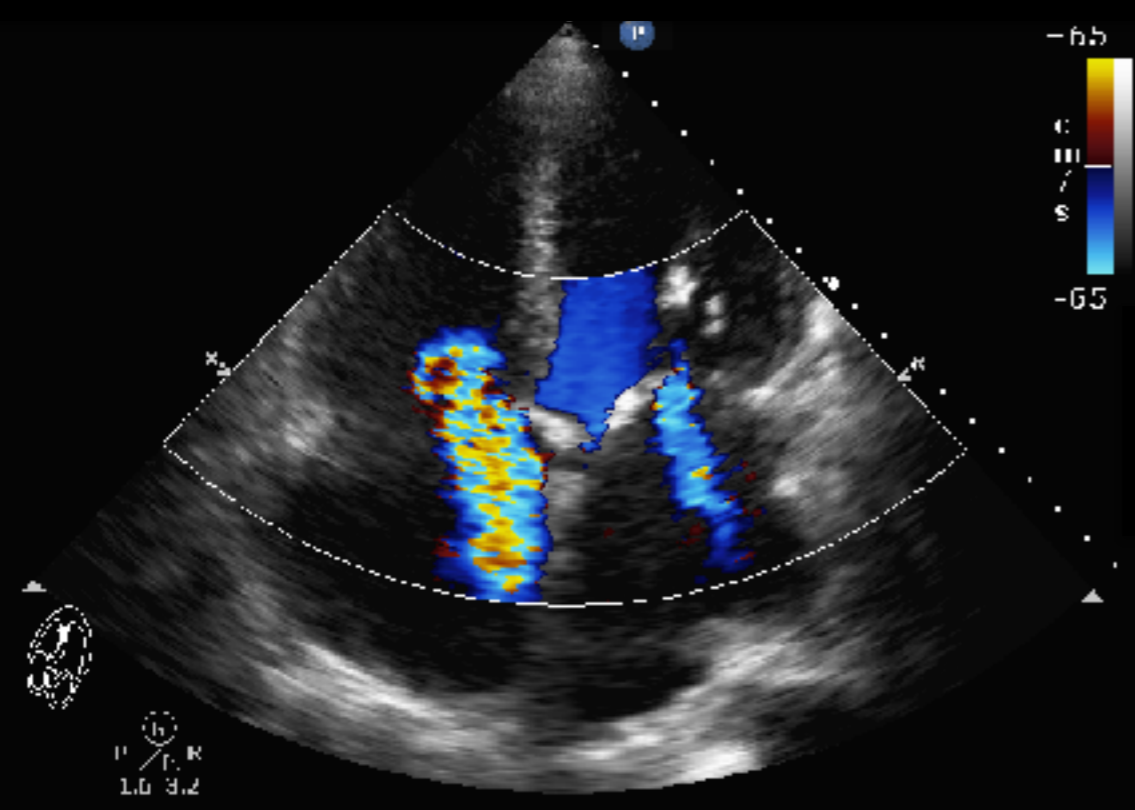


Baseline

Adult Echo
SS 1
9 Hz
19.0cm

2D
HGen
Gn 50
I: 50
3/2/0

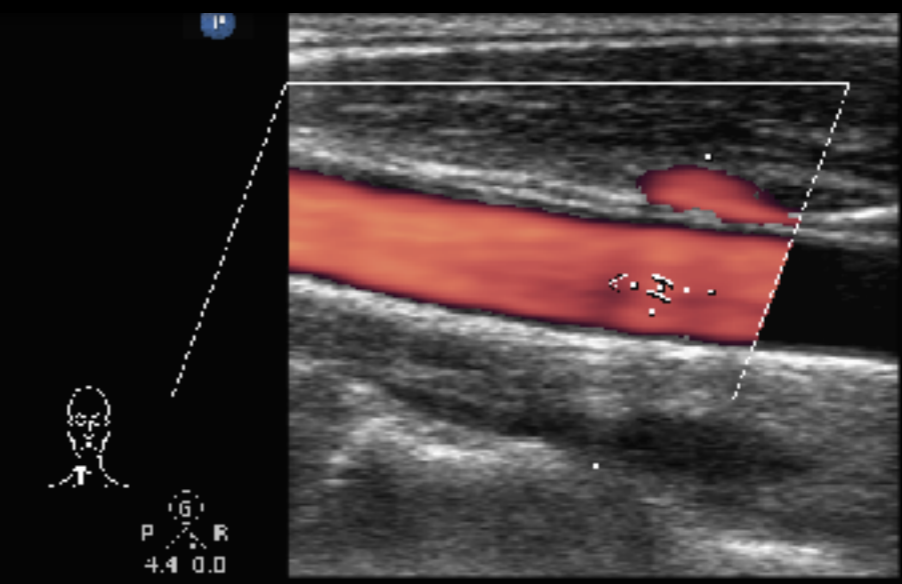
Color
2.5 MHz
Gn 60
4/5/0
Filt High



Arterial
112.3
3.5cm

2D
HGen
Gn 50
I: 41
3/3/2

CPA
5.0 MHz
Gn 29
1/8/6
Filt Med
Baseln 3

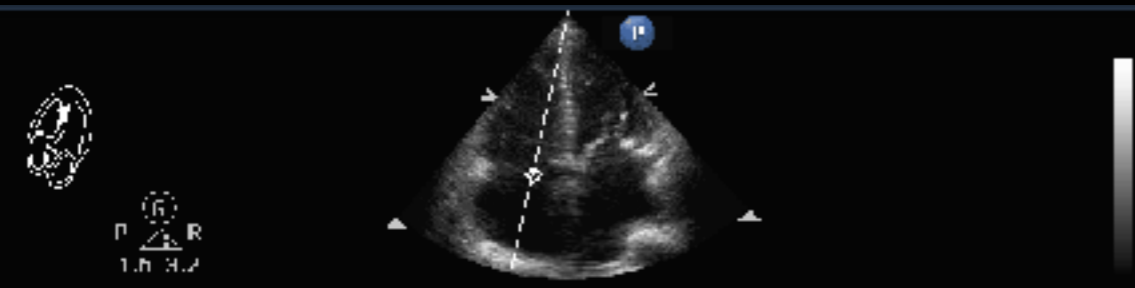


1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0

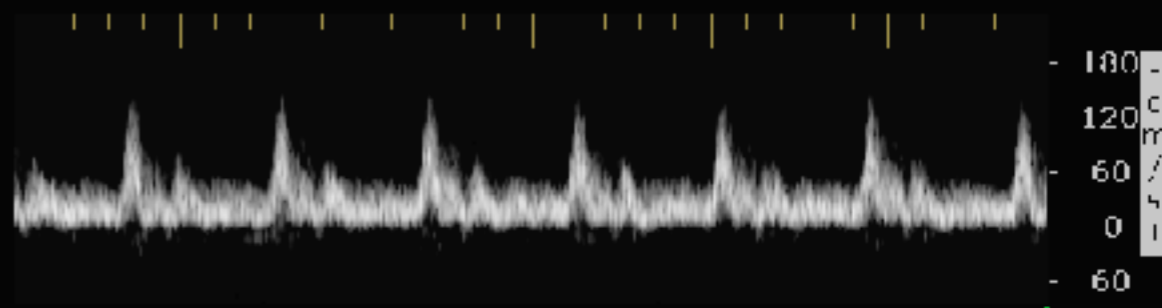
Continuous-Wave

Adult Echo
SS 1
19.0cm

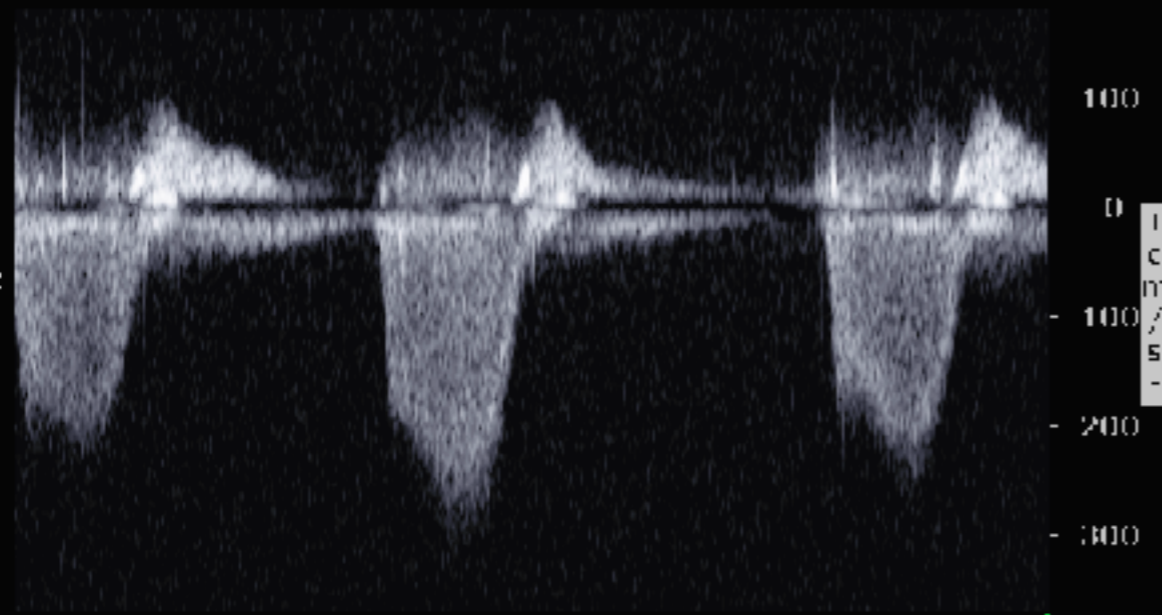
2D
HGen
Gn 50
I: 50
3/2/0



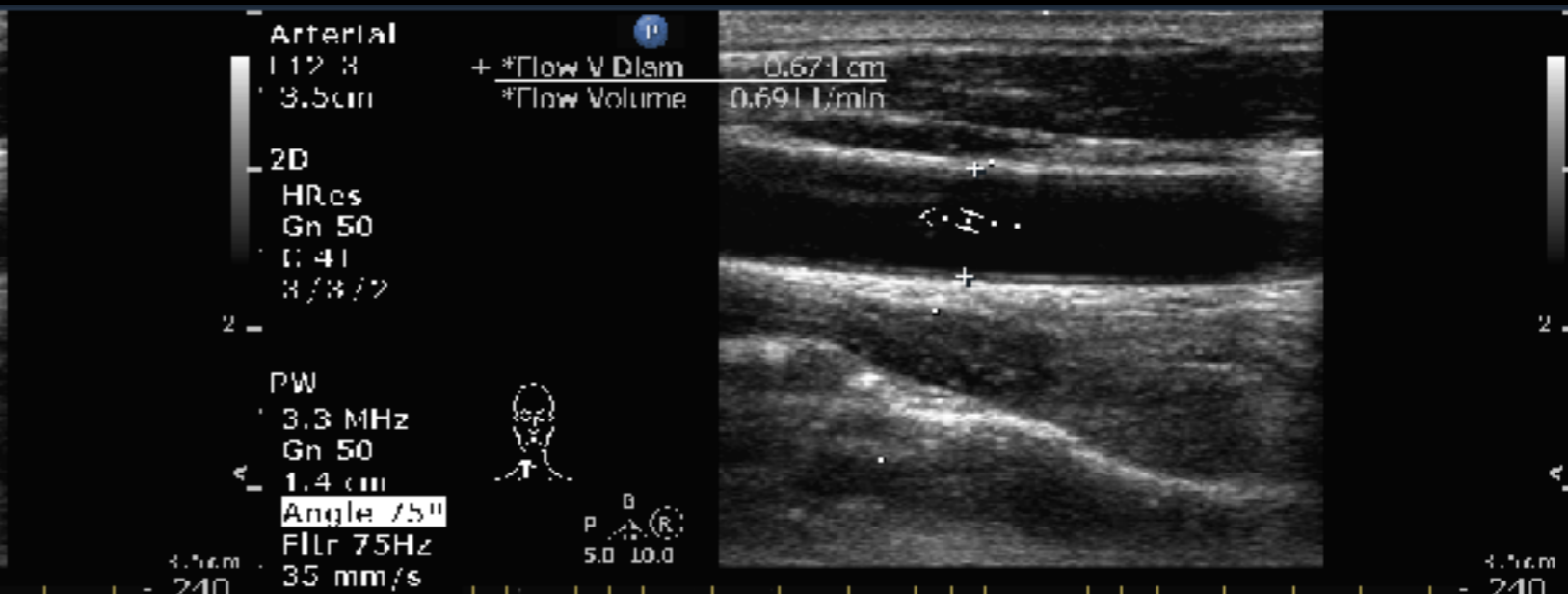
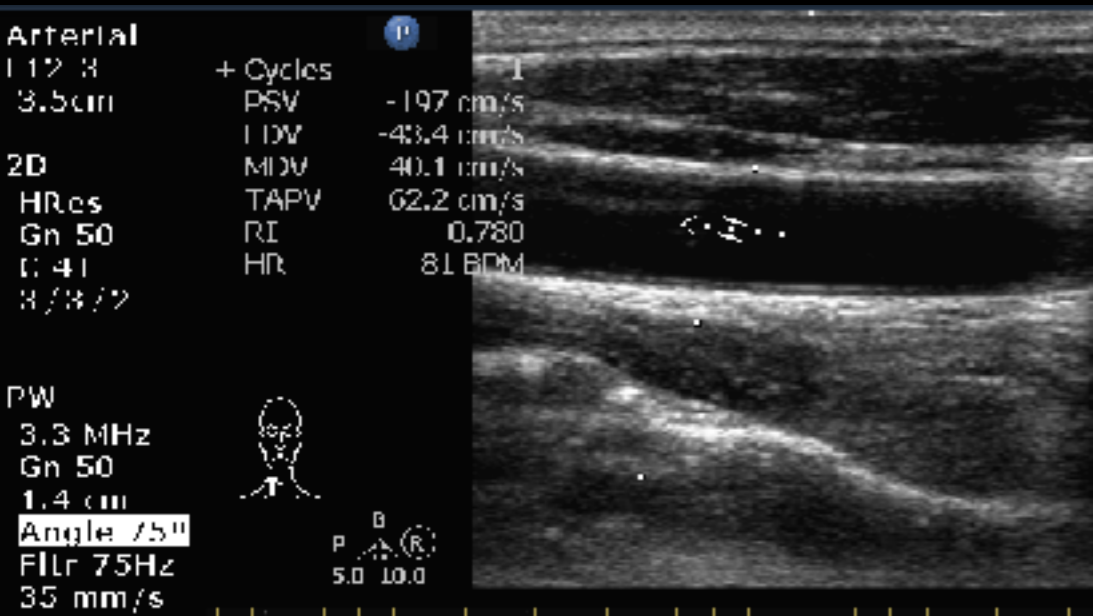
PW
3.3 MHz
Gn 50
1.8 cm
Angle 75°
Filt 75Hz
35 mm/s



CW
1.7 MHz
Gn 56
11.8 cm
Angle 0°
Filt 400Hz
75 mm/s



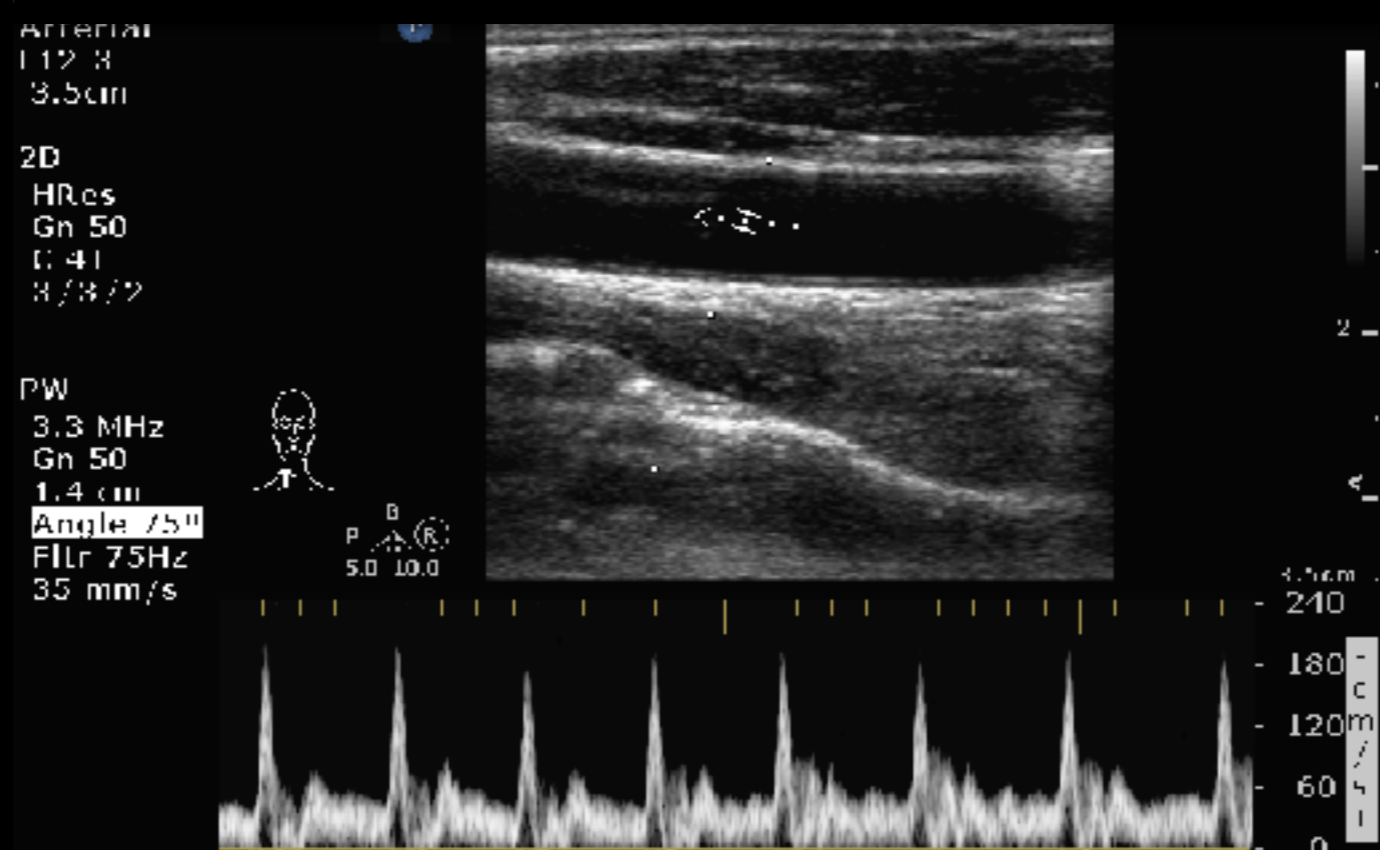
Pulsed-Wave



Velocity

Flow Volume

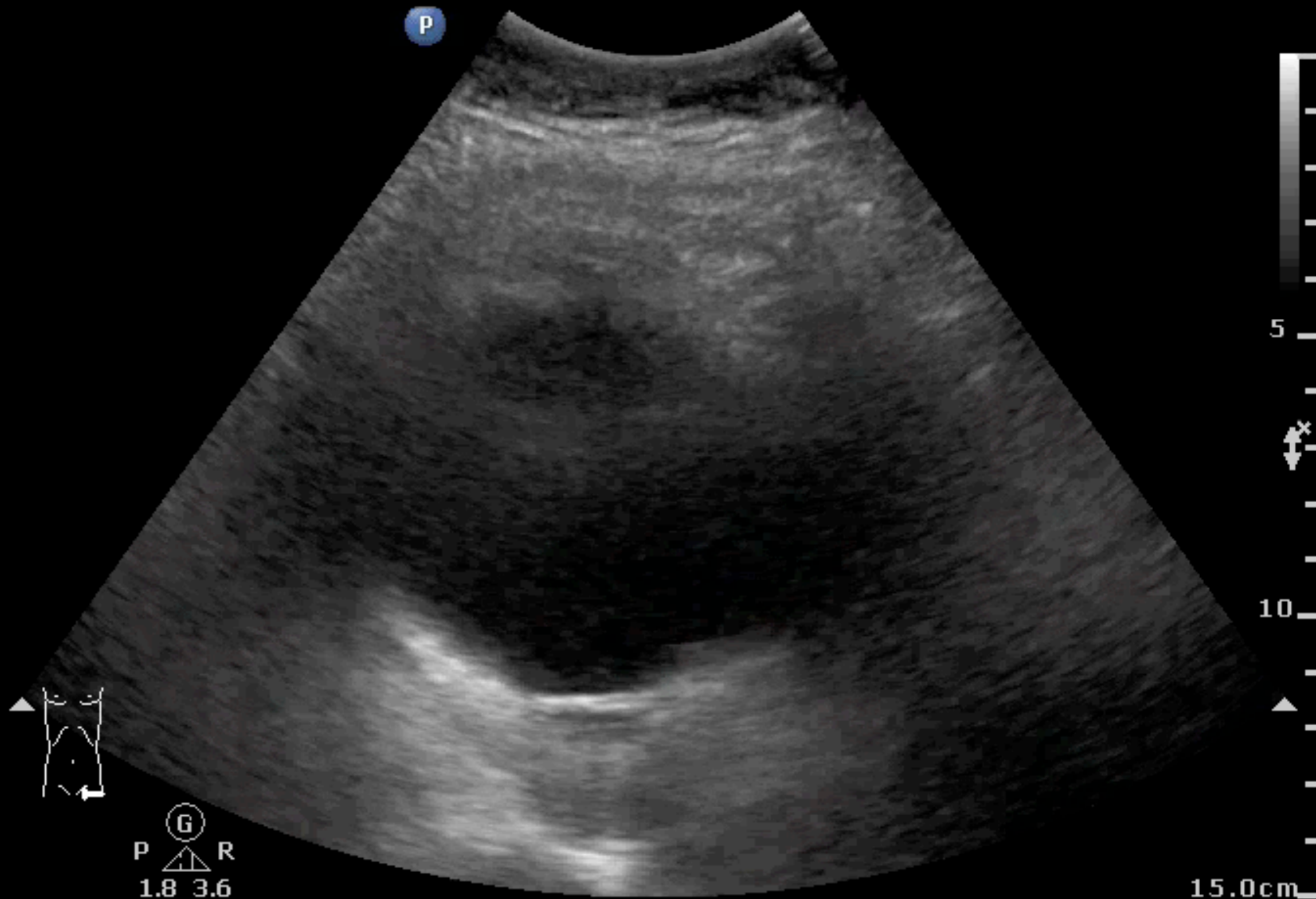
Diameter



Abd Gen
C5-1
34 Hz
15.0cm

2D

HGen
Gn 58
C 56
3 / 3 / 3



15.0cm

I-AIM

Indication

Acquisition

Interpretation

**Making
decision**

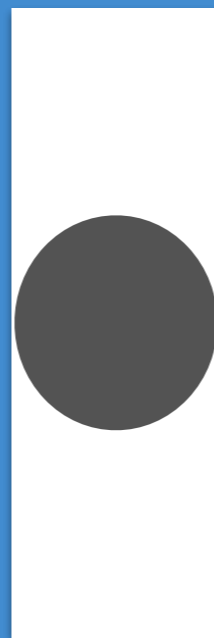
I-AIM

Dilatation



Rupture

Obstruction



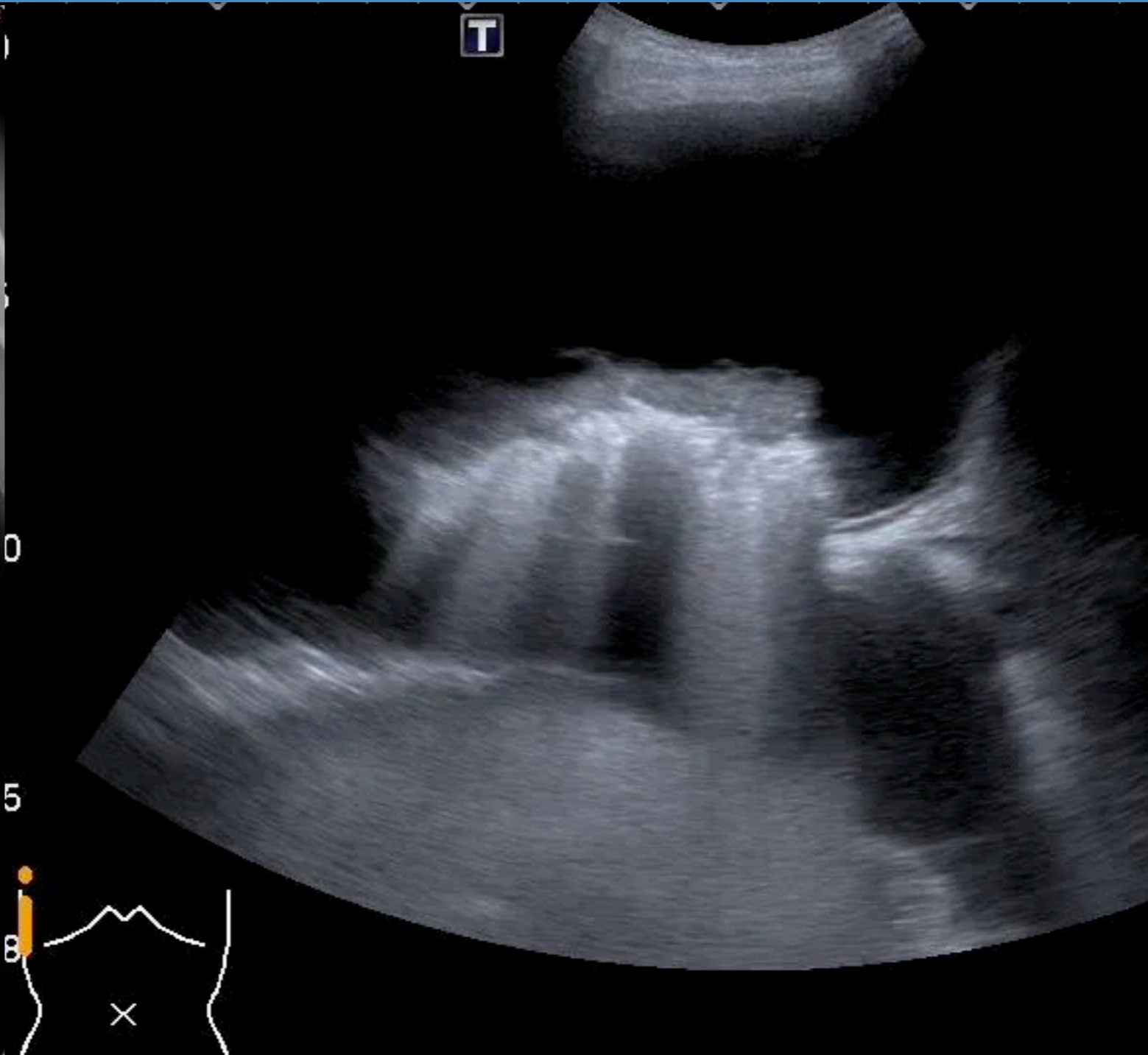
Dissection

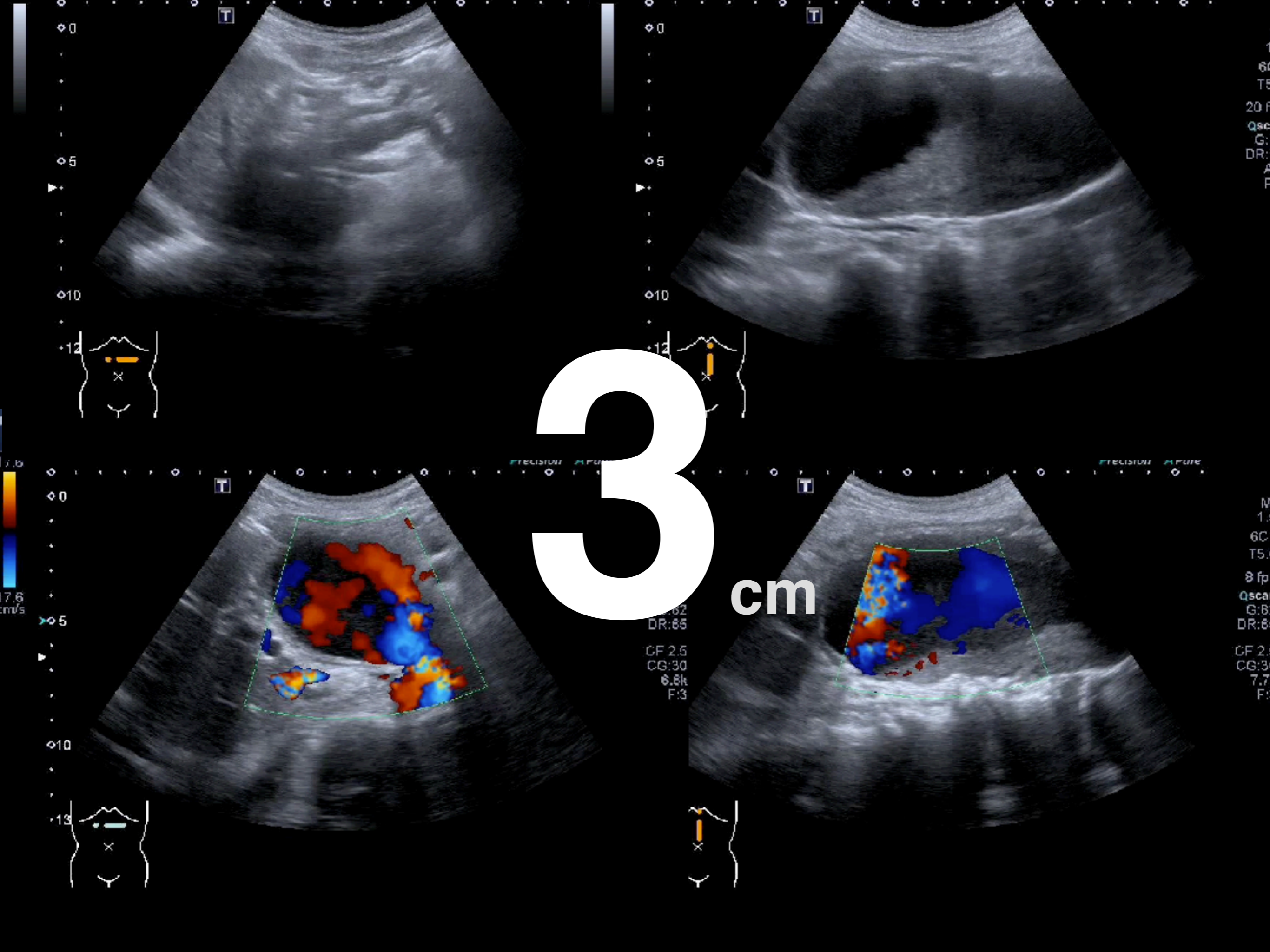


I-AIM



86M, fever for 1wk

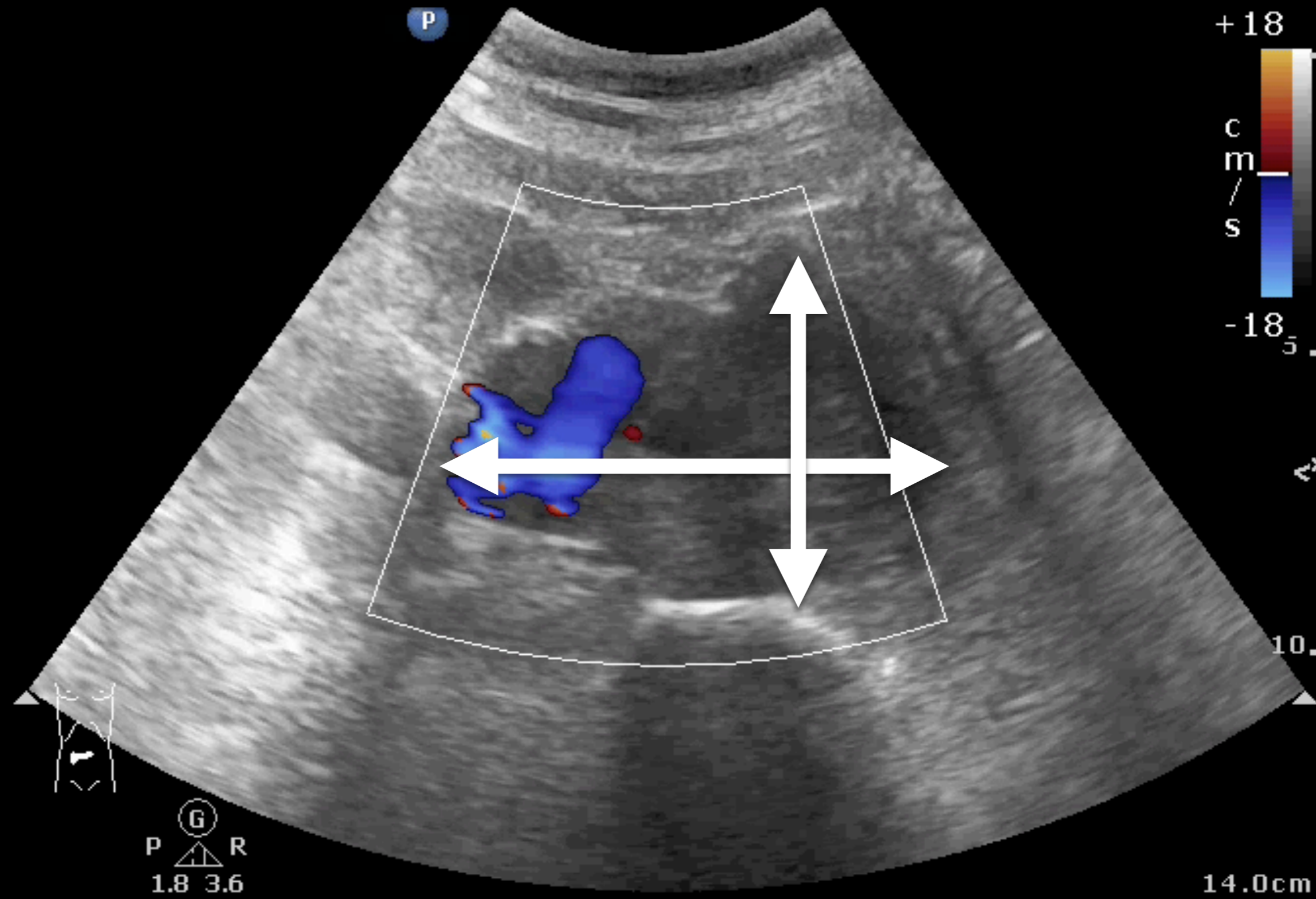




Abd Gen
C5-1
9 Hz
14.0cm

2D
HGen
Gn 78
C 56
3/3/3

Color
2.5 MHz
Gn 60
3/7/3
Fltr Med



+18
cm/s
-18

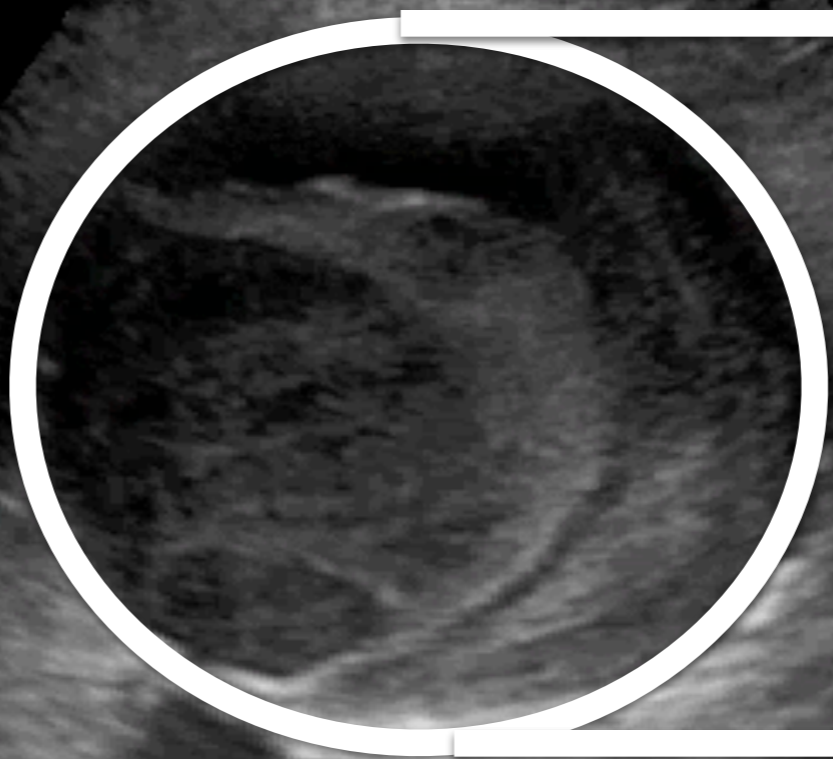
G
P R
1.8 3.6

14.0cm.

