



Con il patrocinio di



Centro Specialistico Ortopedico Traumatologico
Gaetano Pini-CTO

Sistema Socio Sanitario



Regione
Lombardia

ASST Gaetano Pini



ESRA MEETING ANNUAL UPDATE

1 day, 1 programme, 3 cities

MILANO, 13 APRILE 2024

Responsabile scientifico:
Andrea Tognù

Presidente Onorario:
Paolo Grossi

www.esraitalia.it





State of the Art Safety Standards in RA
**THE EUROPEAN SOCIETY OF REGIONAL
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PoCUS in ALR

Point of Care UltraSound

**di Chiara Bajocco®
ASST Gaetano Pini - CTO**

how
to
get
away
with

Anesthesia



Conflitto di interessi



La relatrice dichiara che NON ha avuto rapporti anche di finanziamento con soggetti portatori di interessi commerciali in campo sanitario

Lo stetoscopio di oggi per non essere i medici di ieri



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Cura della Follia - Bosch, 1494

Come cambia la pratica clinica



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Table 2 Change in diagnosis, management plan or treatment following the use of point-of-care ultrasonography (POCUS)

POCUS application*	N	Change in the tentative diagnoses, n (%)	Change in the intended management plan n (%)	Change in the intended treatment n (%)	Overall change†, n (%)
Heart	34	23 (68)	20 (59)	10 (29)	29 (85)
Lung	44	26 (59)	23 (52)	15 (34)	37 (84)
Upper abdomen	36	22 (61)	17 (47)	11 (31)	25 (69)
Urinary tract	67	41 (61)	35 (52)	20 (30)	50 (75)
Obstetric and gynaecological	165	61 (37)	83 (50)	35 (21)	97 (59)
Ascites	15	10 (67)	9 (60)	8 (53)	10 (67)
Aorta	29	25 (86)	11 (38)	5 (17)	26 (90)
Deep vein thrombosis	13	10 (77)	10 (77)	4 (31)	12 (92)
Musculoskeletal	157	76 (48)	90 (57)	55 (35)	124 (79)
Subcutaneous process	31	16 (52)	18 (58)	10 (32)	22 (71)
Thyroid	6	4 (67)	1 (17)	1 (17)	5 (83)
Other	40	21 (53)	18 (45)	7 (18)	26 (65)
Total	528	261 (49)	269 (51)	140 (27)	379 (72)

*The following registered scanning modalities are categorised according to POCUS application: *upper abdominal organs* (including liver, gall bladder, pancreas), *urinary tract* (including kidney, and bladder), *obstetric and gynaecological* (including uterus, ovaries, placenta, fetus and fossa douglasi), *musculoskeletal* (including joints, muscle, tendon, bone, and joint puncture). The *others* category includes free text answers and registered applications with a frequency below five examinations.

†Overall change includes change in either diagnoses, management plan and/or treatment.

Open access

Original research

BMJ Open Use and impact of point-of-care ultrasonography in general practice: a prospective observational study

Camilla Aakjær Andersen ¹, John Brodersen ^{2,3}, Annette Sofie Davidsen ², Ole Graumann ⁴, Martin Bach B Jensen ¹





