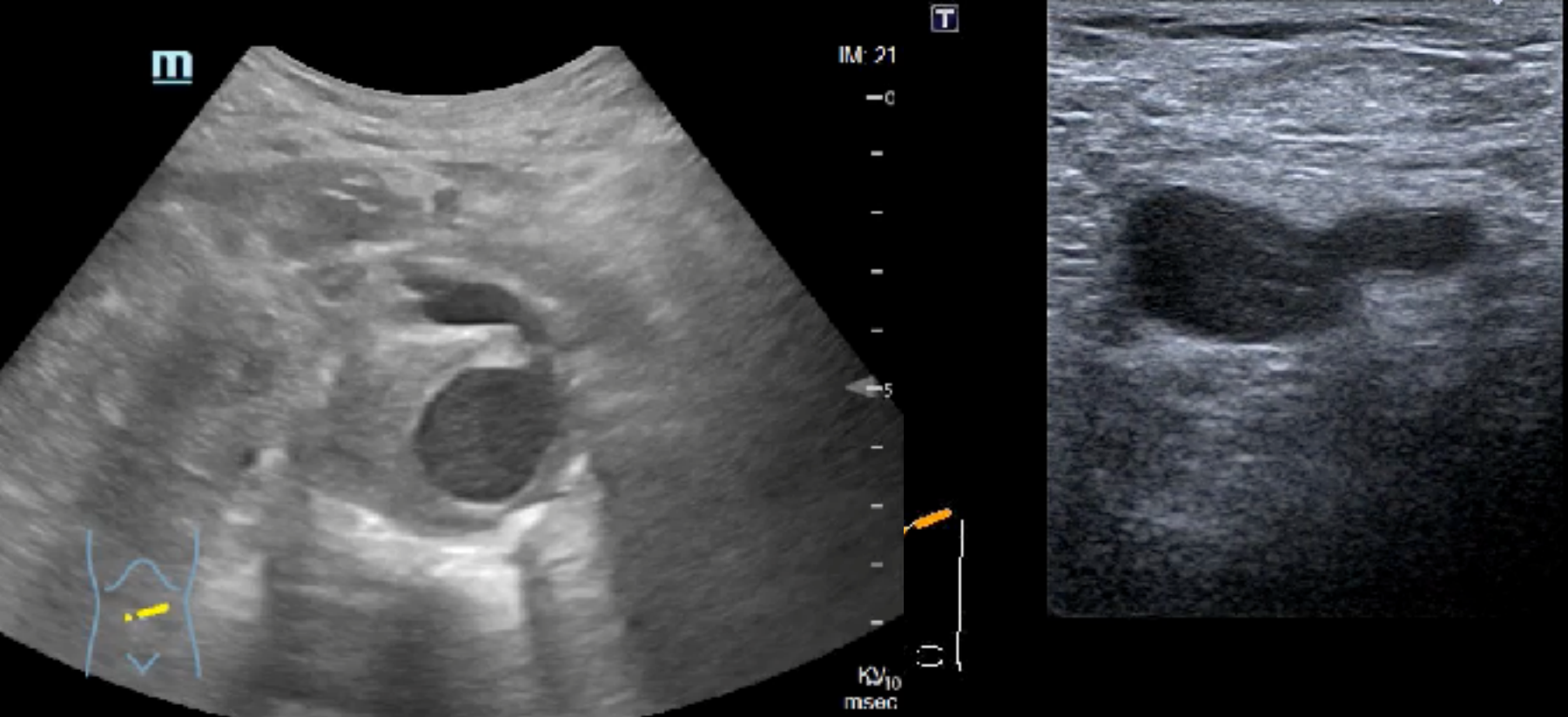




VASCULAR SURVEY & EMERGENCIES

陳國智醫師 雙和醫院急診醫學科

juice119@gmail.com

POCUSAcademy.com

Resuscitative
急救復甦

Diagnostic
臨床診斷

Procedural
Guidance
處置導引

Symptom- or
Sign-Based
症狀導引

Therapeutic
輔助治療



Core Applications (2023 ACEP Emergency Ultrasound Guidelines)
15項急診超音波核心應用

陳國智醫師

Aorta

DVT

Trauma

Thoracic/Airway

Cardia/HD assessment

Procedural Guidance

US-guided NB

Testicular

Ocular

Skin & Soft tissue

Hepatobiliary

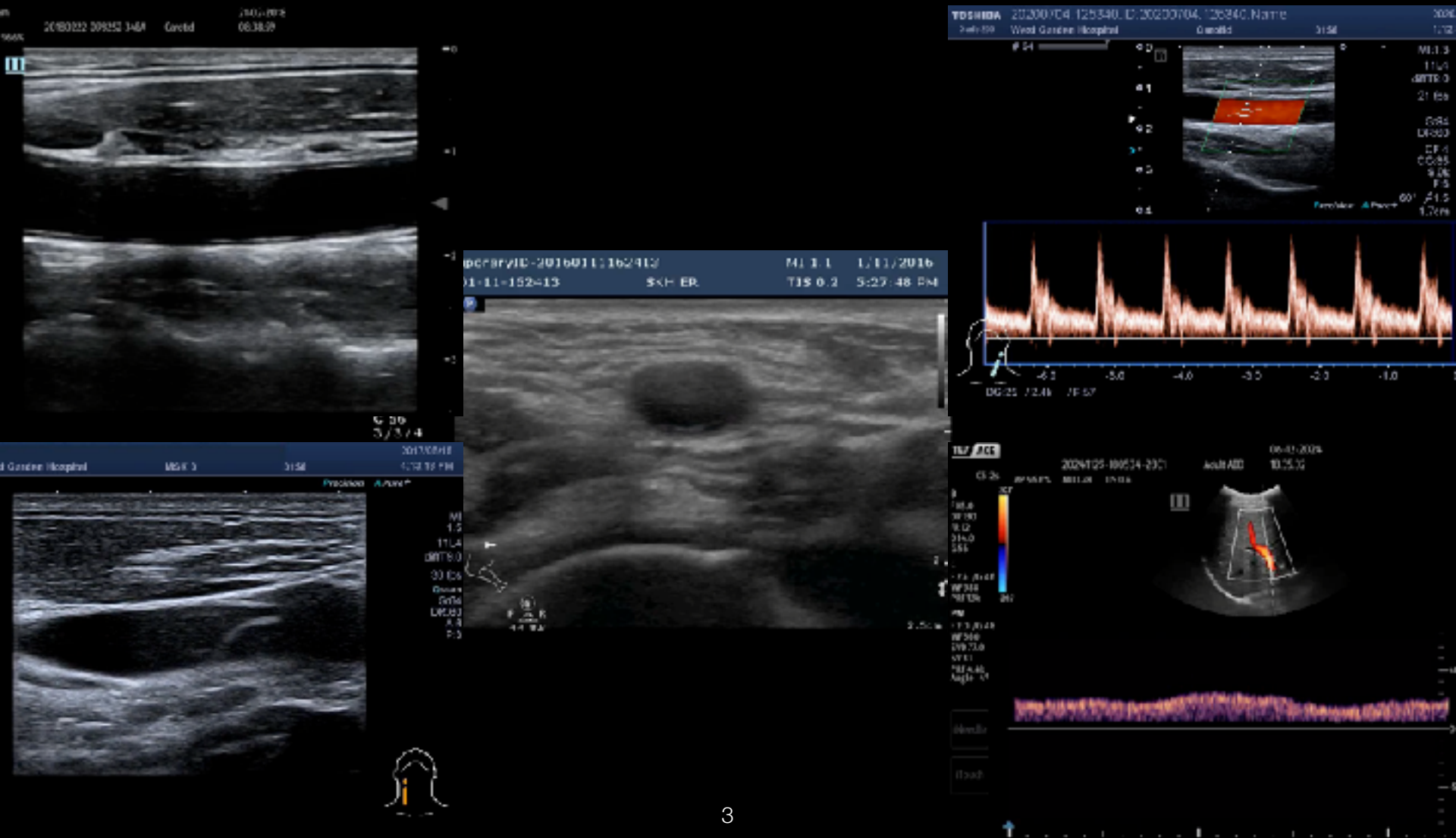
Urinary tract

Pregnancy

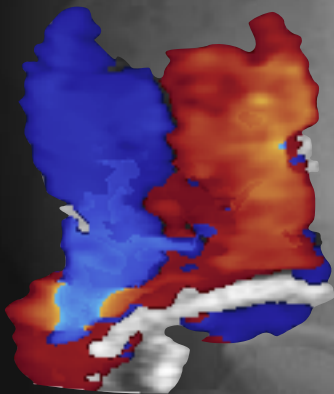
Bowel

MSK

ARTERY / VEIN



64M,
左下腹痛
1小時
冒冷汗
結石病史

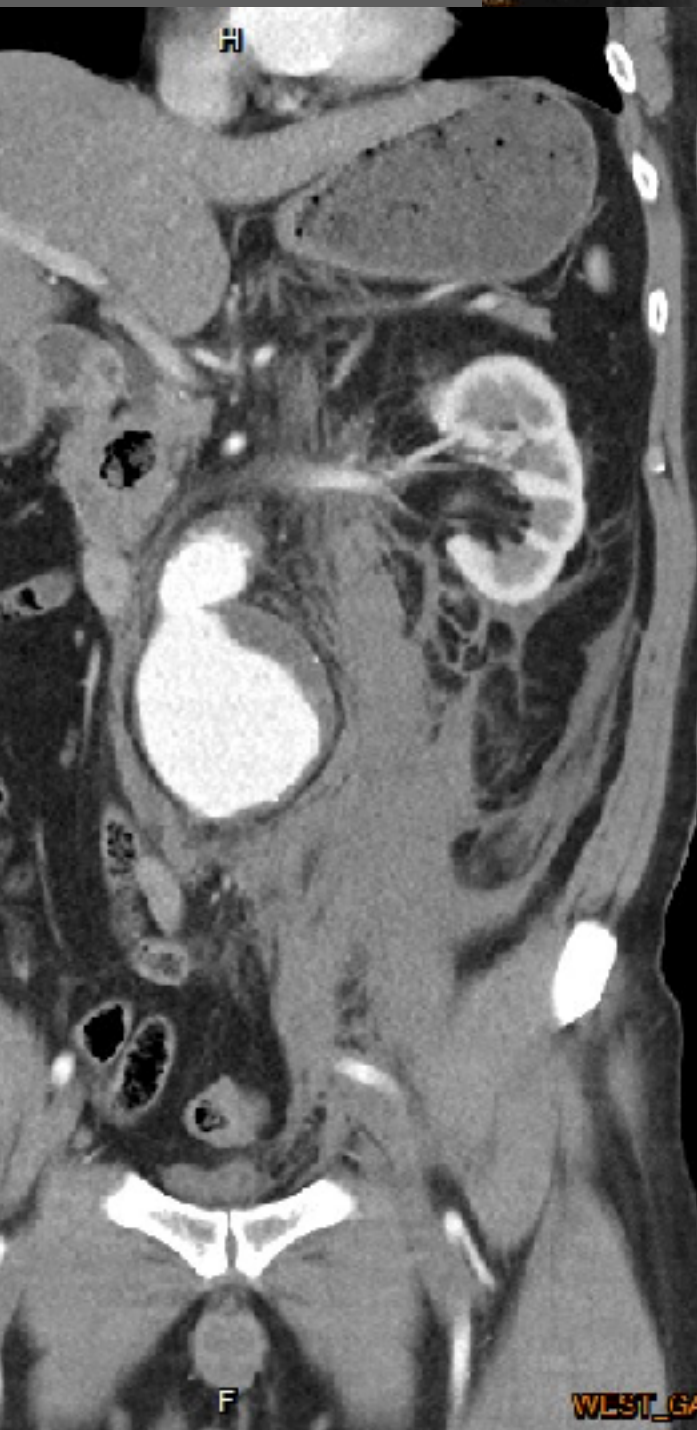


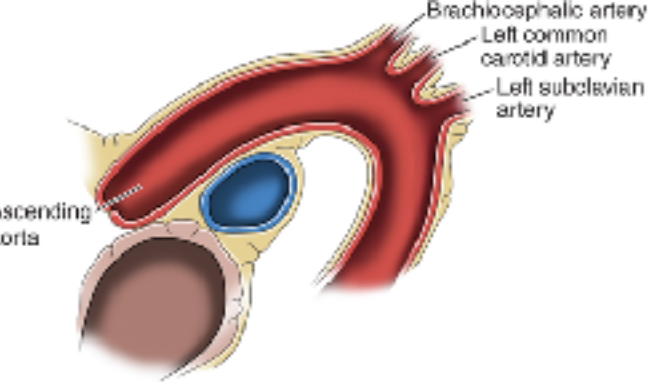
腰痛＋冒冷汗，
我的病人可能是主動脈瘤破裂？

PR 117
BP
88/62

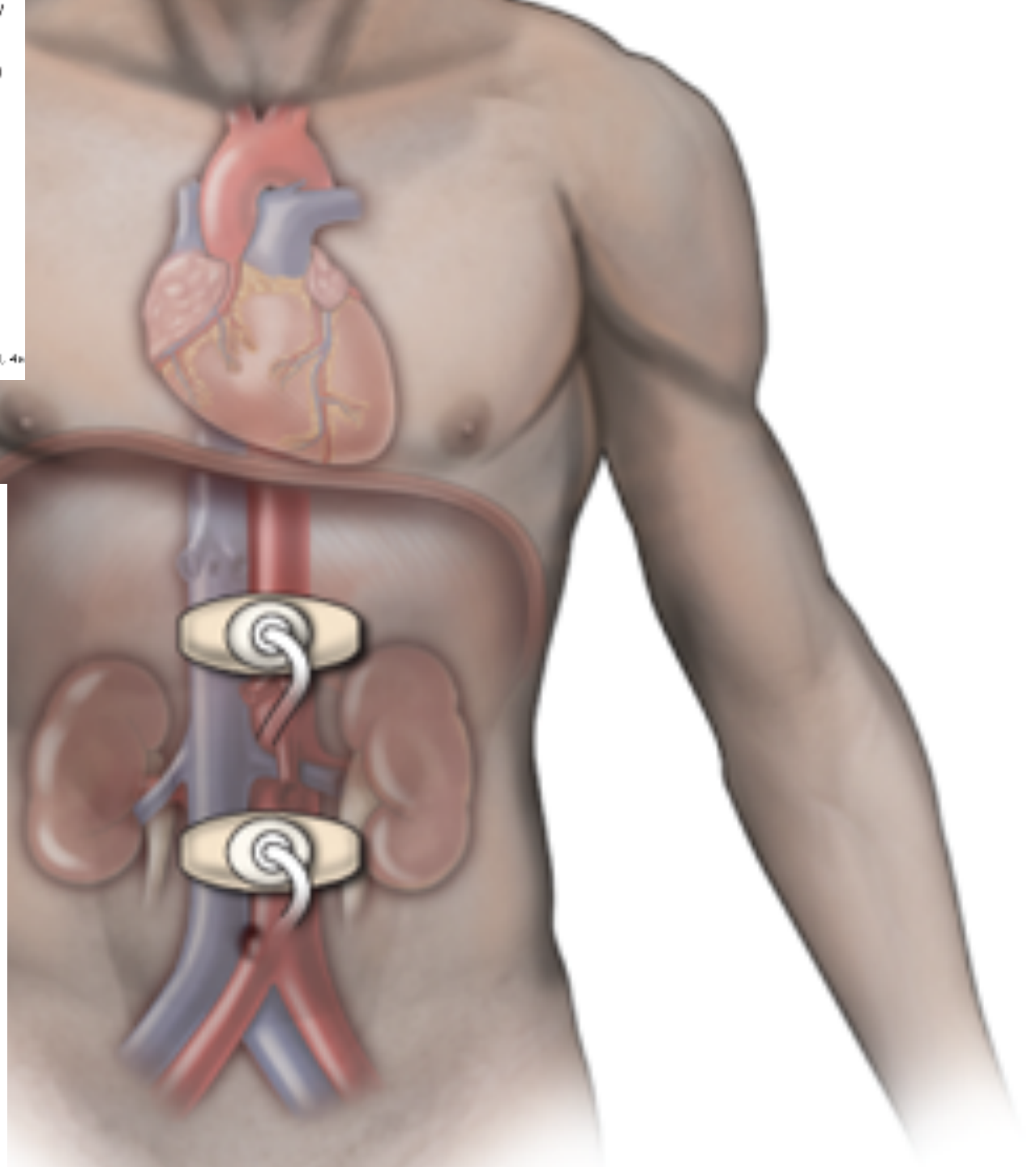
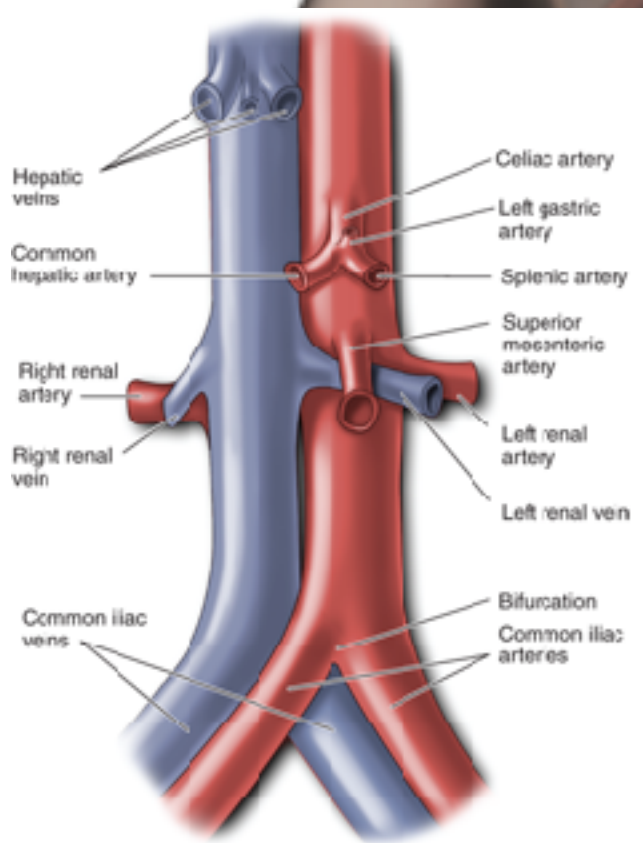




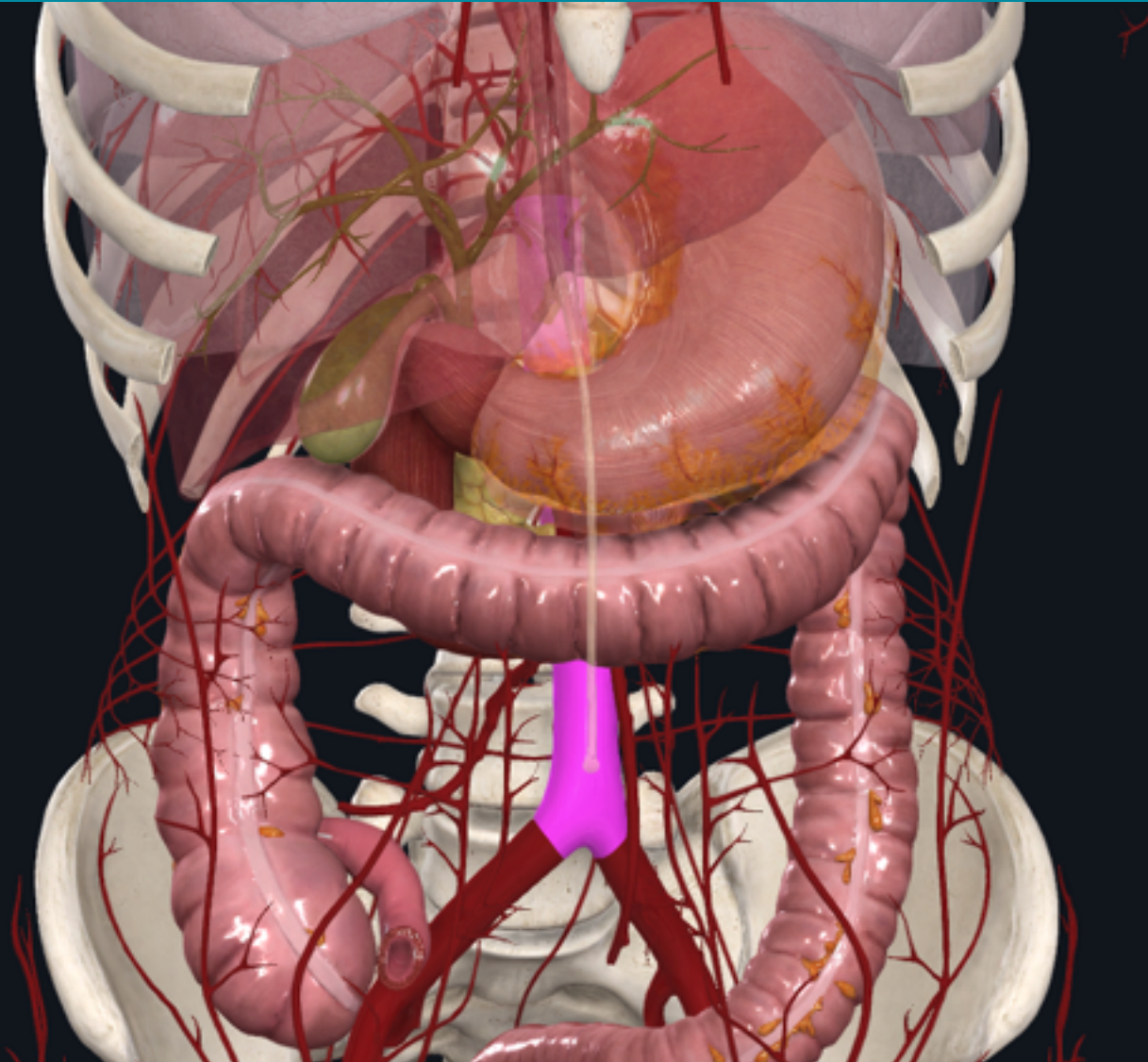




Source: G. John Ho, James R. Houser, Robert E. Beardon, Donald V. Pyers, Berry S. Knapp, Andrew S. Lasterbach: Ho and Valeri's Emergency Ultrasound, 4e. Copyright © McGraw-Hill Education. All rights reserved.



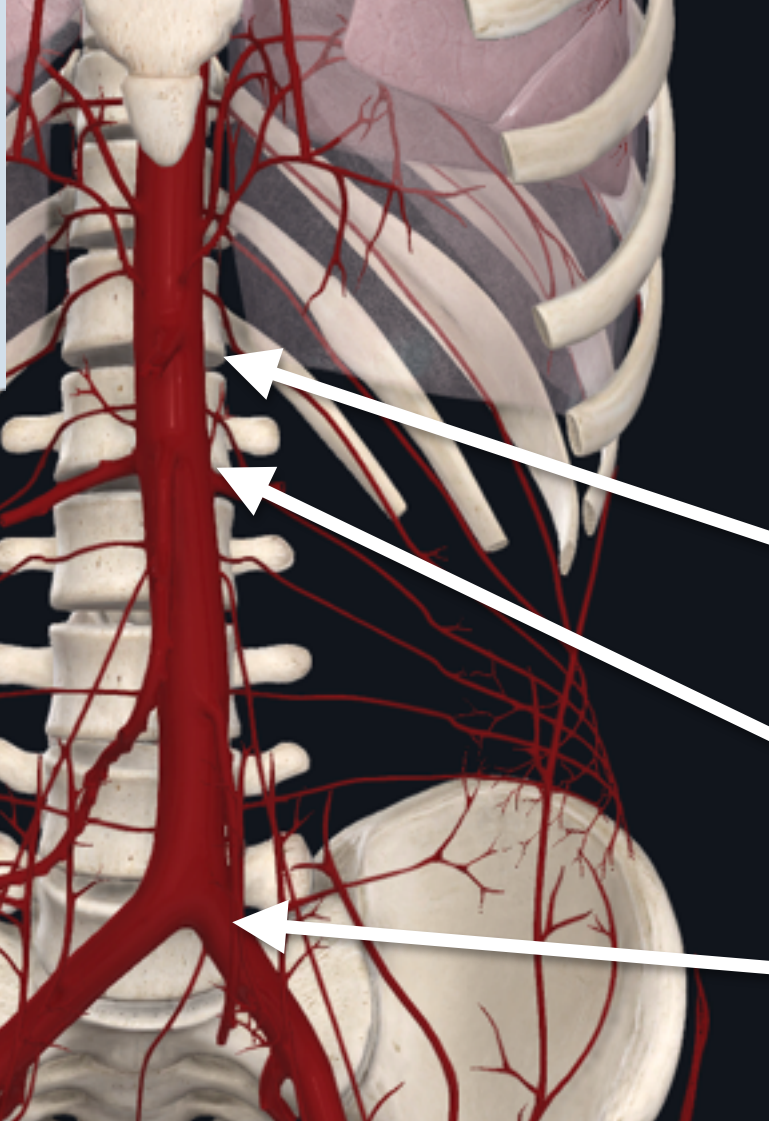
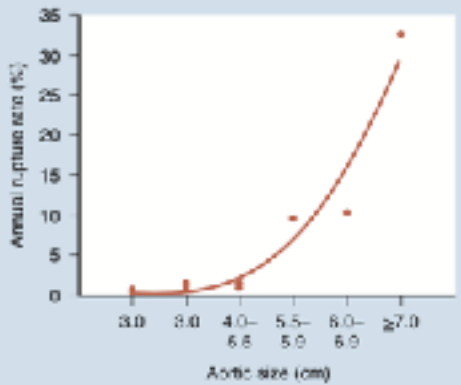
ABDOMINAL AORTA



Pain
Shock

AAA

AORTA

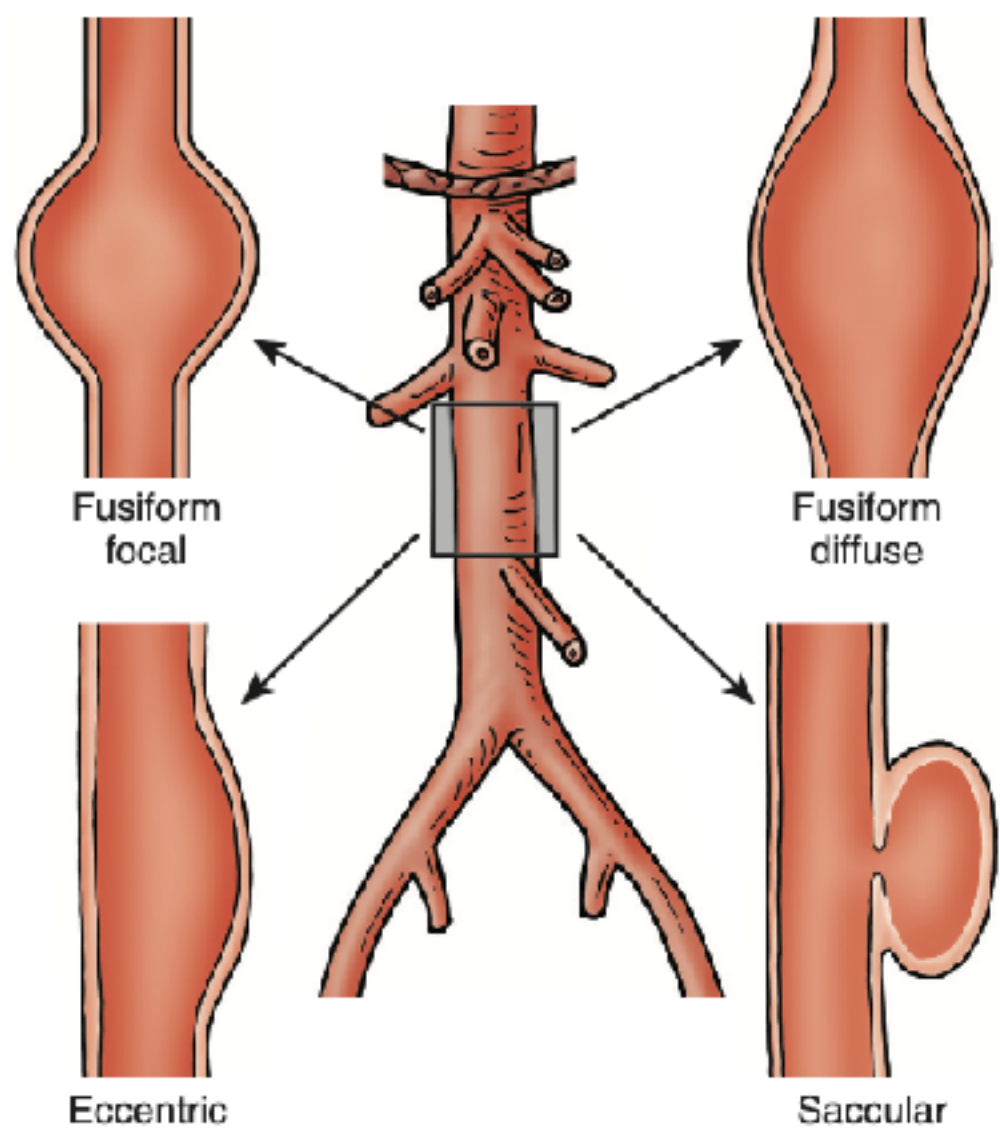
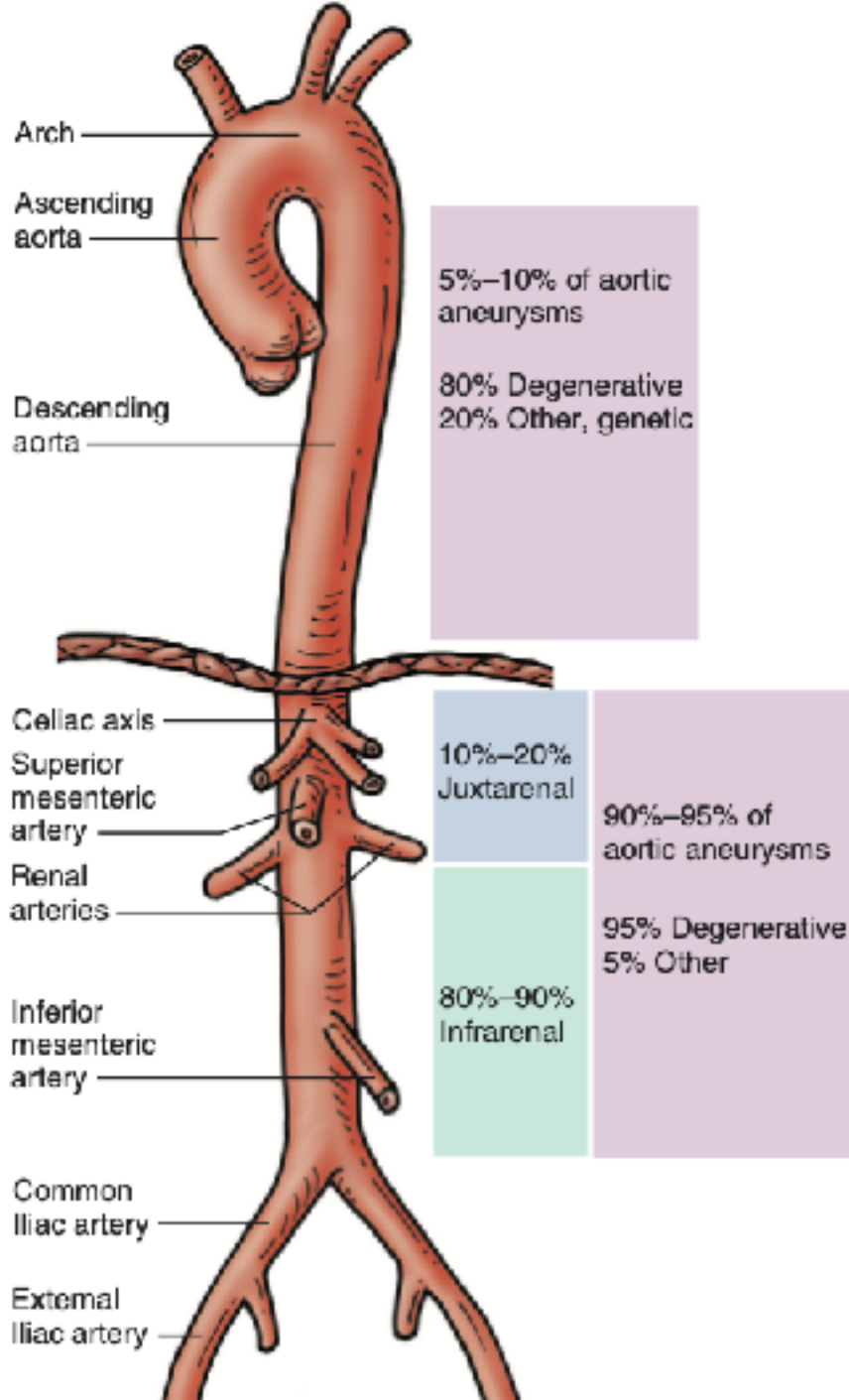


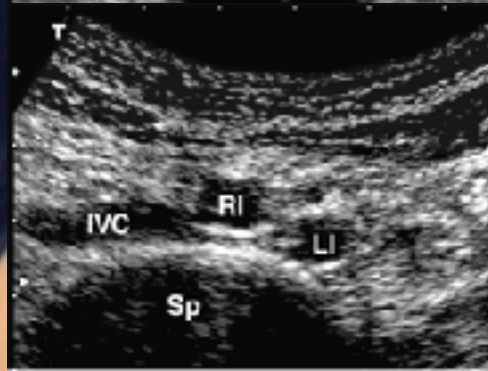
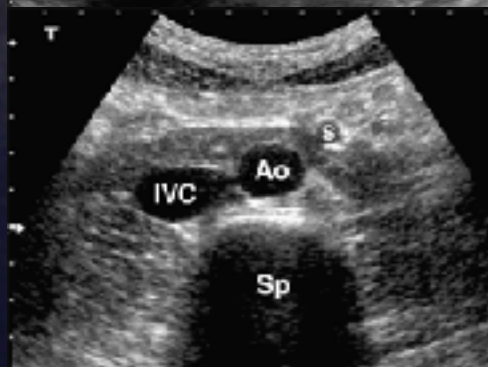
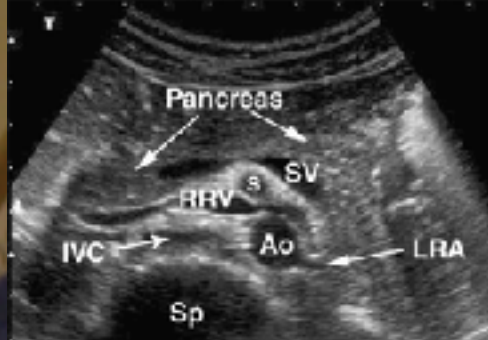
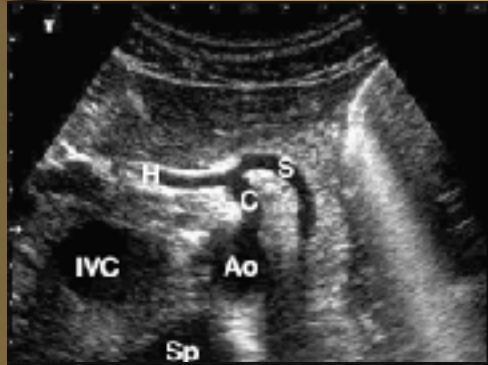
**Abdominal
Aorta (3cm)**

Celiac trunk

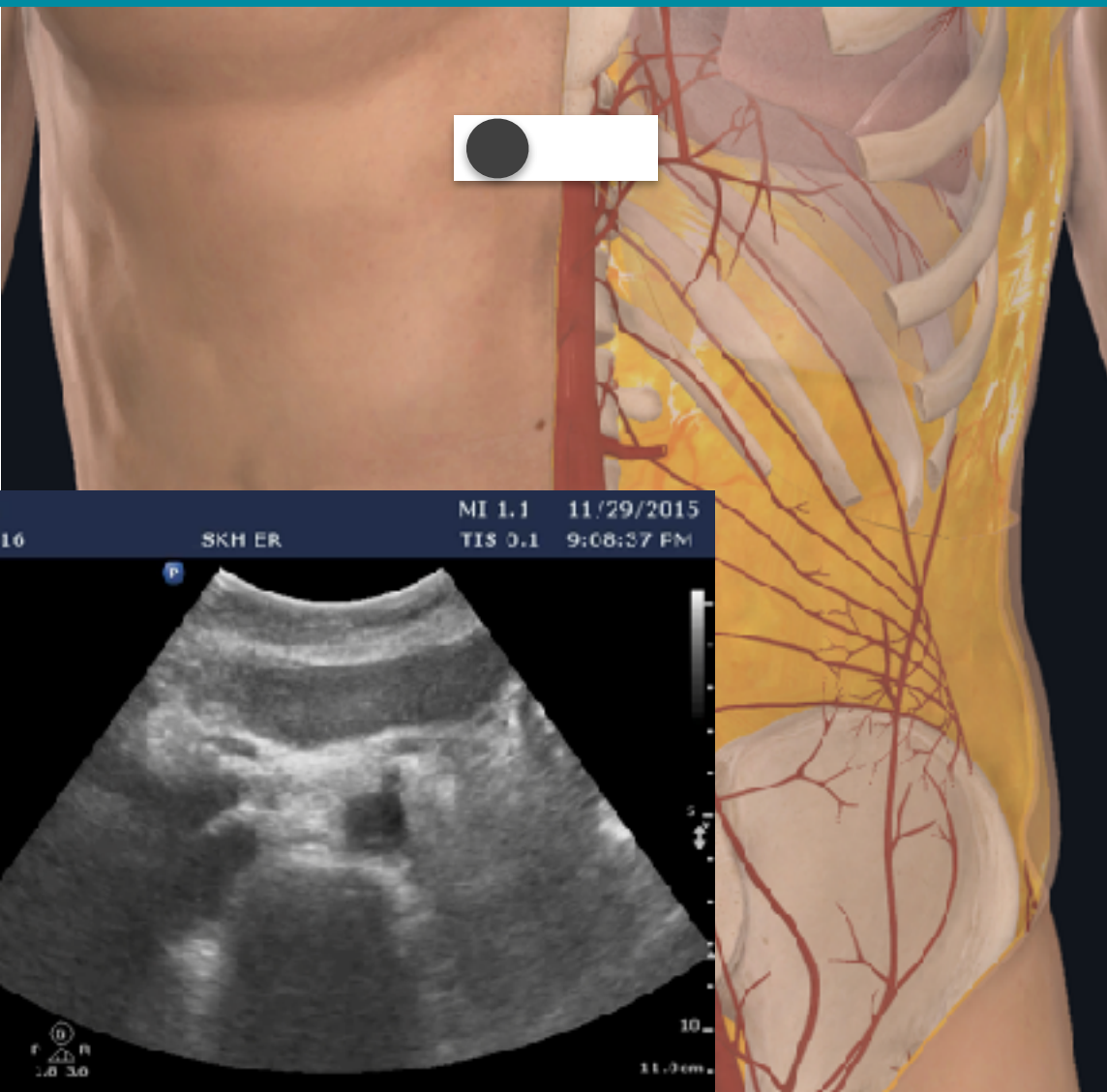
SMA

Bifurcation



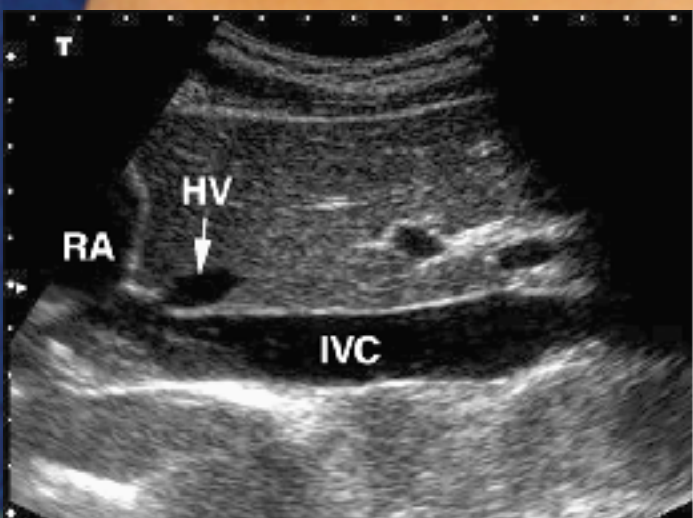
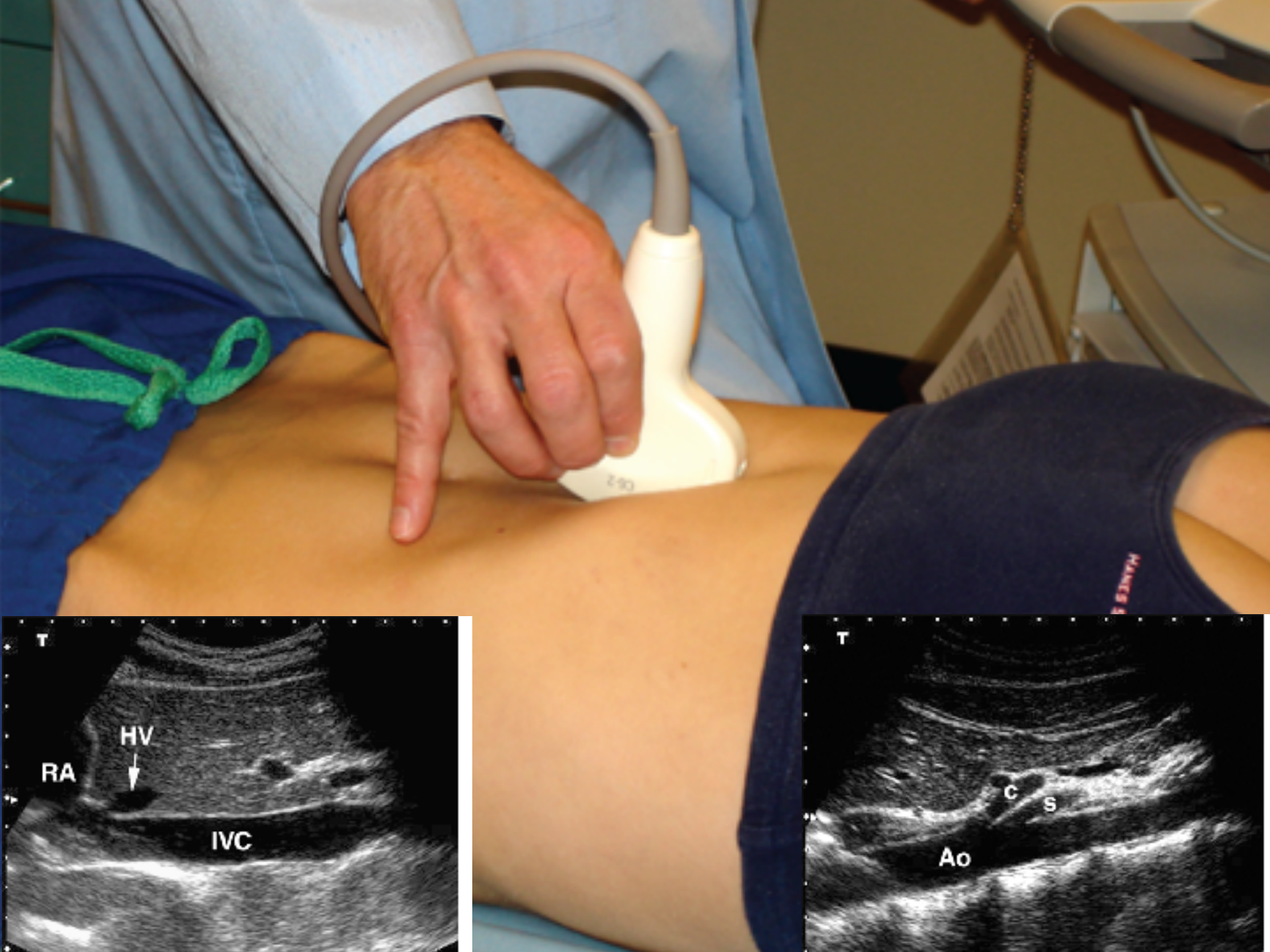