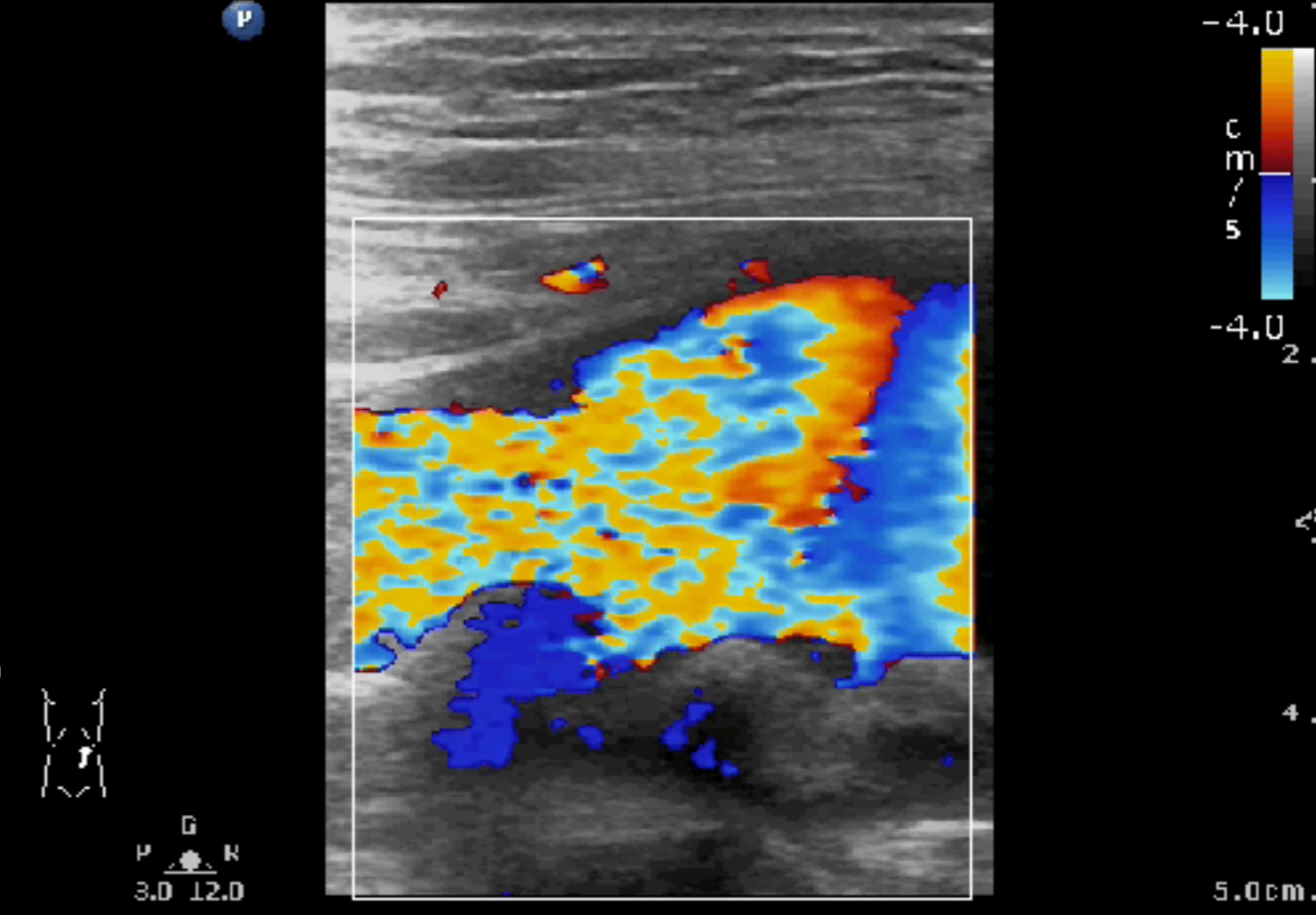
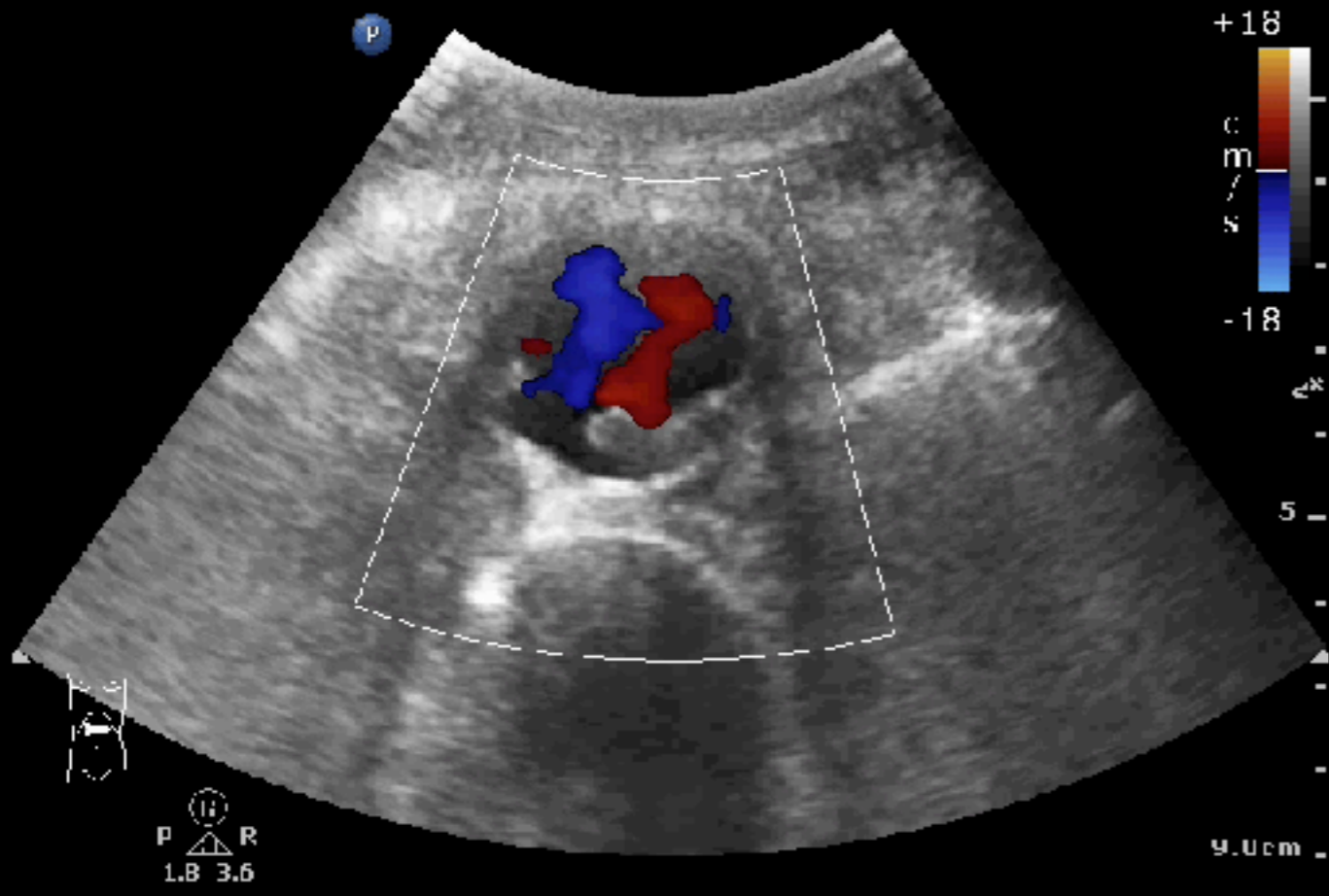
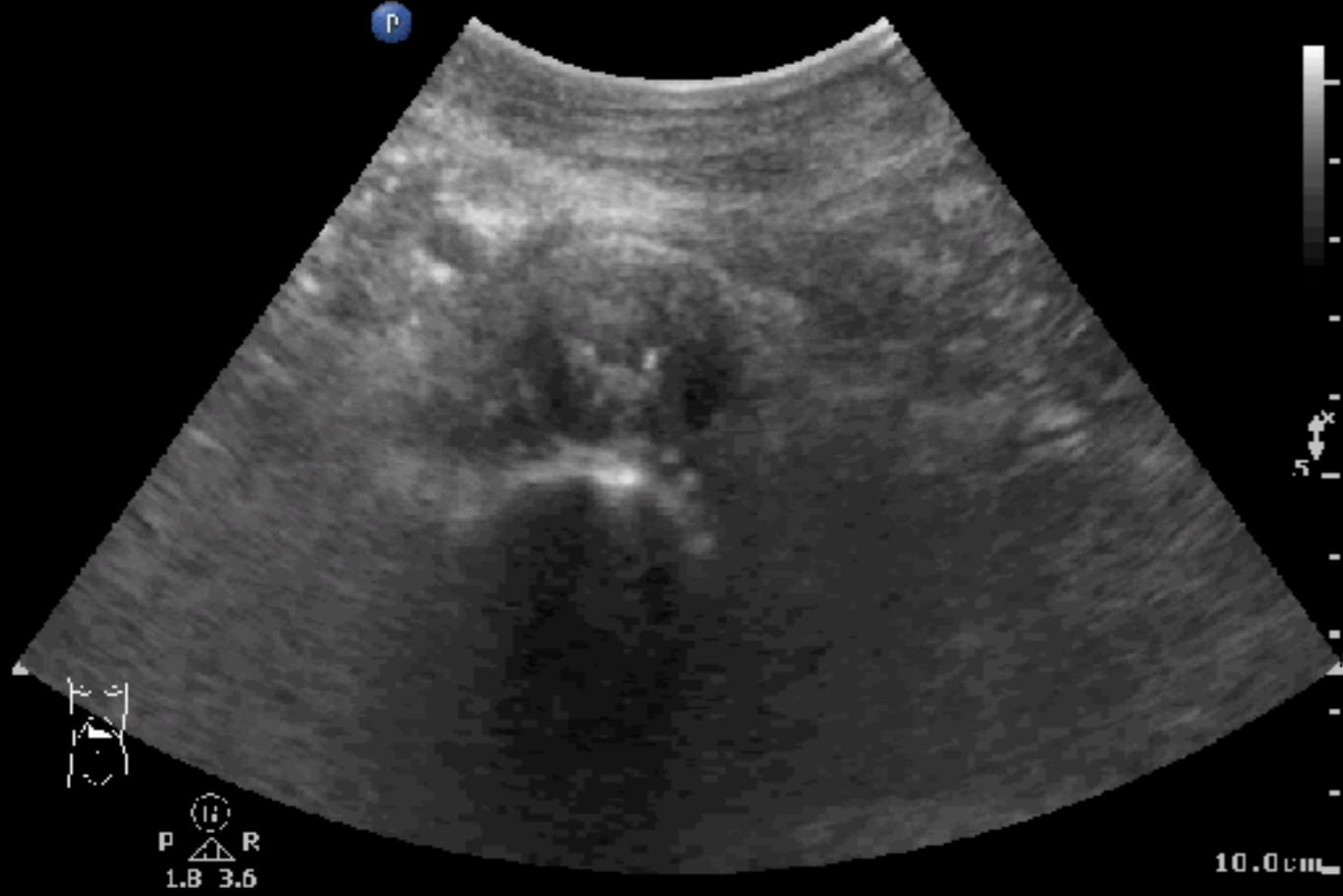
Abd Gen
C5-1
34 Hz
15.0cm