BMJ 2020

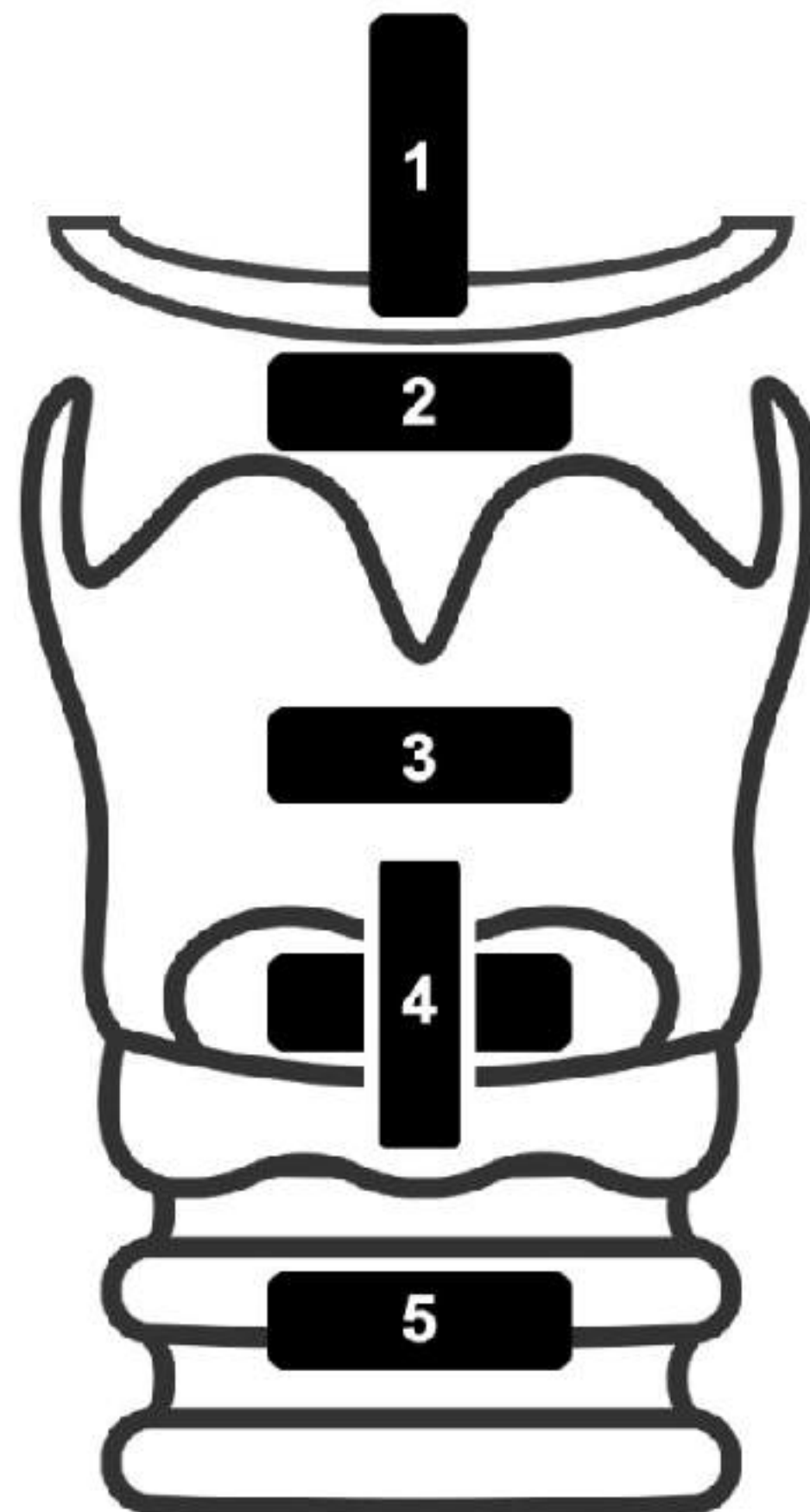
A - Airways

Ultrasuoni e vie aeree

Review

Point-of-Care Ultrasound in Airway Evaluation and Management: A Comprehensive Review

Judy Lin ^{1,2}, Ryan Bellinger ¹, Andrew Shedd ^{1,2}, Jon Wolfshohl ^{1,2}, Jennifer Walker ^{1,2}, Jack Healy ² , Jimmy Taylor ², Kevin Chao ² , Yi-Hsuan Yen ^{1,3}, Ching-Fang Tiffany Tzeng ^{1,3}  and Eric H. Chou ^{1,2,3,*} 



Upper Airway POCUS Views and Main Function

1. Suprahyoid: Oral space assessment
2. Thyrohyoid: Epiglottis identification
3. Thyroid: Vocal cord function
4. Cricothyroid: CTM identification
5. Suprasternal: ETT Confirmation