ABDOMINAL AORTA

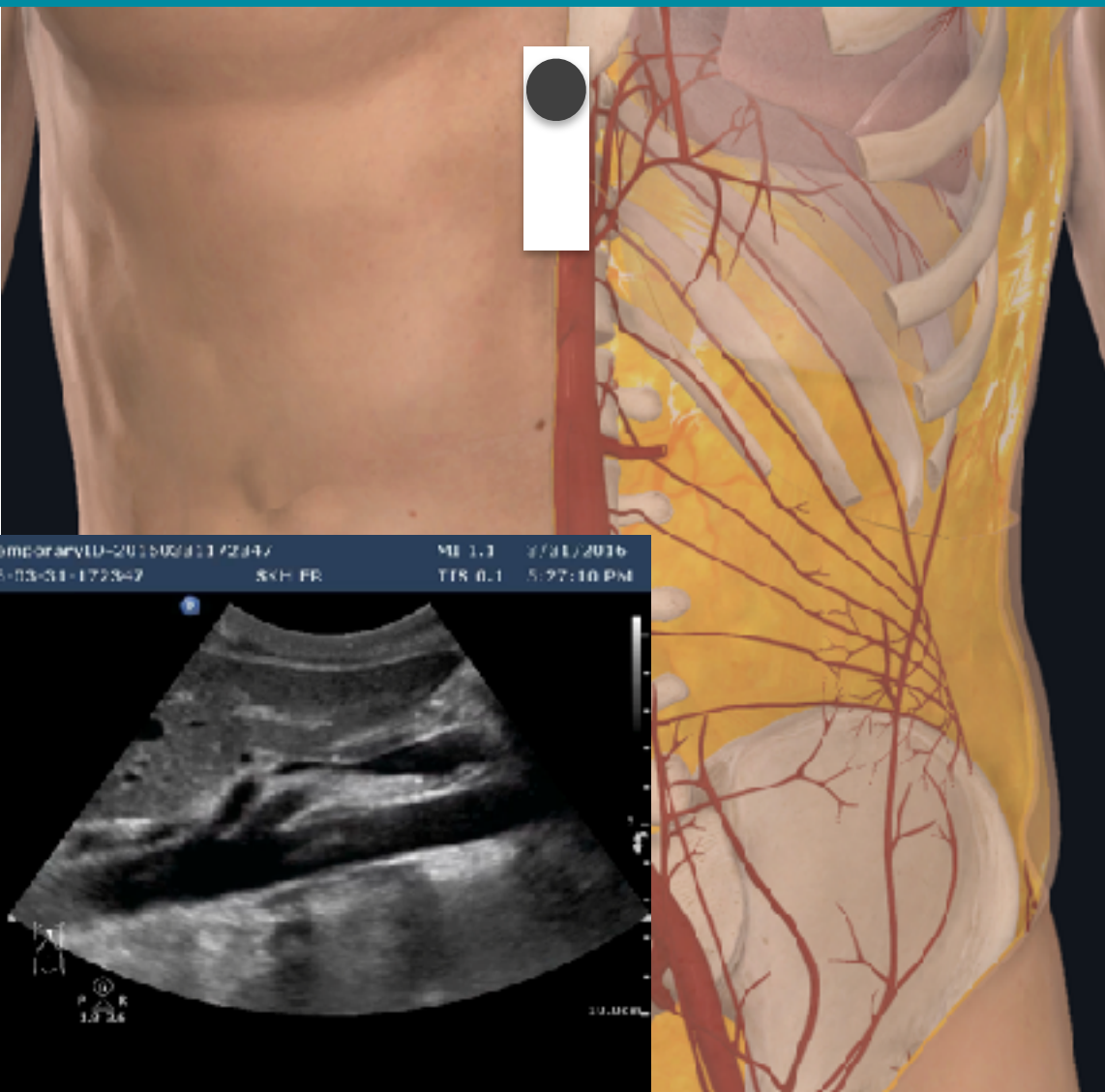


探頭: 弧形

位置: 劍突下



ABDOMINAL AORTA



探頭: 弧形

位置: 劍突下

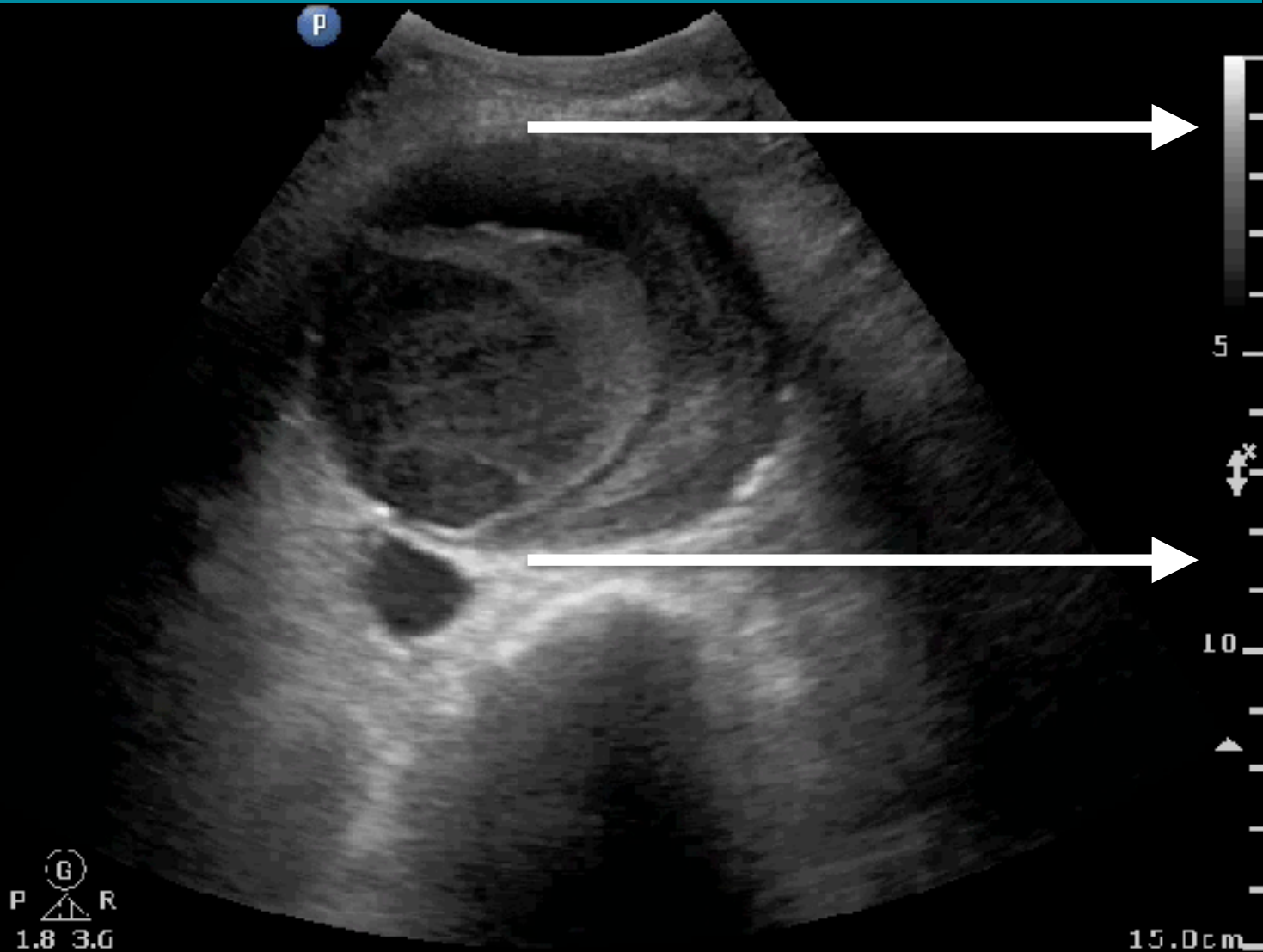


AAA: EYEBALLING

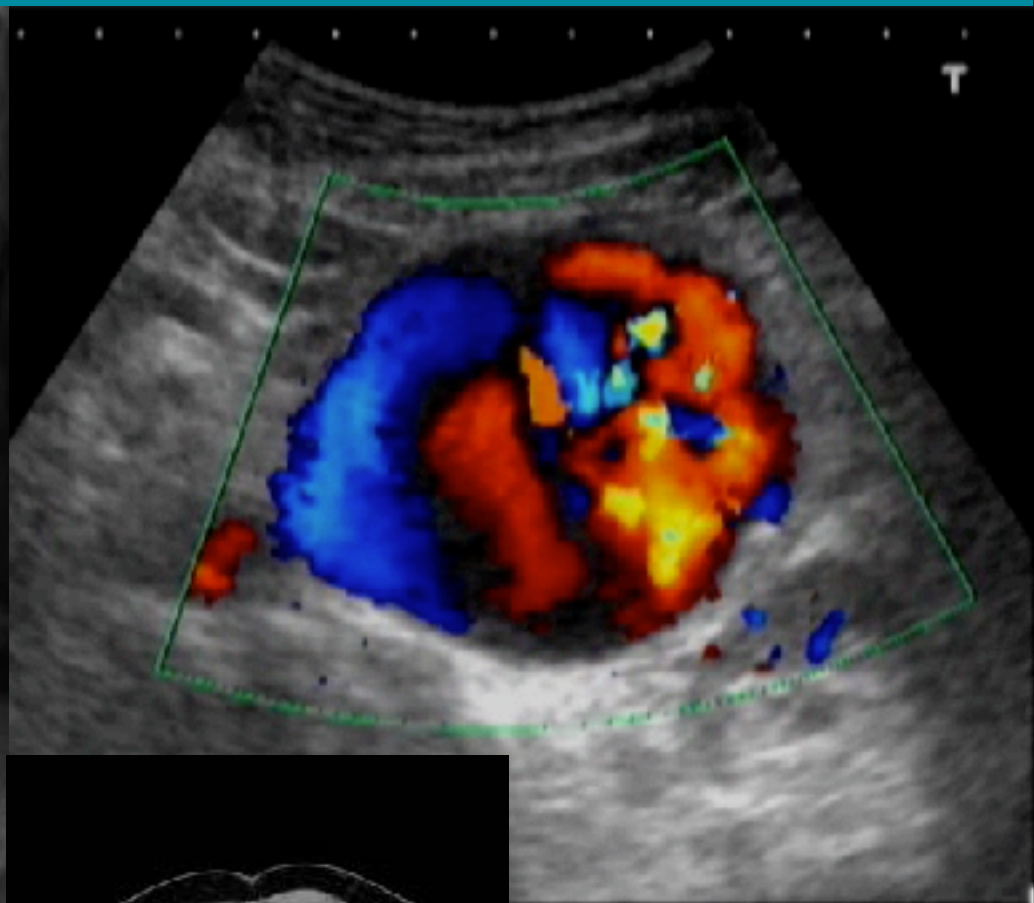
Abd Gen
Ch-1
34 Hz
15.0cm

2D

HGen
Gn 57
C 56
3/3/3

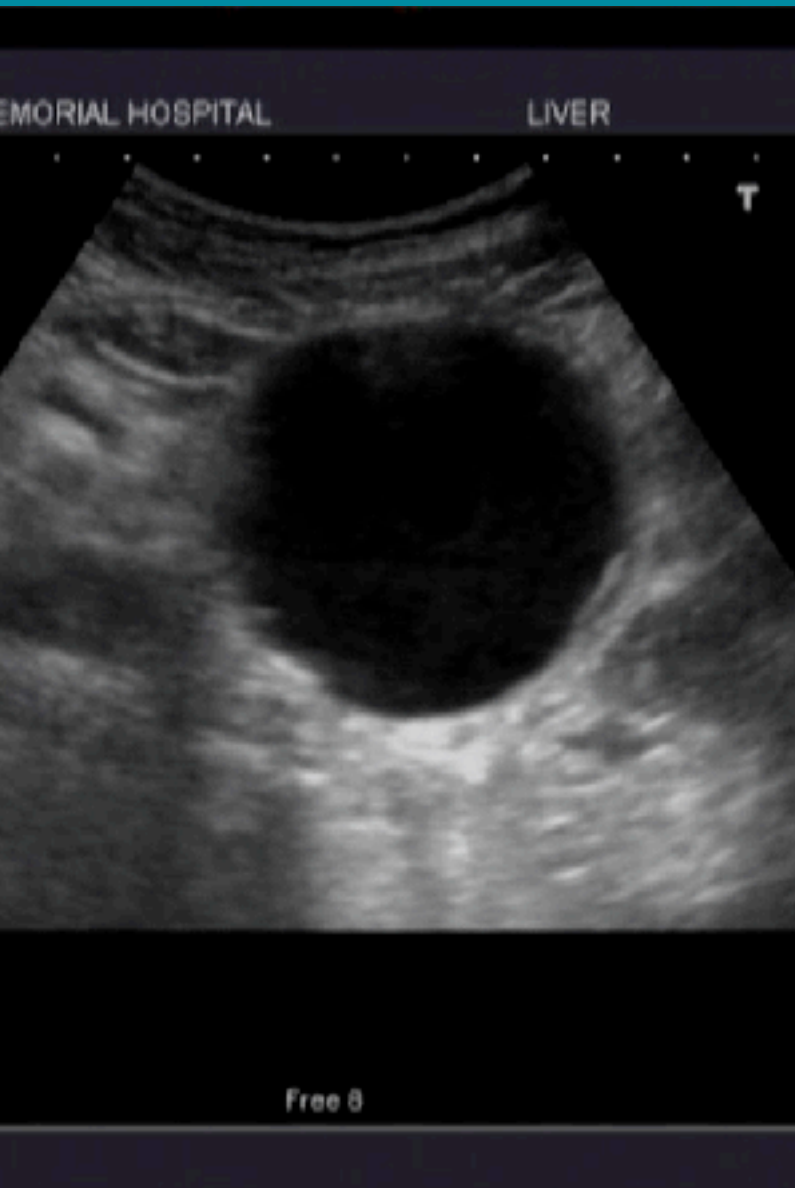


59M WITH HEMATURIA & L FLANK PAIN



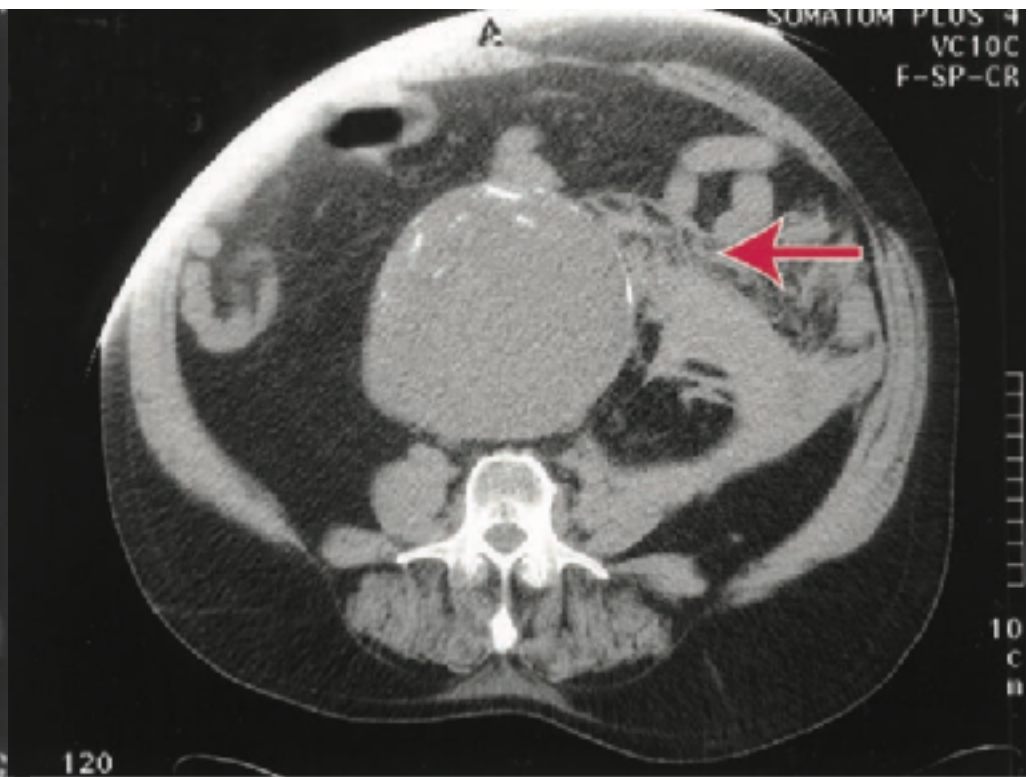
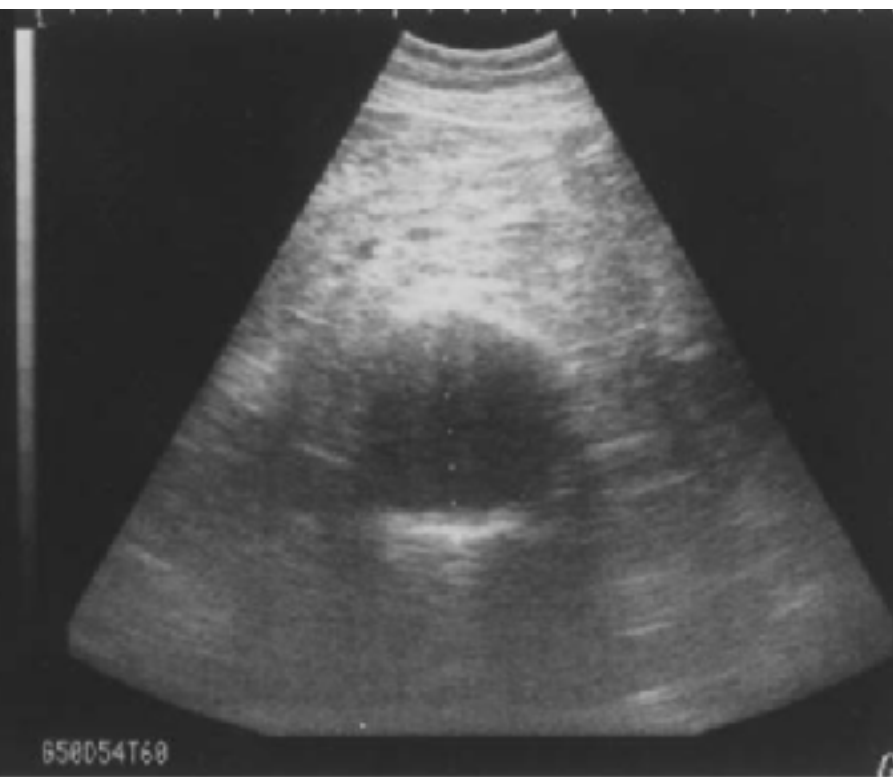
SELECT

RUPTURED AAA ?



ECHO FOR AAA(> 3CM)

Not for rupture or AD

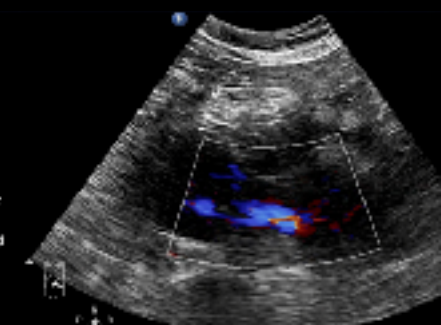
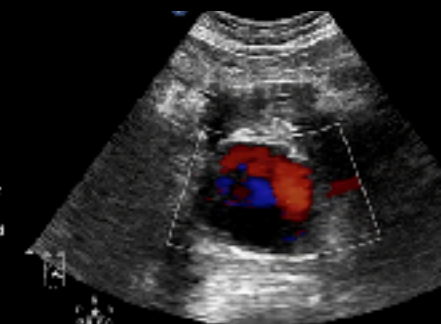
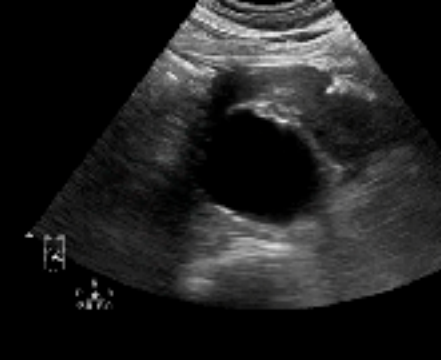




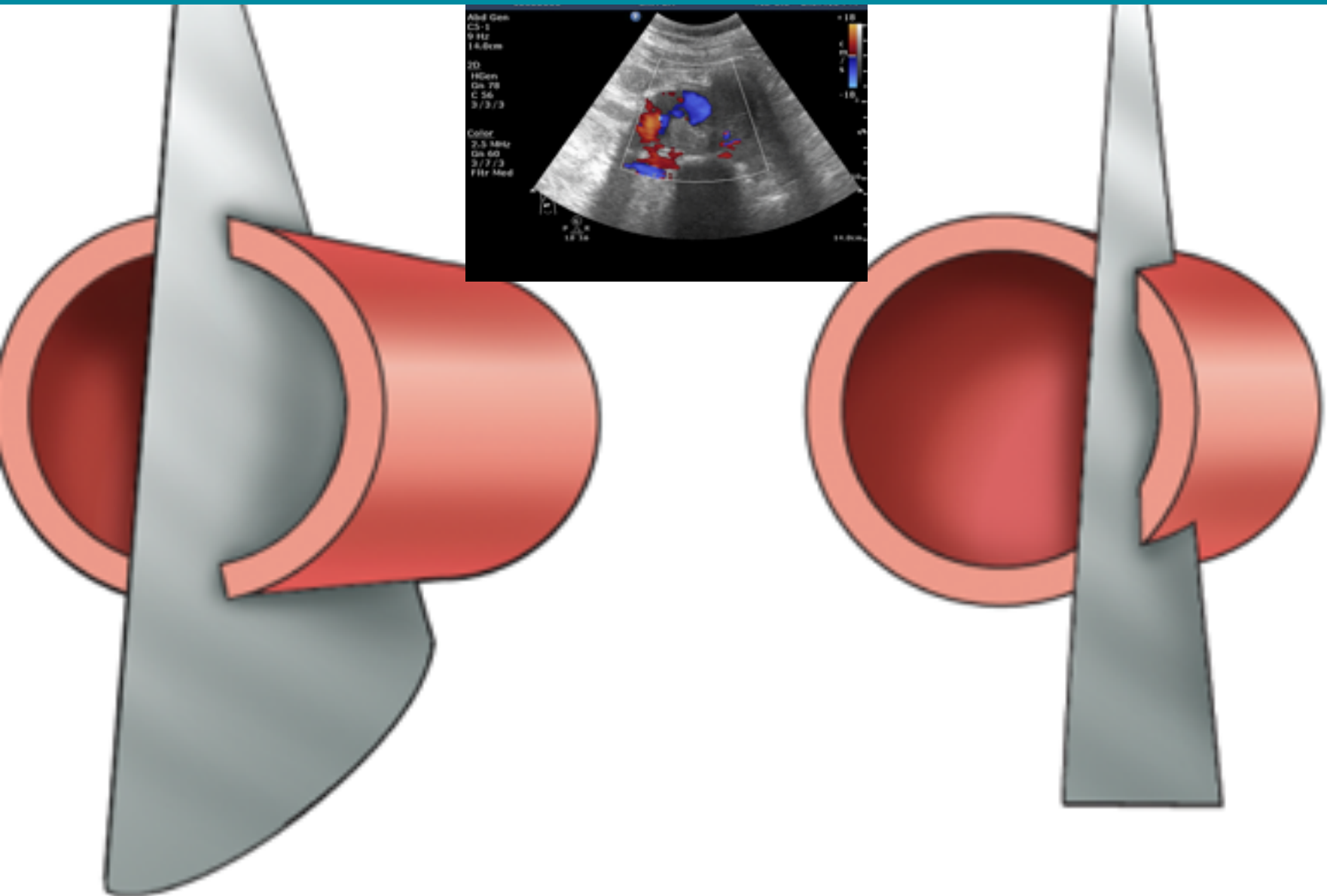
76M
abdominal pain



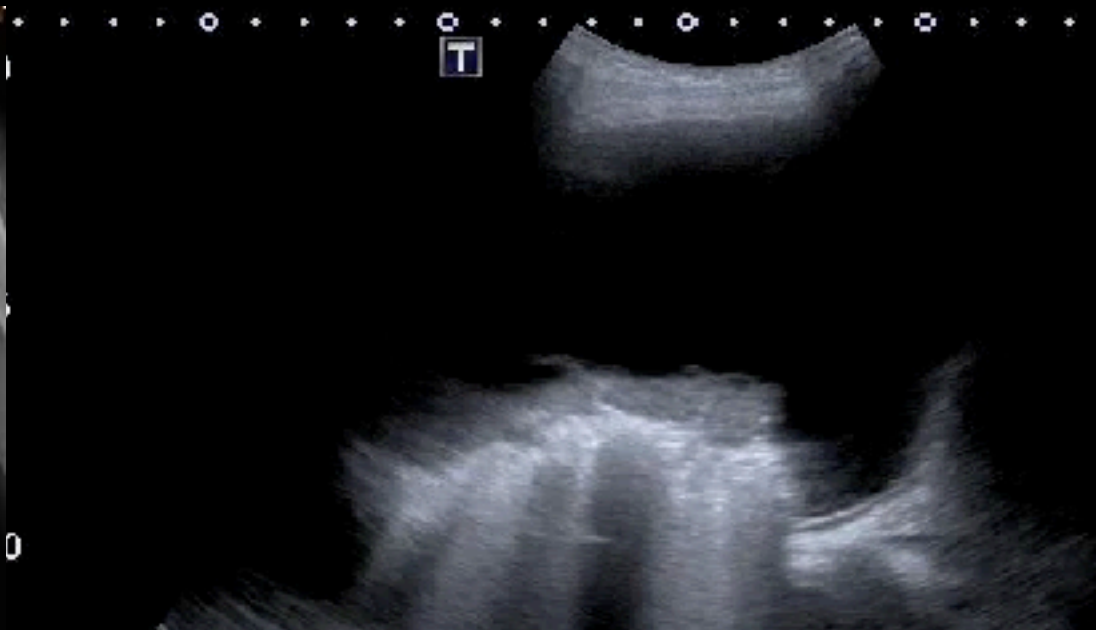
78M / AAA s/p
abdominal pain

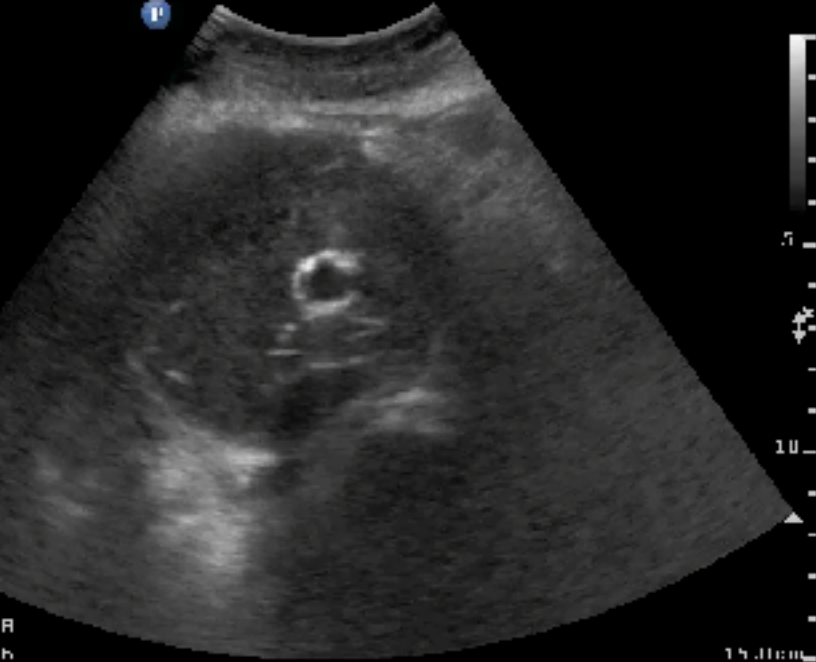


THE CYLINDER TANGENT EFFECT

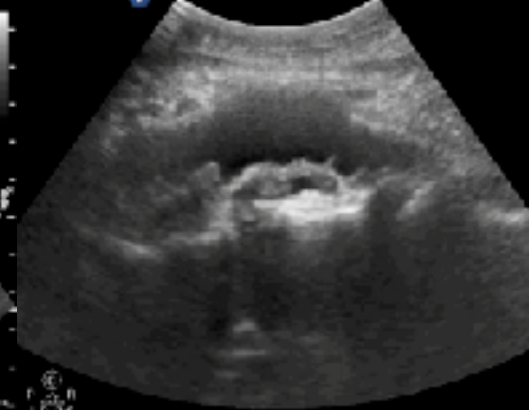


80M, FEVER FOR ONE WEEK

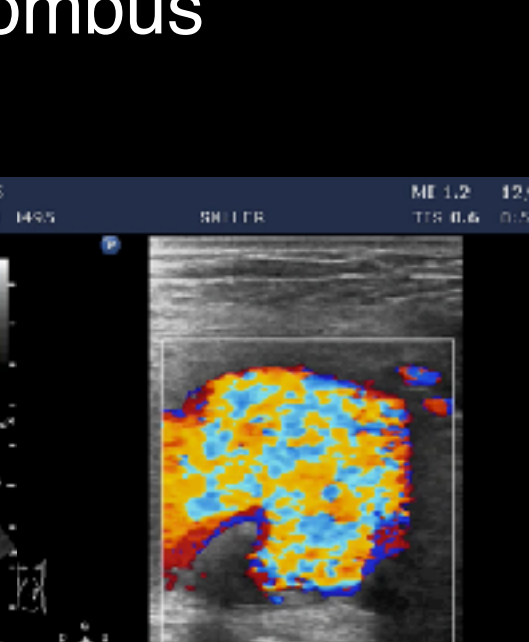
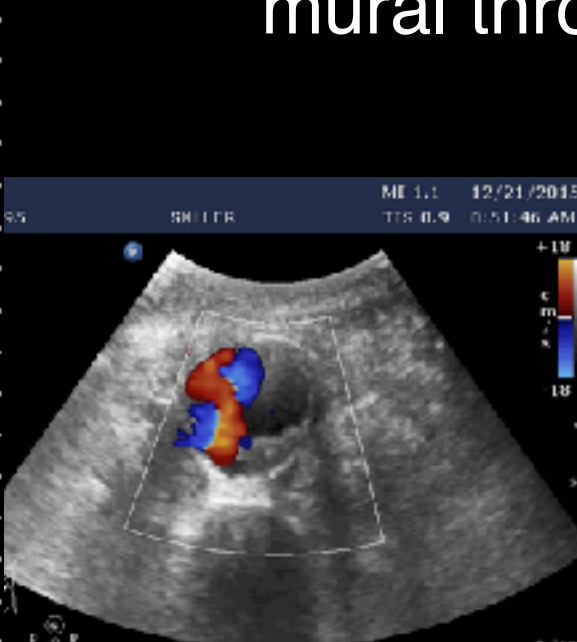




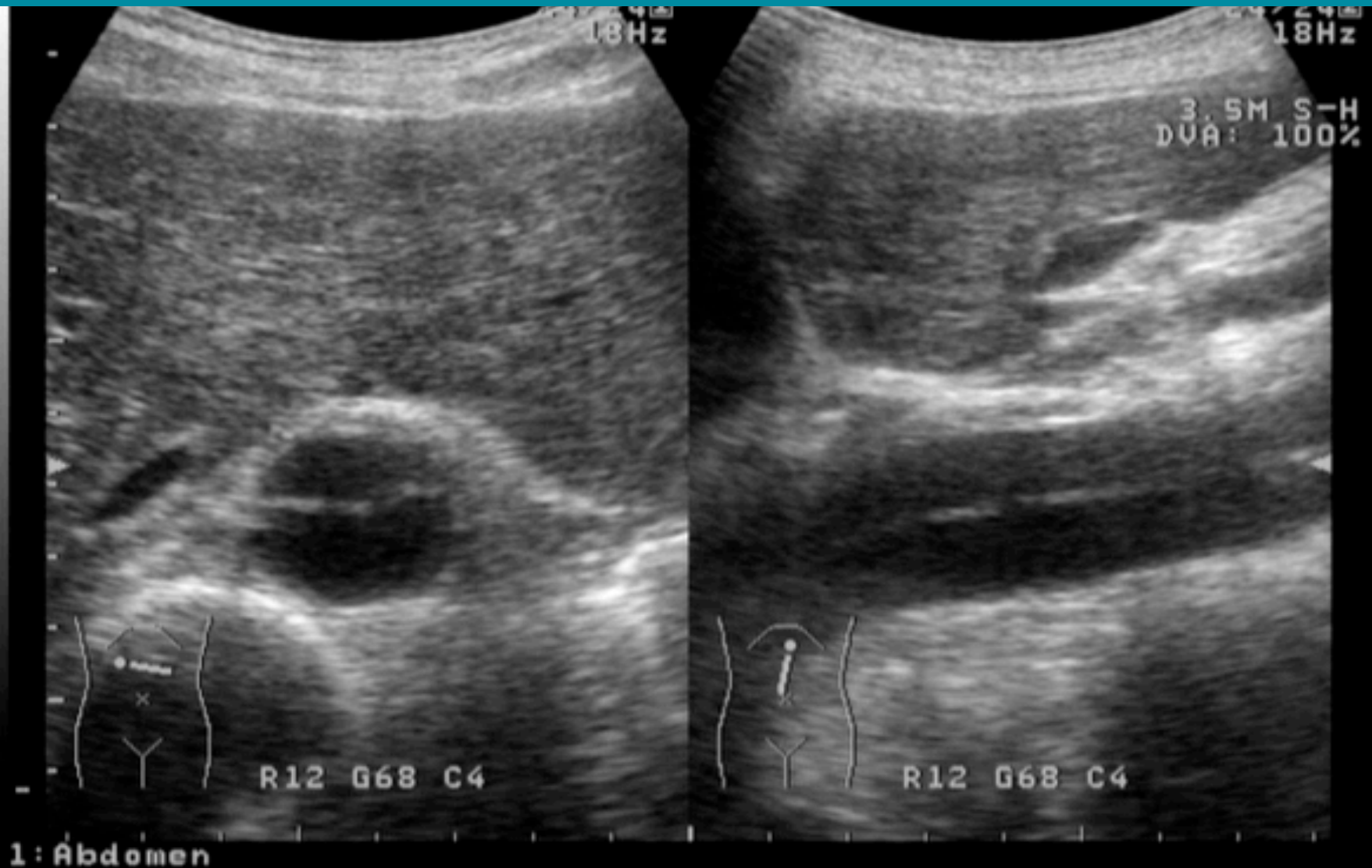
AAA s/p



Abdominal aorta
mural thrombus



AAA ?