2D
HGen
Gn 57
C 56
3 / 3 / 3

P

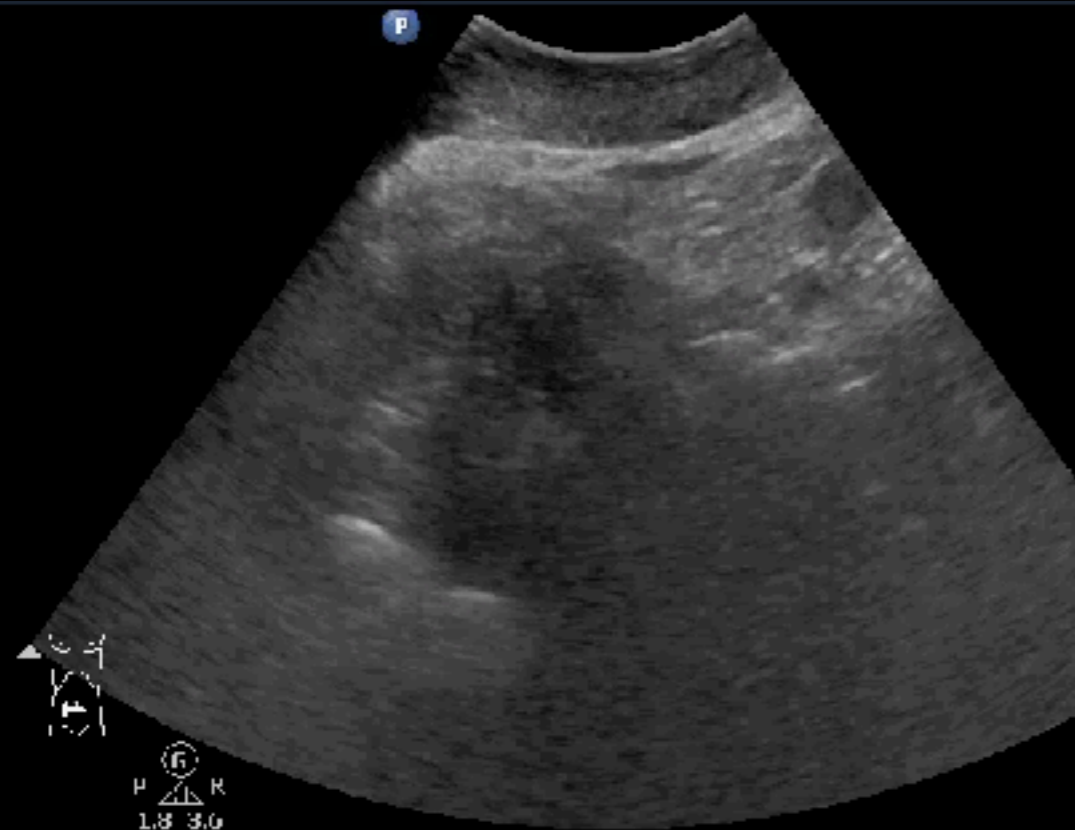


15.0cm



Abd Gen
C5 1
34 Hz
15.0cm

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



Abd Gen
C5 1
34 Hz
15.0cm

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



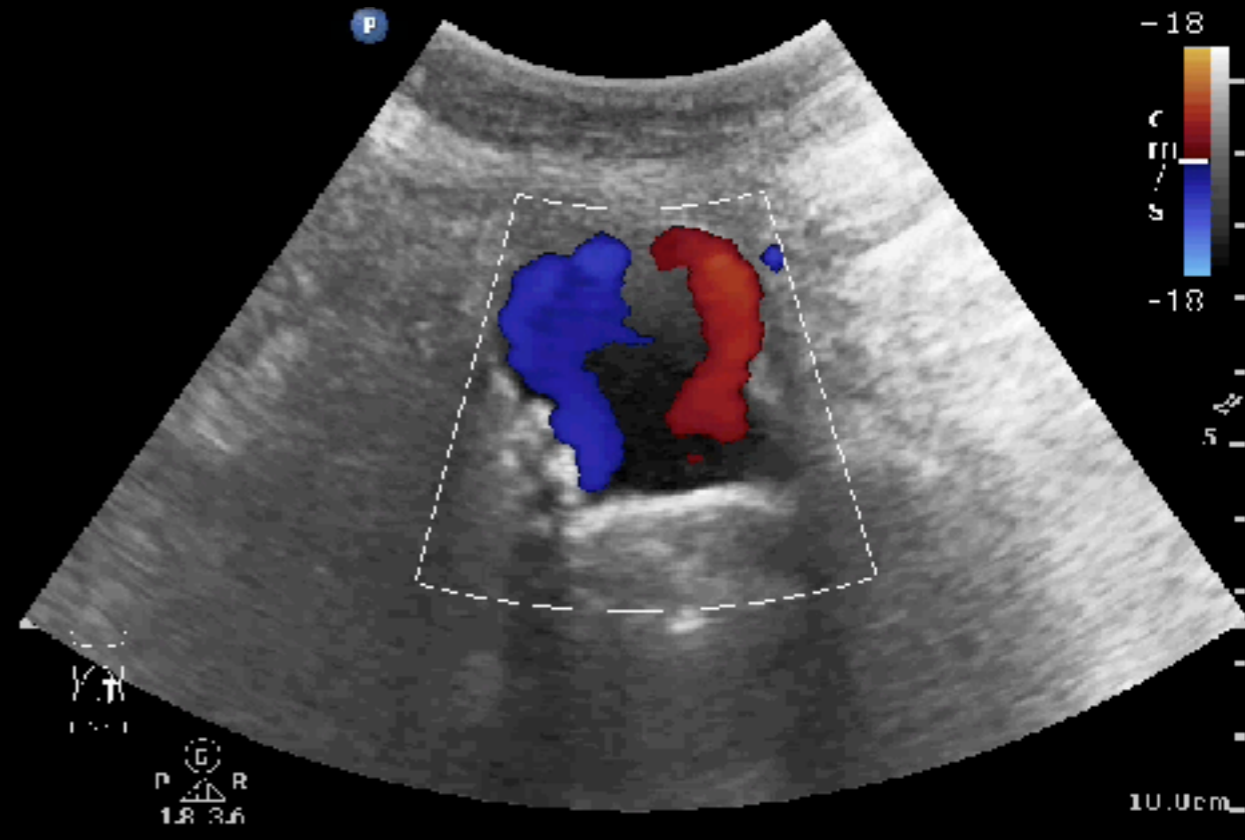
Gen
m
5
/3



Abd Gen
C5-1
12 Hz
10.0cm

2D
HGen
Gn 85
C 56
3/3/3

Color
2.5 MHz
Gn 60
3/1/3
Htr Med



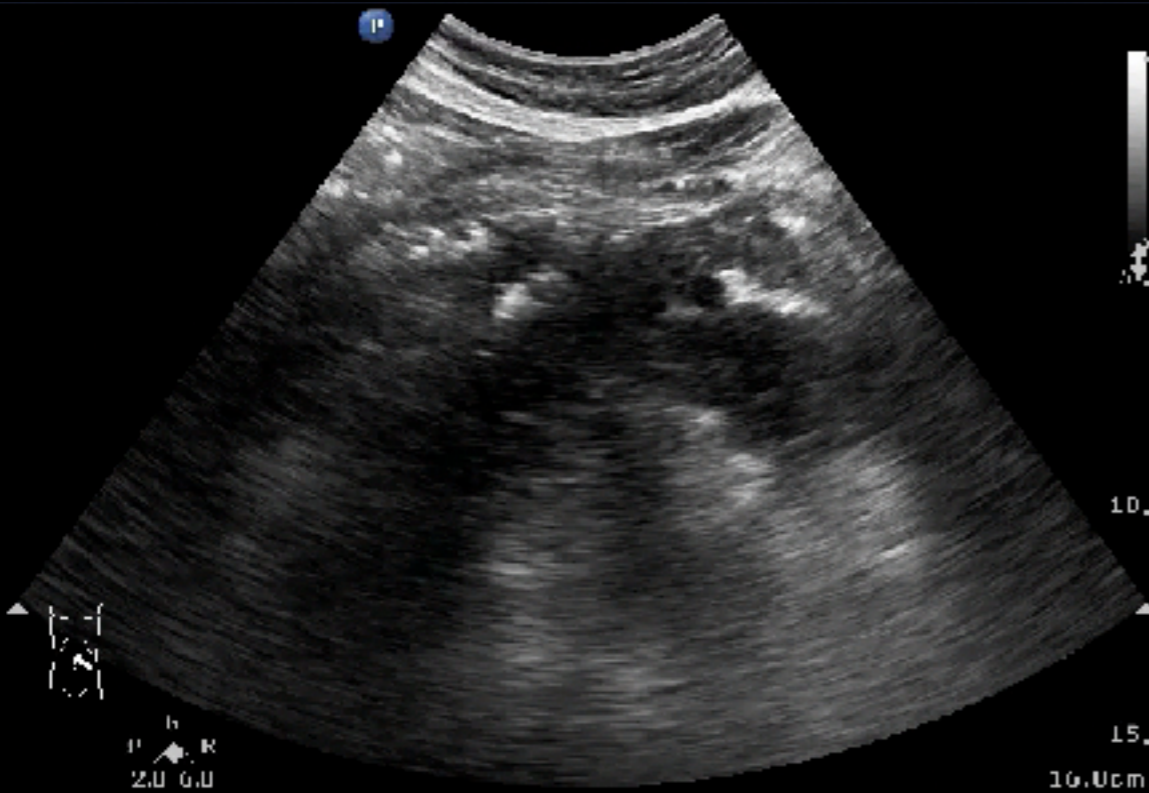
-18
cm/s
-18

10.0cm

P G R
1.8 3.6

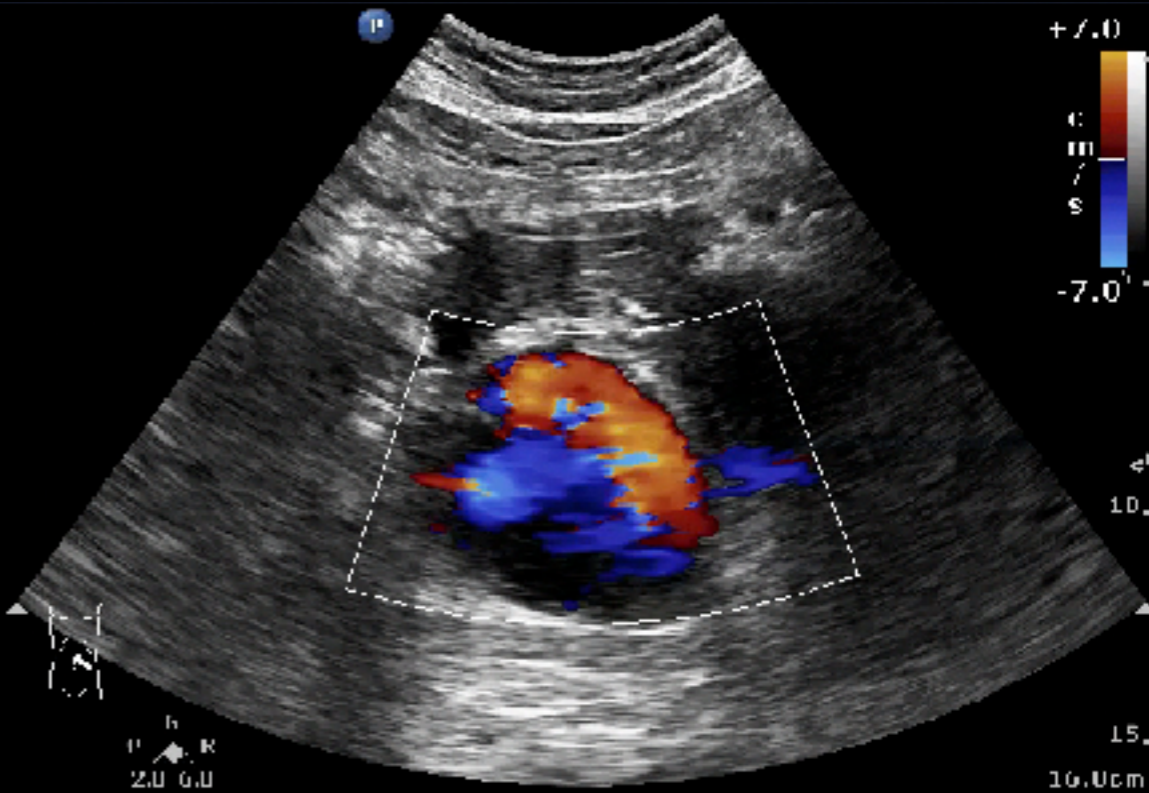
P G R
1.8 3.6

D: Nerve
06 7
22 Hz
16.0cm
2D
Gen
0n 60
0: 58
2/3/4

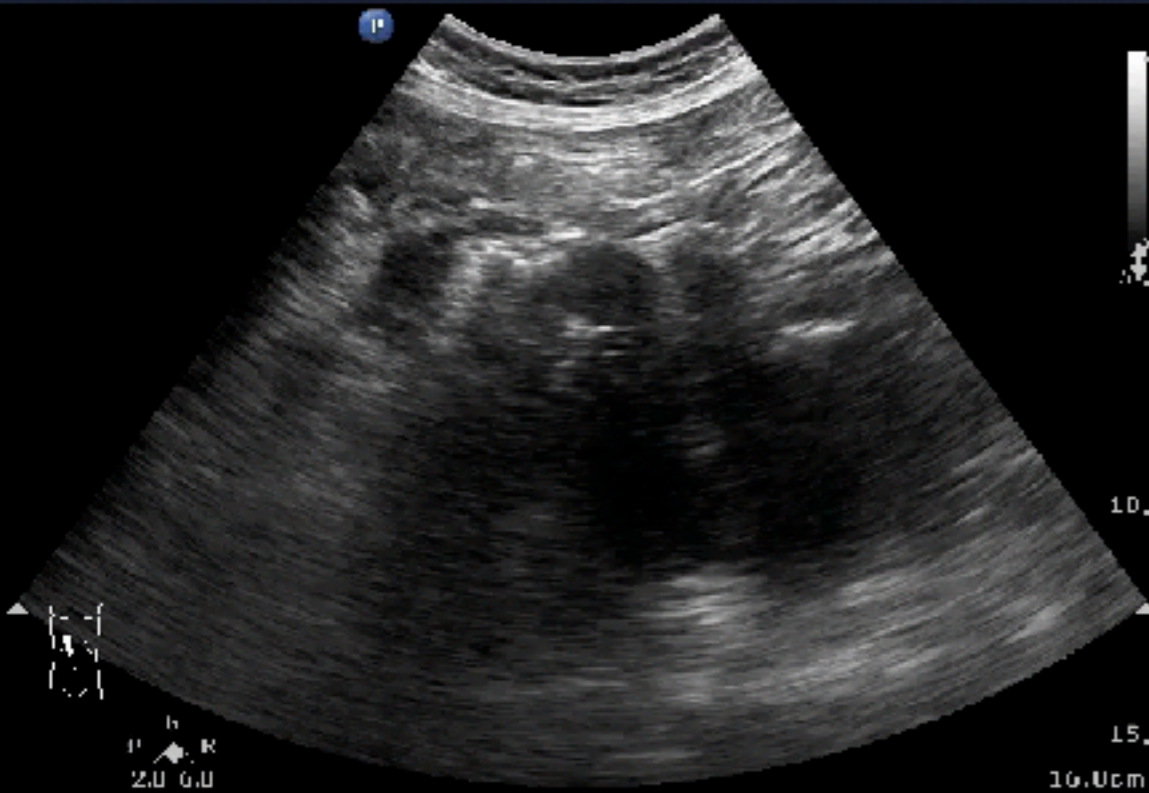


D: Nerve
06 7
22 Hz
16.0cm
2D
Gen
0n 60
0: 58
2/3/3

-Color
- 2.5 MHz
0n 66
3/5/4
- Filr Med

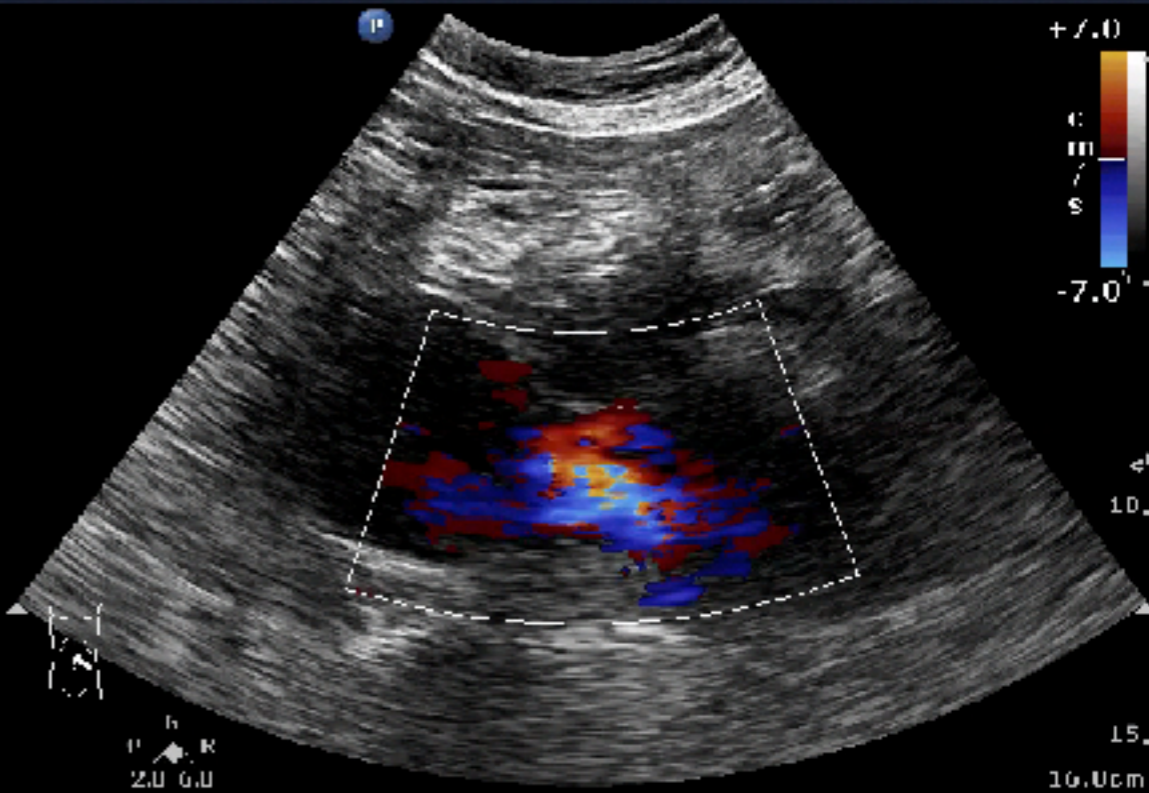


D: Nerve
06 7
22 Hz
16.0cm
2D
Gen
0n 60
0: 58
2/3/4



D: Nerve
06 7
22 Hz
16.0cm
2D
Gen
0n 60
0: 58
2/3/3

-Color
- 2.5 MHz
0n 66
3/5/4
- Filr Med



22Hz 3.5M S-H
DUA: 100%
MI = 0.6

AAA protocol

3_{cm}

Not for
ruptured

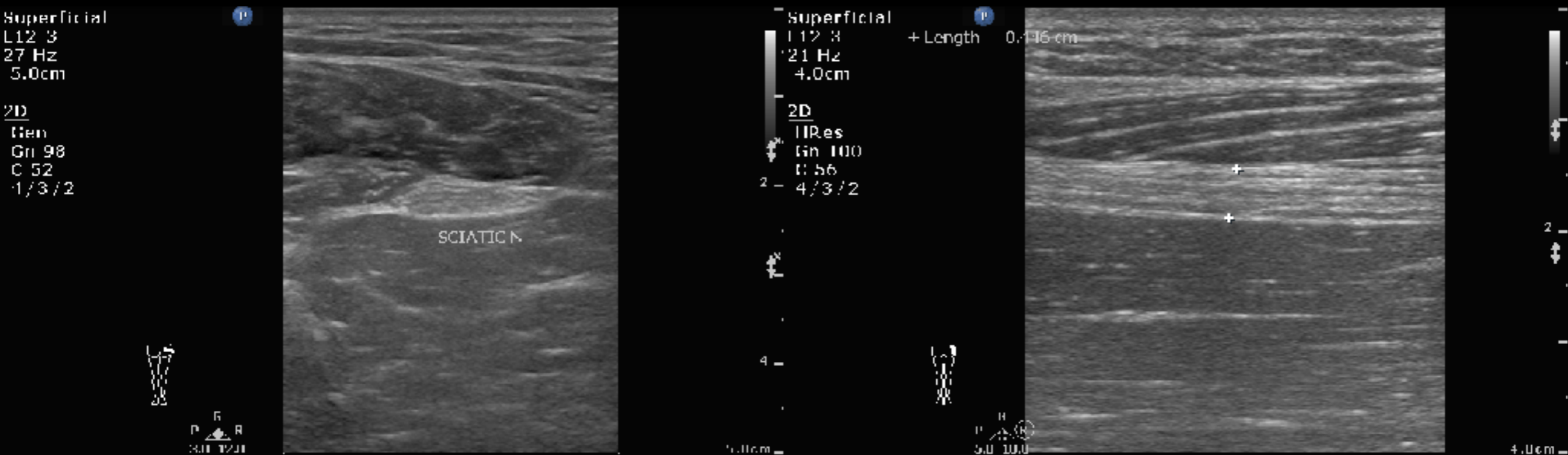
I-AIM

Dilatation

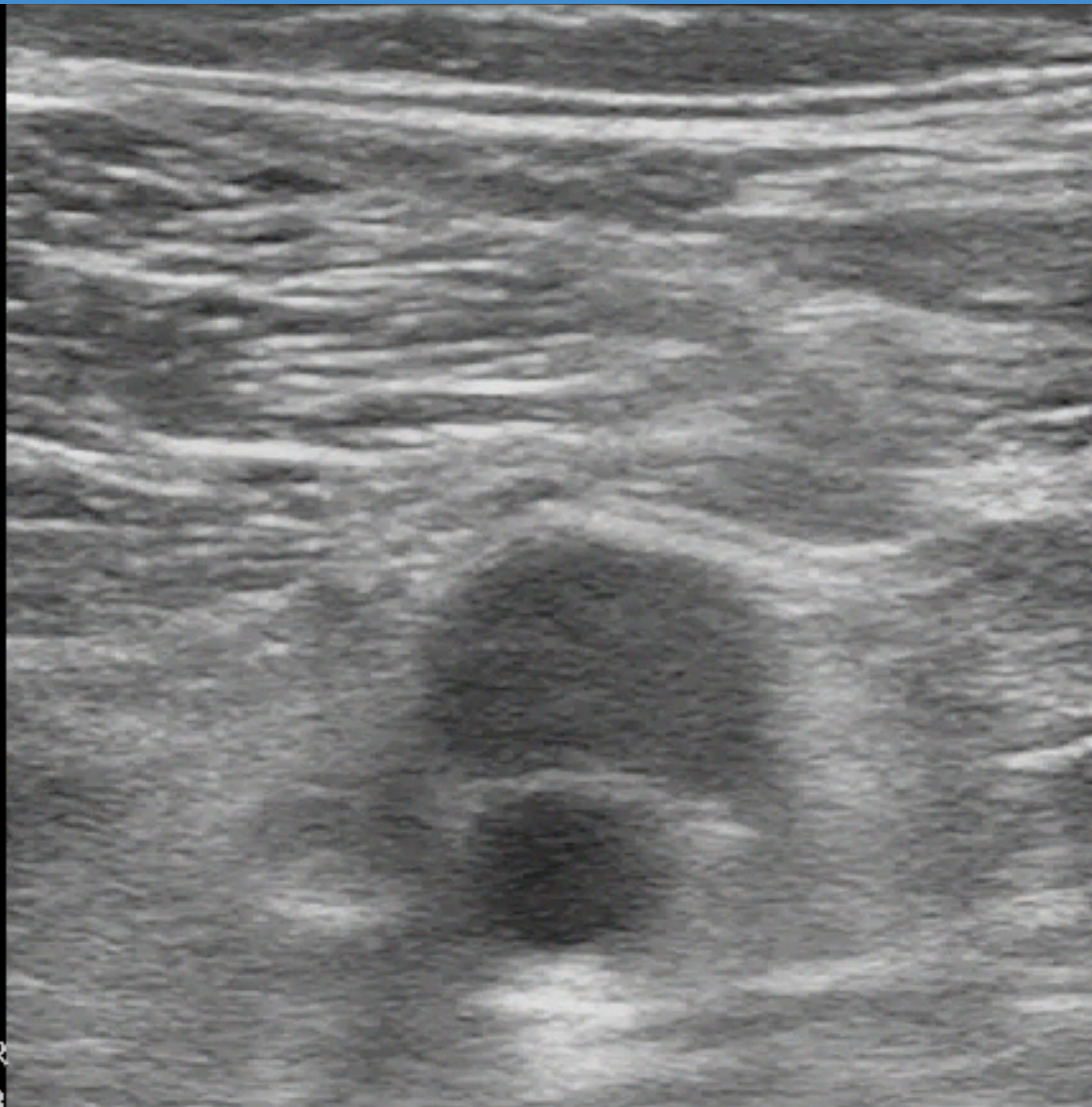


Middle-aged man

Right leg pain for 2-3 weeks



Popliteal fossa



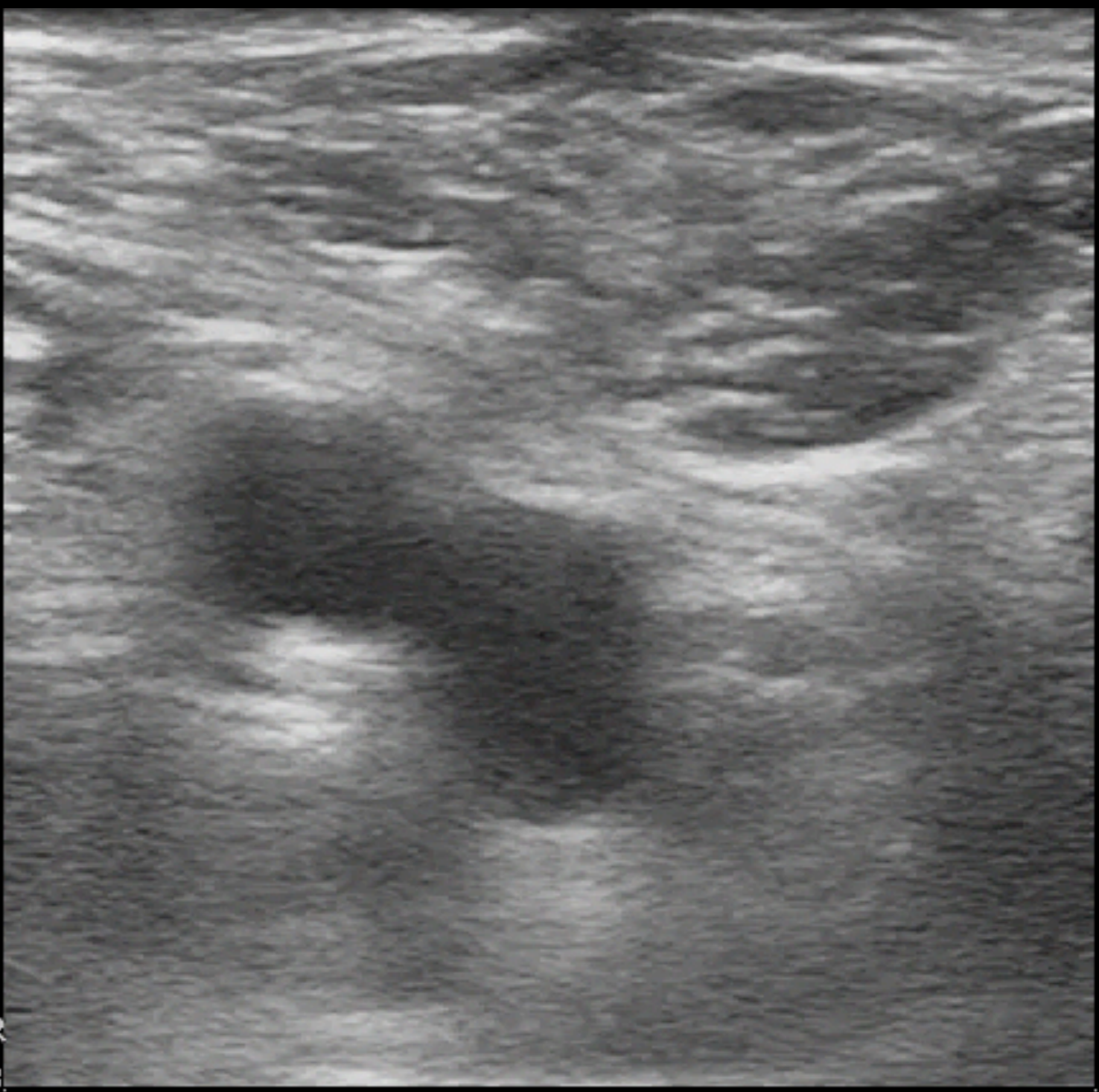
2



4 0 cm

L1273
37 Hz
4.0cm

2D
HGen
Gn 96
C 41
3/3/2

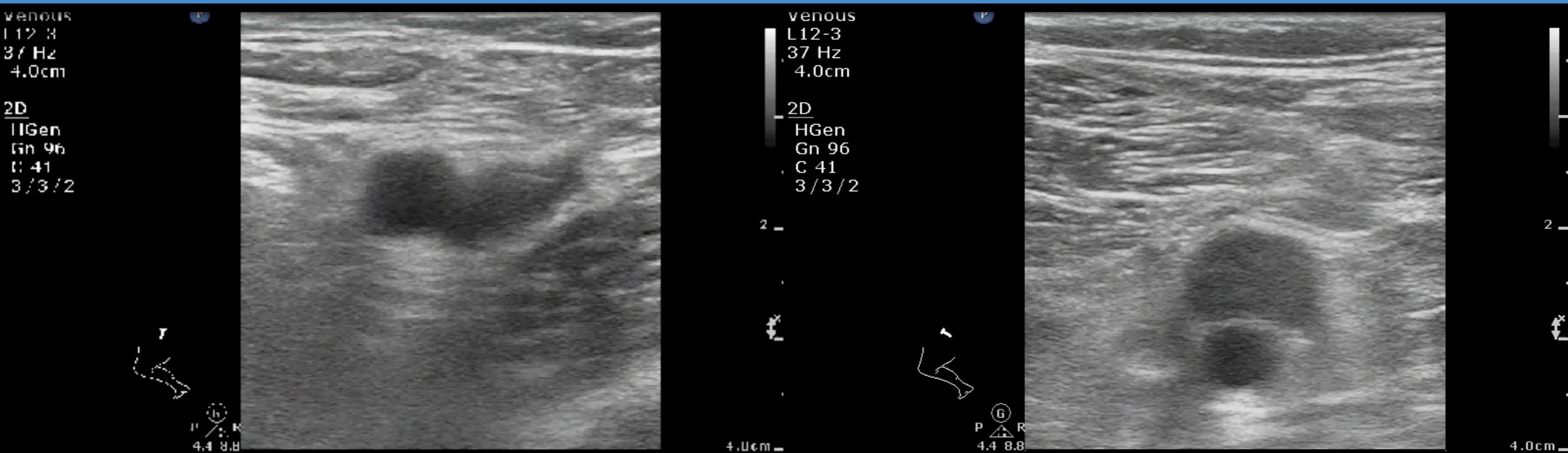


2



4.0cm

DVT

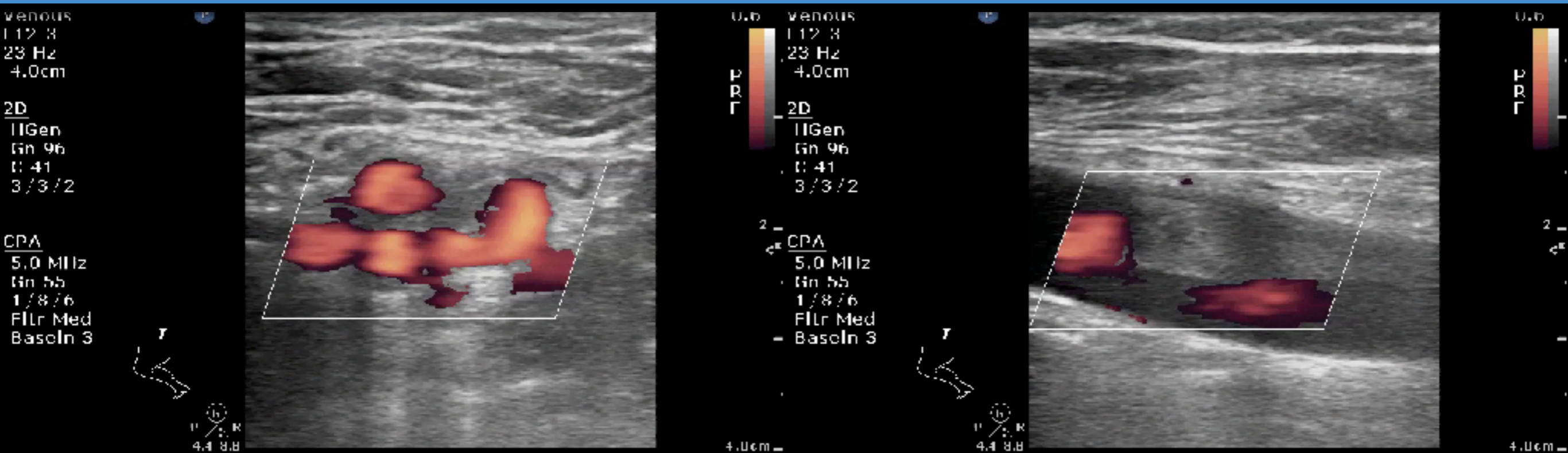


**Linear
3 points**

**Not
compressible**

Anticoagulant

DVT



**Linear
2 points**

**Not
compressible**

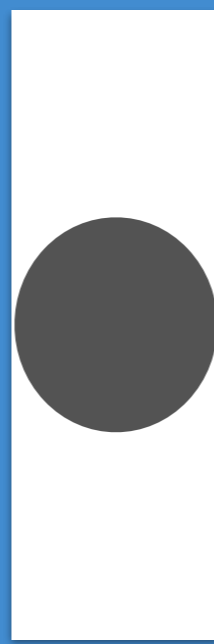
Anticoagulant

I-AIM

Dilatation

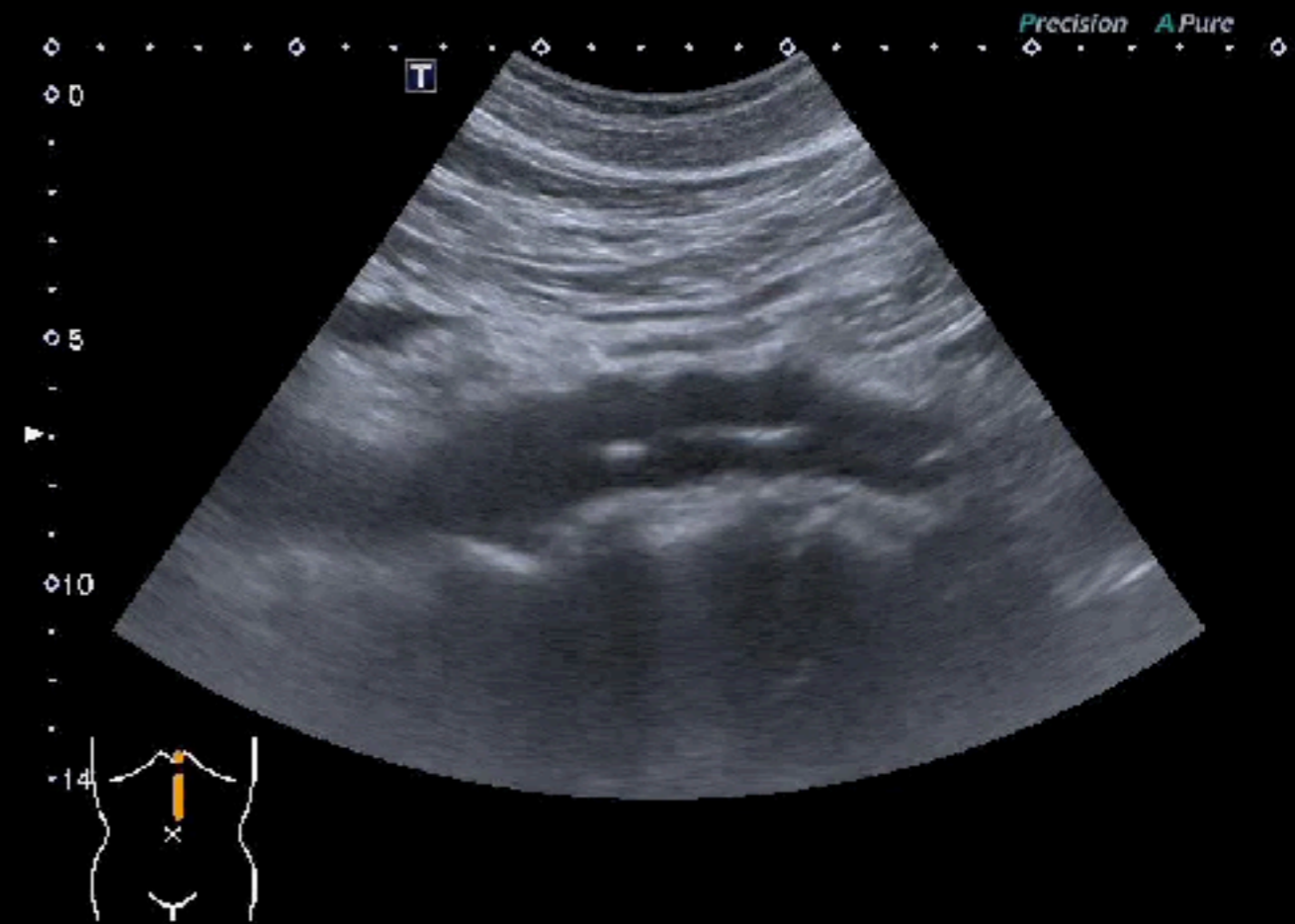
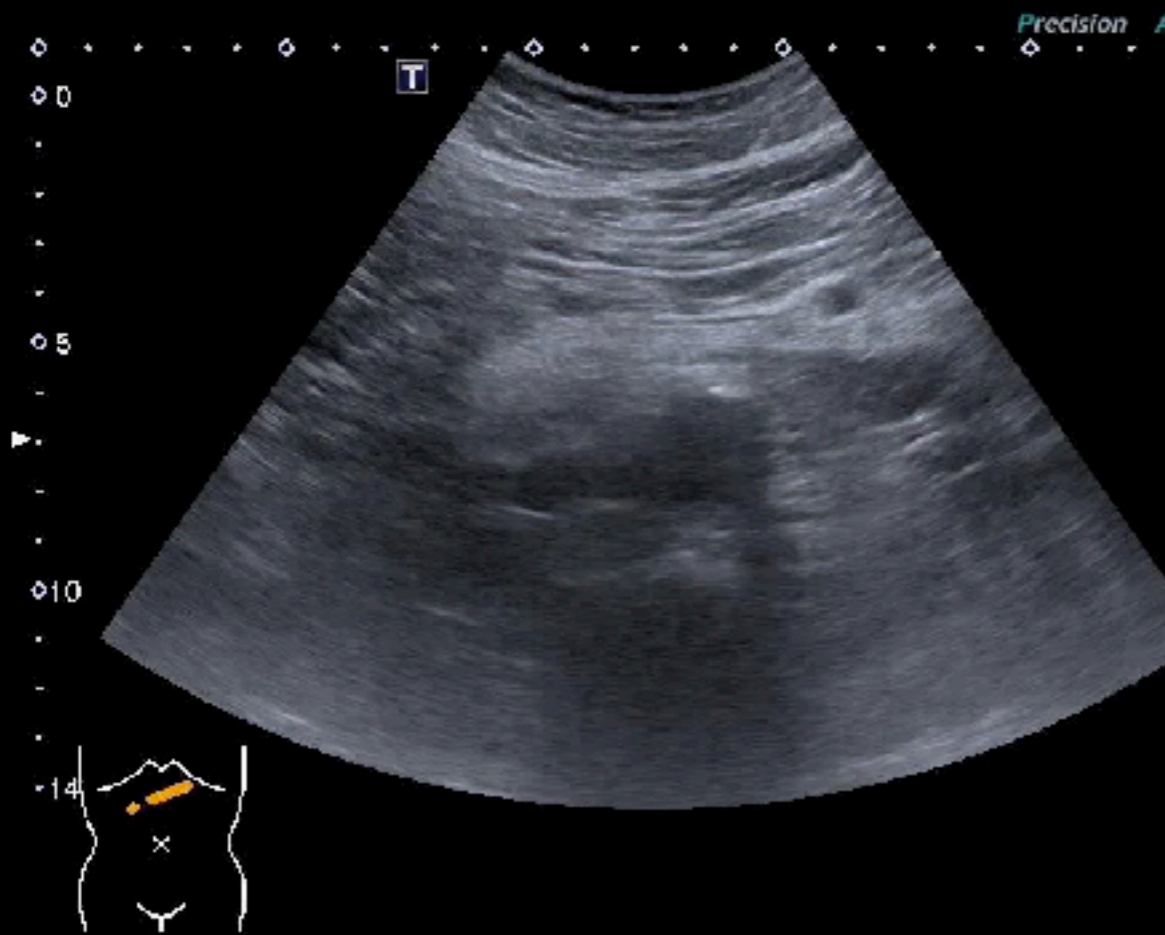


Obstruction



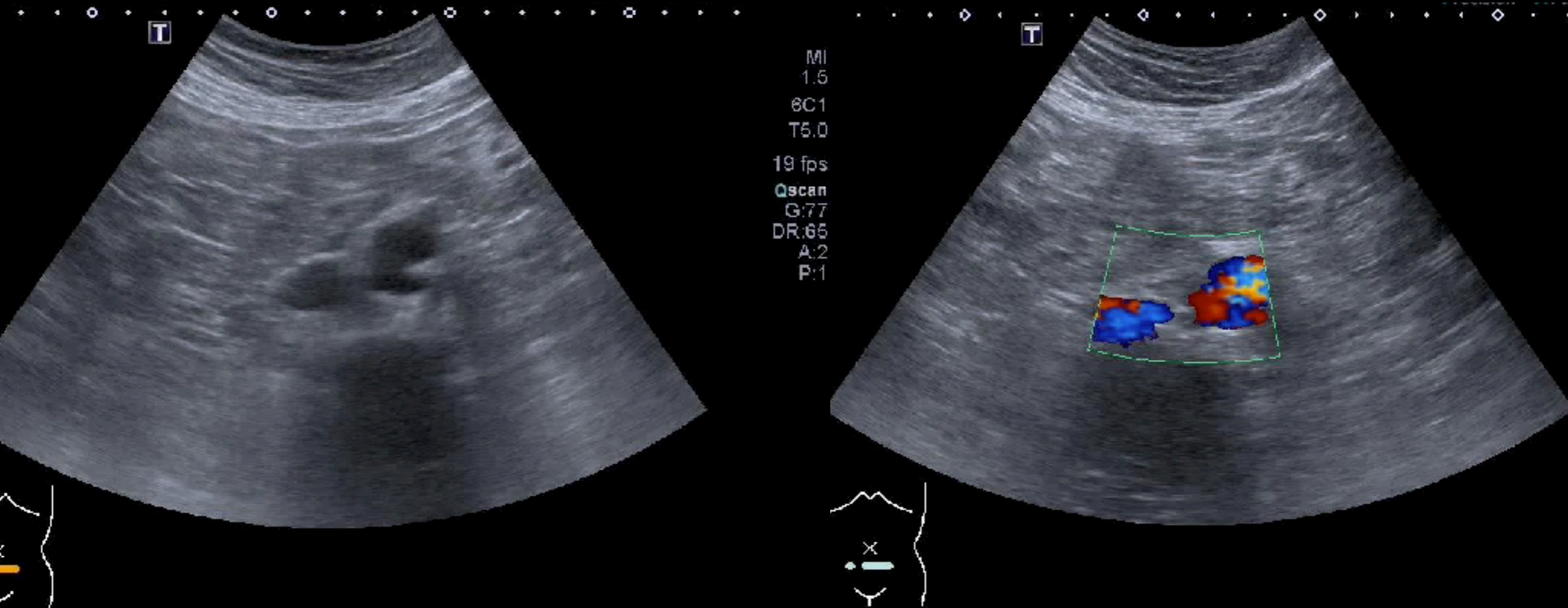
71M, ABD pain/V/D

Cold sweating at home



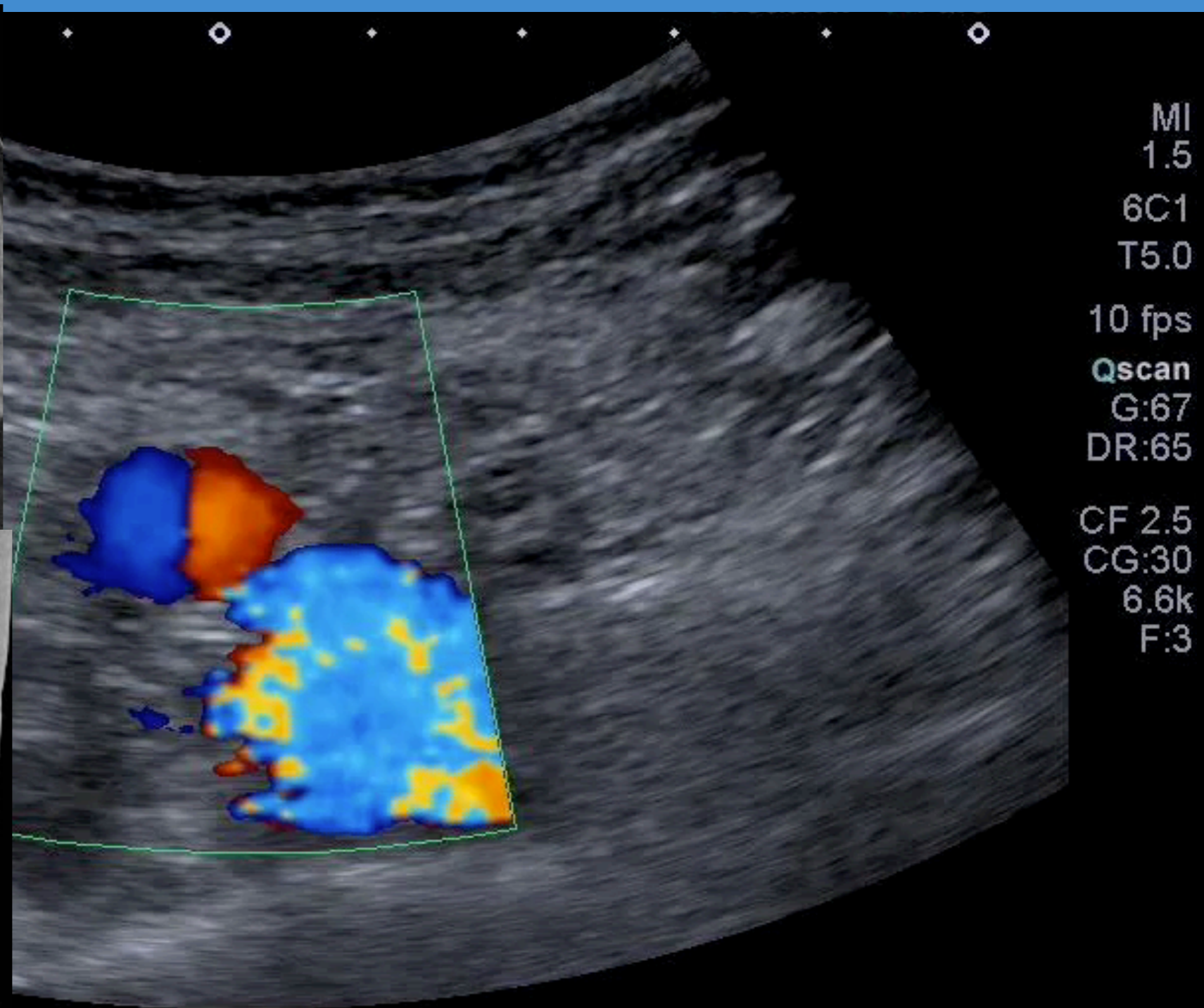
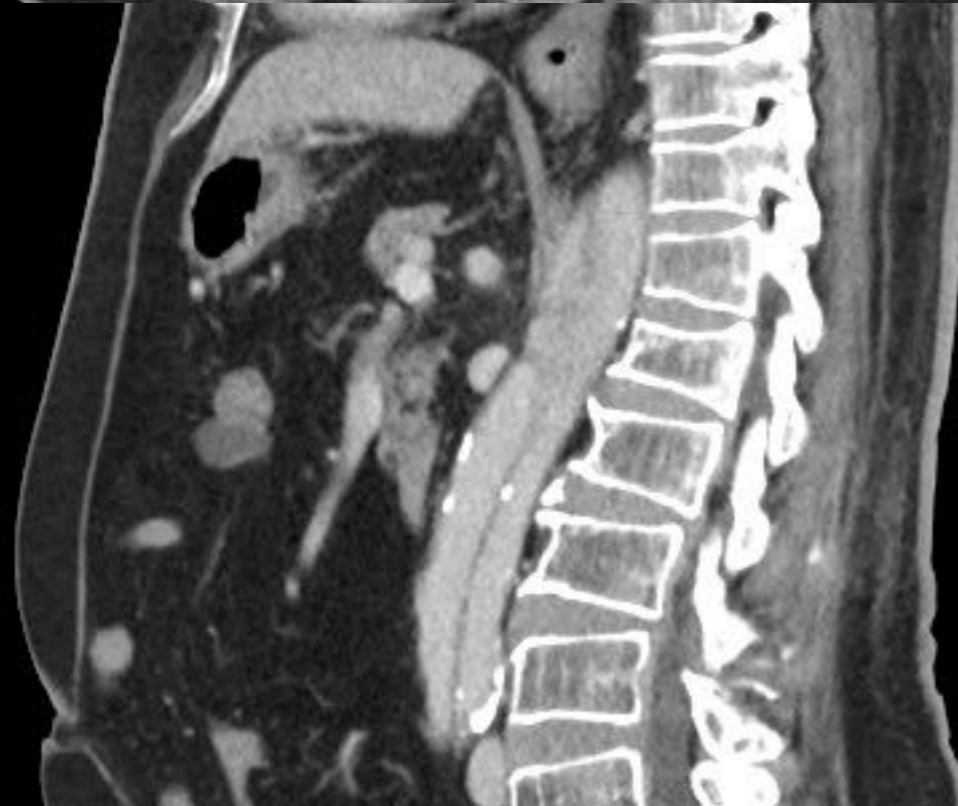
MI
1.3
6C1
T5.0
18 fps
Qscan
G:79
DR:65
A:2
P:1

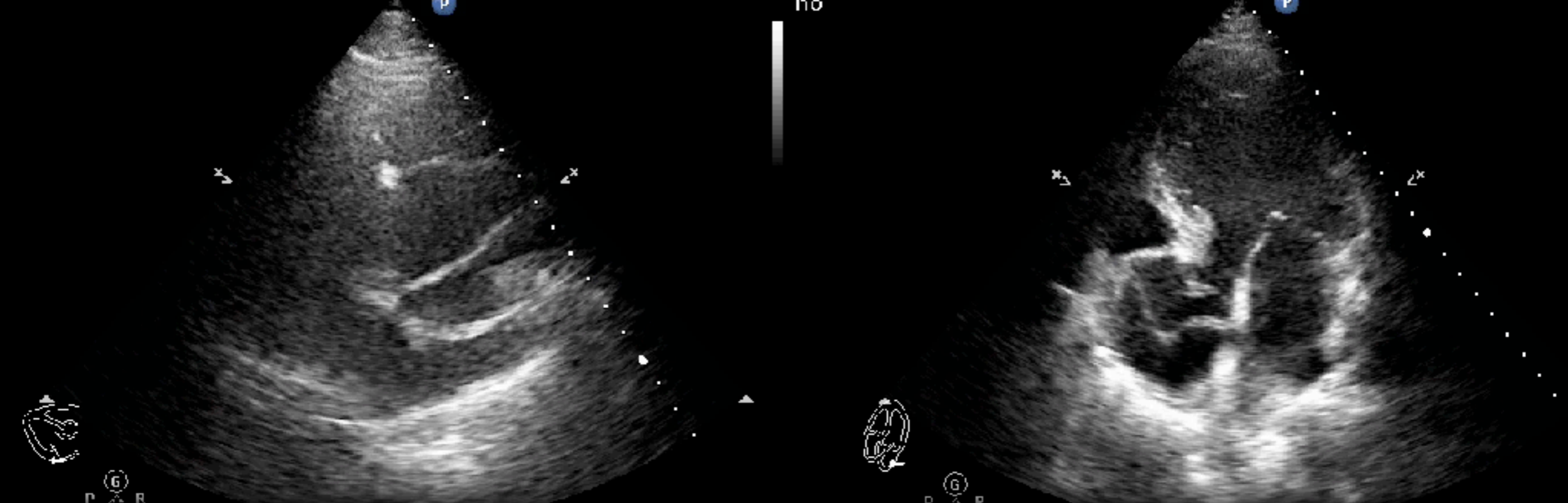
71 M, ABD pain/V/D/ Cold sweating at home



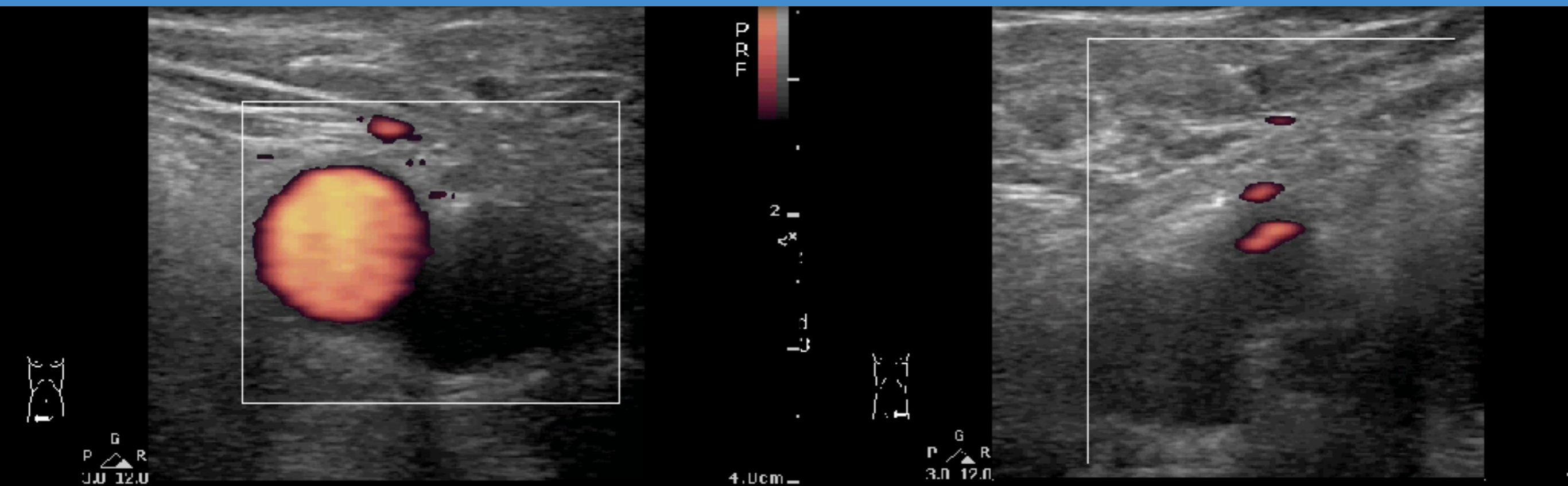
Aortic dissection

Ying-yang sign



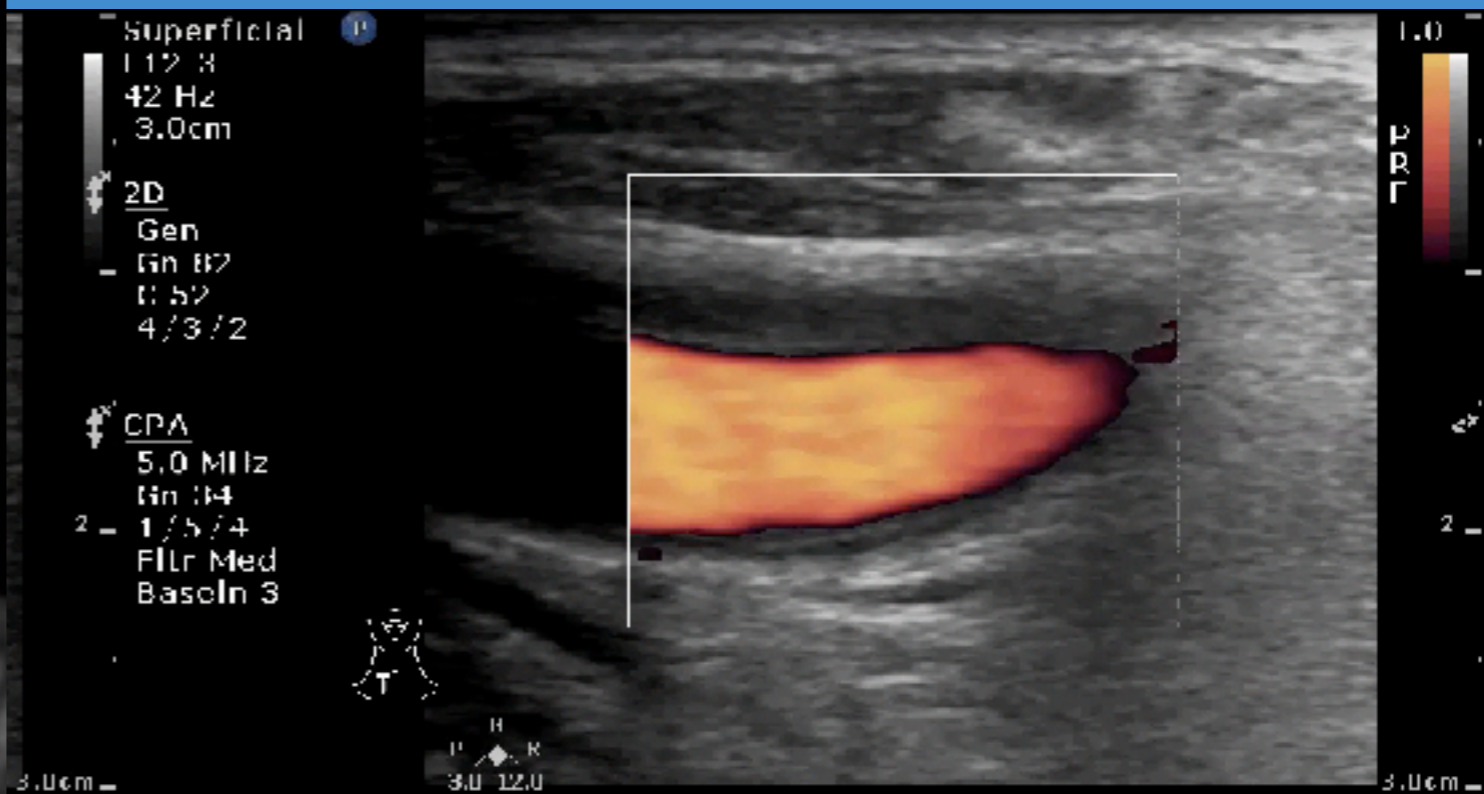
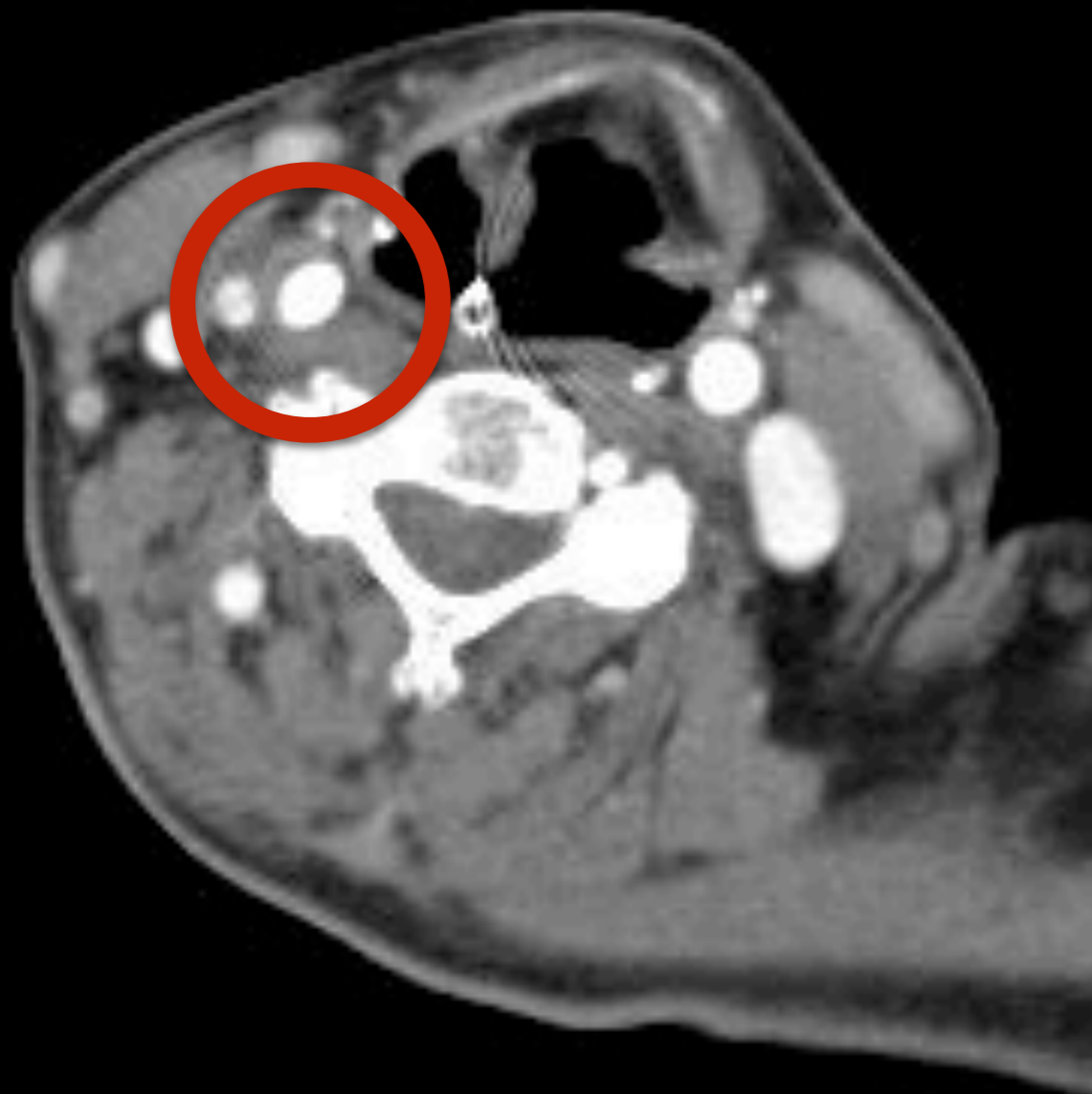