DARES protocol

Difficult Airways Evaluation with Sonography

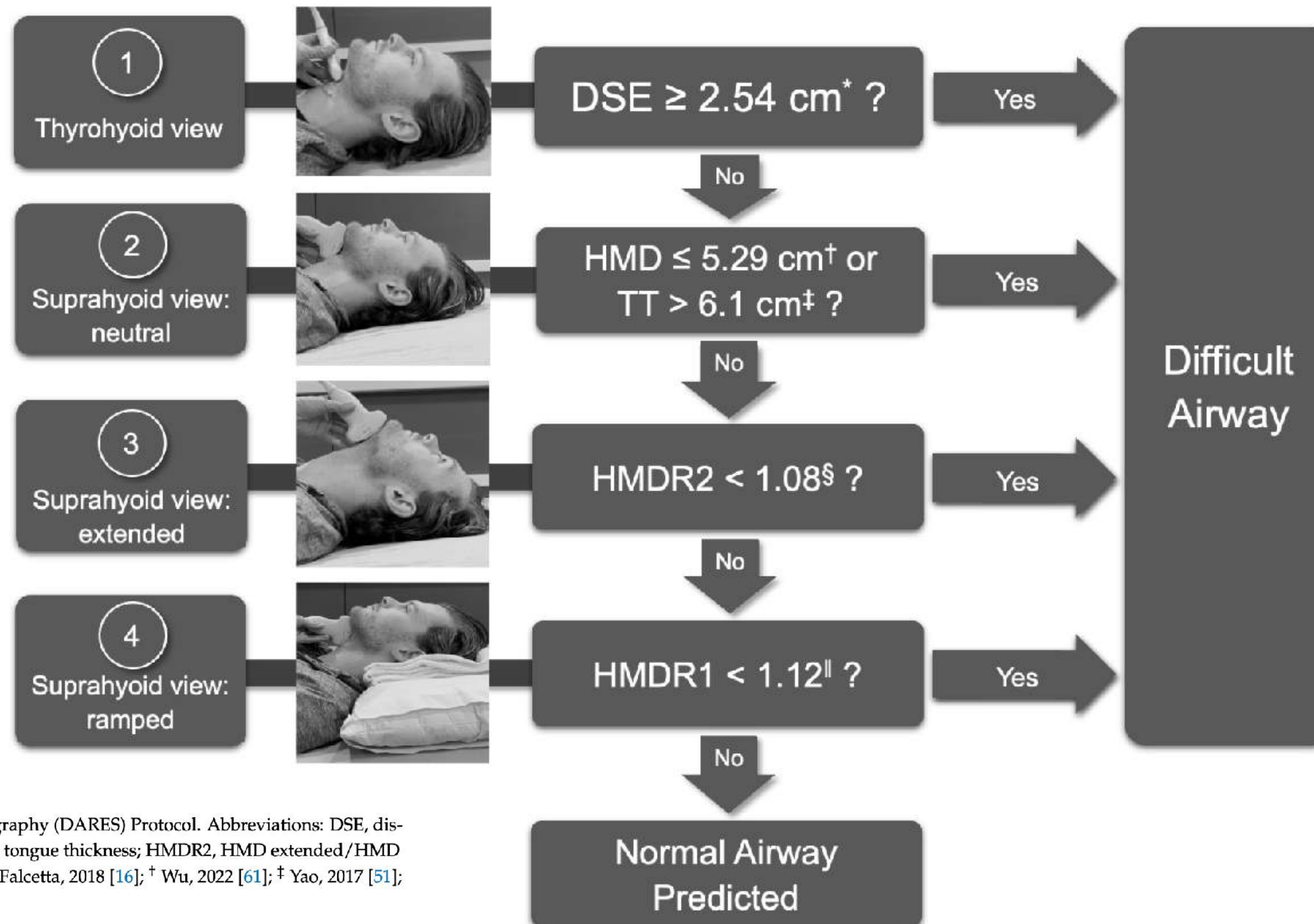
