

陳國智 醫師 / POCUSAcademy.com



急診超音波臨床評核醫師
醫用超音波學會指導醫師



WINFOCUS director / instructor
Certified Interventional Pain Sonologist

急診 / 重症 / 介入 / 急性疼痛

經歷

新光急診超音波訓練中心主任

西園醫院急診醫學科主任

急診醫學會超音波委員會主委

台灣疼痛醫學會大體模擬手術講師

急救加護醫學會重症超音波負責人

EFAST



NEEDLING & VASCULAR ACCESS





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

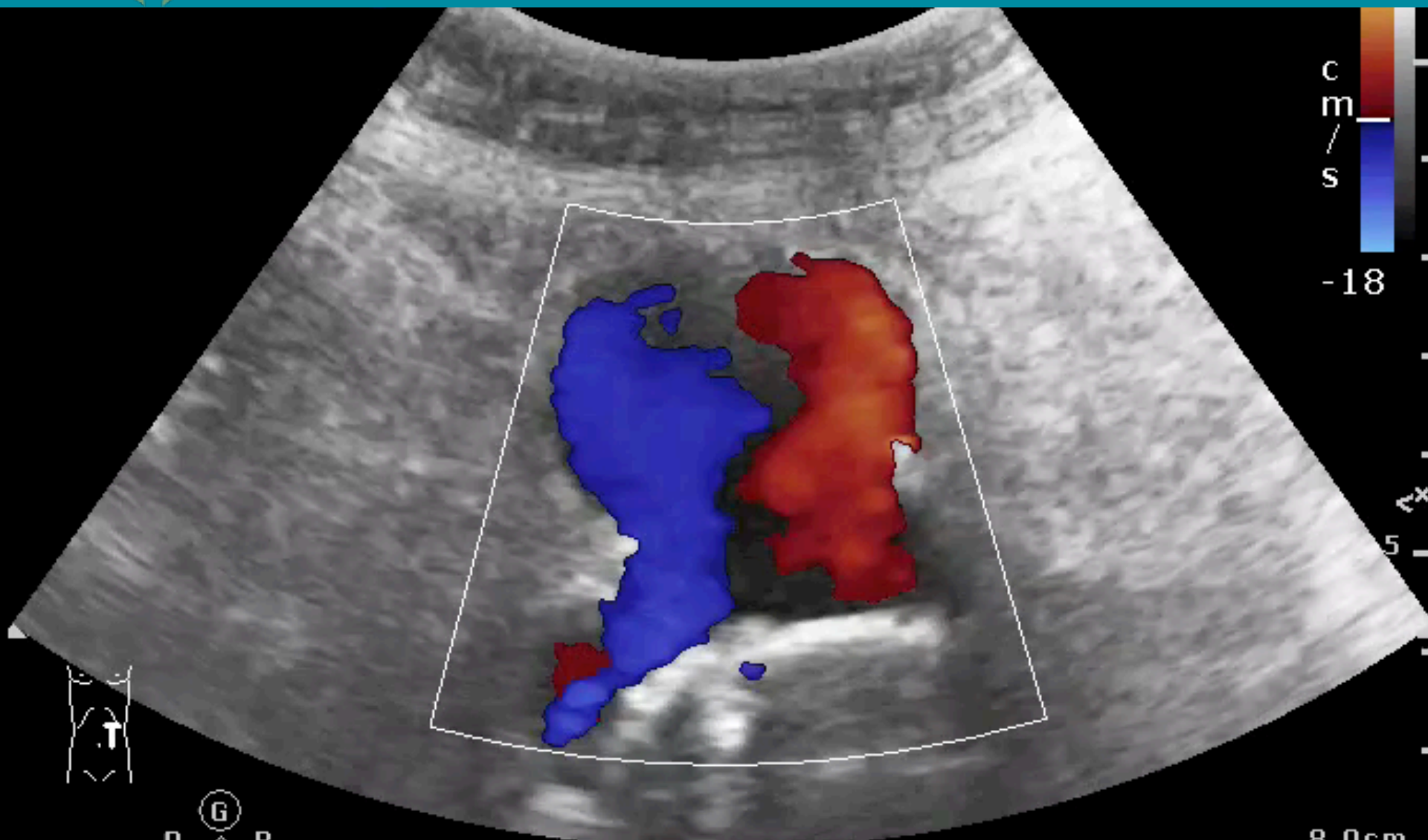
Bowel

MSK

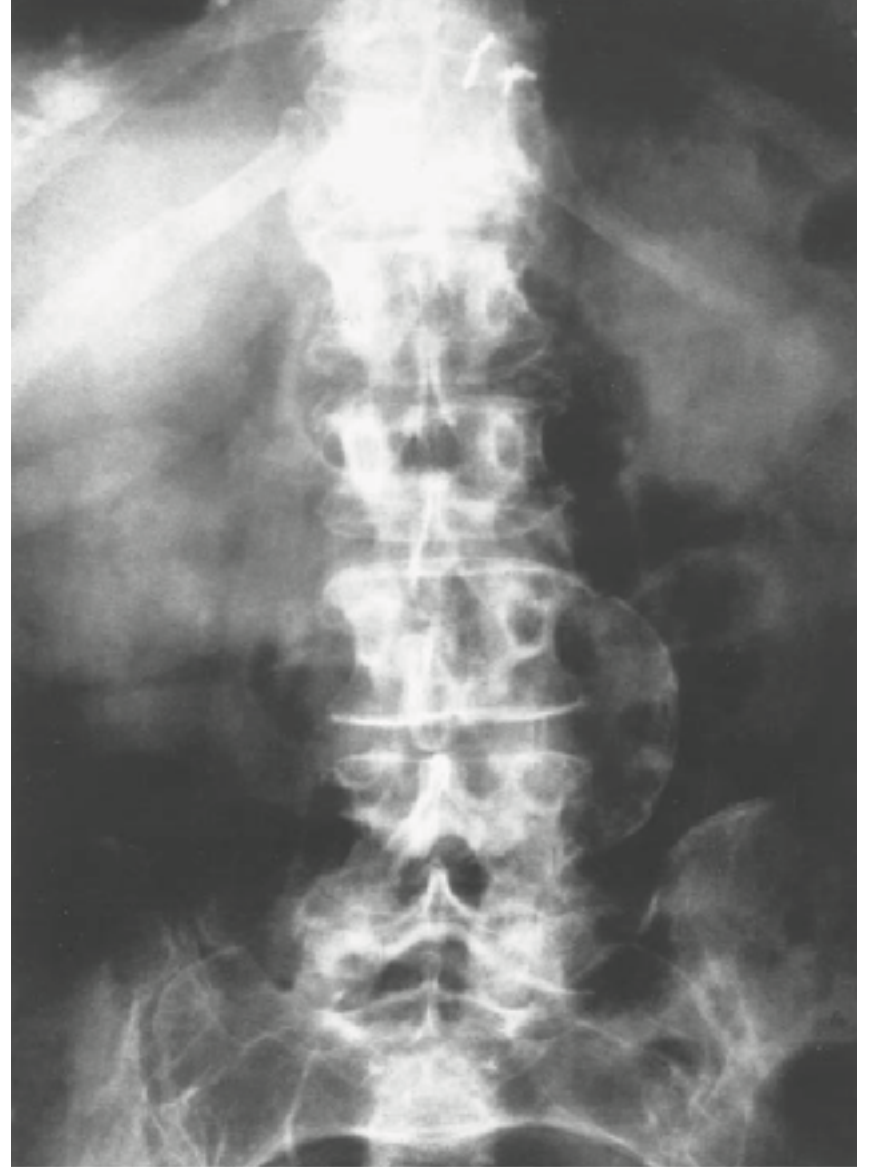



雙和急診POCUS訓練

Great Vessels



AAA ?



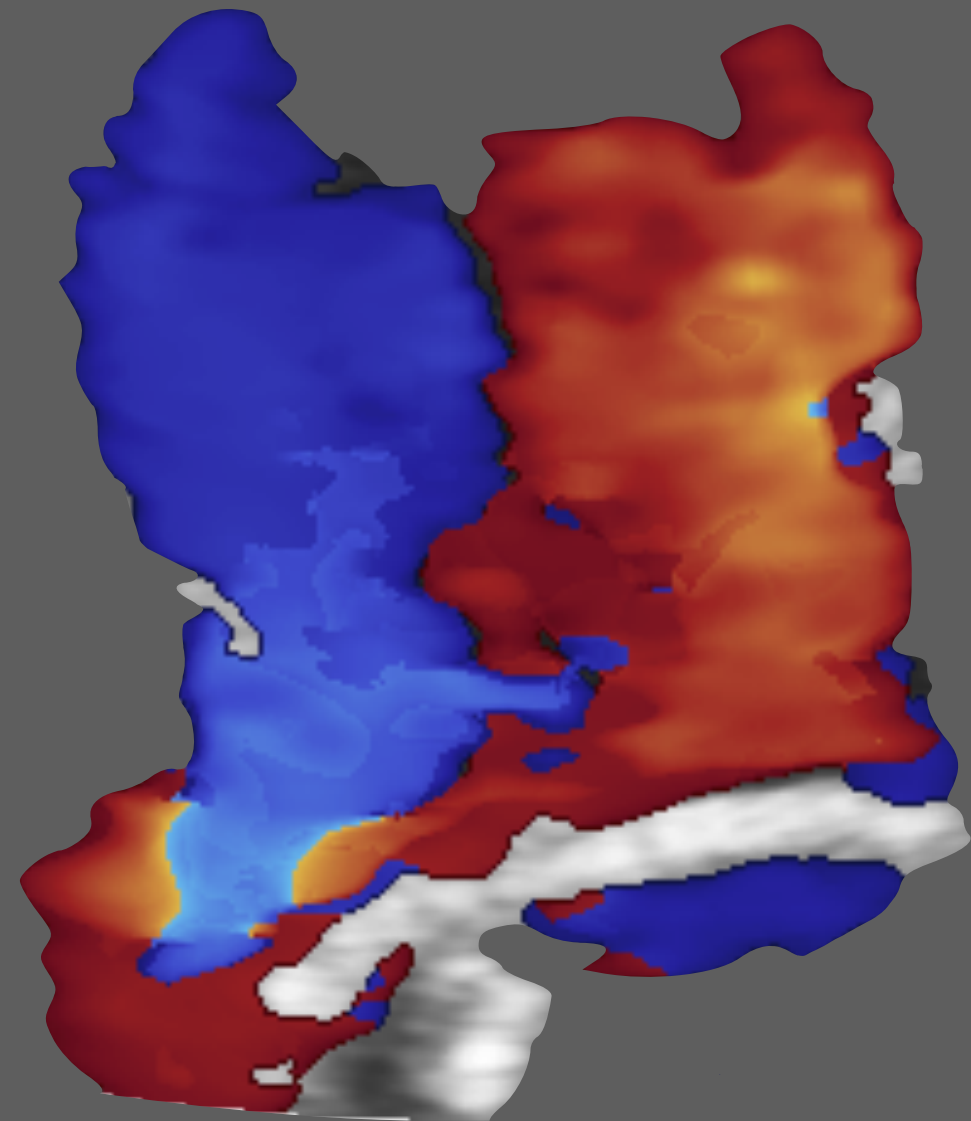


**64M,
左下腹痛
1小時
冒冷汗
結石病史**

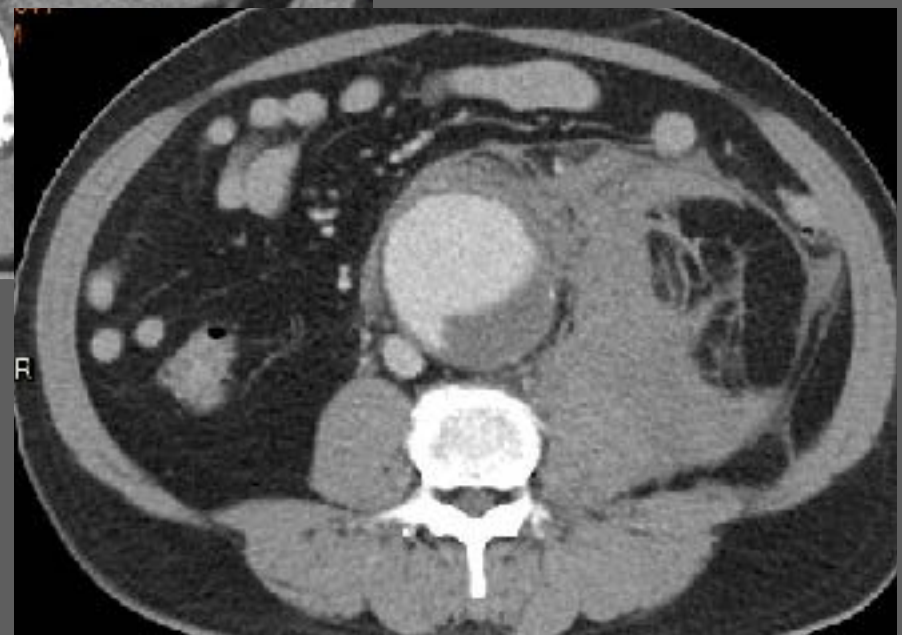
PR 117

BP

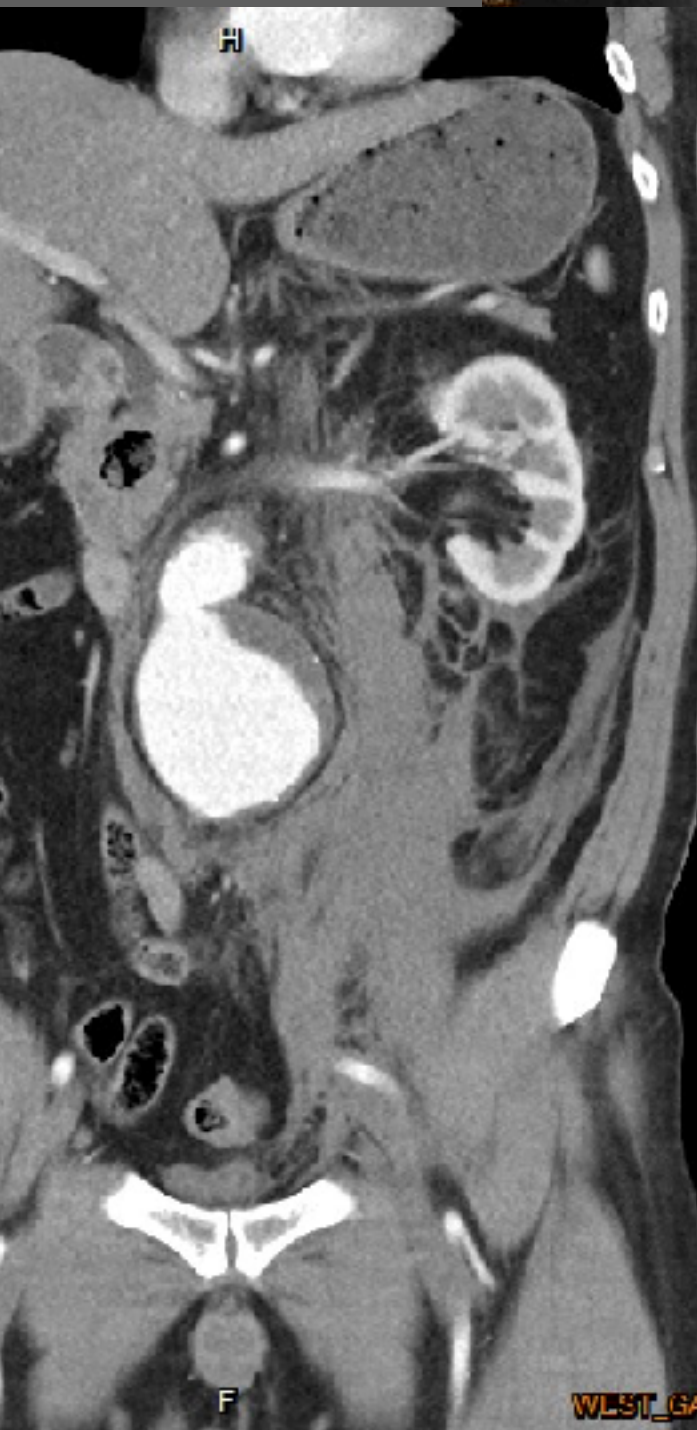
88/62

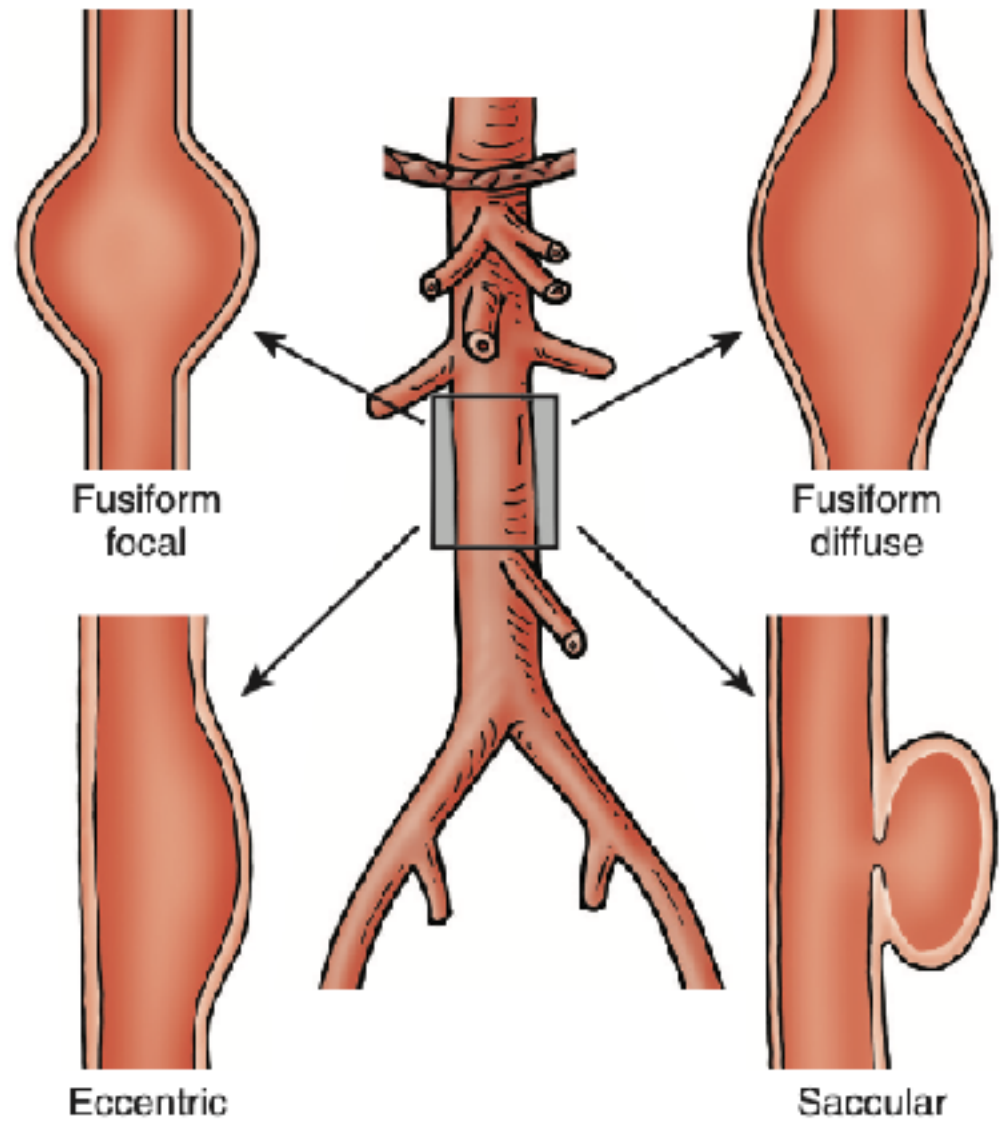
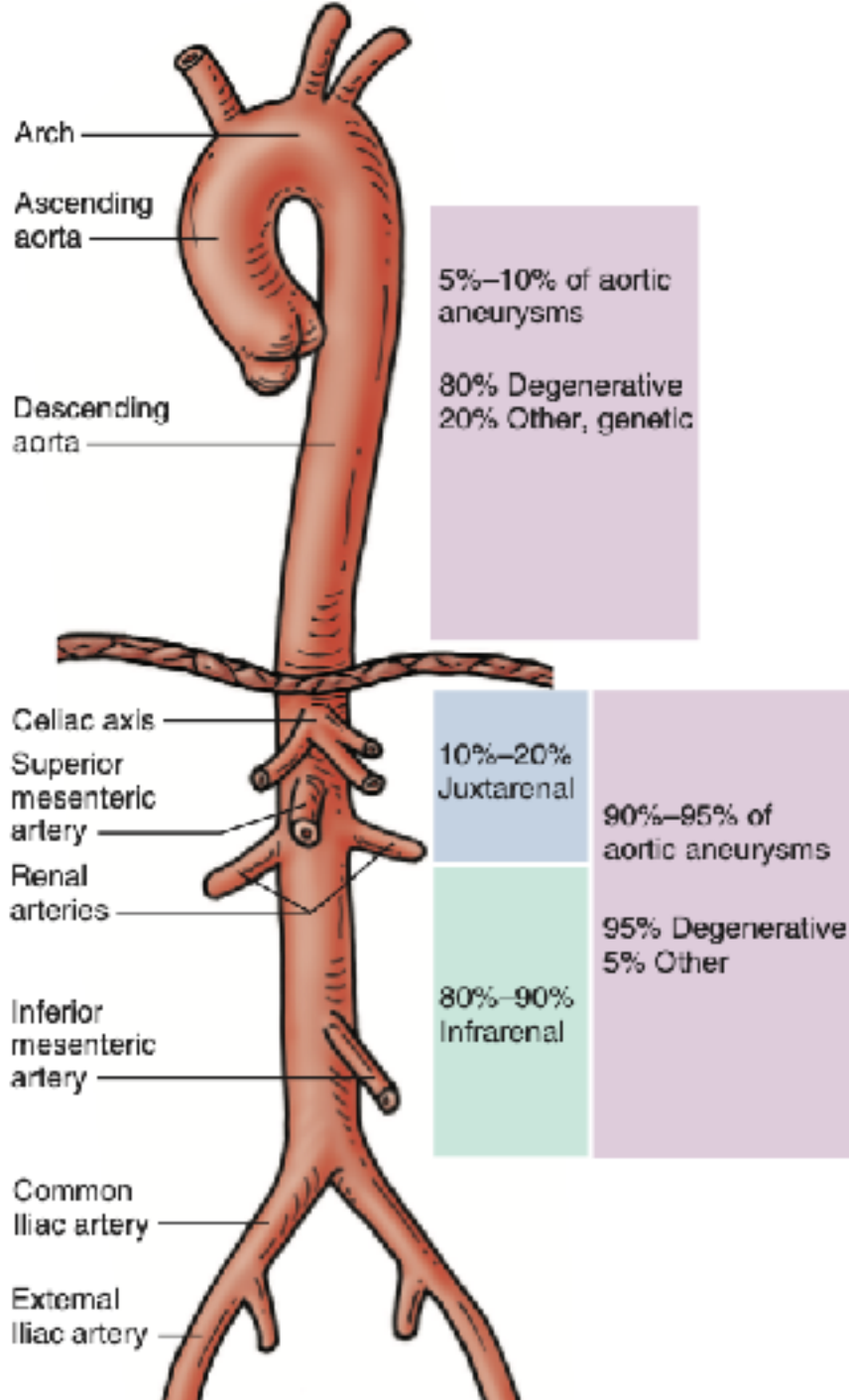