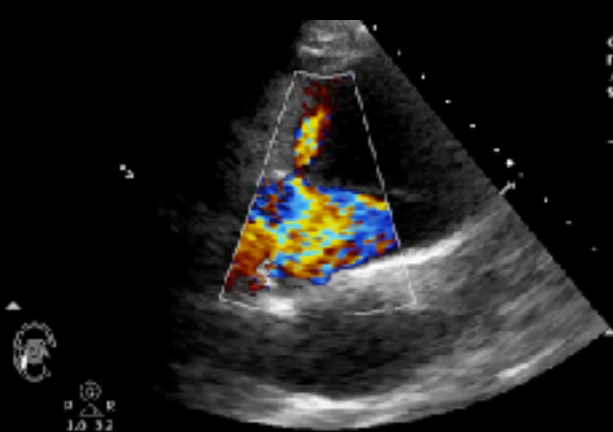
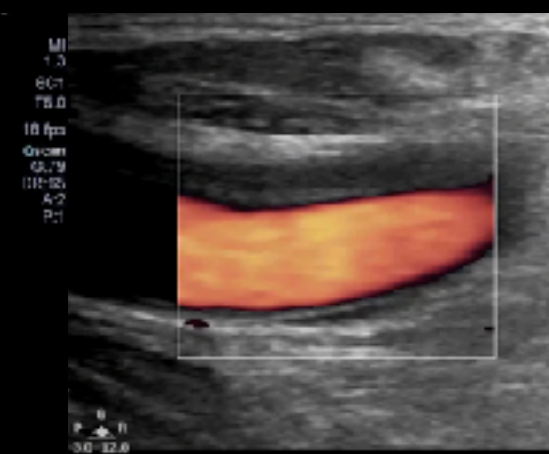
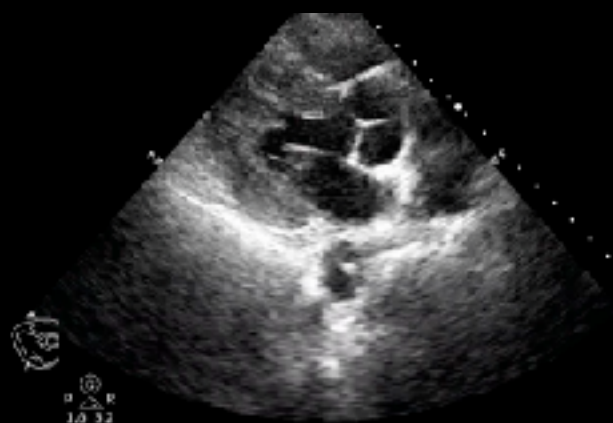
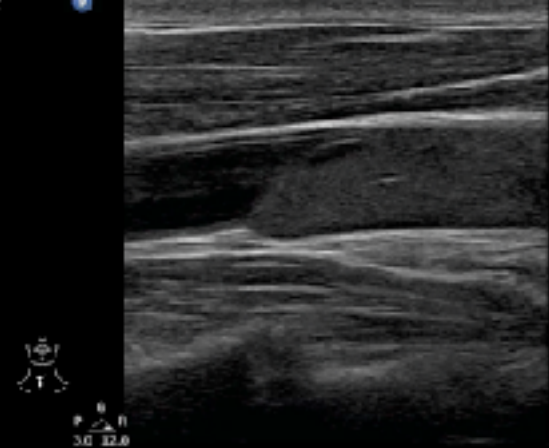
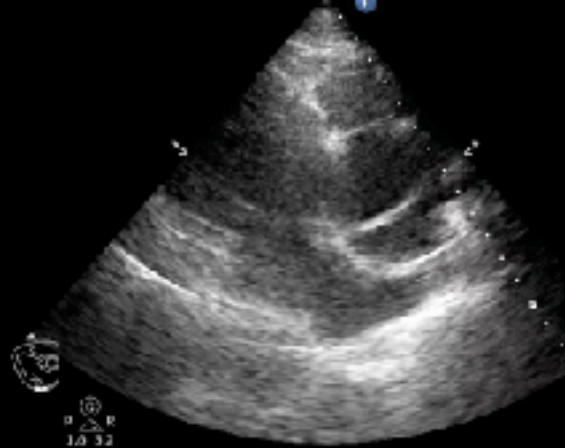


該懷疑AD的情境

TABLE 59-1

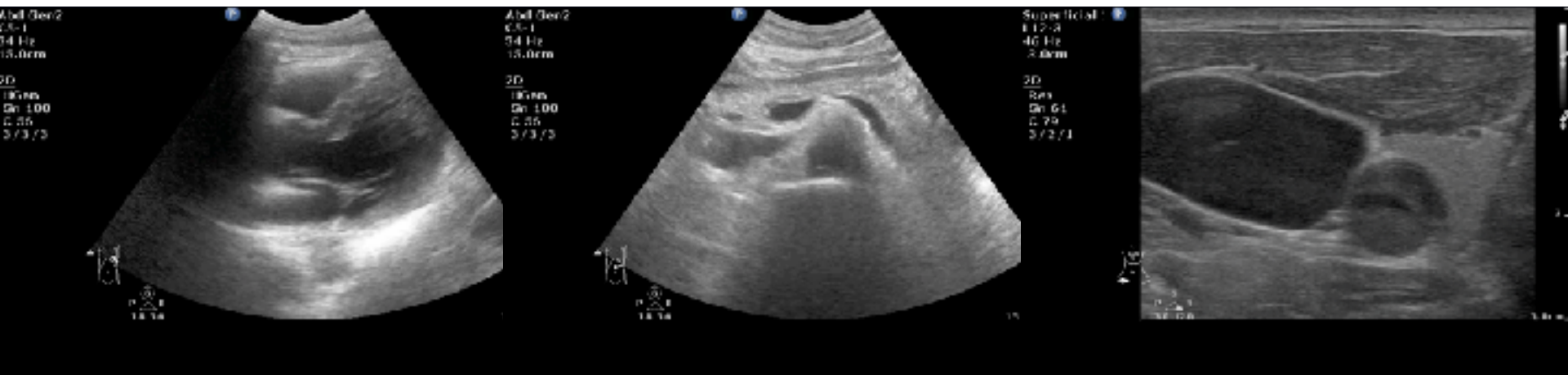
Acute Aortic Dissection: Features From the International Registry of Acute Aortic Dissection

Category 1: Underlying Condition	Category 2: Pain in Chest, Back, or Abdomen	Category 3: Abnormal Examination
Marfan's syndrome Family history of aortic disease Aortic valvular disease Recent aortic manipulation Thoracic aortic aneurysm	Abrupt onset Severe in intensity Ripping or tearing	Pulse amplitude difference or systolic blood pressure differential in extremities Focal neurologic deficit and chest, back, or abdominal pain New murmur of aortic insufficiency and chest, back, or abdominal pain Shock or hypotension



懷疑AD時的POCUS:PAC

CTA仍是最重要的檢查



Pericardium

ABD Aorta

CCA

小心Mirror artifact

Abd Gen
C5-1
29 Hz
19.0cm

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



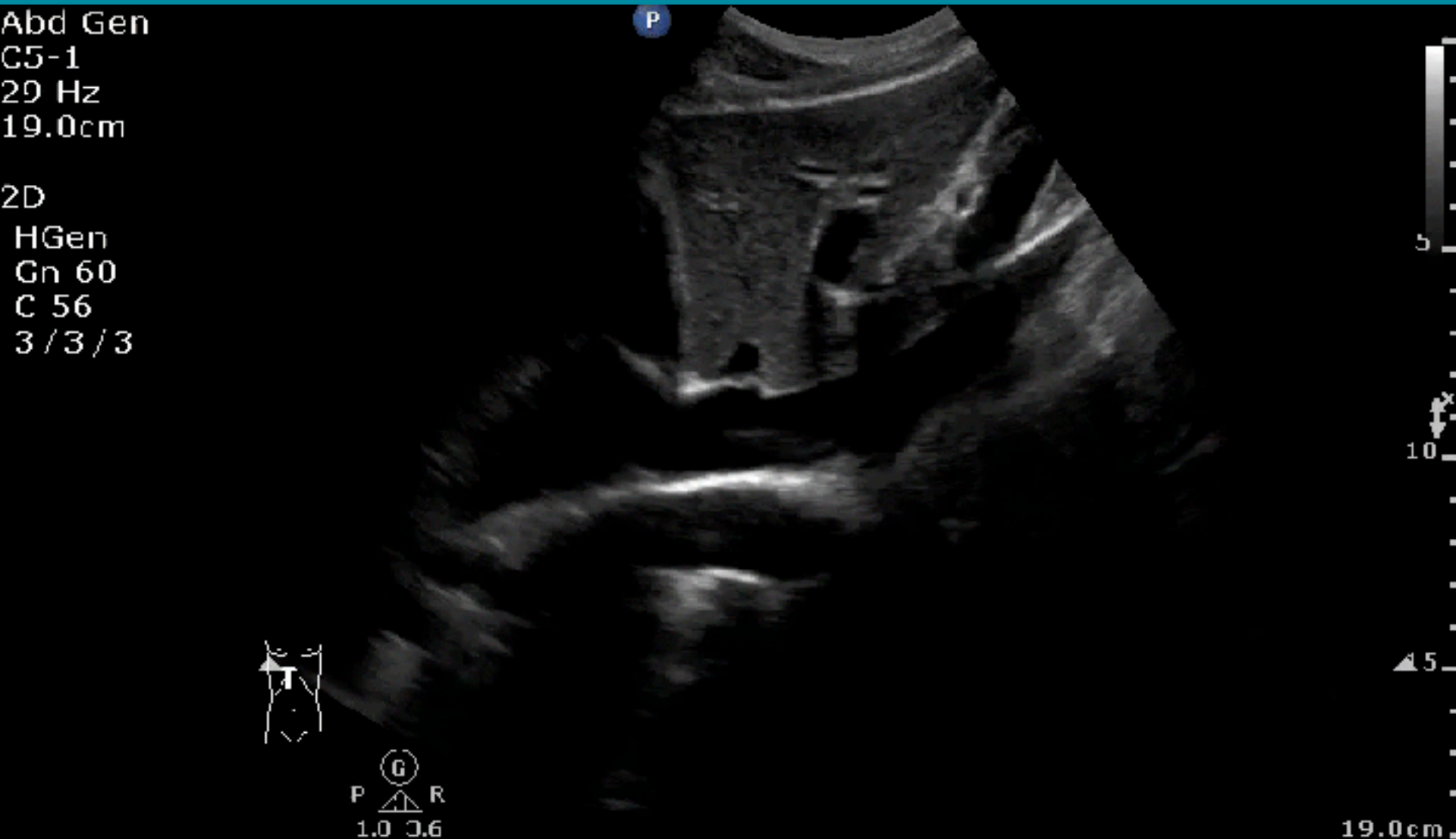
G
P R
1.0 3.6

5

10

5

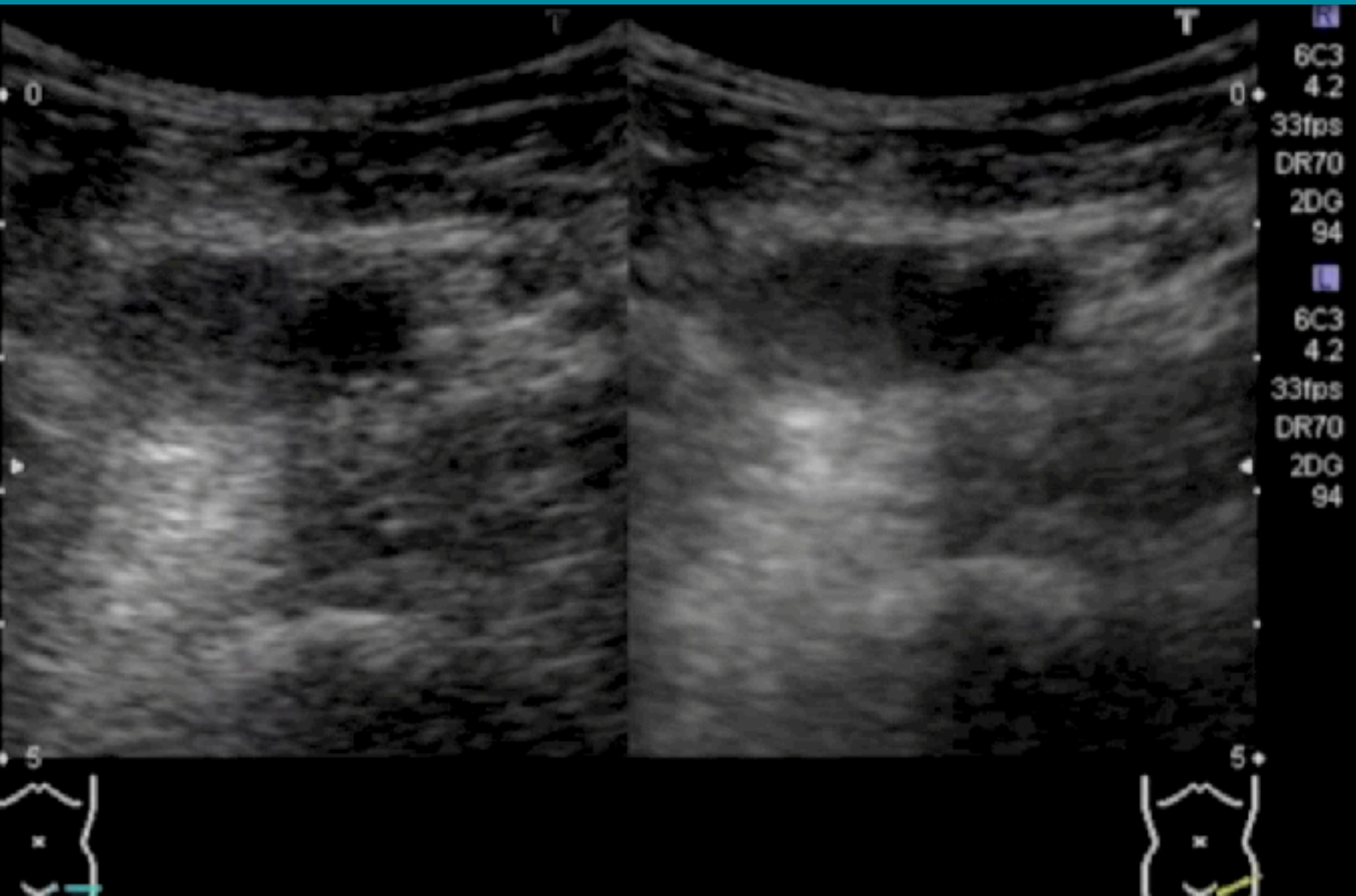
19.0cm



47F, left leg swelling for 7d



Compression test for DVT





DVT



Superficial
L12-3
31 Hz
3.0cm

P

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



2

P G R
3.0 12.0

3.0cm

TABLE 56-6 Wells' Score for Deep Vein Thrombosis (DVT)	
Clinical Feature	Points*
Active cancer (treatment within 6 mo, or palliation)	1
Paralysis, paresis, or immobilization of lower extremity	1
Bedridden for >3 d because of surgery (within 12 wk)	1
Localized tenderness along distribution of deep veins	1
Entire leg swollen	1
Unilateral calf swelling of >3 cm (10 cm below tibial tuberosity)	1
Unilateral pitting edema	1
Collateral superficial veins	1
Alternative diagnosis as likely as or more likely than DVT	−2
Prior history of DVT or pulmonary embolism†	1

*Risk score interpretation (probability of DVT) in original Wells DVT model: ≥ 3 points = high risk (75%); 1 or 2 points = moderate risk (17%); < 1 point = low risk (3%).

†DVT is defined as a proximal DVT (above the knee) or a distal DVT (below the knee) confirmed by Doppler ultrasound or venography.

Determine pretest probability
of DVT using Wells' criteria*

Low probability
score (<1 point)

D-dimer testing

-

+

DVT ruled
out

US

+

DVT ruled
out

High or moderate
probability score
(≥0 points)

US

+

-

Treat
DVT

D-dimer
testing

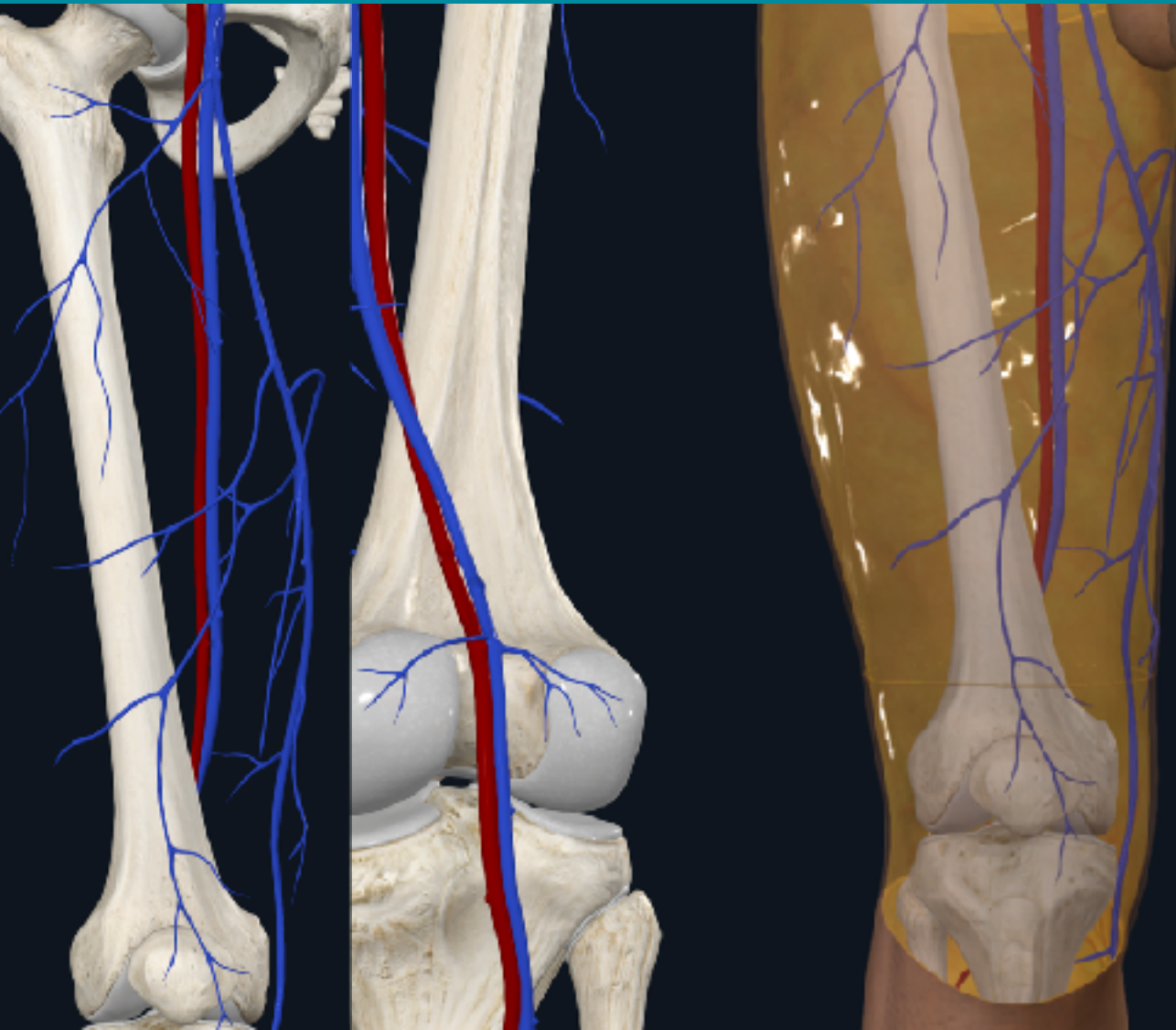
-

+

DVT ruled
out

Repeat
US in 1 week

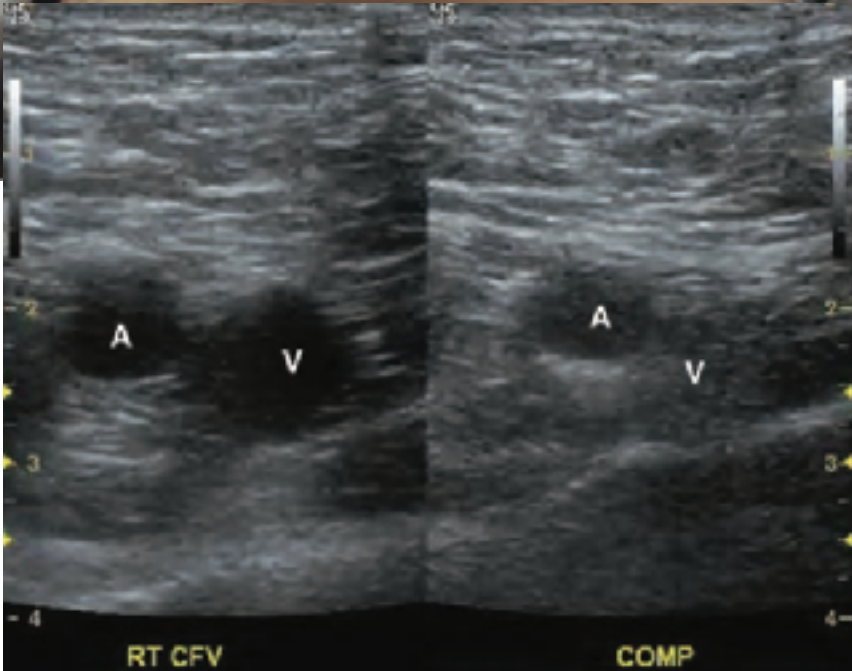
DVT



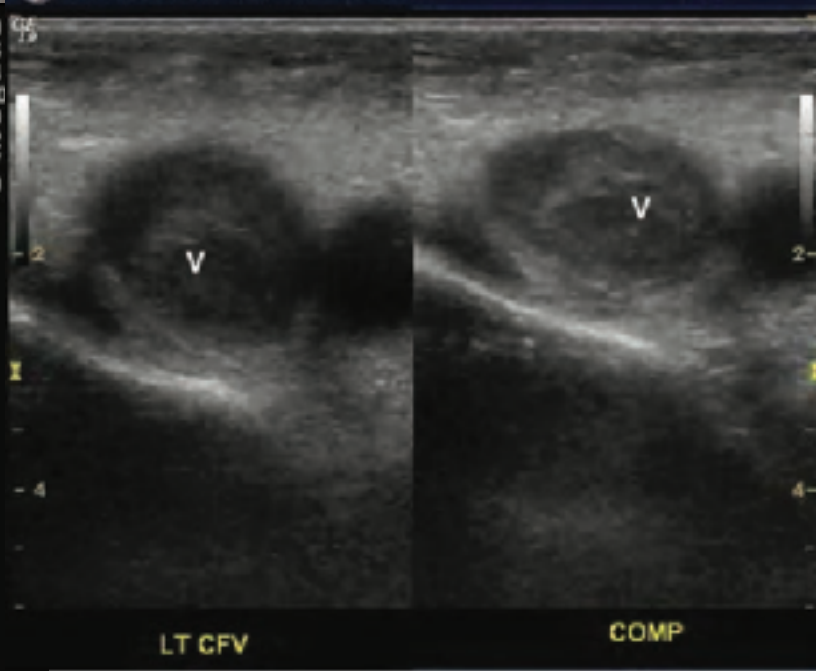
Swelling
Dyspnea
Shock

DVT

Compression test for DVT



Frq 10.0
Gn 36
S/A 2/4
Map K/D/D
D 4.0
DR 72
FR 27
AO 100



B
Frq 10.0 MHz
Gn 23
S/A 3/1
Map H/D/D
D 5.0 cm
DR 72
FR 66 Hz
AO 100 %

RT CFV

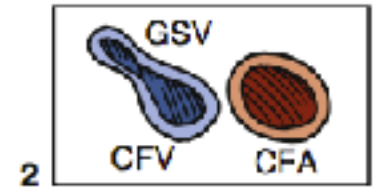
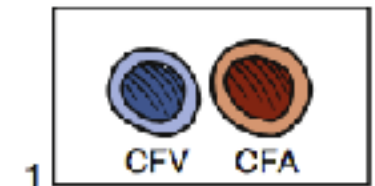
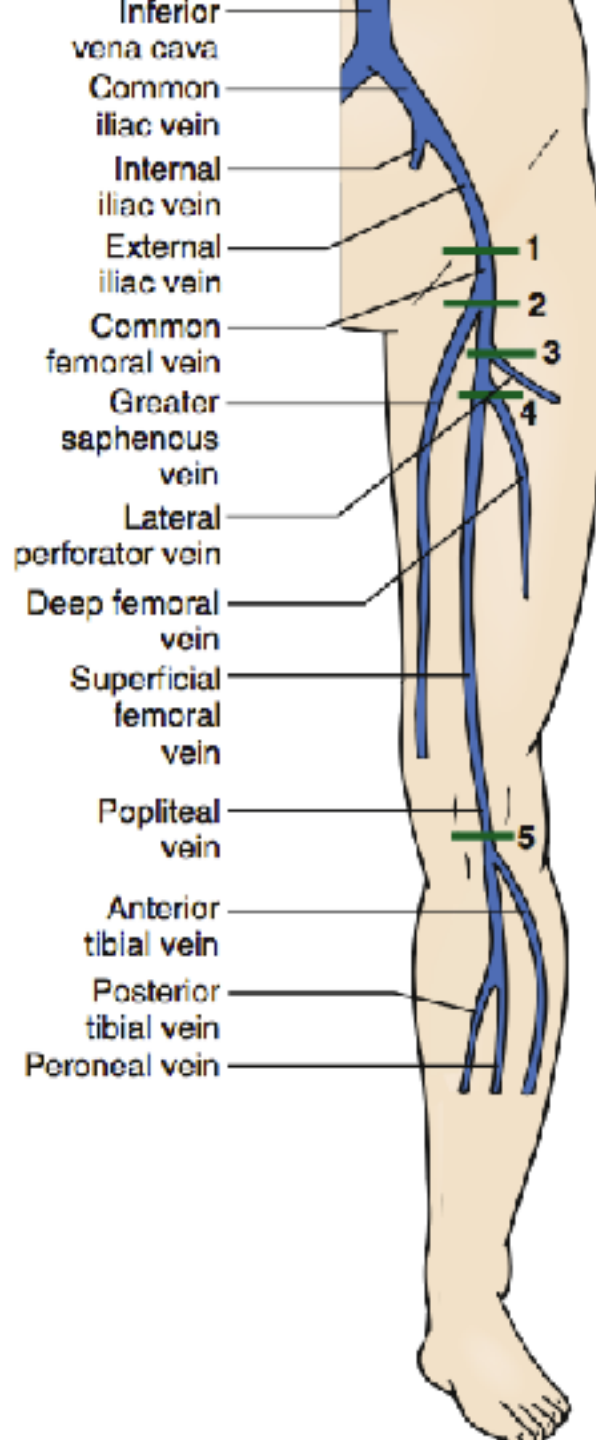
COMP

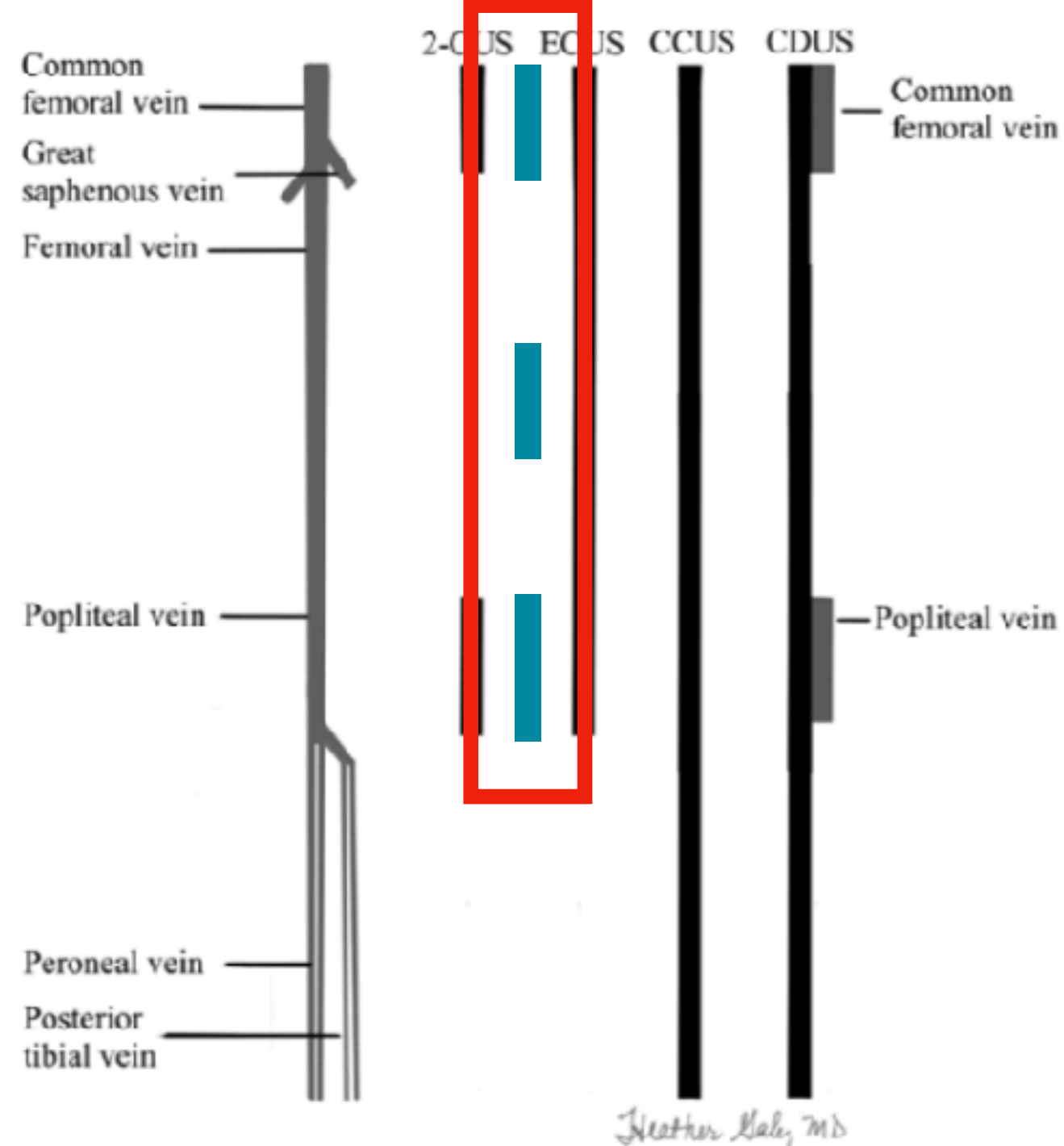
LT CFV

COMP



COMPRESSION US

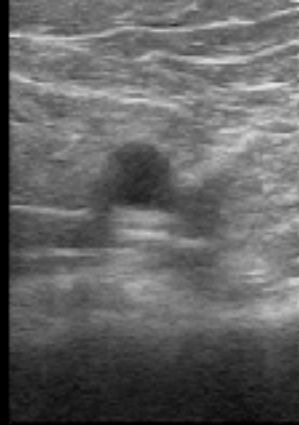




3 regions
Sen 90.57%
Spe 98.52%

2 regions
Sen 82.76%
Spe 98.52%

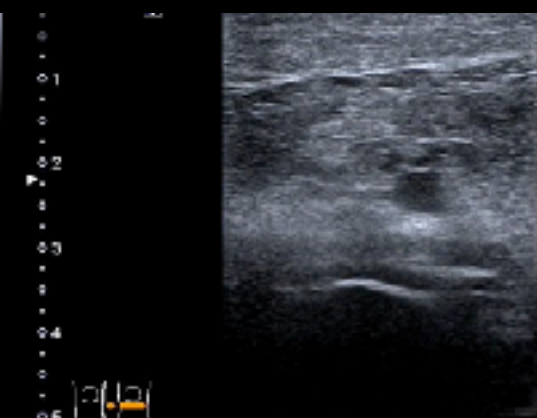
Gen
n 32
41
/3/2



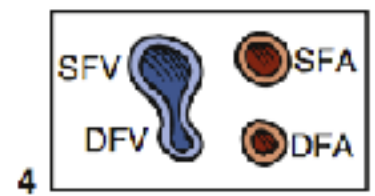
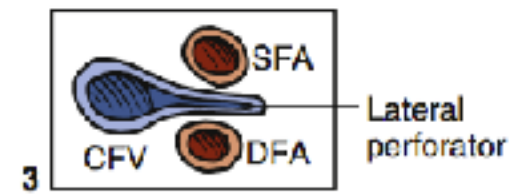
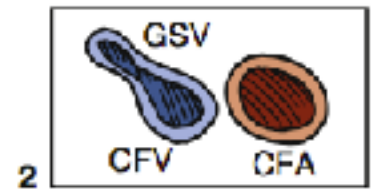
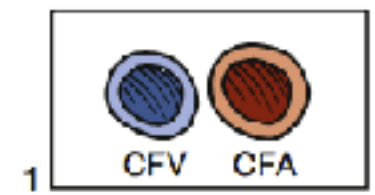
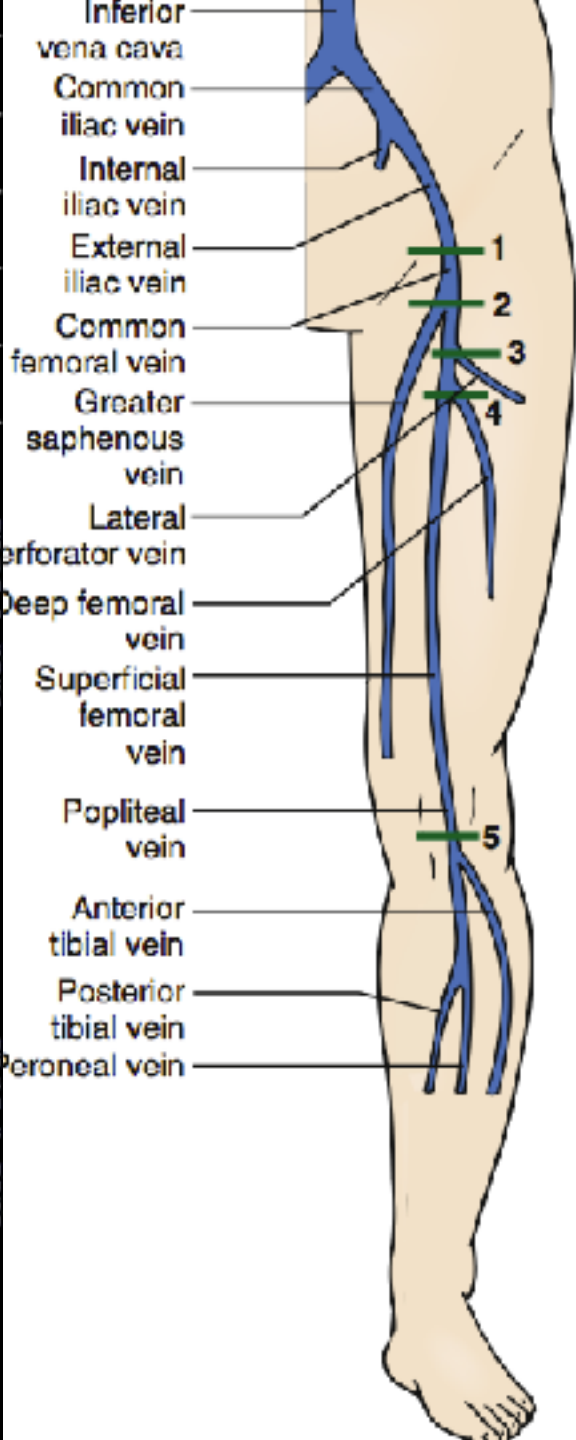
0.4 0.2



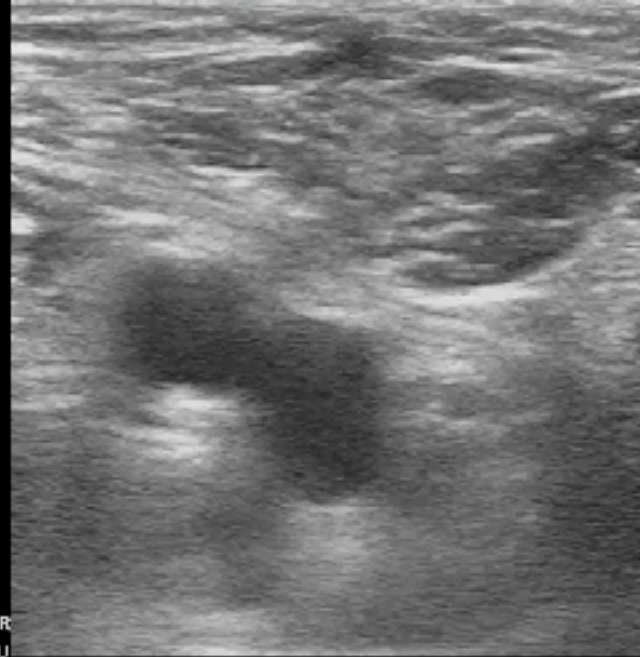
MI 1.5
11L4
dWT9.0
25 fps
Q.88
D11.60
A.5
P.3



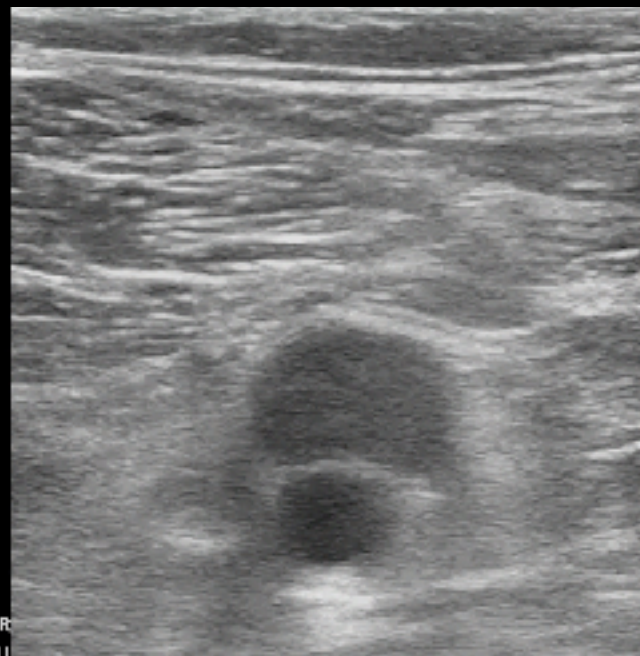
MI 1.5
11L4
dWT9.0
27 fps
Q.88
D11.60
A.5
P.3



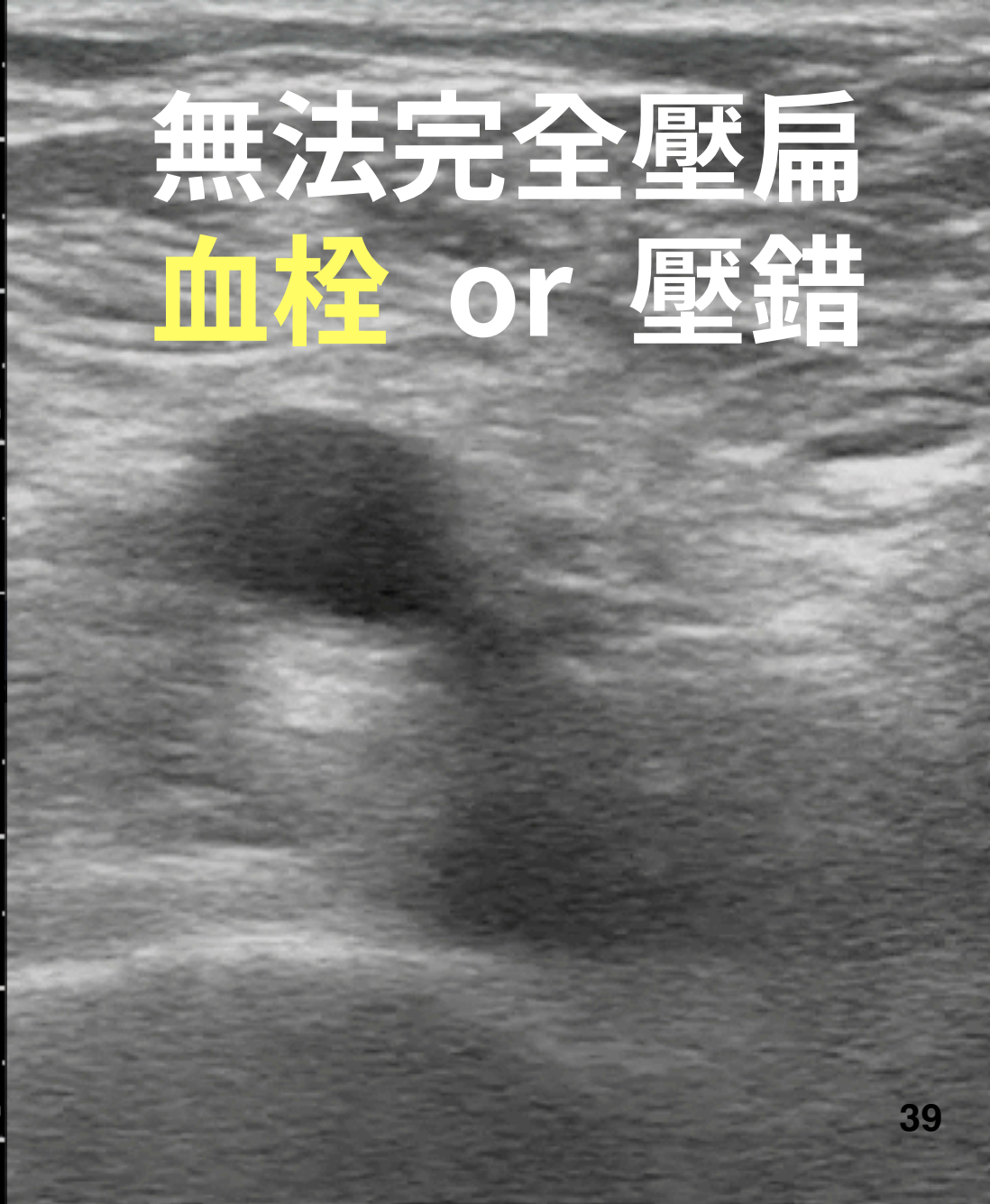
無法完全壓扁
血栓 or 壓錯



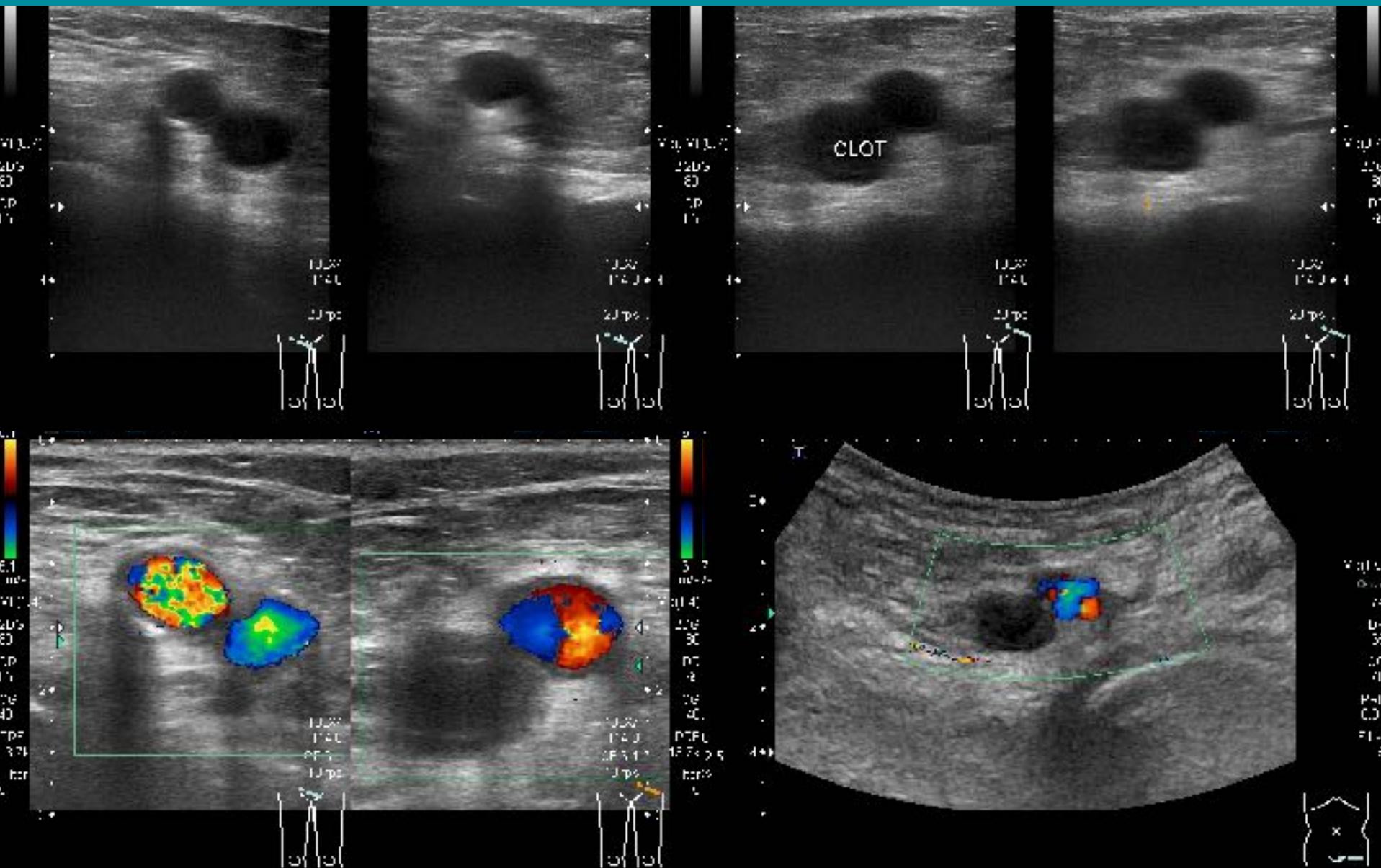
4.0cm



4.0cm



DVT的記錄



DVT ?