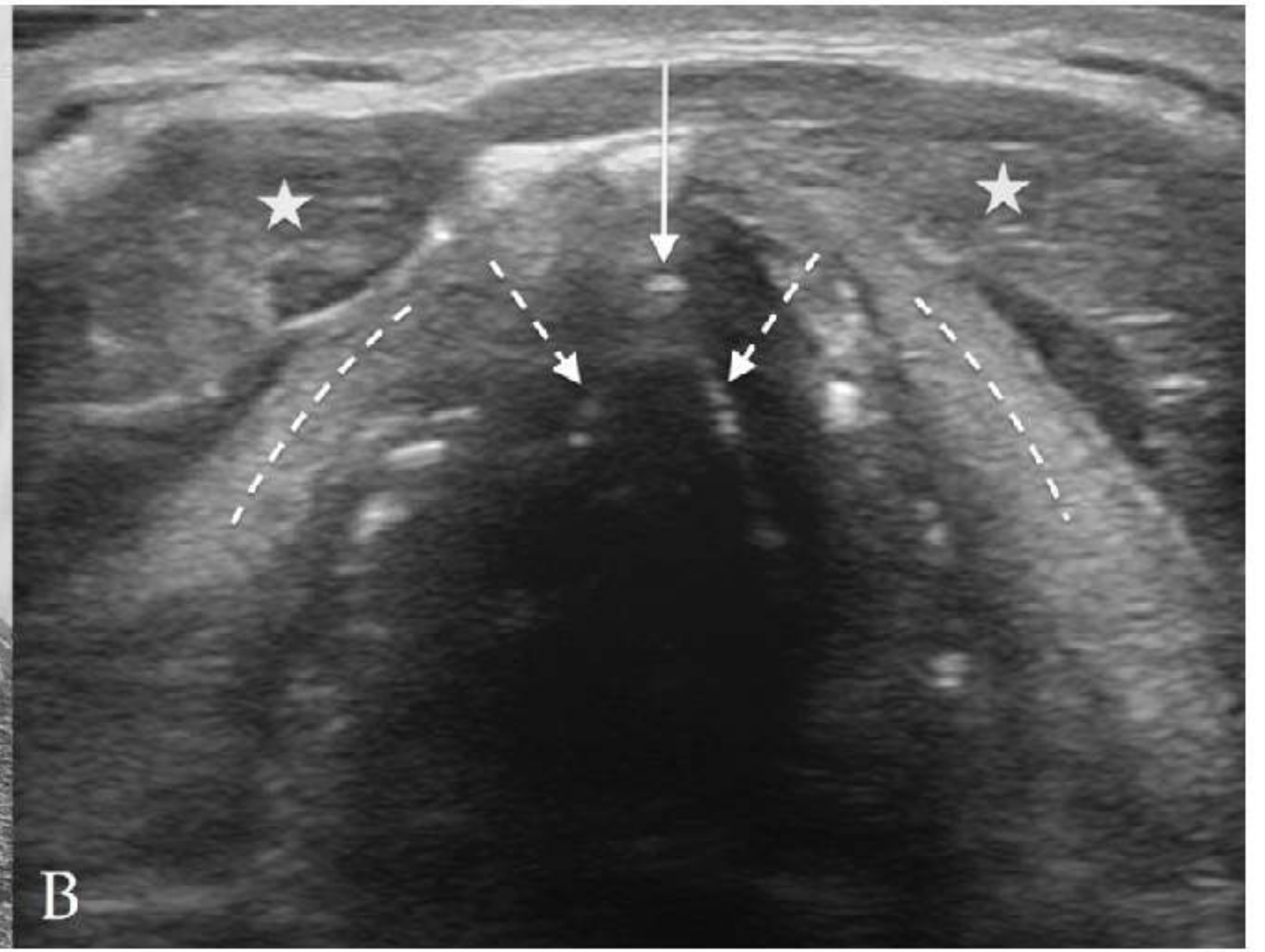
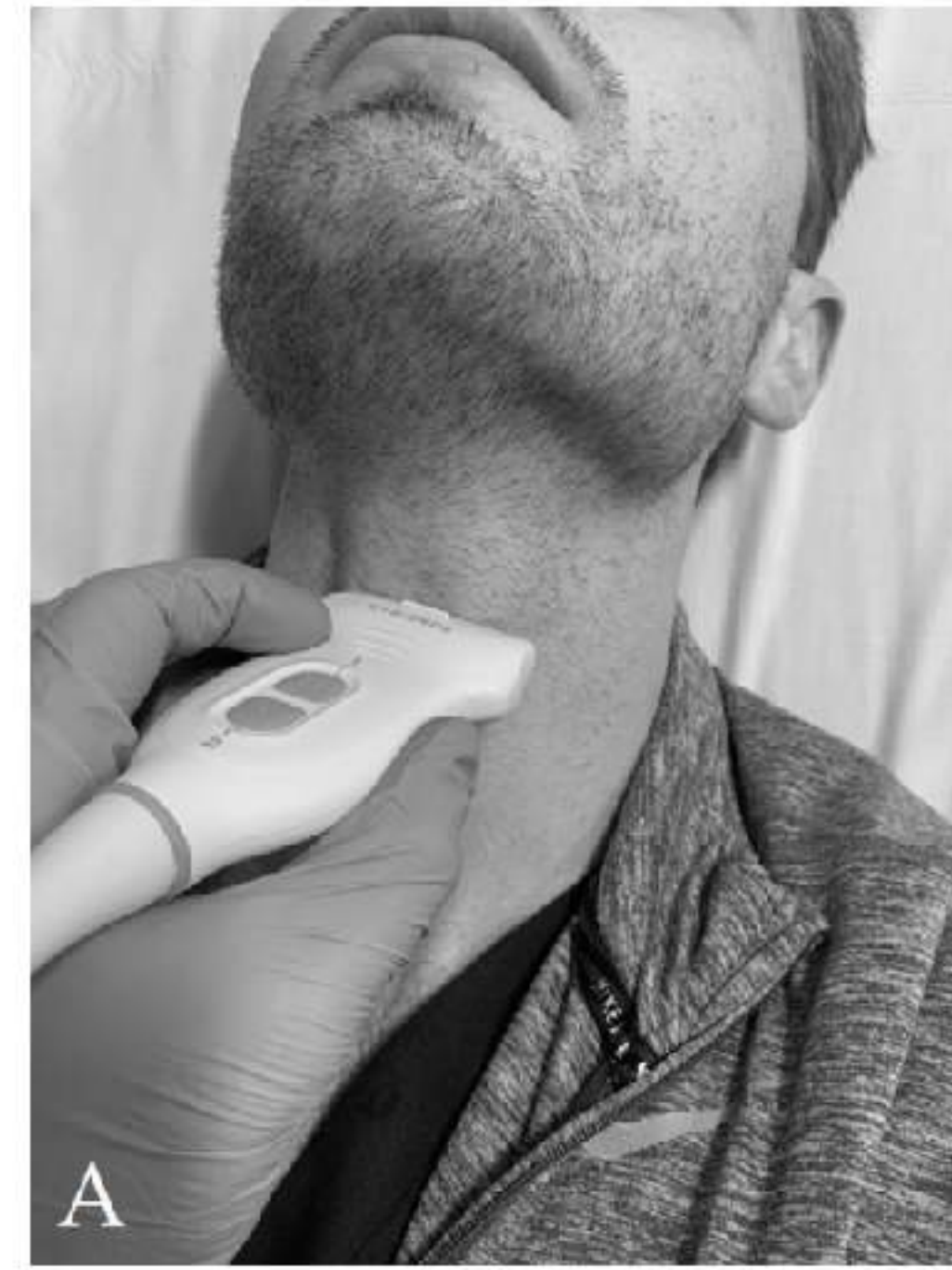