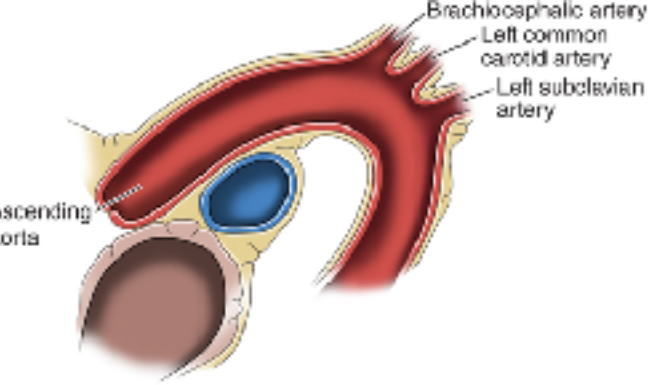
腰痛 + 冒冷汗，
我的病人可能是
主動脈瘤破裂？



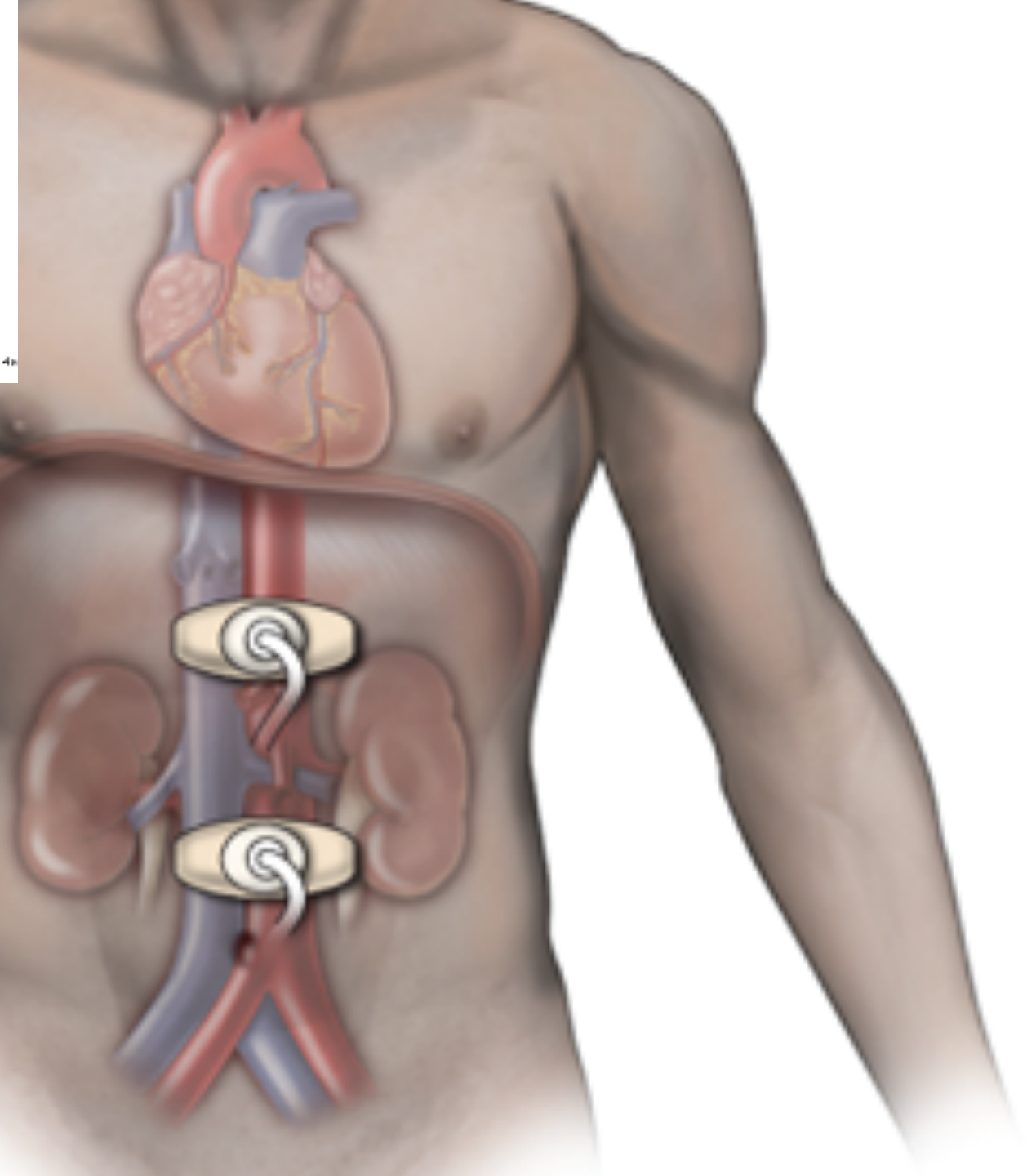
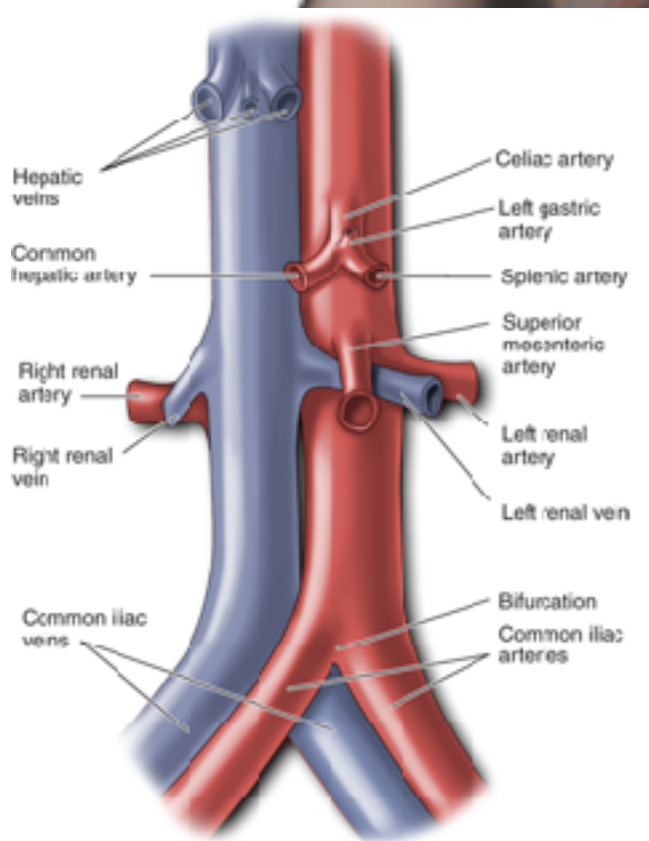








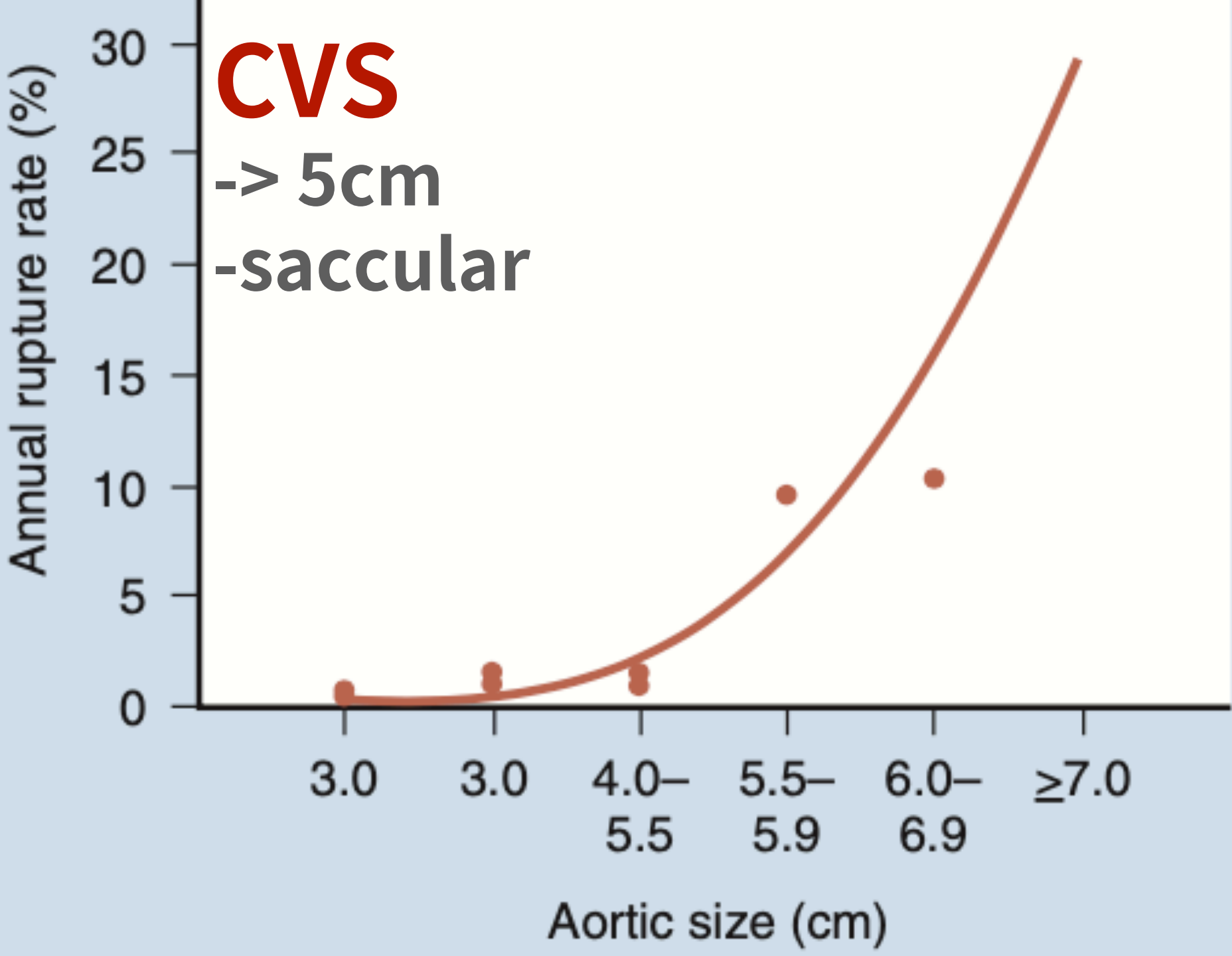
Source: G. John Ho, James B. Healey, Robert F. Beardon, Donald V. Pyers, Barry S. Knapp, Andrew S. Lasterbach: Ho and Valeri's Emergency Ultrasound, 4e. Copyright © McGraw-Hill Education. All rights reserved.



CVS

-> 5cm

-saccular



AAA

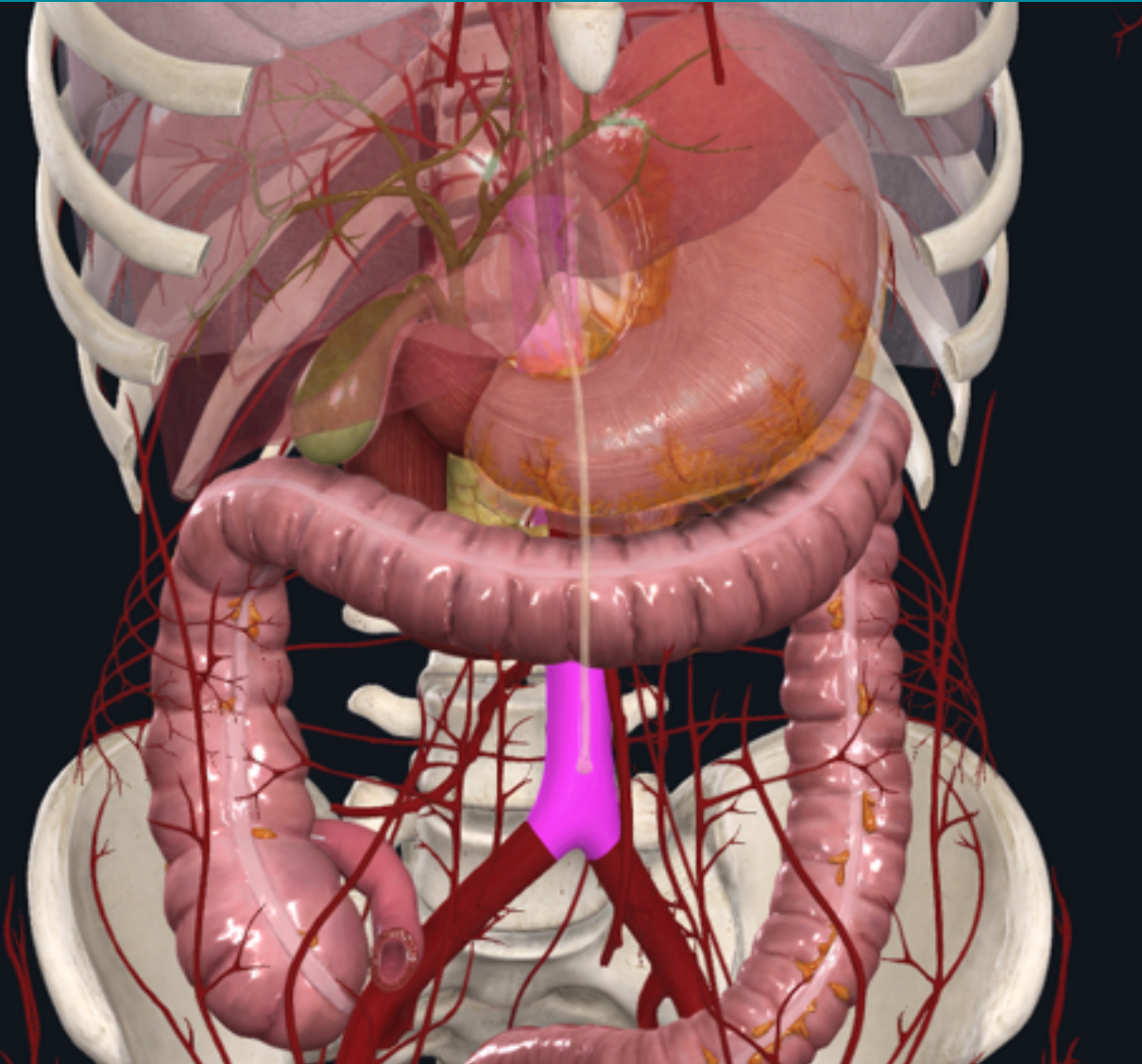


3_{cm}

> 50 y/o
Syncope
Hypotension
ABD/Flank/Back/Groin

Sensitivity **97.5-100%**
Specificity **94.1-100%**

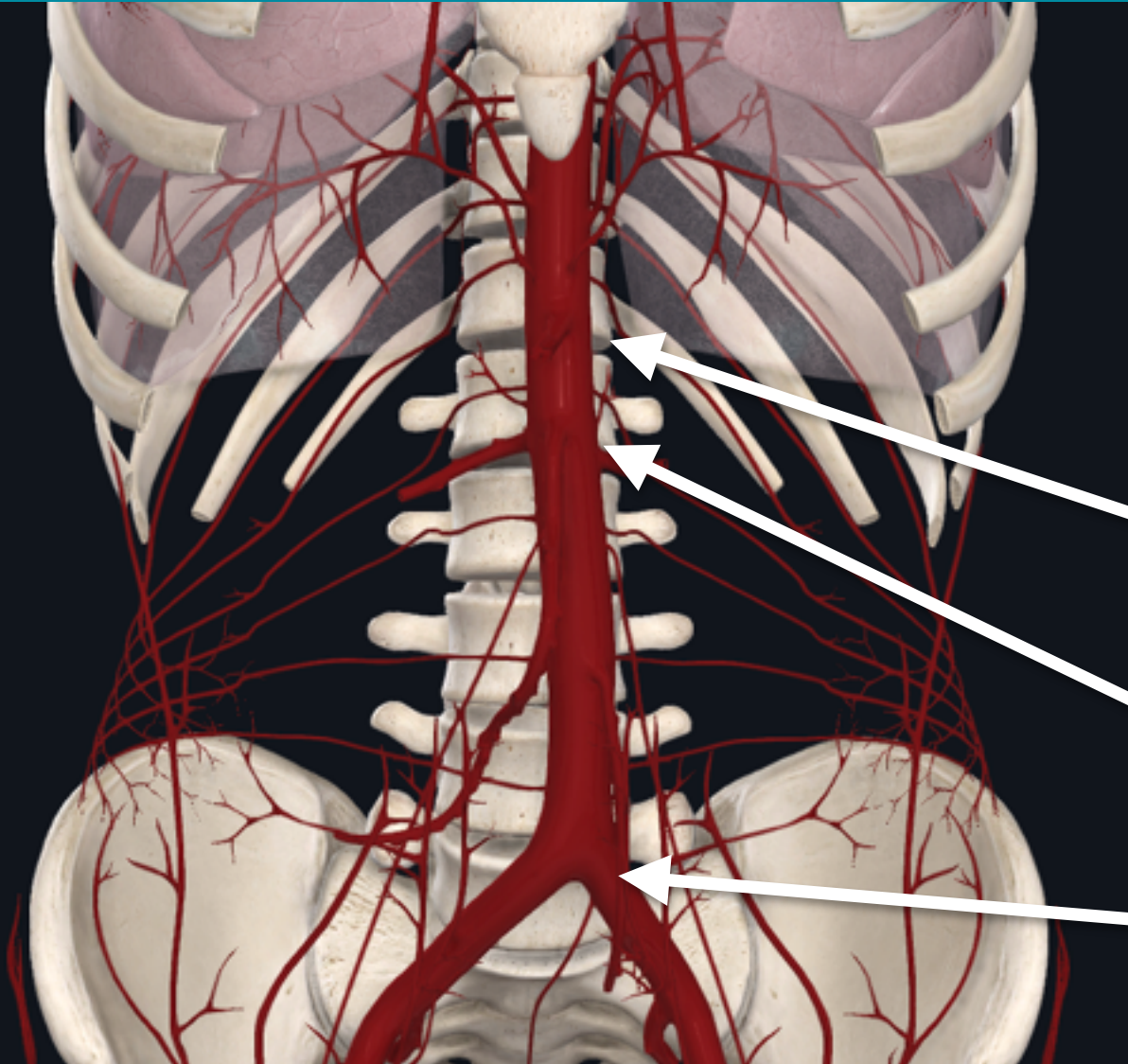
ABDOMINAL AORTA



Pain
Shock

AAA

AORTA



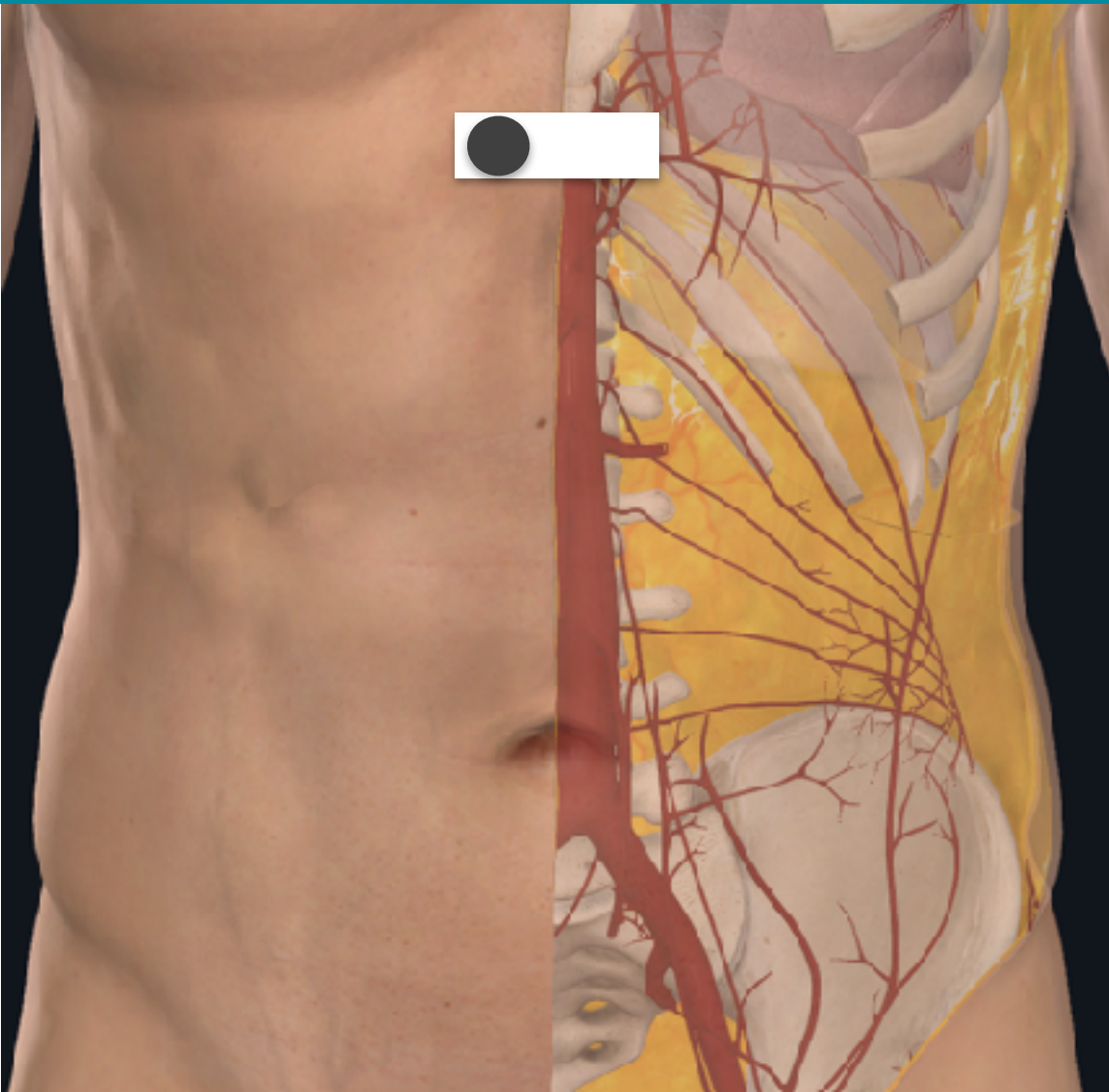
**Abdominal
Aorta (3cm)**

Celiac trunk

SMA

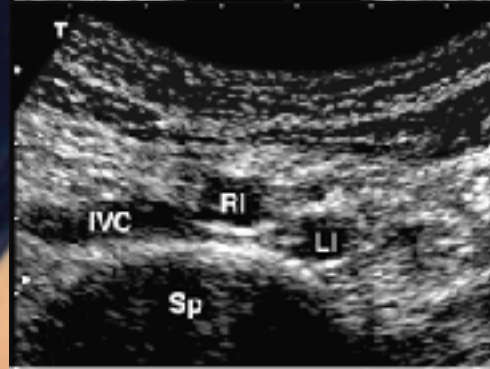
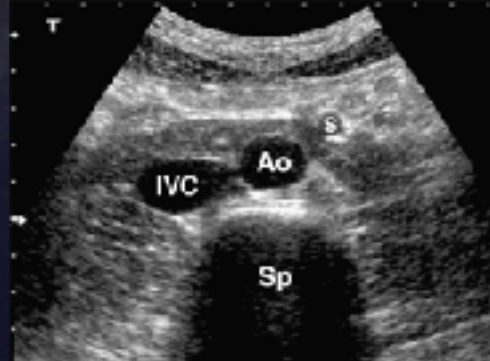
Bifurcation