Superficial

L12-3

34 Hz

2.5cm

2D

Gen

Gn 60

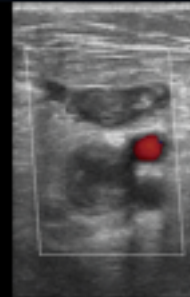
C. 57

4/3/2

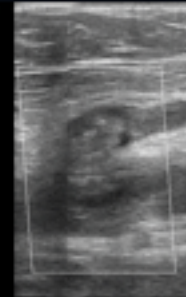




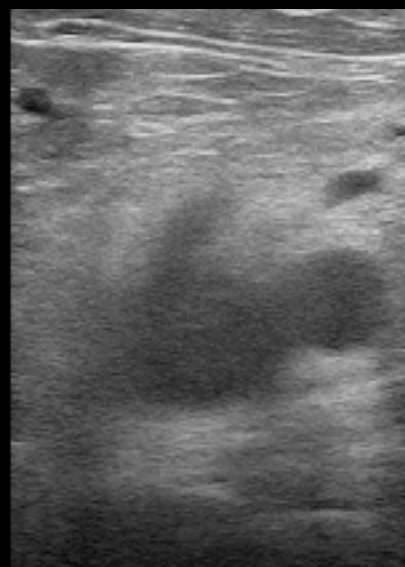
Varicose
L12-3
17 Hz
5.0cm
2D
HGen
On 82
C 41
3/3/2
Color
5.0 kHz
On 55
3/3/4
Filt Low



Varicose
L12-3
17 Hz
5.0cm
2D
HGen
On 82
C 41
3/3/2
Color
5.0 kHz
On 55
3/3/4
Filt Low



+7.0
-7.0



懷疑PE時的POCUS:DHL

CTA仍是最重要的檢查

Deep Vein

D sign

Wedged



左腳痛，請問是動脈還是靜脈出問題？

Superficial

L12-3

24 H7

4.0cm

2D

Res

Gn 76

C 56

3/2/2

CPA

5.0 MHz

Gn 60

1/5/5

Filtr Med

Baseln 3



0.8

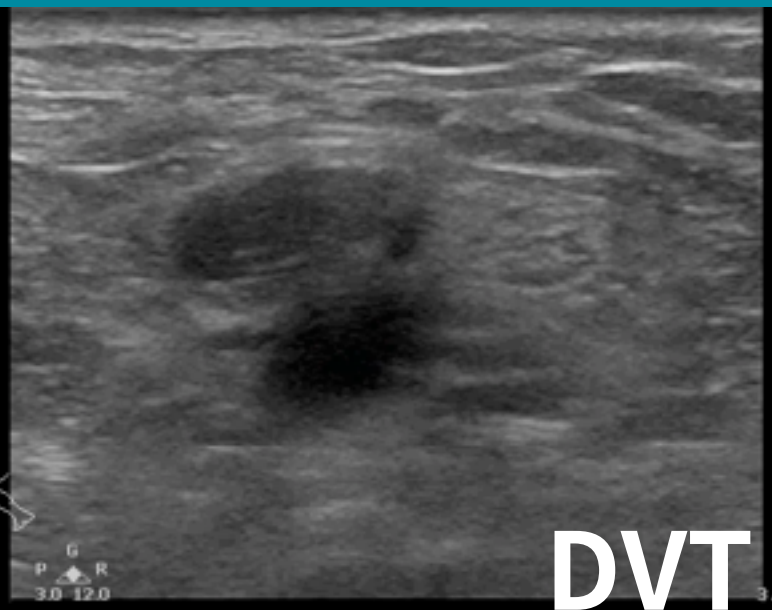
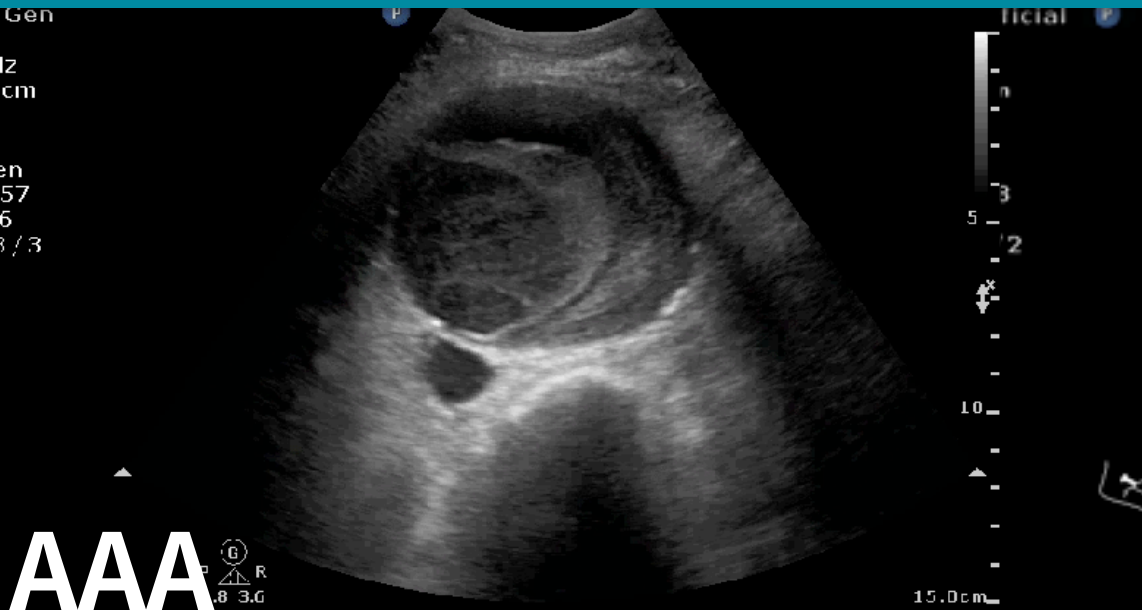
PRF

2

4x

4.0cm

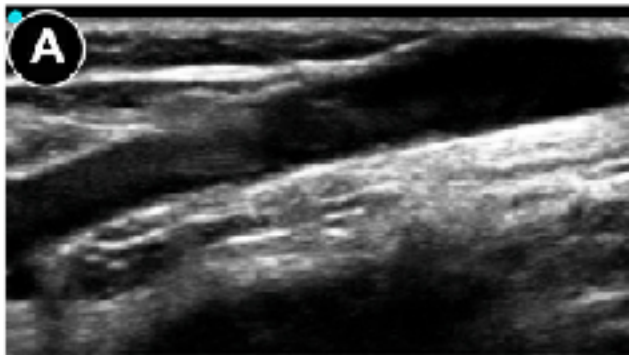
Great vessels



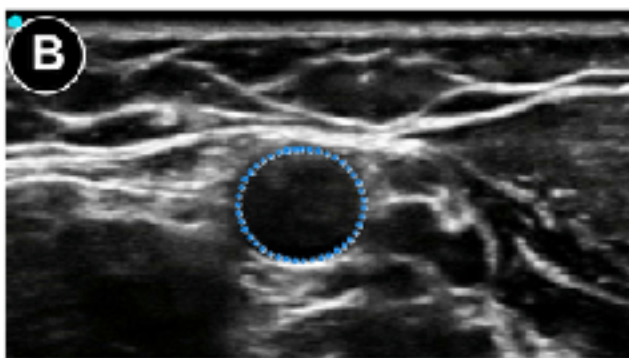
Abd Gen2
C5-1
34 Hz
15.0cm
2D
HGen
Gm 100
C 56
3/3/3



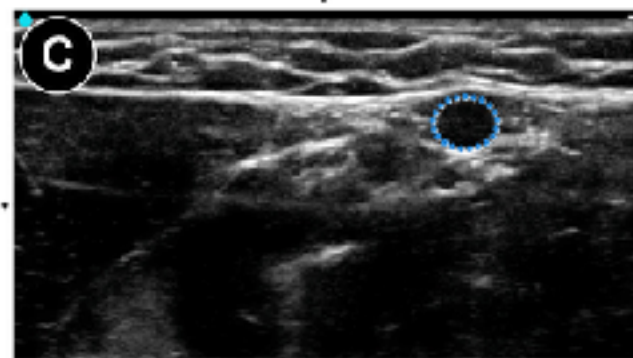
Axillary vein



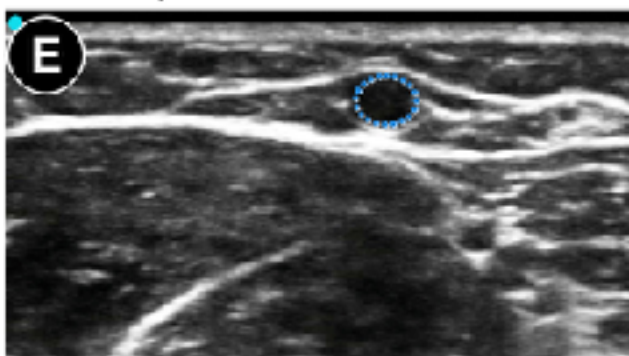
Cephalic proximal



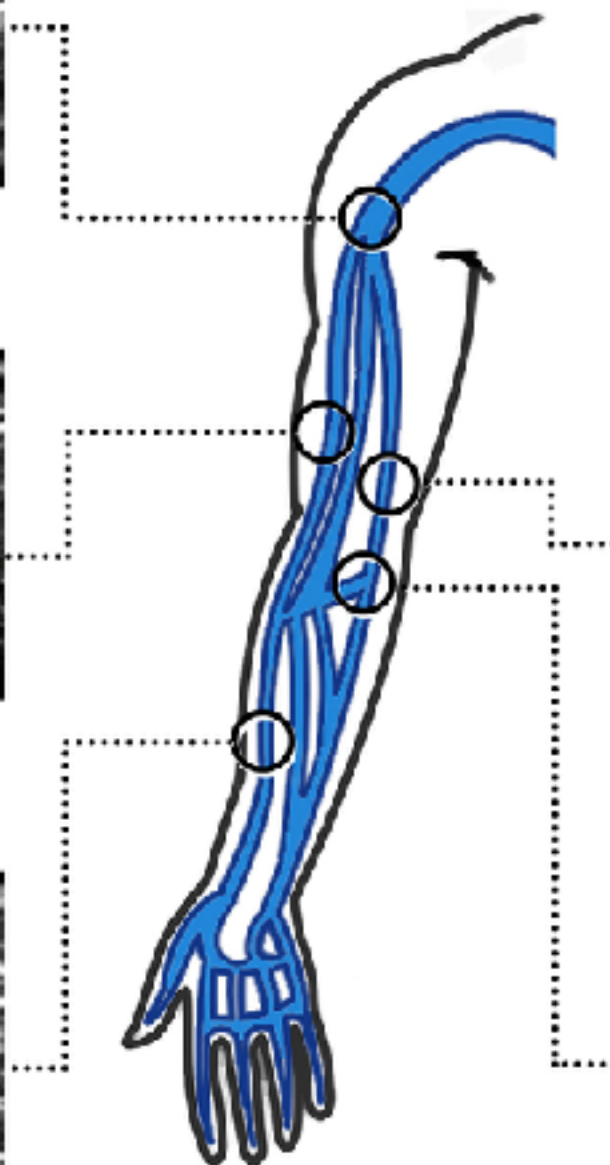
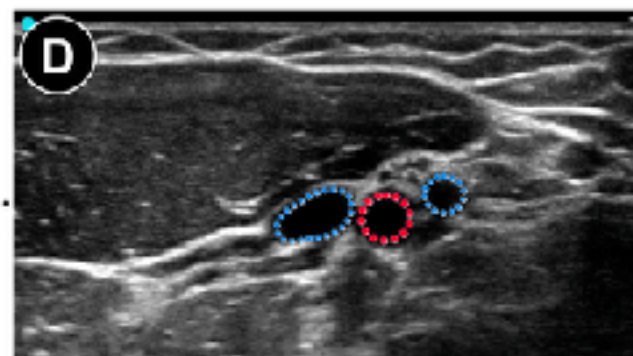
Basilic proximal

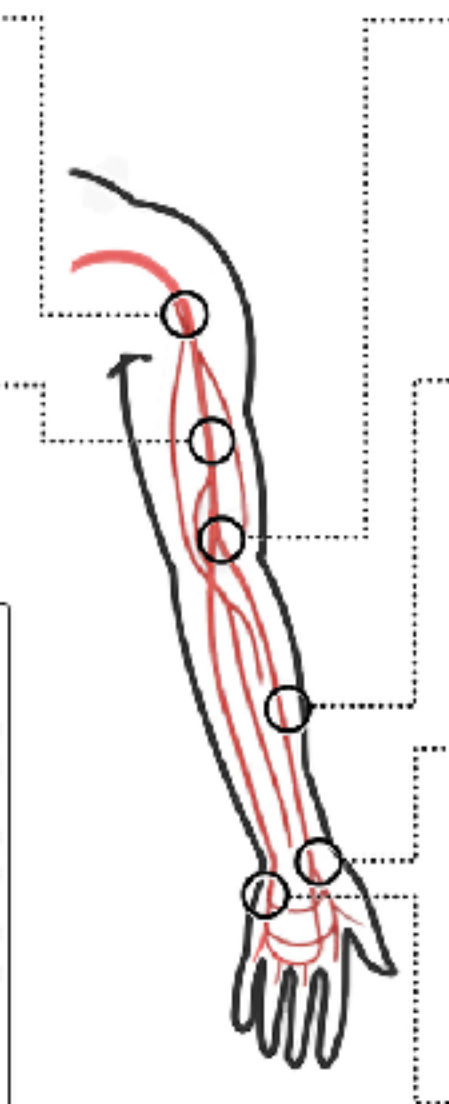
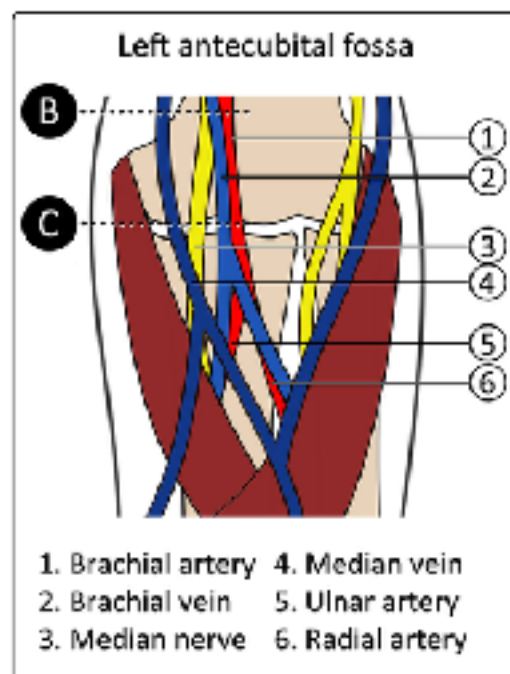
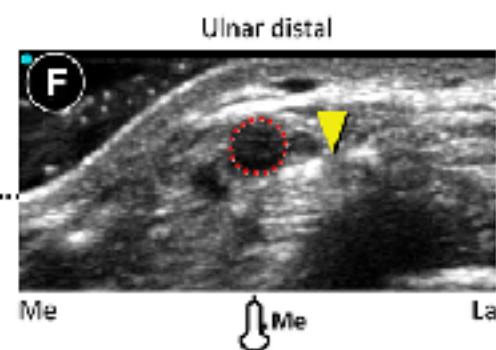
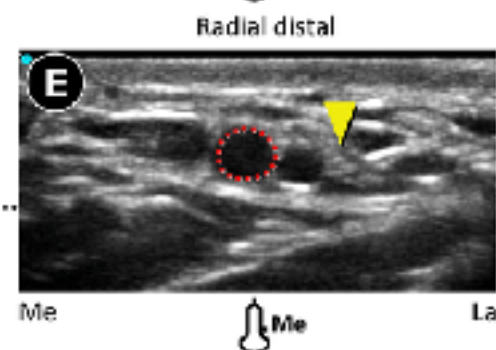
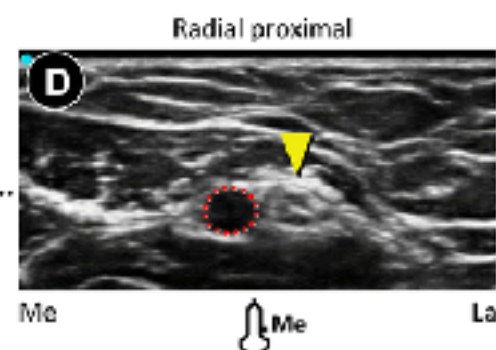
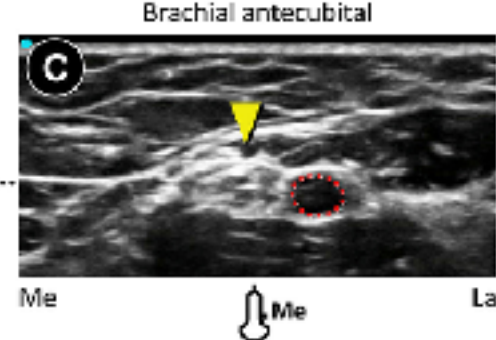
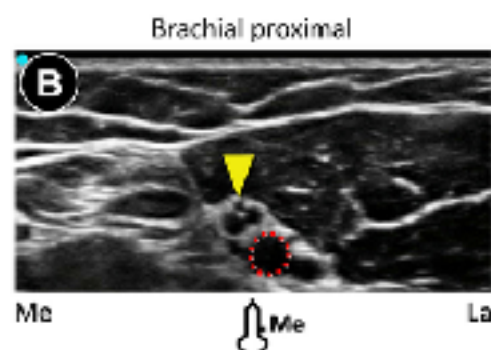


Cephalic or basilic distal

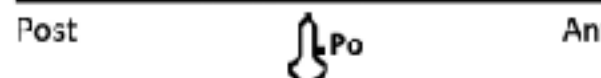
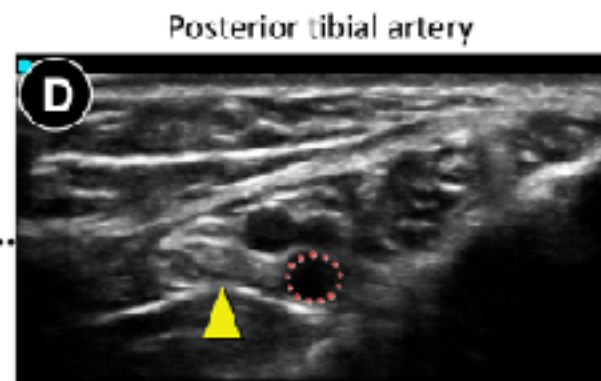
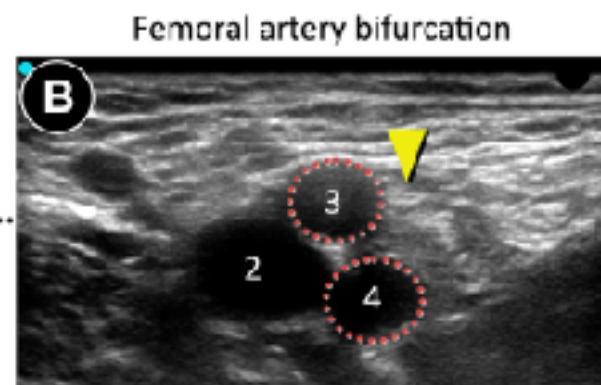
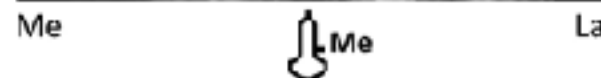
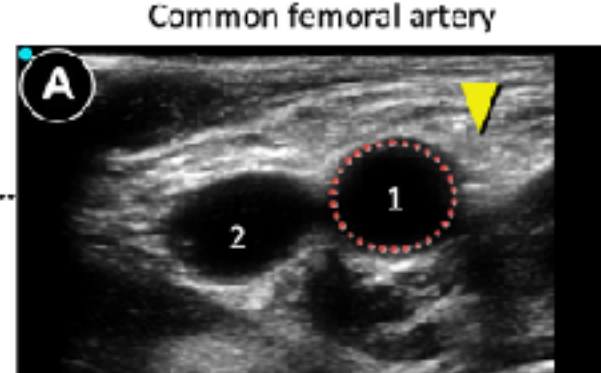
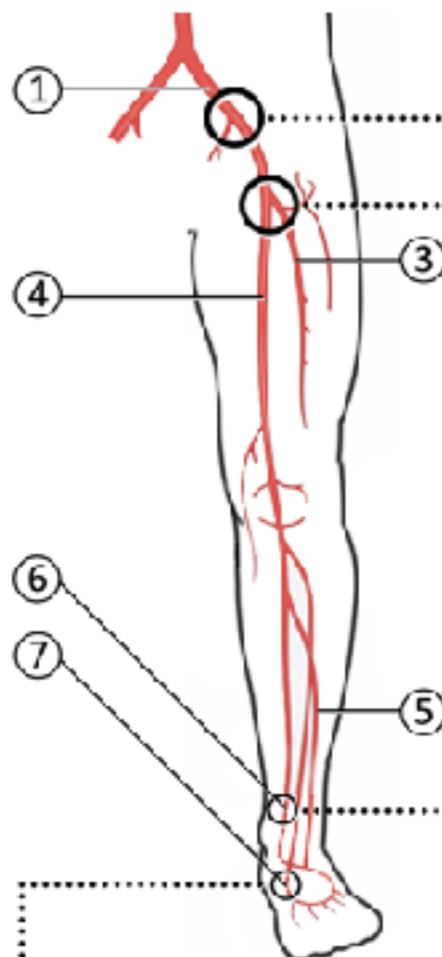
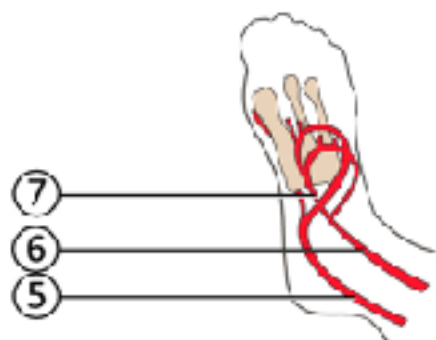


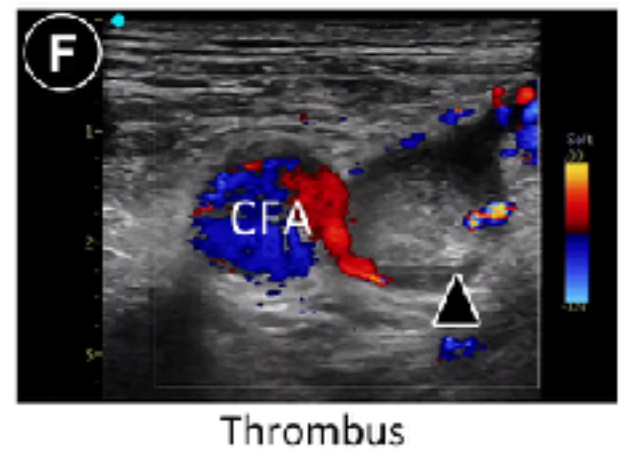
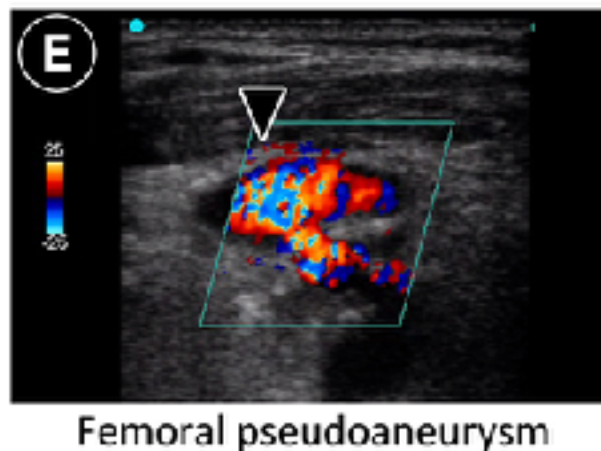
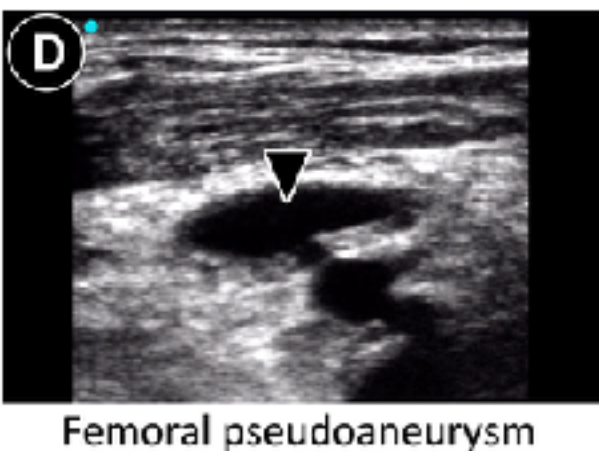
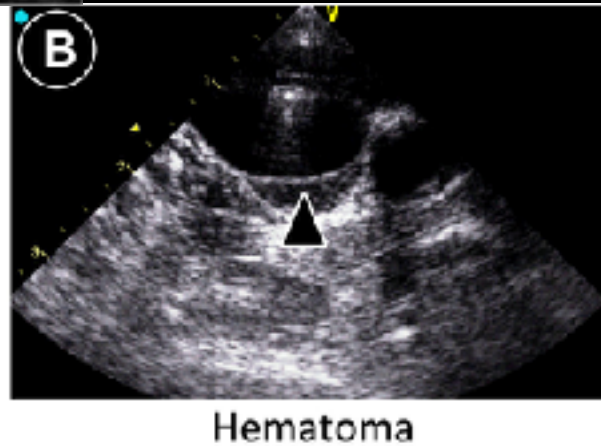
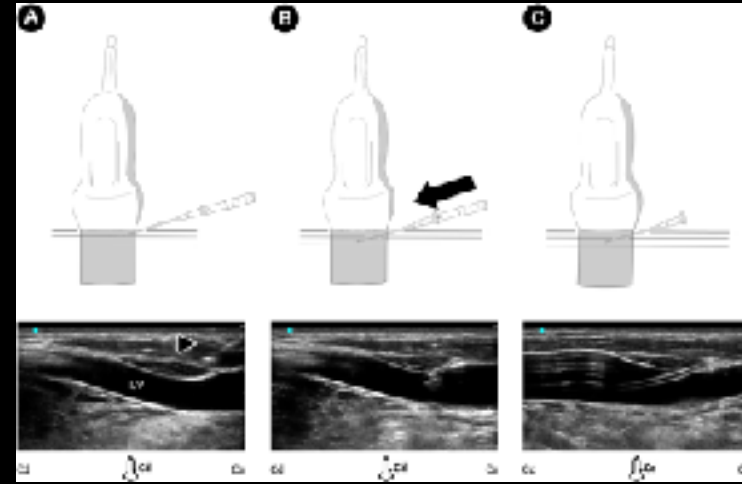
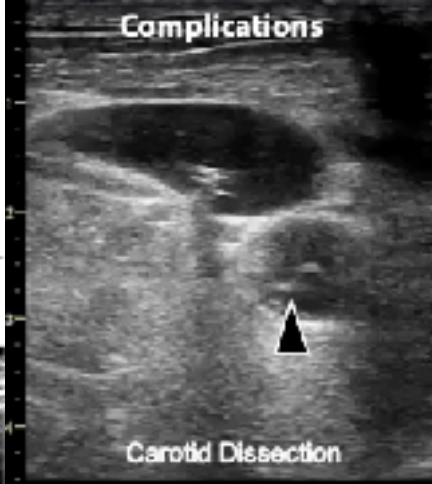
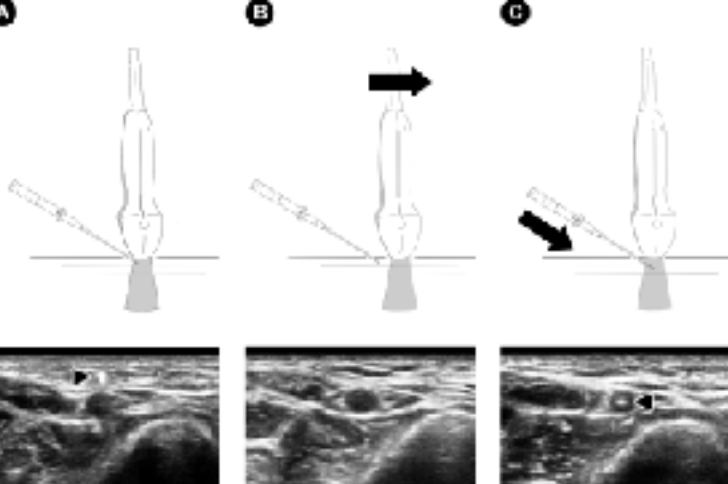
Brachial x2





1. Common femoral artery
2. Common femoral vein
3. Superficial femoral artery
4. Deep femoral artery
5. Anterior tibial artery
6. Posterior tibial artery
7. Dorsalis pedal artery



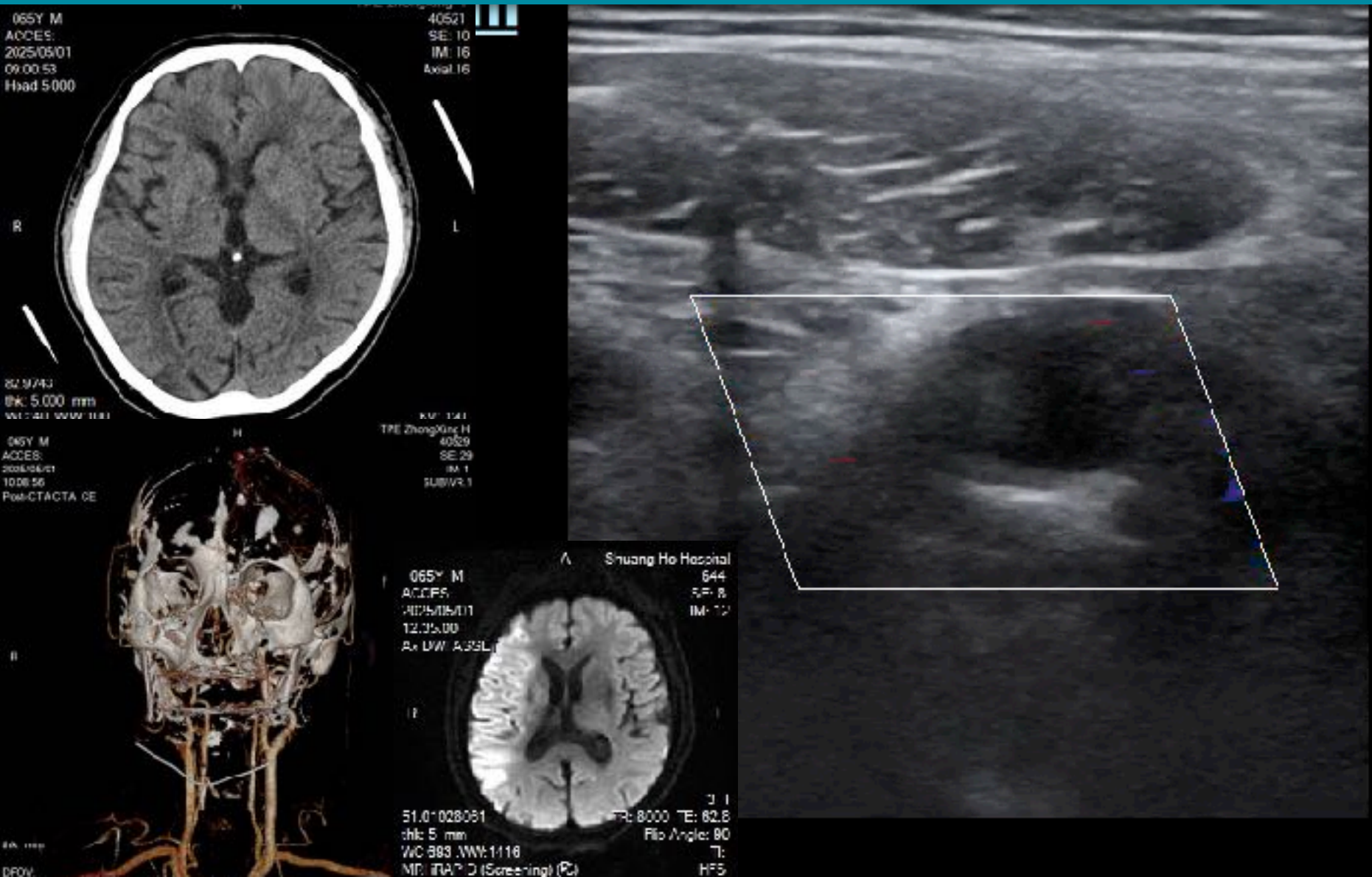


VASCULAR SURVEY

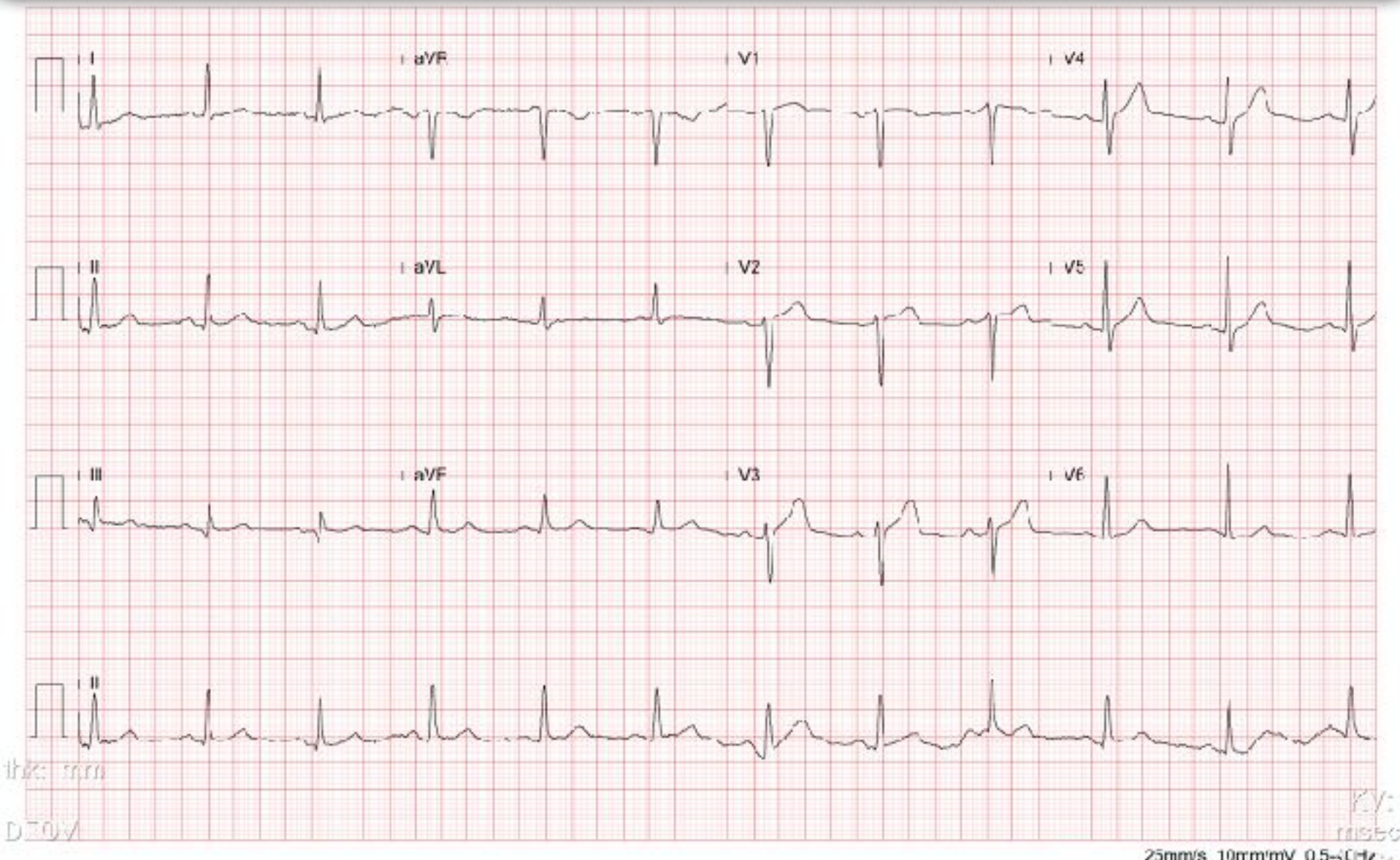
CCA / IJV	Aorta - thoracic	Iliac A / V
Subclavian A / V	Aorta - abdominal	CF A / V
Axillary/Brachial A / V	Celiac trunk / SMA	SF A / V
Basilic V / Cephalic V	IVC / HV	Popliteal A / V
RA / UA	SV / SMV / PV	ATA / PTA