Figure 7. Difficult Airway Evaluation with Sonography (DARES) Protocol. Abbreviations: DSE, distance to epiglottis; HMD, hyomental distance; TT, tongue thickness; HMDR2, HMD extended/HMD neutral; HMDR1, HMD ramped/HMD neutral. * Falcetta, 2018 [16]; † Wu, 2022 [61]; ‡ Yao, 2017 [51]; § Rana, 2018 [44]; || Petrisor, 2018 [60].



A

B



A

B

Conferma di intubazione

monitoraggio cuffia

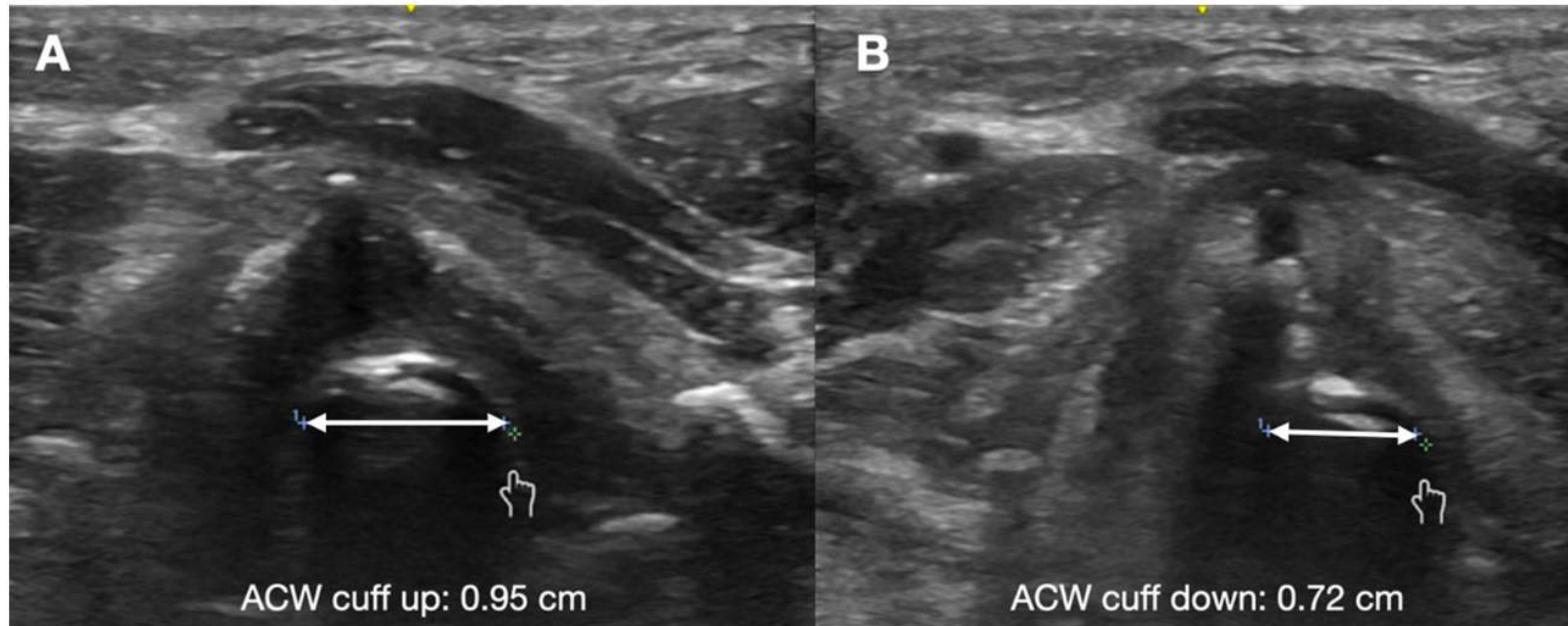


Figure 9. Air column width (*double-headed arrow*). (A) With ETT cuff up. (B) With ETT cuff down.