Chest pain & L leg pain



Stroke & L hemiplegia

NIHSS 26



Stroke & L hemiplegia

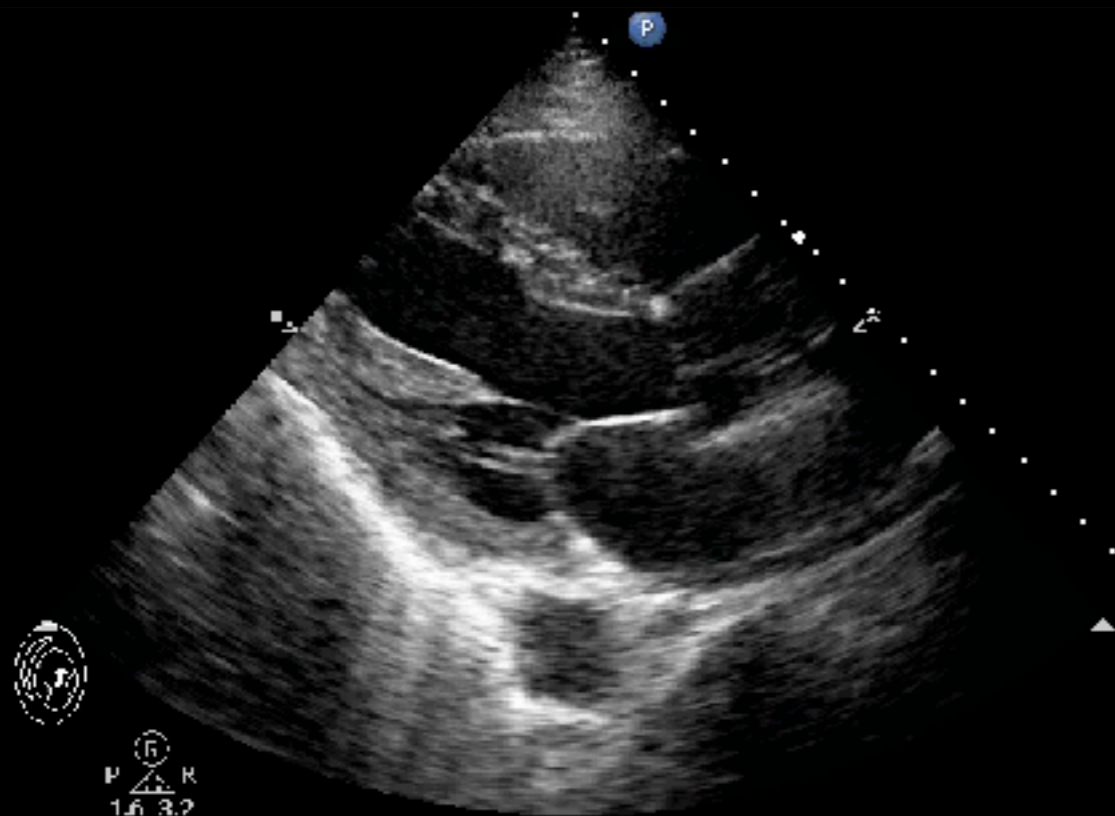
NIHSS 26



Do you see flap ?

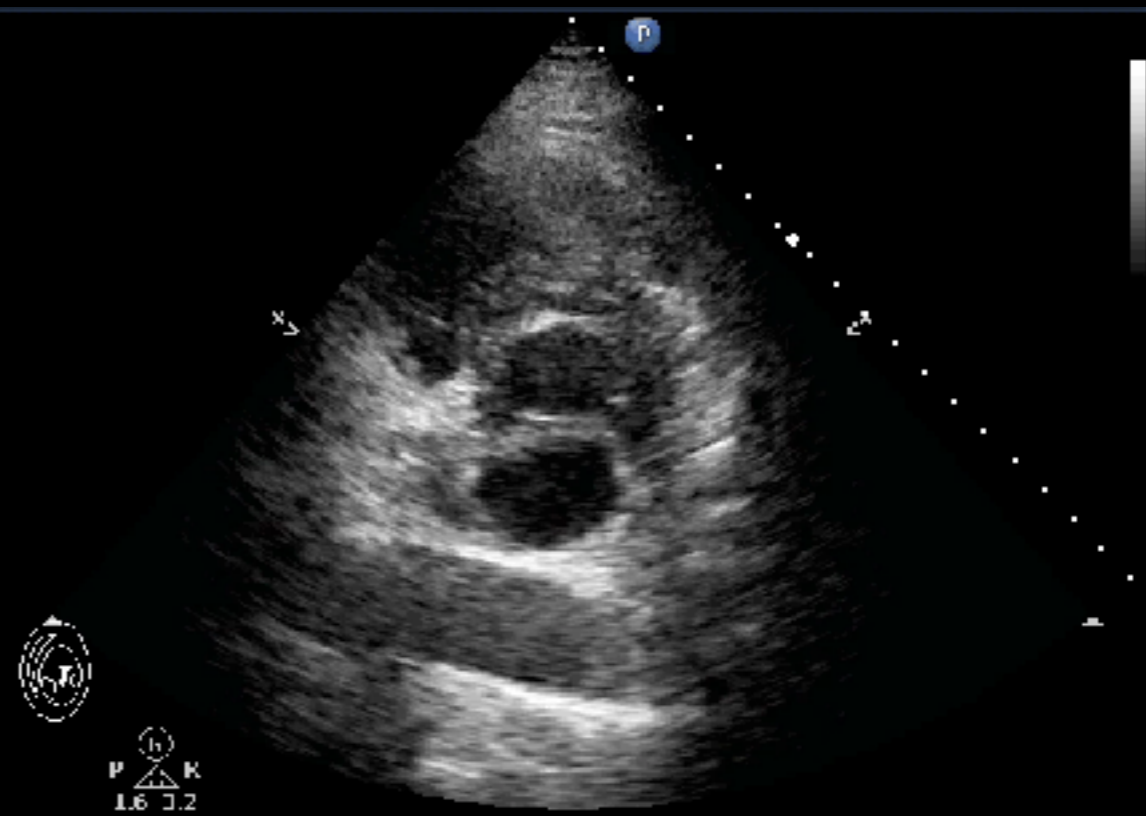
It Echo
1
17
0cm

en
12
0
2/0



Adult Echo
55 1
28 Hz
19.0cm

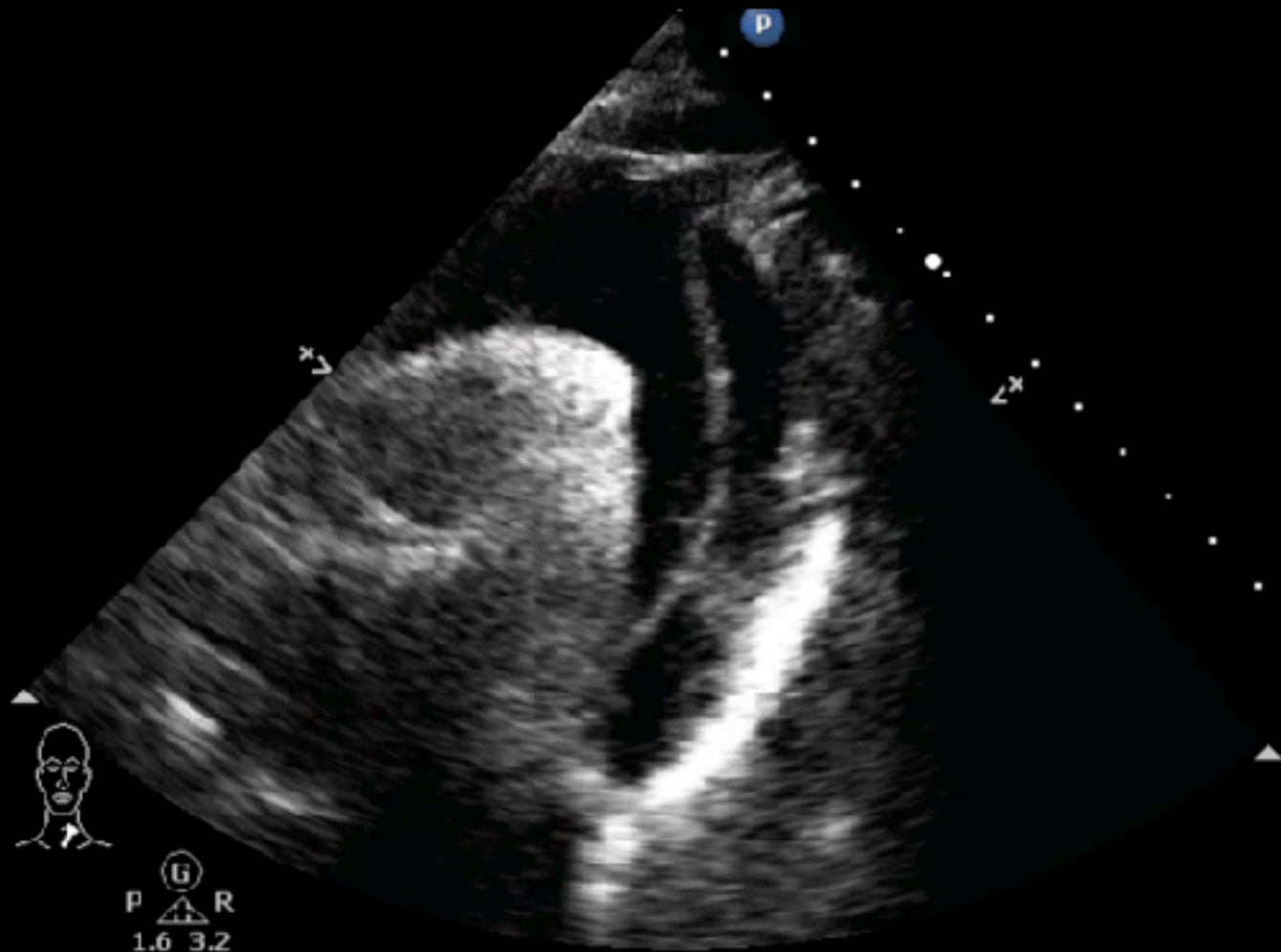
2D
HGen
Gn 12
0:50
3/2/0



t Echo2

z
cm

en
34
4
2/0

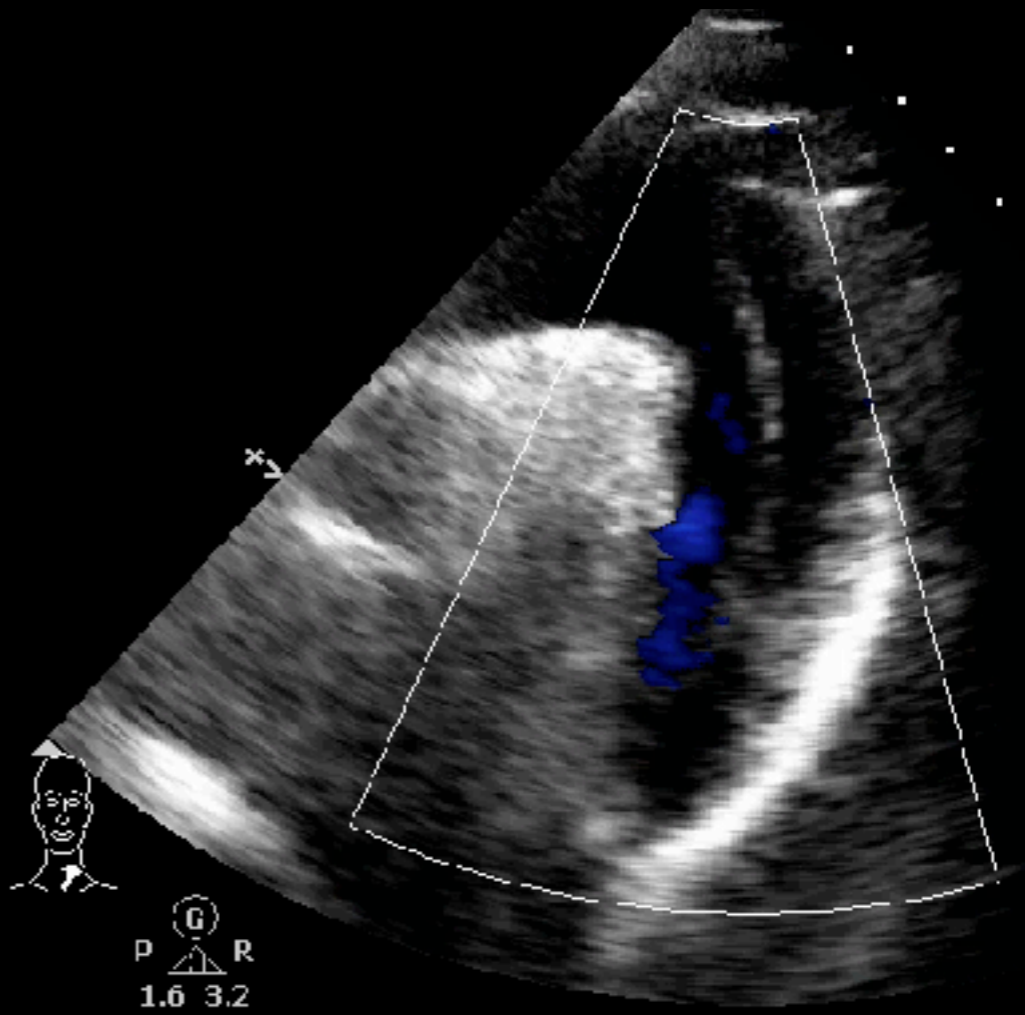


Flap ?

Easy ?