ABDOMINAL AORTA

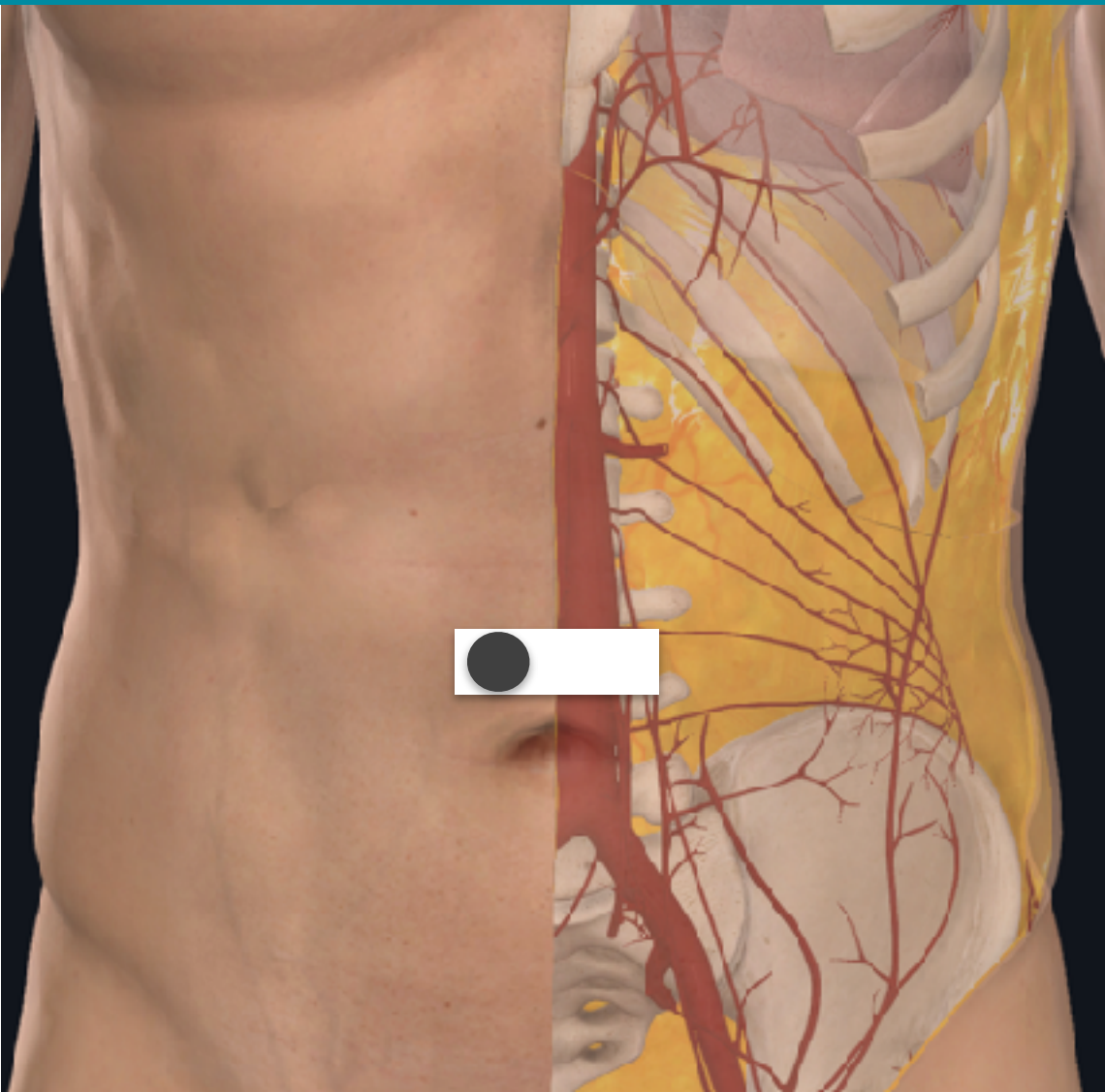


探頭: 弧形

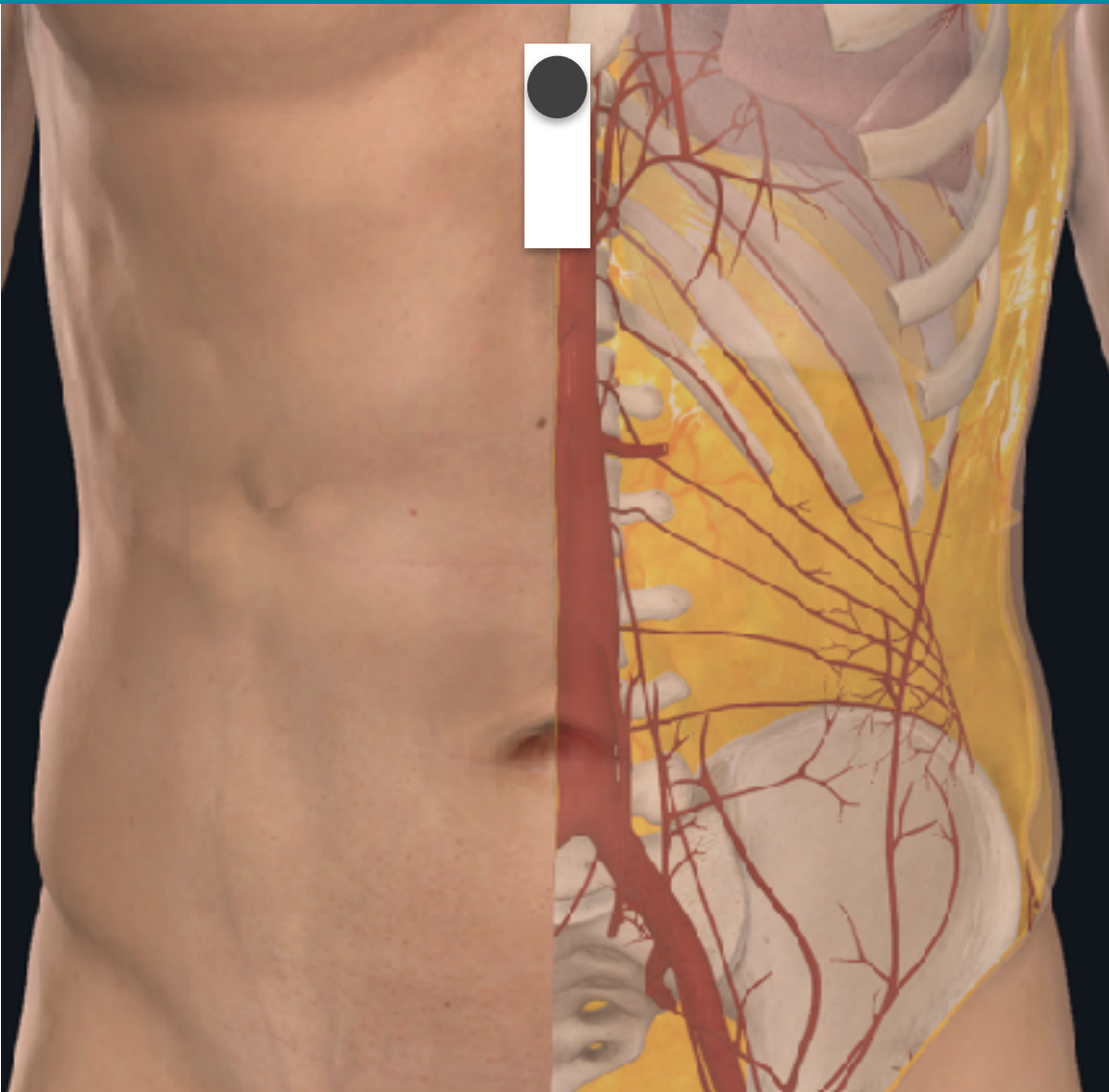
位置: 劍突下



ABDOMINAL AORTA

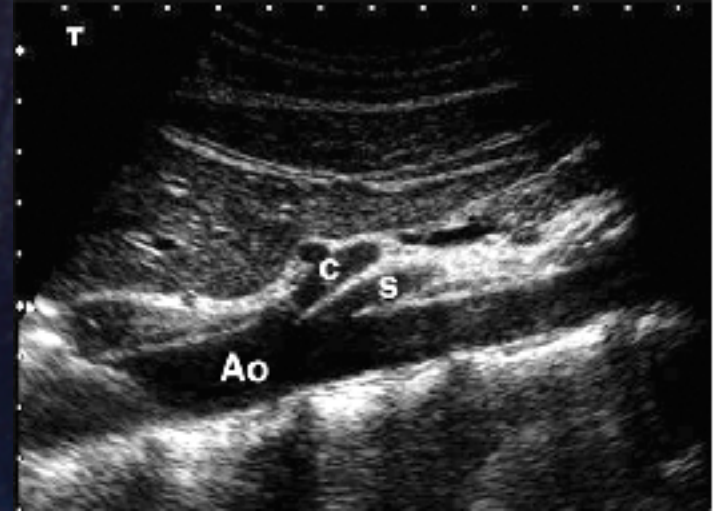
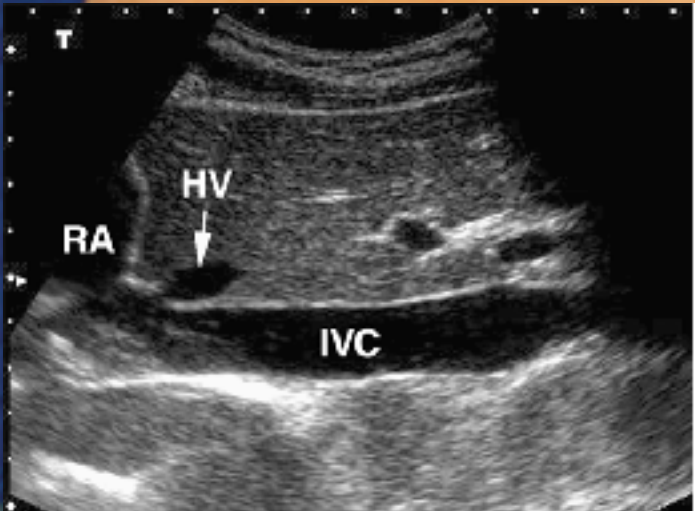


ABDOMINAL AORTA

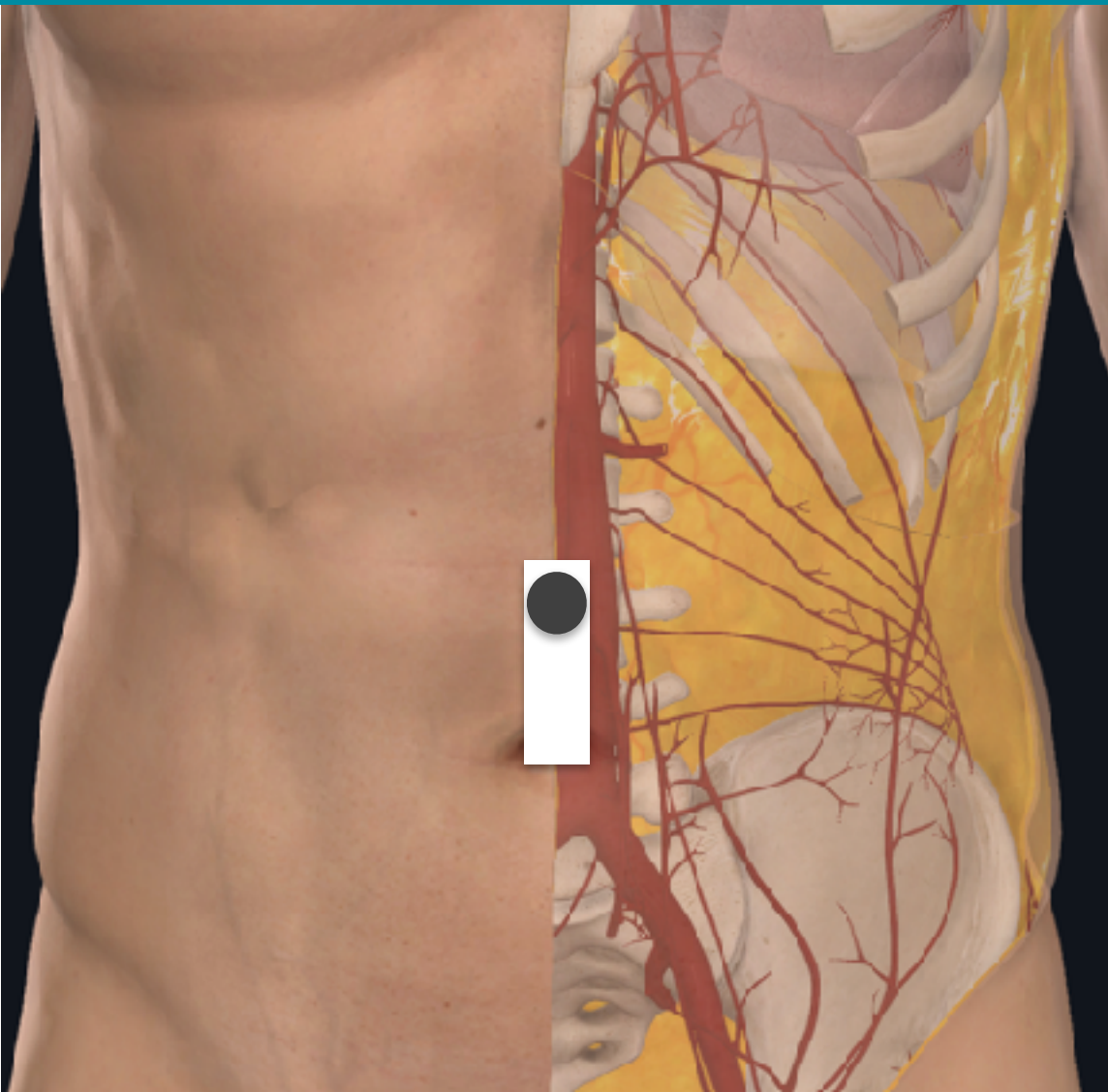


探頭: 弧形

位置: 劍突下



ABDOMINAL AORTA

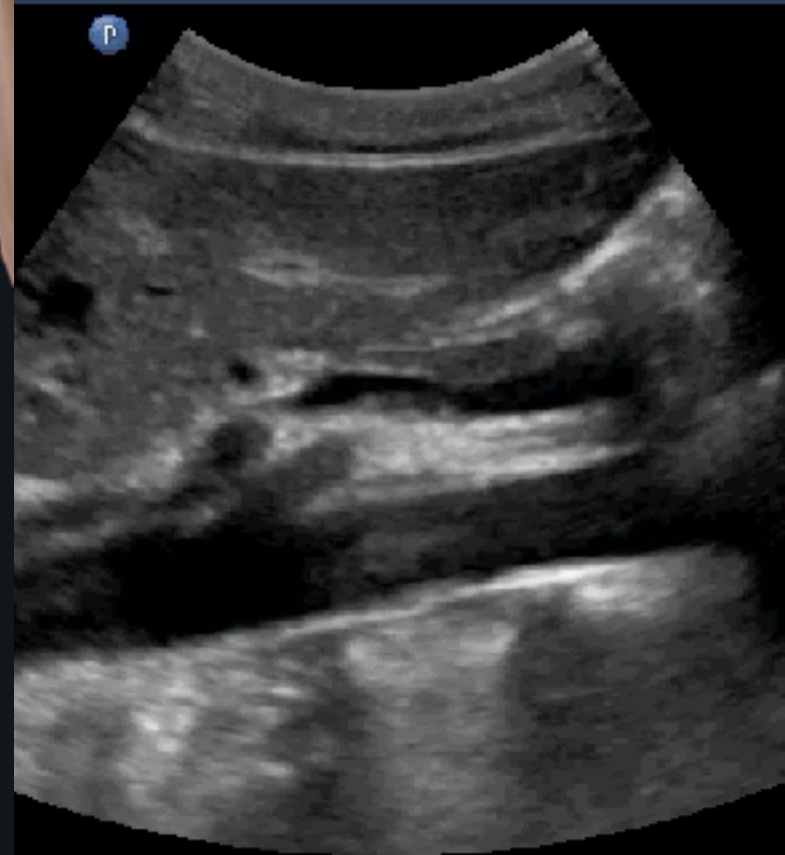


160331172347

SKII ER

MI 1.1

TIS 0.1





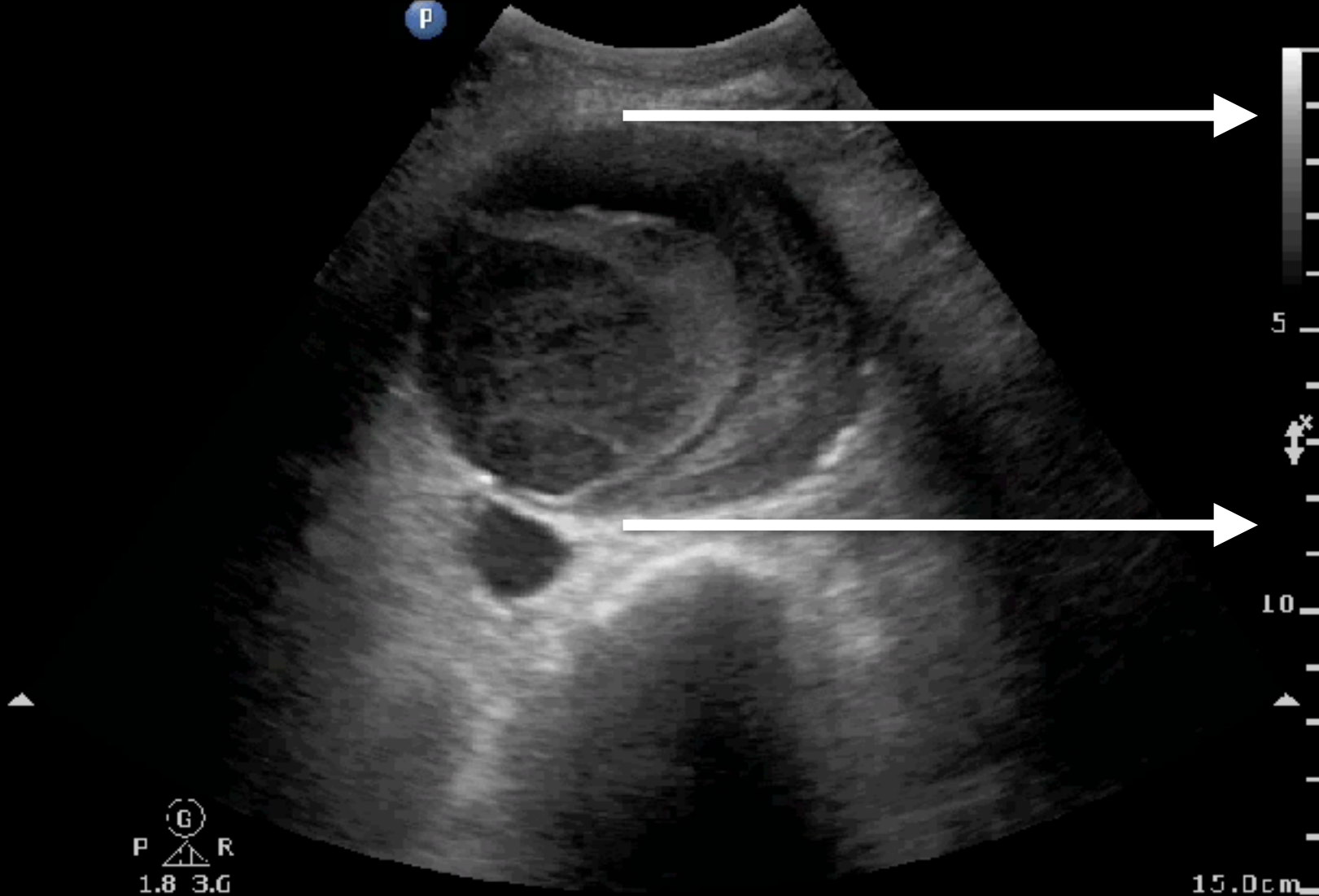


AAA: EYEBALLING

Abd Gen
Ch-1
34 Hz
15.0cm

2D

HGen
Gn 57
C 56
3/3/3



59M WITH HEMATURIA & L FLANK PAIN



RUPTURED AAA ?

SHIN KONG HOSPITAL

IDI
I

YI

JAN. 01, 09
20:03:59

24/24
22Hz

24/24
22Hz

3.5M 5-H
DUR: 100%

R19 052 C4

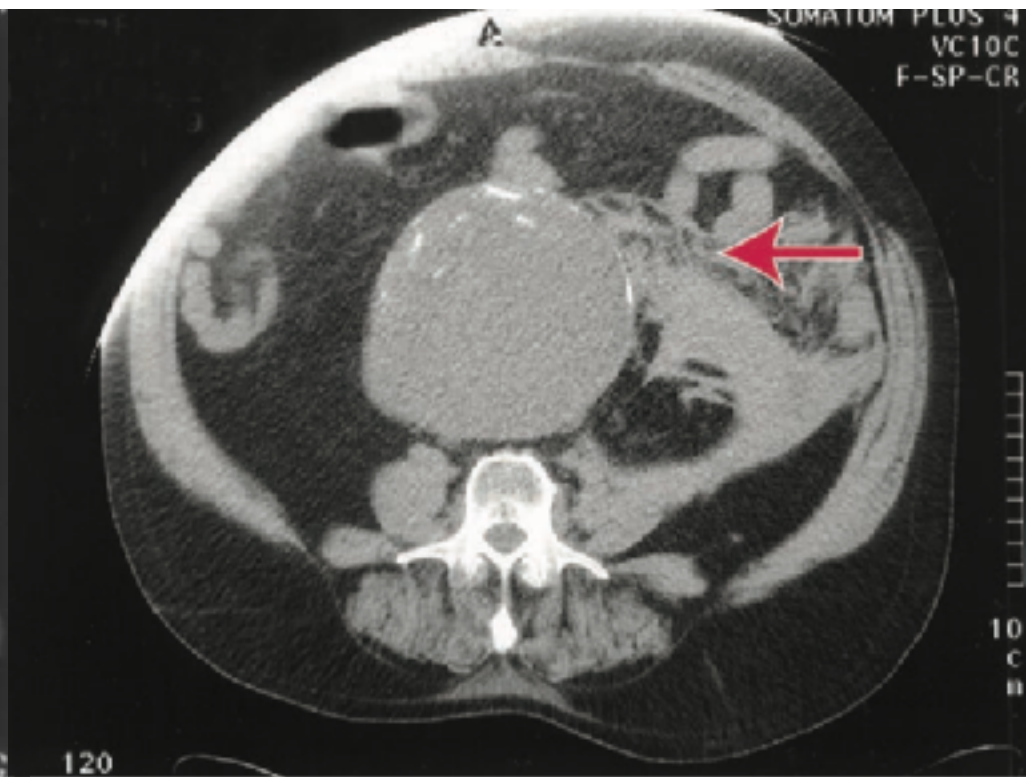
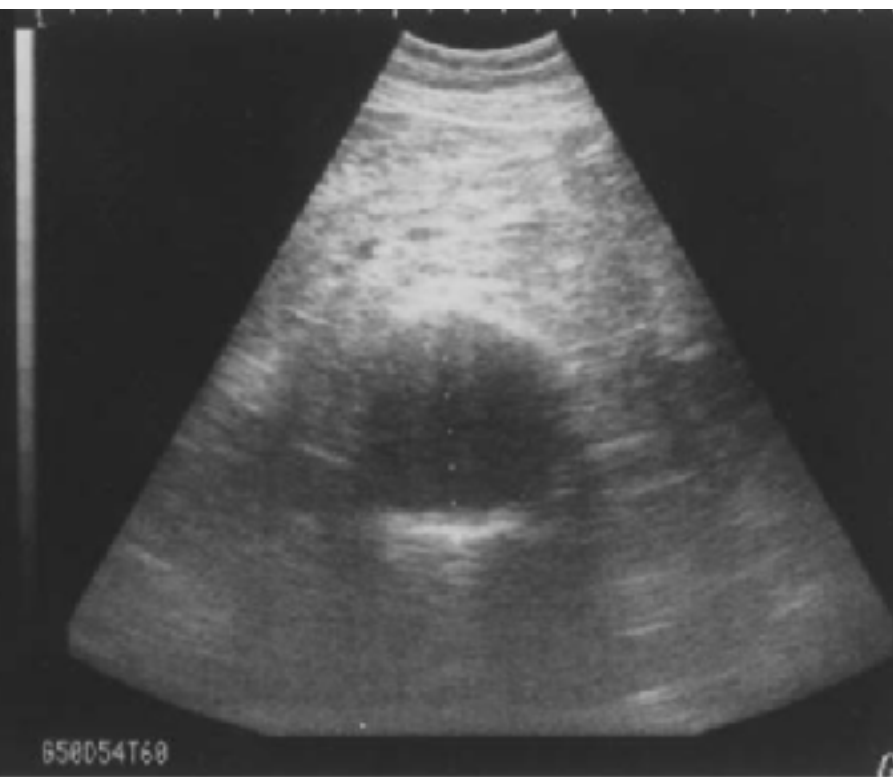
R15 052 C4

1: Abdomen

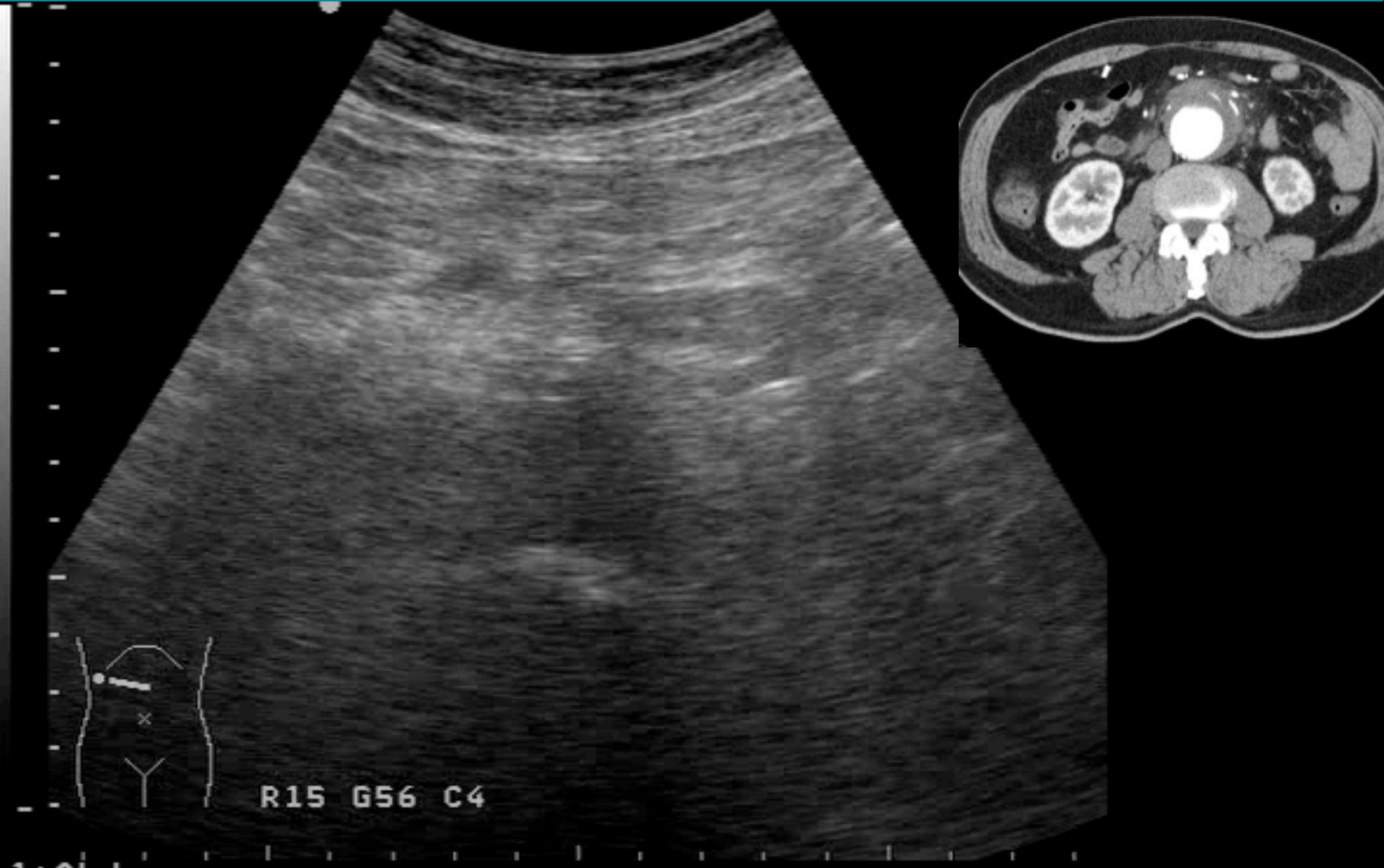


ECHO FOR AAA(> 3CM)

Not for rupture or AD



76M WITH ABDOMINAL PAIN

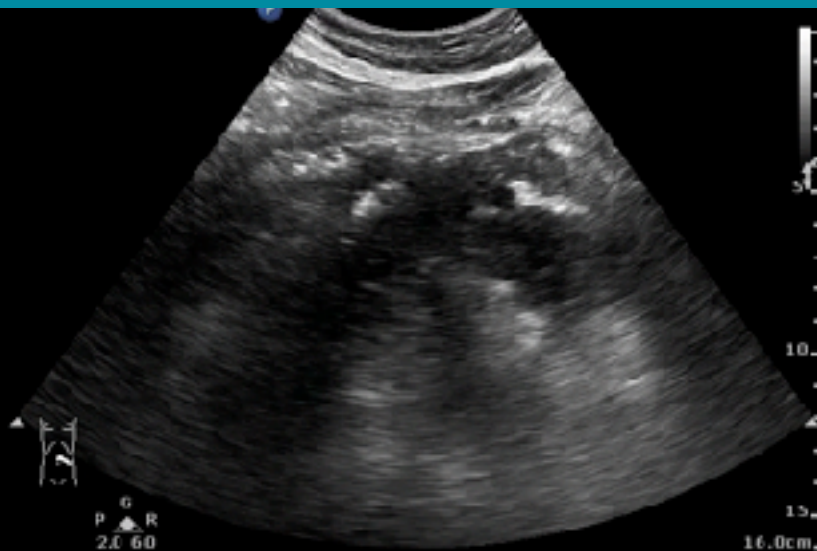


78M WITH AAA S/P GRAFTING, ABDOMINAL PAIN

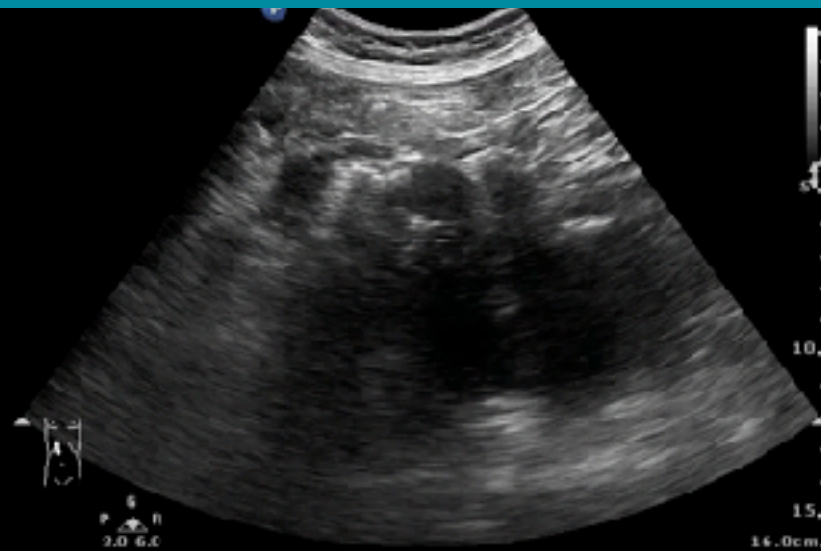


AAA ?