TACA protocol

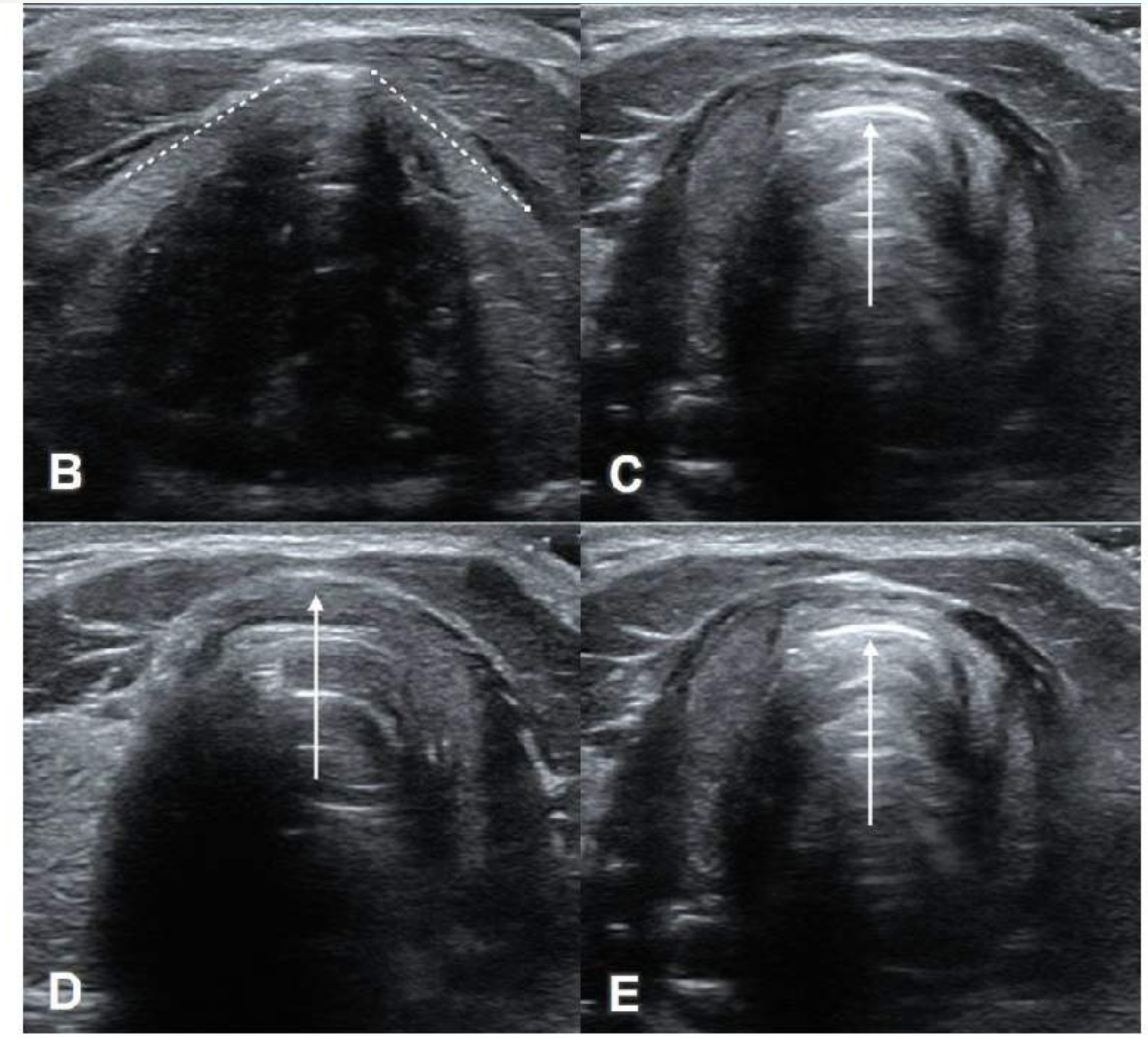
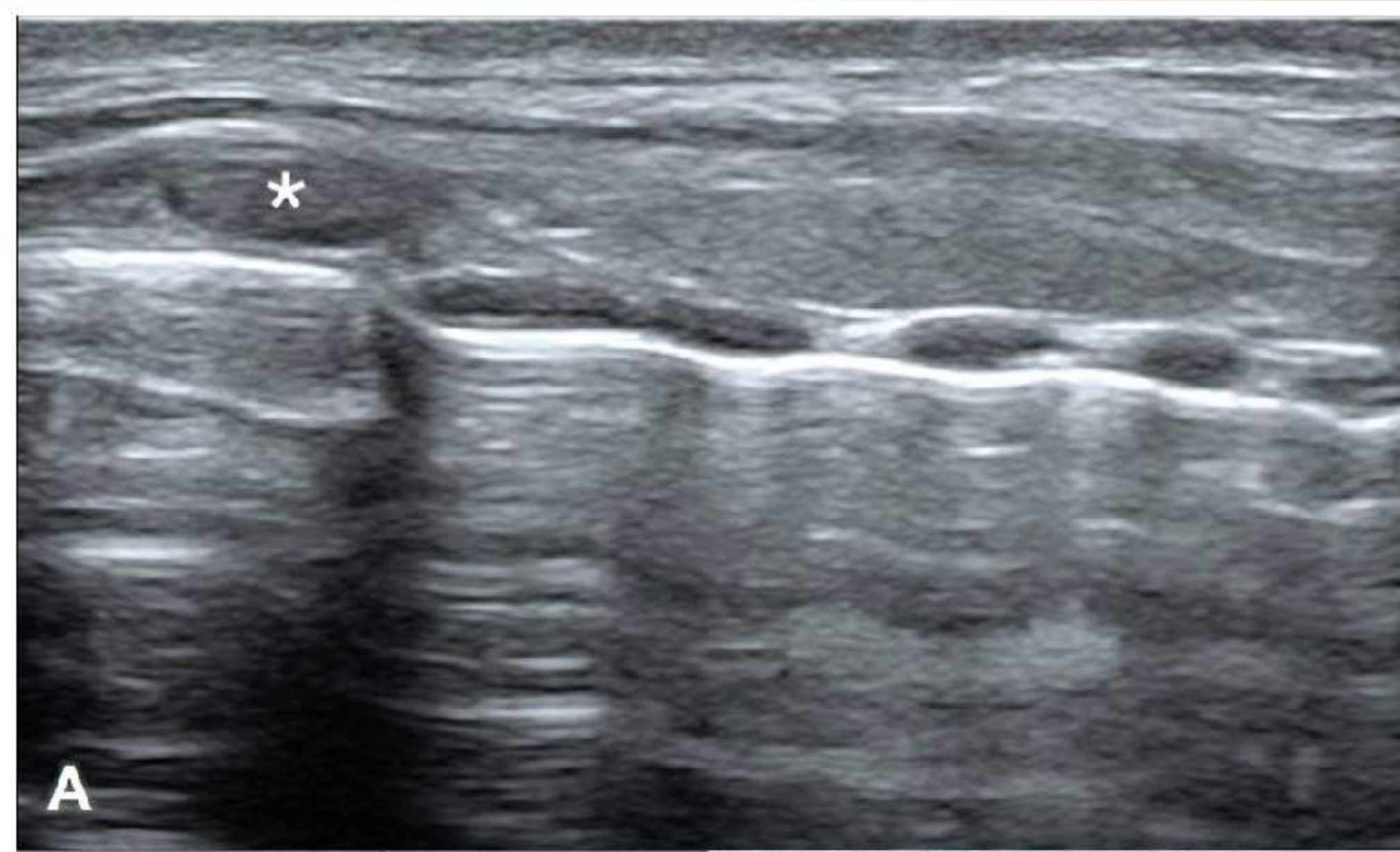
Thyroid - Airline - Cricloid - Airline