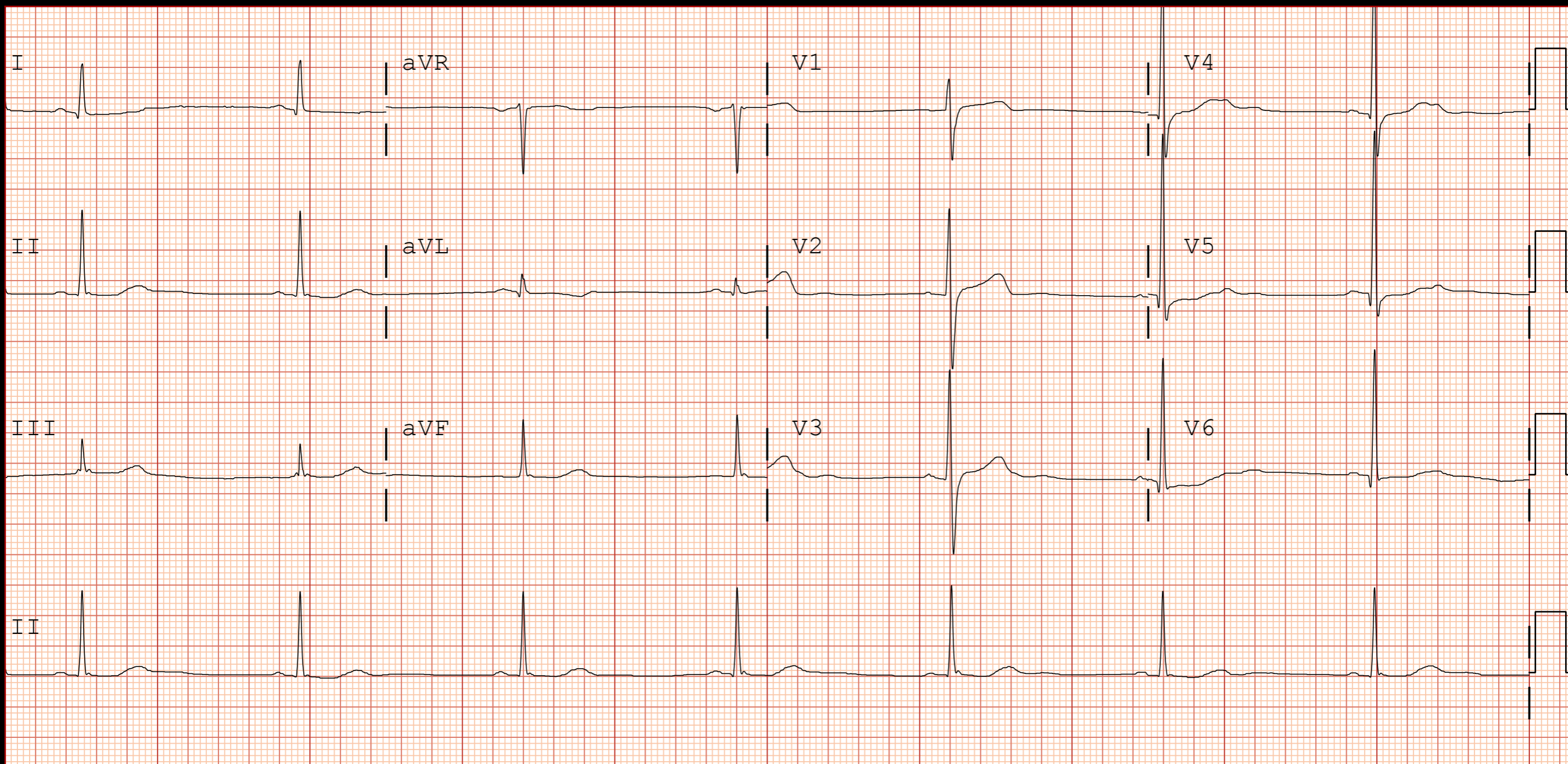
C 44
3/2/0

Color
2.5 Mhz
Gn 60
4/5/0
Fltr High



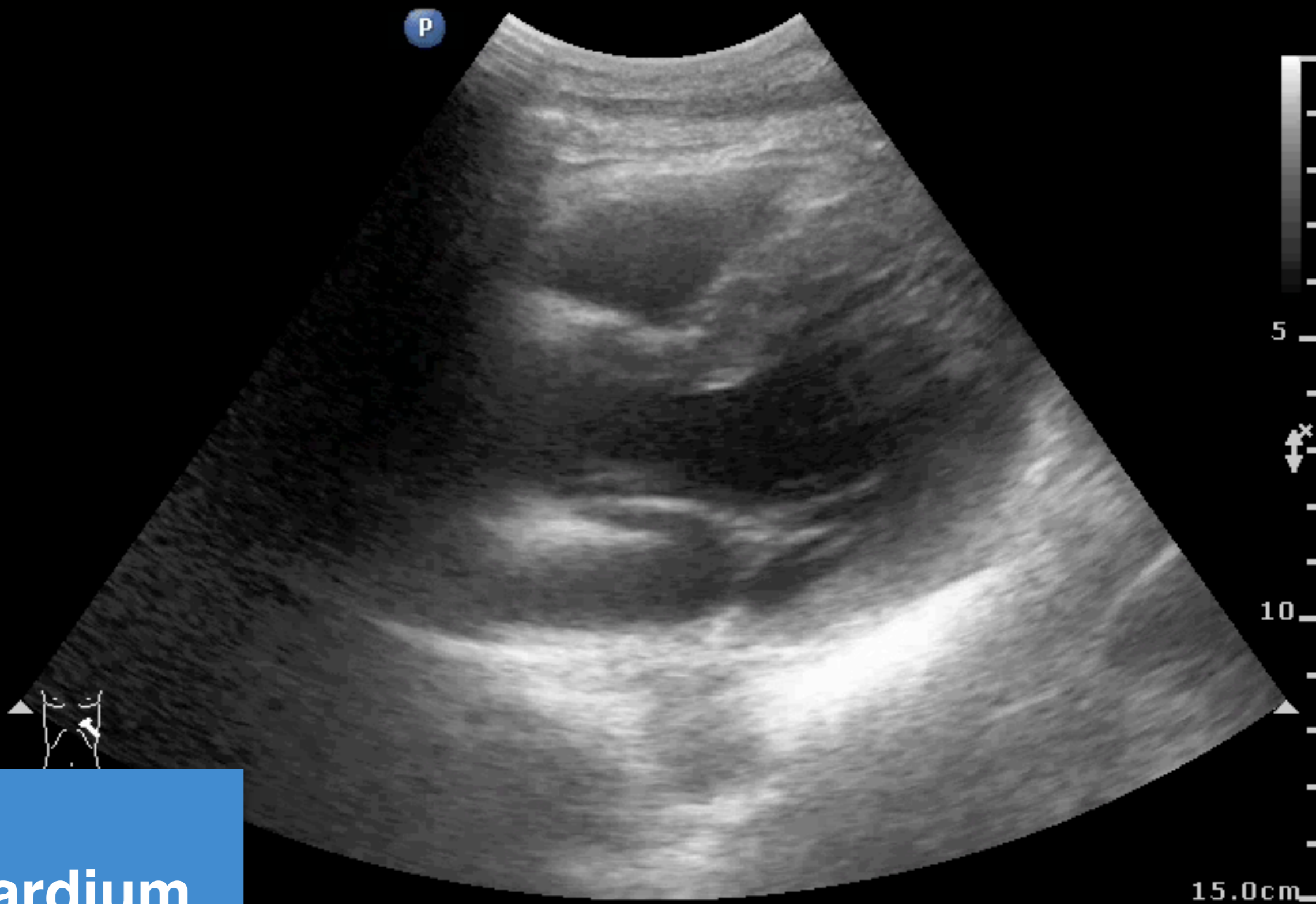
P G R
1.6 3.2

63M, Chest pain & cold sweating & low BP



Abd Gen2
C5-1
34 Hz
15.0cm

2D
HGen
Gn 100
C 56
3 / 3 / 3

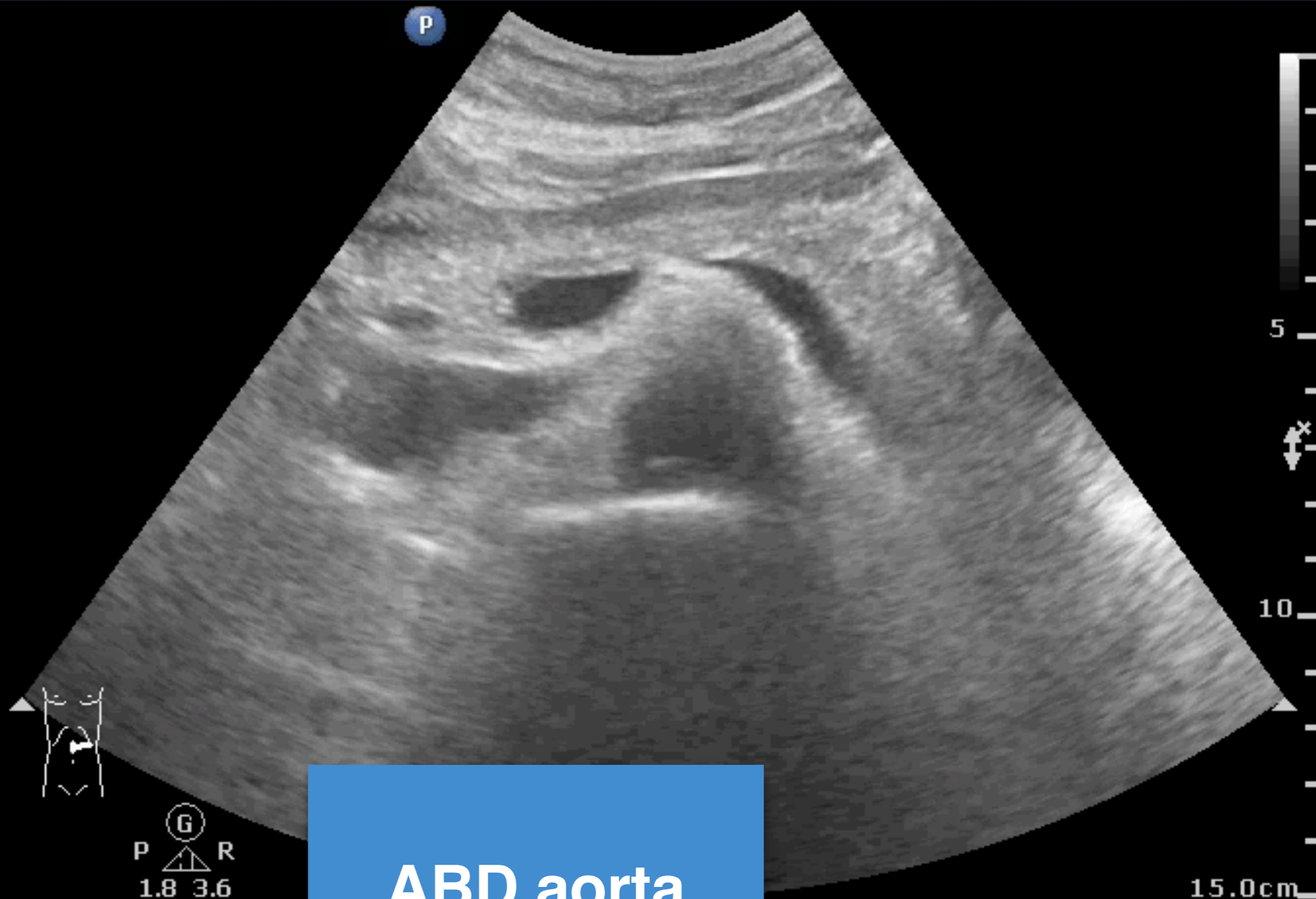


Pericardium

15.0cm

Abd Gen2
C5-1
34 Hz
15.0cm

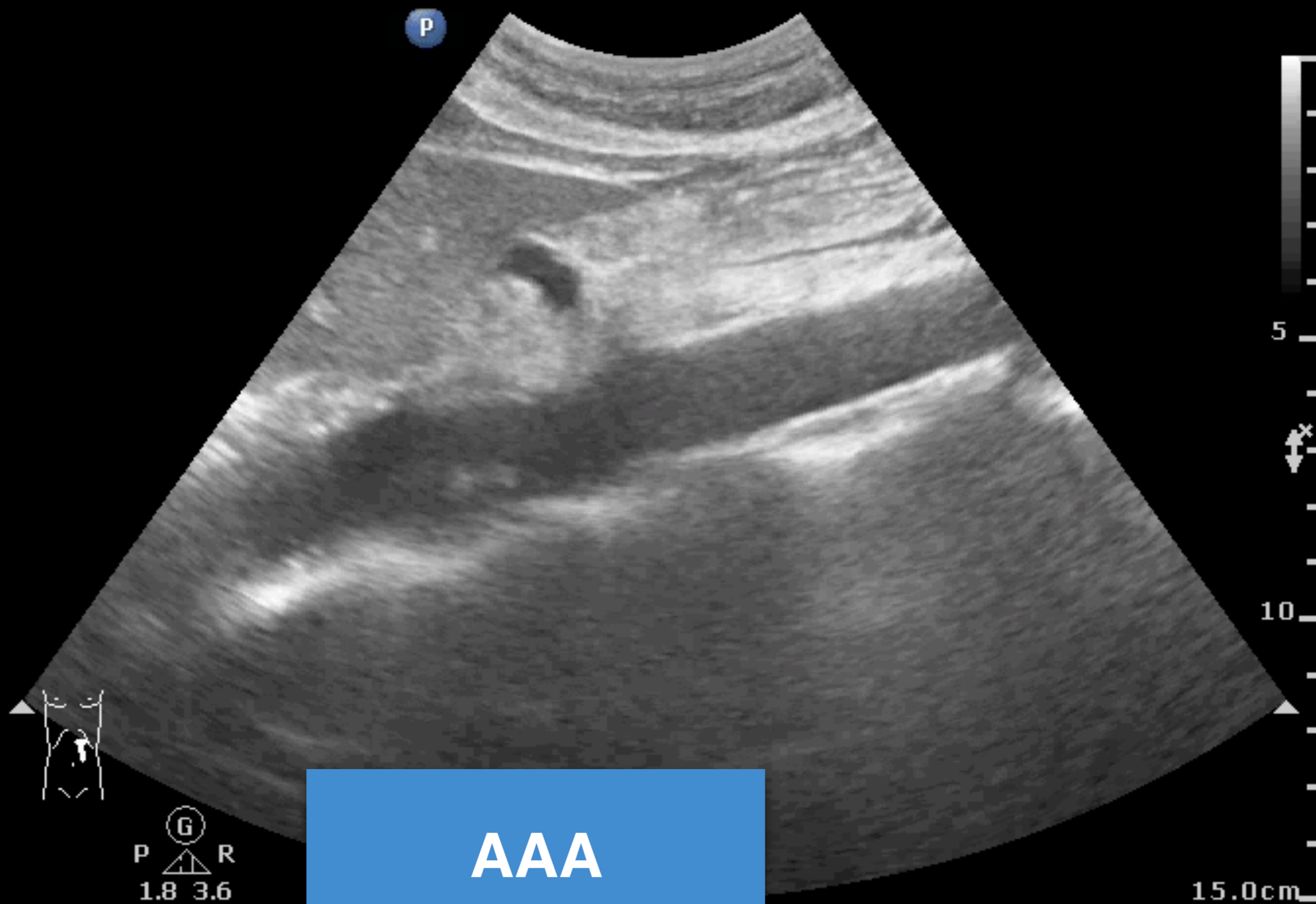
2D
HGen
Gn 100
C 56
3 / 3 / 3



G
P R
1.8 3.6

Abd Gen2
C5-1
34 Hz
15.0cm

2D
HGen
Gn 100
C 56
3 / 3 / 3



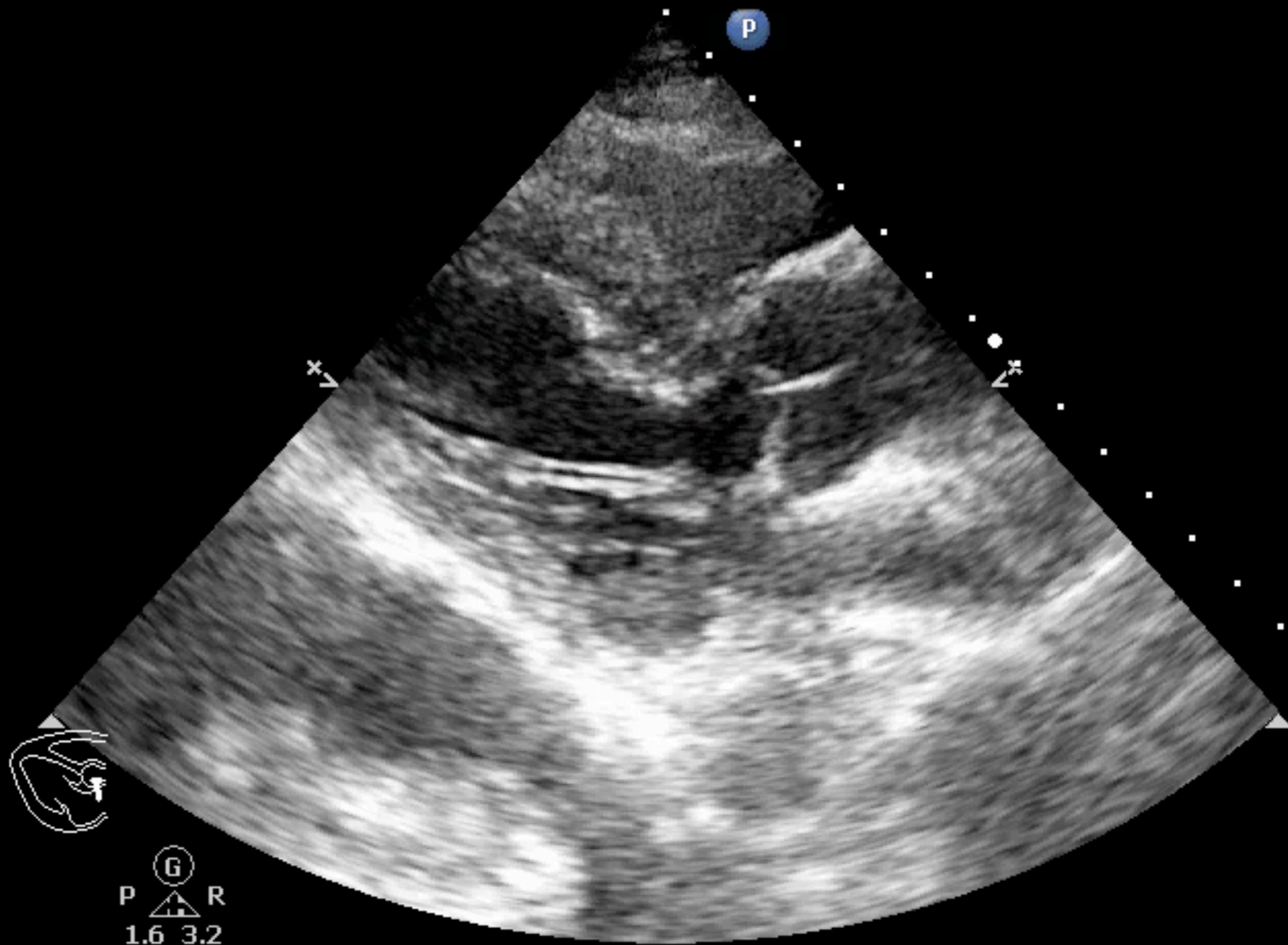
AAA
Flap



15.0cm

Adult Echo2
S5-1
34 Hz
15.0cm

2D
HGen
Gn 50
C 50
3/2/0



Adult Echo2
S5-1
30 Hz
18.0cm

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



G
P R
1.6 3.2

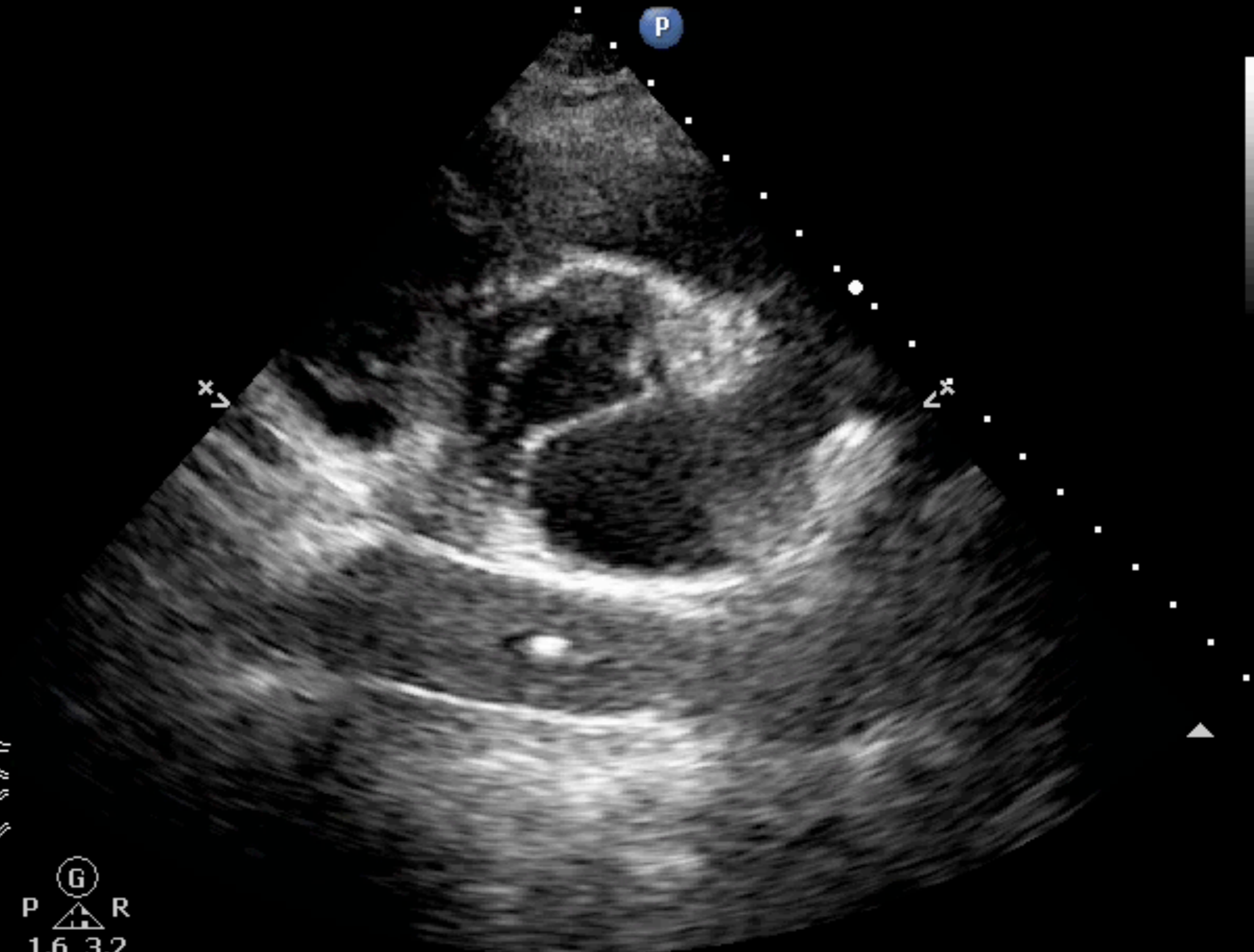


Adult Echo2
S5-1
30 Hz
18.0cm

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



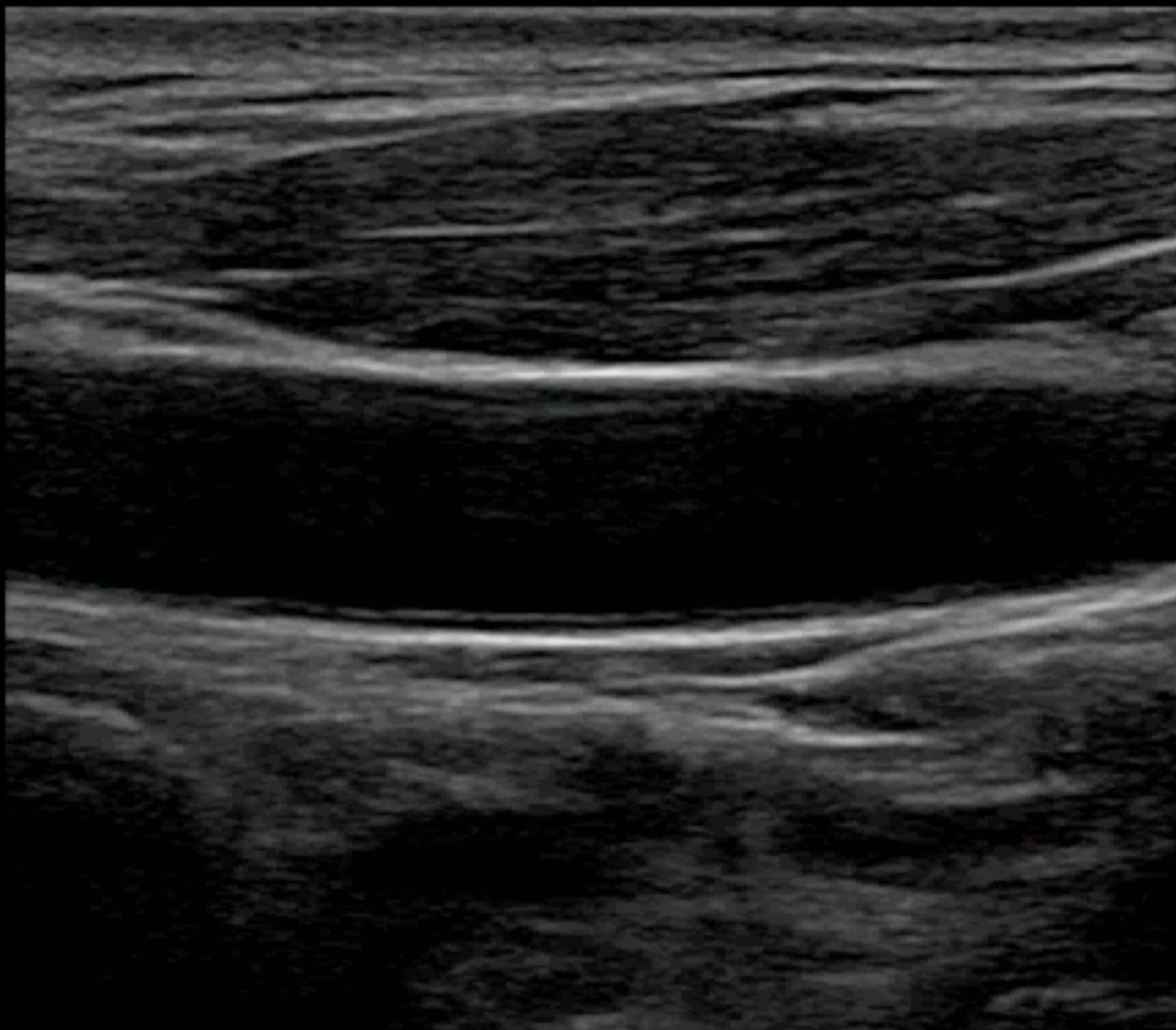
G
P R
1.6 3.2



Superficial :
L12-3
43 Hz
4.0cm

P

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



2



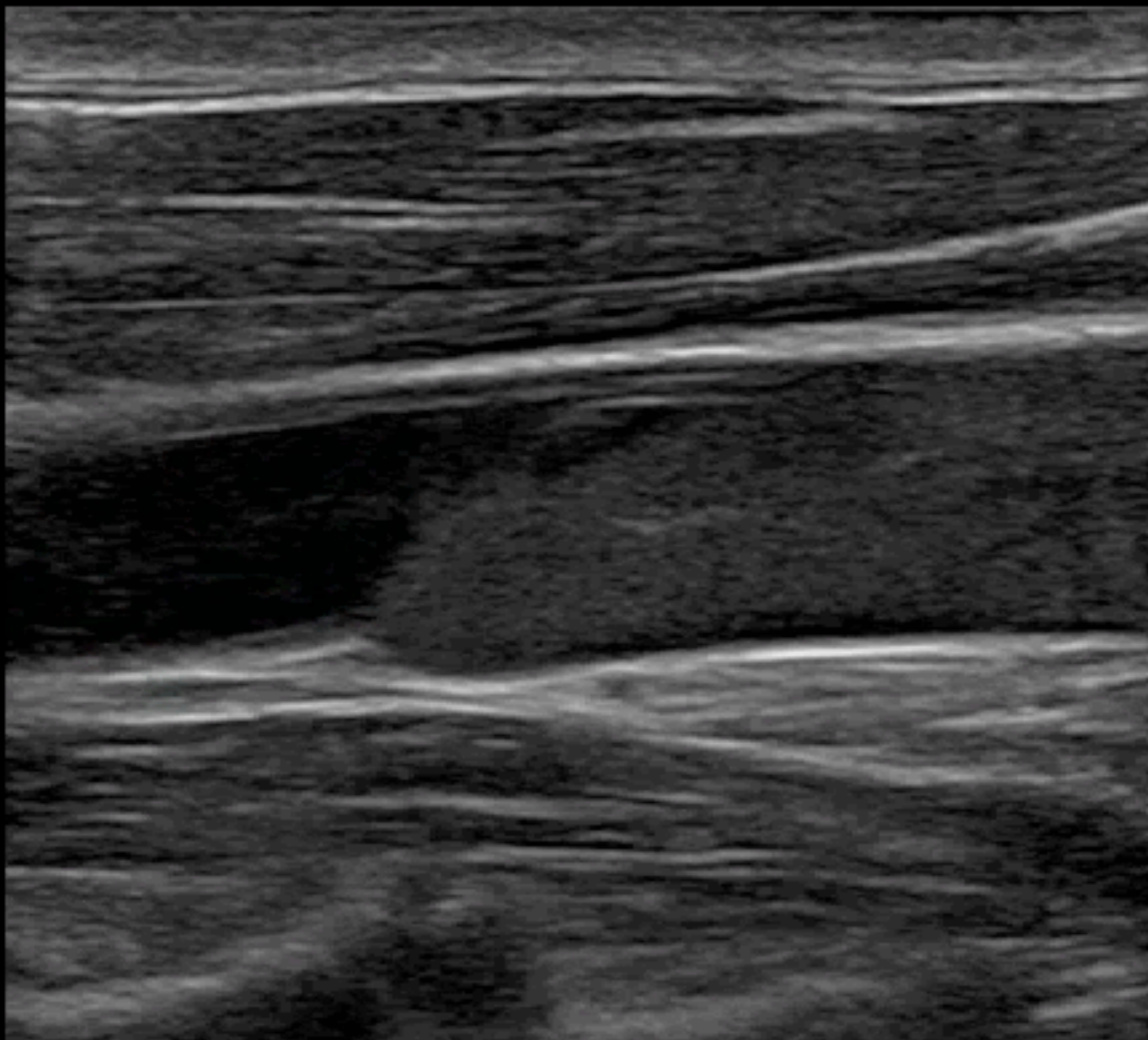
G
P R
3.0 12.0

CCA

Superficial :
L12-3
43 Hz
4.0cm

P

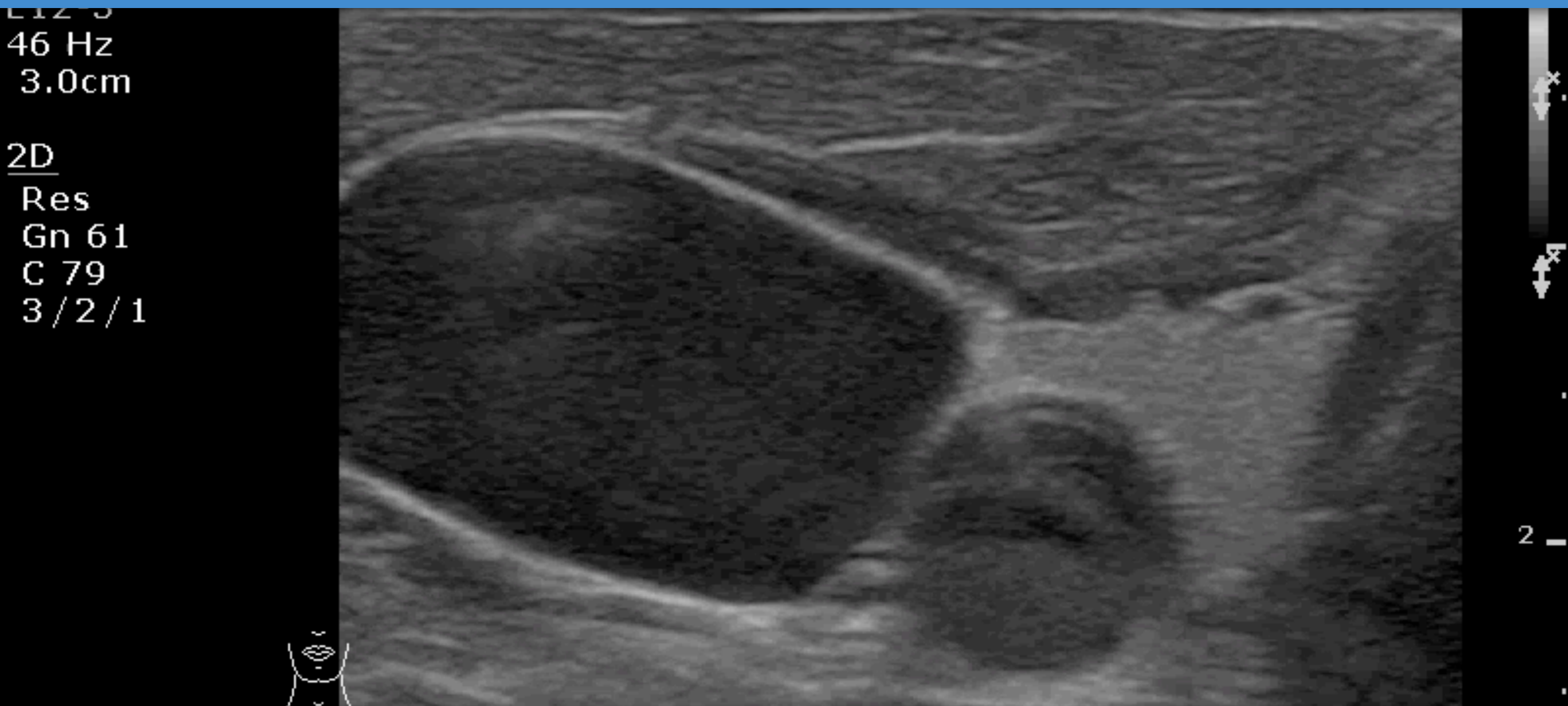
2D
Res
Gn 60
C 56
3 / 2 / 1



G
P R
3.0 12.0

CCA

AD or tPA



Pericardium
Aortic root

ABD aorta
Flap

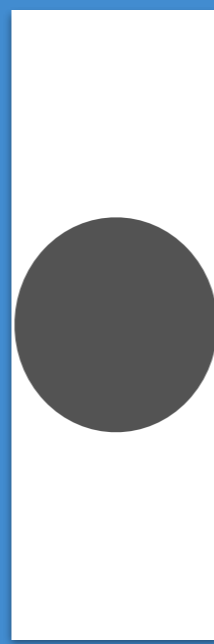
CCA

I-AIM

Dilatation



Obstruction



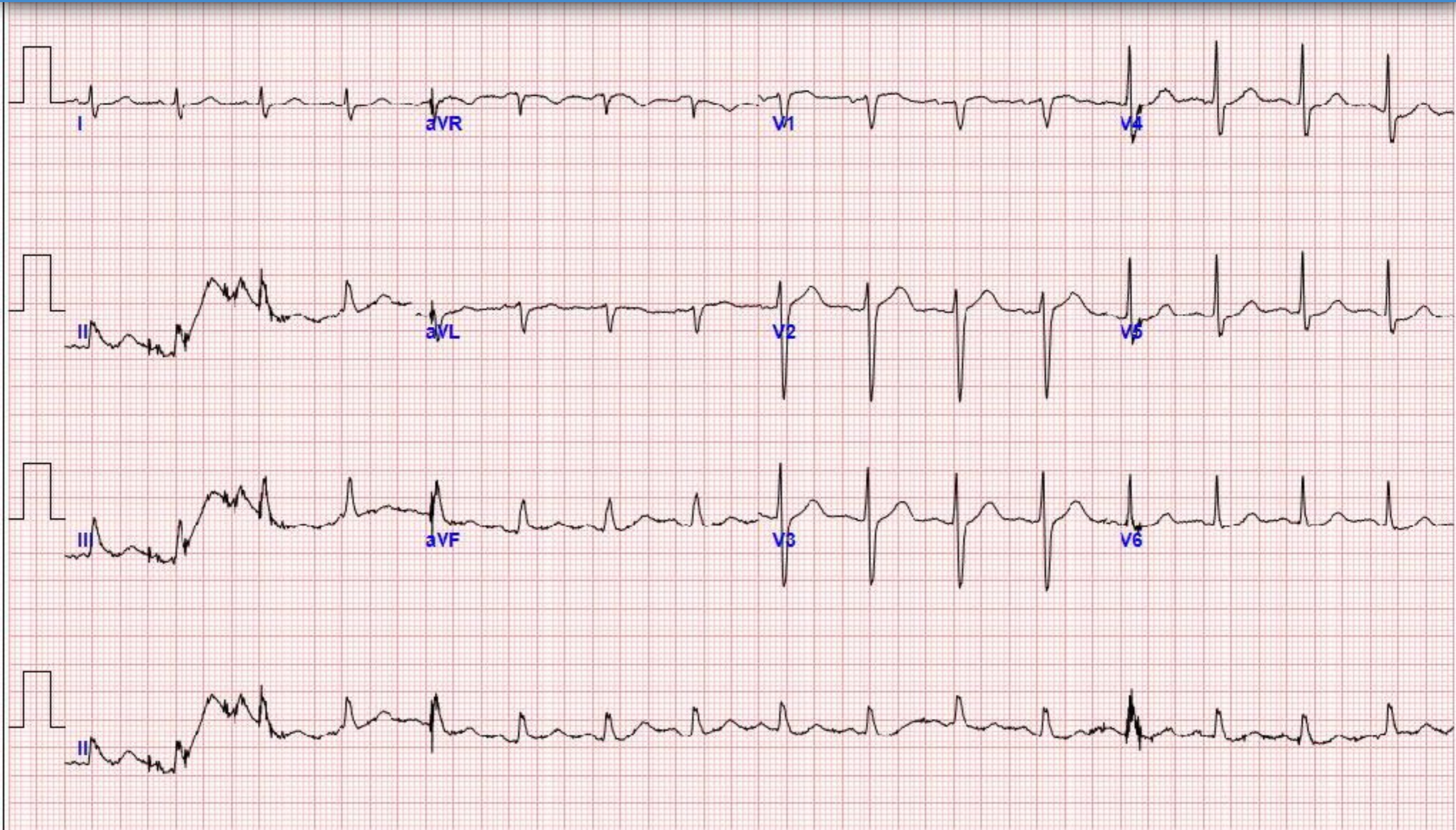
Dissection



76M, Dyspnea & desaturation



76M, Dyspnea & desaturation