C Nerve
C6-2
22 Hz
16.0cm

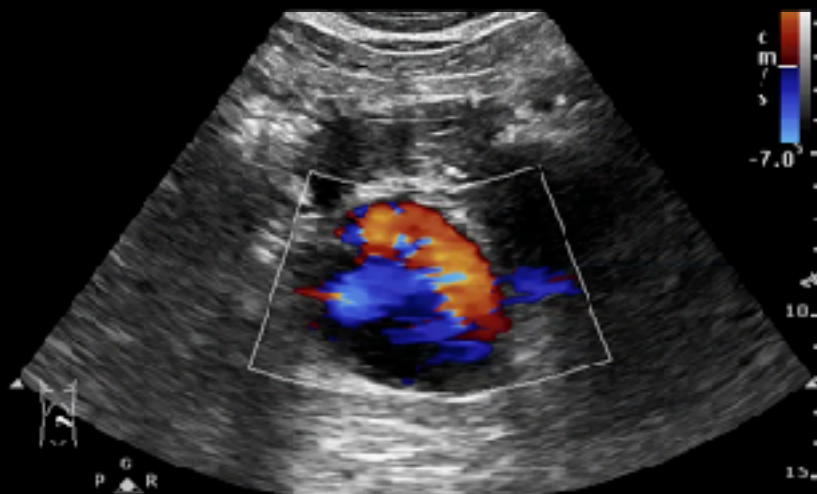


C Nerve
C6-2
22 Hz
16.0cm

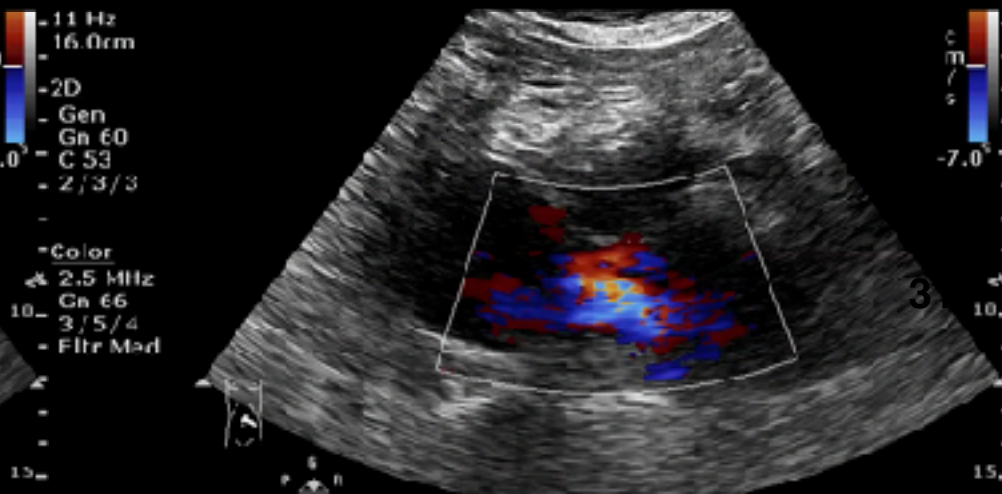


11 Hz
16.0cm

2D
Gen
Gh 60
C 53
2/3/3



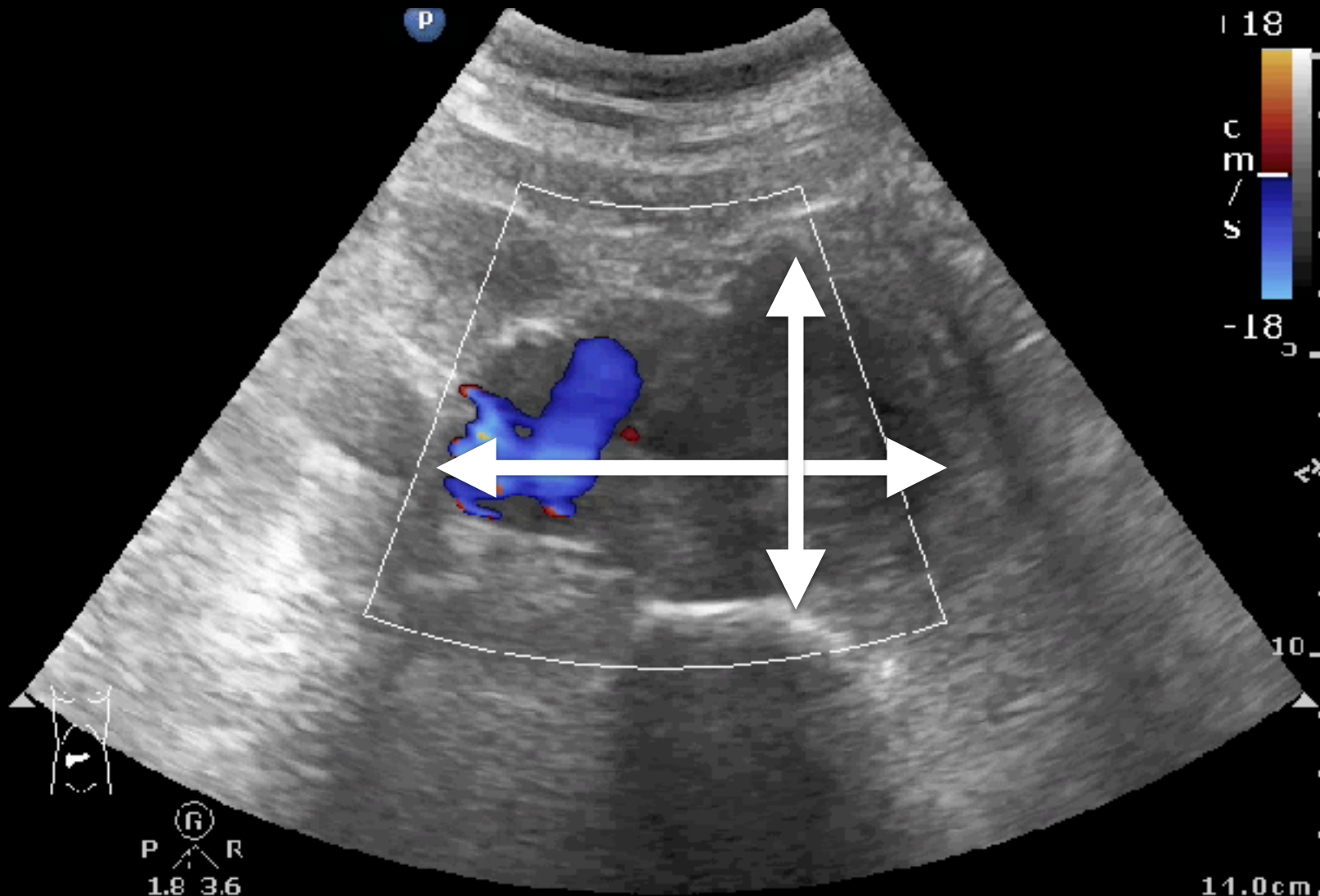
11 Hz
16.0cm
-2D
Gen
Gh 60
C 53
2/3/3



Abd Gen
C5-1
9 Hz
14.0cm

2D
HGen
Gn /8
C. 56
3/3/3

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

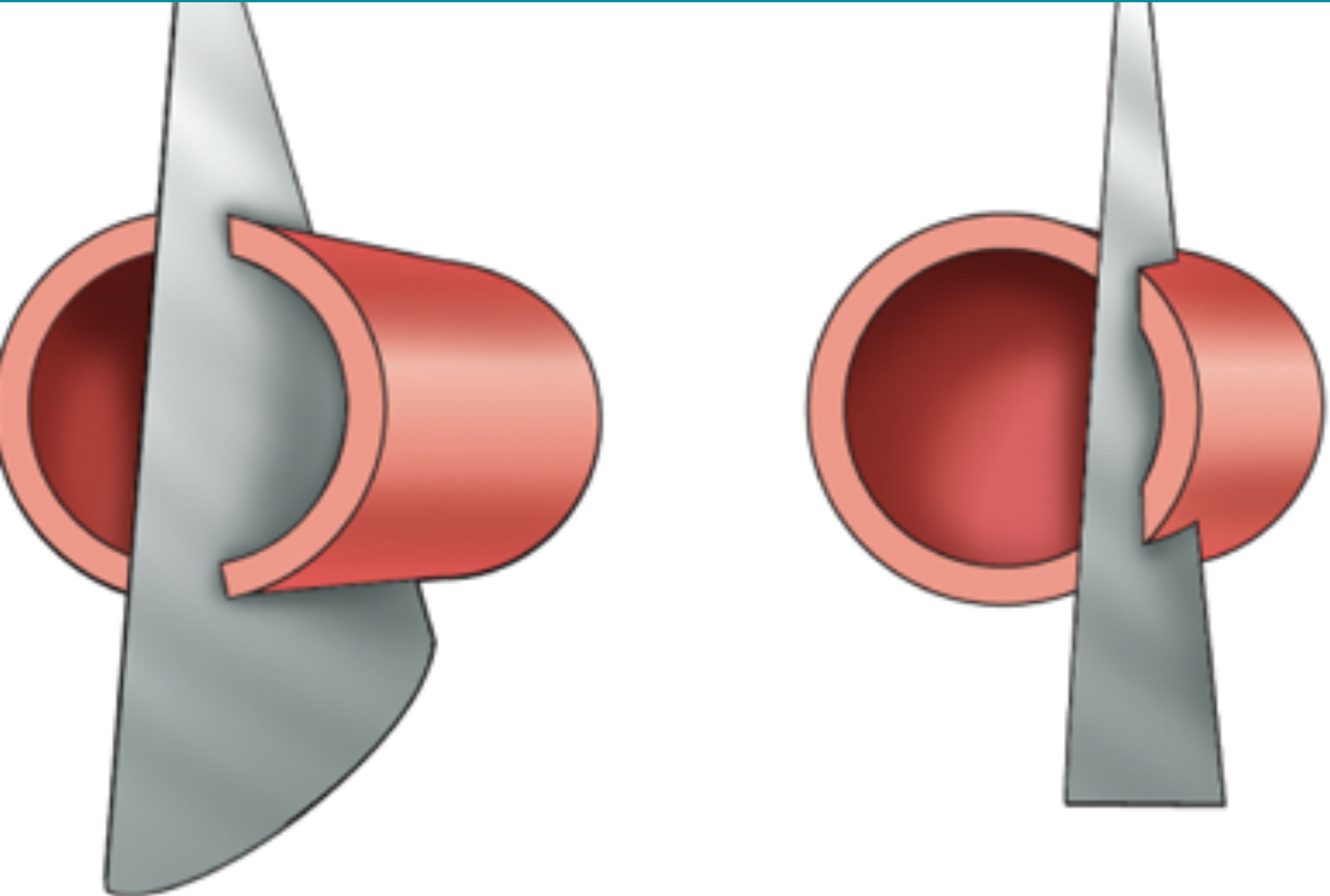


18
cm/s
-18

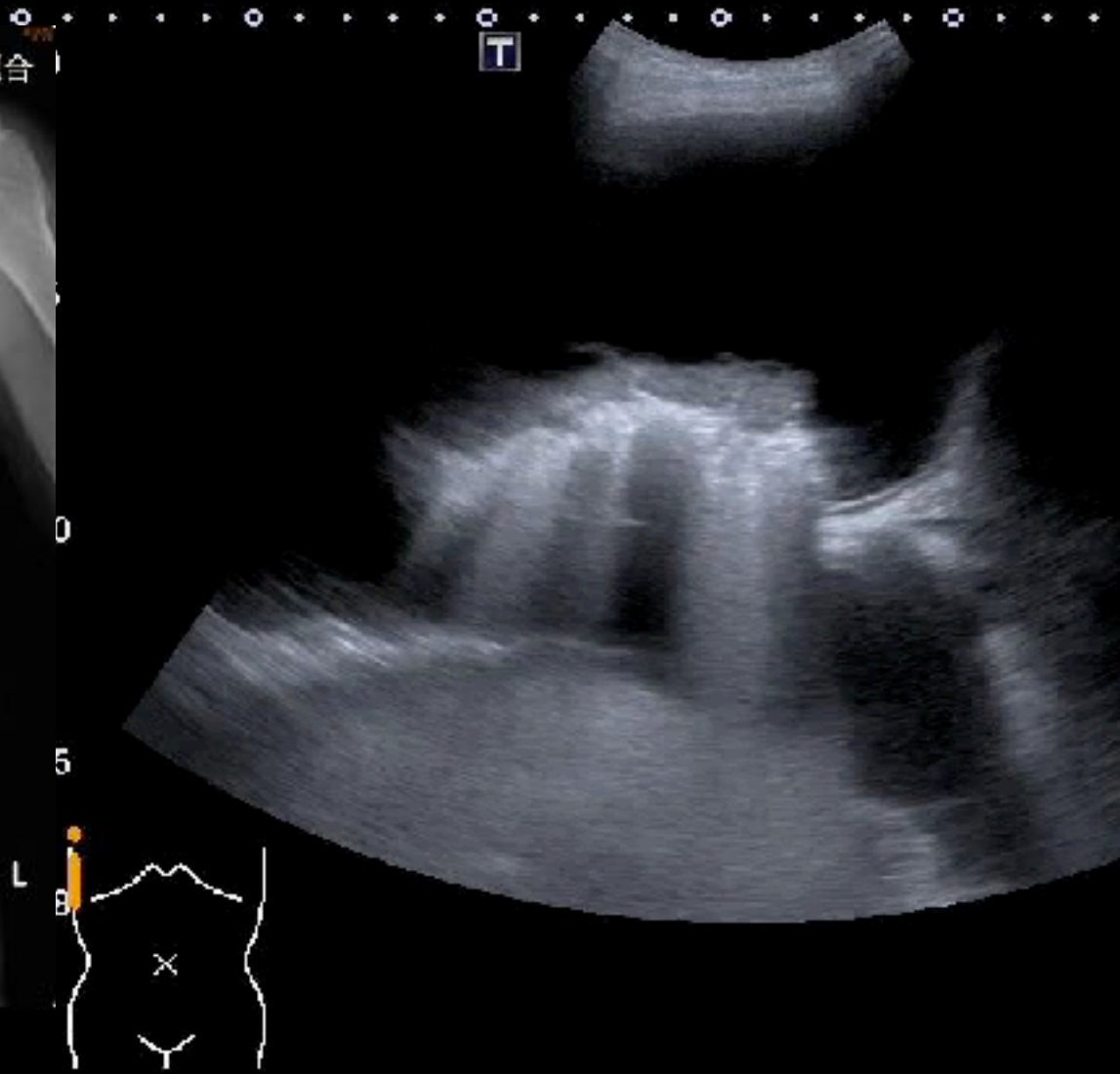
P R
1.8 3.6

11.0cm

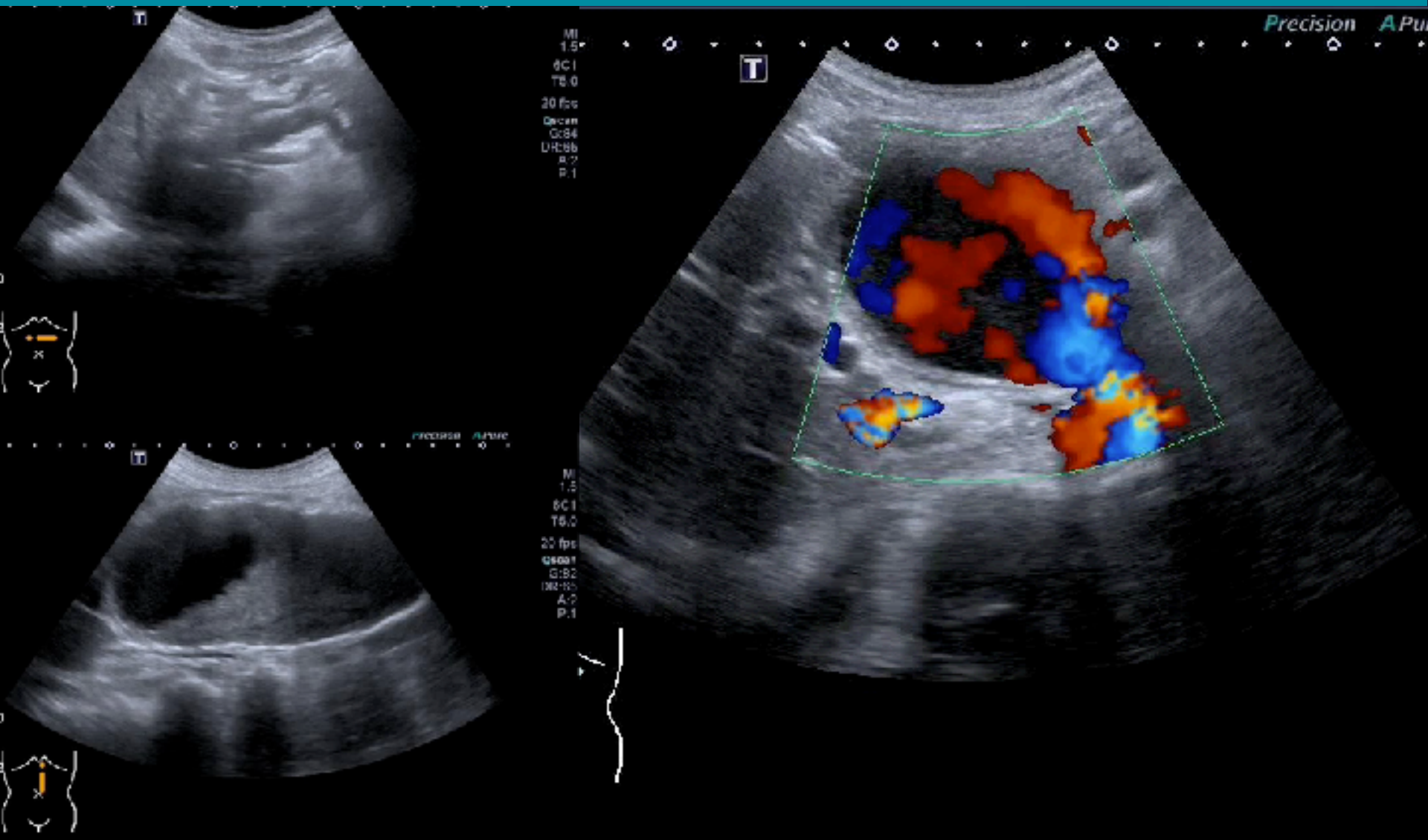
THE CYLINDER TANGENT EFFECT

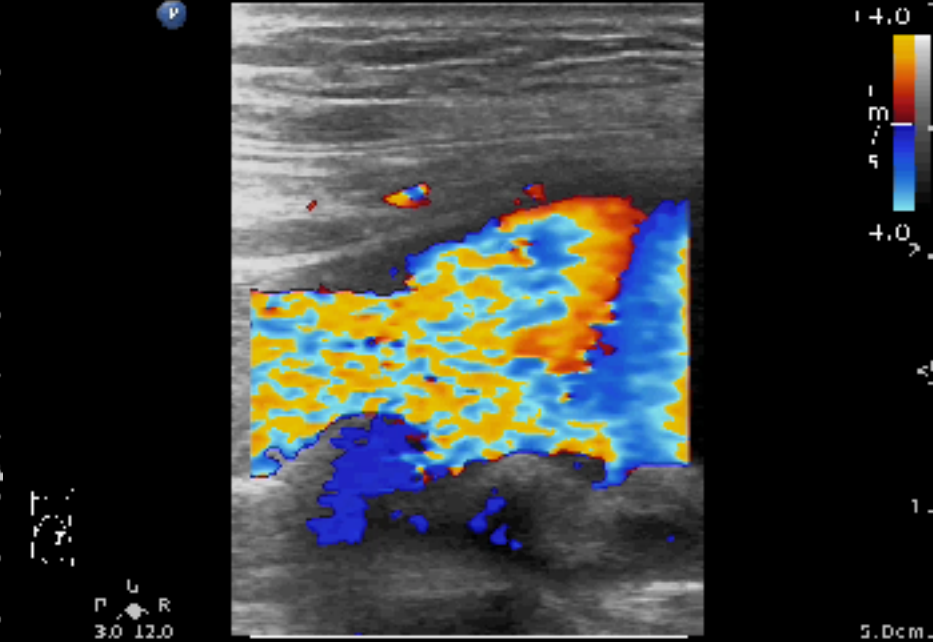
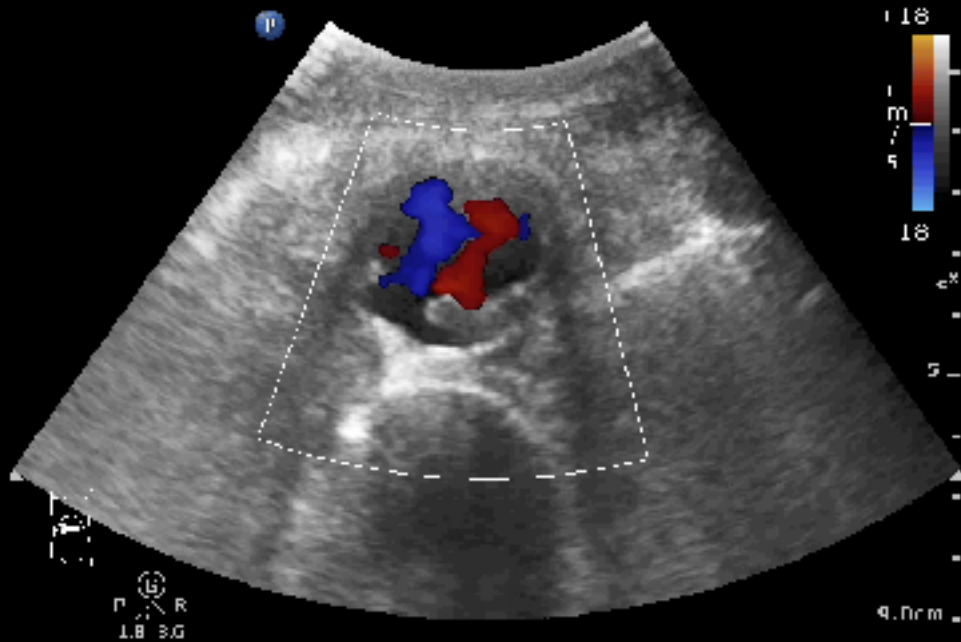


80M, FEVER FOR ONE WEEK



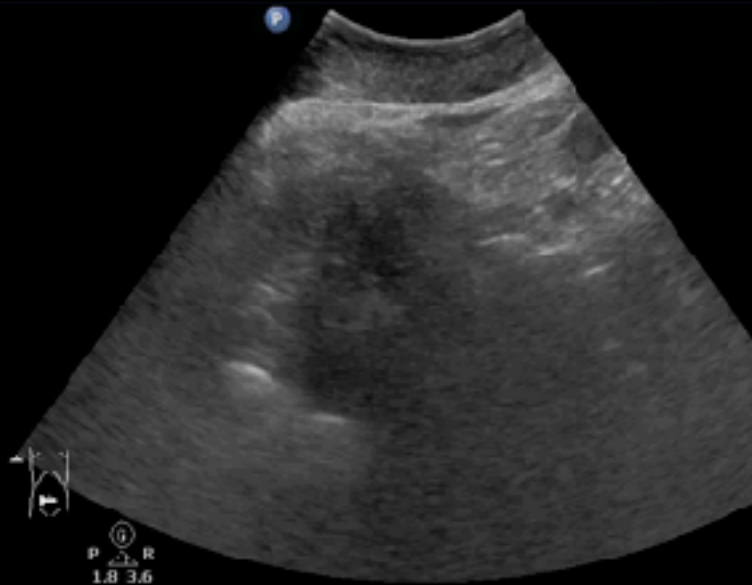
AAA ?