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B - Breathing

BLUE Protocol

Valutazione di uno stato di dispnea severa



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Chest 2008

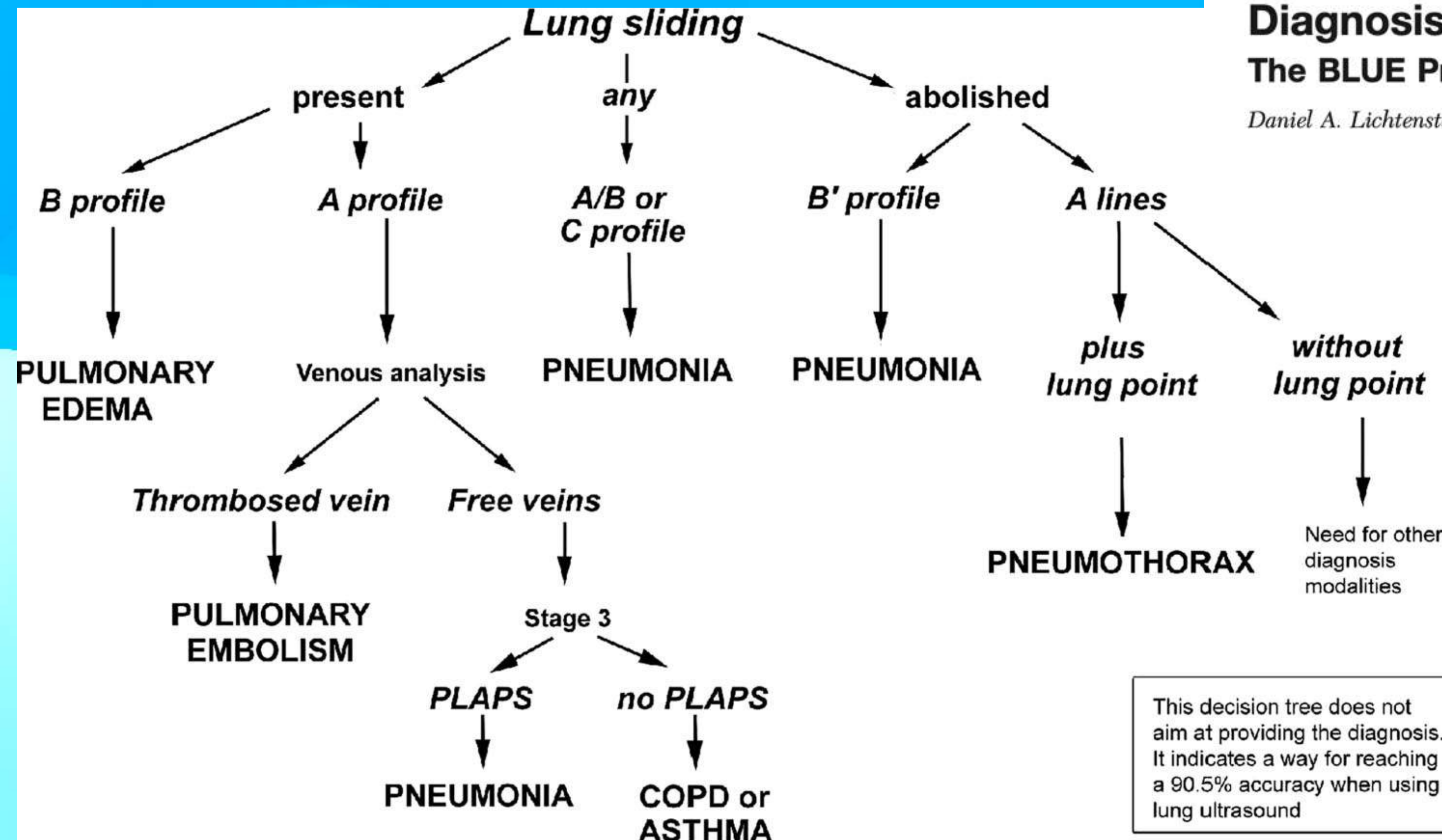


FIGURE 7. A decision tree utilizing lung ultrasonography to guide diagnosis of severe dyspnea.