76M, Dyspnea & desaturation



Lung

76M, Dyspnea & desaturation

Superficial
L12-3
31 Hz
3.5cm

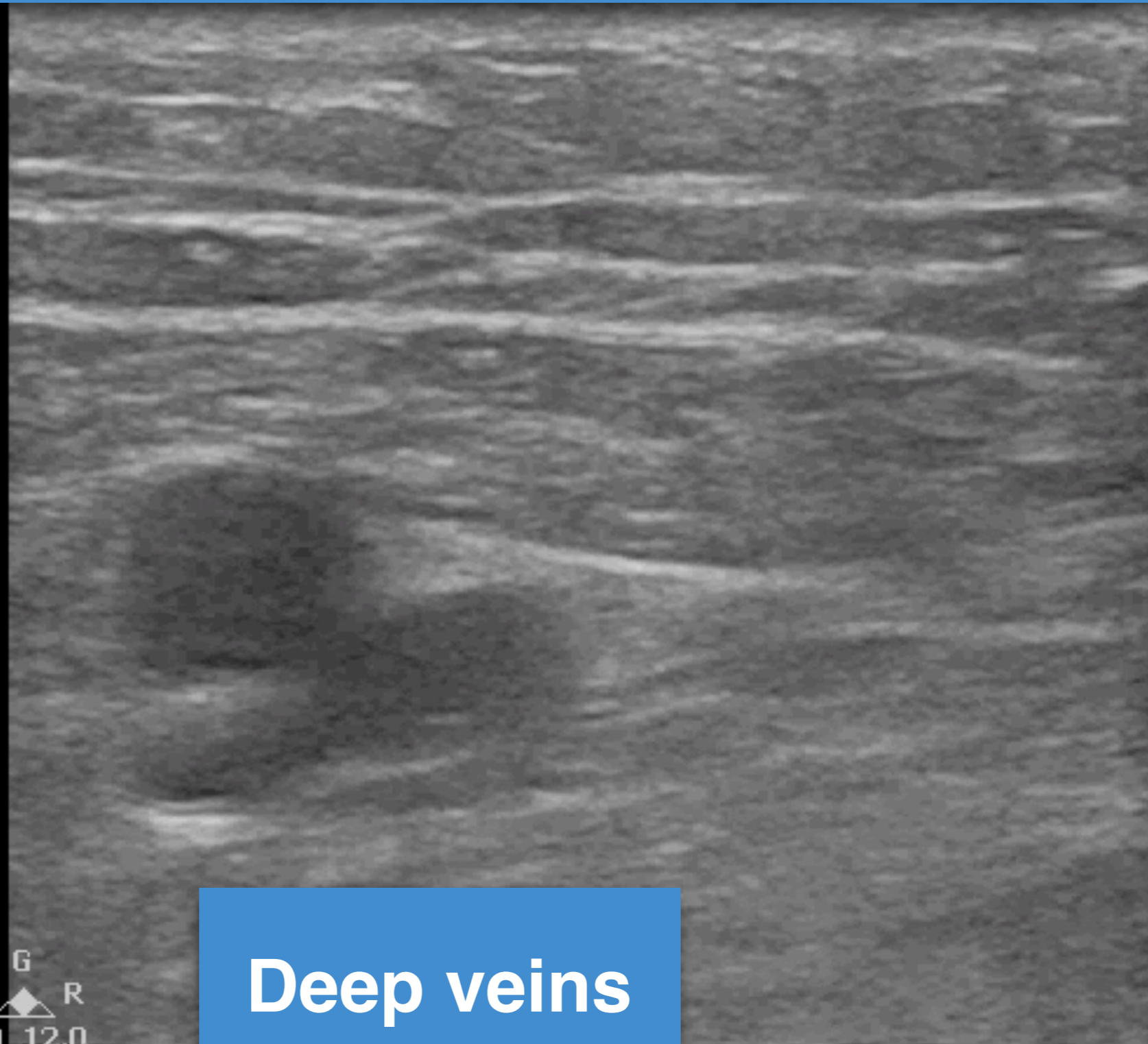
2D
Gen
Gn 100
C 52
4/3/2



P G R
3.0 12.0

Deep veins

3.5cm



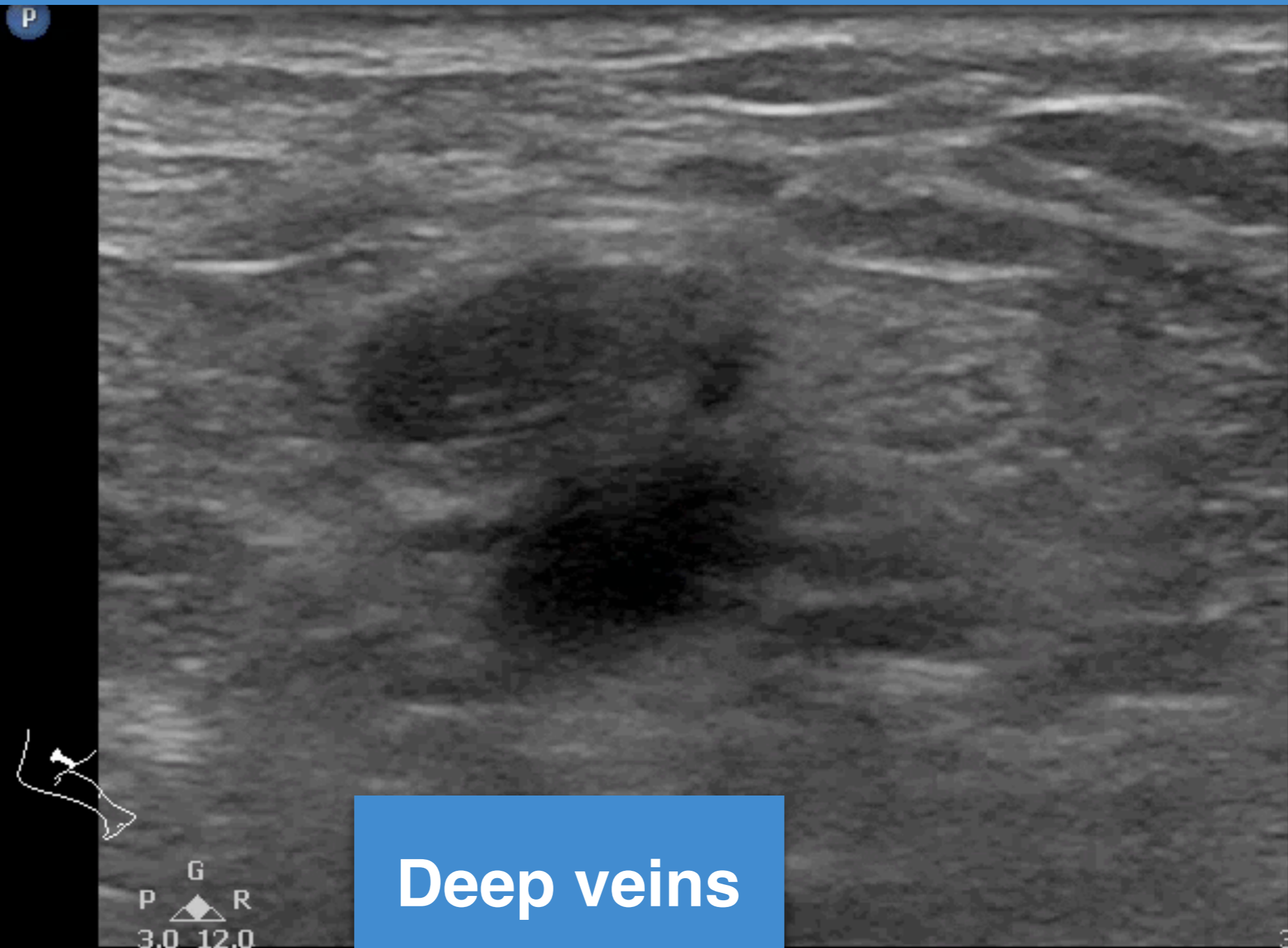
2

—

76M, Dyspnea & desaturation

Superficial
L12-3
31 Hz
3.0cm

2D
Gen
Gn 88
C 52
4/3/2



P G R
3.0 12.0

Deep veins

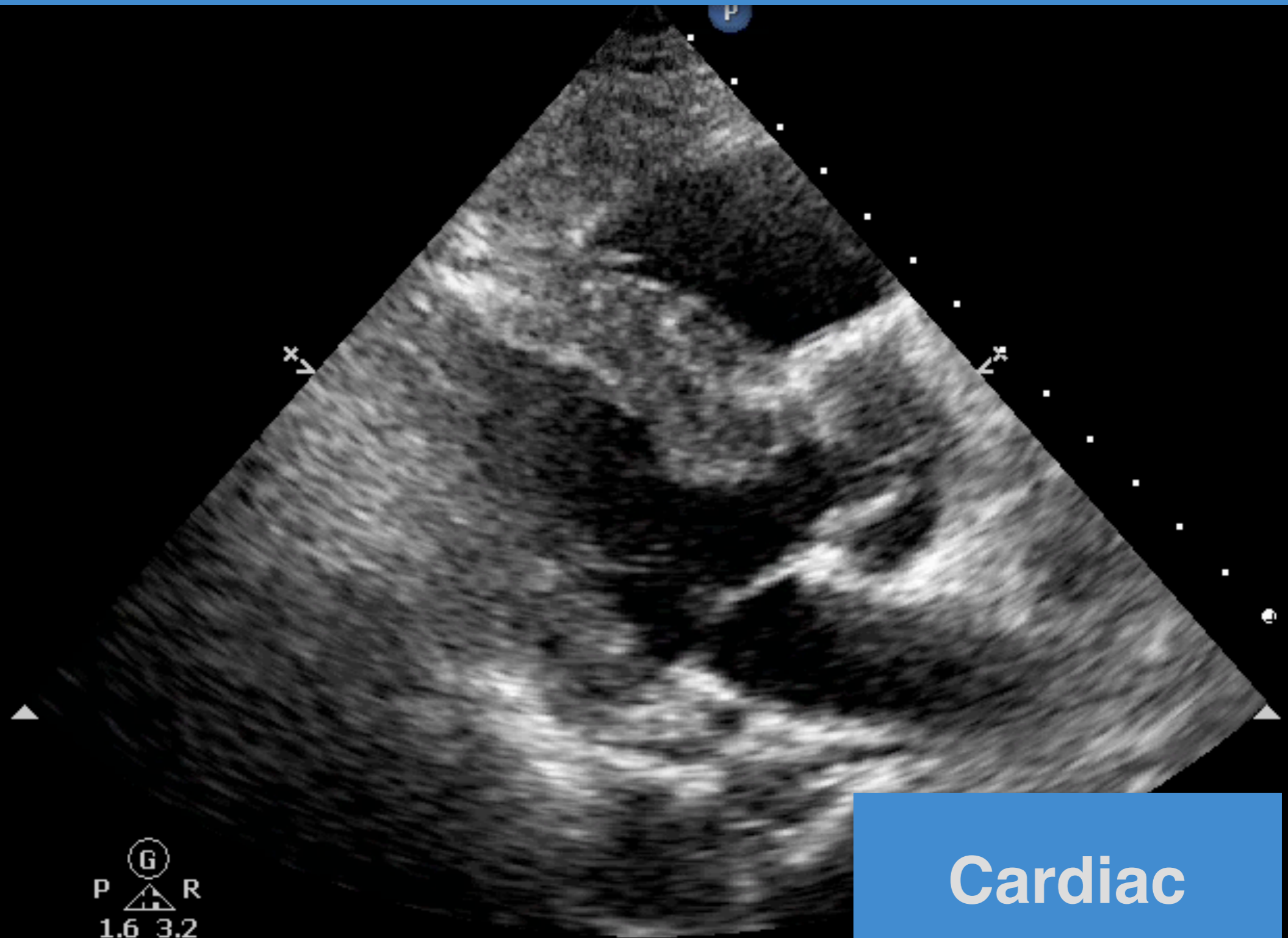
3.0cm

76M, Dyspnea & desaturation

Adult Echo2
S5-1
34 Hz
15.0cm

2D

HGen
Gn 9
C 50
3 / 2 / 0

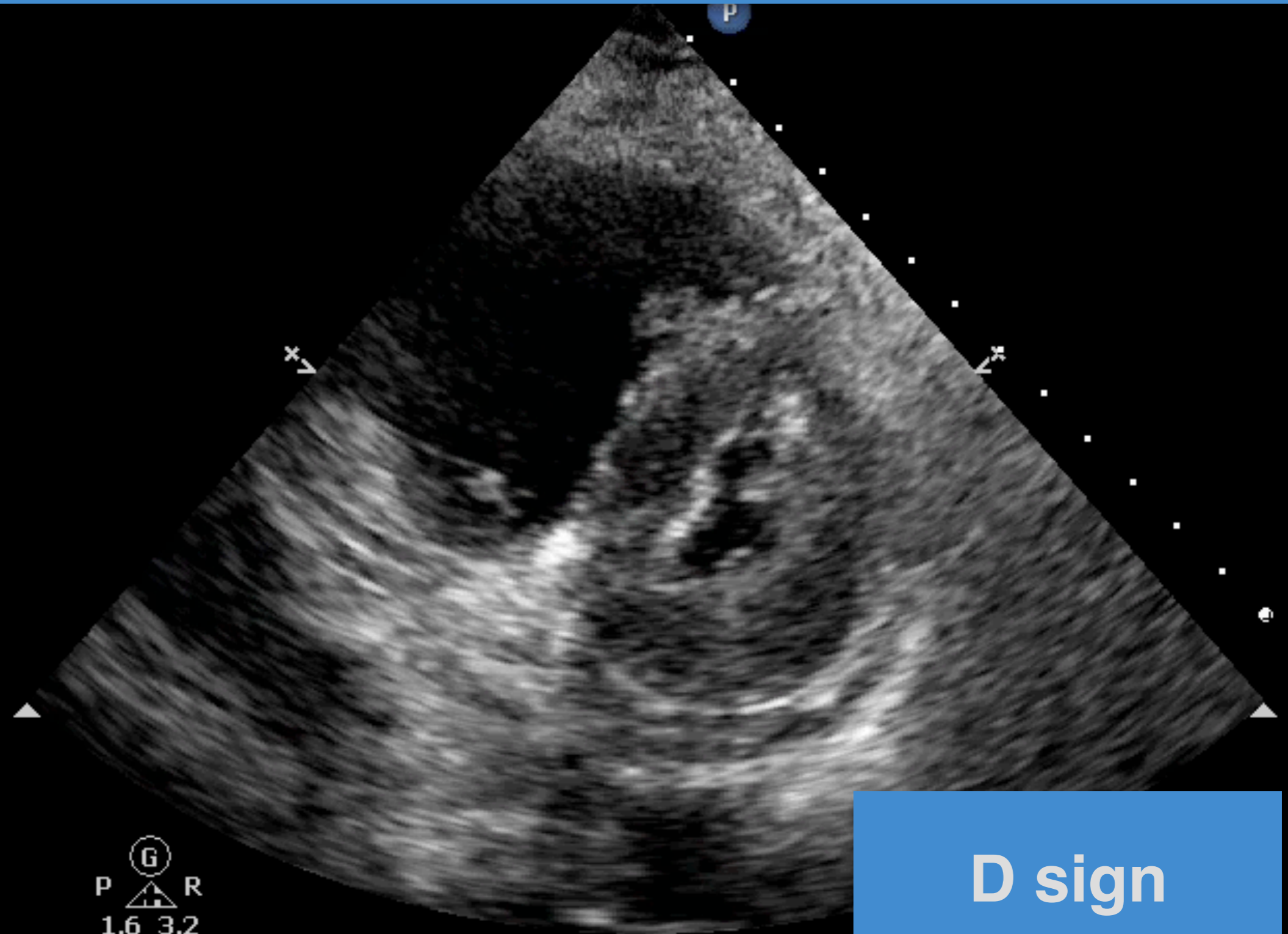


Cardiac

76M, Dyspnea & desaturation

Adult Echo2
S5-1
34 Hz
15.0cm

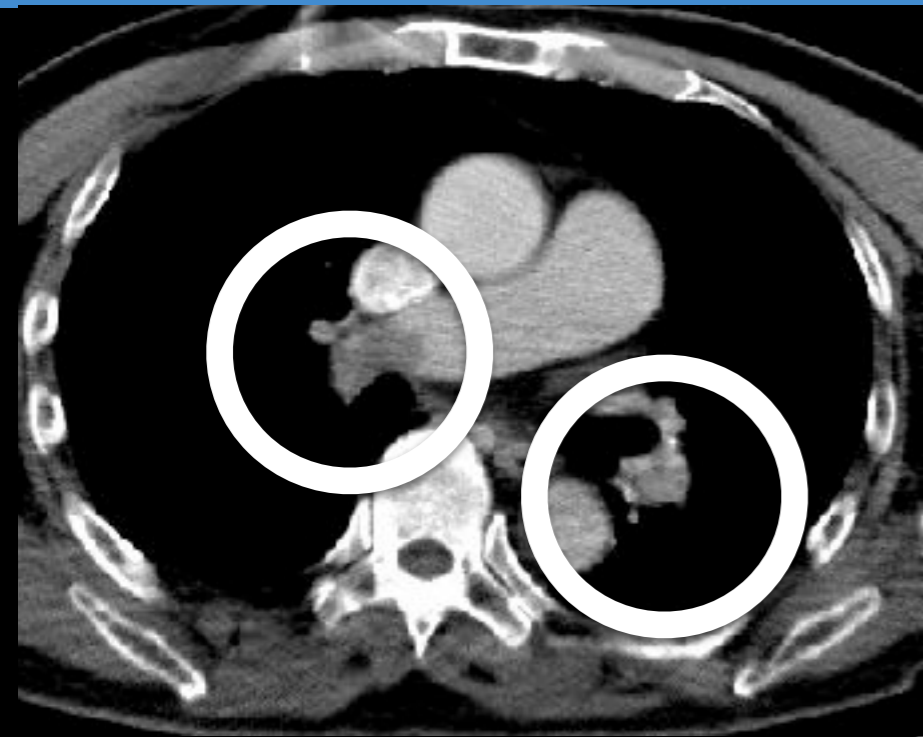
2D
HGen
Gn 9
C 50
3 / 2 / 0



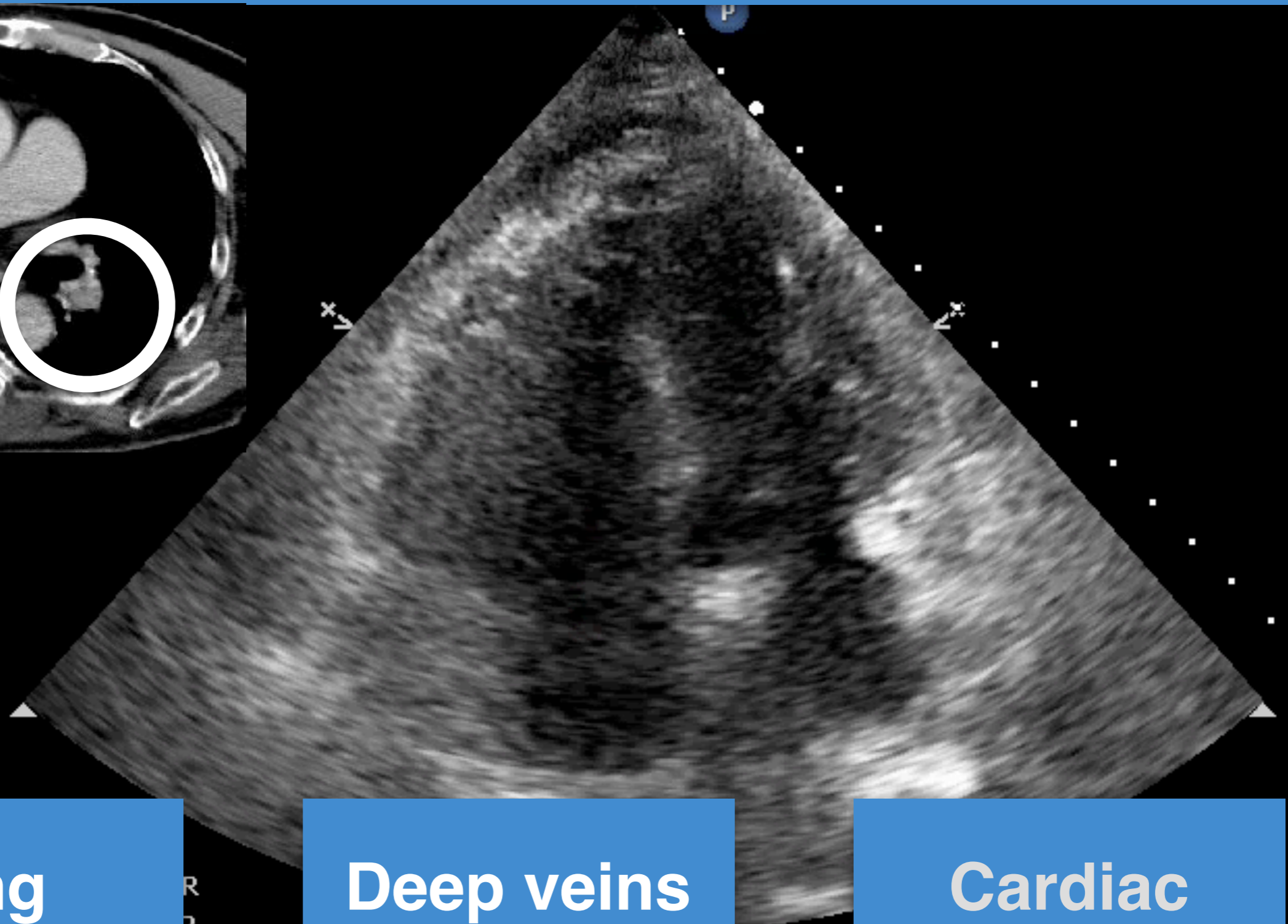
D sign

G
P R
1.6 3.2

Pulmonary embolism



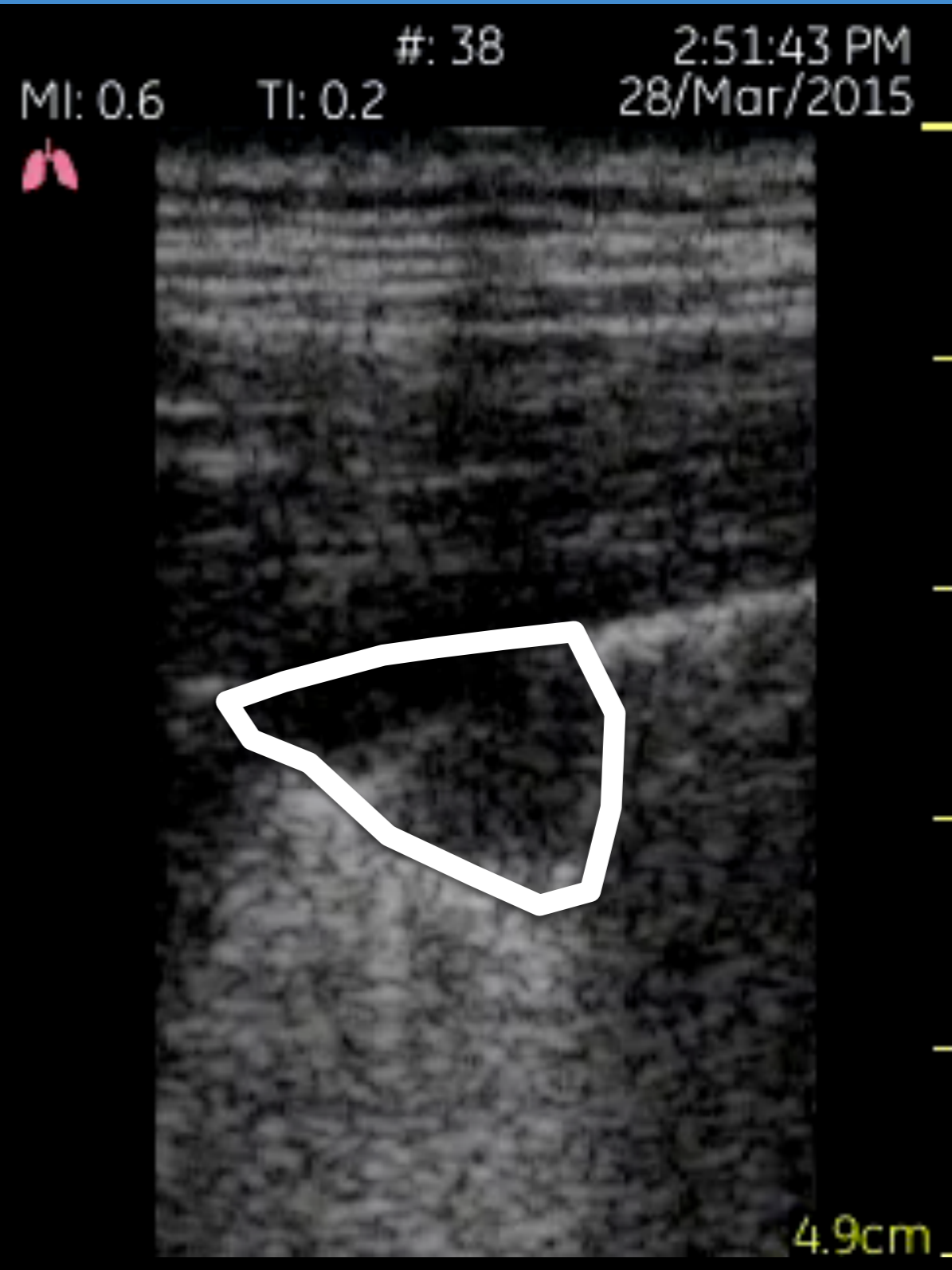
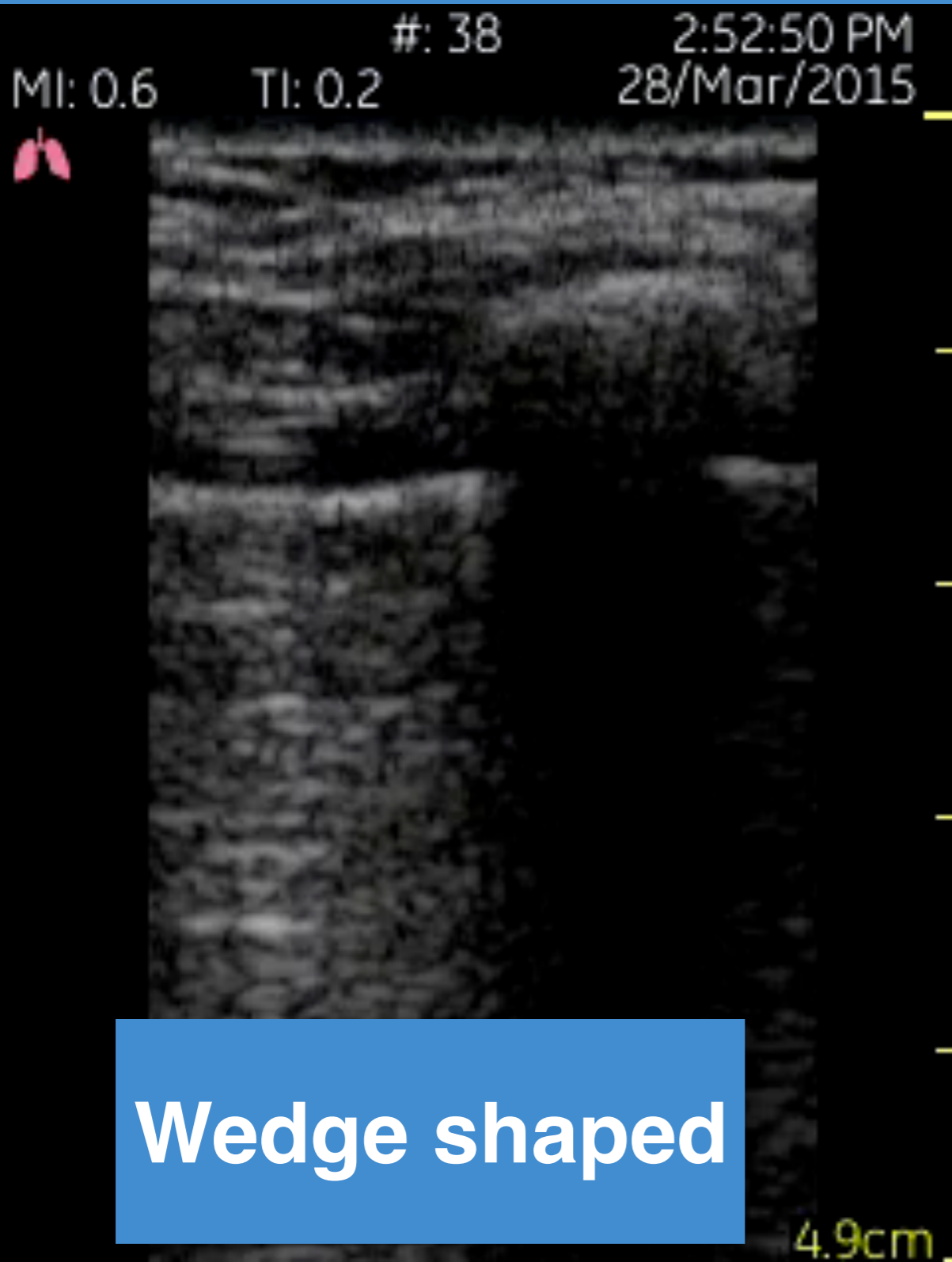
Lung



Deep veins

Cardiac

Pulmonary infarction

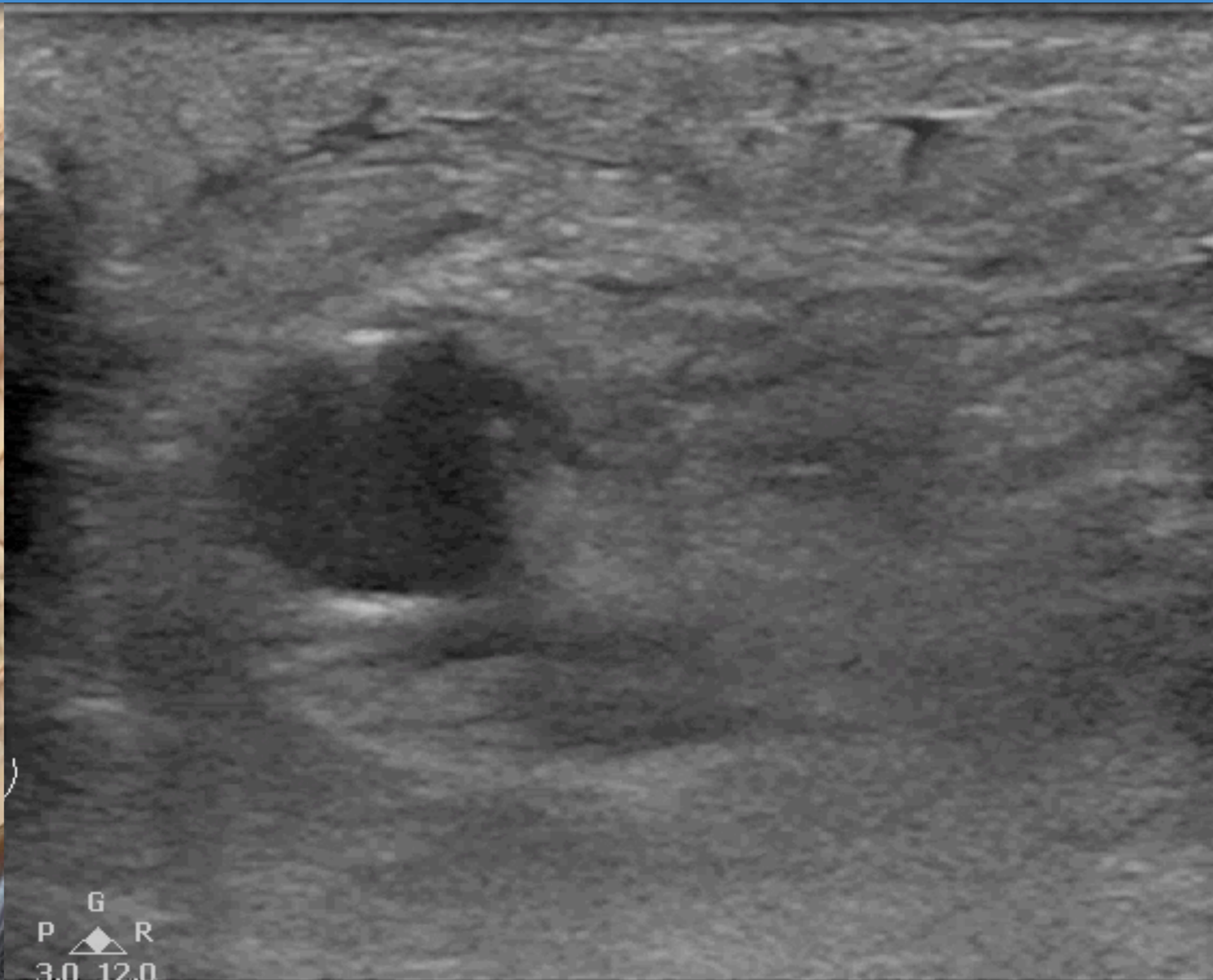


Wedge shaped

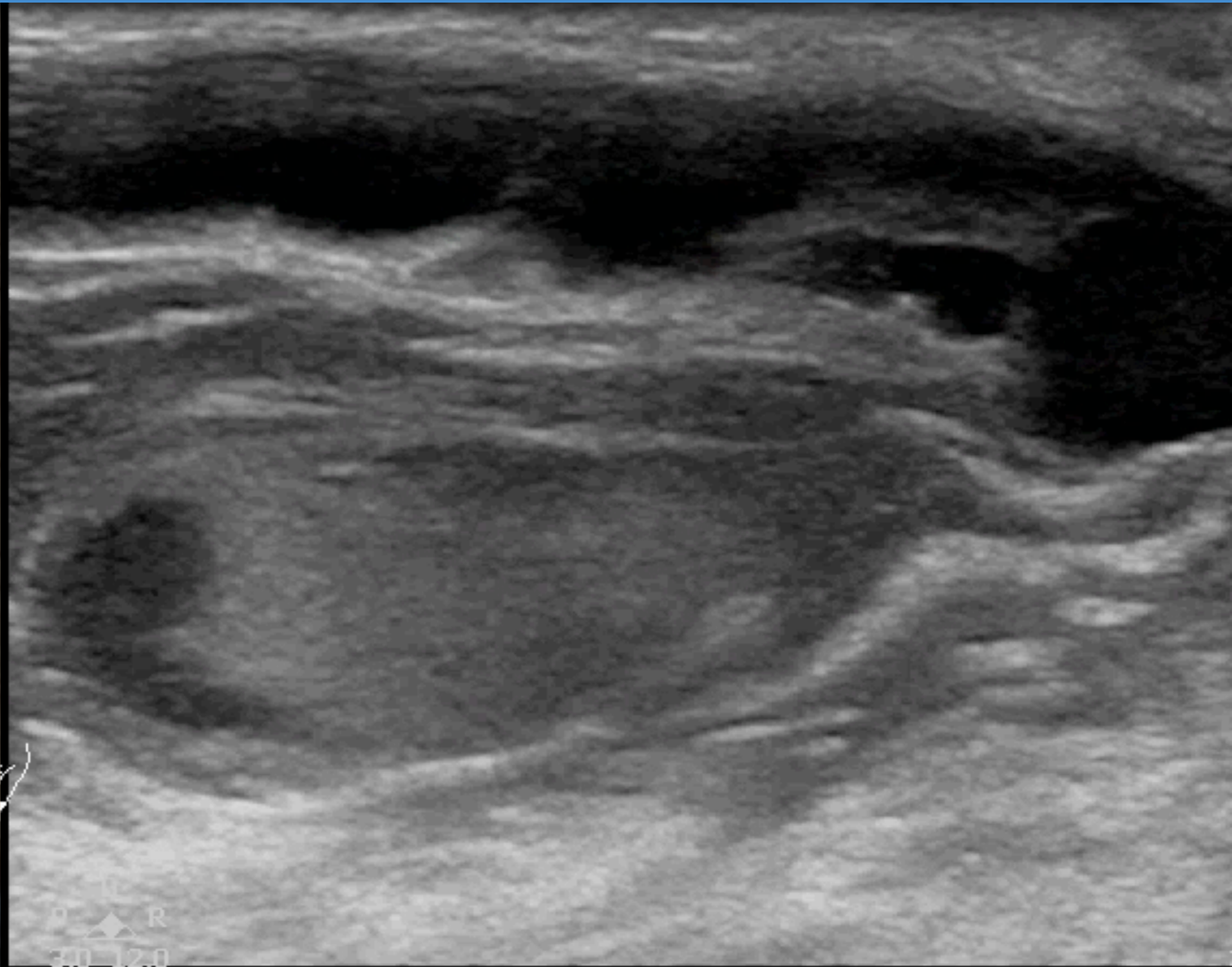
91 F, right thigh pain for 3 d



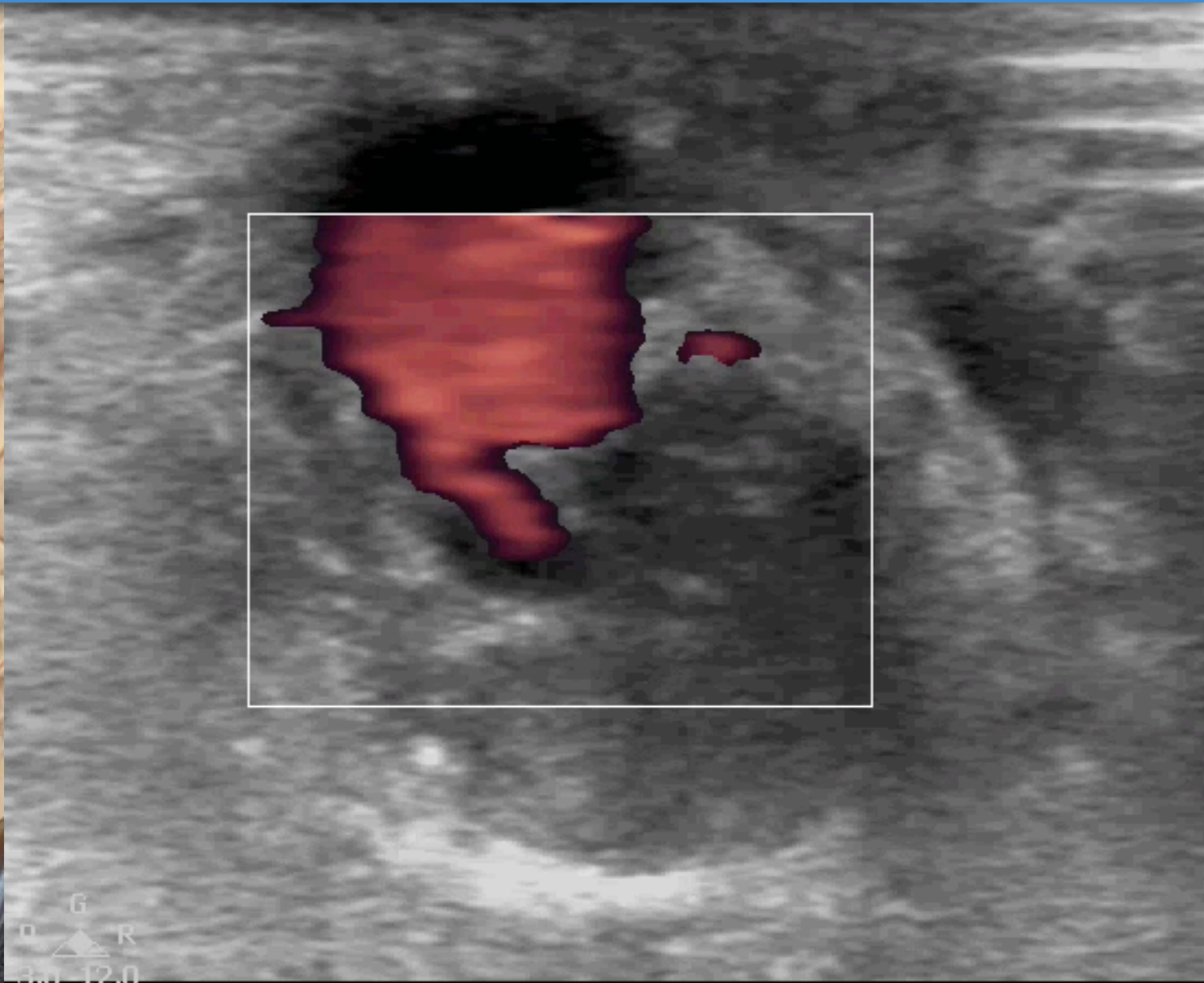
57F, ESRD on HD



57F, ESRD on HD



57F, ESRD on HD



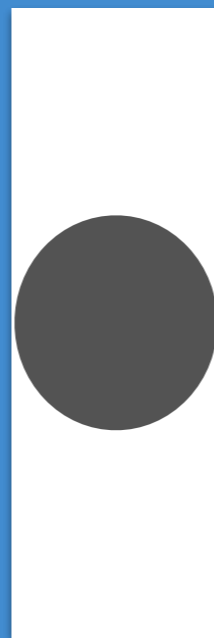
I-AIM

Dilatation



Rupture

Obstruction

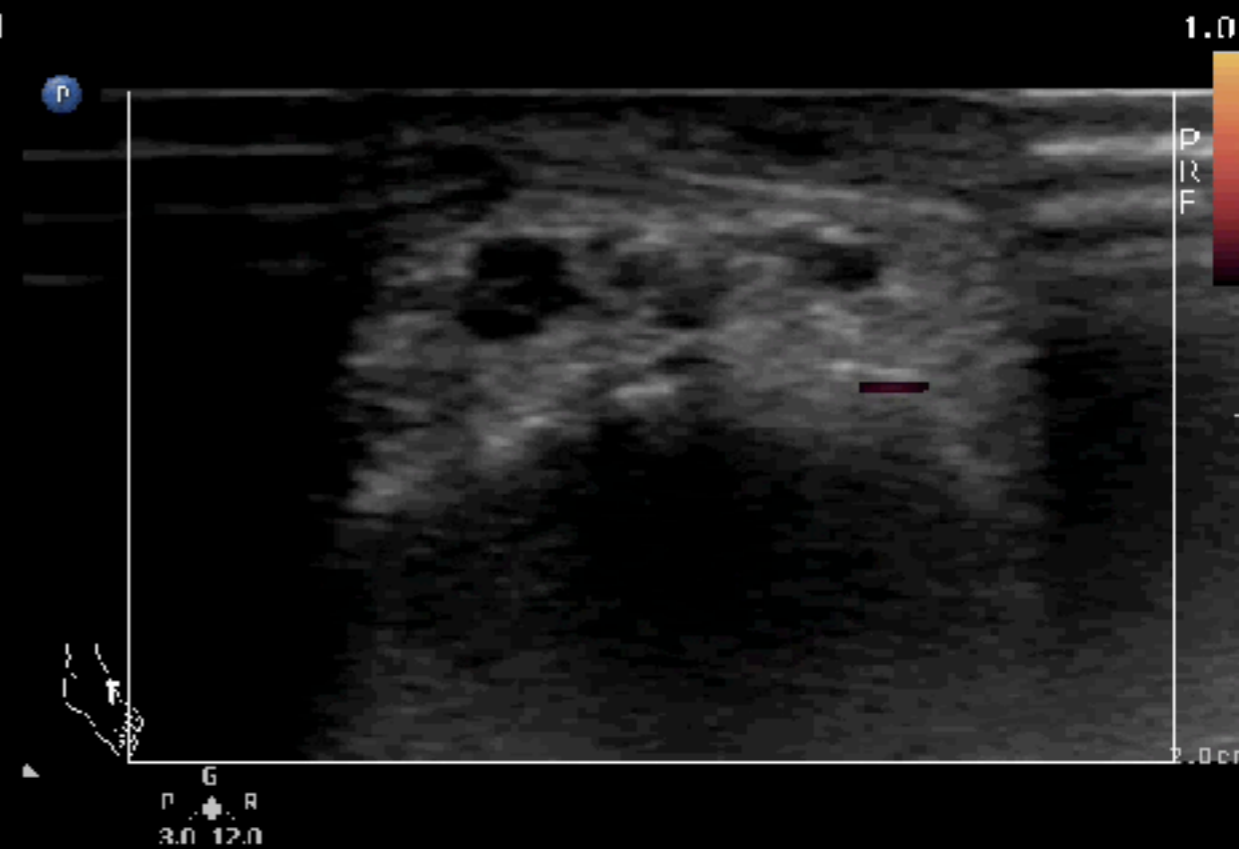
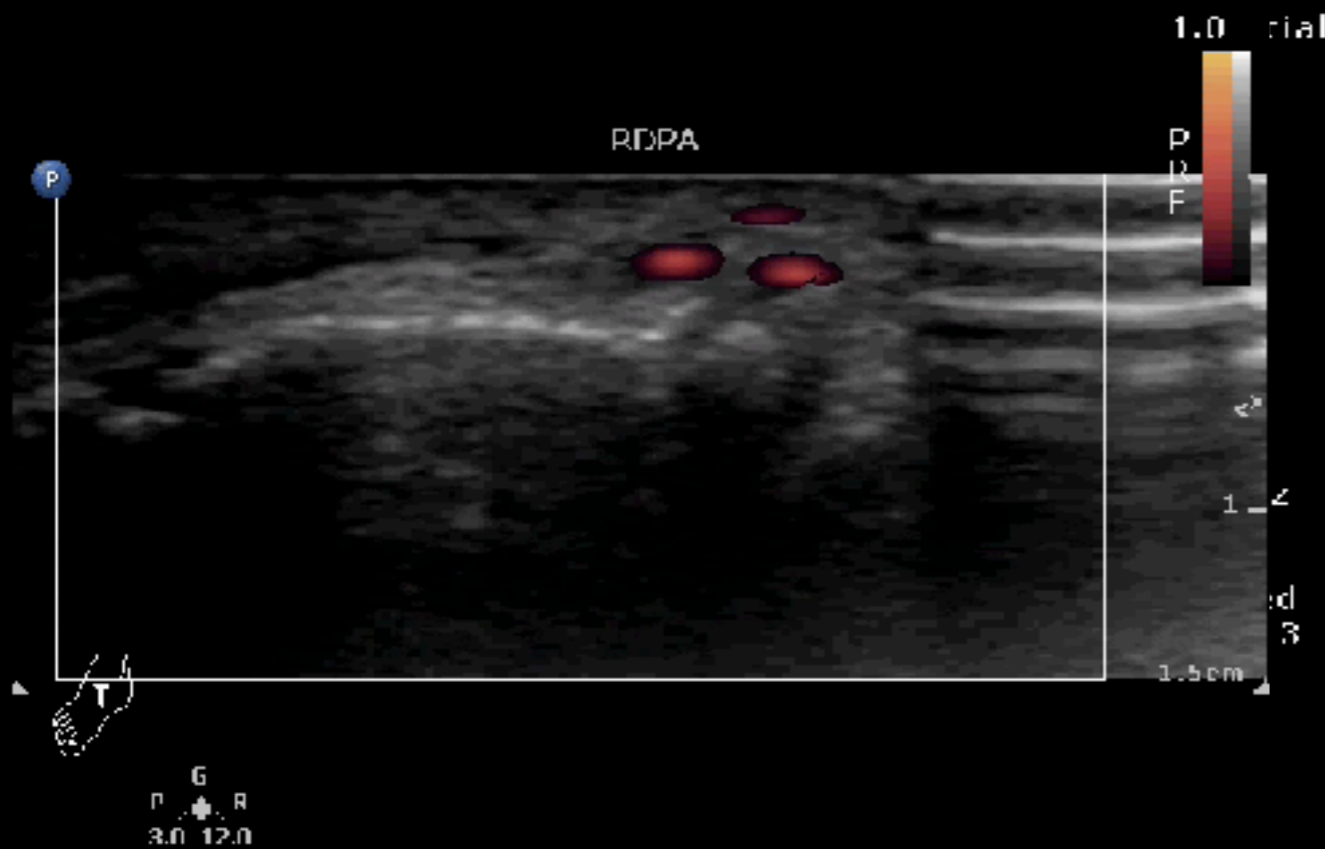


Dissection



71F, Leg pain & cold

Superficial
2-3
117
1.5cm
Gen
in 74
52
13/7
PA
0.0 MHz
in 53
15/1
ltr Med
aseln 3