Abd Gen
C5-1
34 Hz
15.0cm

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

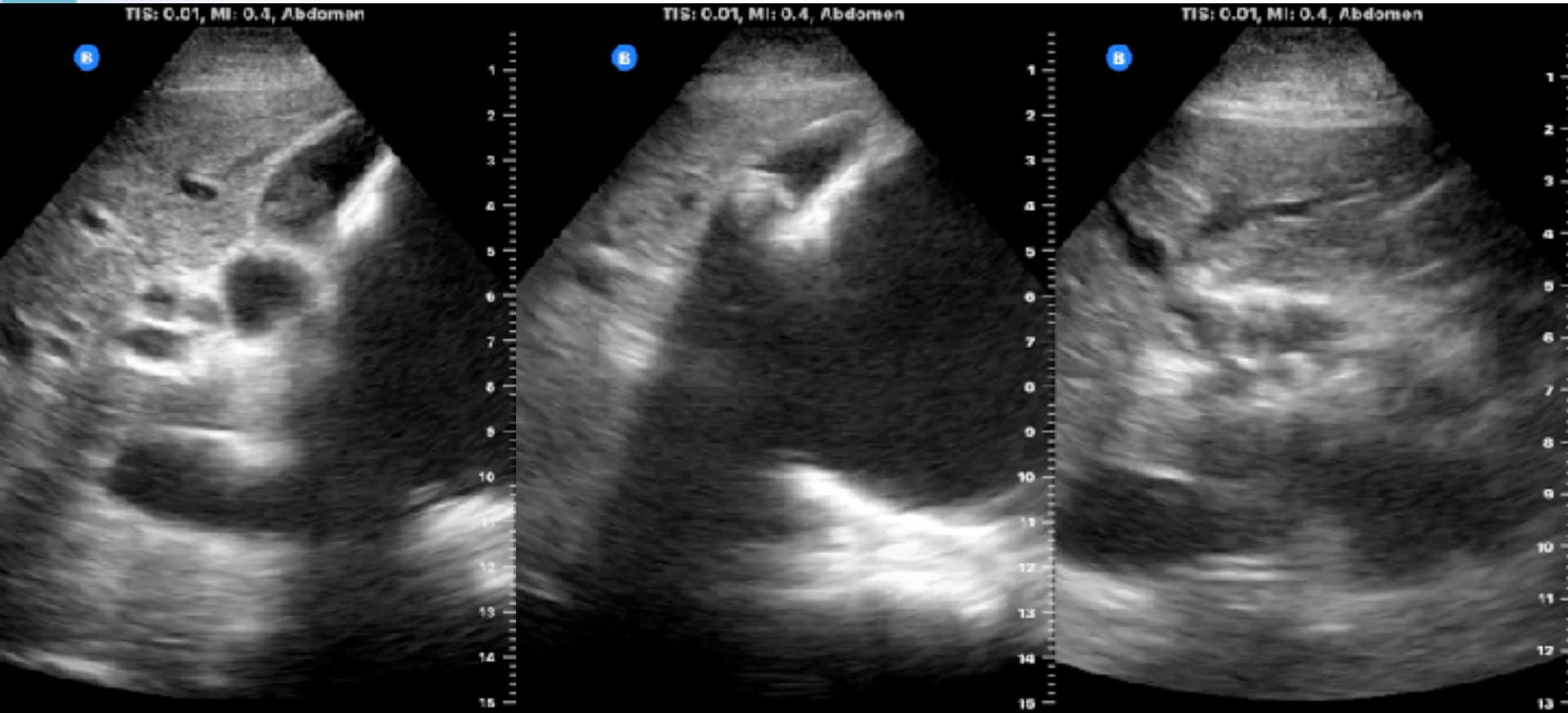


Abd Gen
C5-1
34 Hz
15.0cm

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

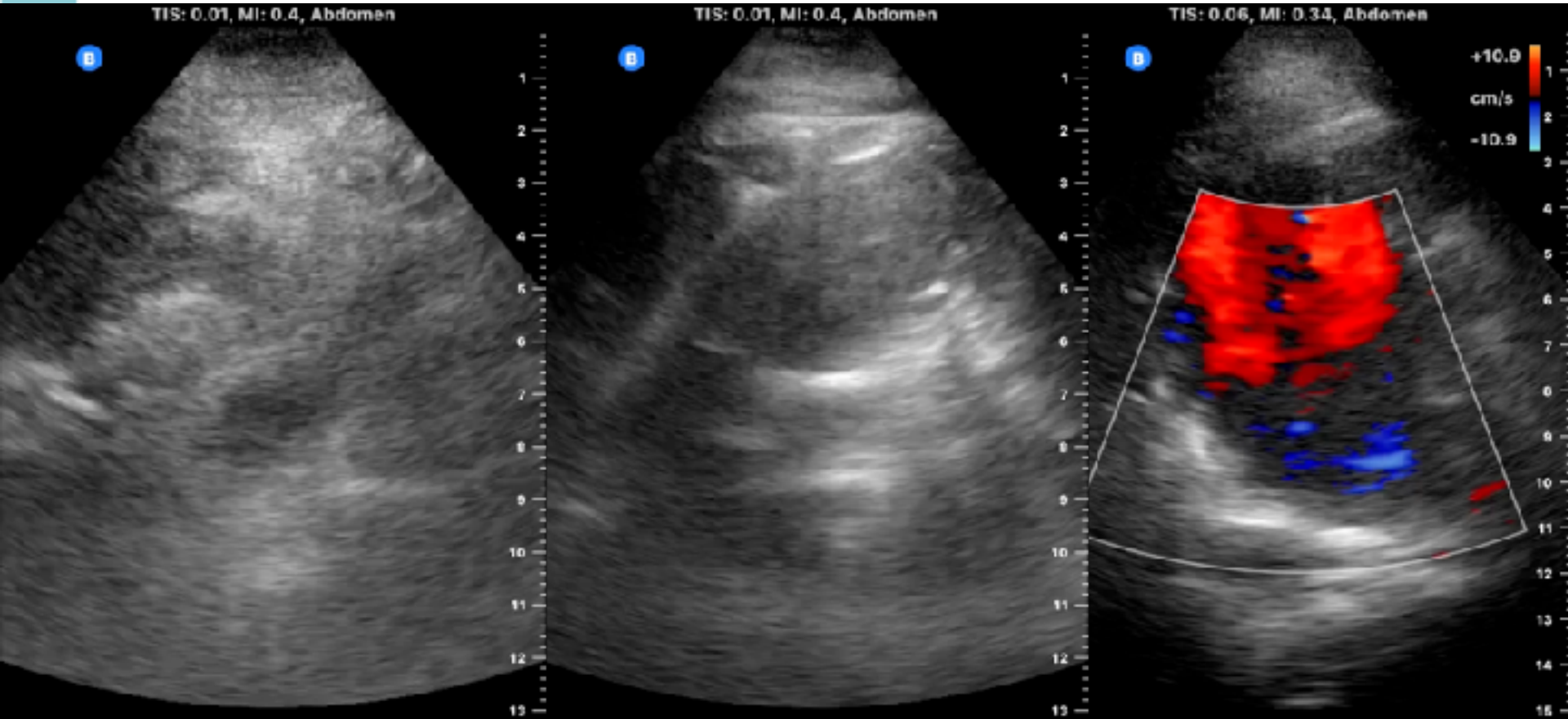


94M, epigastric pain & anemia



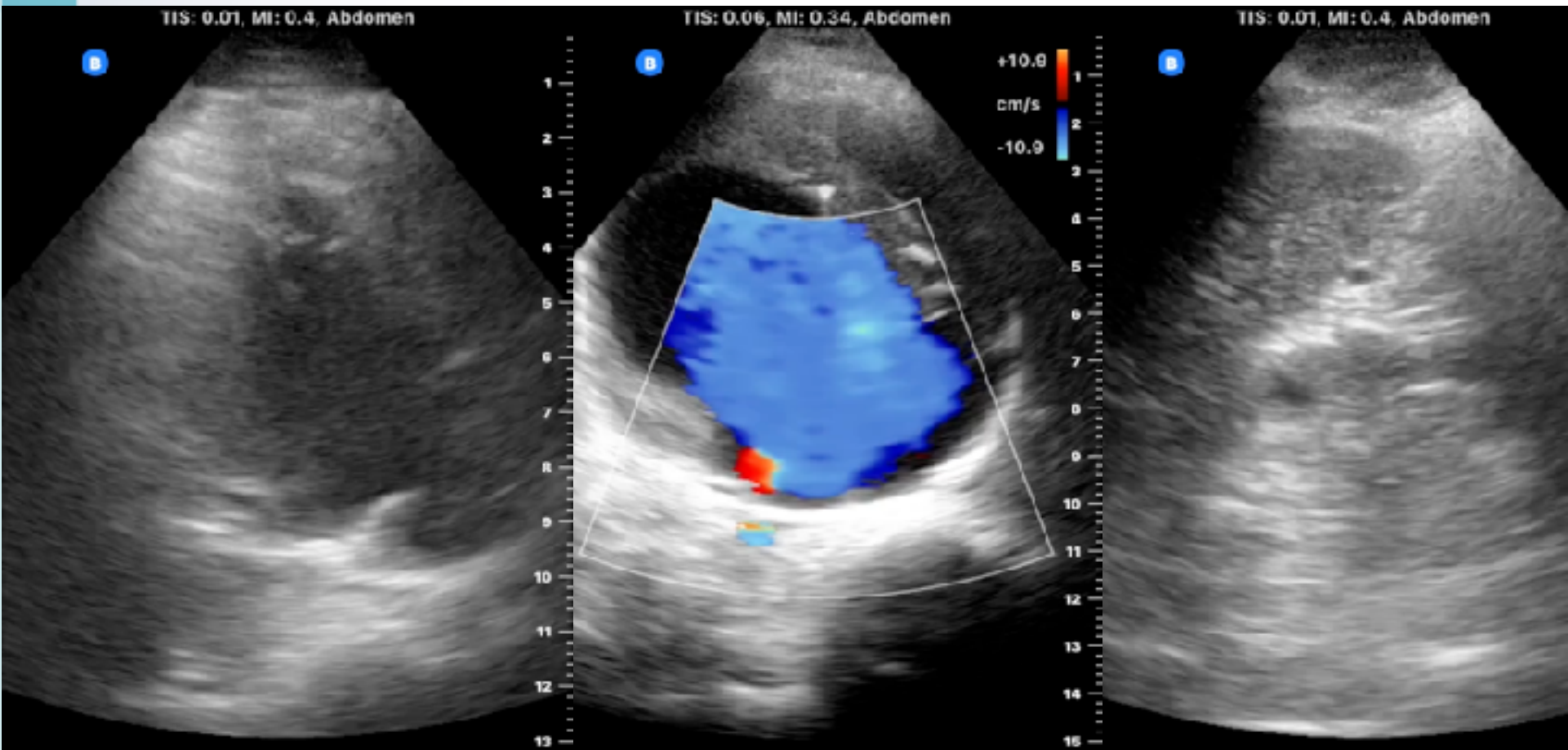


94M, epigastric pain & anemia



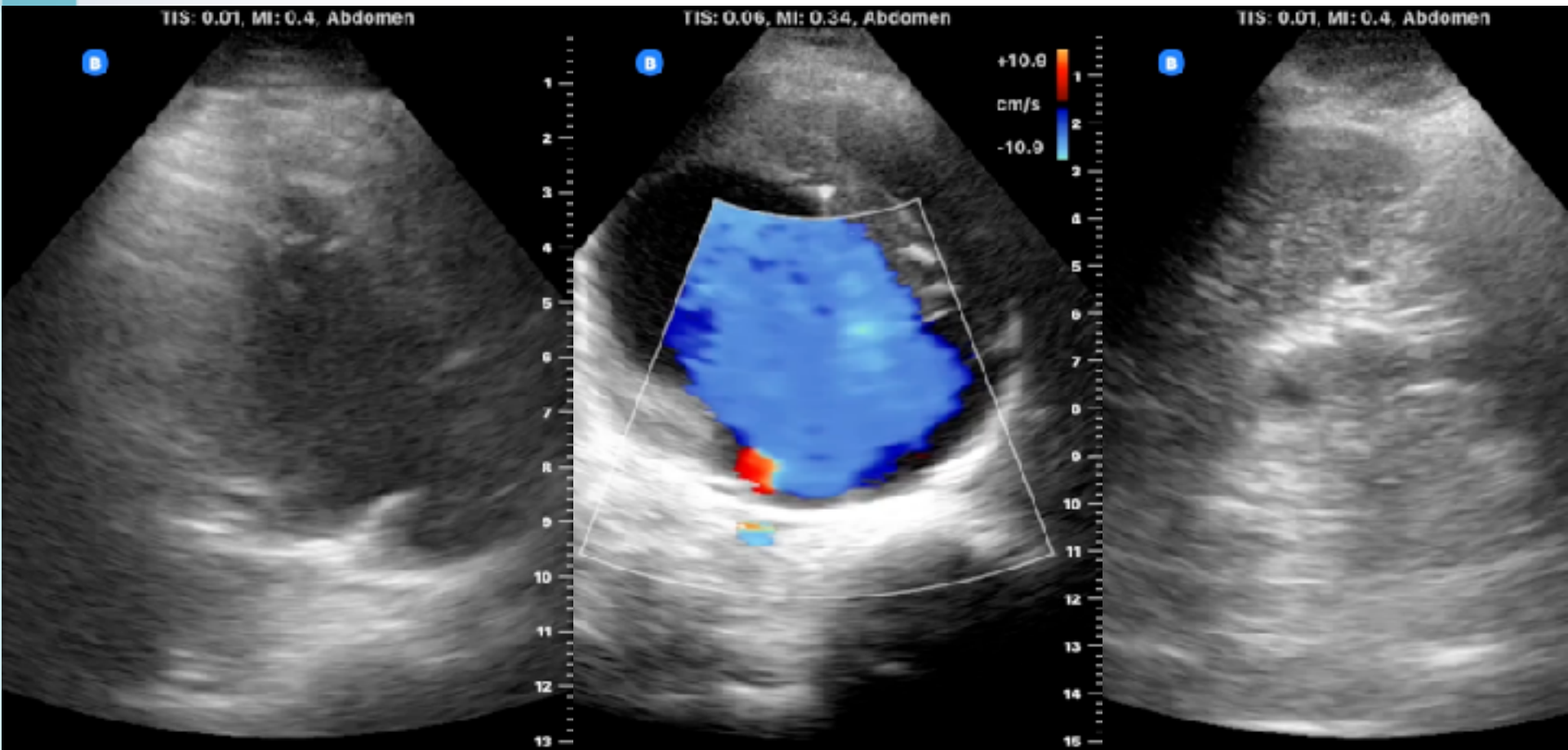


94M, epigastric pain & anemia



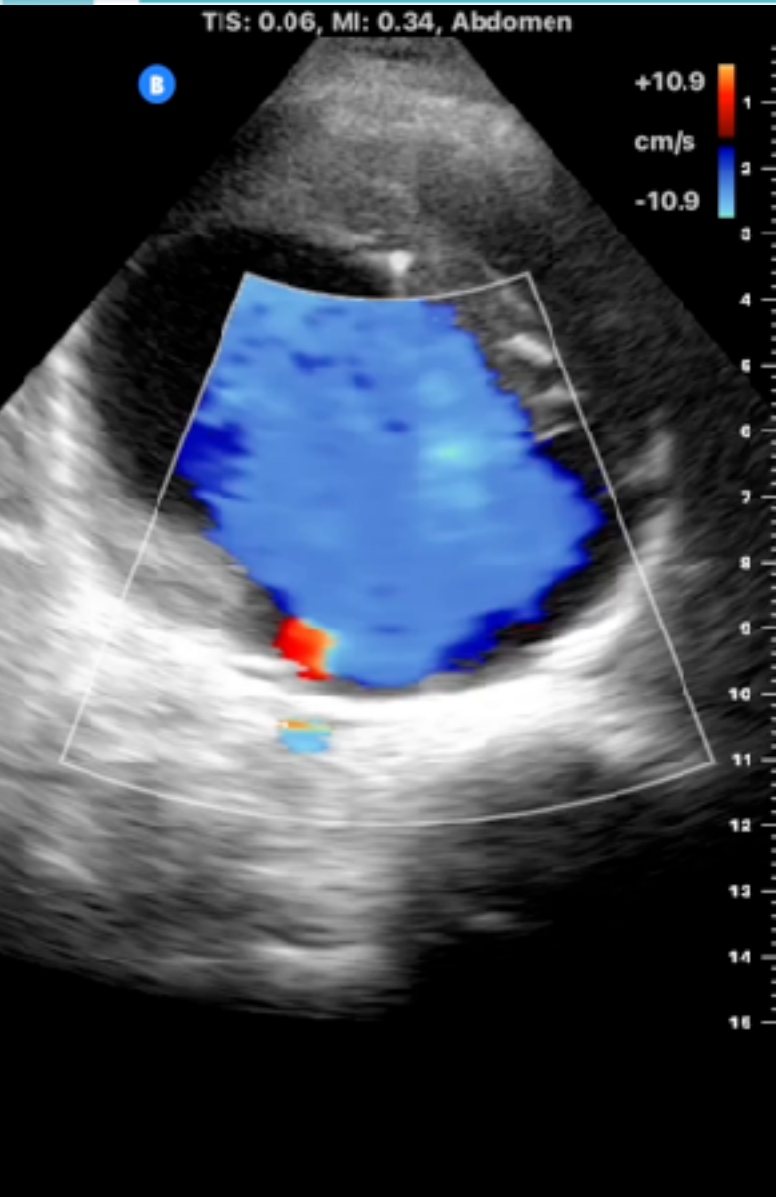


94M, epigastric pain & anemia





94M, epigastric pain & anemia



> 50 的腹/背/腰痛

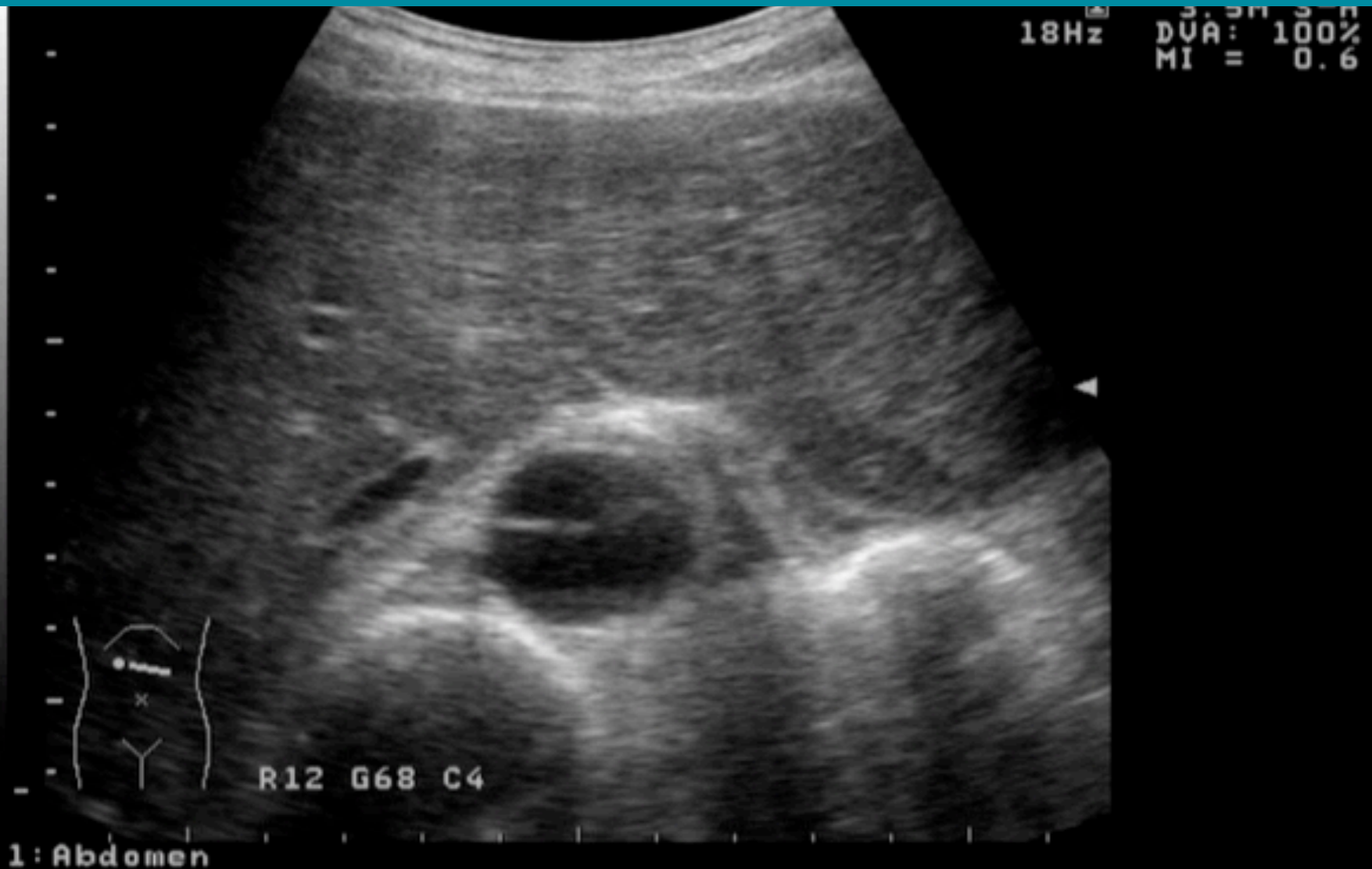
不明Syncope

不明休克

重點病史和PE還是要確實

一定要掃描腹主動脈到分岔

AAA ?

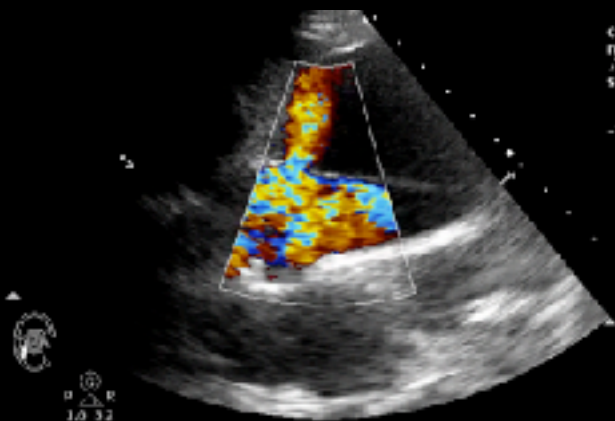
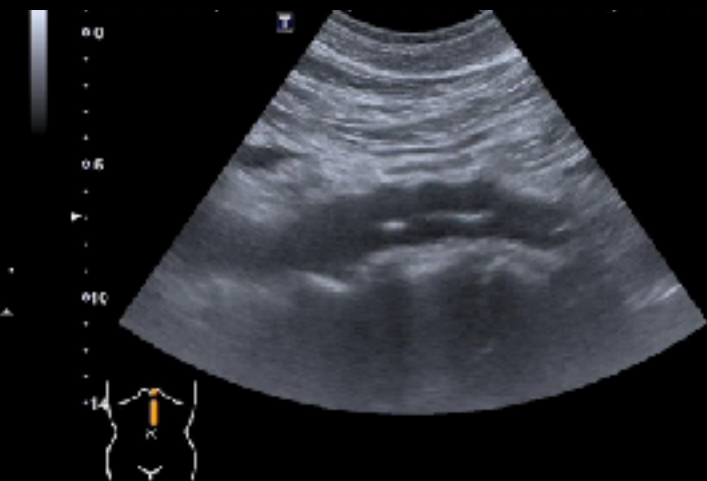