65M, L side weak, NIHSS 12

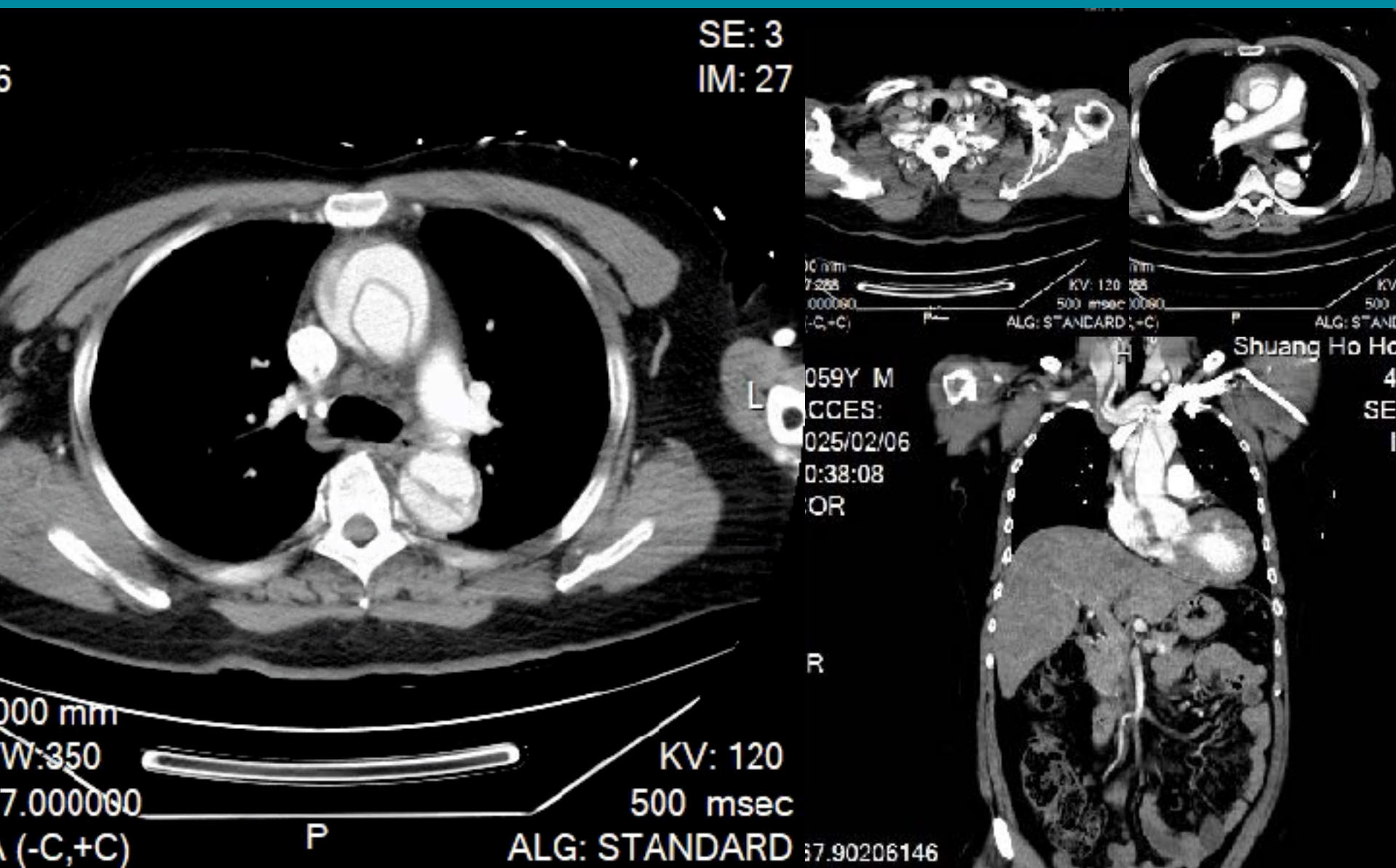
R ICA occlusion



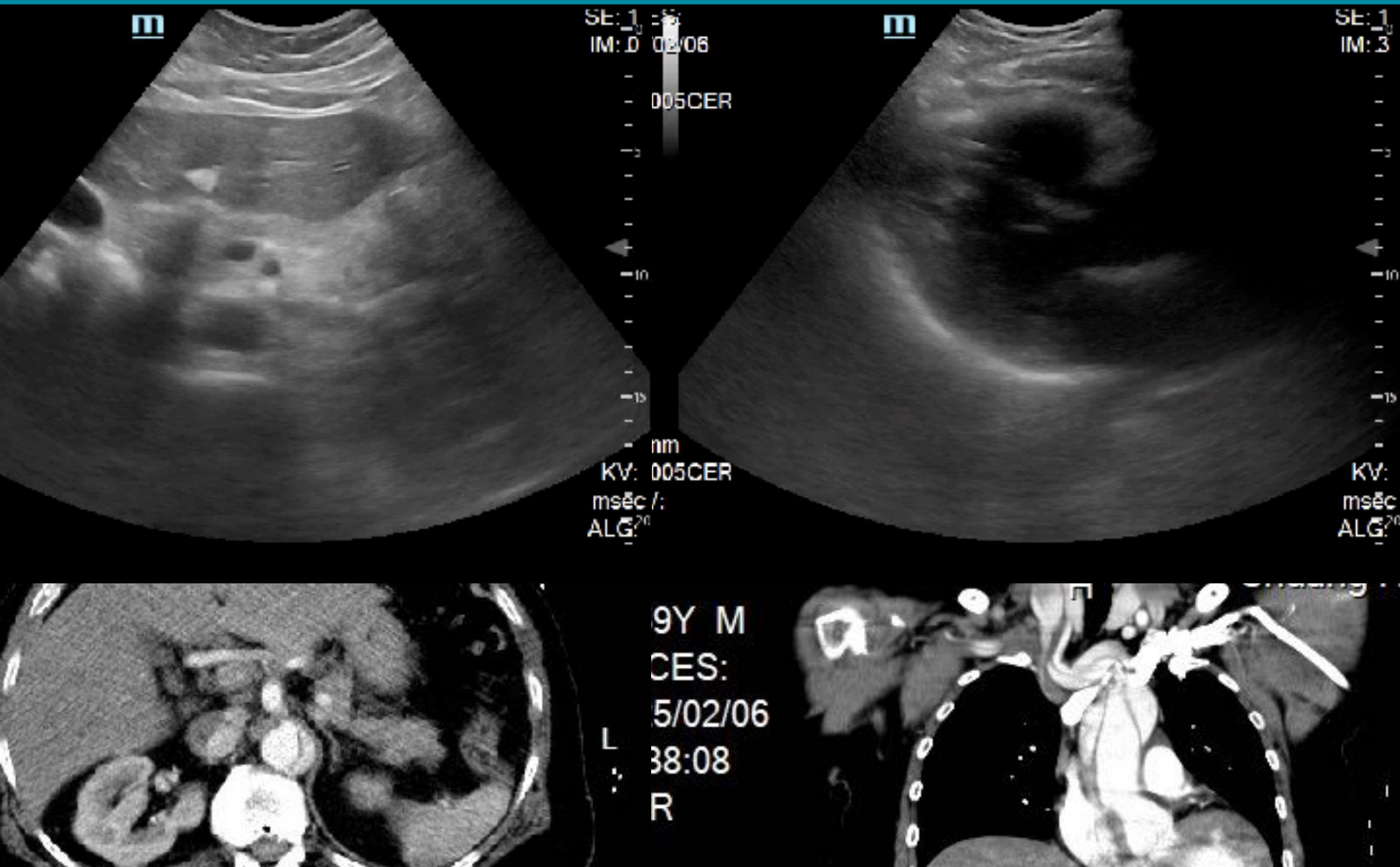
**59M, back pain / cold sweating /
left lower leg weakness**



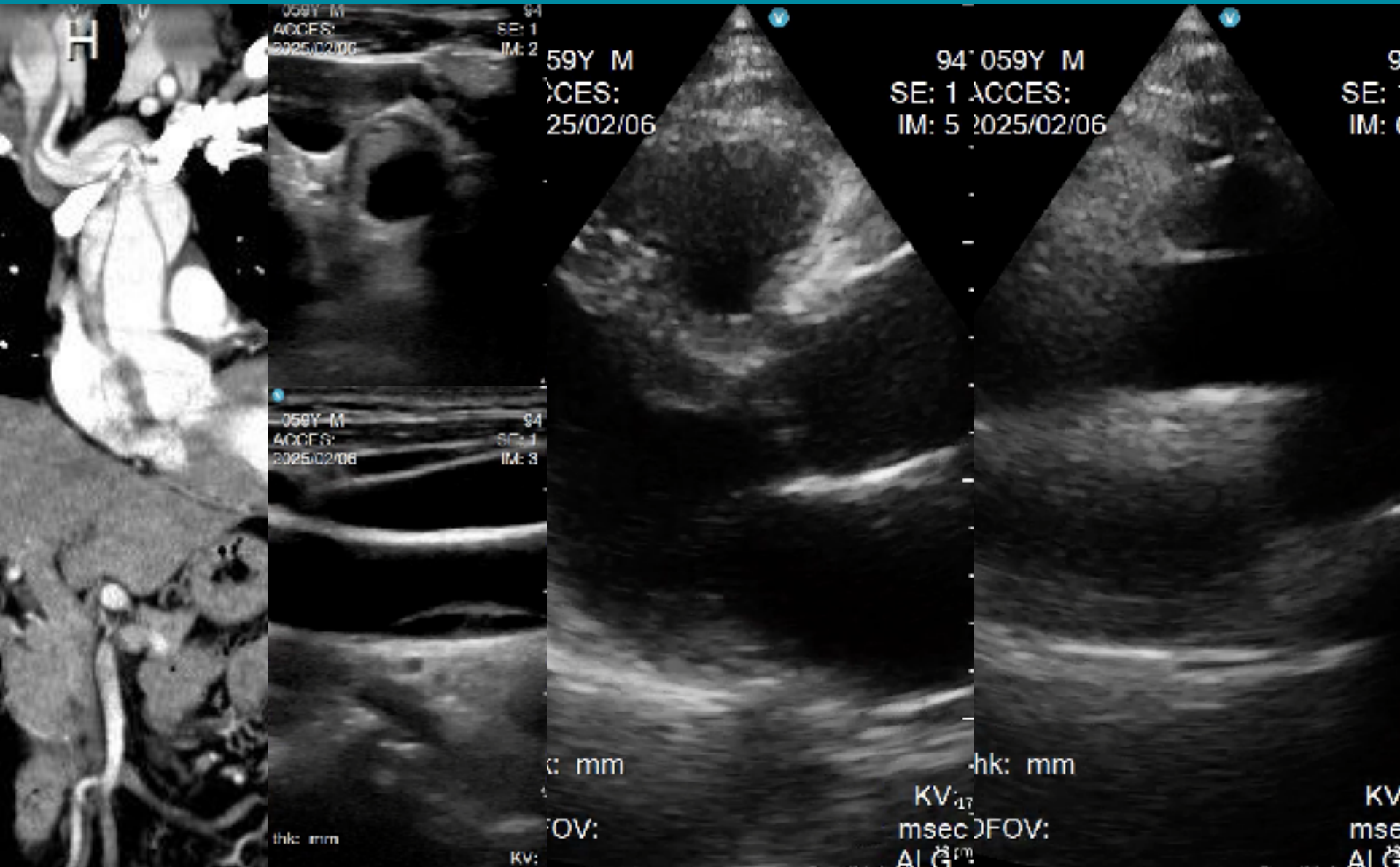
AD, type A



AD, type A



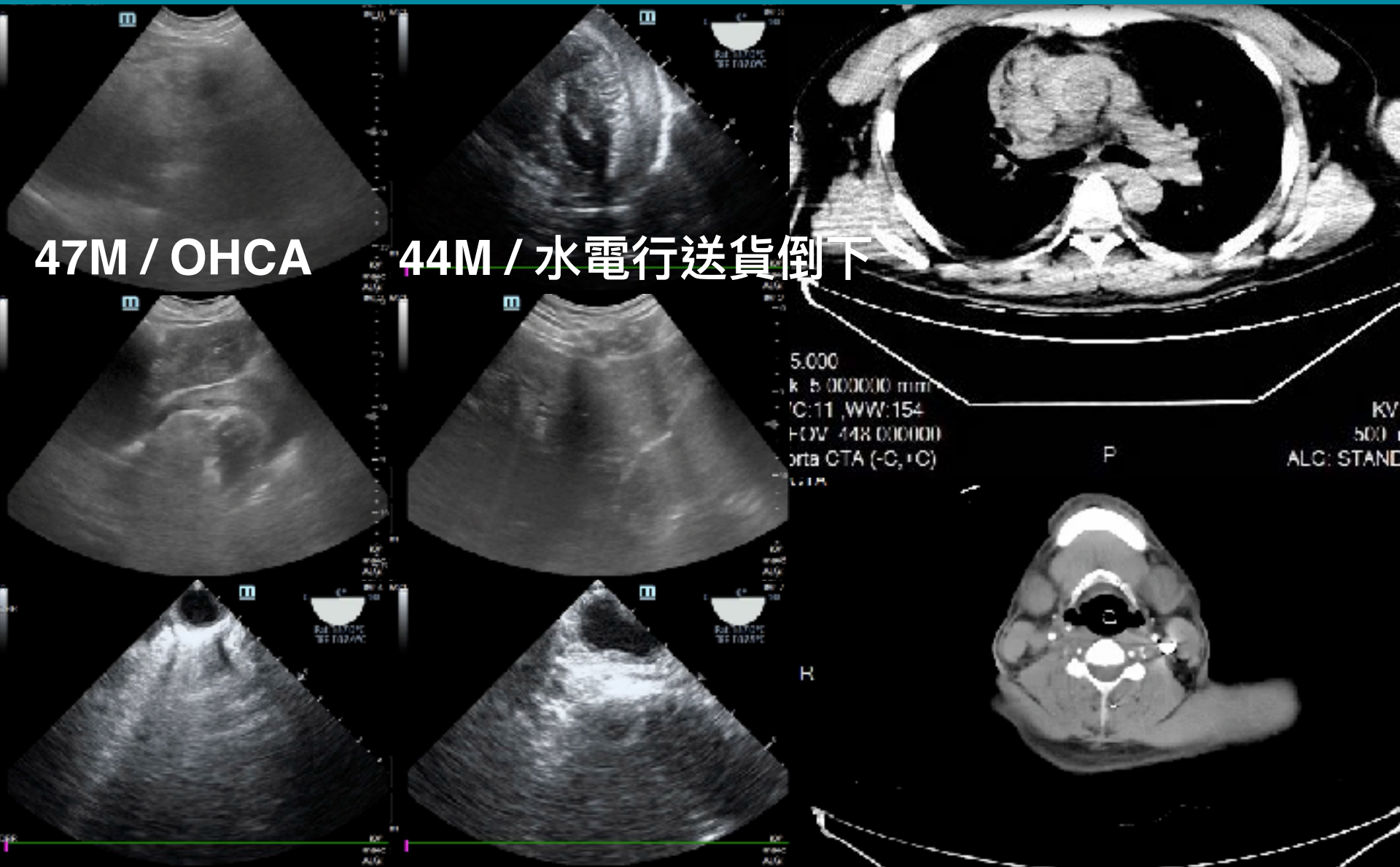
Flap: ascending aorta / RCCA



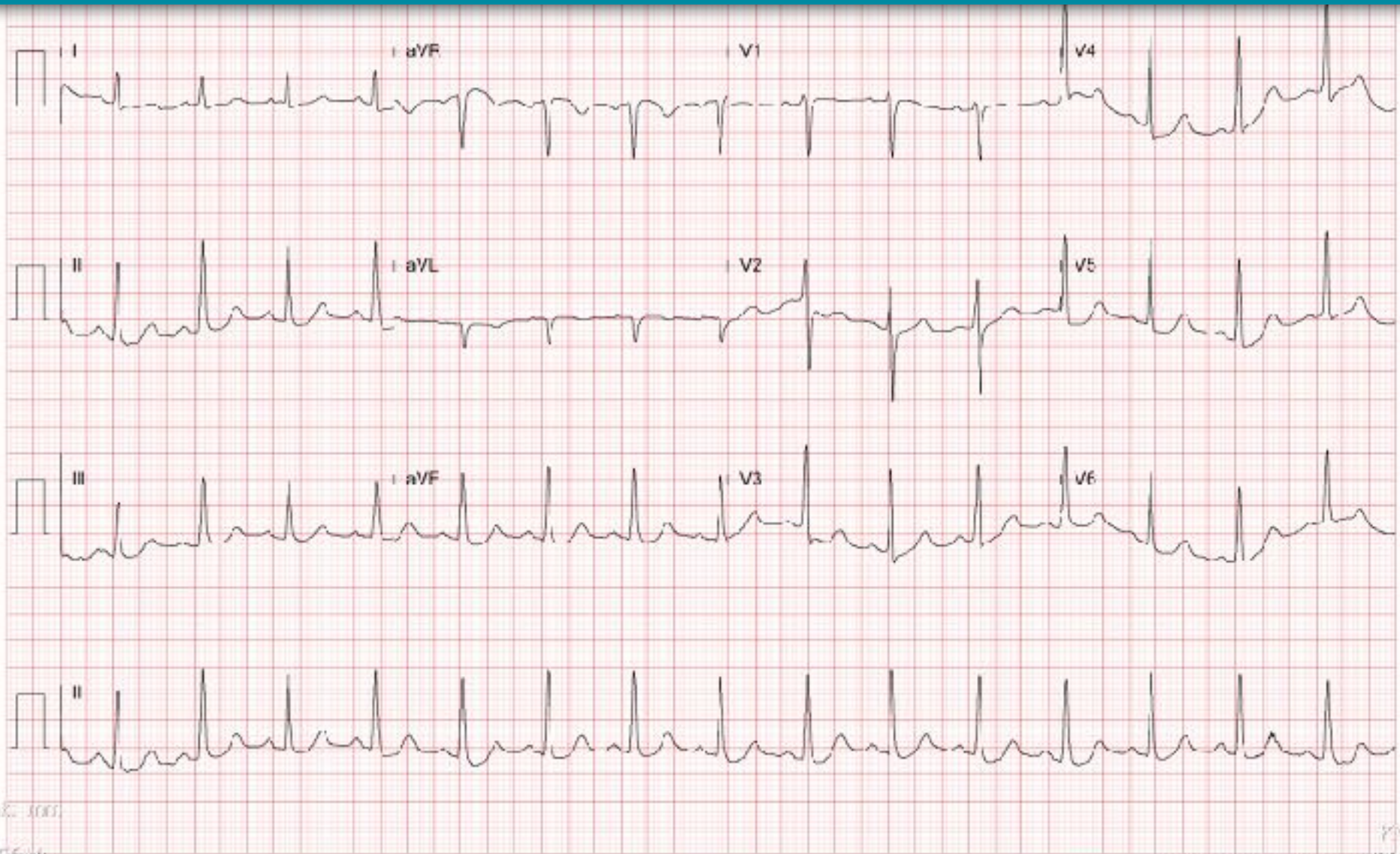
OHCA: hemopericardium

47M / OHCA

44M / 水電行送貨倒下



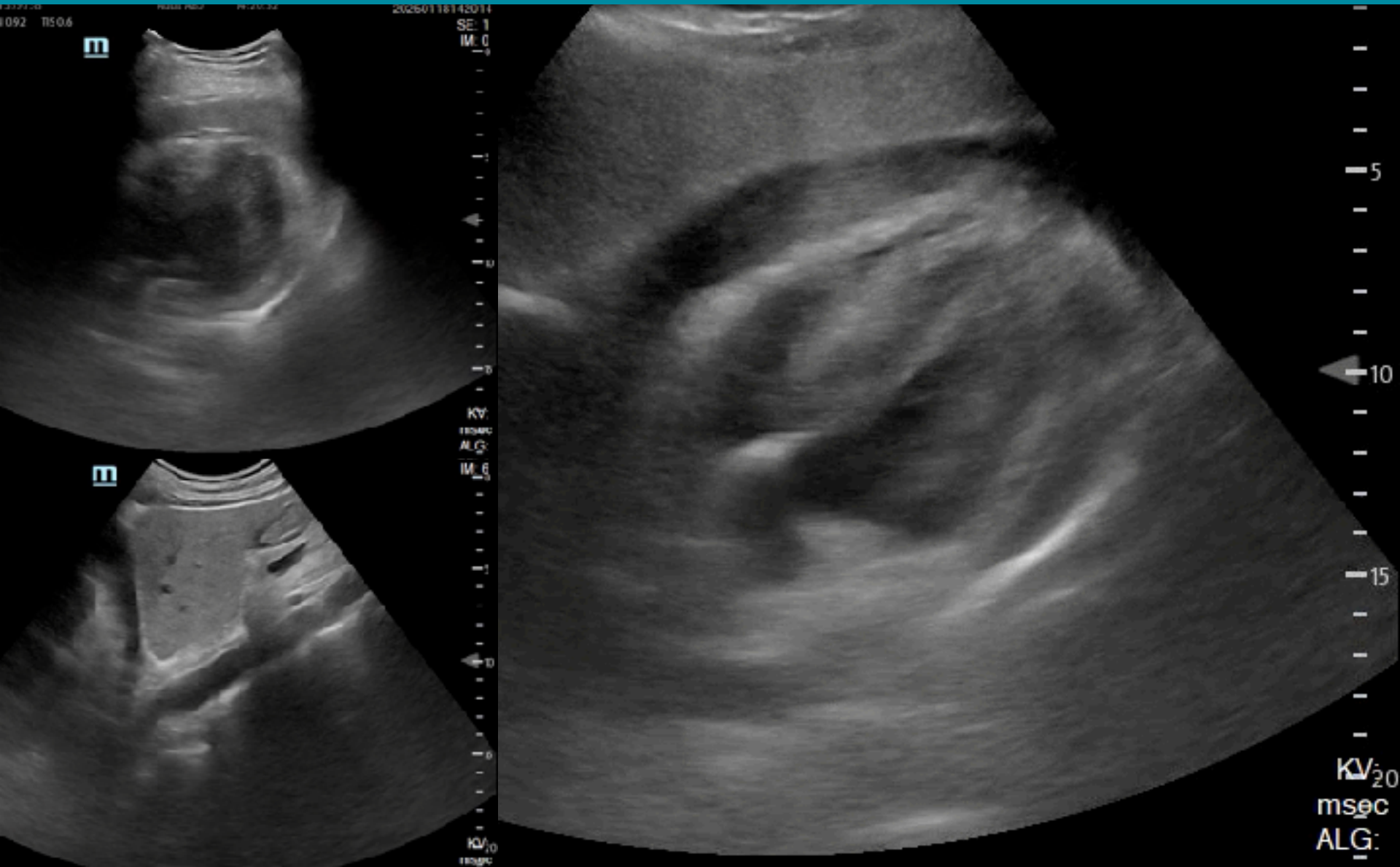
65M, chest pain to left arm for 2 h



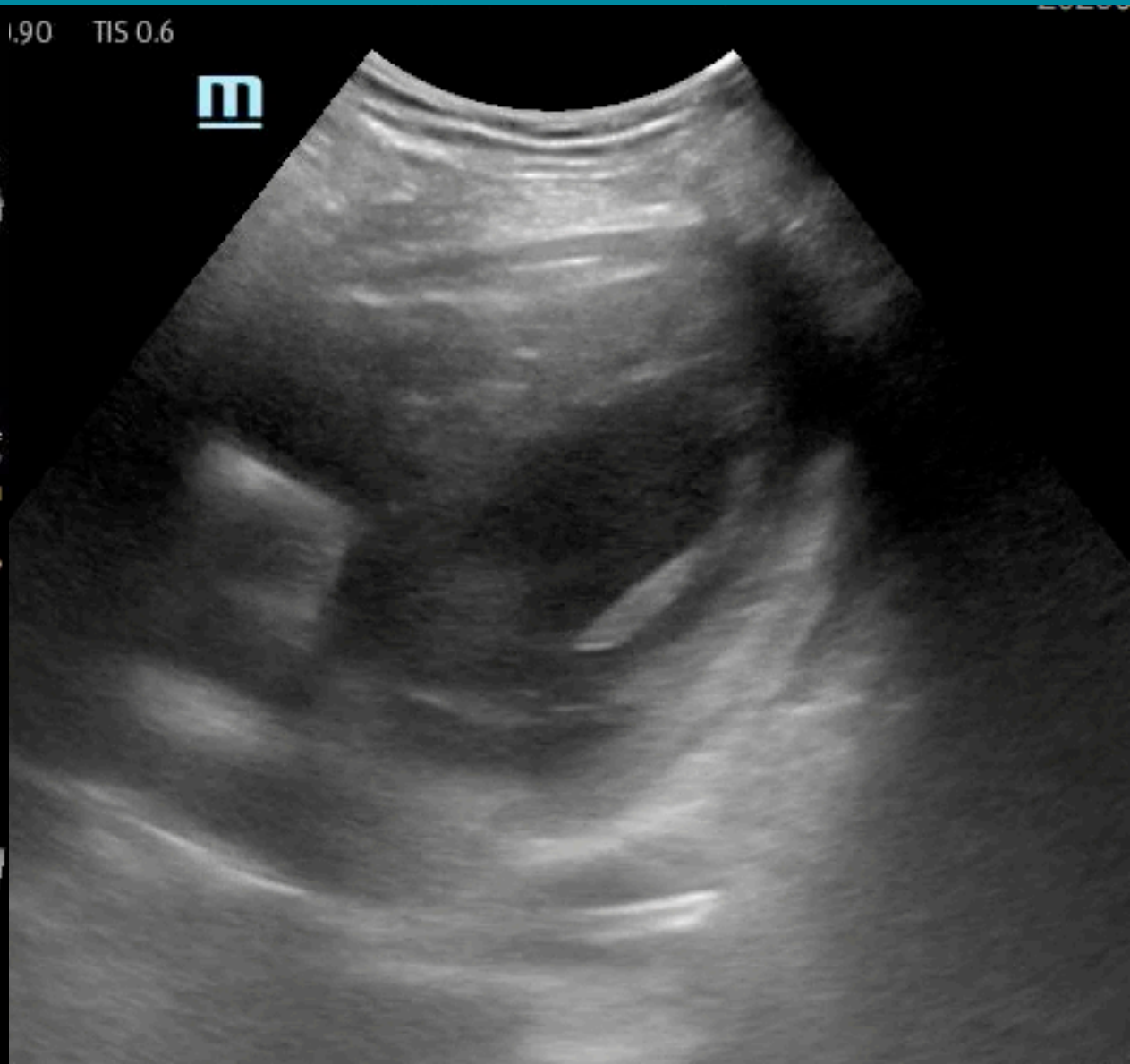
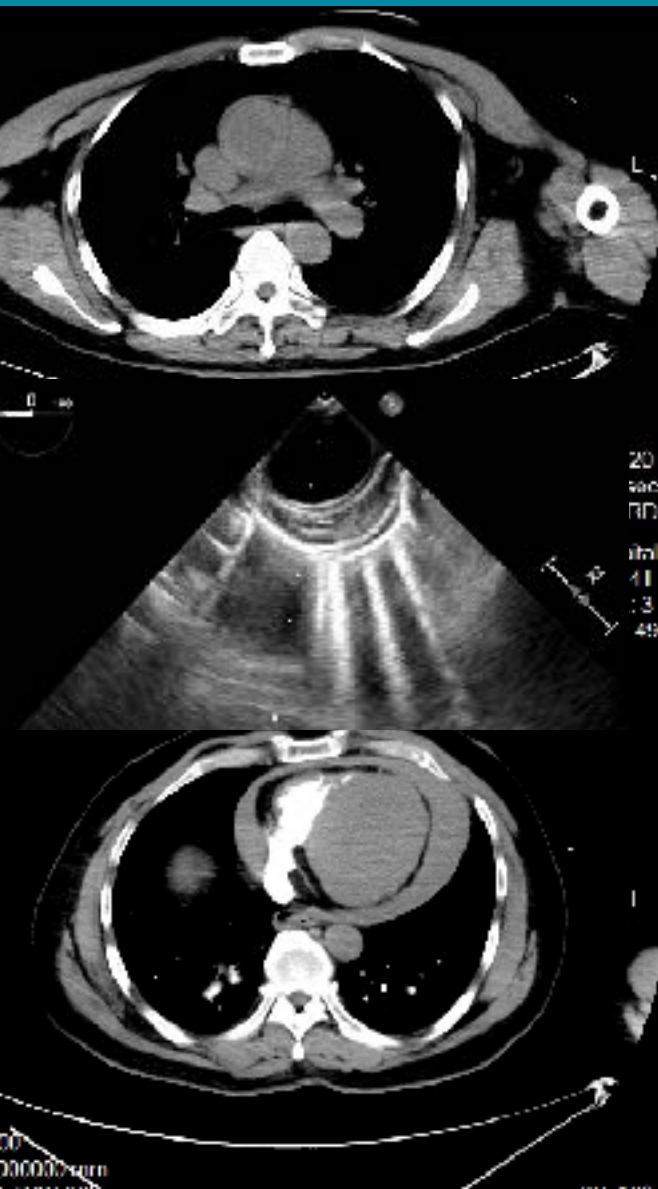
the 1000

DP54:

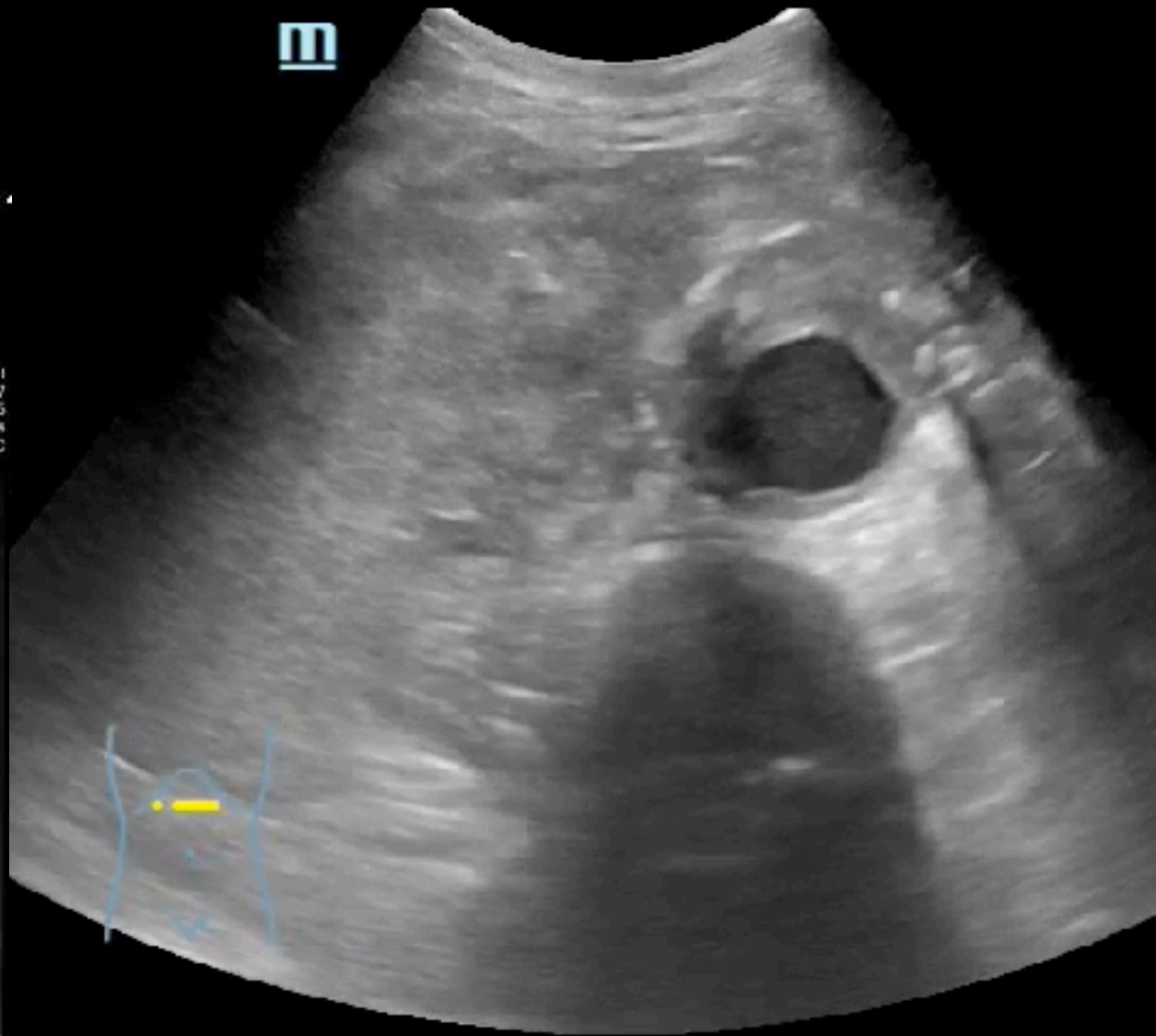
Hemopericardium



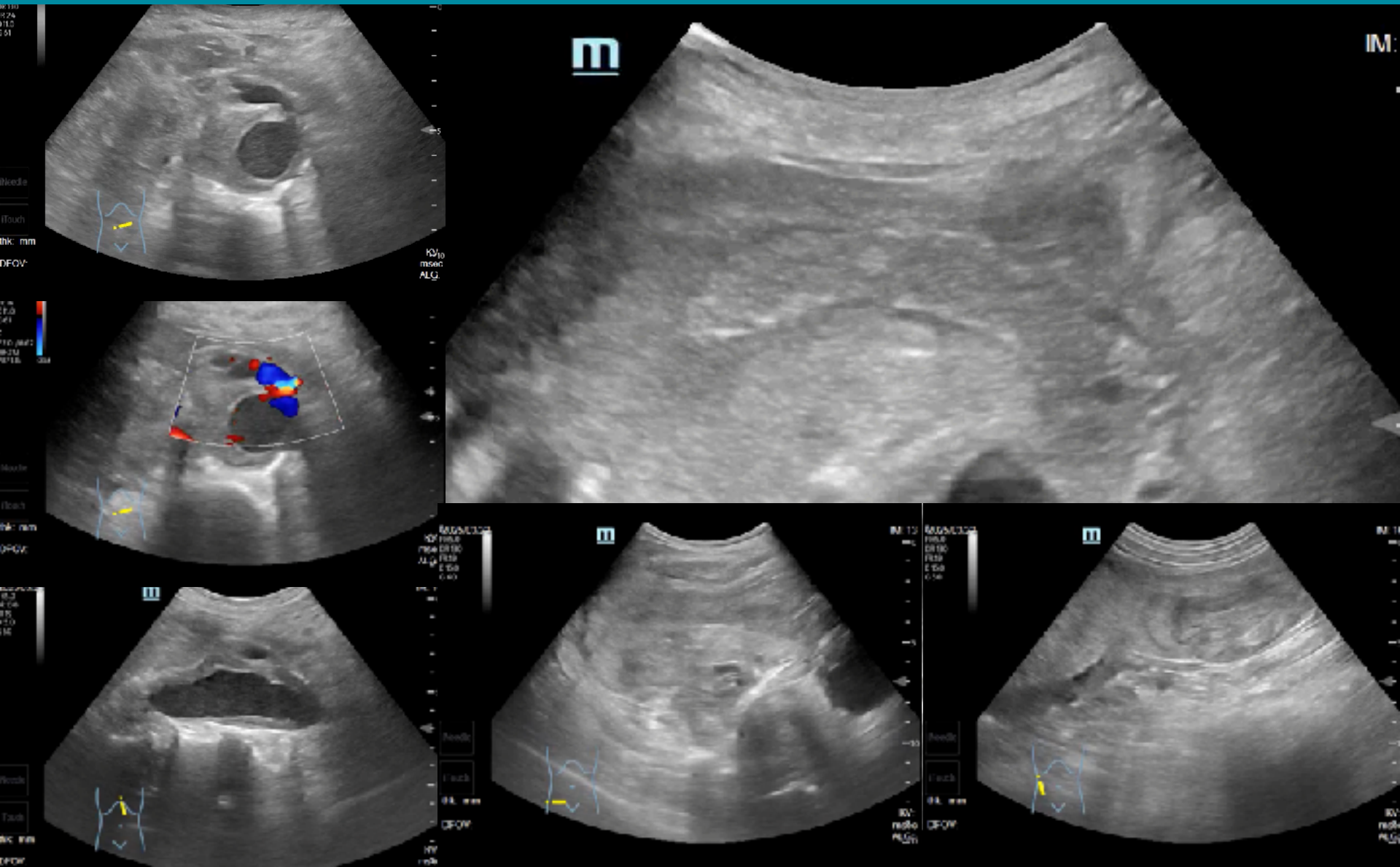
AD, type A, IMH



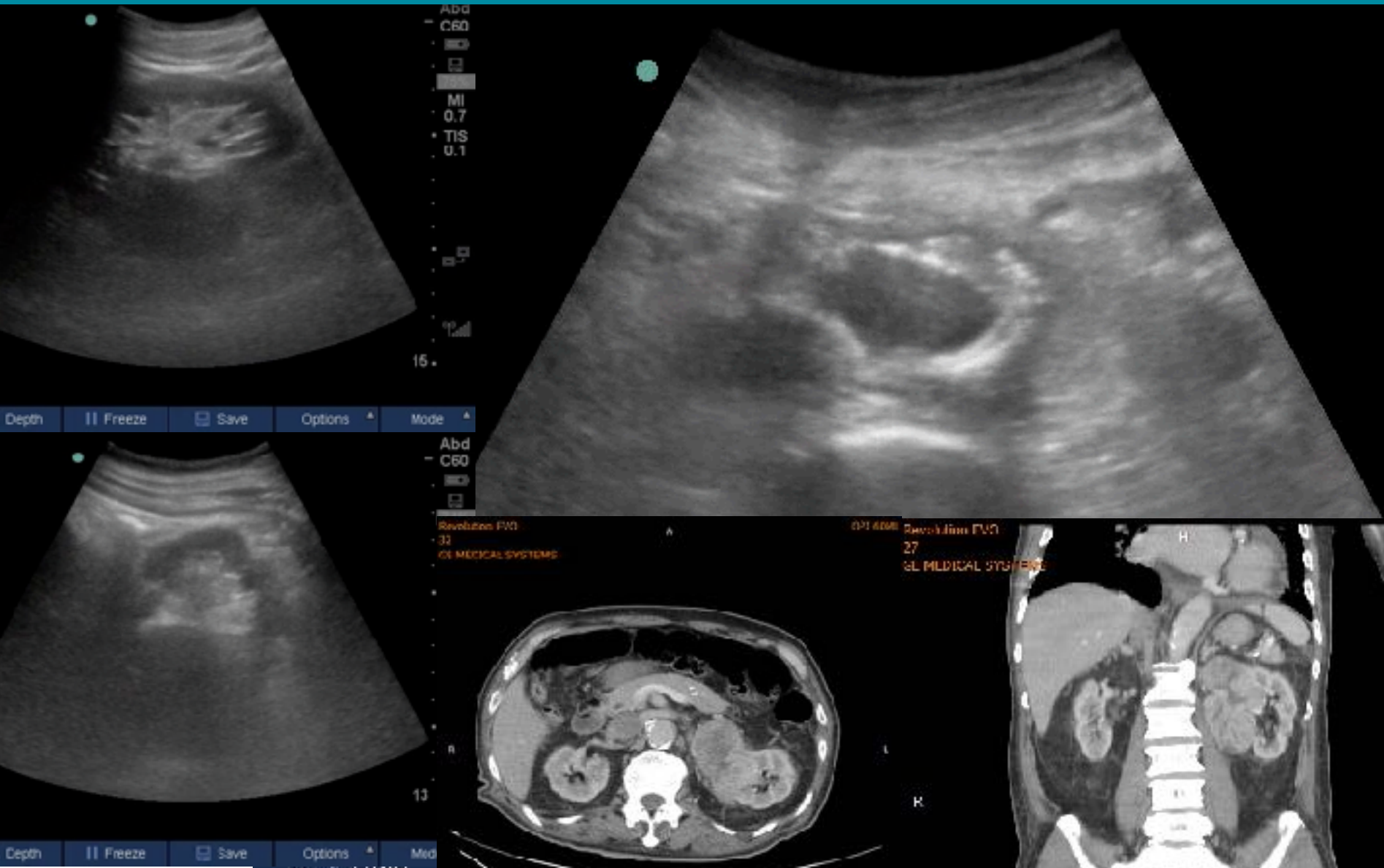
70M, flank pain > 敏盛 > cold
sweating / AMS > ETT