Y

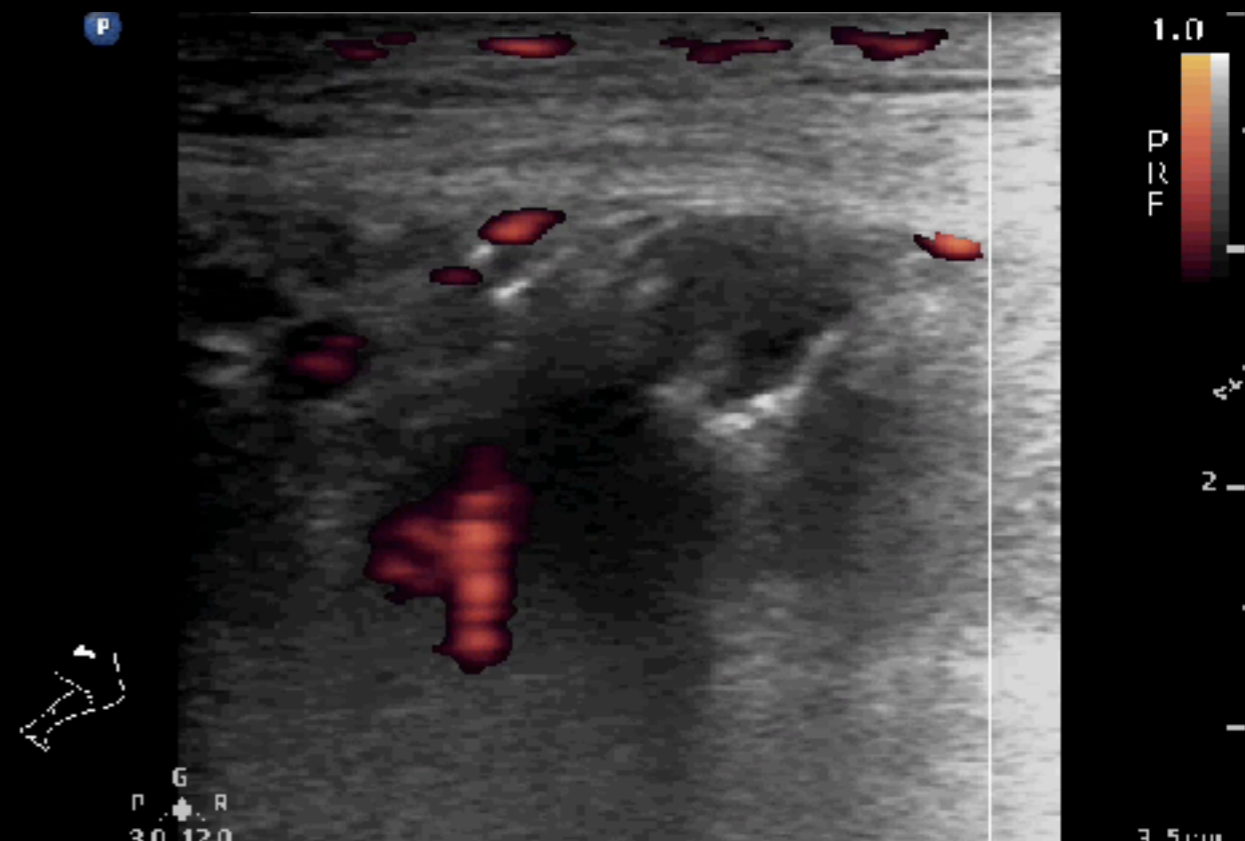
PAOD

N

Superficial
12-3
10 Hz
3.0cm

D
Gen
5n 100
C 52
1/3/7

PA
5.0 MHz
5n 54
L/5/1
Filtr Med
Baseln 3



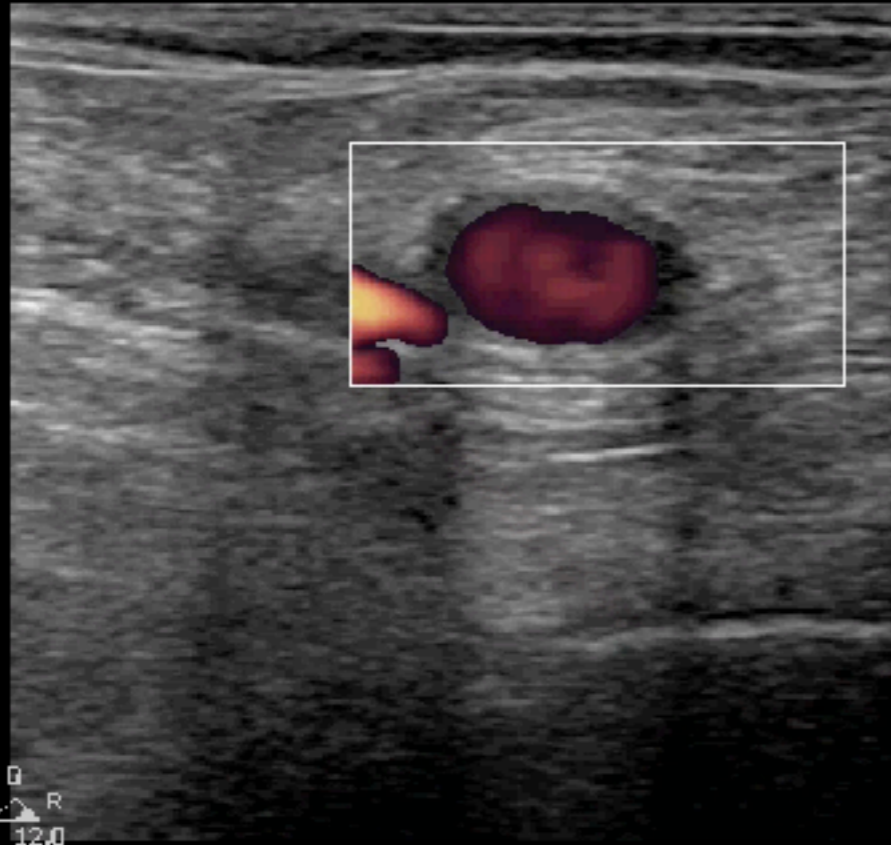
86F, Leg pain

Superficial
12 3
4 Hz
3.5cm

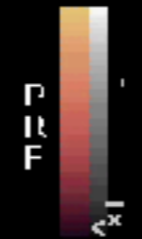
D
tes
Gn 67
C 56
3/2/2

PA
5.0 MHz
Gn 51
1/5/5
Ftr Med
BaseIn 3

P



0.8



2

3.5cm

P



0.8



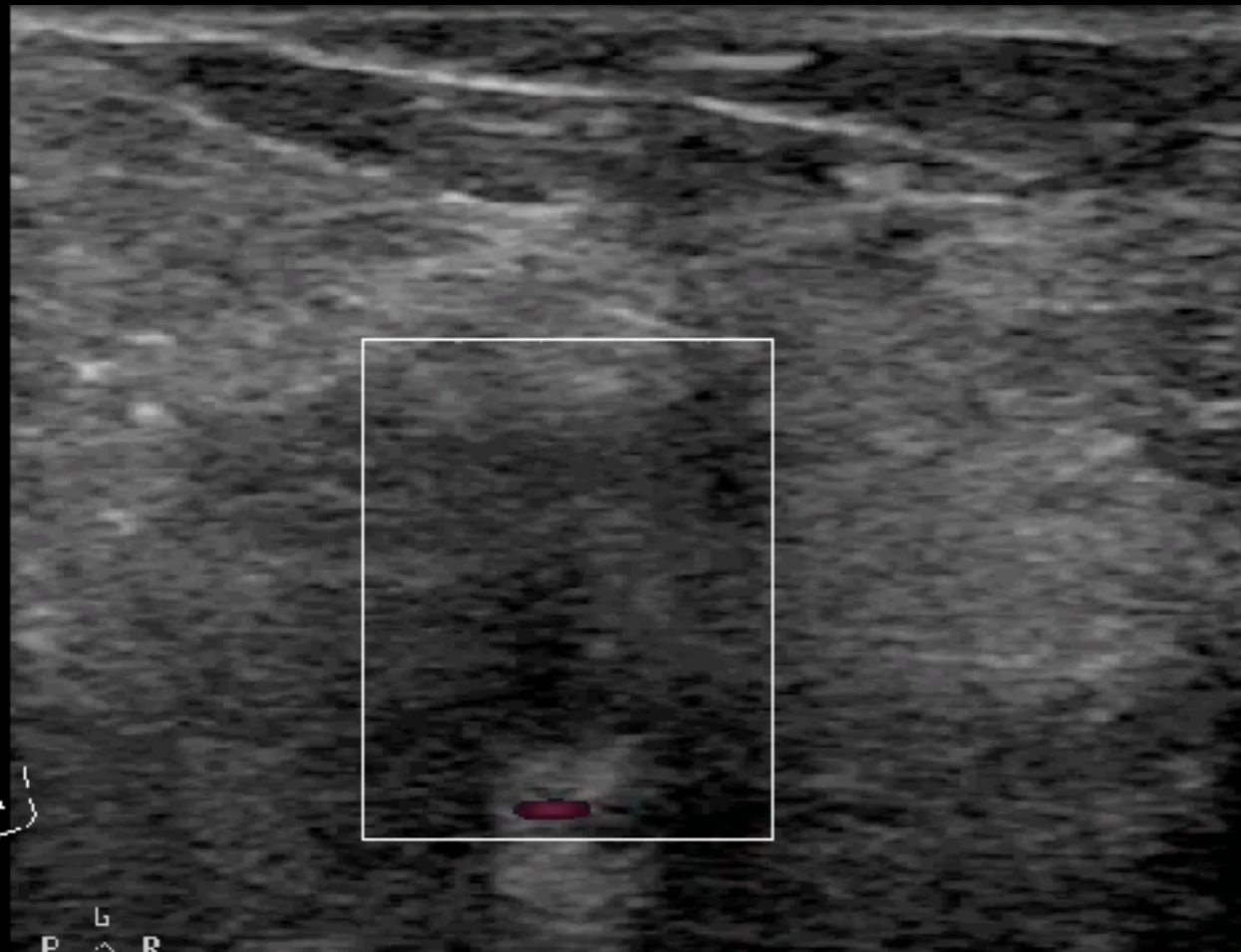
2

3.0cm

Y

PAOD

N



DP/PTA

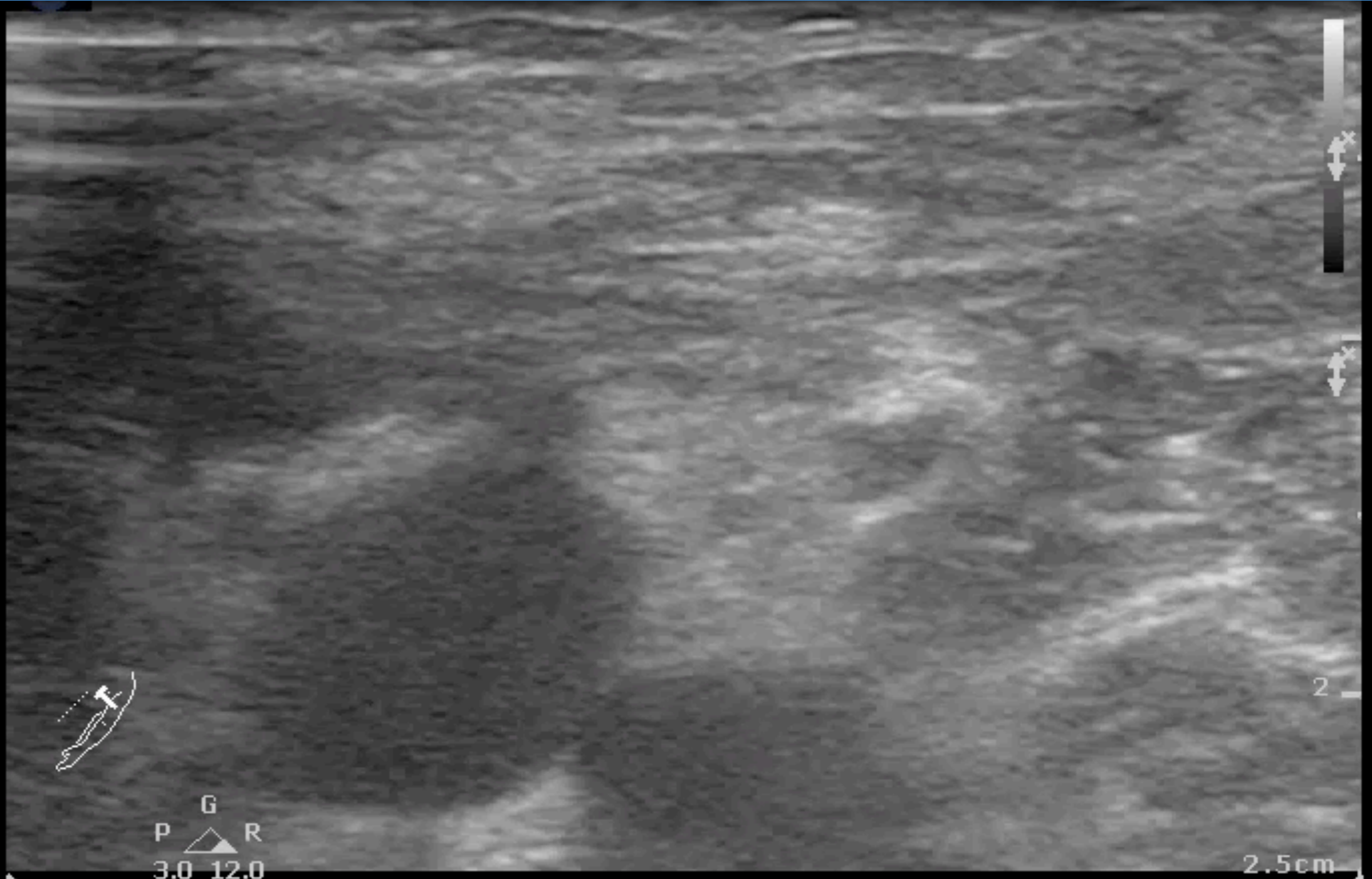
PA

FA

72M, ESRD on HD

L12-3
50 Hz
2.5cm

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



76F, Leg pain

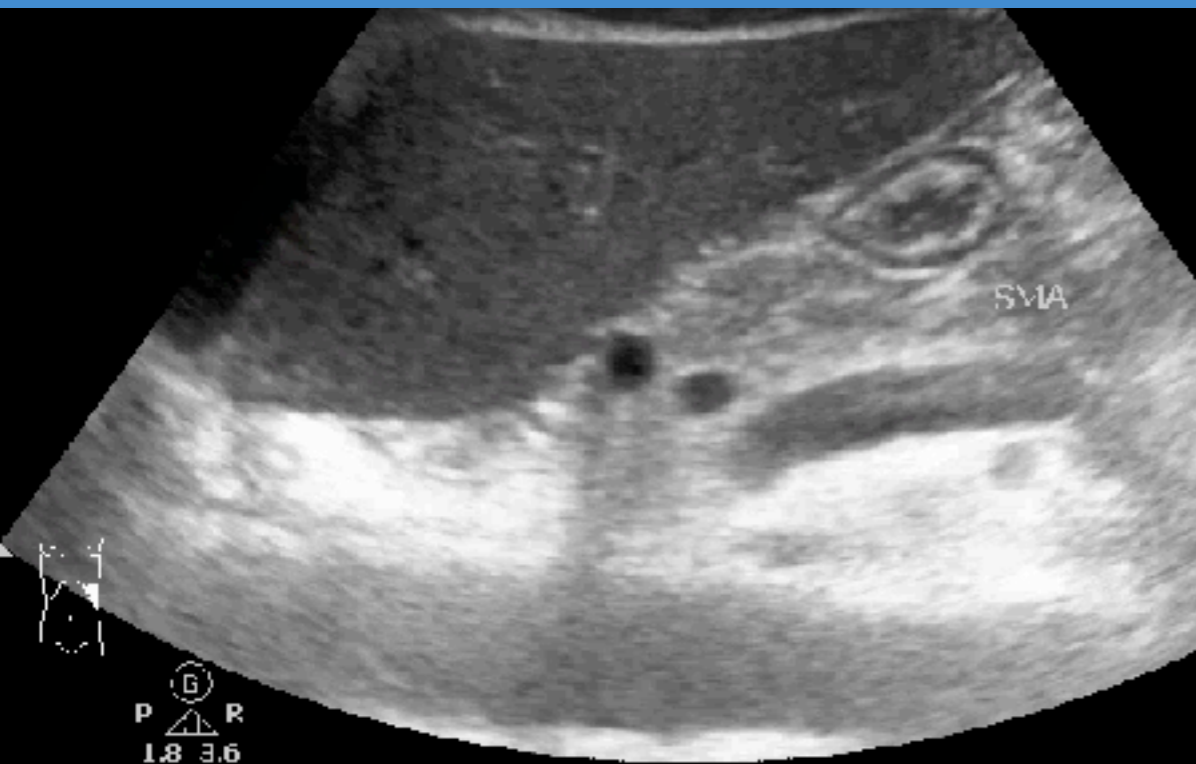
Superficial
L12-3
50 Hz
2.5cm

2D

Res
Gn 77
C 56
3 / 2 / 1

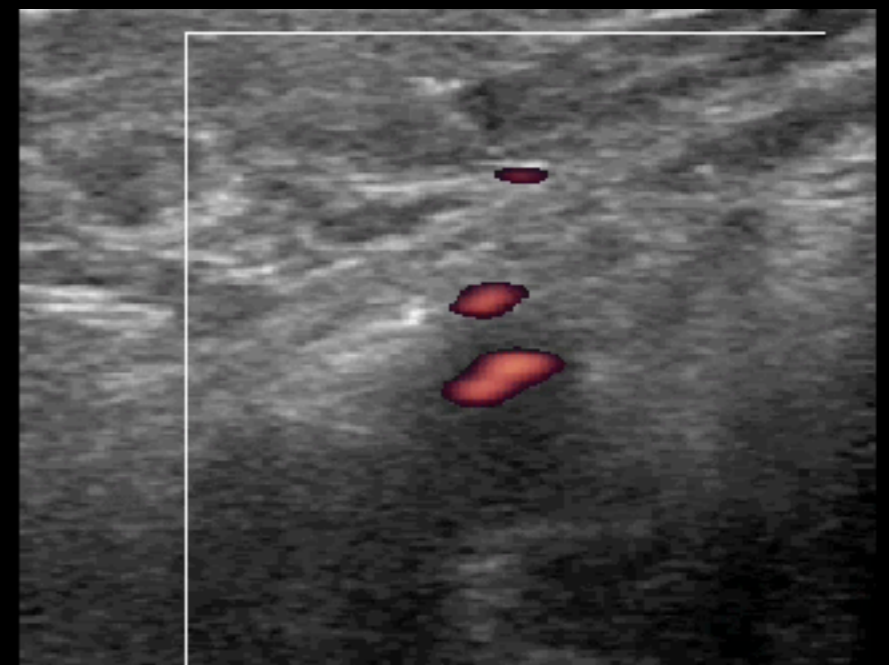
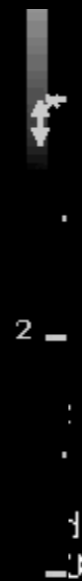
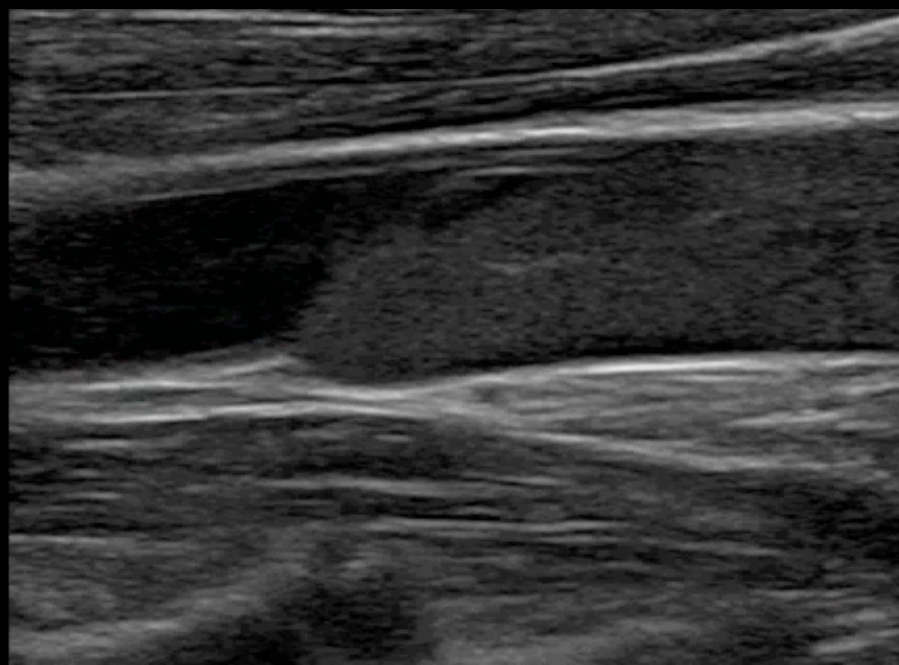
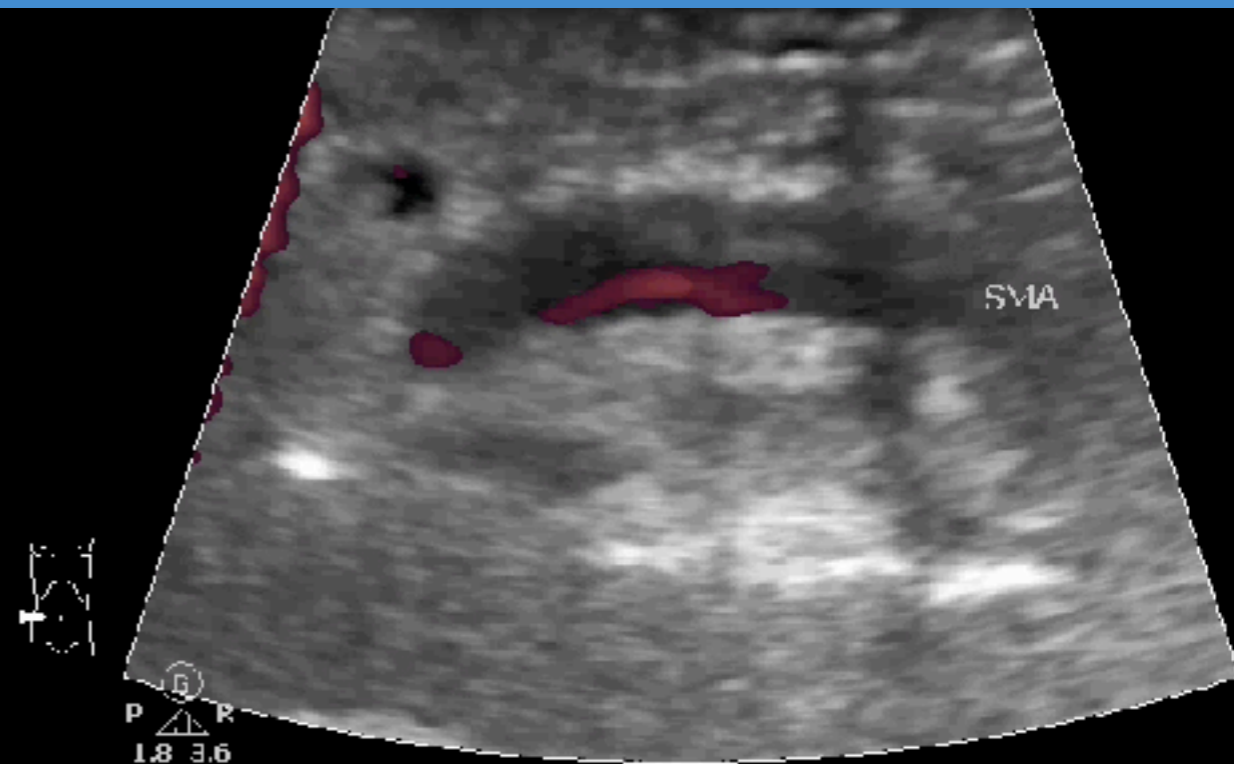


Complication of AD



2D
II Gen
Gn 34
C 56
3/3/3

CPA
2.5 MHz
Gn 66
1/8/4
Filtr High
Baseln 8



45M, Severe ABD pain



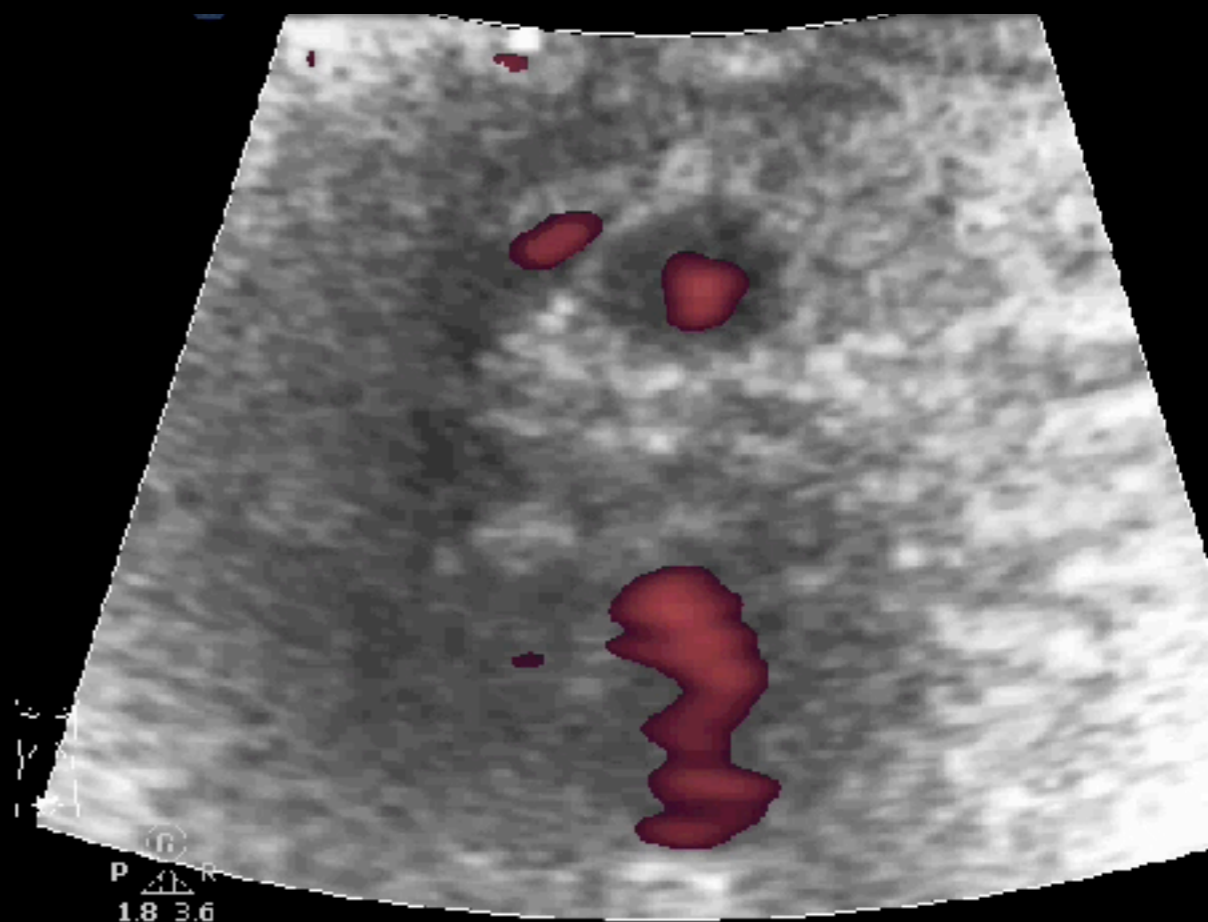
C5-1
12 Hz
HD 700m

2D
HGen
Gn 58
C 40
3/3/3

CDA
2.5 MHz
Gn 66
1/8/4
Filtr High
Baseln 8

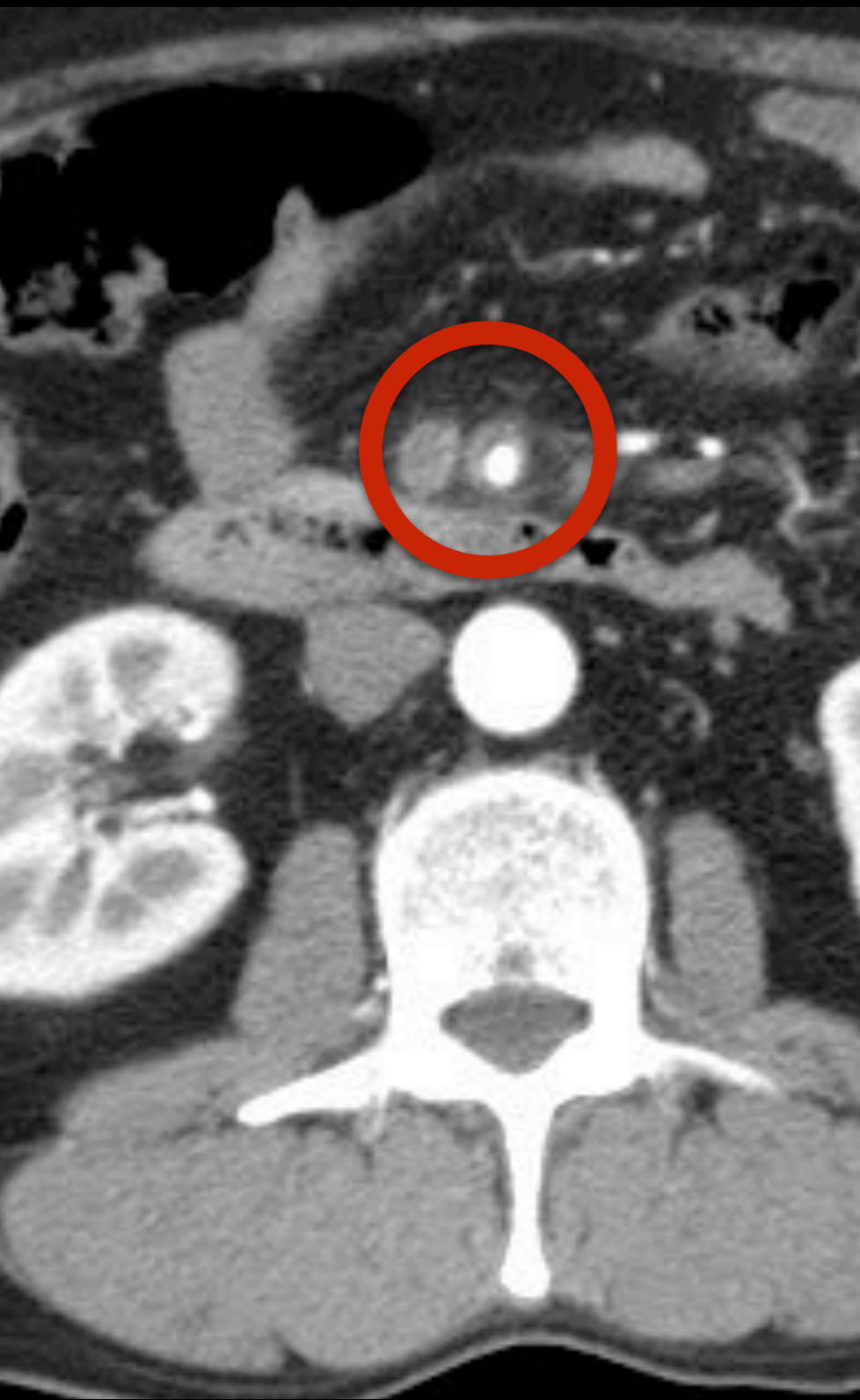
P R
1.8 3.6

1:



P R
1.8 3.6

out of portion pain



Abd Gen2
Cb-1
14 Hz
HD Zoom

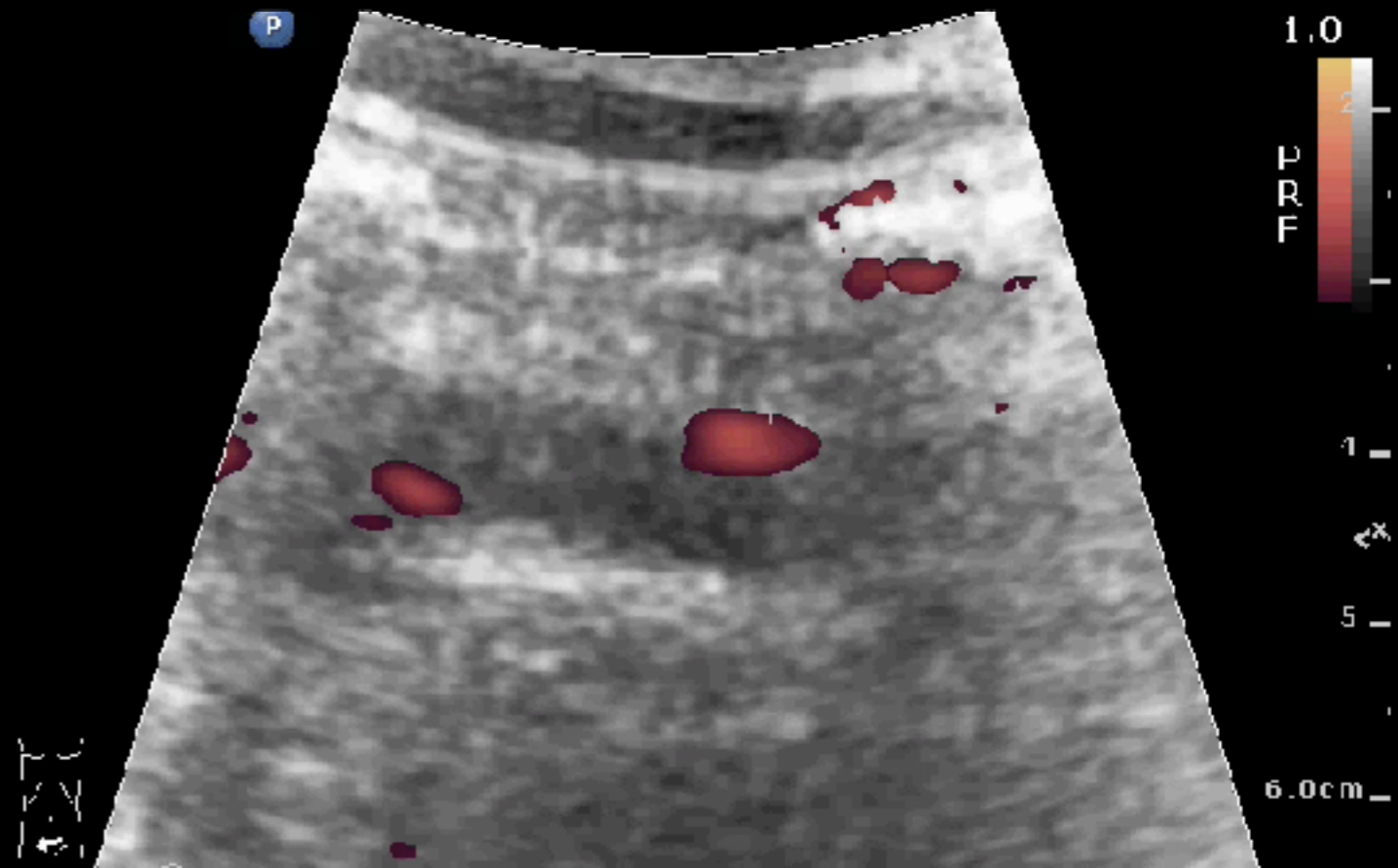
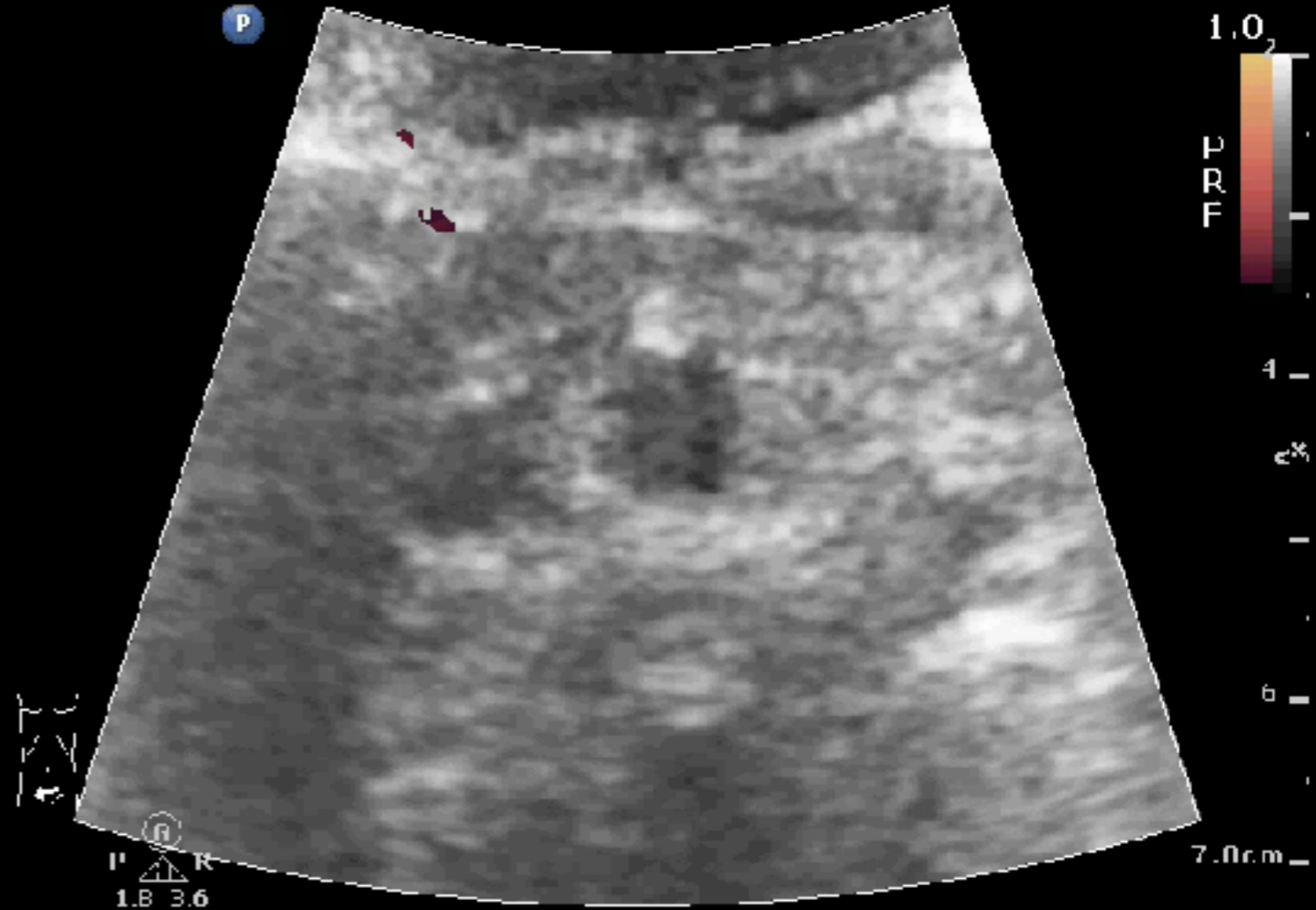
2D
HGen
Gn 60
C 56
3/3/3