該懷疑AD的情境

TABLE 59-1

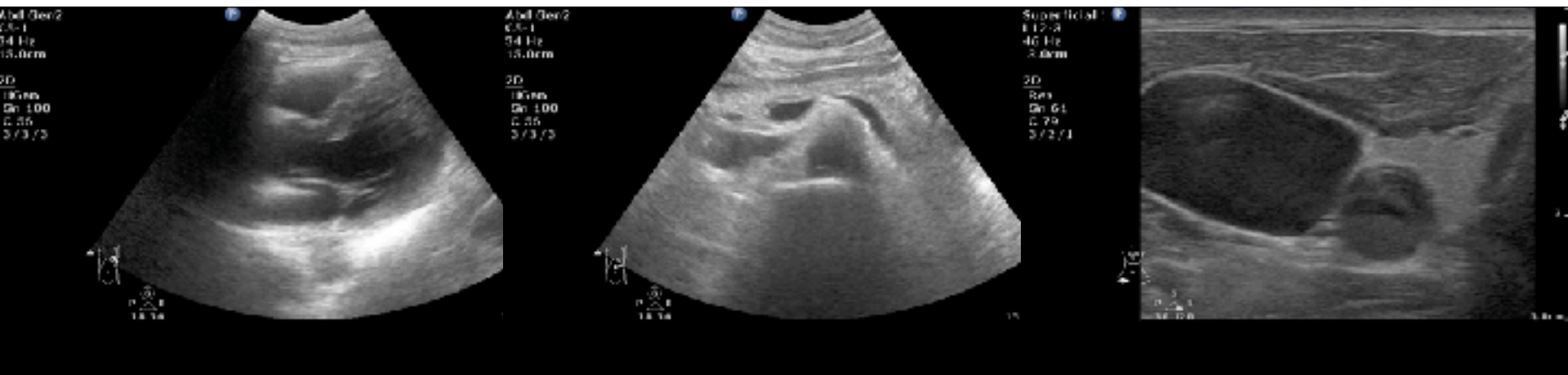
Acute Aortic Dissection: Features From the International Registry of Acute Aortic Dissection

| 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

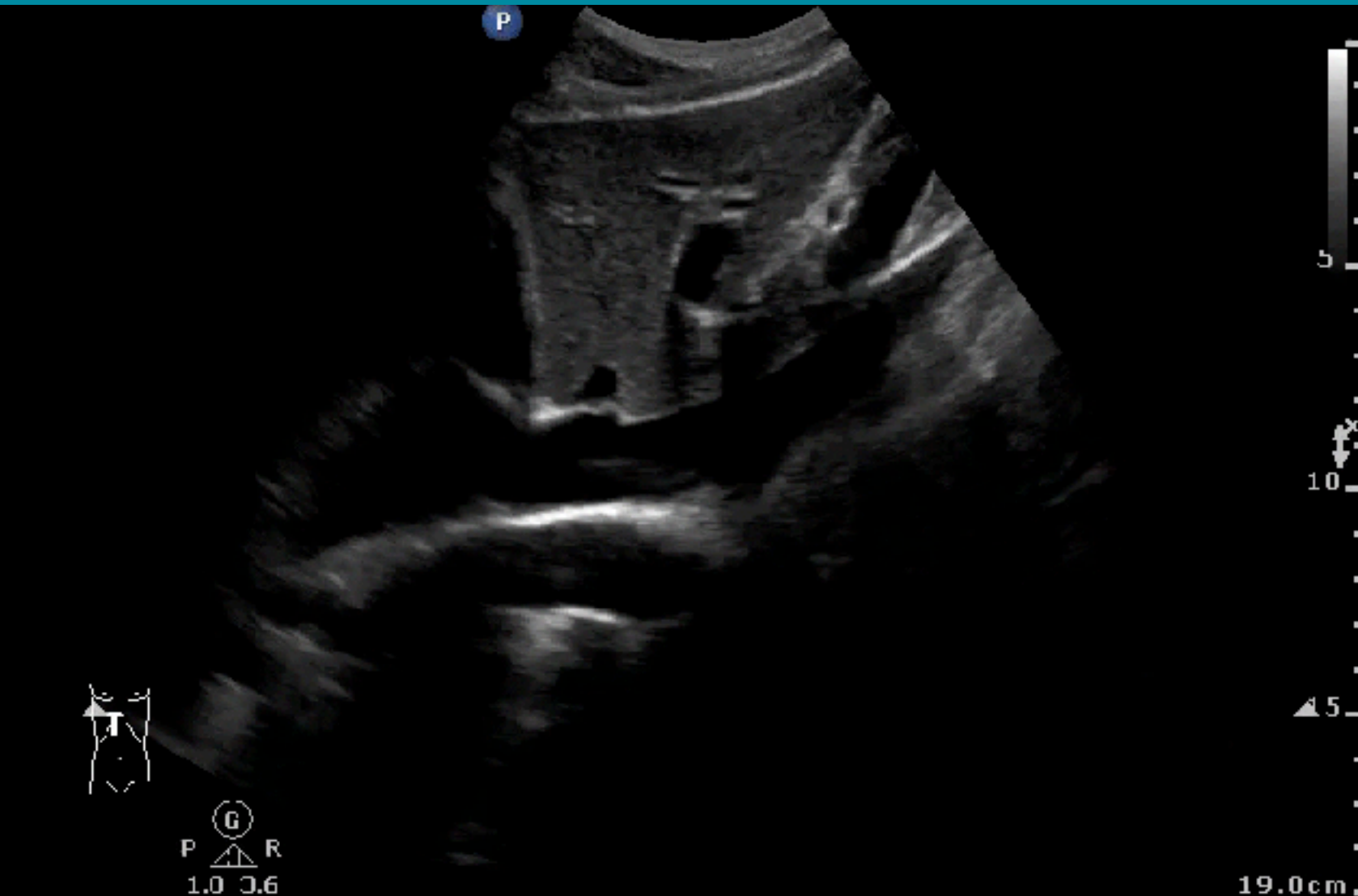
Abd Gen
C5-1
29 Hz
19.0cm

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



G
P R
1.0 3.6

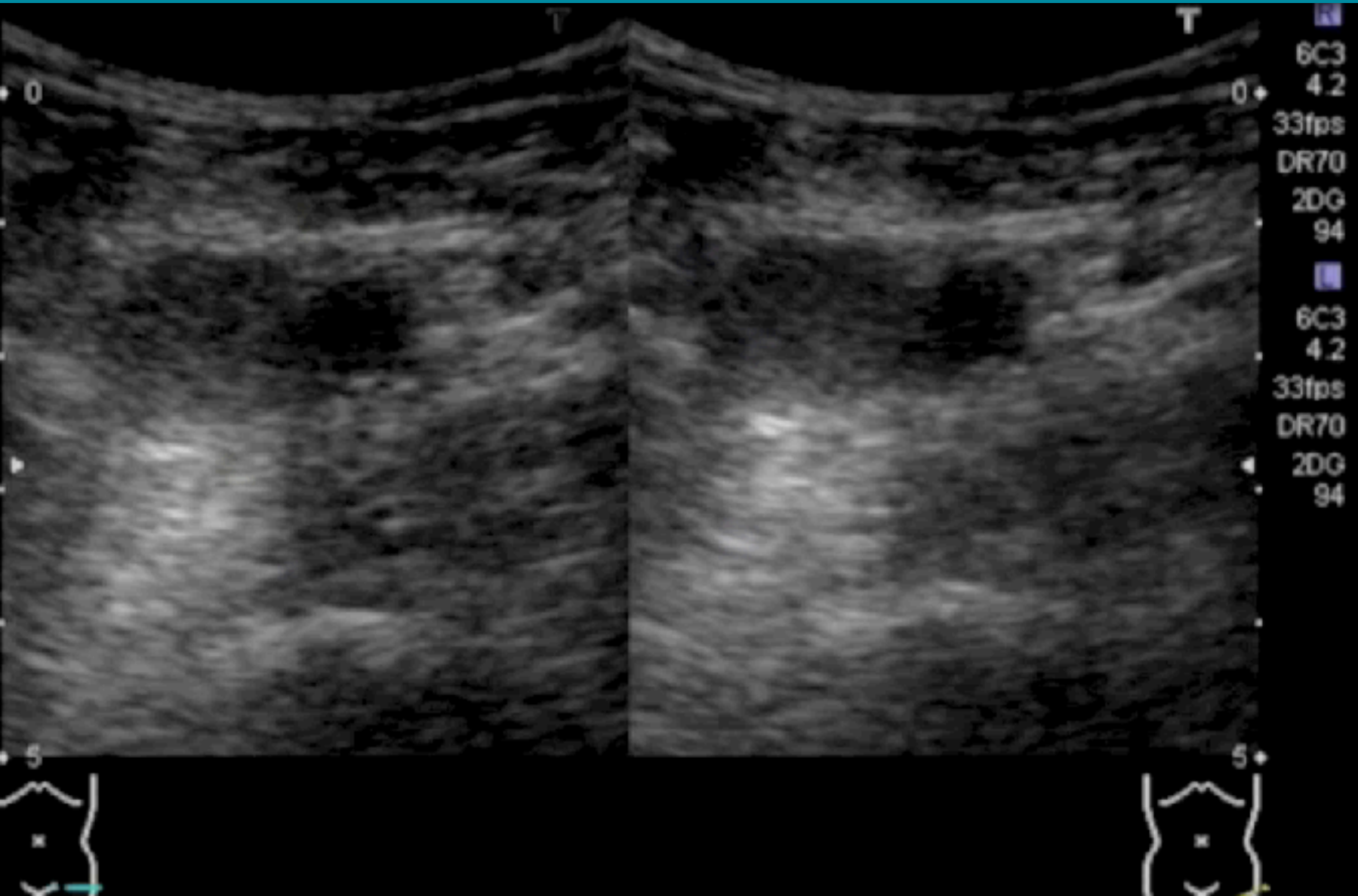
19.0cm



47F, left leg swelling for 7d



Compression test for DVT



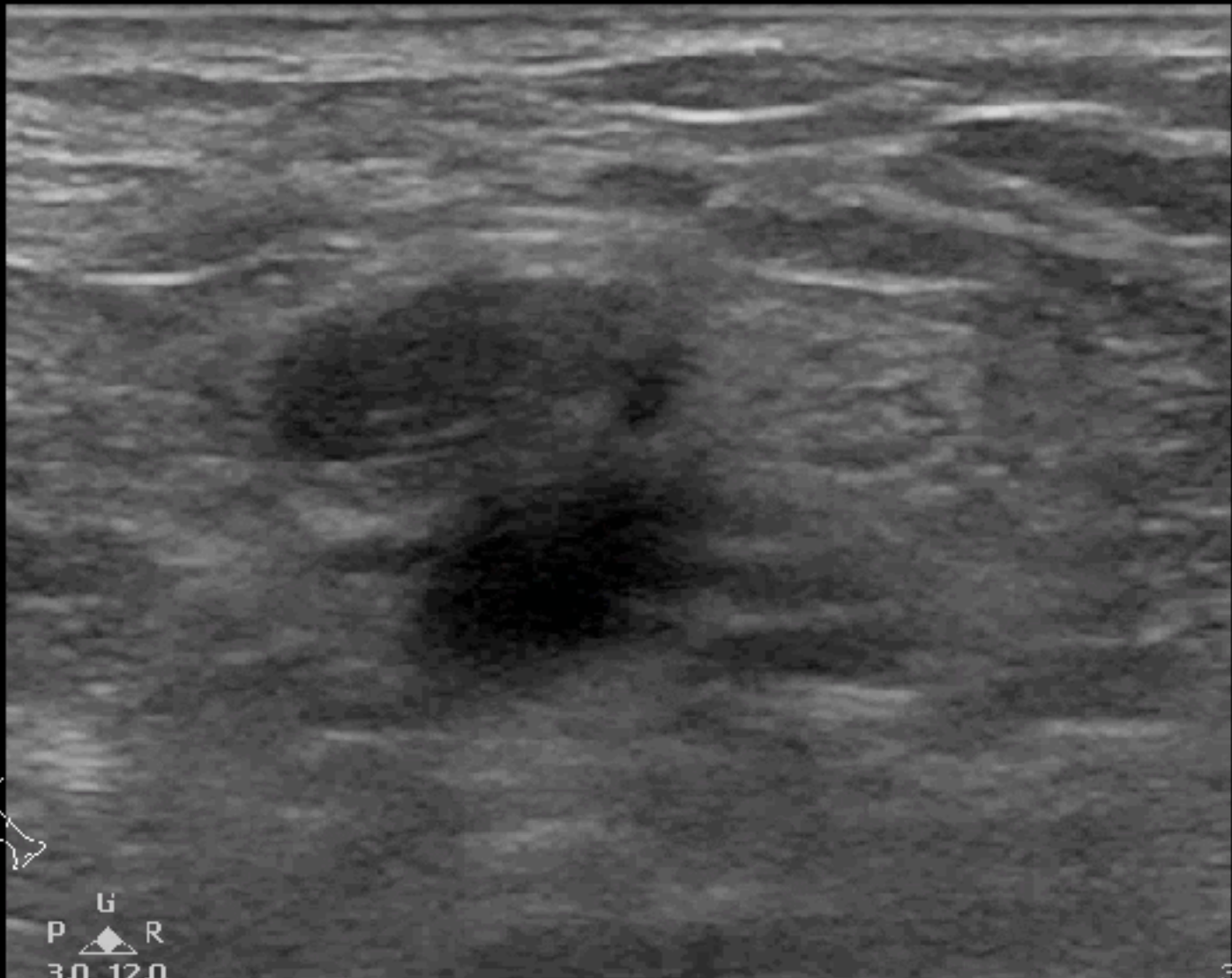
DVT



Superficial
_12-3
31 Hz
3.0cm

P

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



G
P ▲ 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%).

Determine pretest probability of DVT using Wells' criteria*

Low probability score (<1 point)

High or moderate probability score (>0 points)

D-dimer testing

US

DVT ruled out

US

Treat DVT

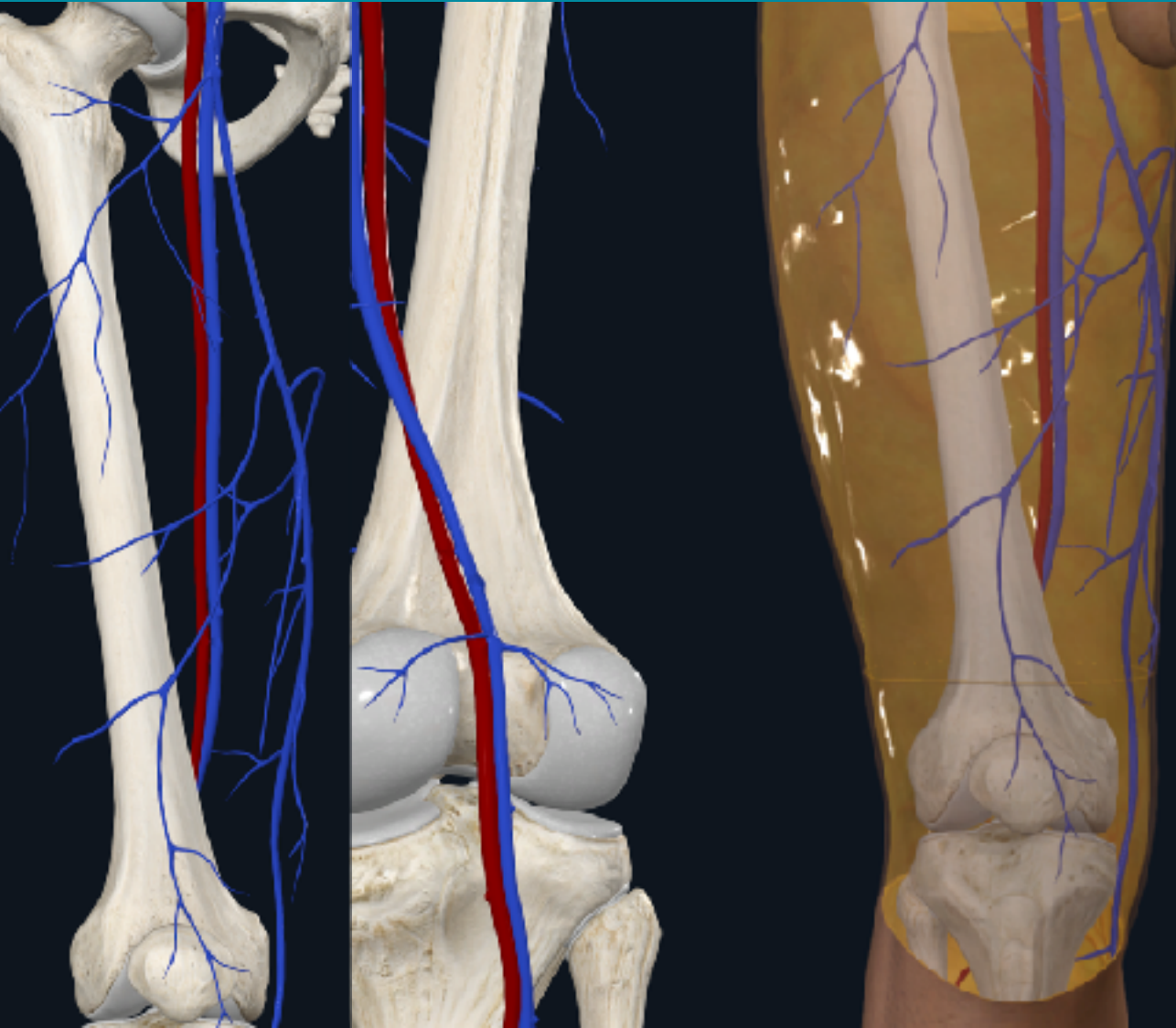
D-dimer testing

DVT ruled out

DVT ruled out

Repeat US in 1 week

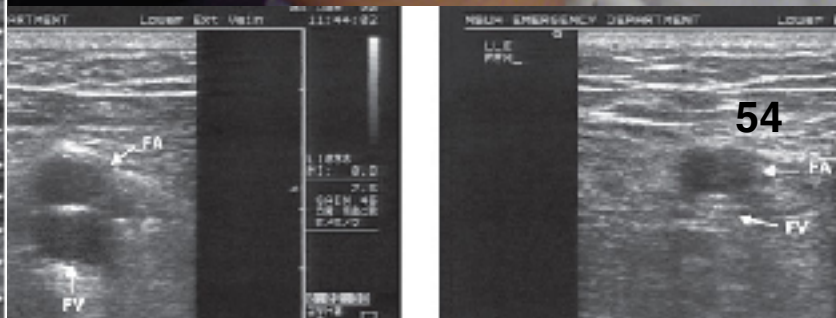
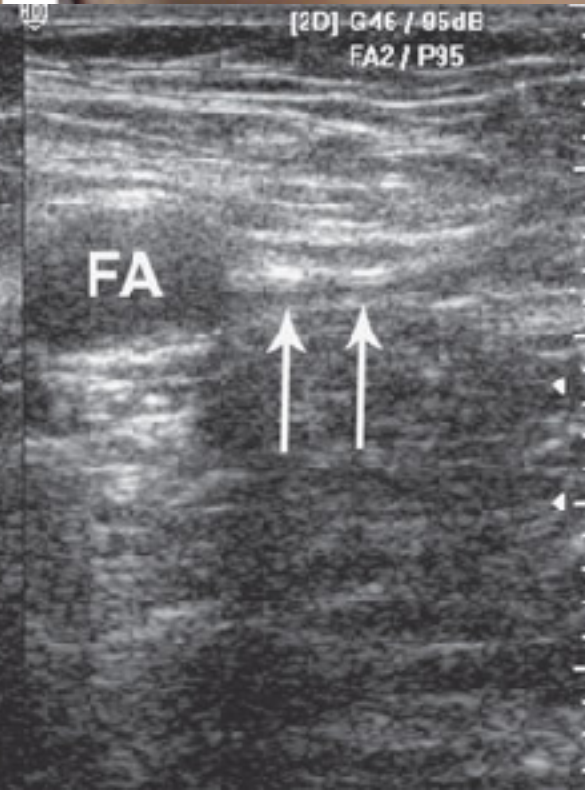
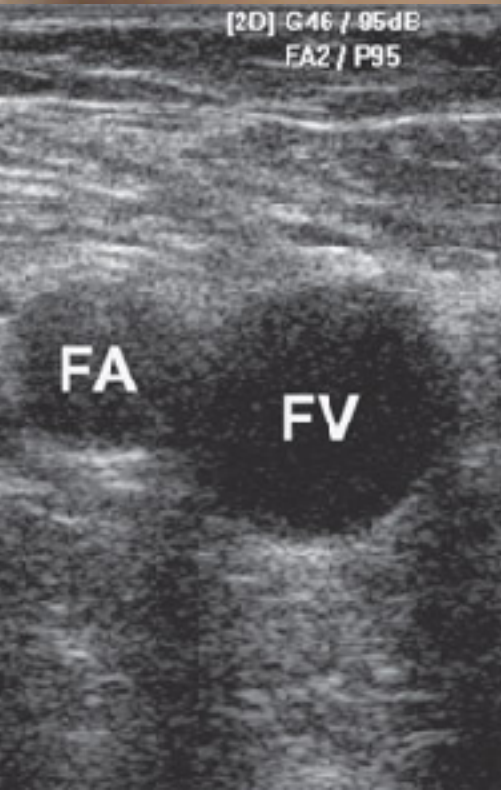
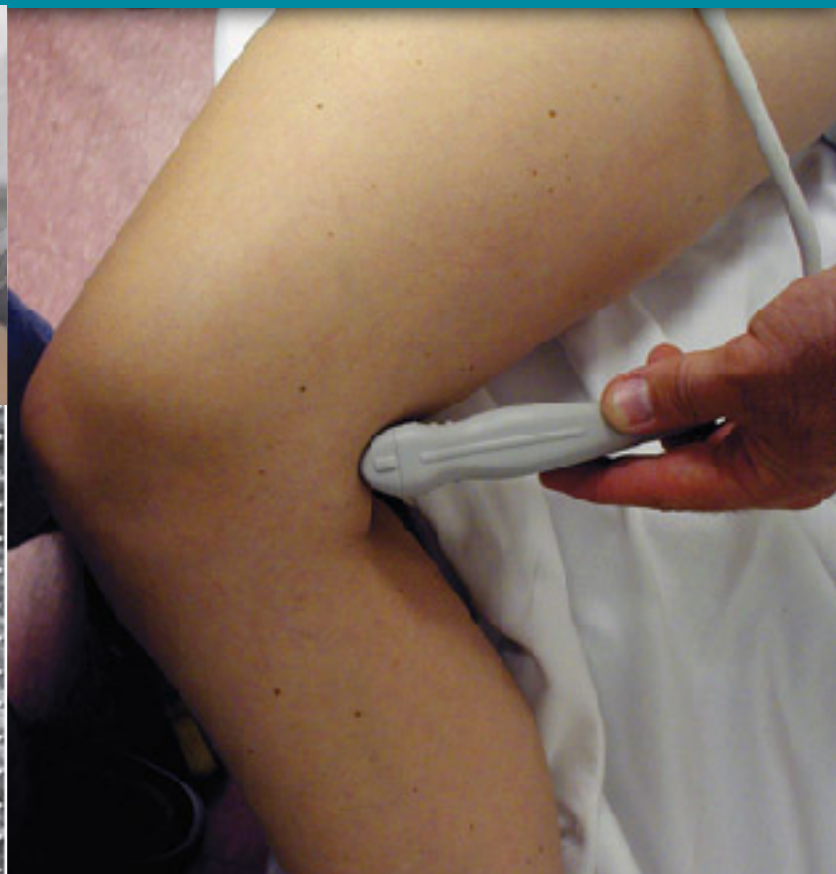
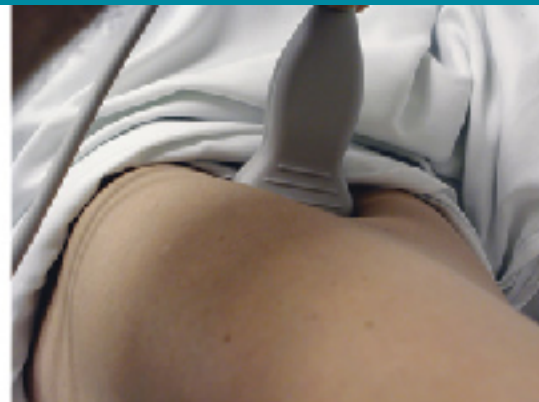
DVT



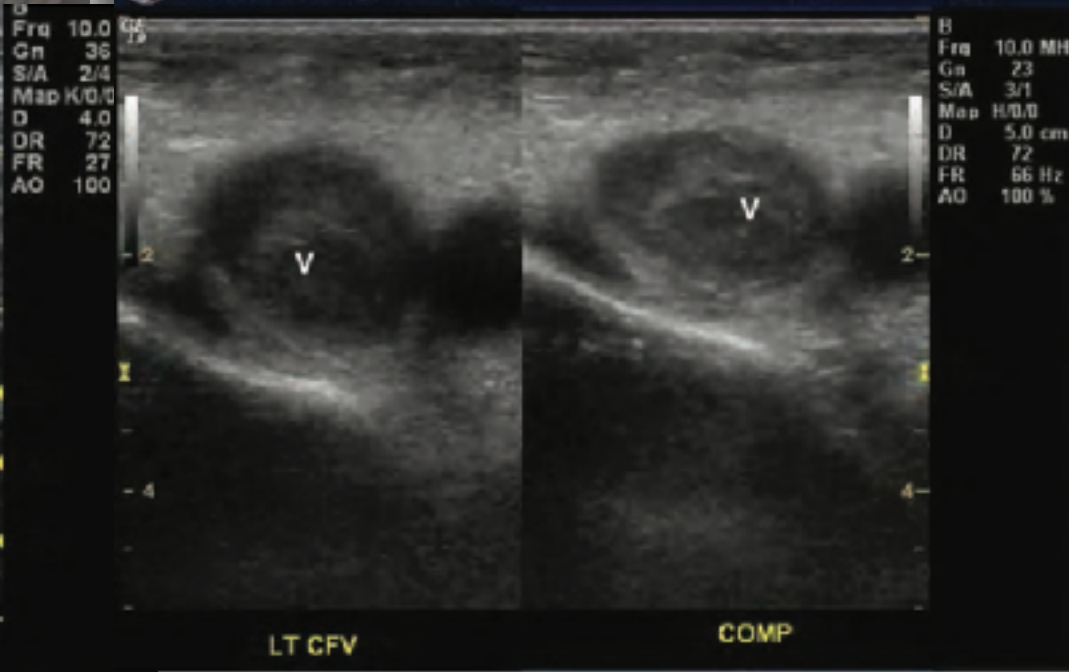
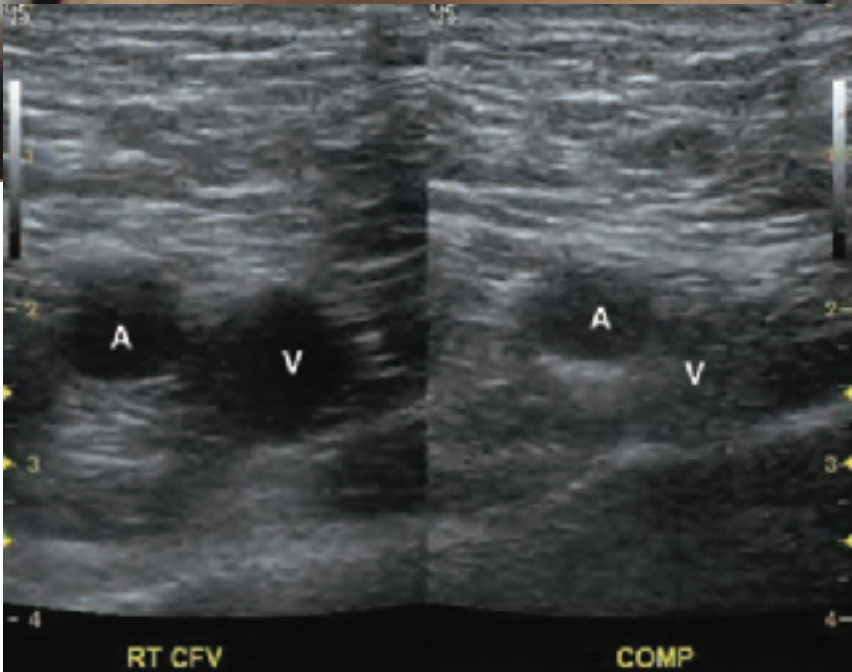
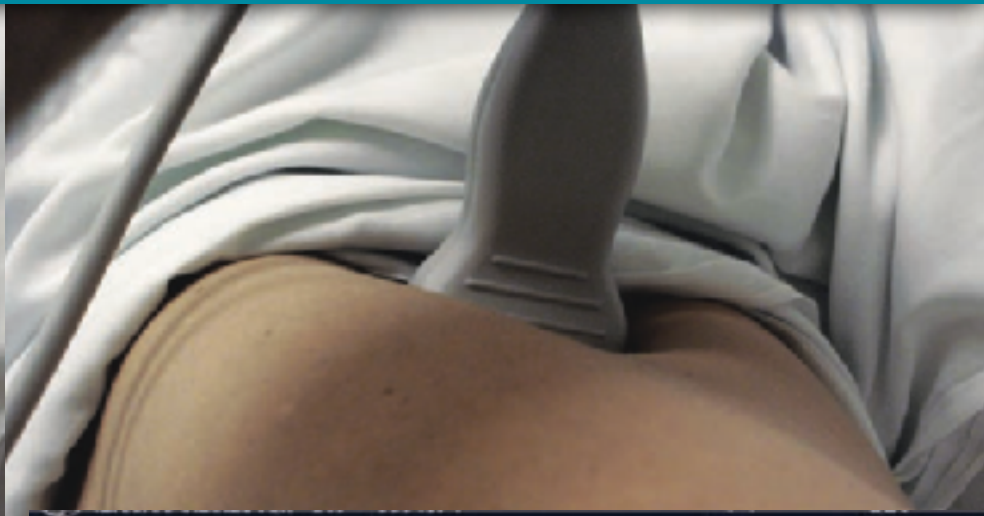
Swelling
Dyspnea
Shock