AAA rupture



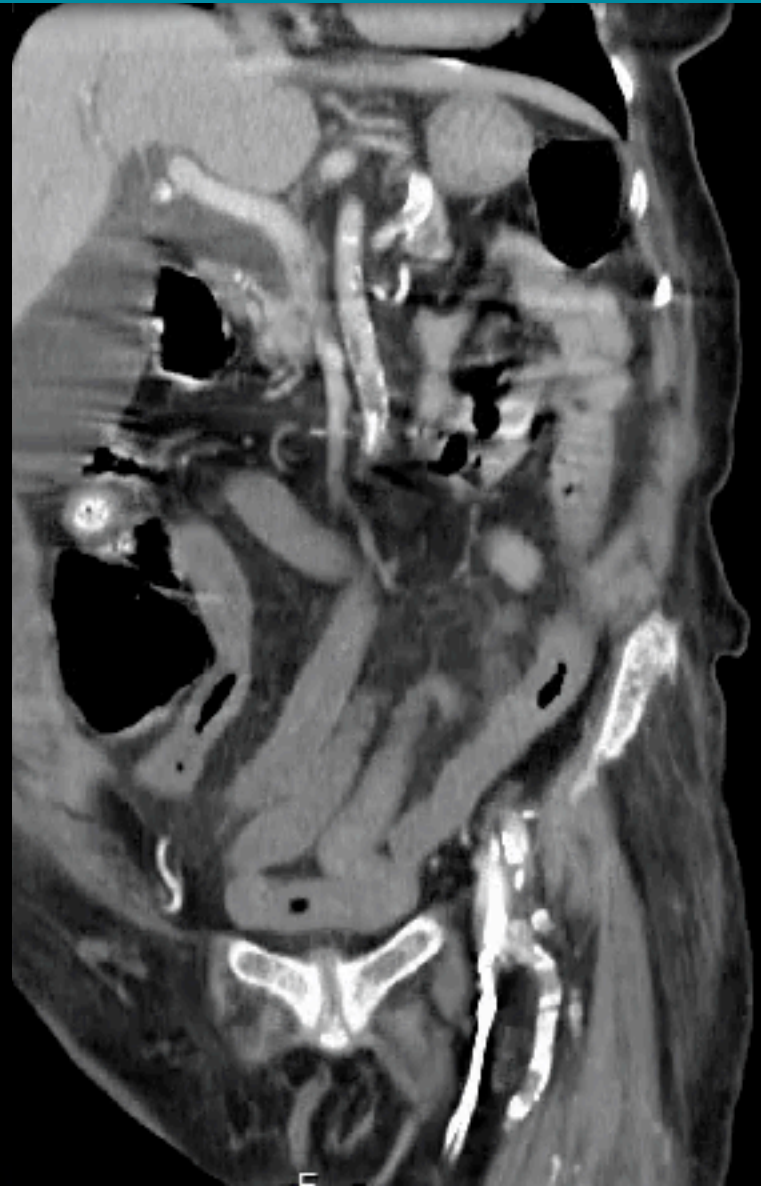
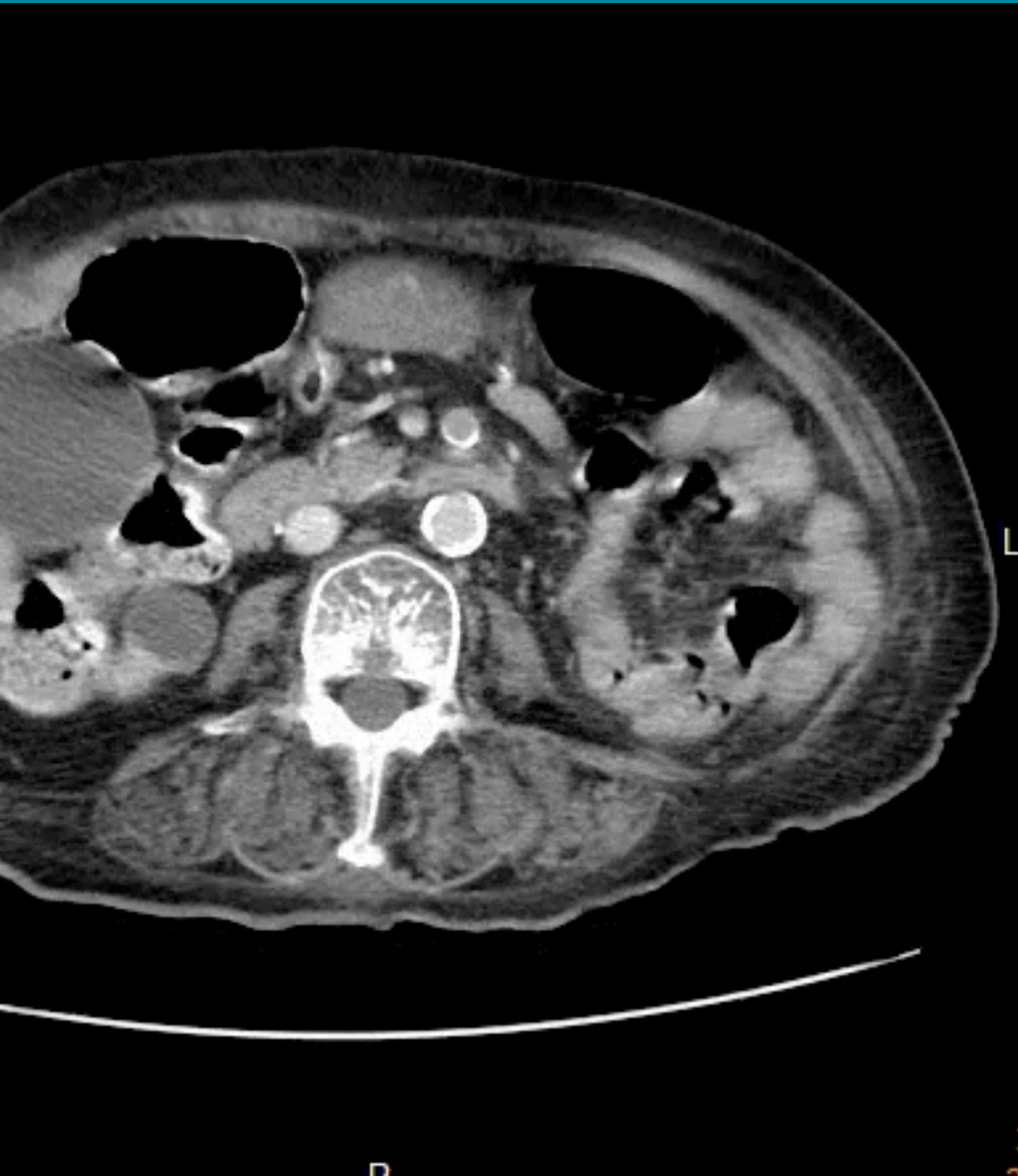
84F with fever



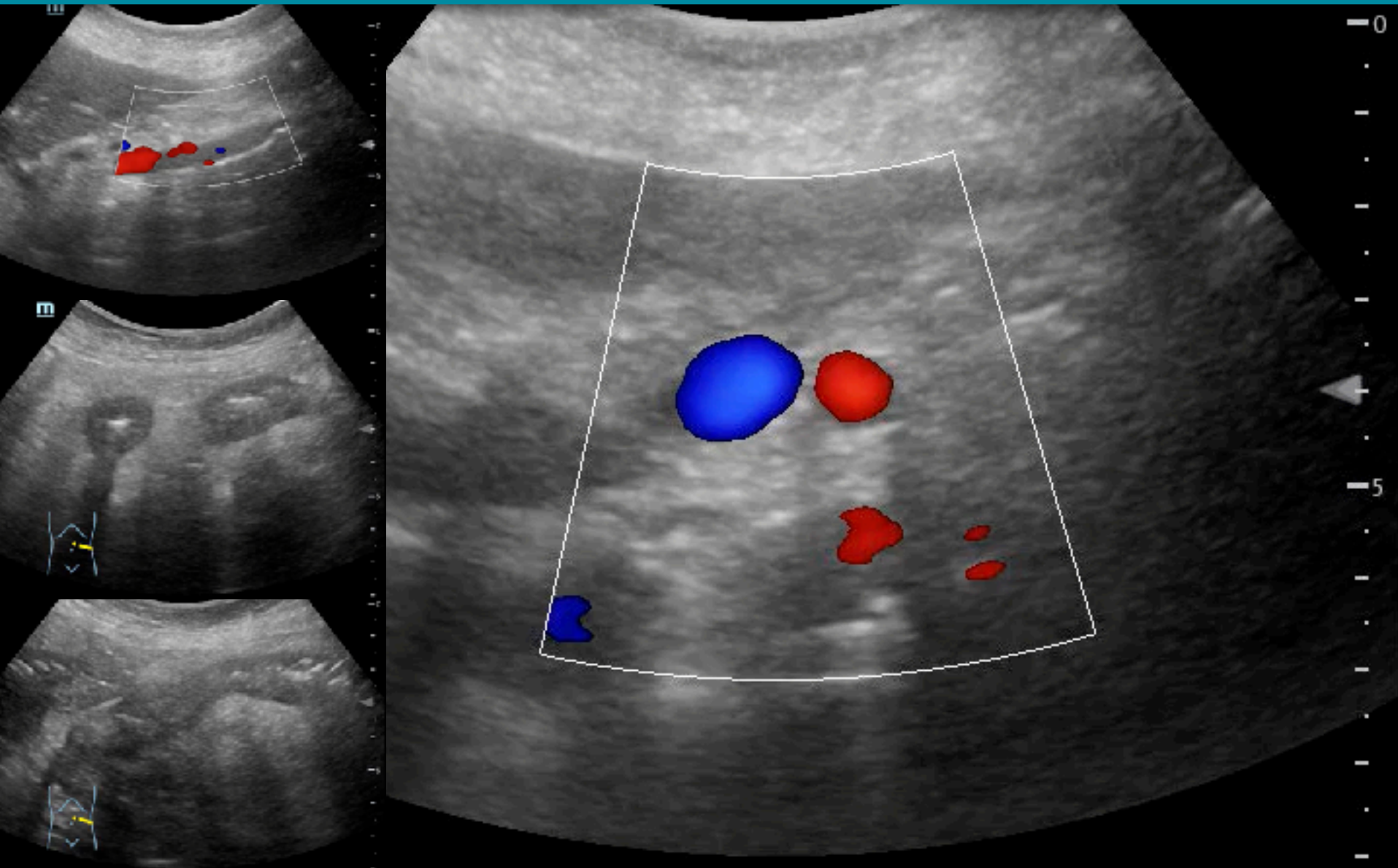
Mycotic aneurysm



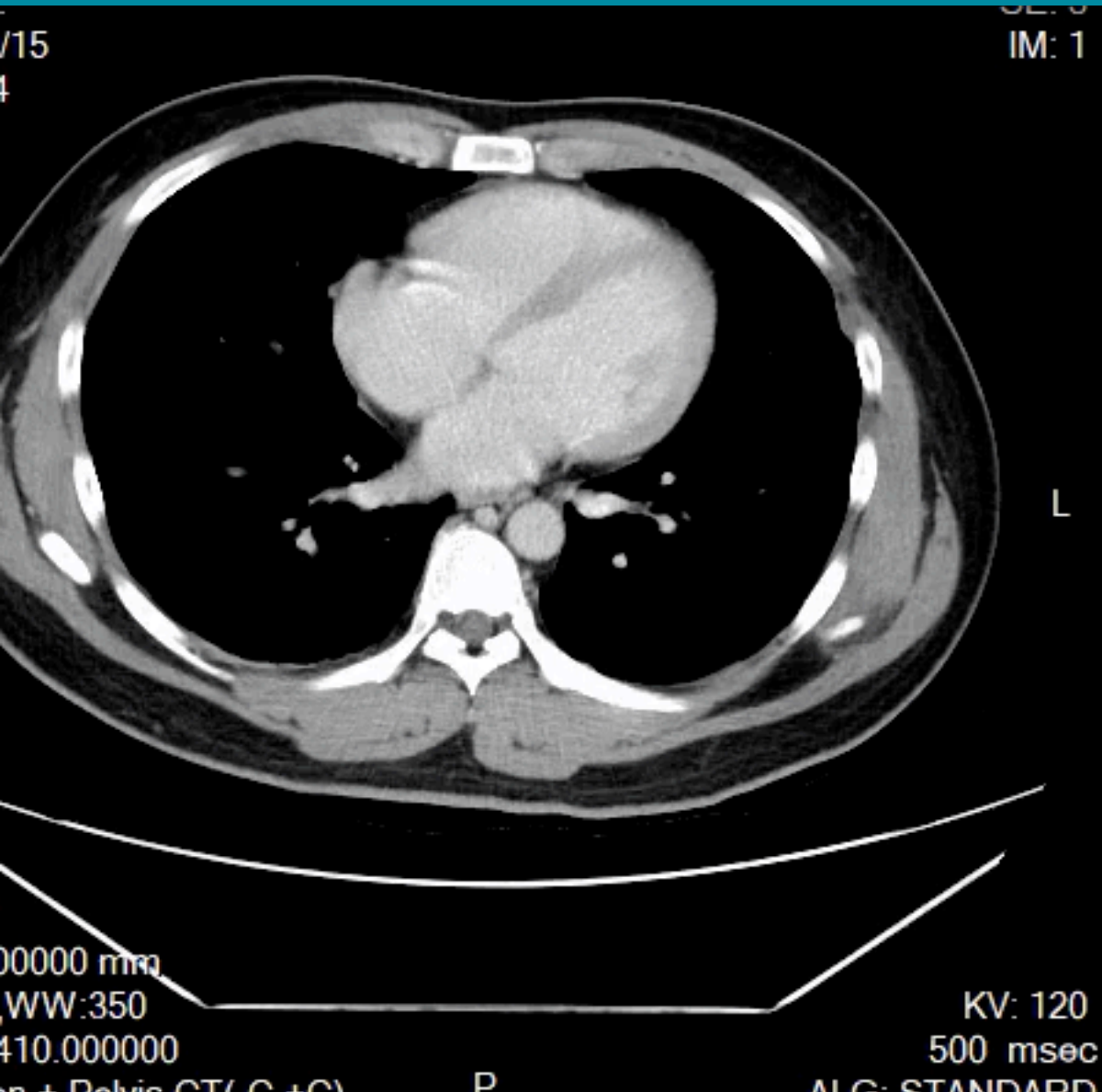
85F, ESRD, abdominal pain with bloody stool



SMA thrombosis

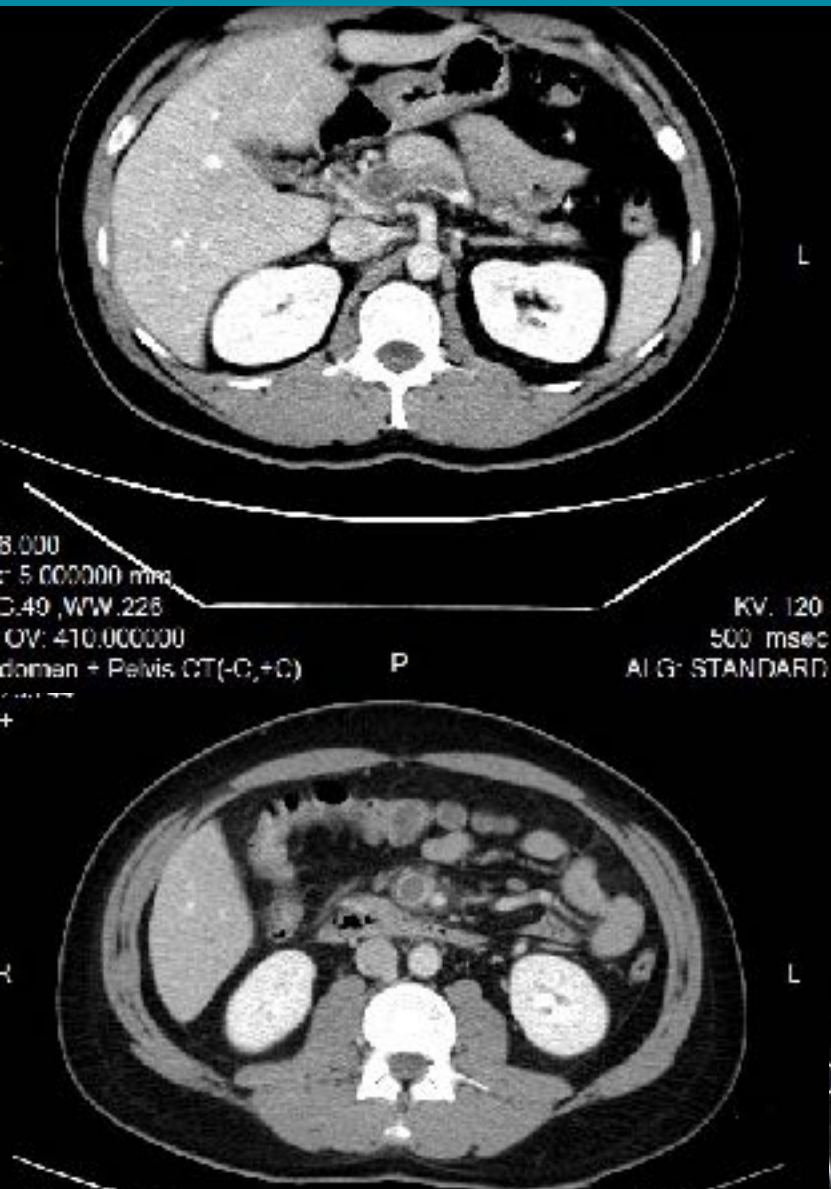


39F, fever for 4 days

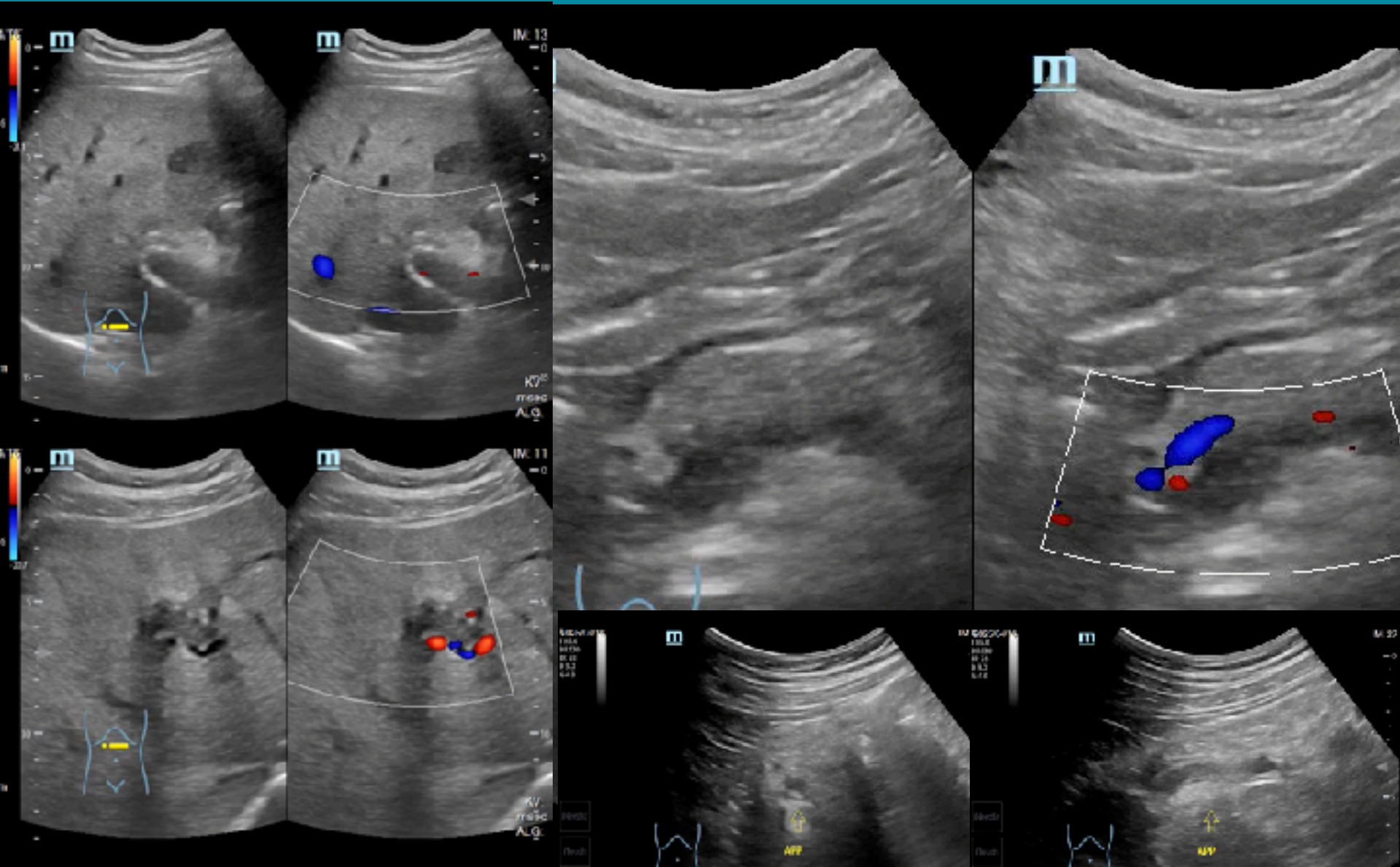


WBC 21000
CRP 21
Glucose 155
Hb 13
GOT 39
Cr 1.12

PV / SMV / SV thrombosis

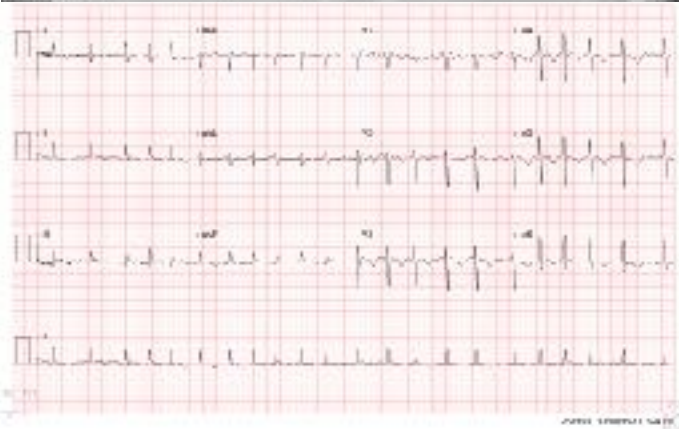


PV / SMV / SV thrombosis

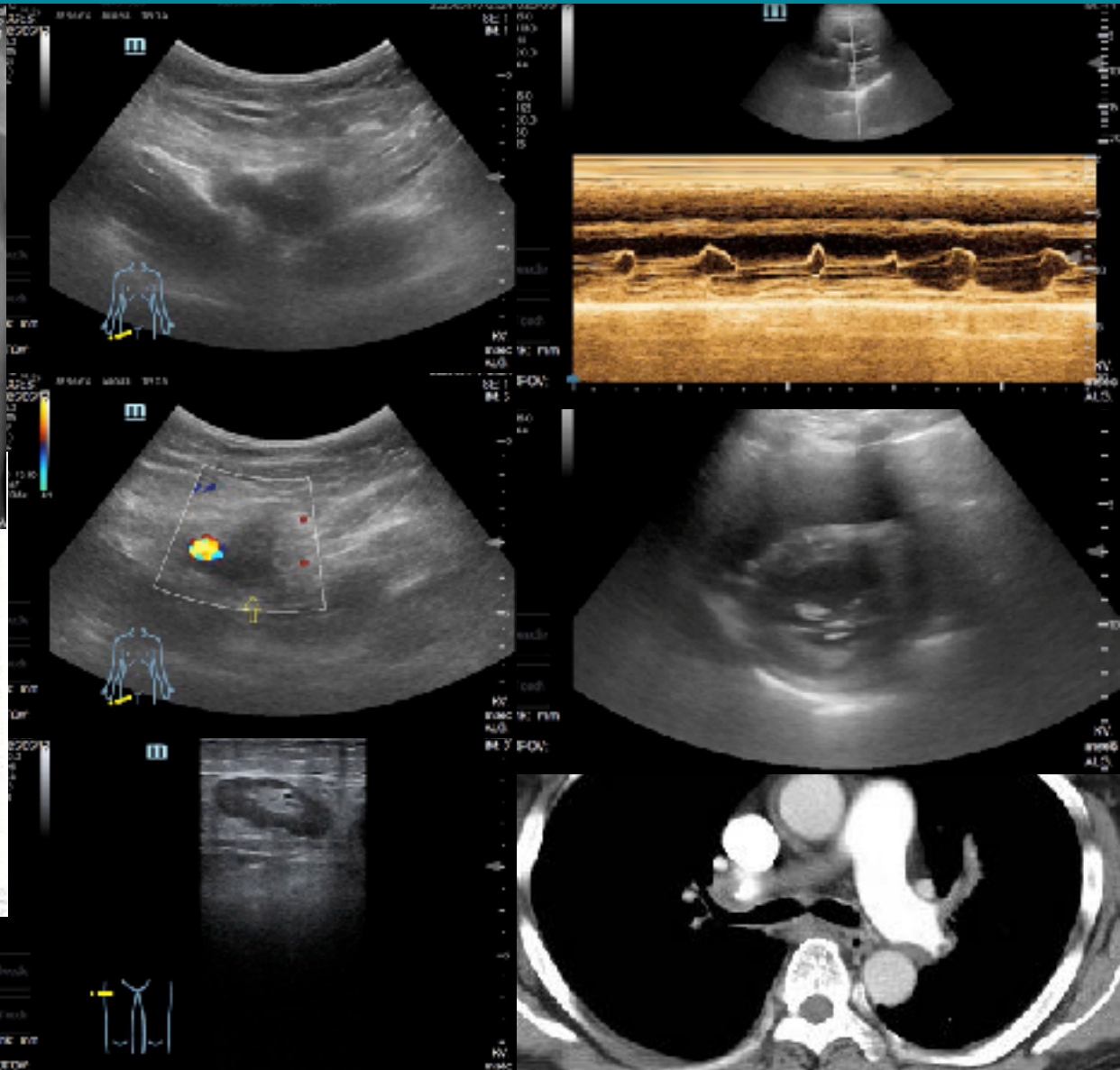


48M, R leg swelling 2 days

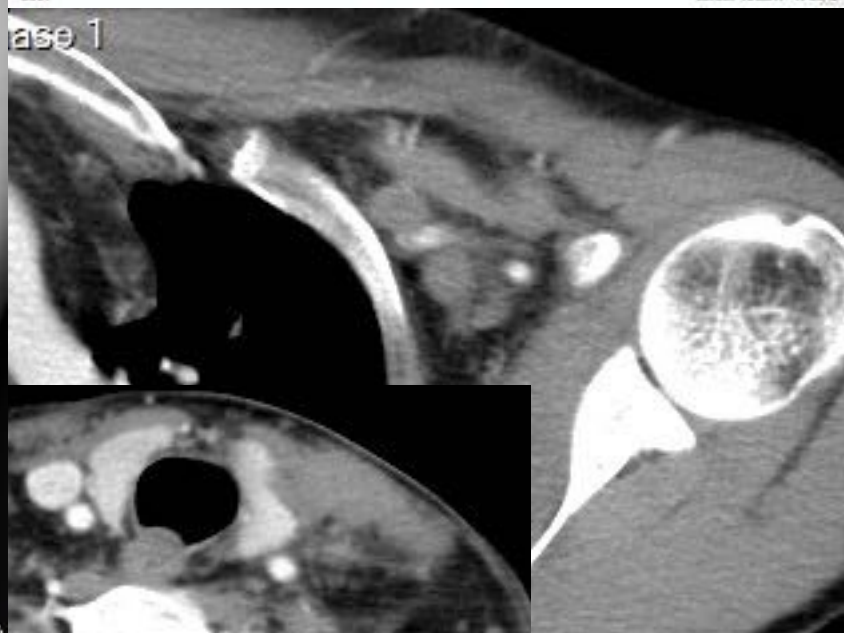
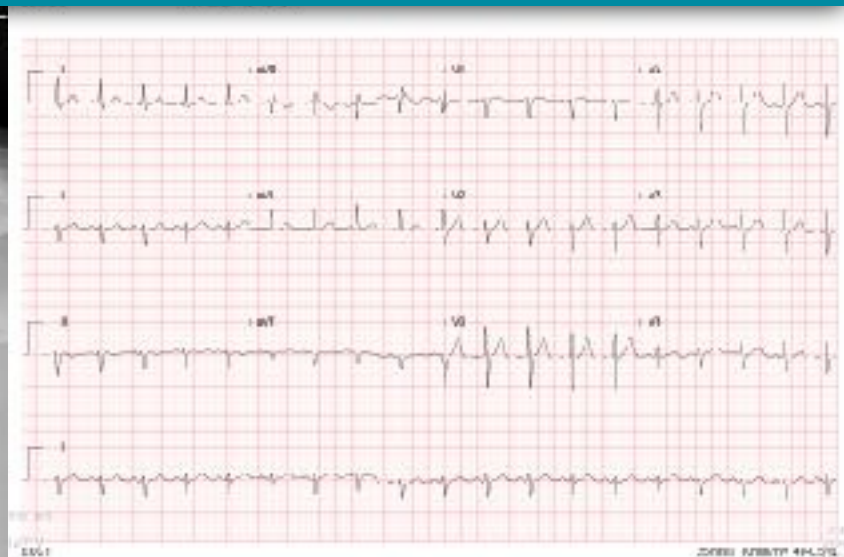
DVT



D dimer 9.88



46M, left arm swelling for 2 days OPD referred for r/o DVT

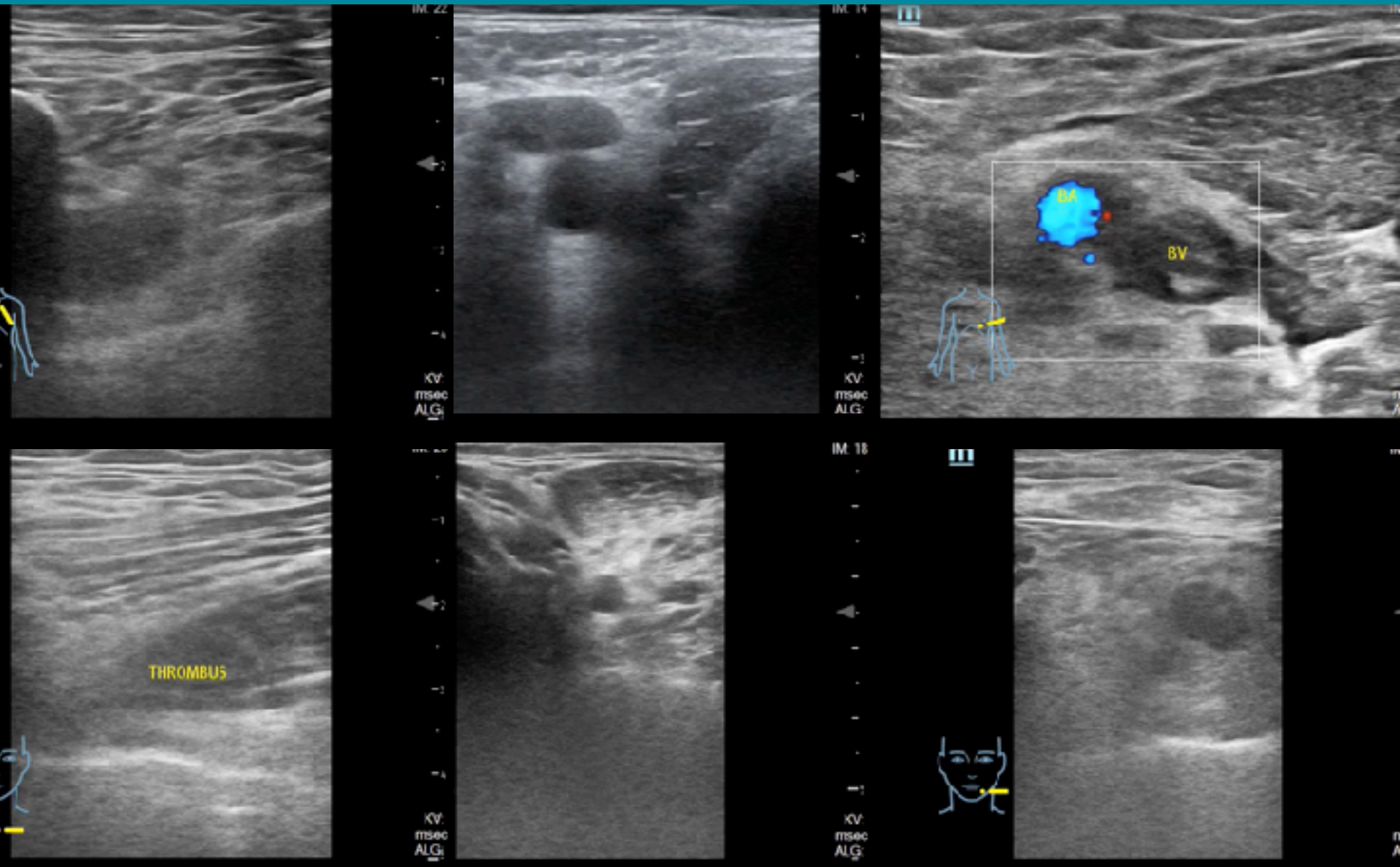


D dimer 3.2

DVT



DVT



Carcinomatosis

[12:52]

Object: POCUS :

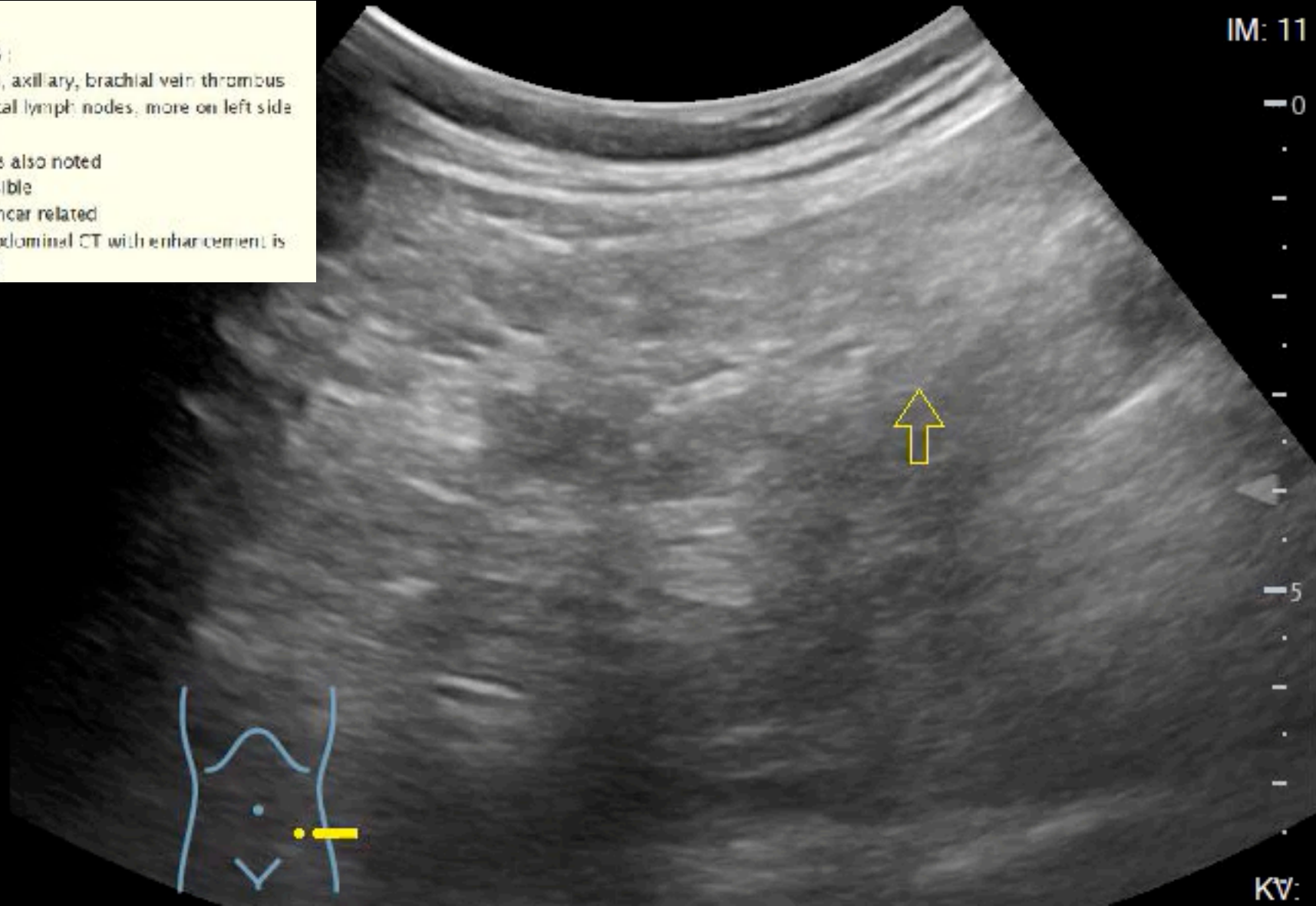
left subclavian, axillary, brachial vein thrombus
multiple cervical lymph nodes, more on left side
ascites noted

carcinomatosis also noted

left IIV : Invisible

>> suspect cancer related

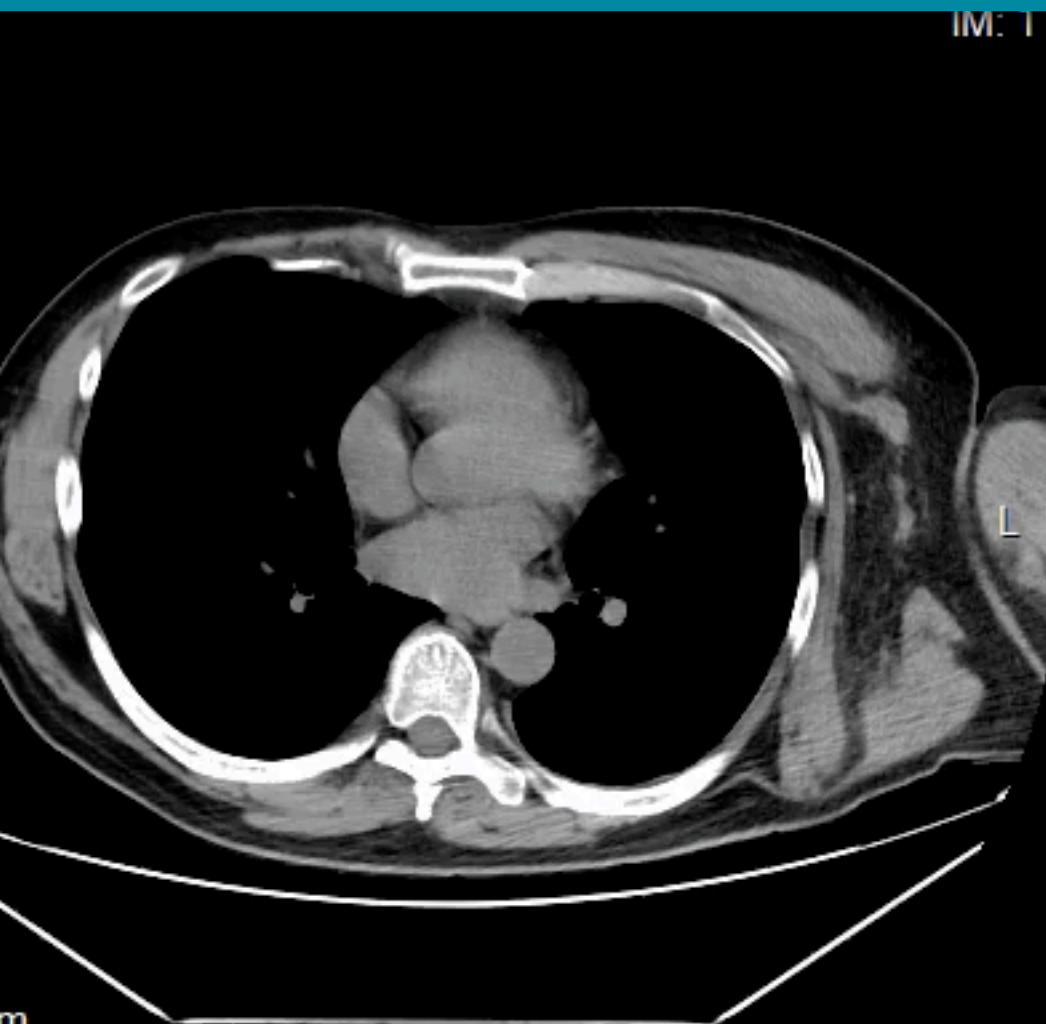
>> Chest & abdominal CT with enhancement is
recommended



iNeedle

iTouch

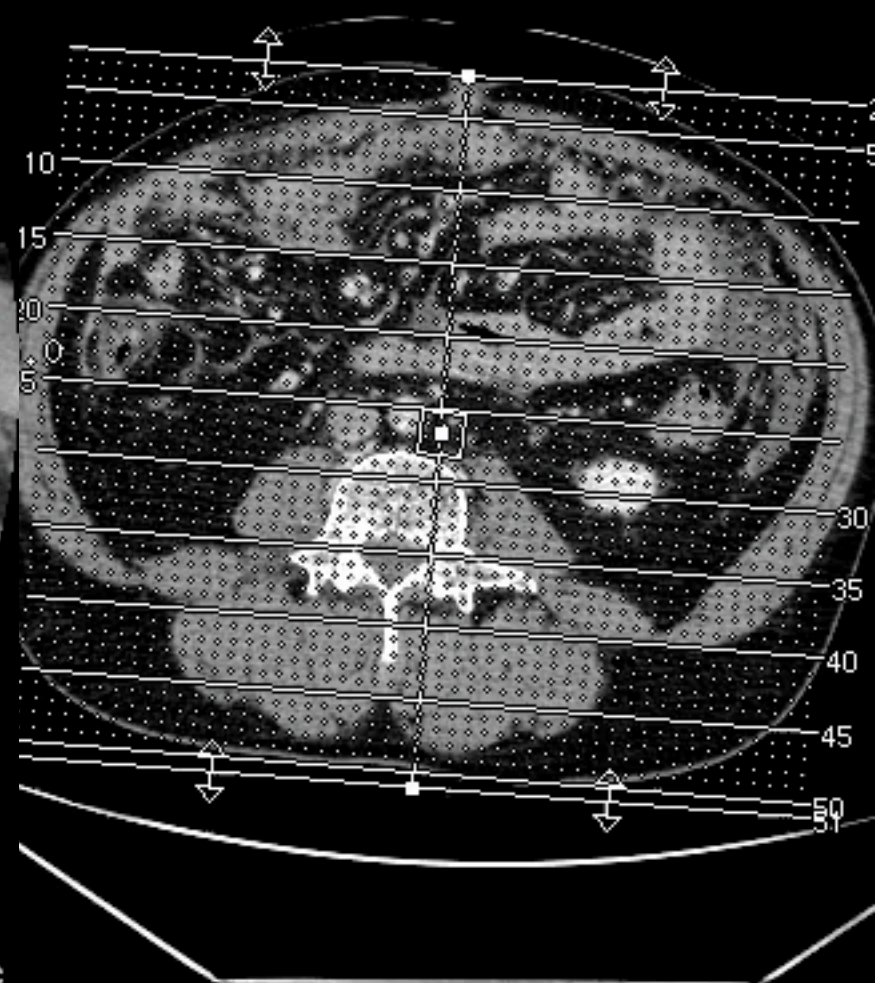
Methothelioma (間皮瘤)