CPA
2.5 MHz
Gn 66
1/8/4
Filtr High
Baseln 8

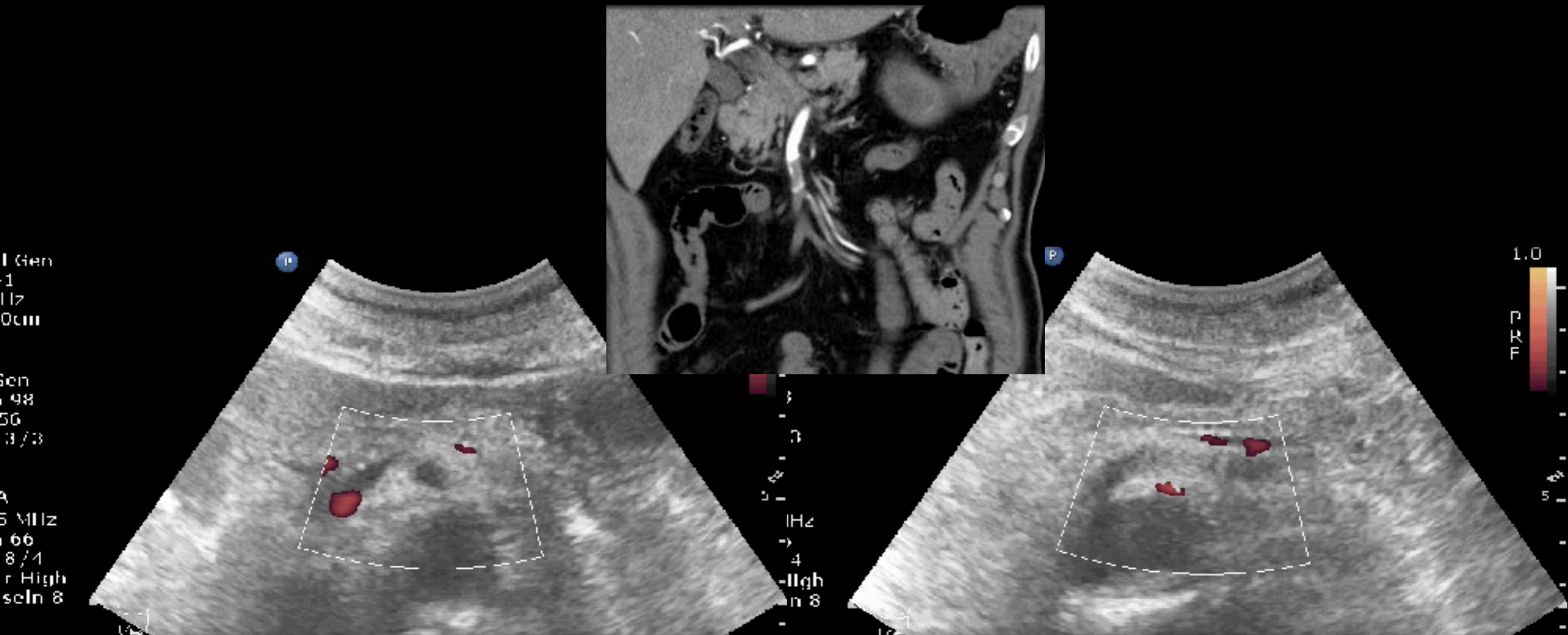
Abd Gen2
Cb-1
14 Hz
HD Zoom

2D
HGen
Gn 58
C 49
3/3/3

CPA
2.5 MHz
Gn 66
1/8/4
Filtr High
Baseln 8

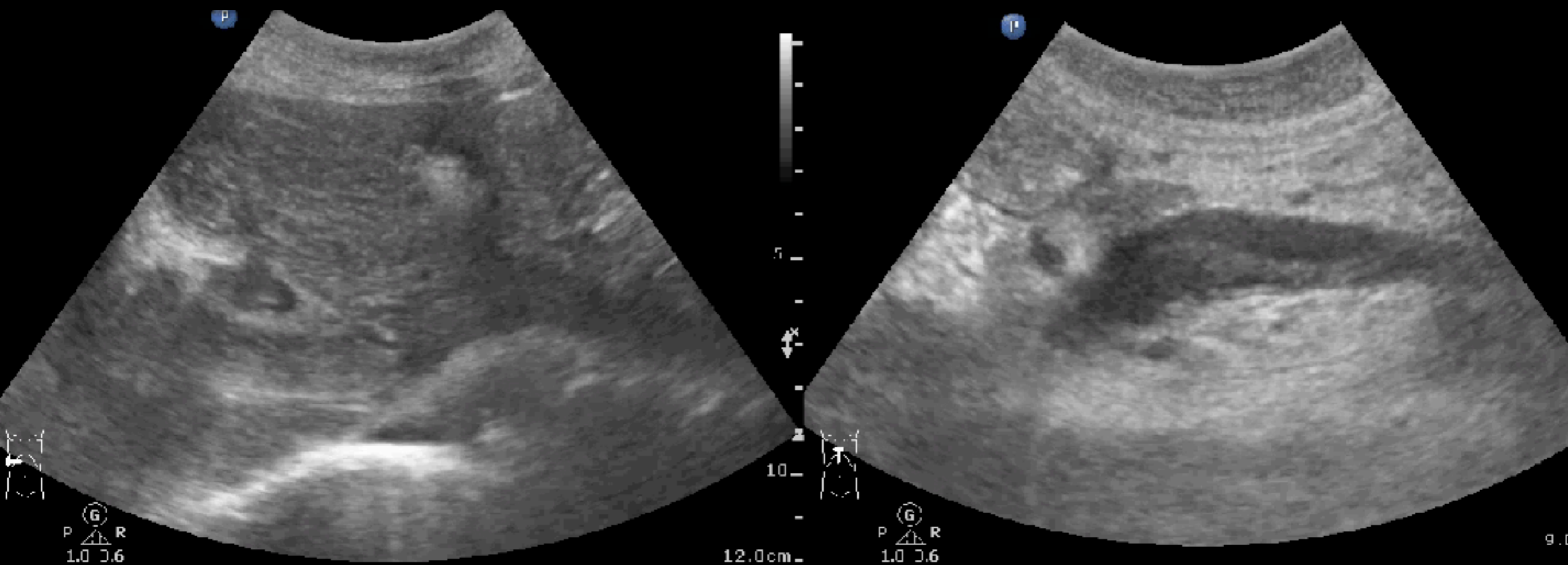


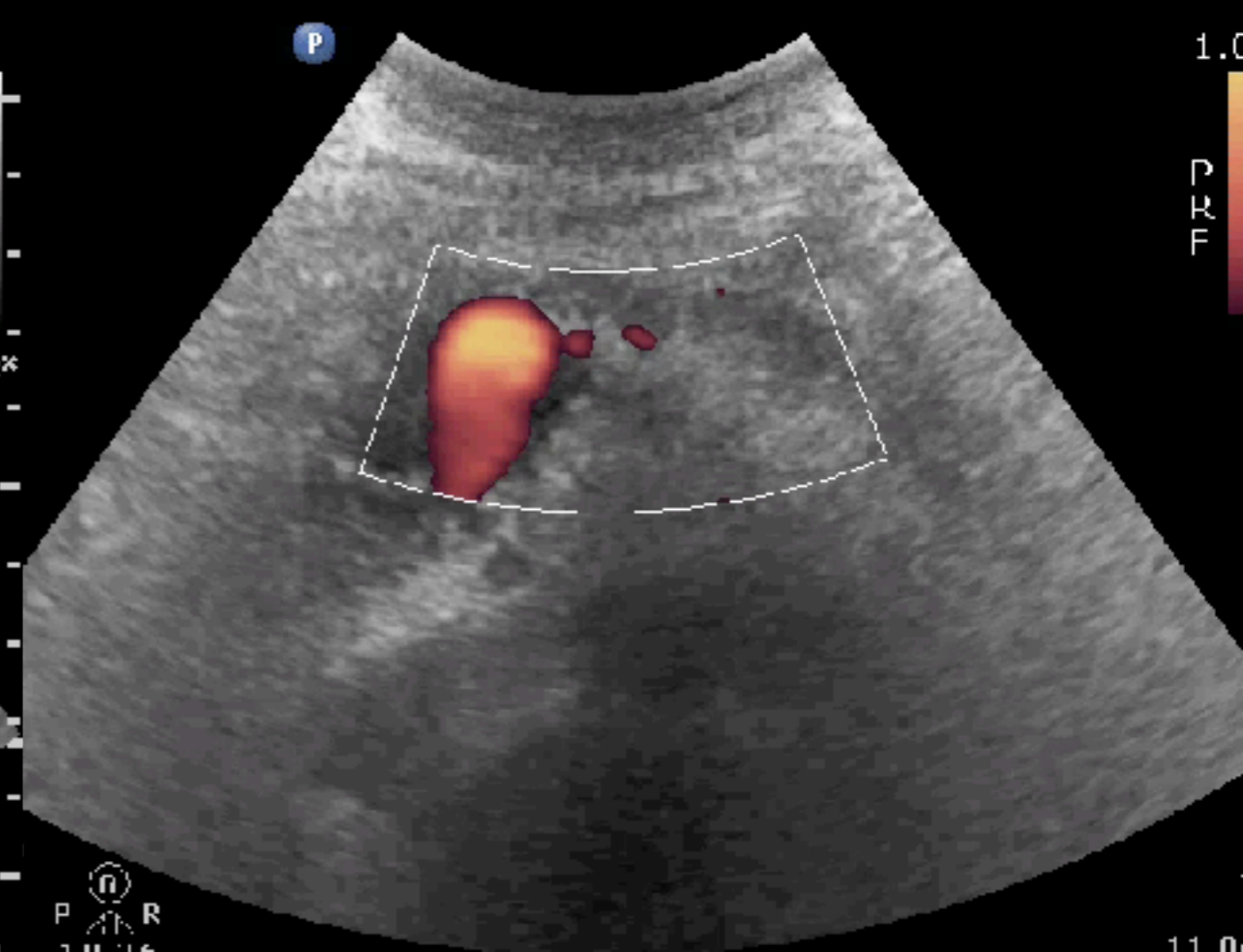
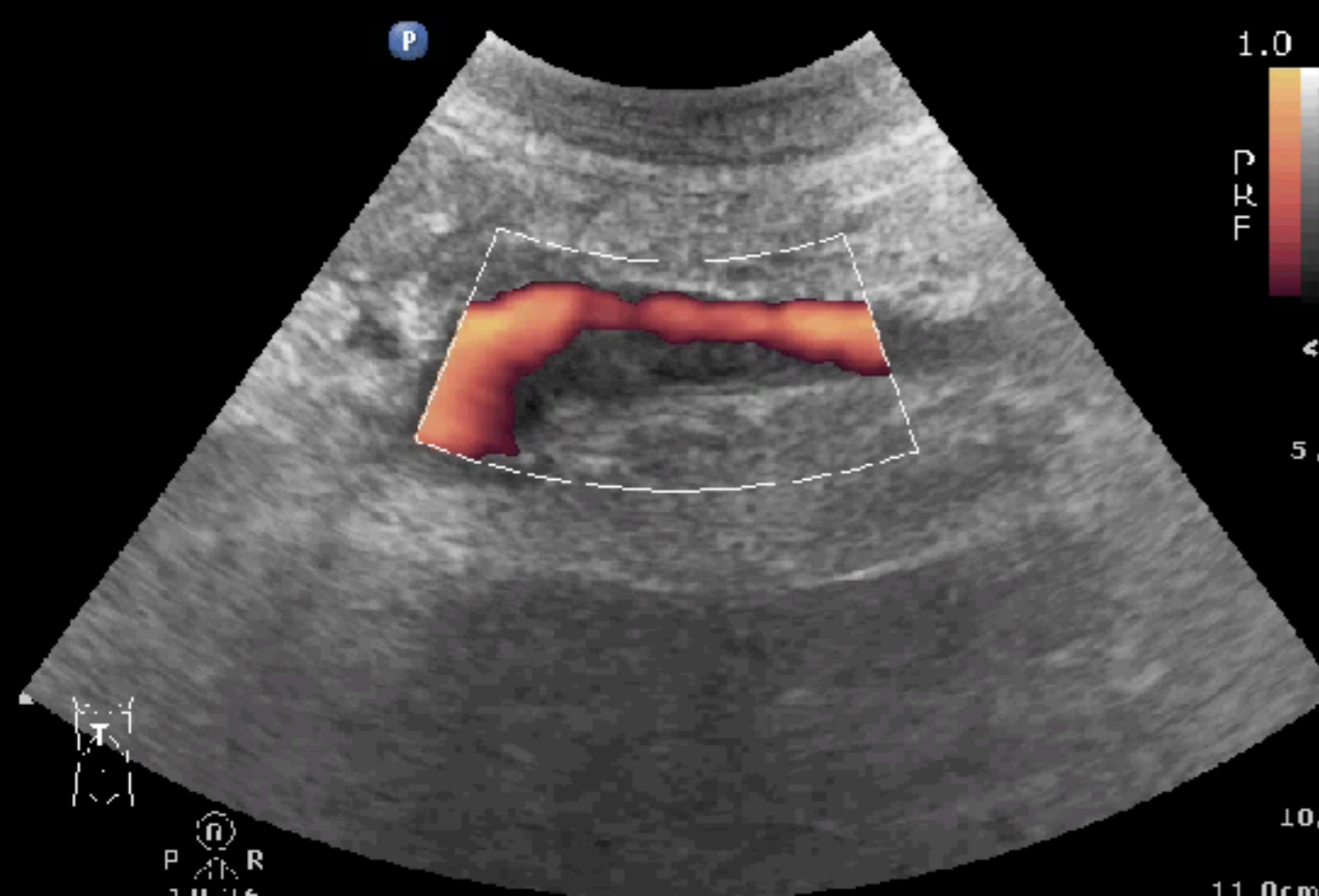
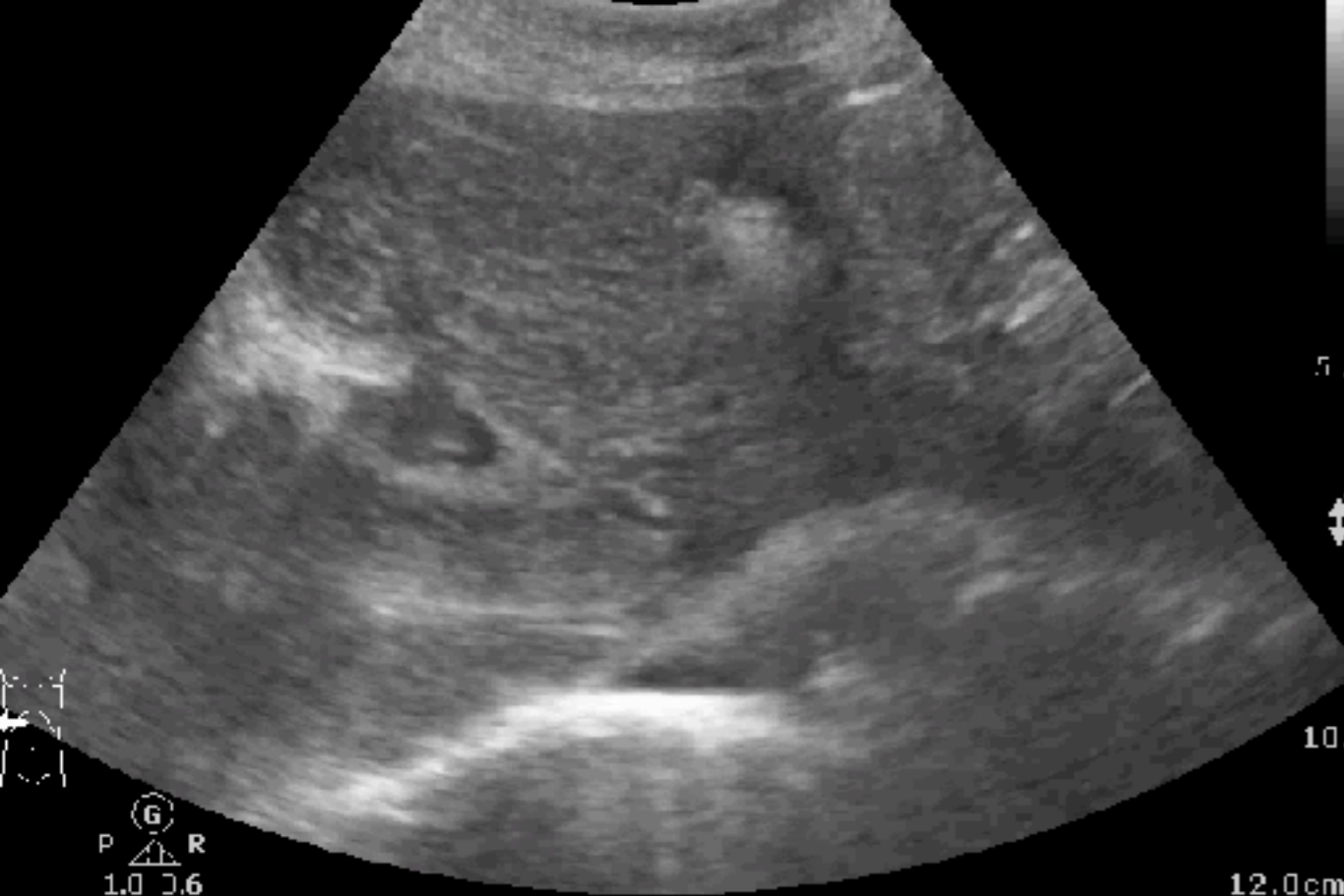
77M, Severe ABD pain



out of portion pain

68F, Cirrhosis, ABD pain





Volvulus

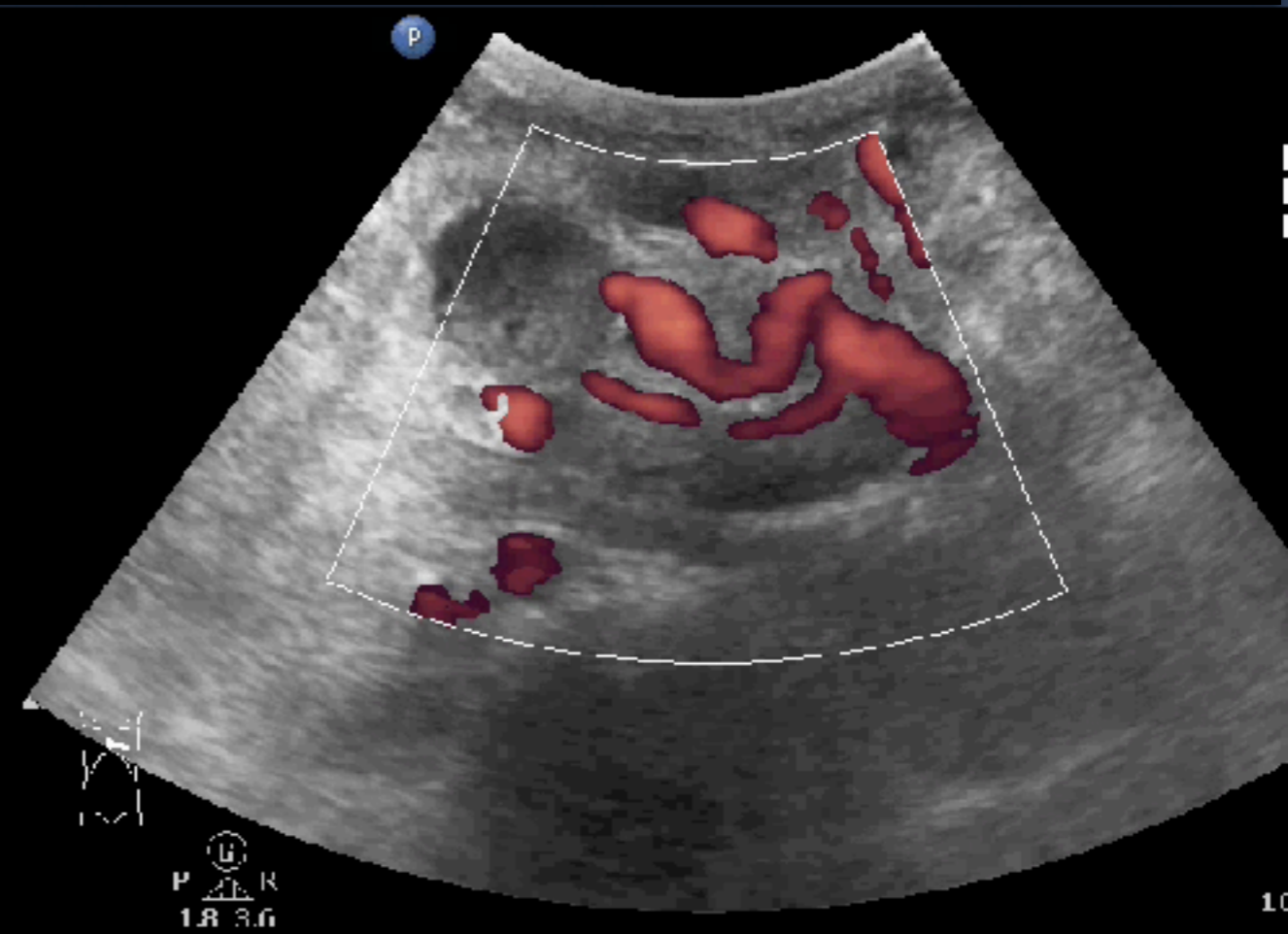
Whirlpool sign



Abd Gen
C5-1
10 Hz
10.0cm

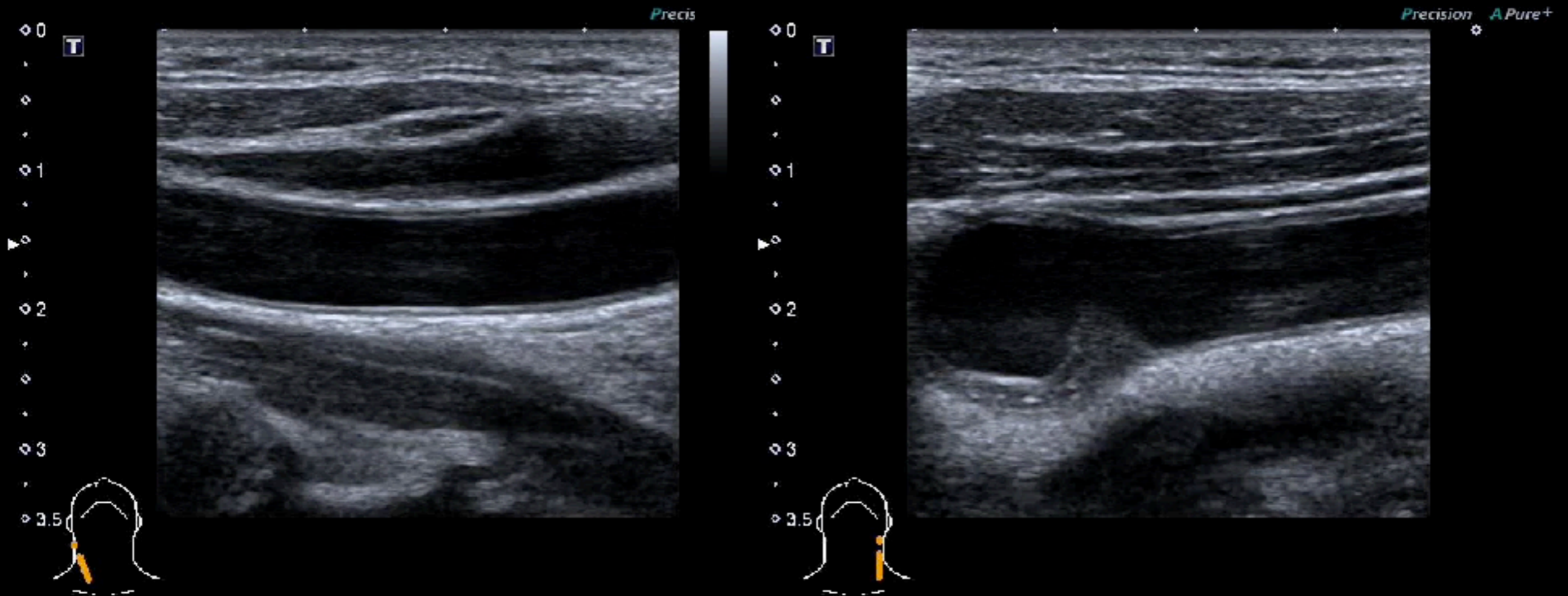
2D
IIGen
Gn 70
C 56
3/3/3

CPA
2.5 MHz
Gn 66
1/8/4
Filtr High
Baseln 8

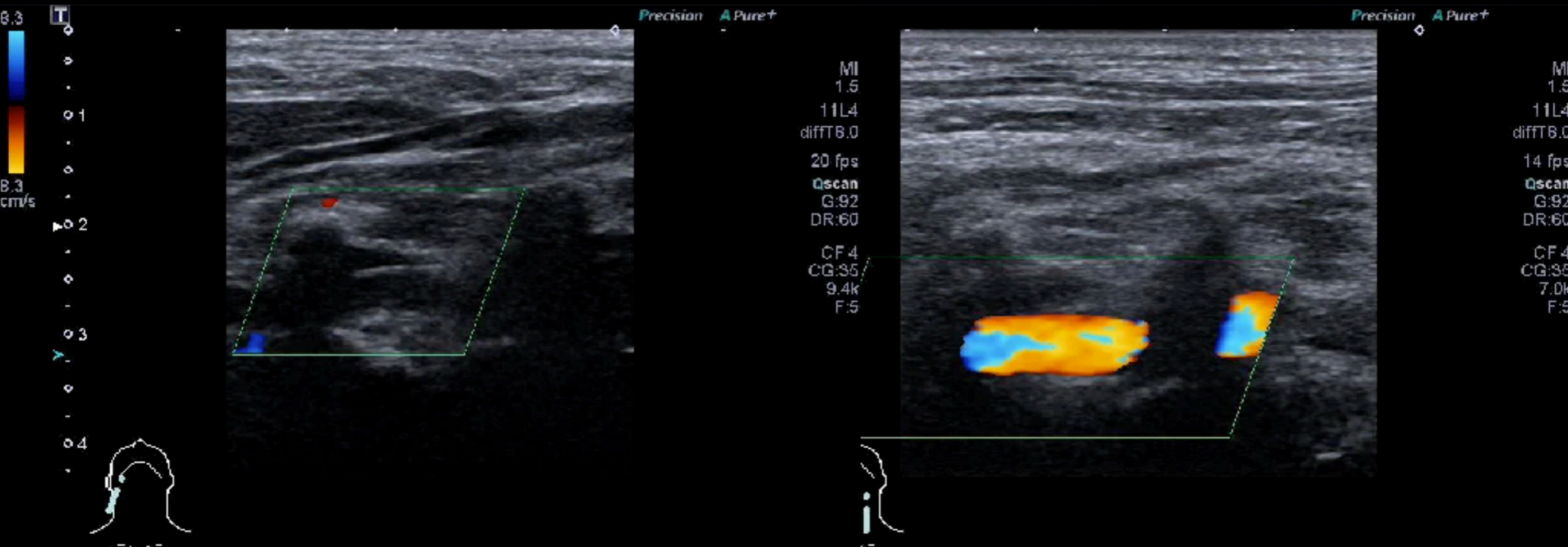


P R
1.8 3.6

51 M, Headache (VAS 10) sleep-soreness-pain-dizziness

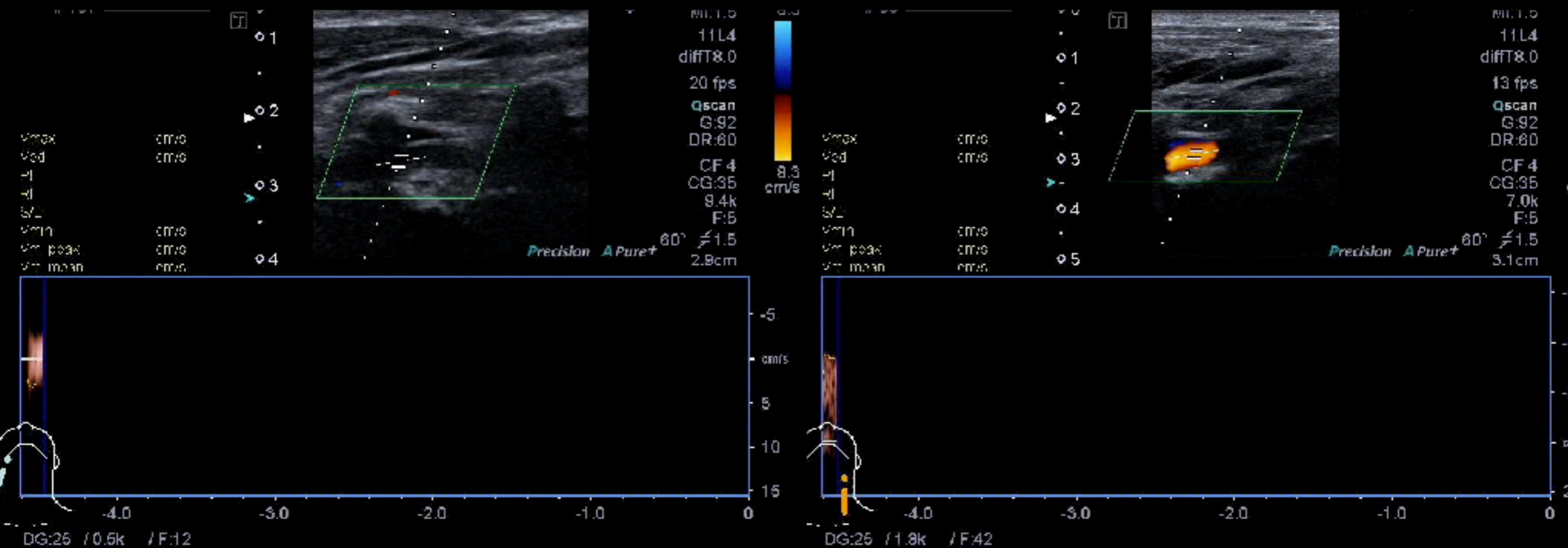


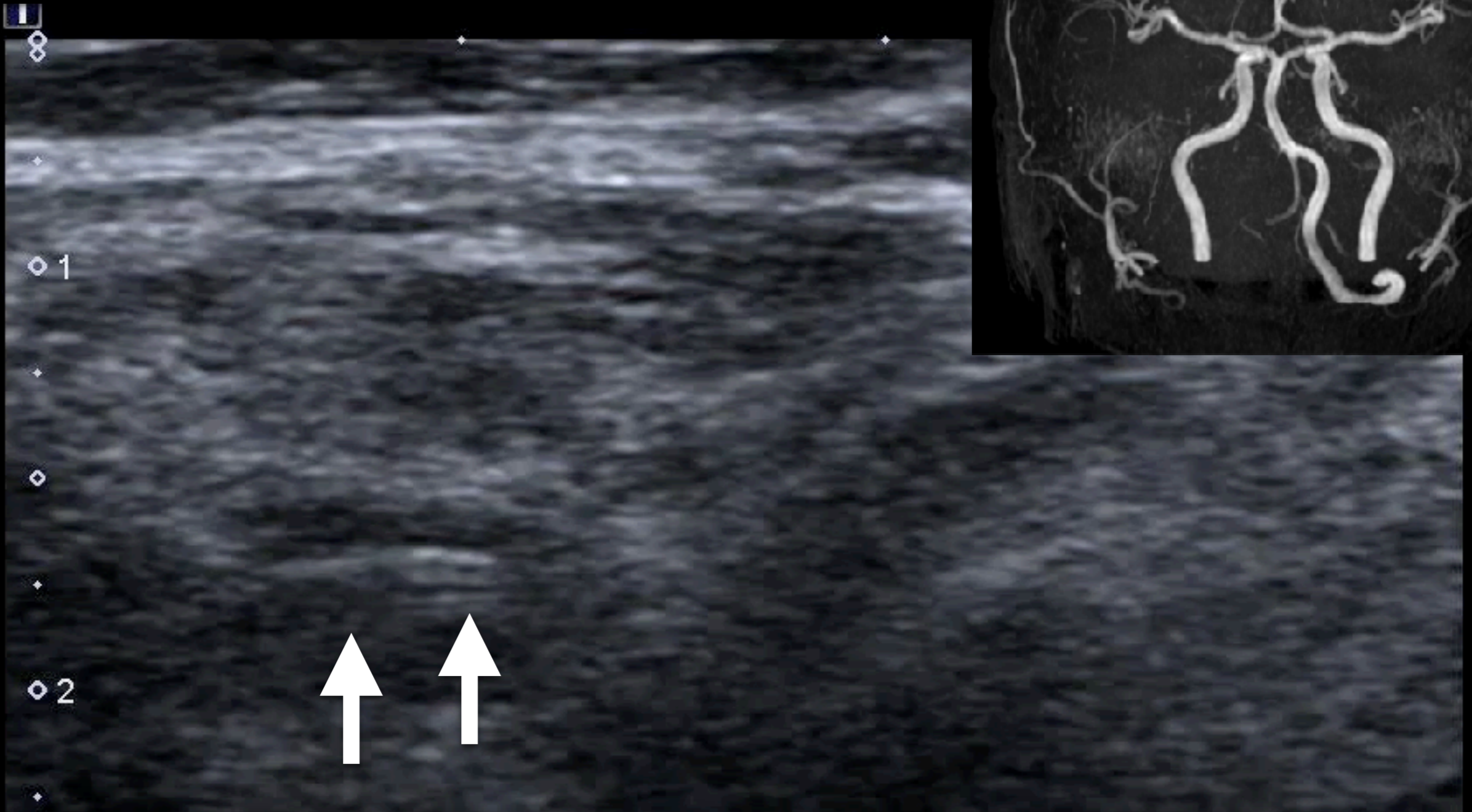
51 M, Headache (VAS 10) sleep-soreness-pain-dizziness



51 M, Headache (VAS 10)

sleep-soreness-pain-dizziness





VA dissection

I-AIM

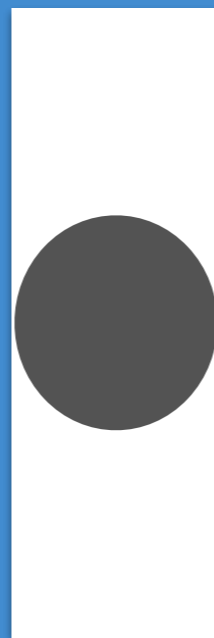
Vascular Emergencies

Dilatation

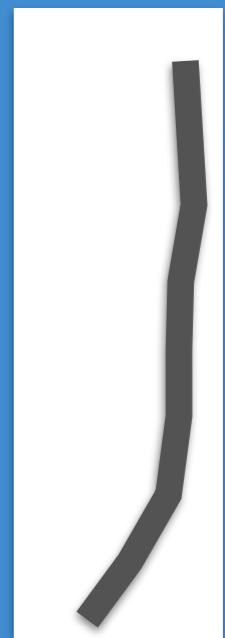


Rupture

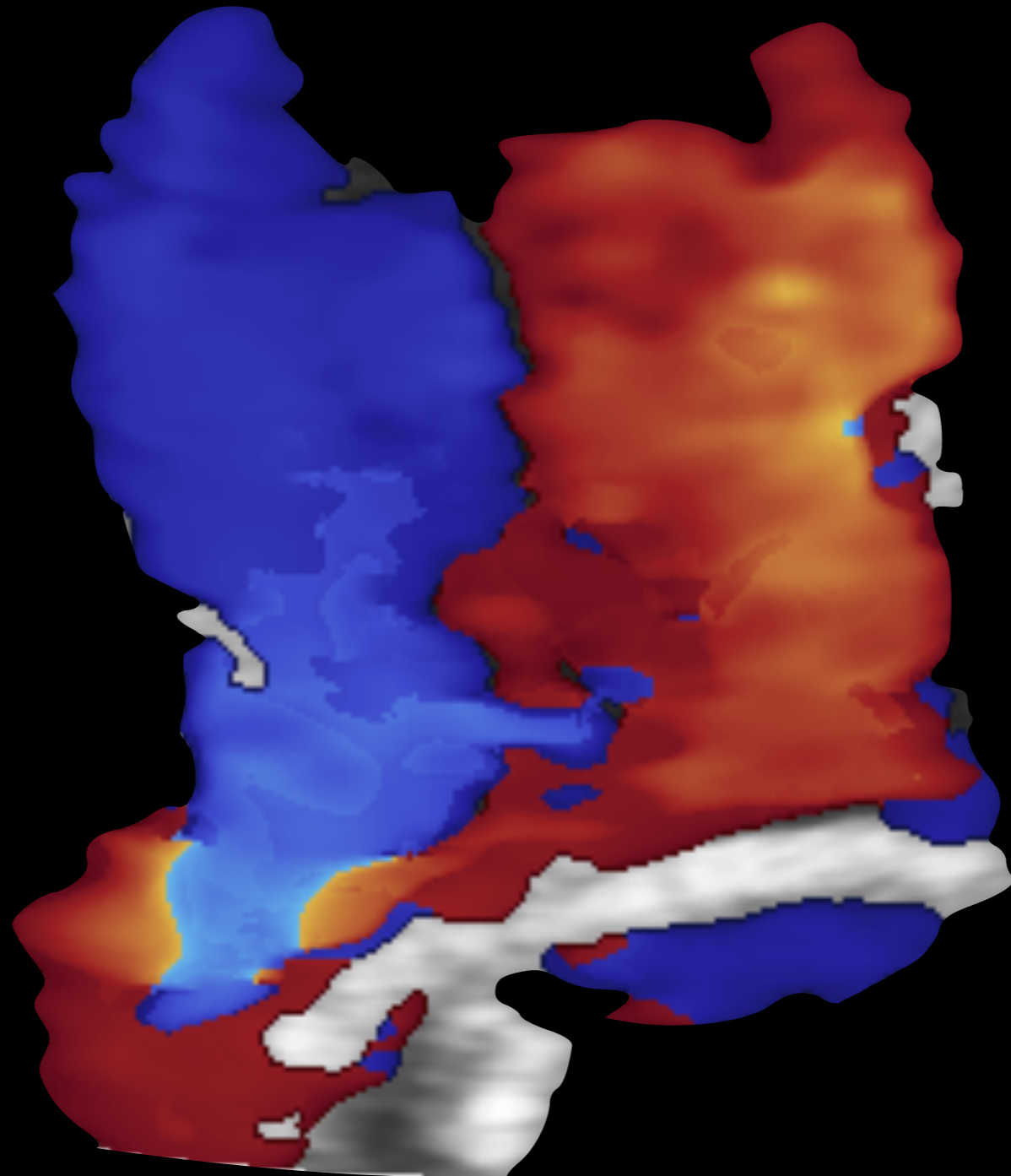
Obstruction



Dissection



The best way to earn respect is to
consult for **definite treatment !!**



POCUS Academy

Let's transform EM practice



juice119@gmail.com

FB: Emergency Ultrasound Training Center