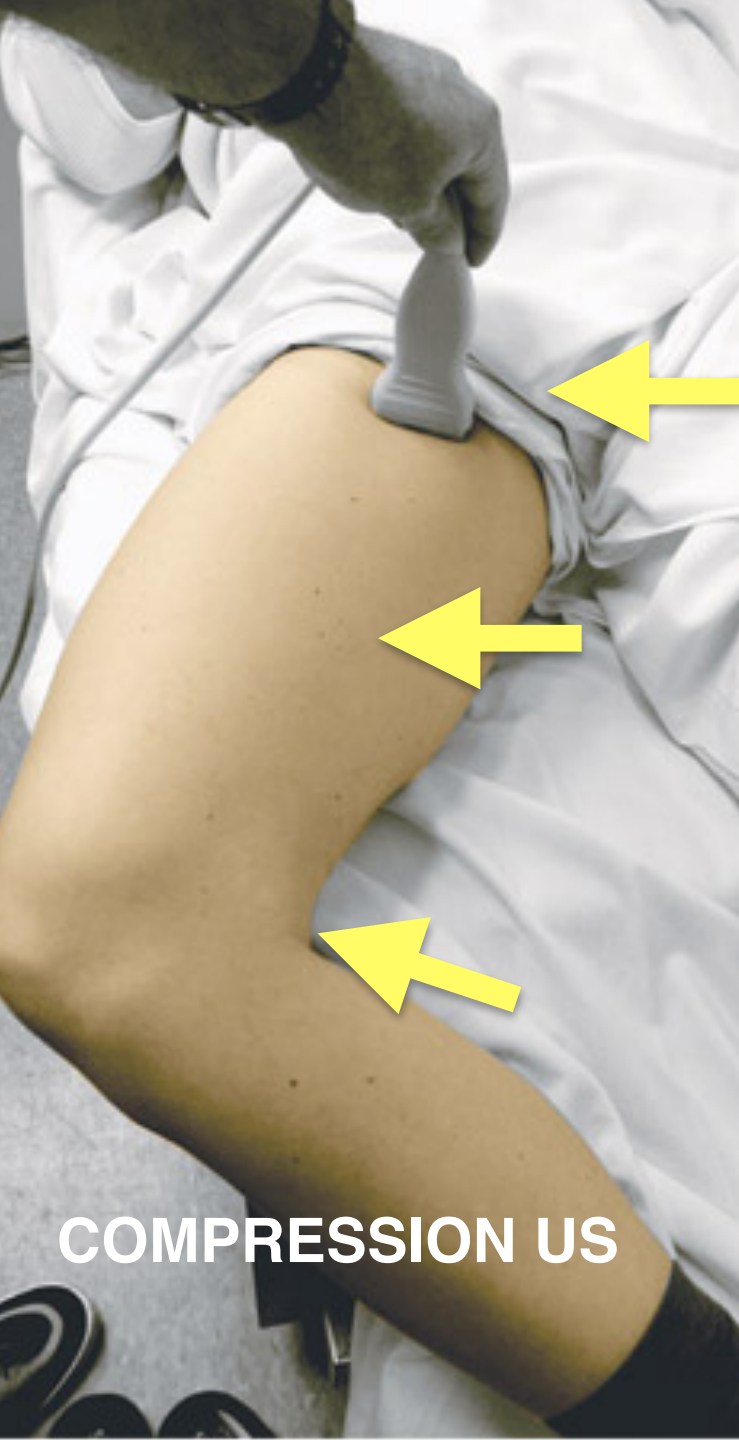
DVT

Compression test for DVT

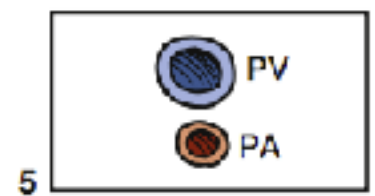
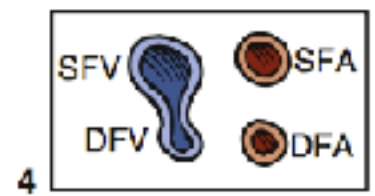
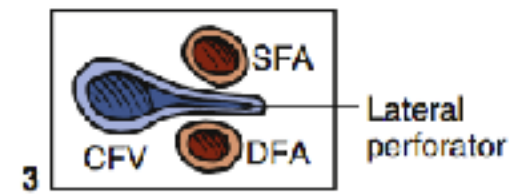
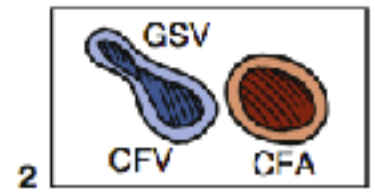
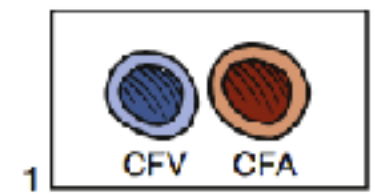
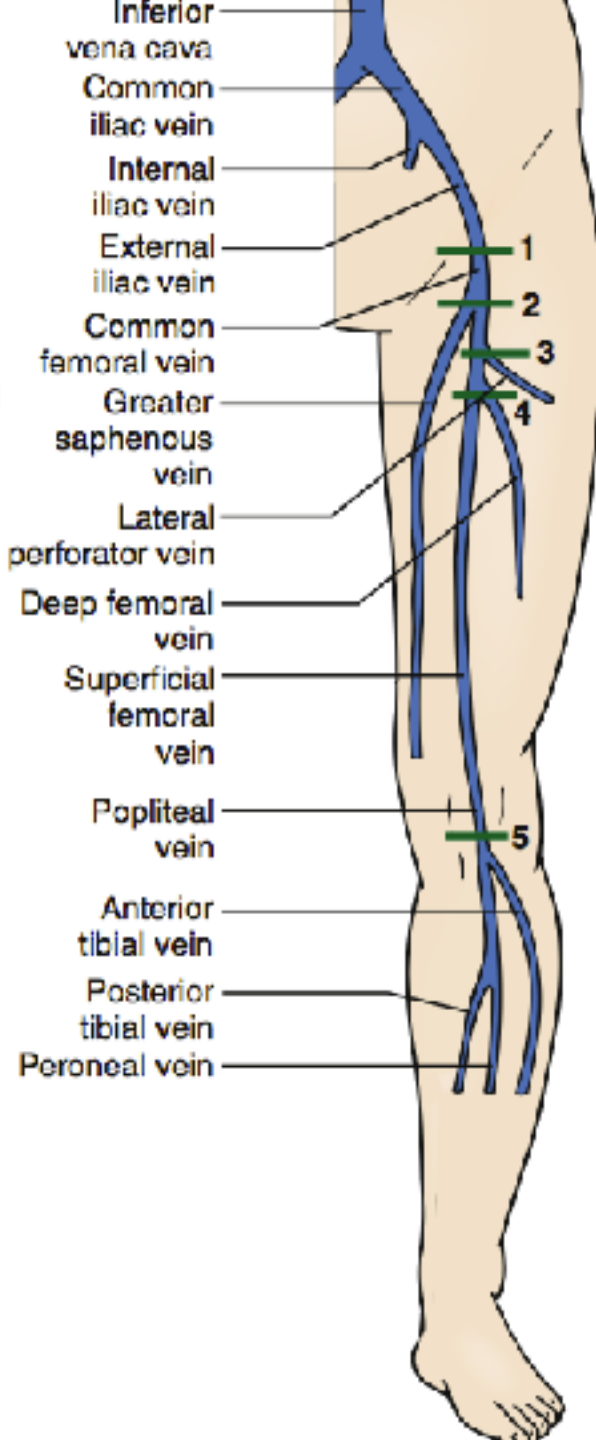


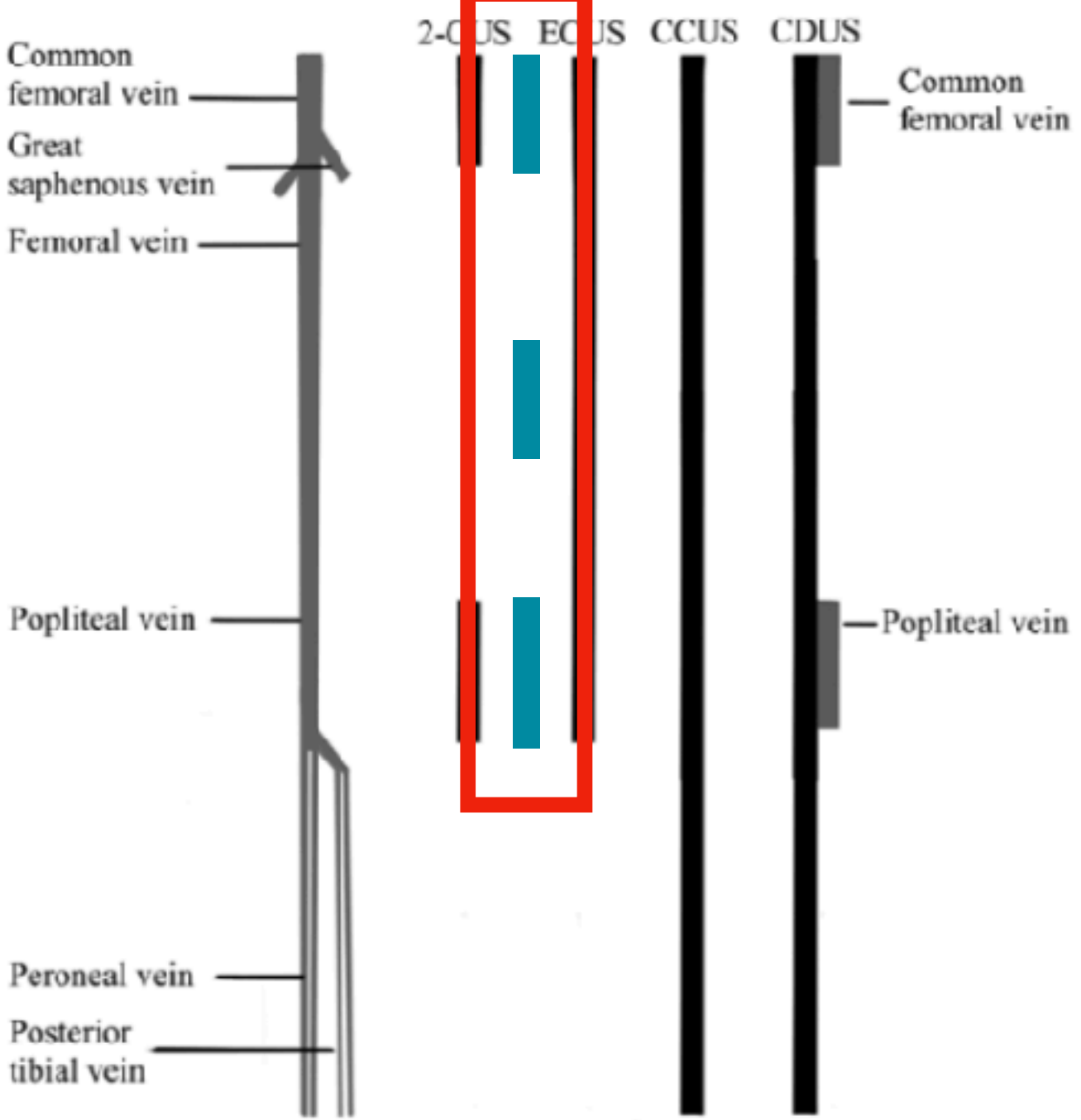
懷疑DVT時的3點壓迫





COMPRESSION US



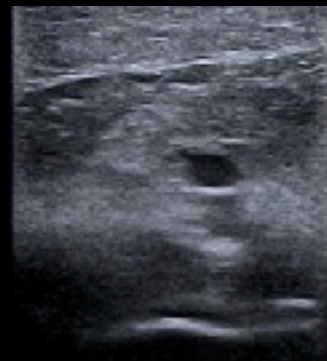
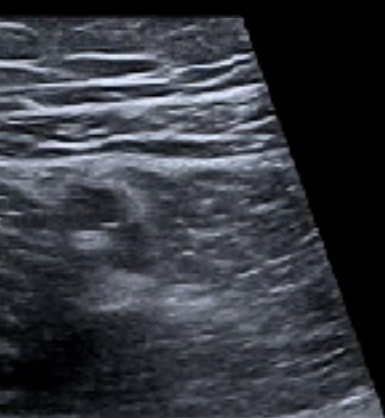
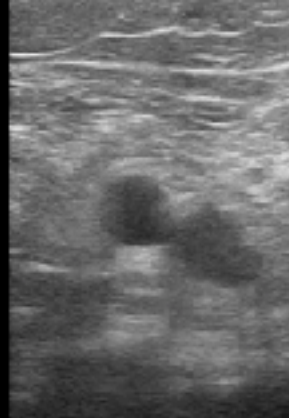


3 regions
Sen 90.57%
Spe 98.52%

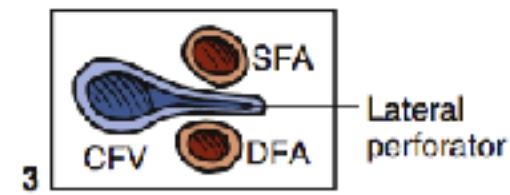
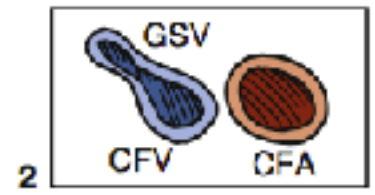
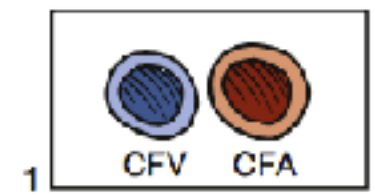
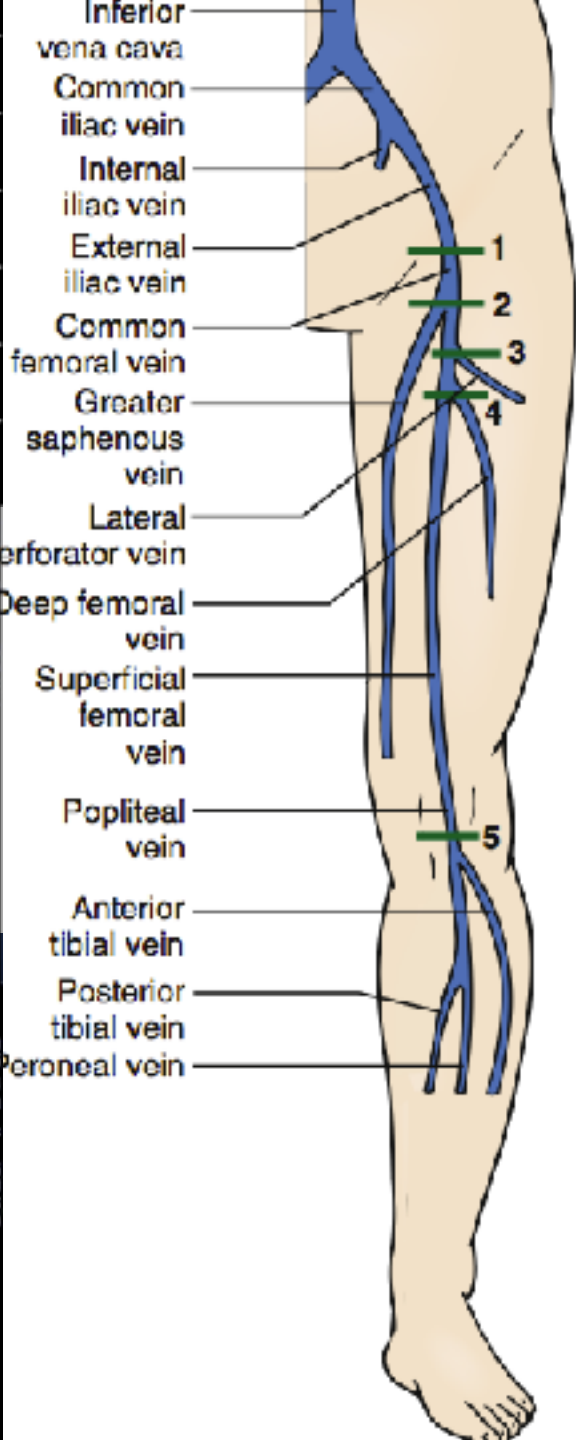
2 regions
Sen 82.76%
Spe 98.52%