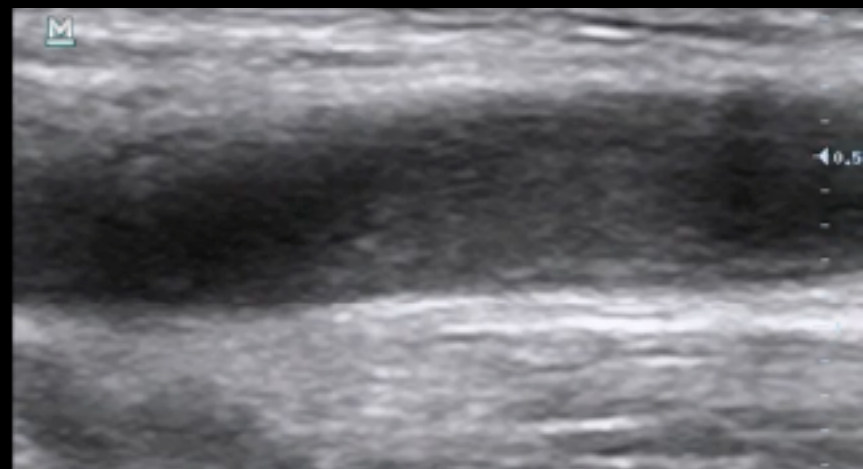
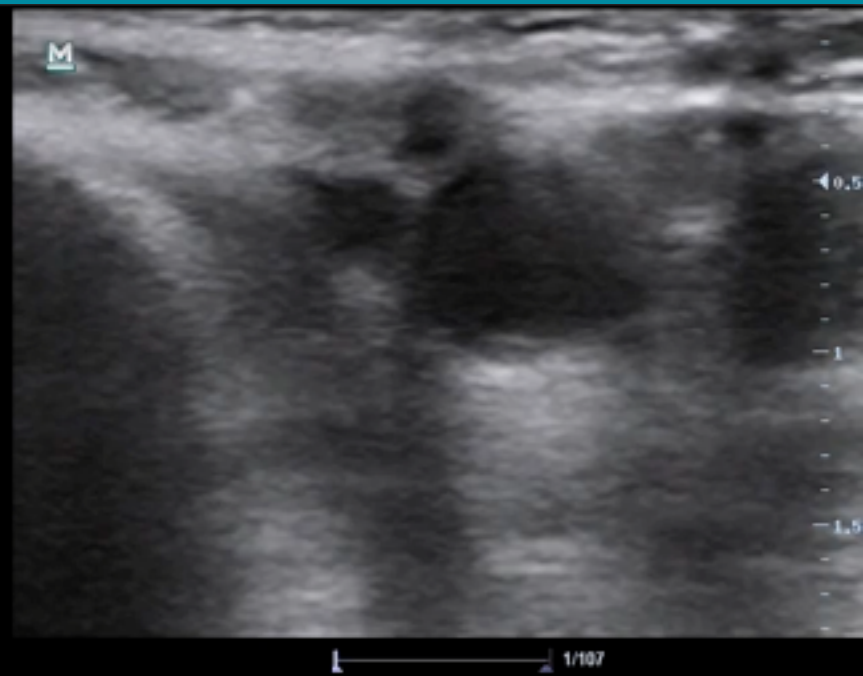
m
0
100
is CT(-C,+C)

P

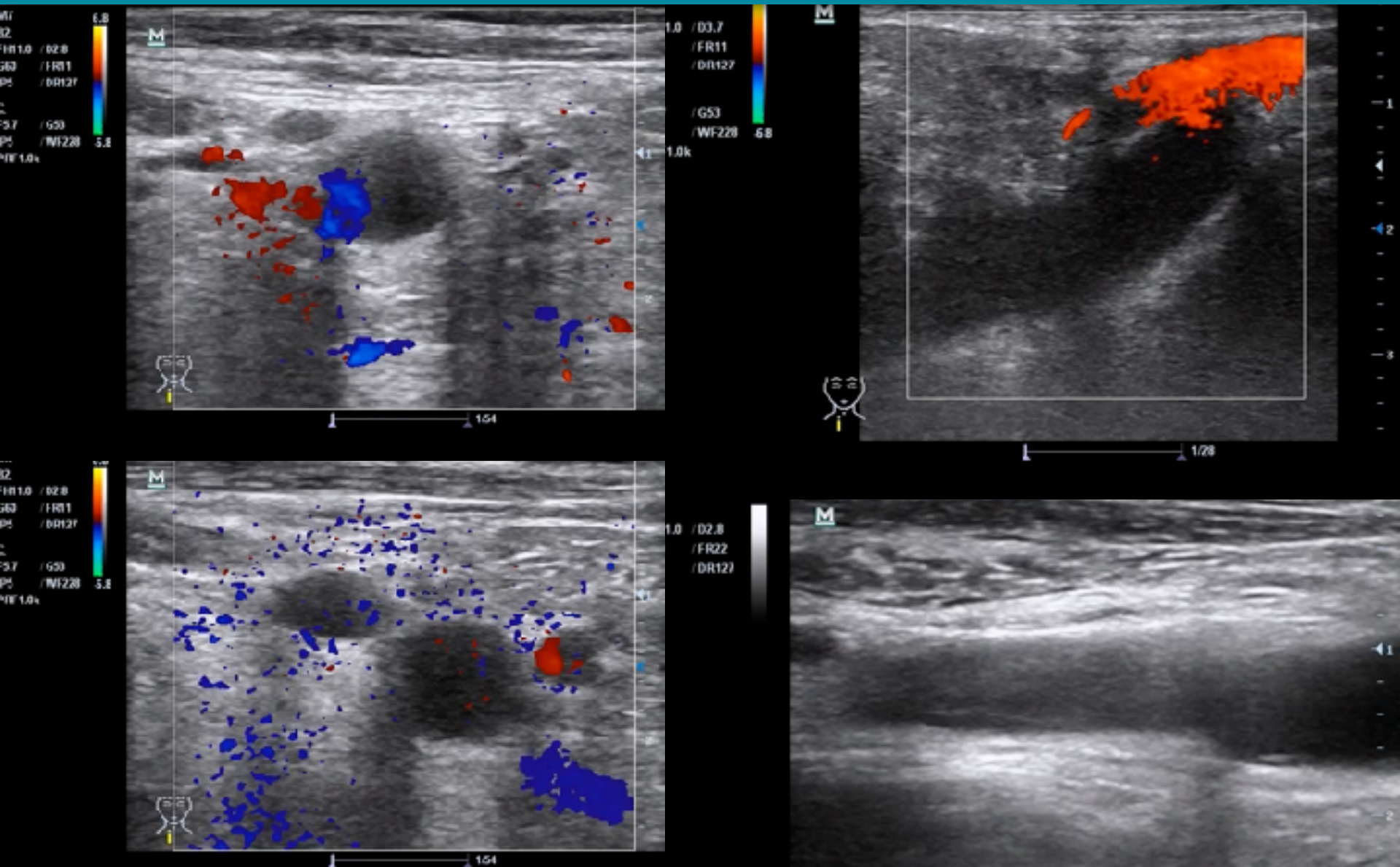
KV: 120
500 msec
ALG: STANDARD 50



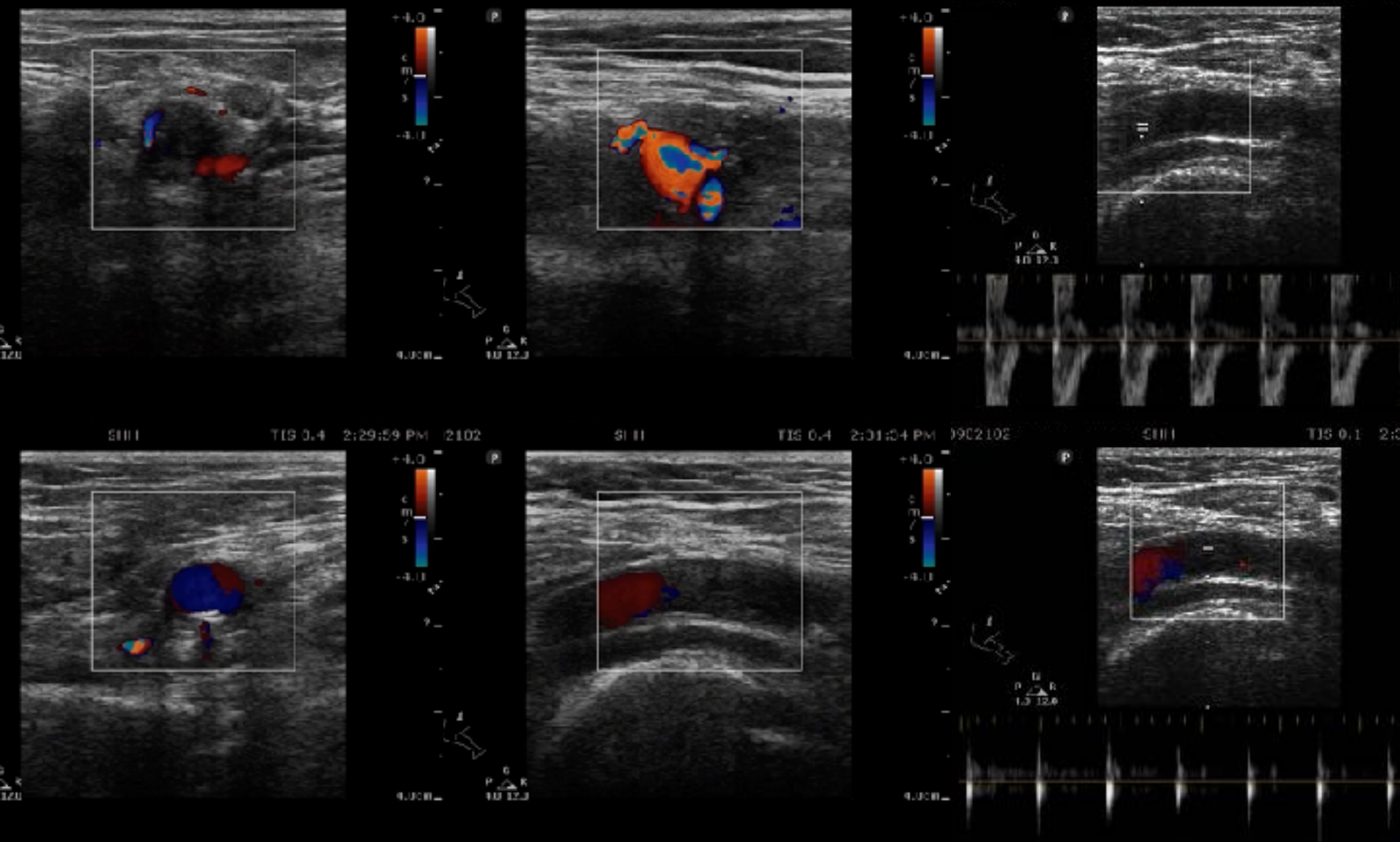
89M, right hand cyanosis



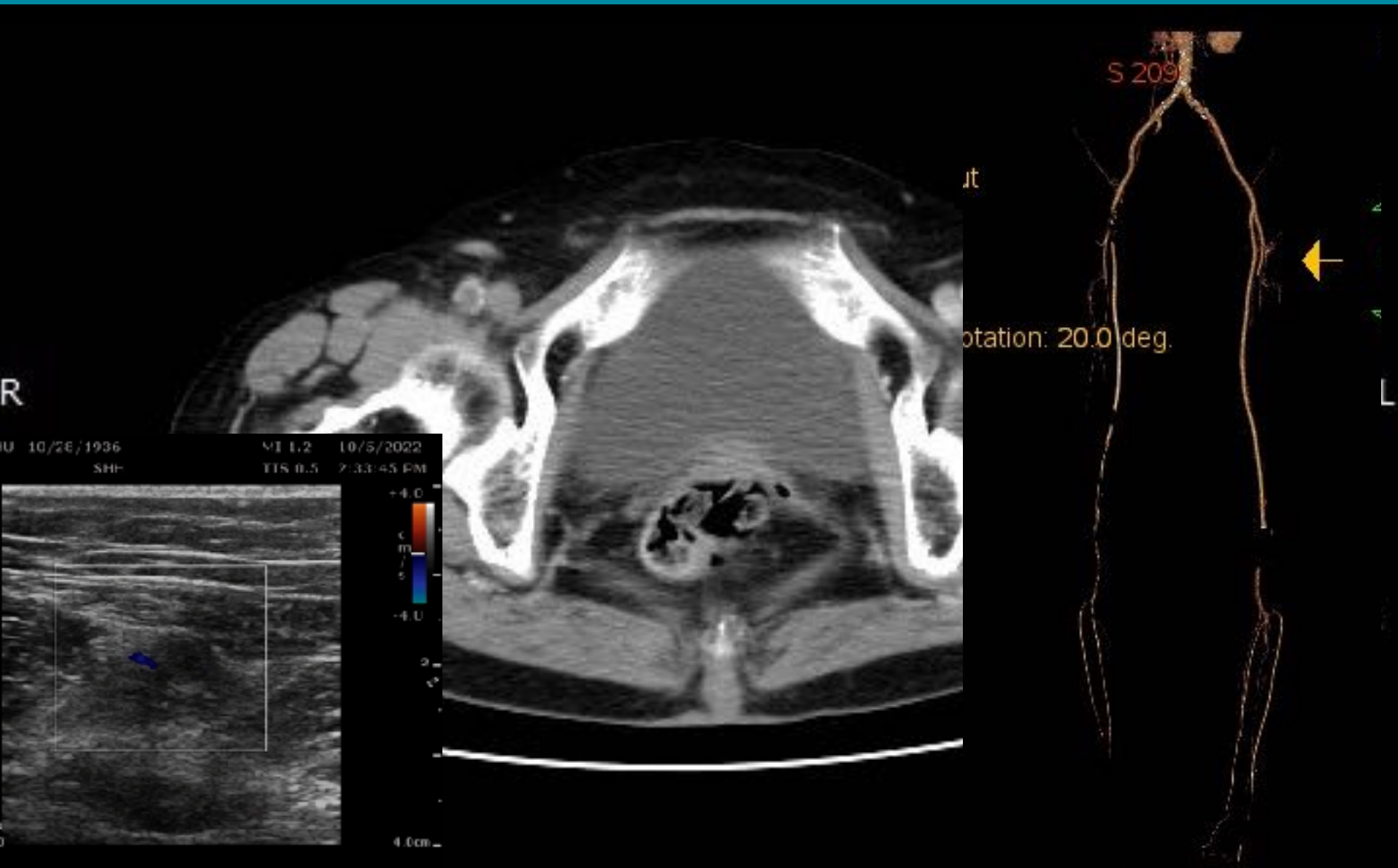
Axillary artery thrombus



85F, right leg soreness/pain for 1D



PAOD



65M, CVA WITH LEFT SIDE WEAKNESS; 住豐榮 RIGHT NGUINAL CARBUNCLE & PUS DISCHARGE

evolution EVO
24/05/03
C:45, WW:350
+
1 55 09



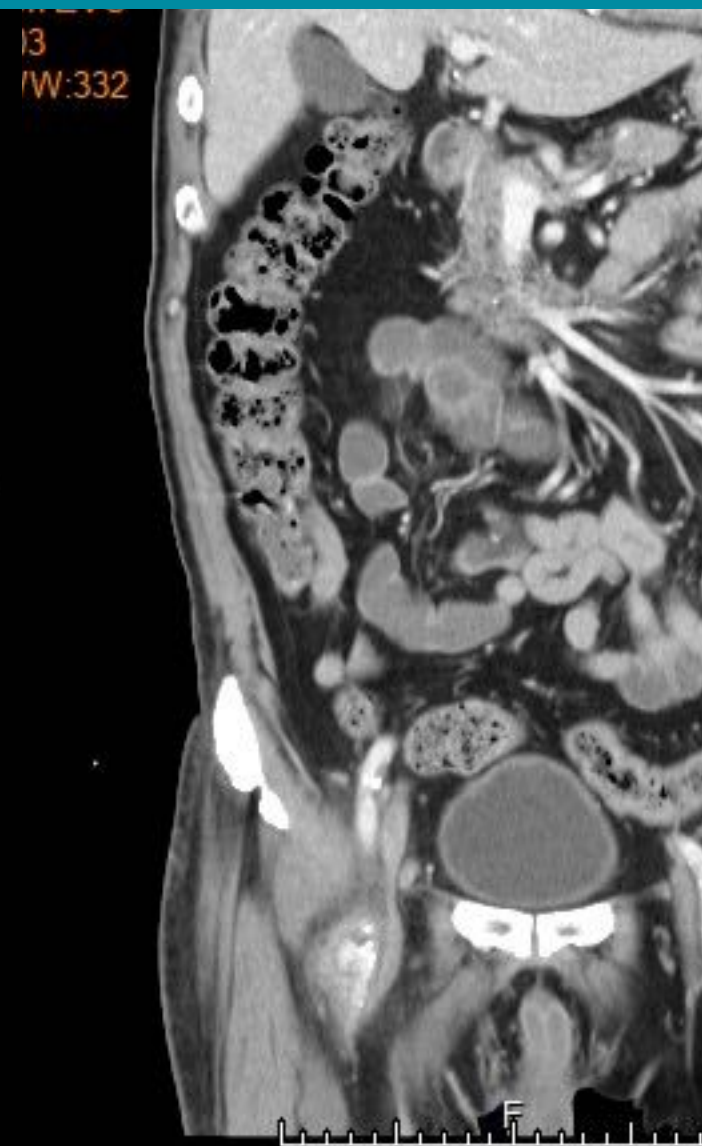
15cm

evolution EVO
24/05/03
C:45, WW:350
IR
1 55 09

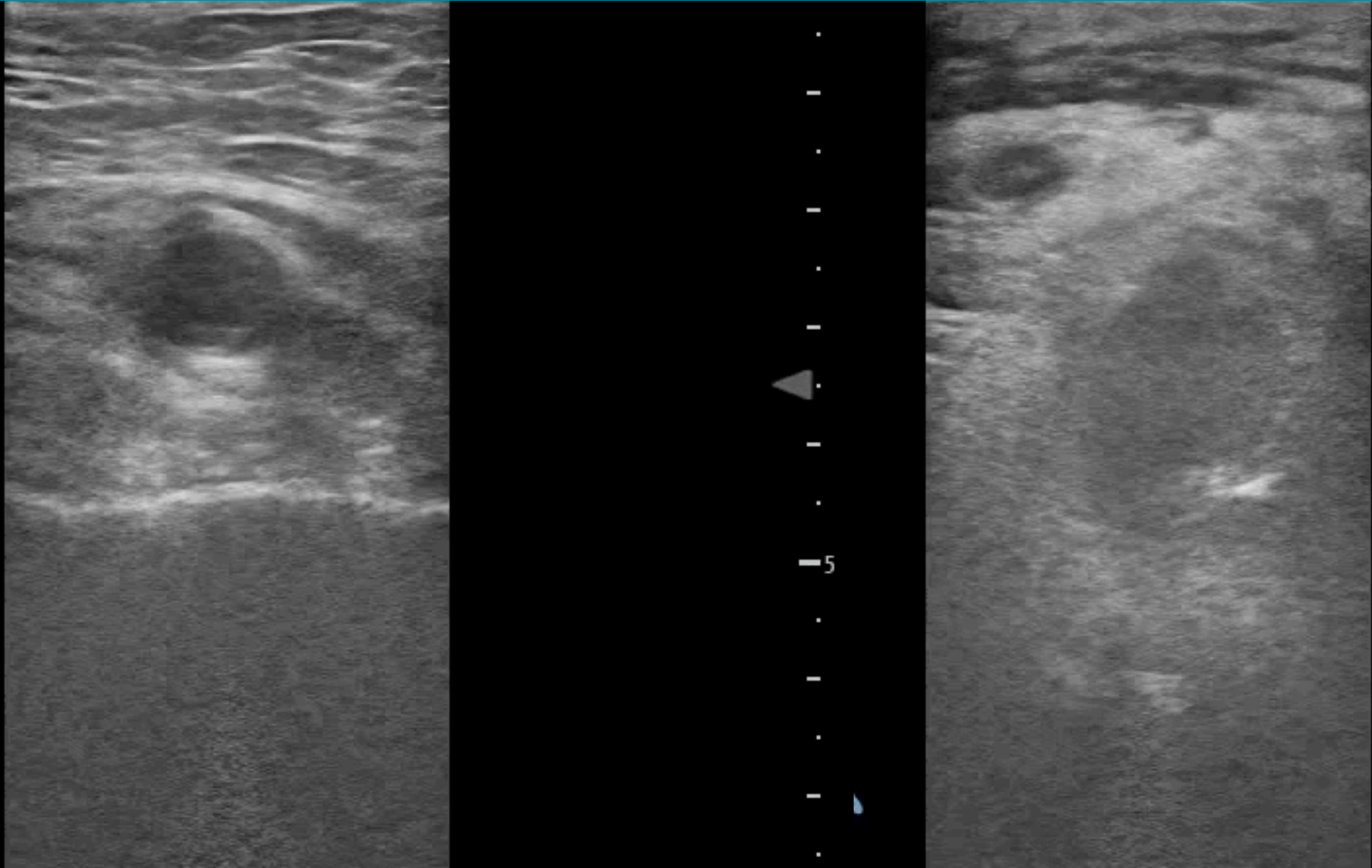


15cm

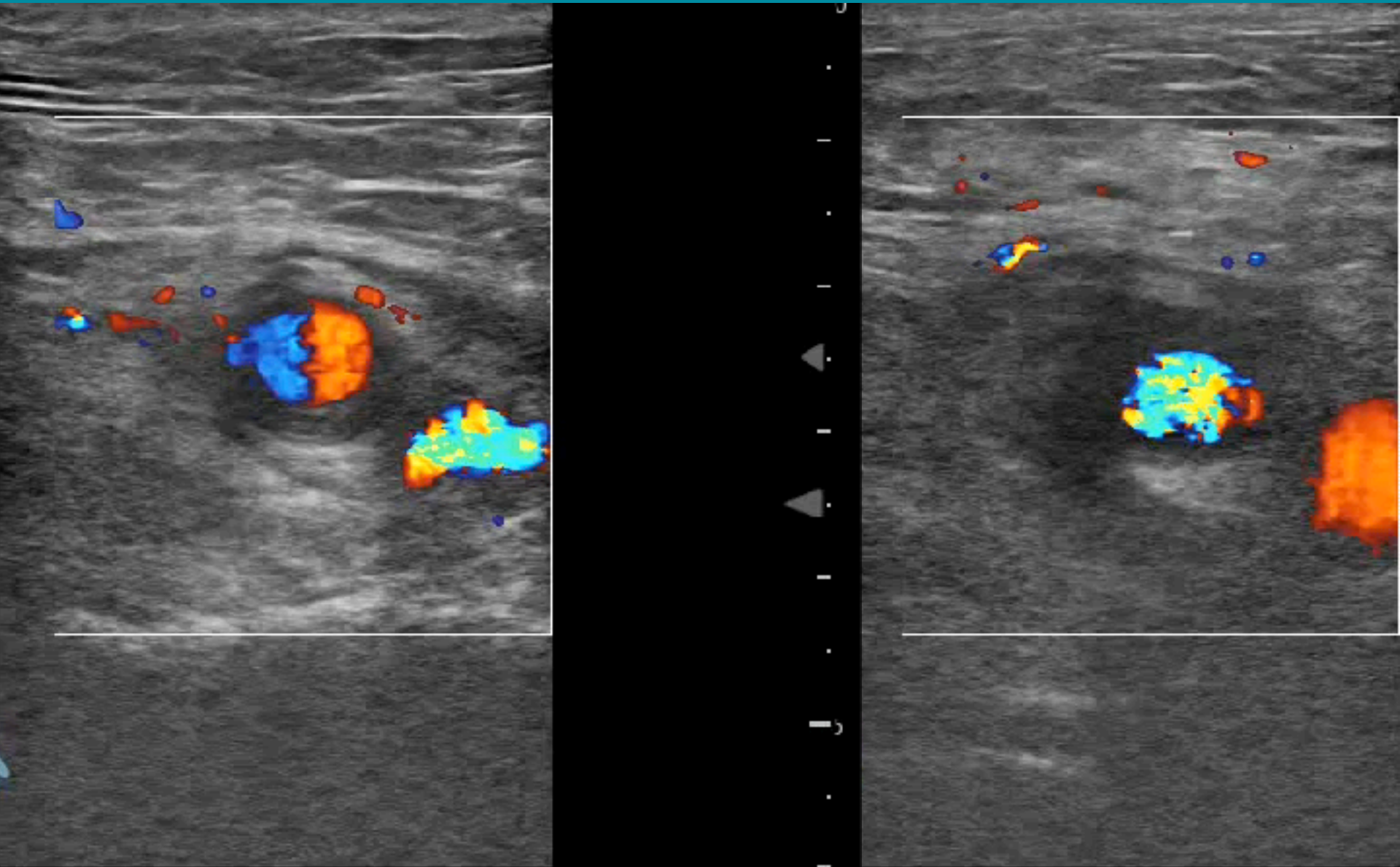
WBC 10050; CRP 12.55; GLU 237; PUS: KP



WBC 10050; CRP 12.55; GLU 237; PUS: KP



WBC 10050; CRP 12.55; GLU 237; PUS: KP



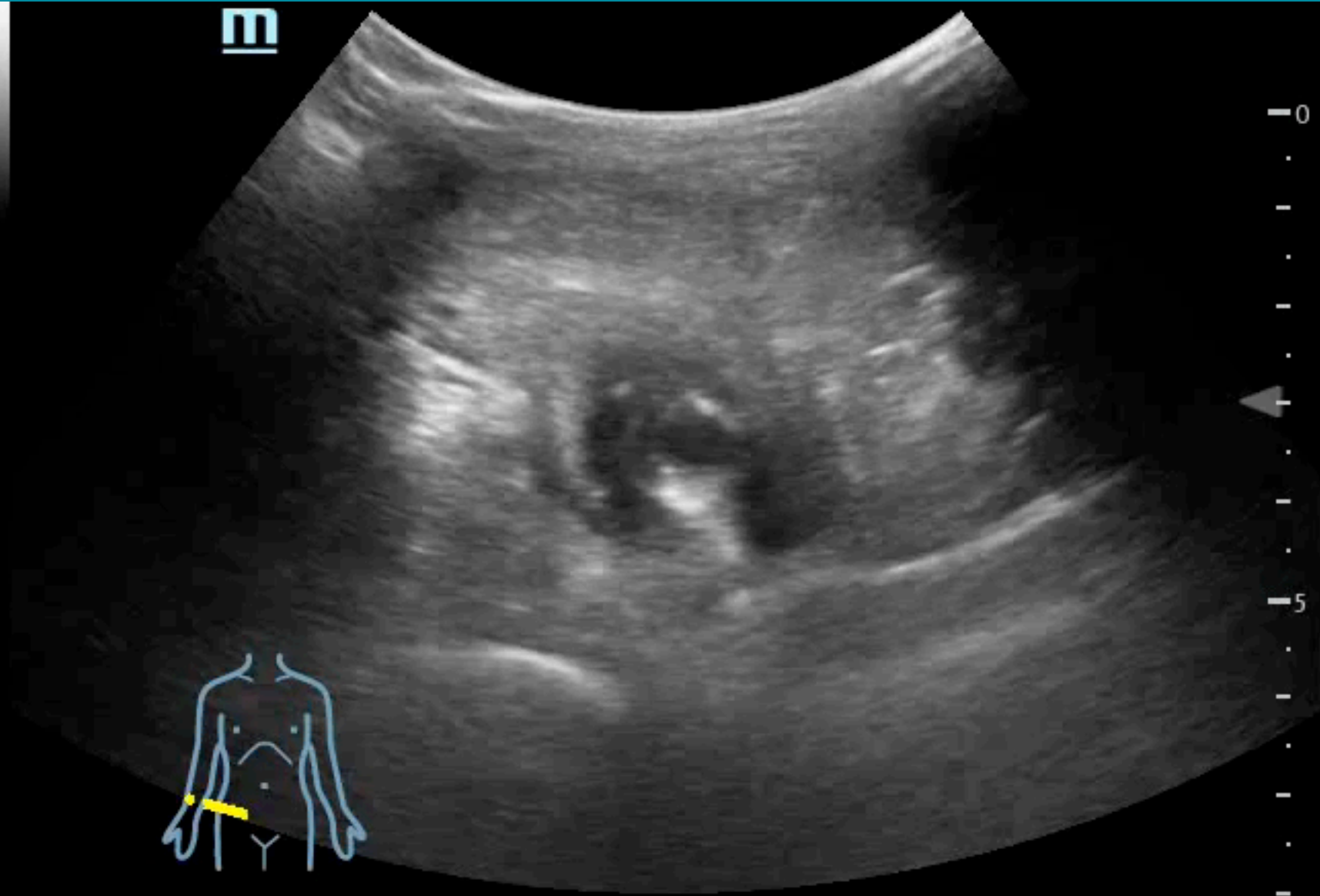
WBC 10050; CRP 12.55; GLU 237; PUS: KP

FH5.0
DR 115
FR 25
D 8.0
G 63



iNeedle

iTouch

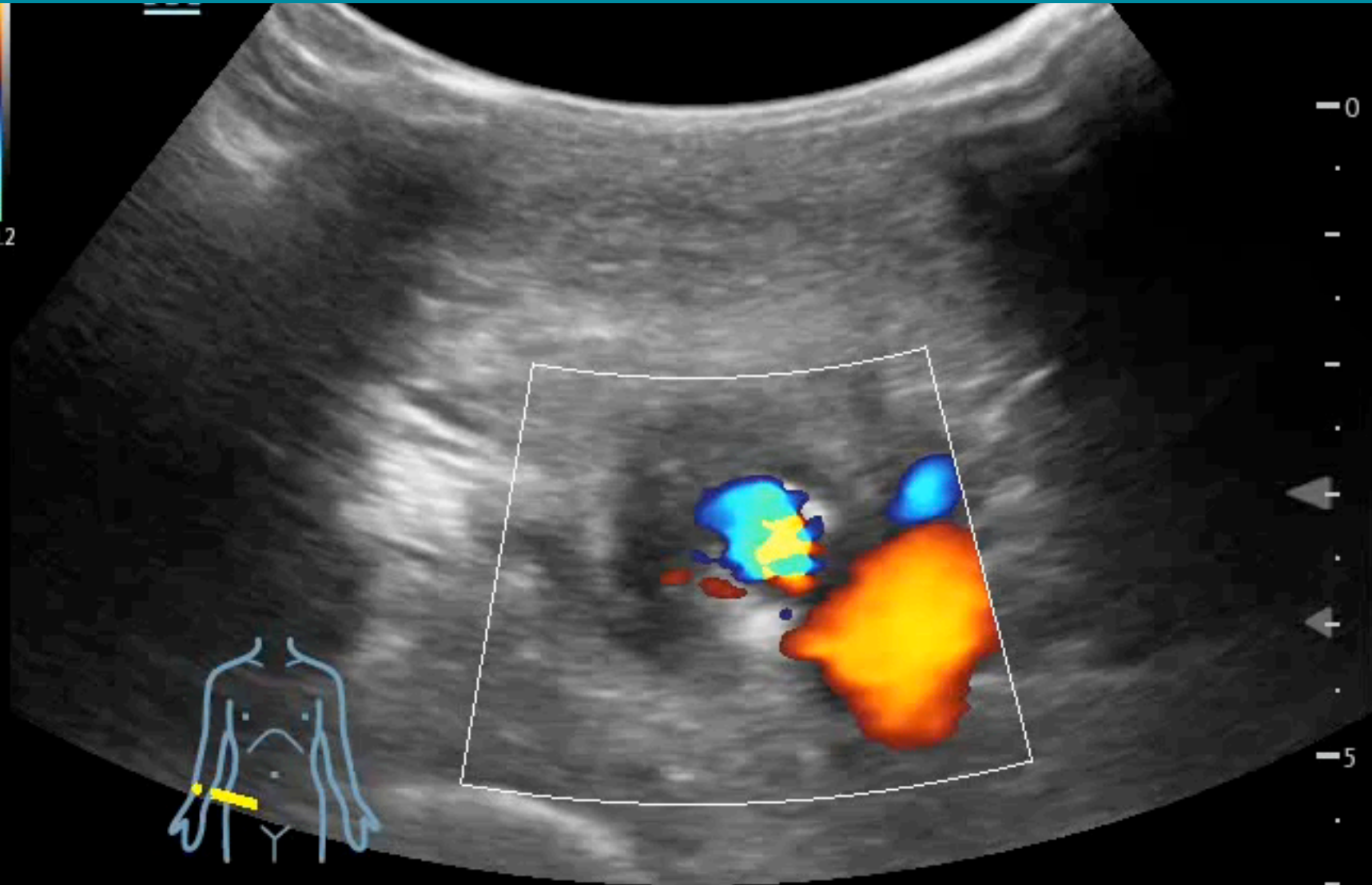


WBC 10050; CRP 12.55; GLU 237; PUS: KP

DR 115
FR 20
D 6.0
G 63
C
F2.5 /G30
WF171
PRF0.6k -9.2

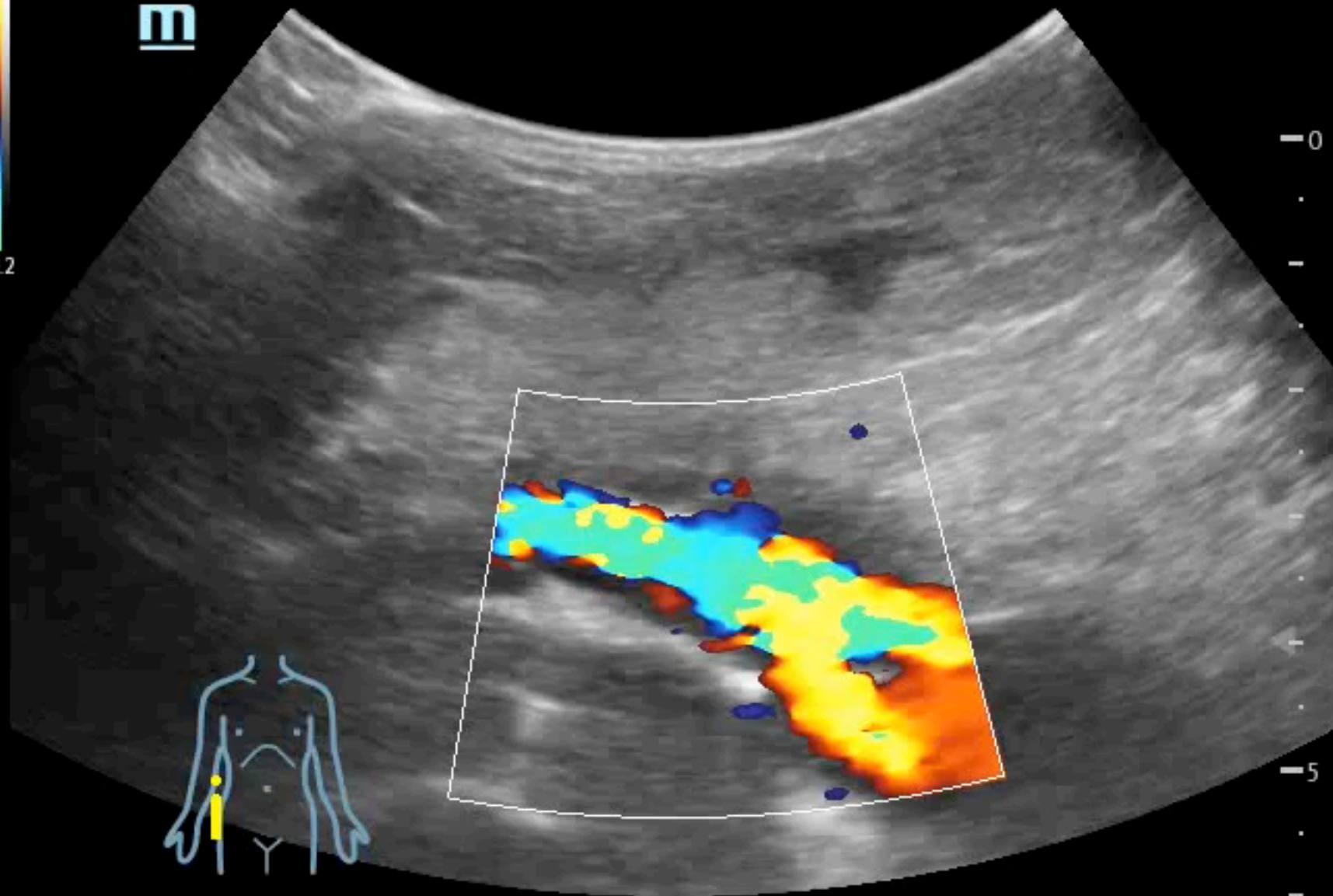
iNeedle

iTouch



WBC 10050; CRP 12.55; GLU 237; PUS: KP

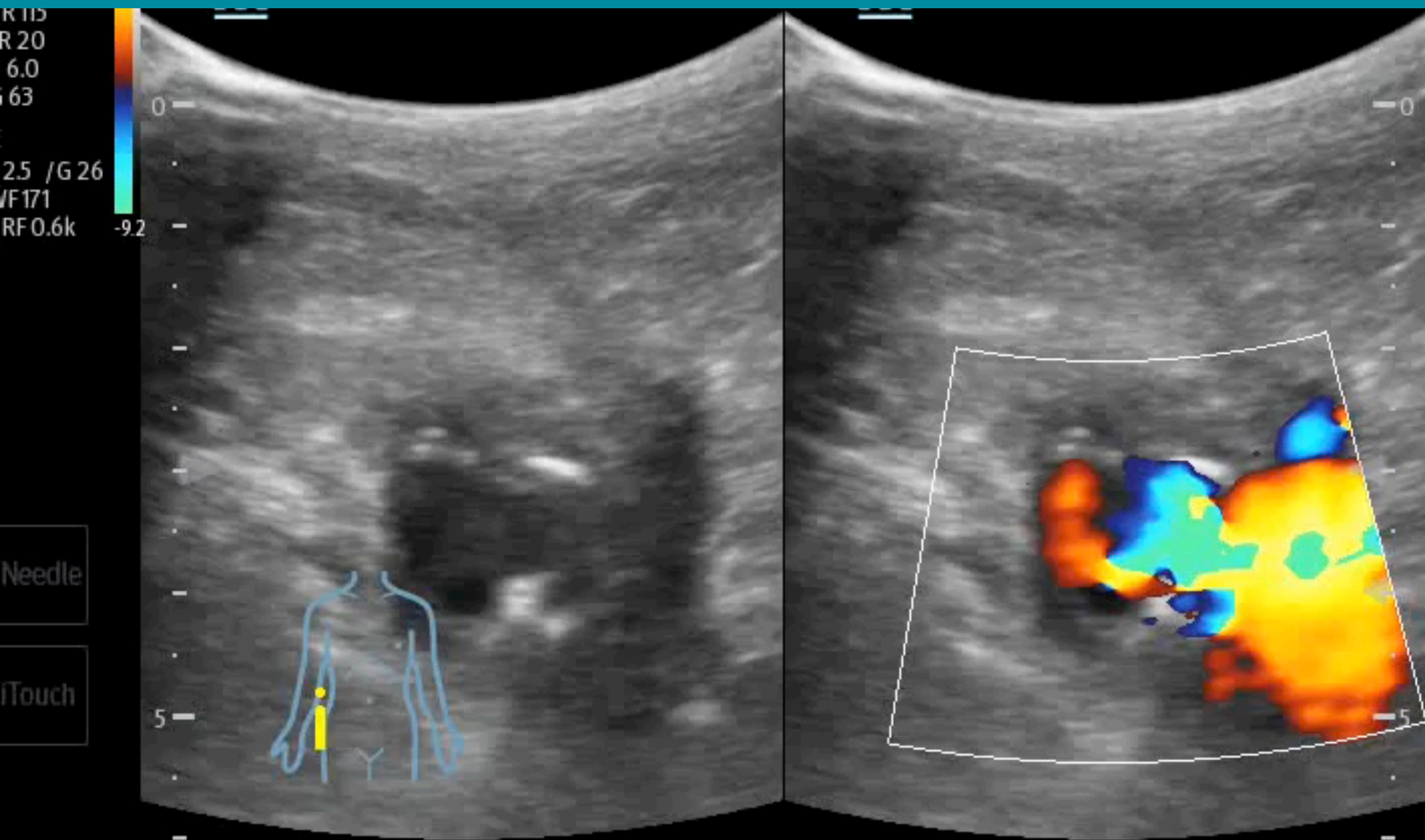
FH5.0
DR 115
FR 20
D 6.0
G 63
C
F2.5 /G 26
WF171
PRF 0.6k -9.2



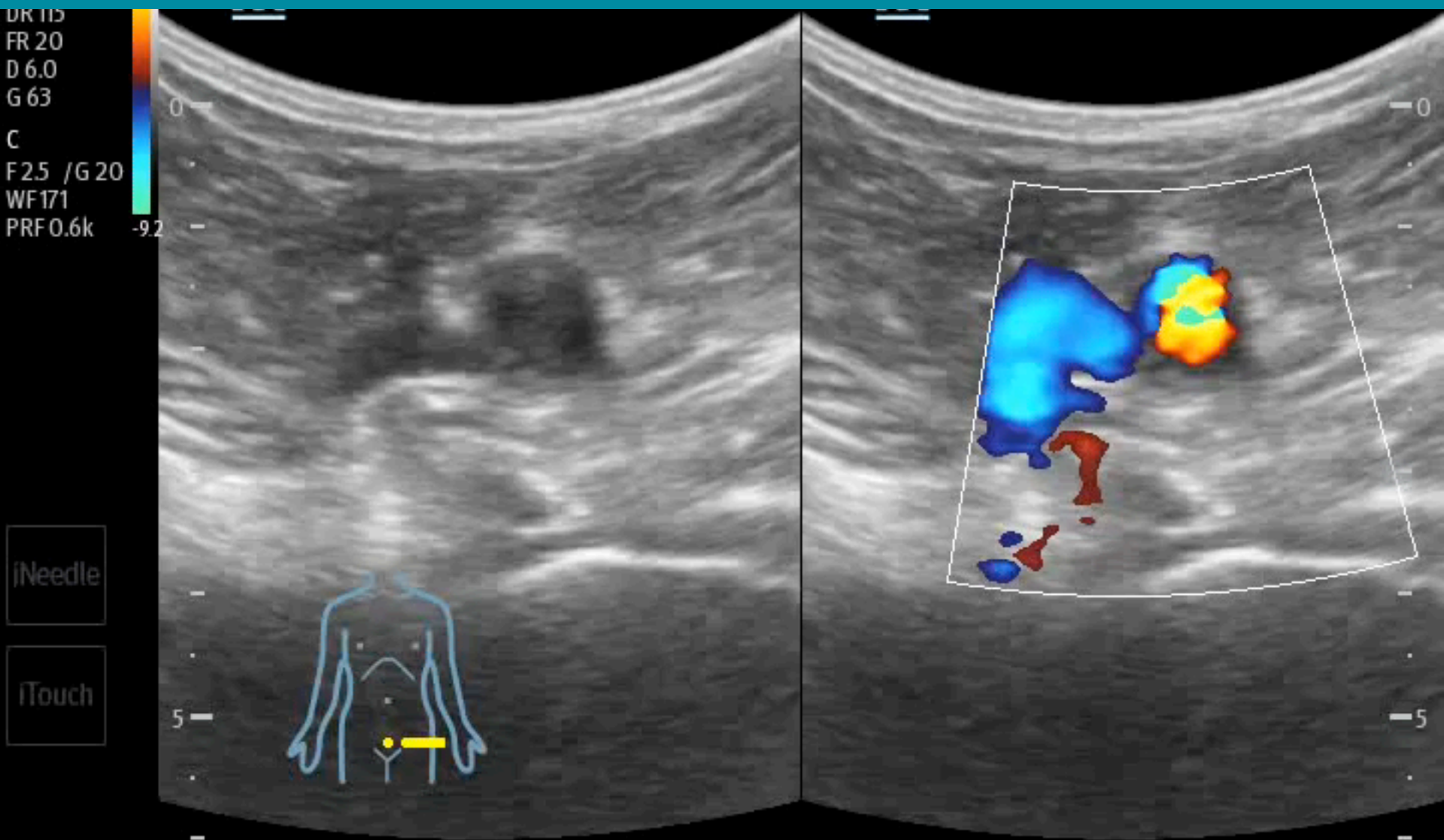
iNeedle

iTouch

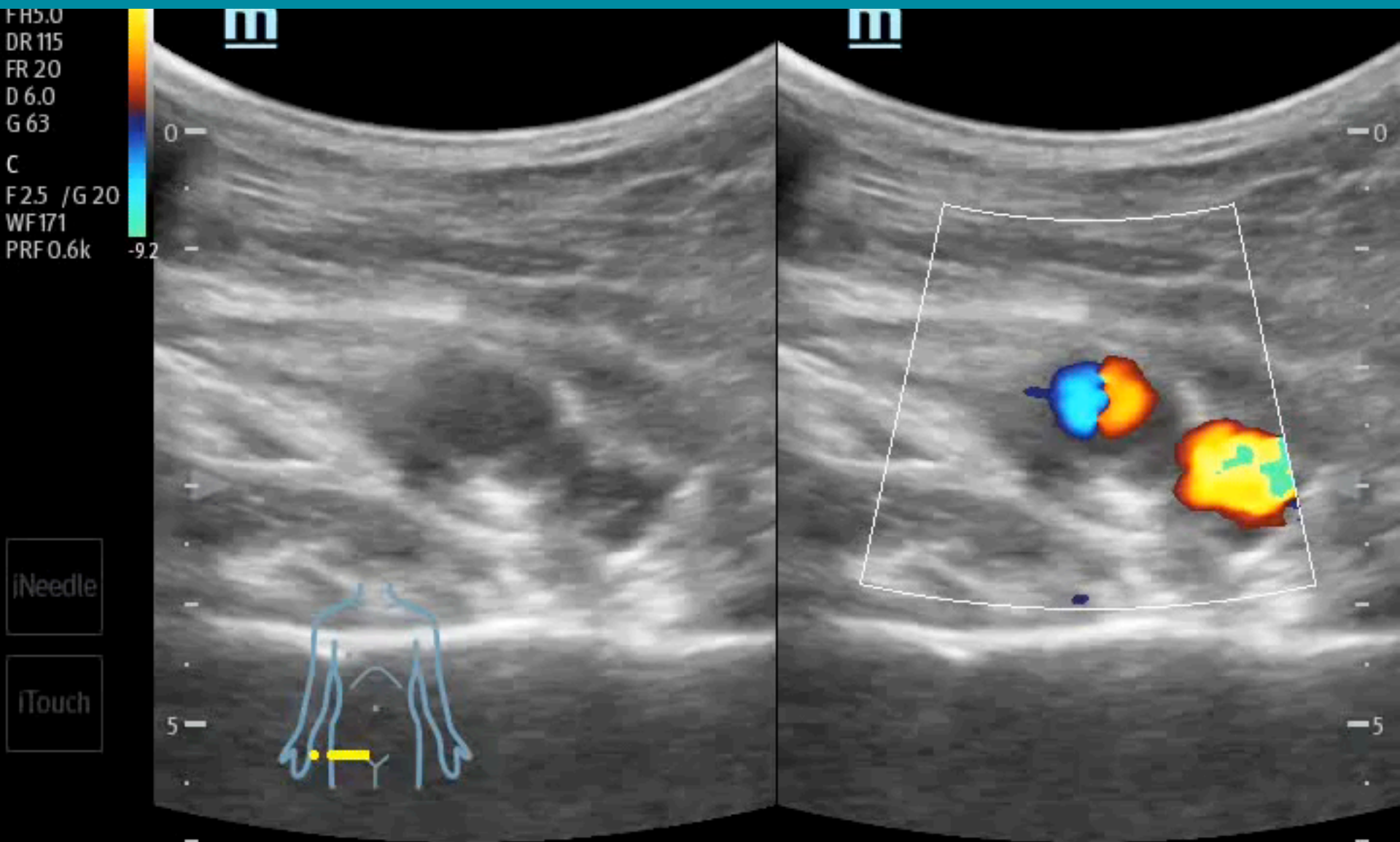
MYCOTIC ANEURYSM



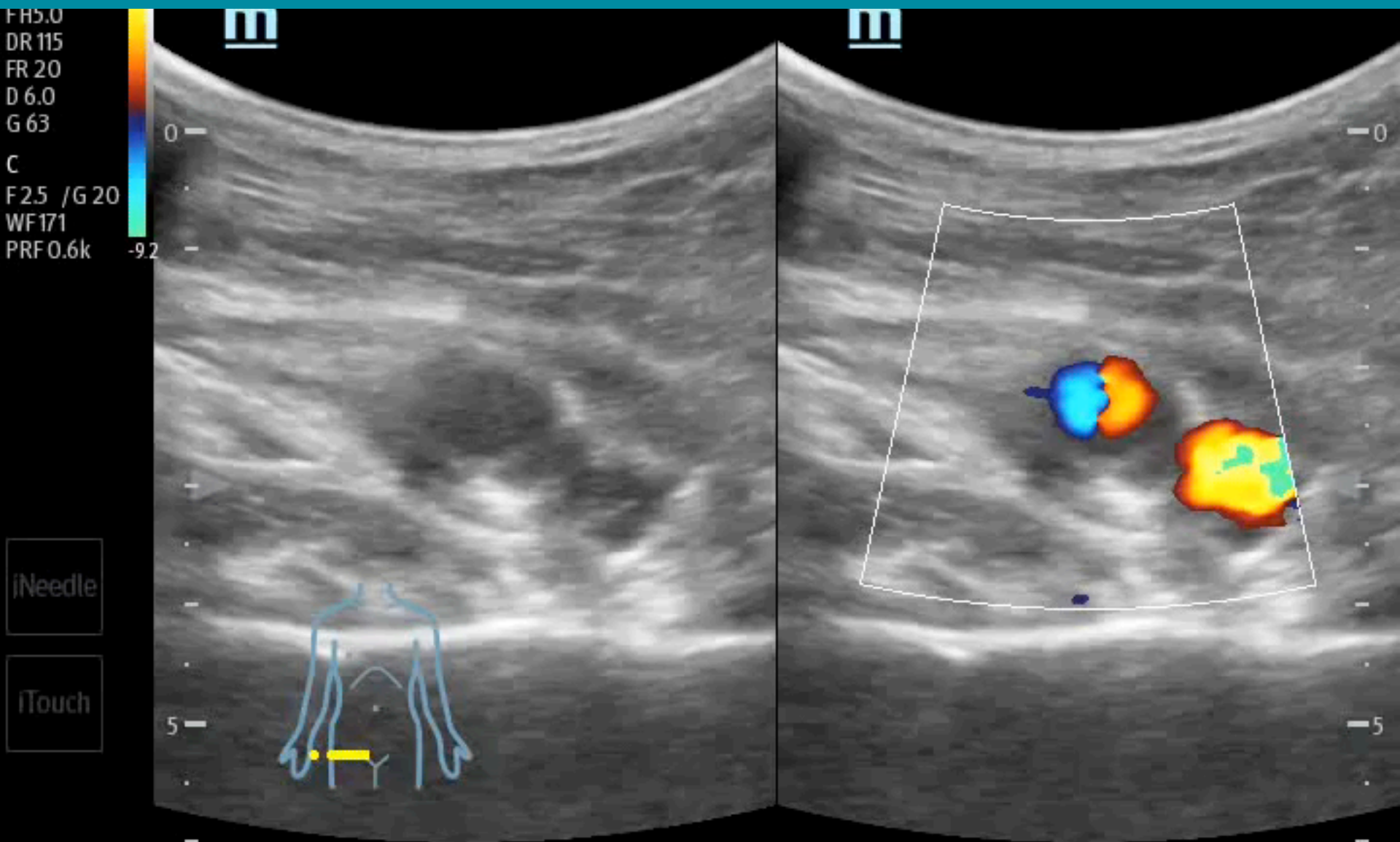
MYCOTIC ANEURYSM



MYCOTIC ANEURYSM



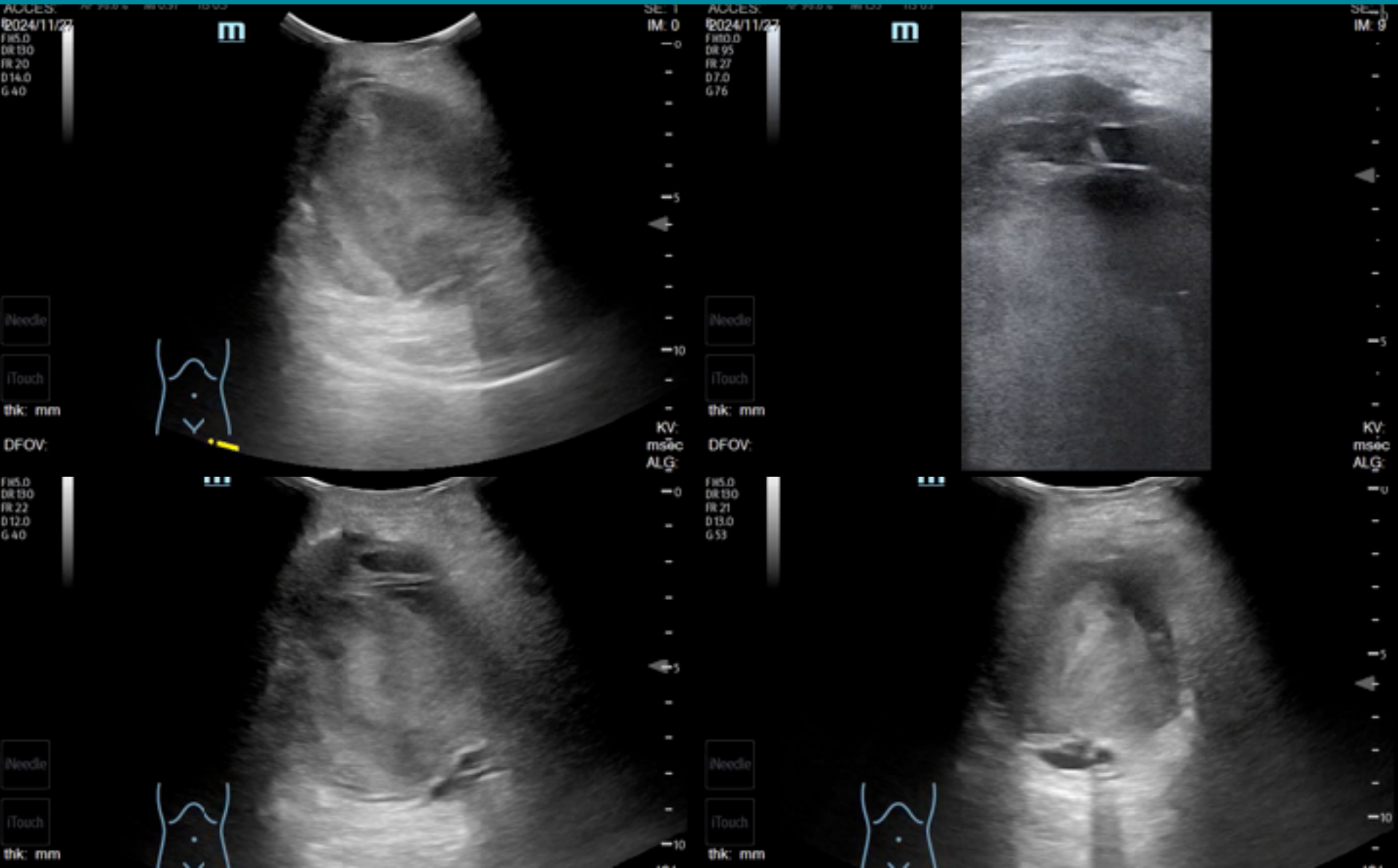
MYCOTIC ANEURYSM

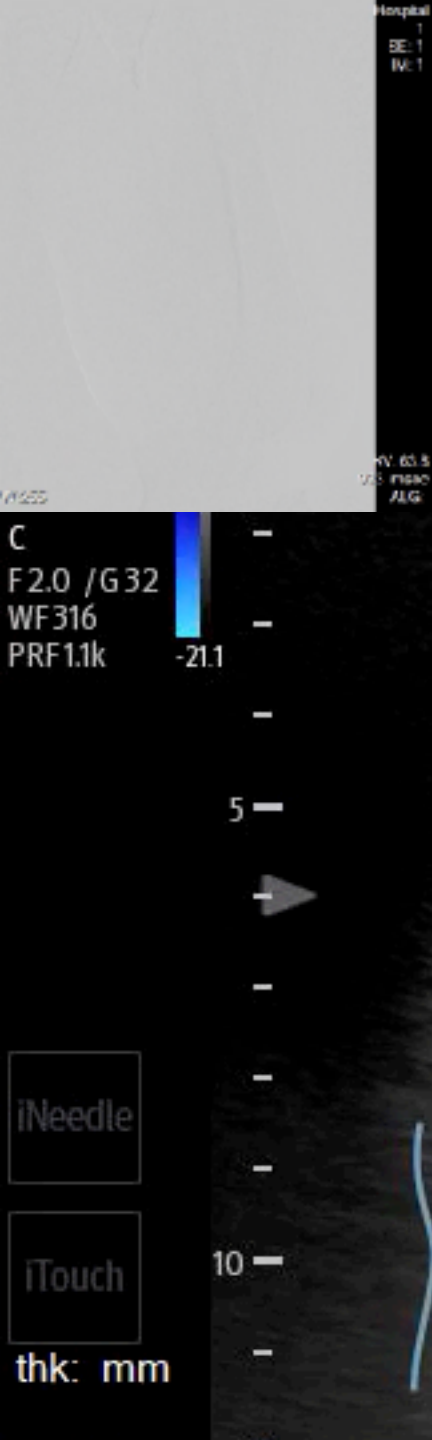


63F, left thigh painful swelling 1d



63F, left thigh painful swelling 1d

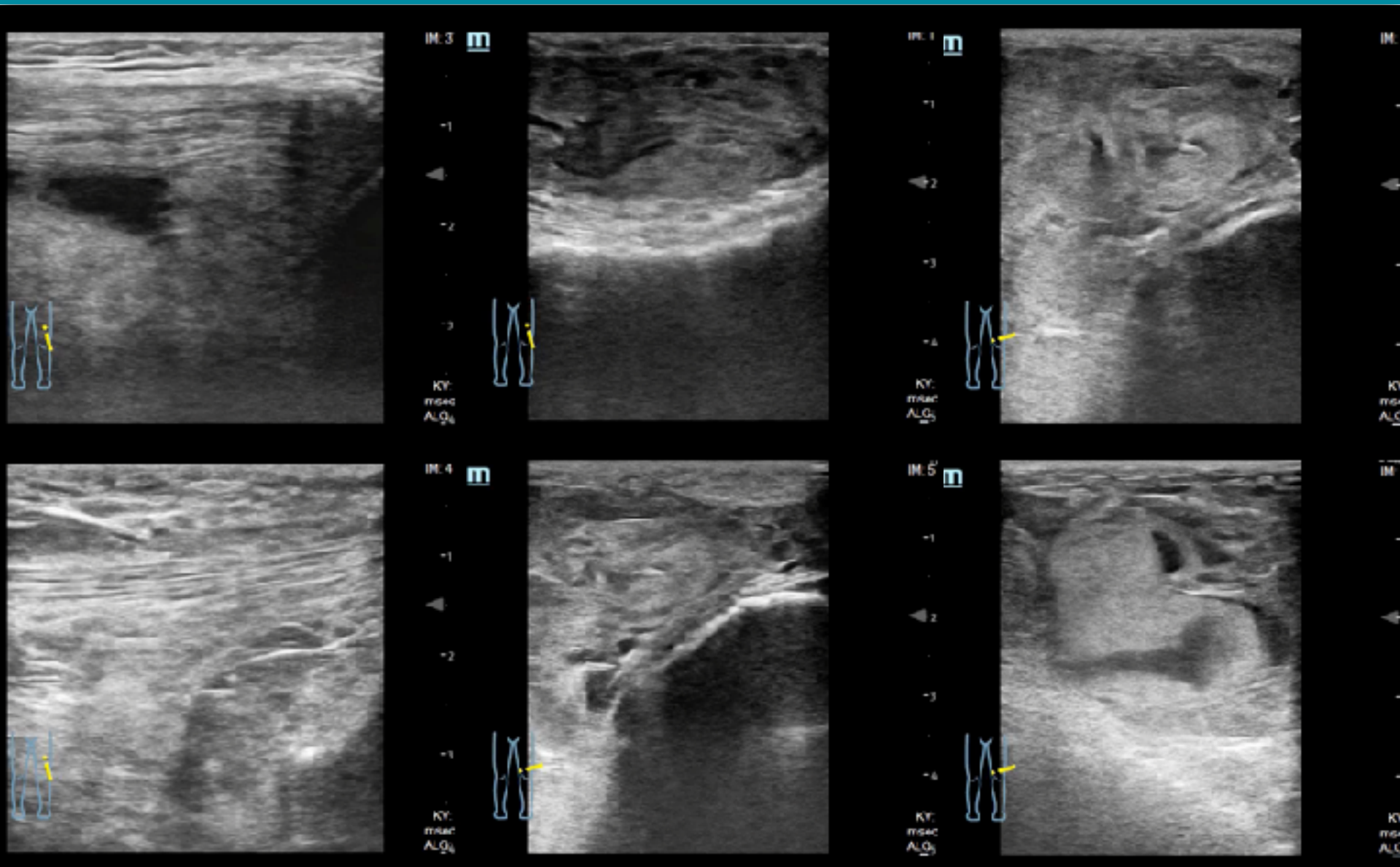




78M, TA, LK painful swelling



78M, TA, LK painful swelling



SMGA injury

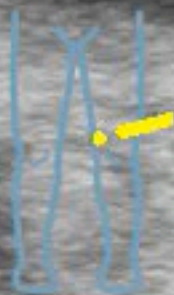
2025/03/29
F 6.6~13.0
DR 115
PF19007BER
PR 18
D 4.0
G 71
C
F5.0 /G 68
WF 244
PRF15k



1-

2-

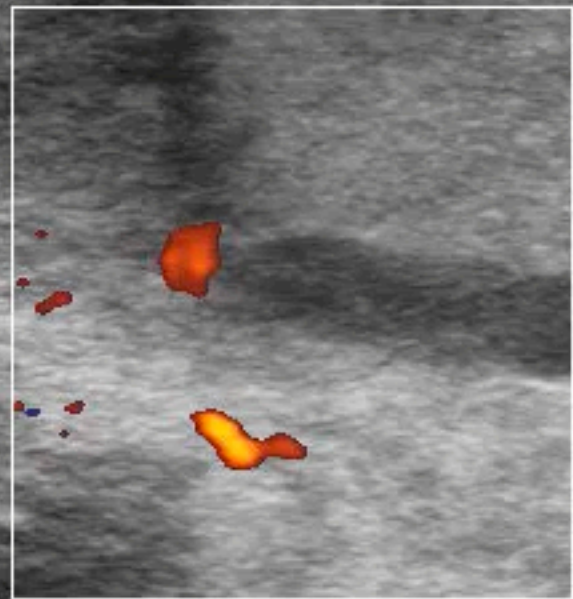
3-



IM: 23

-1

-2



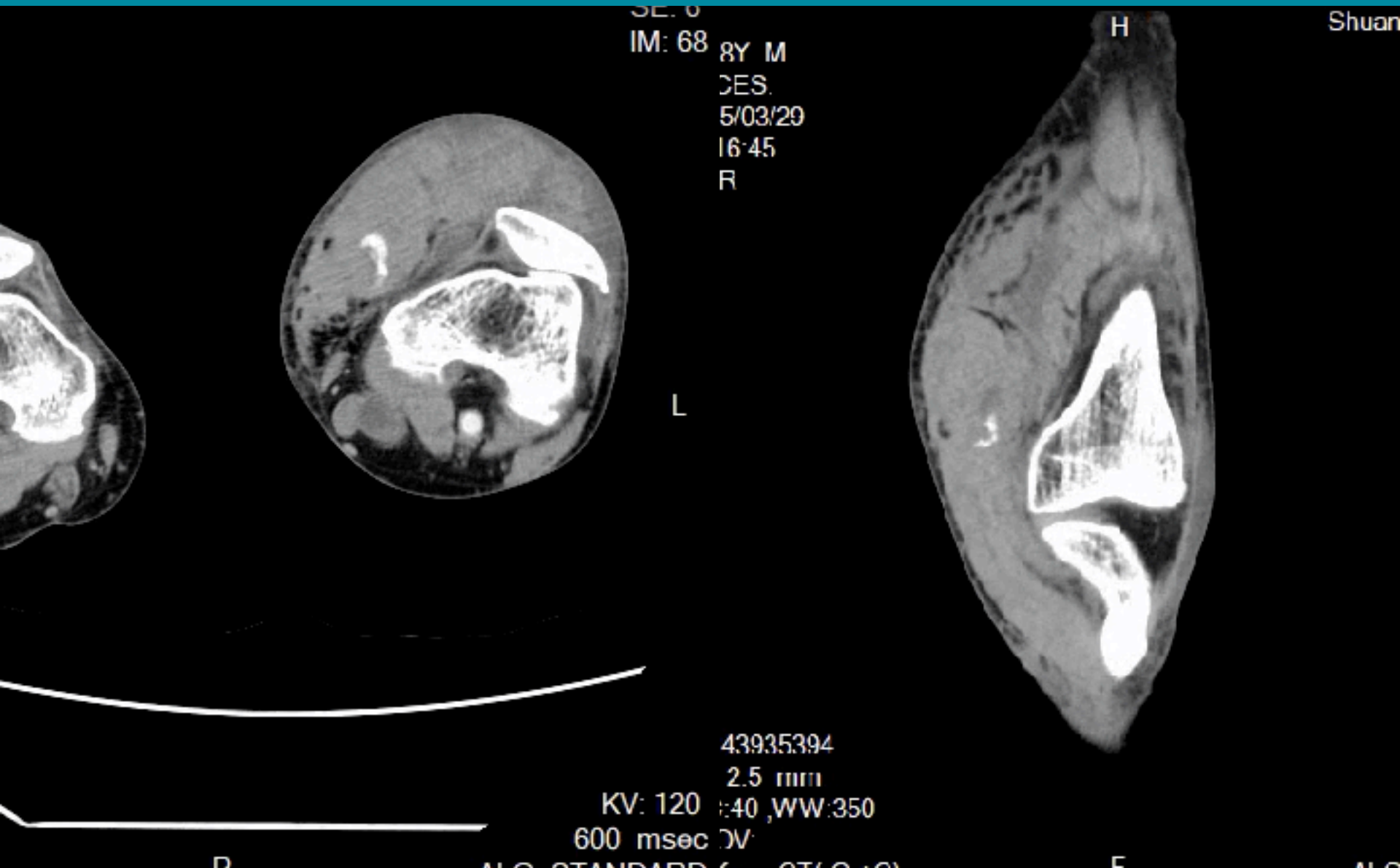
KV:

iNeedle

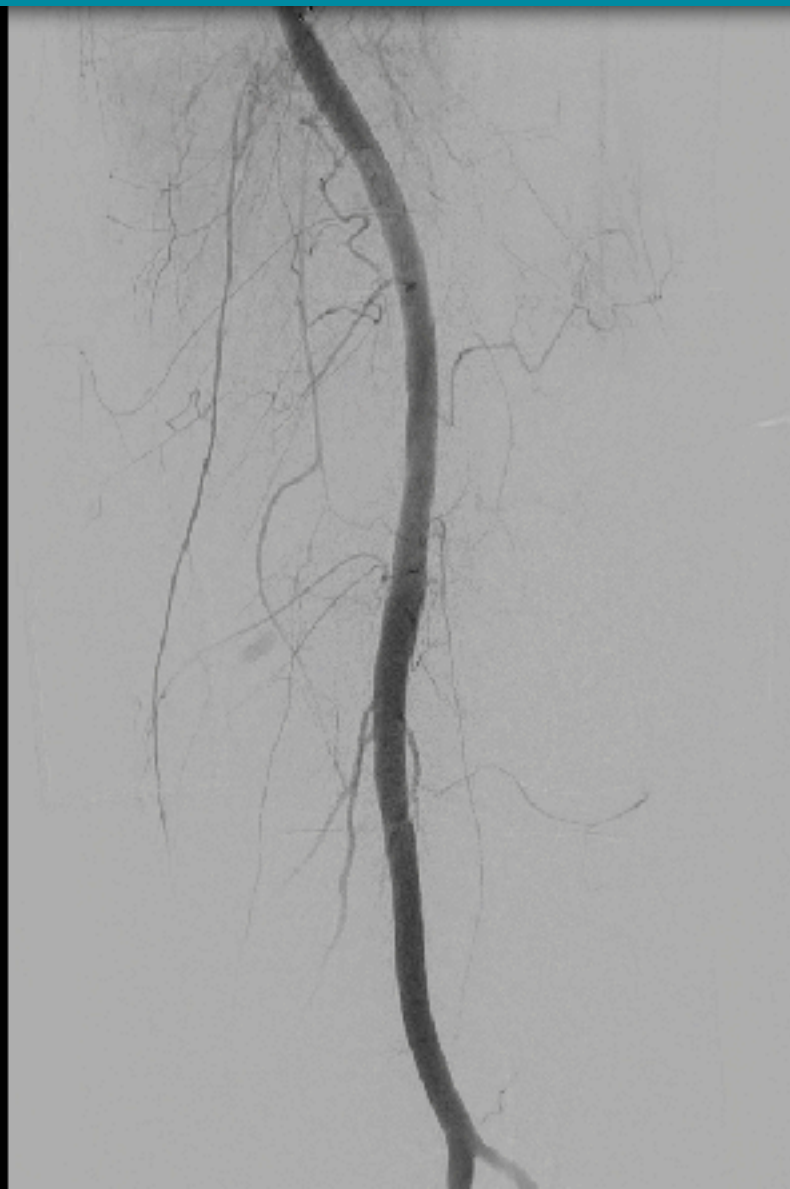
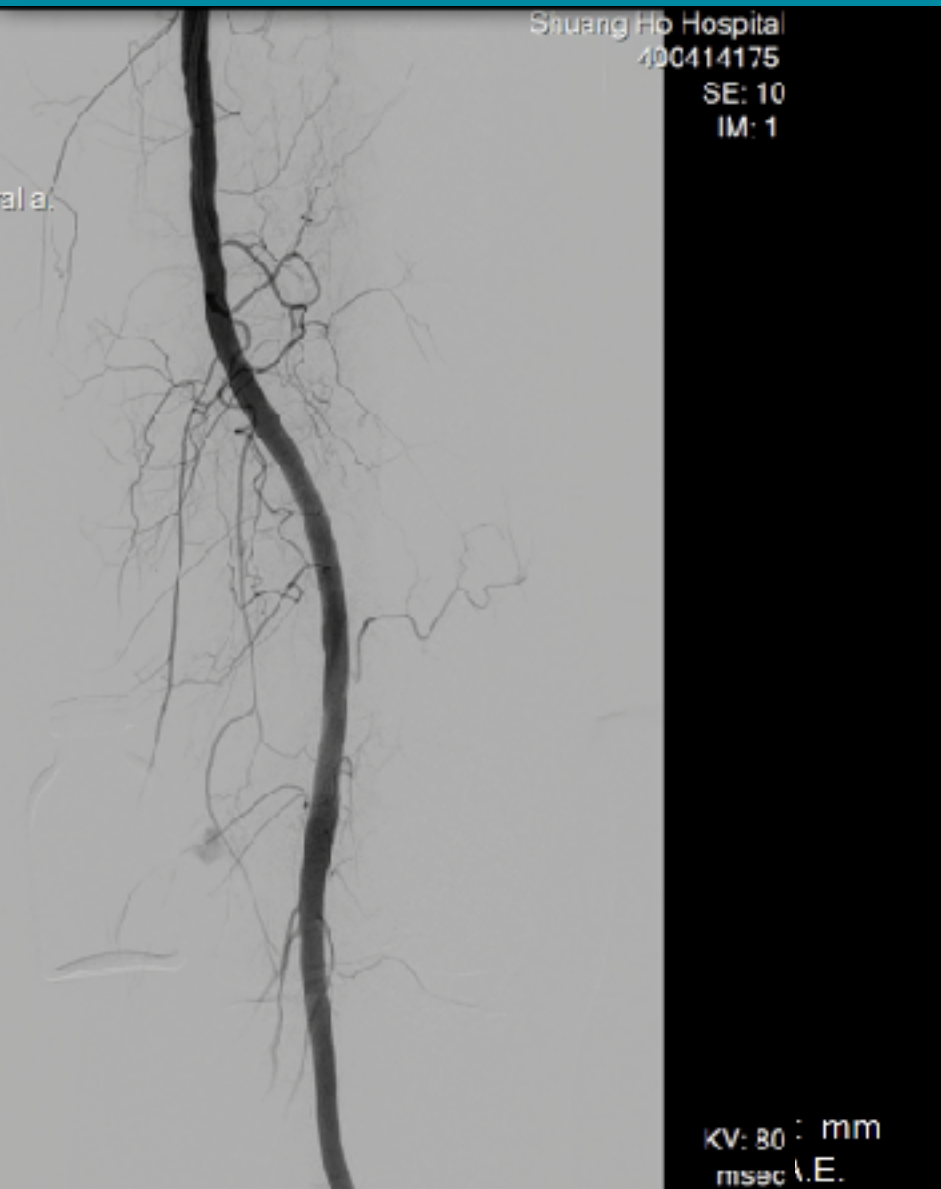
iTouch

thk: mm
PF19007BER
DEOV:

SMGA injury



TAE



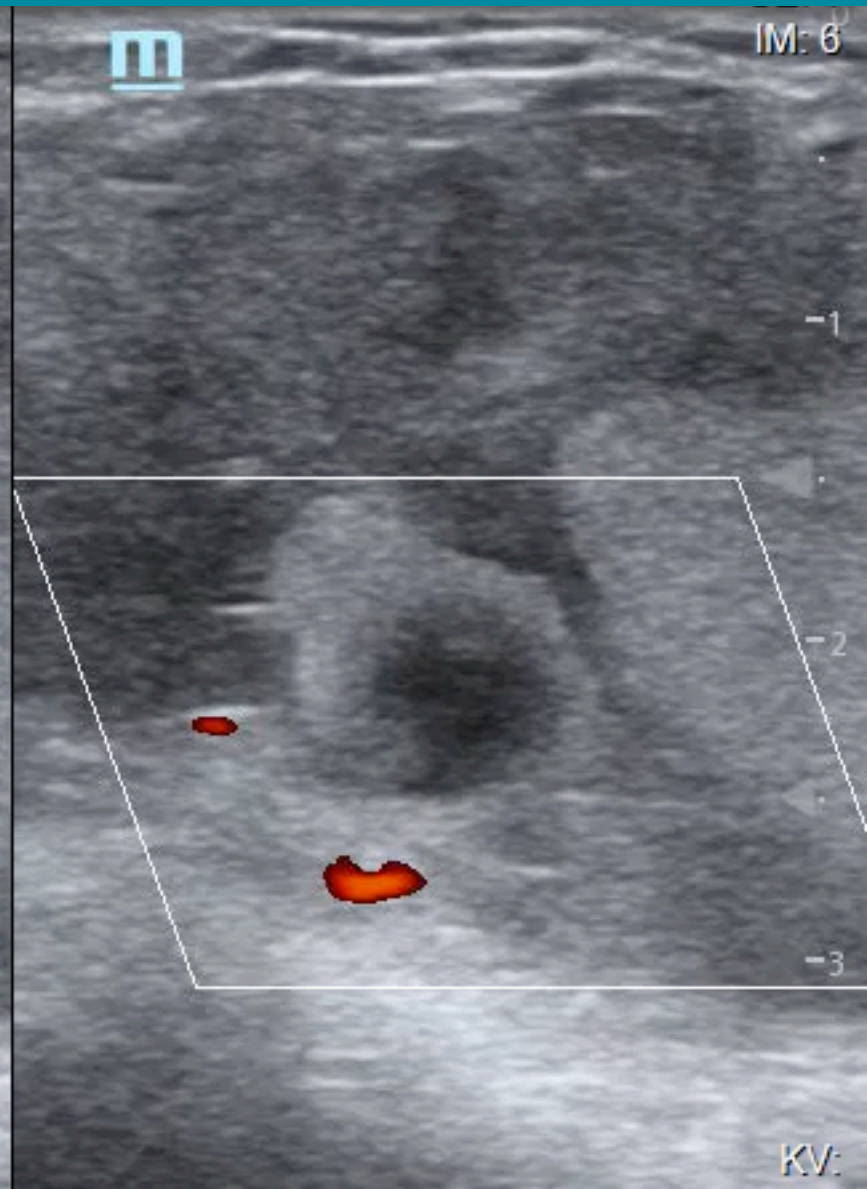
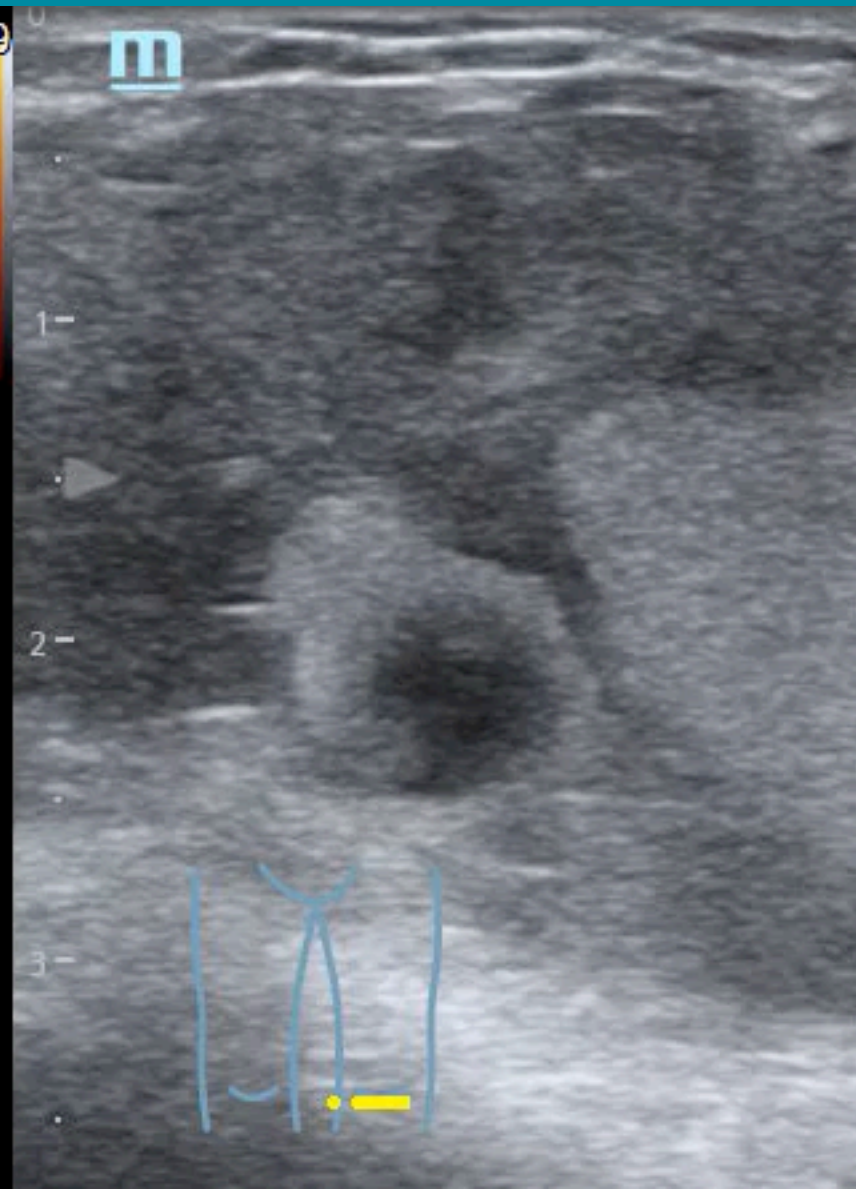
POCUS after TAE

2025/03/29
FH10.0
DR 95
FR 22
D 4.0
G77
P
F5.0 /G 60
WF191
PRF1.2k

iNeedle

iTouch

thk: mm



46F, Colitis, insisted wrist needle

Superficial venous thrombosis