Heather Hale, MD

0cm
Gen
n 32
41
7/3/12

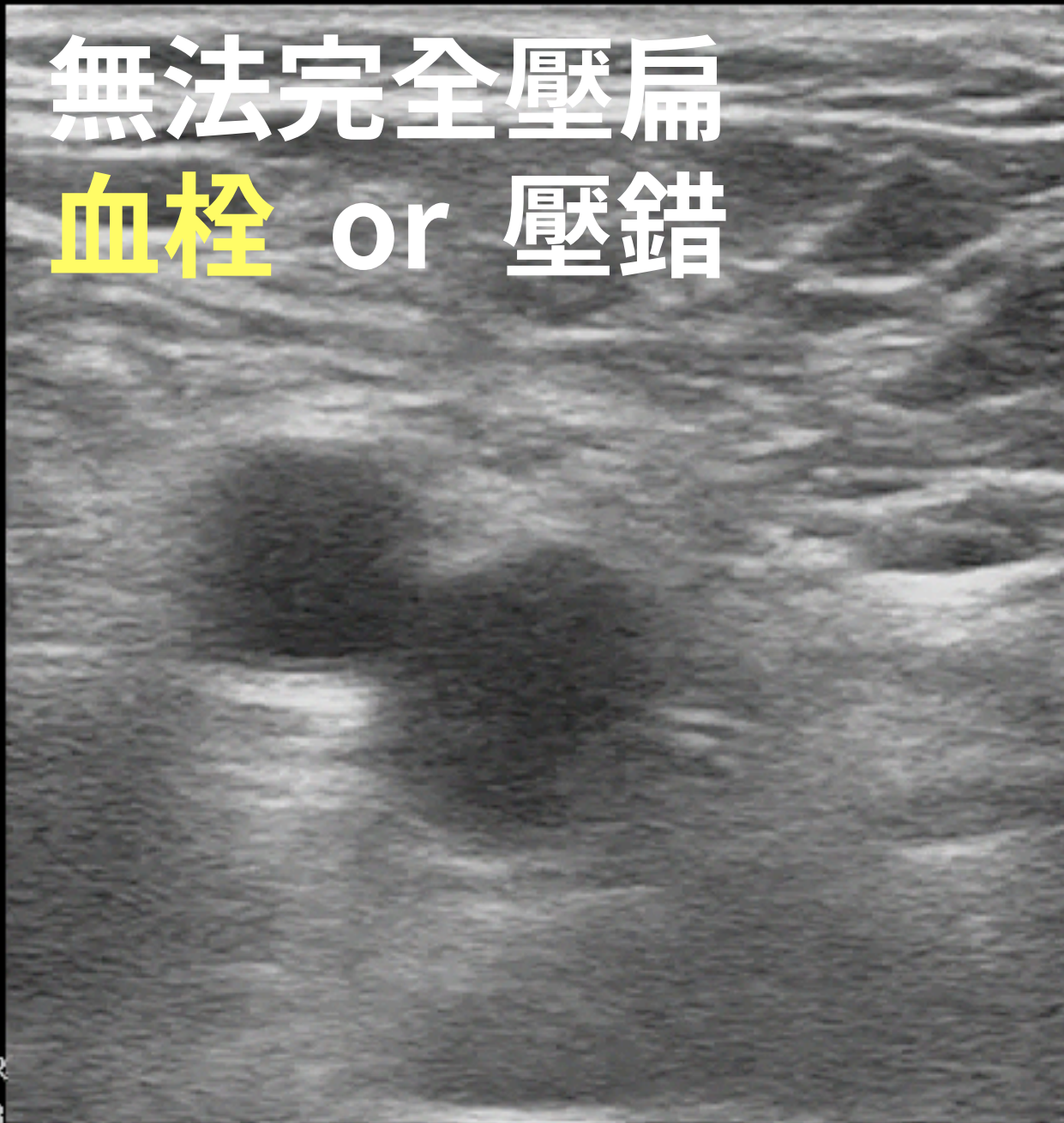


6.0cm
MI 1.5
11L4
dWT0.0
25 fps
G86
DR.80
A15
P3



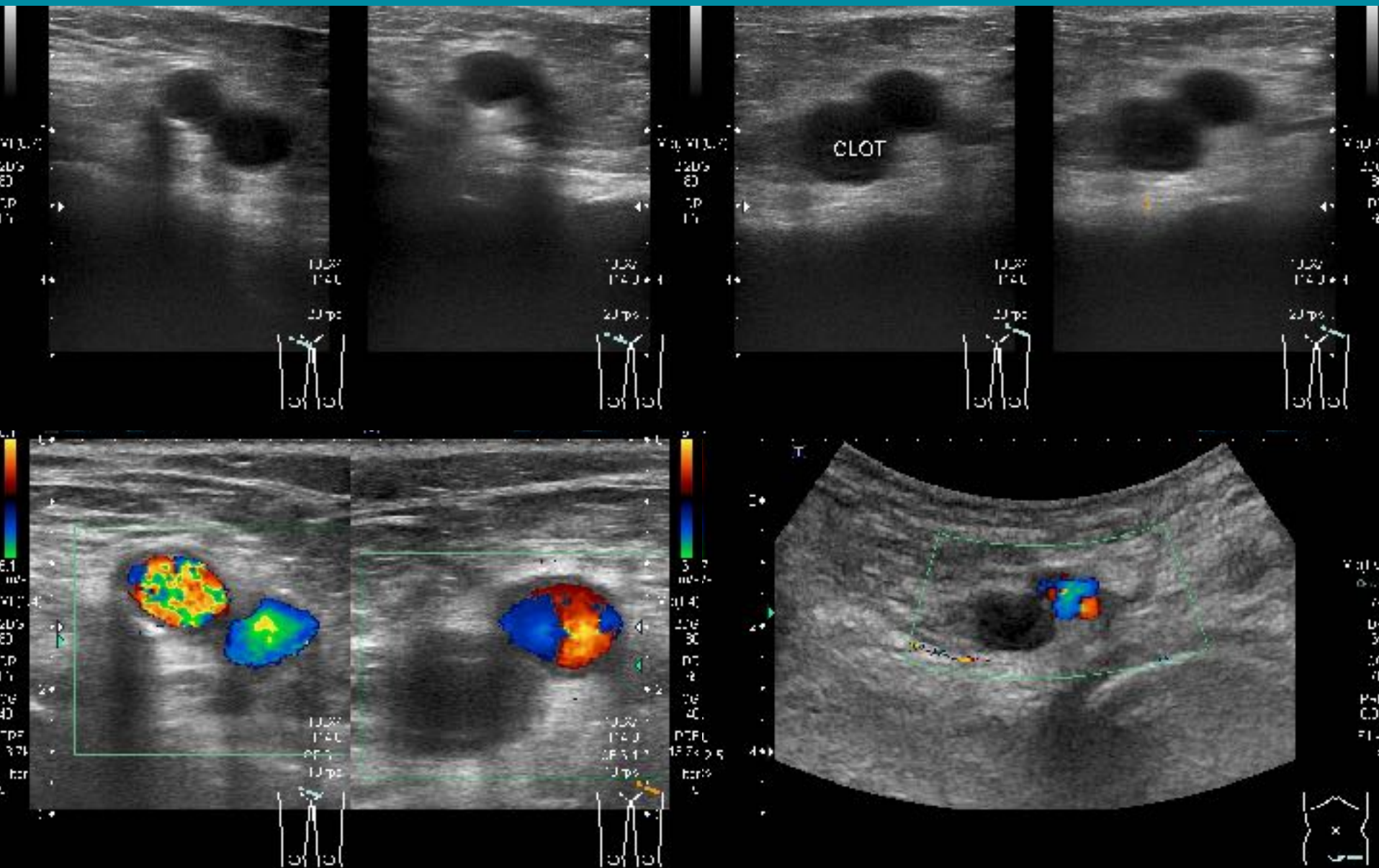
P

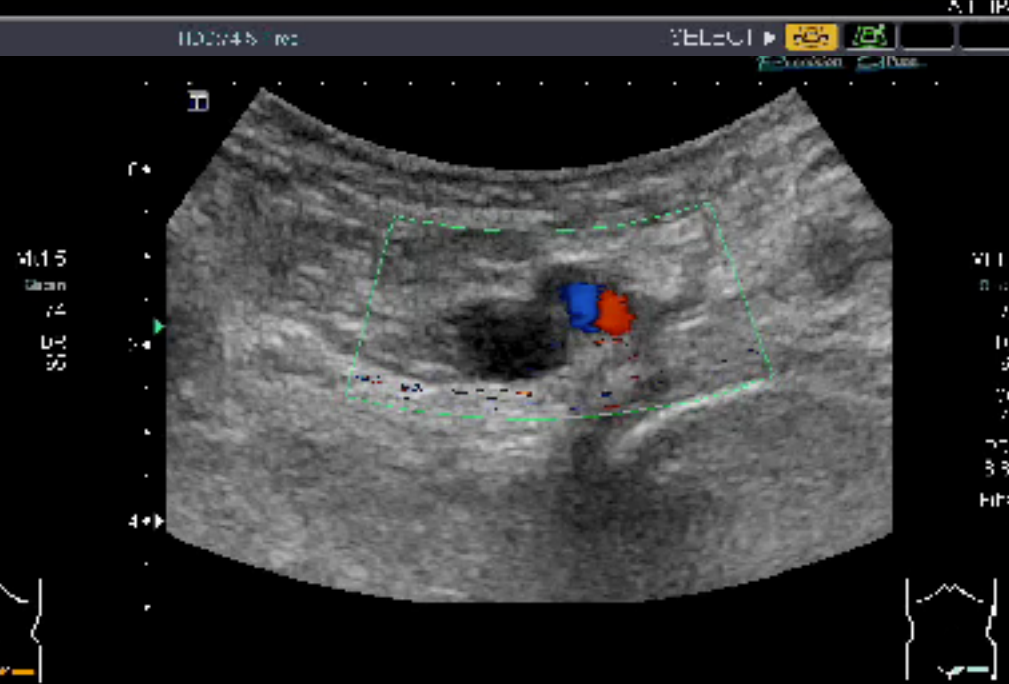
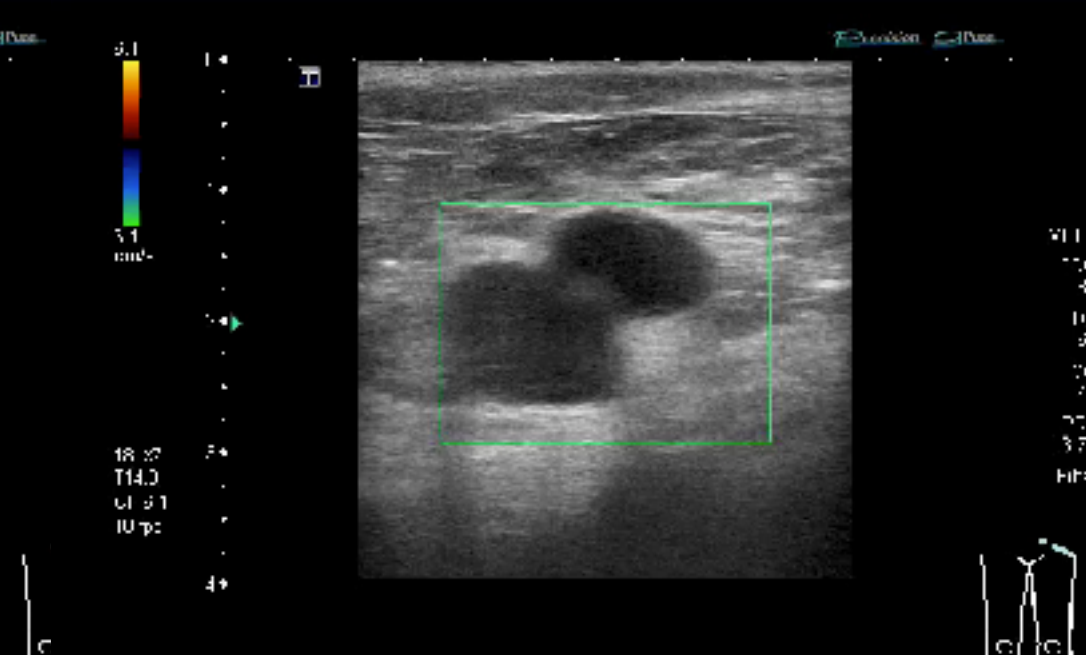
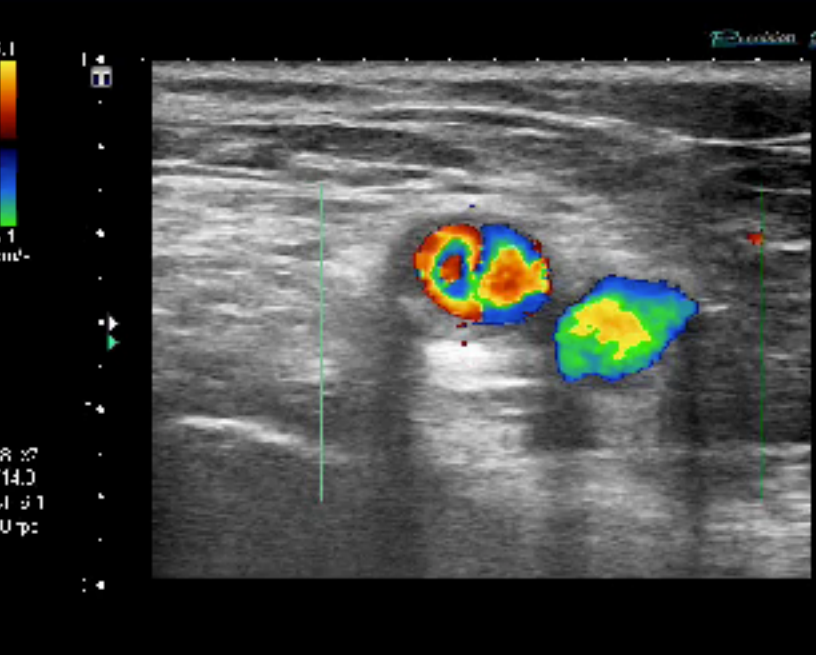
無法完全壓扁
血栓 or 壓錯



G
P R
4.4 8.8

DVT的記錄





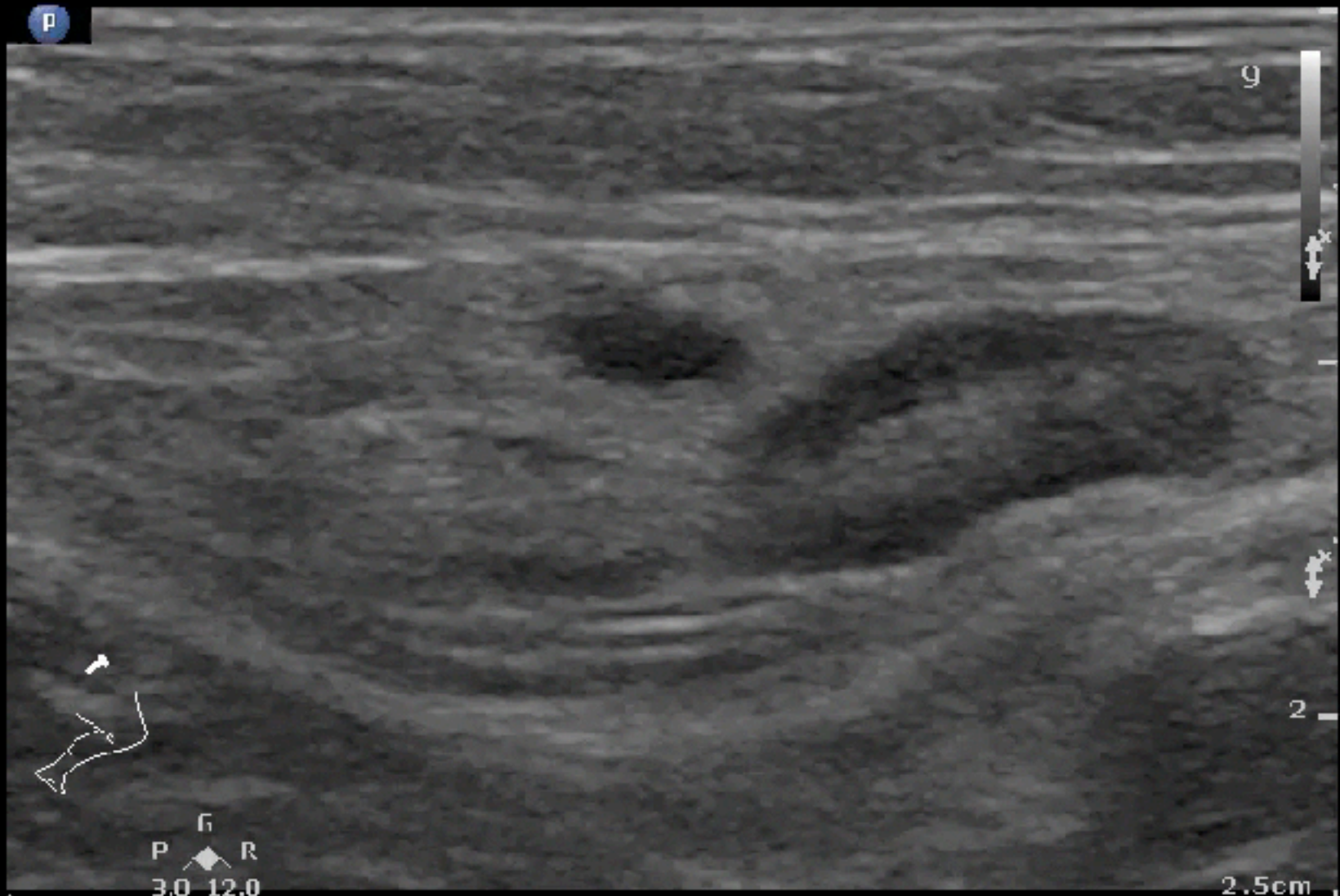
DVT ?

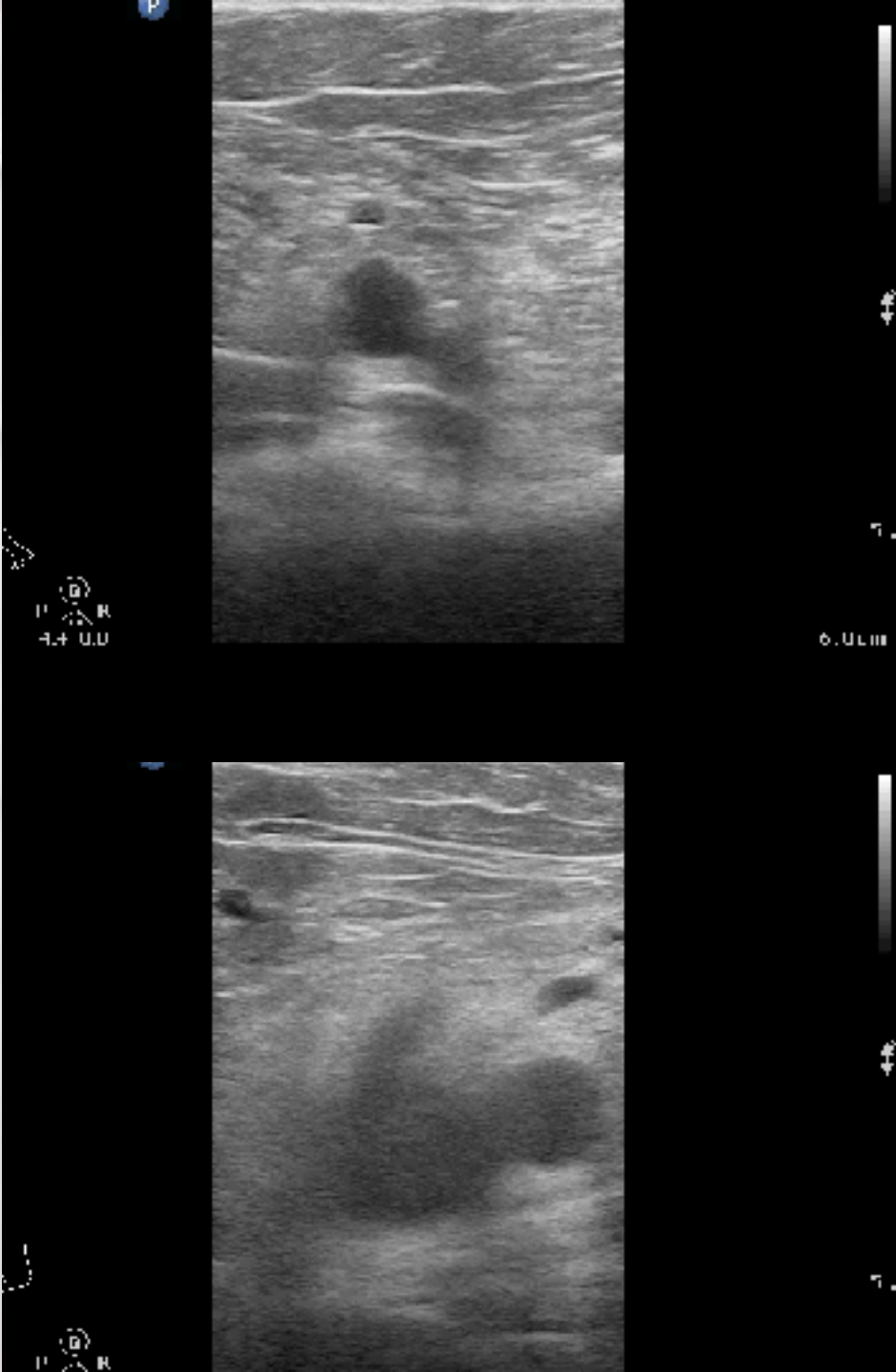
Superficial

L12-3
34 Hz
2.5cm

2D

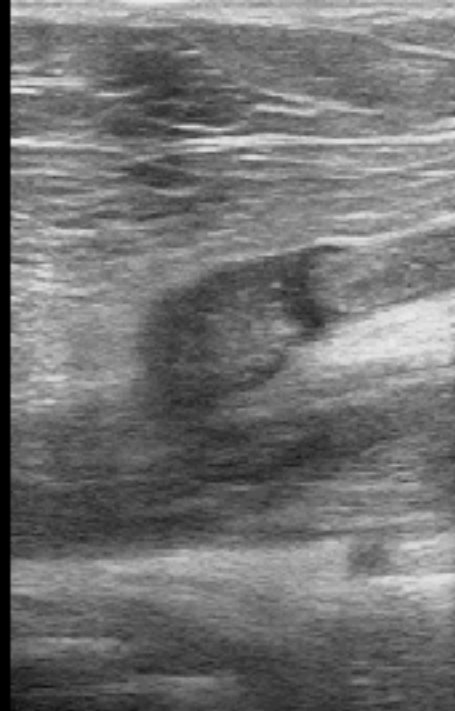
Gen
Gn 60
C. 57
4/3/2



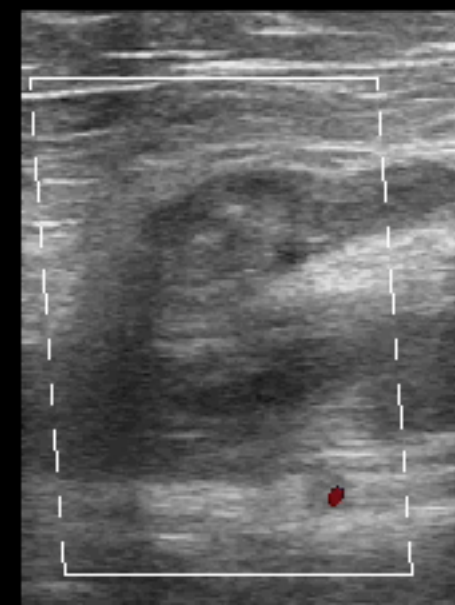




6.0cm
R
D.D



6.0cm



3.0
0.0
-1.0

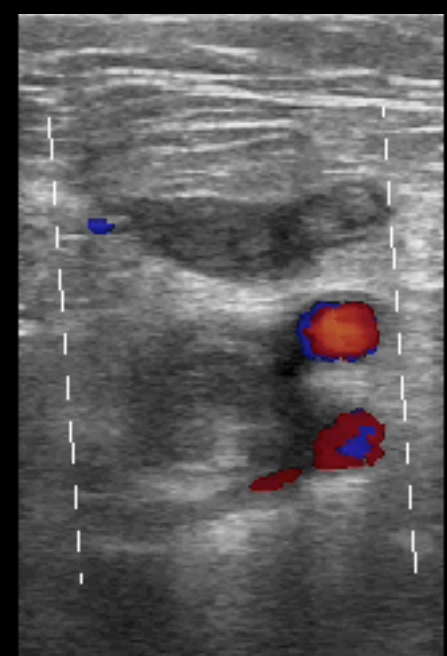


P
R
4.1 8.8

P
R
4.1 8.8



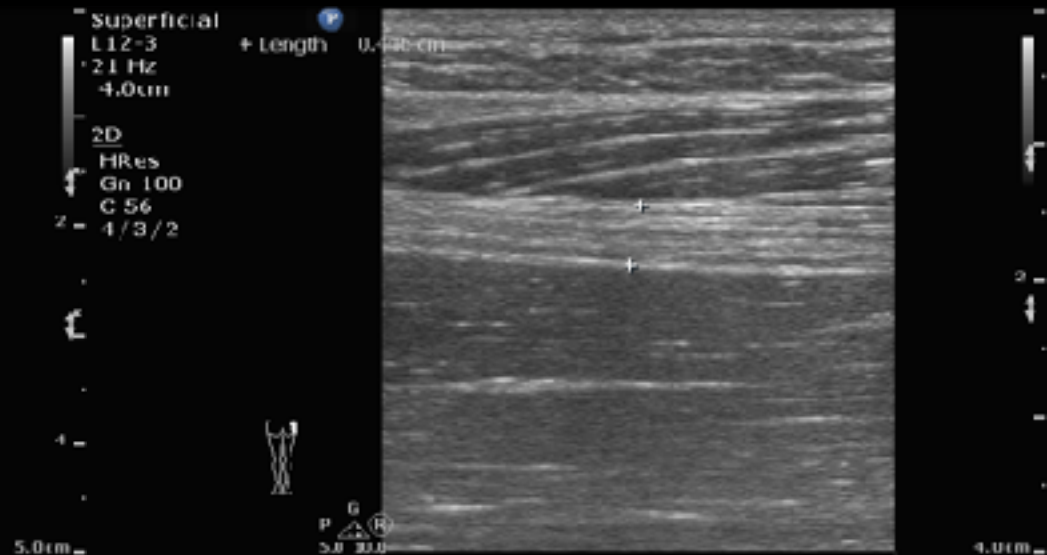
0.0cm



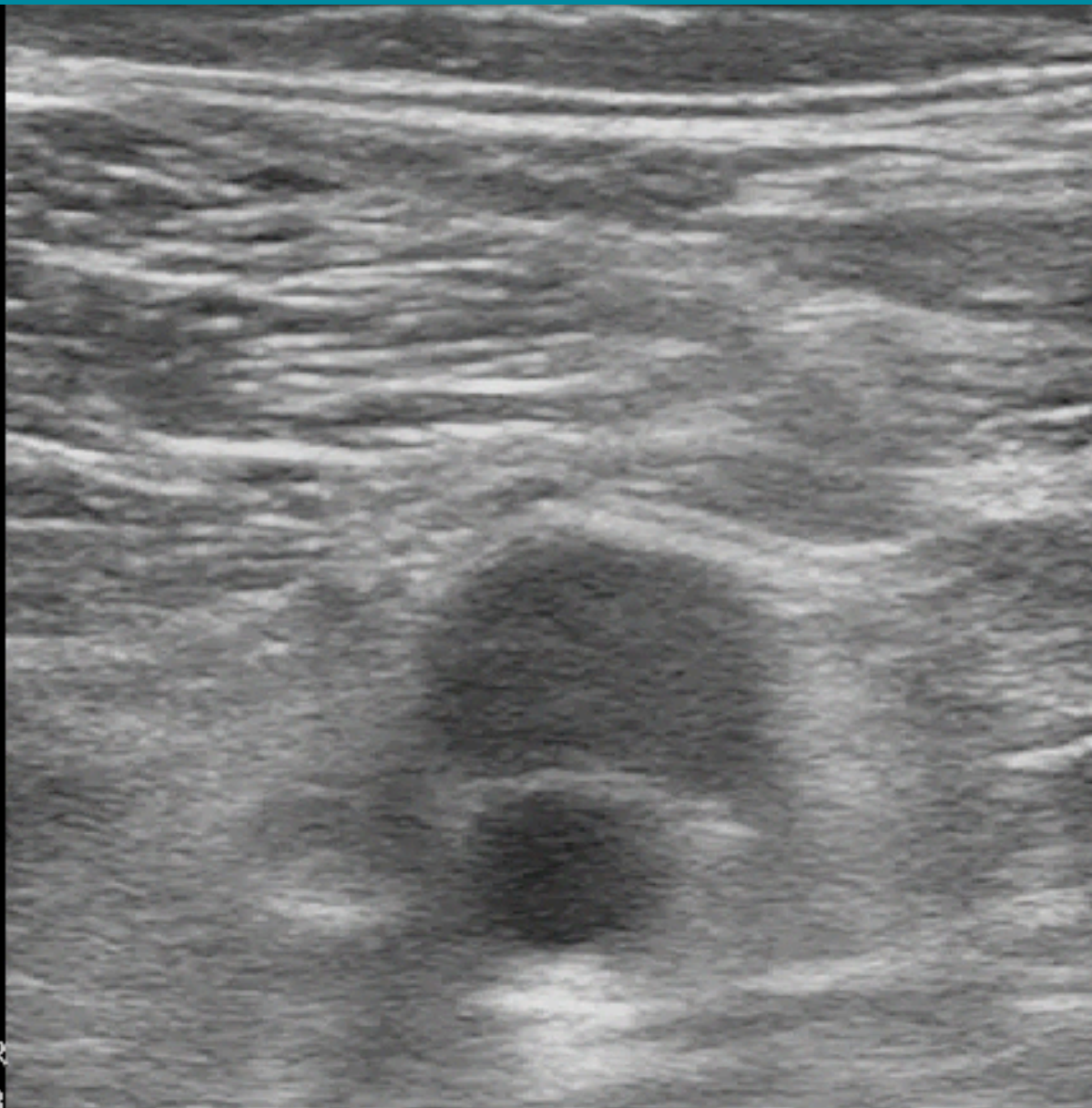
0.0
cm
s
-7.0

Middle-aged man

Right leg pain for 2-3 weeks



Popliteal fossa



P (G) R
44 88

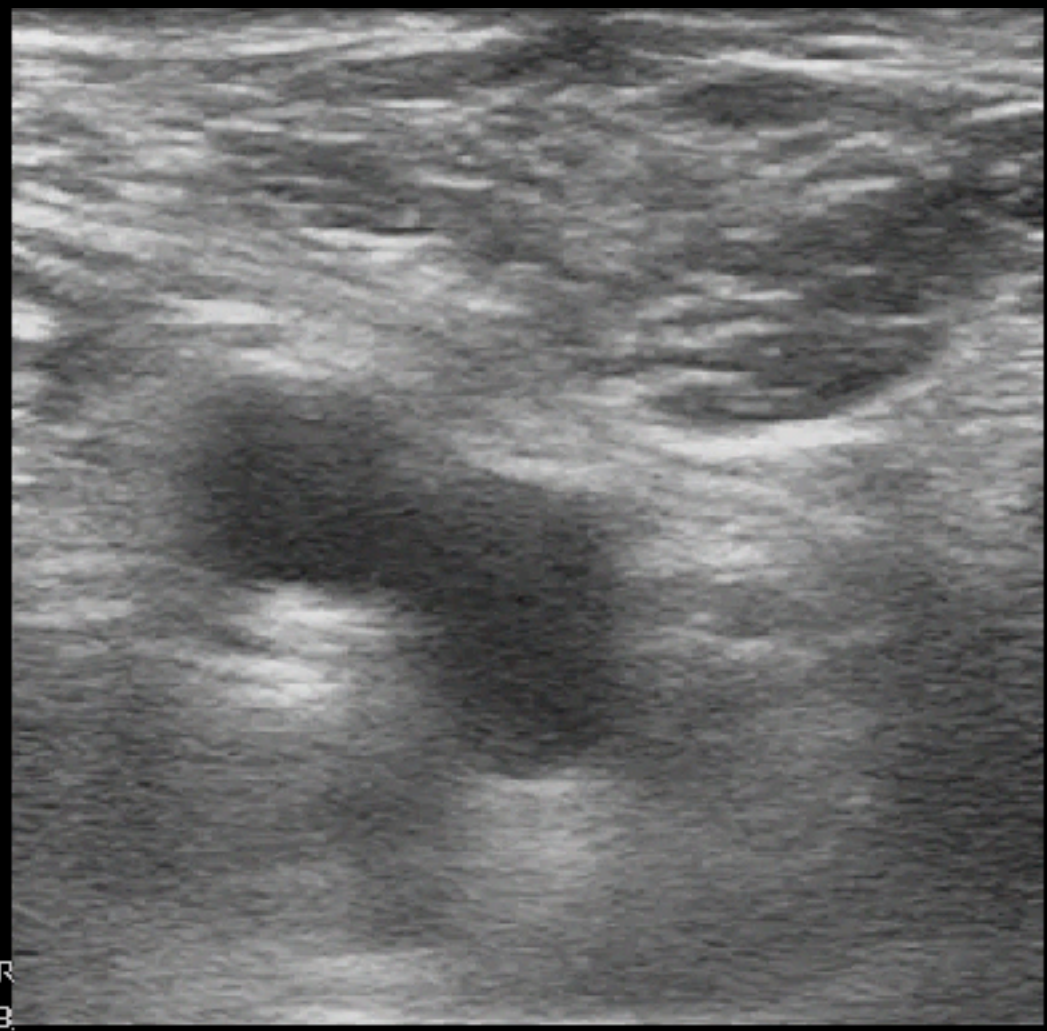
2



4.0cm

L1270
37 Hz
4.0cm

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



P R
1.1 8.8



2



1.0cm

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

74 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



P
G
R
3.0 12.0



0.8

PRF

2

4.0cm

4.0cm

Great vessels