PNX

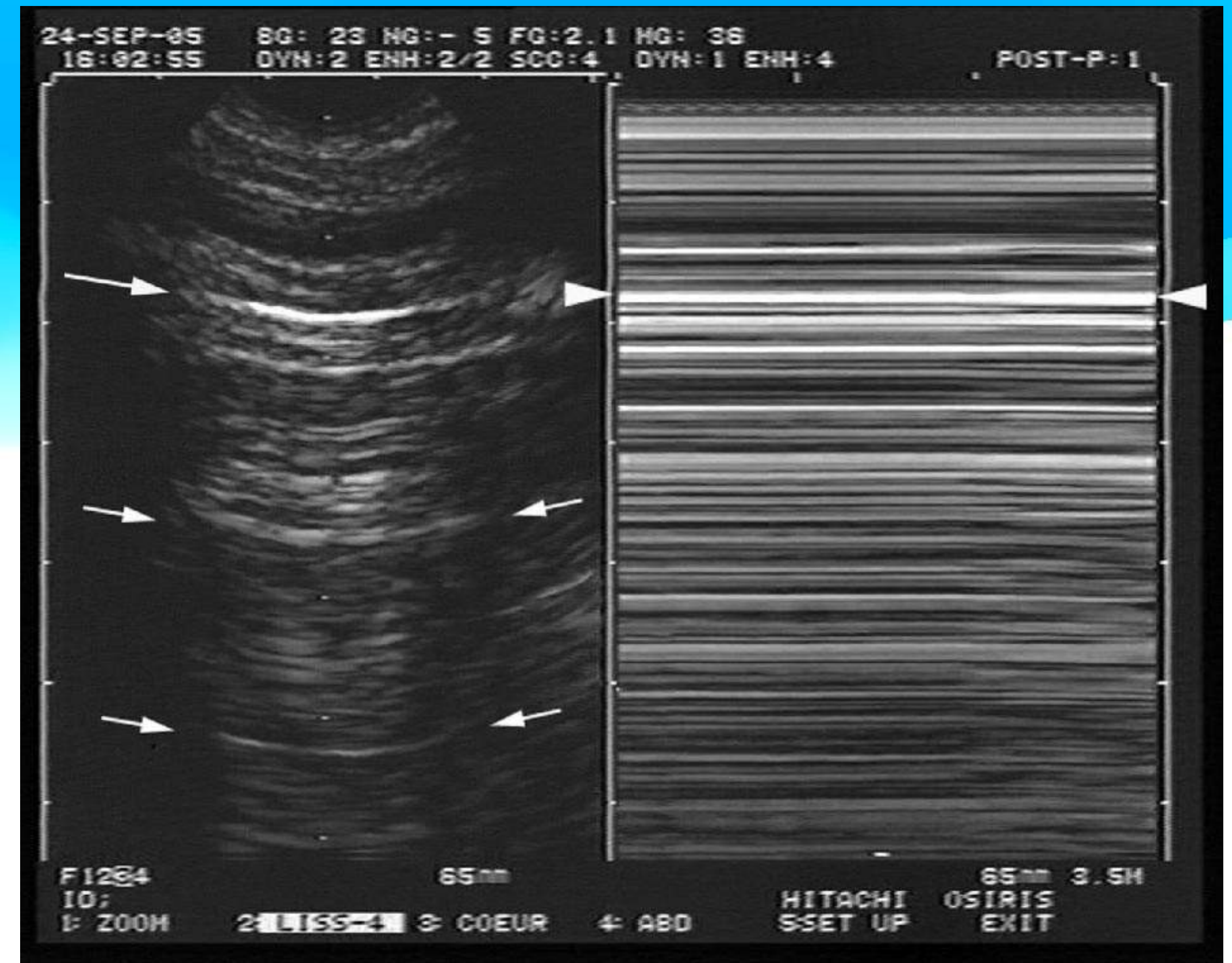
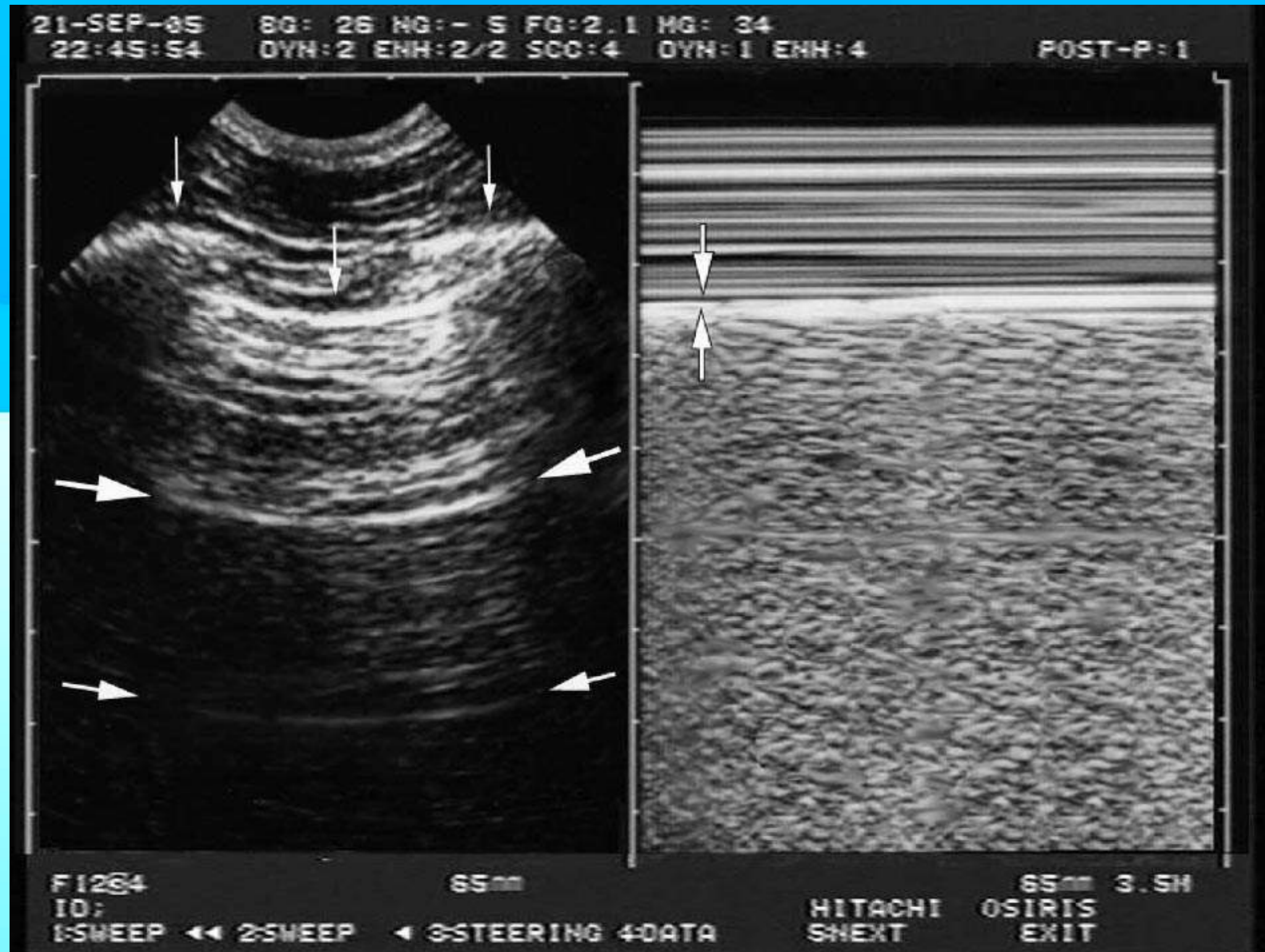
Seashore - Barcode



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PNX

Lung point e Lung pulse

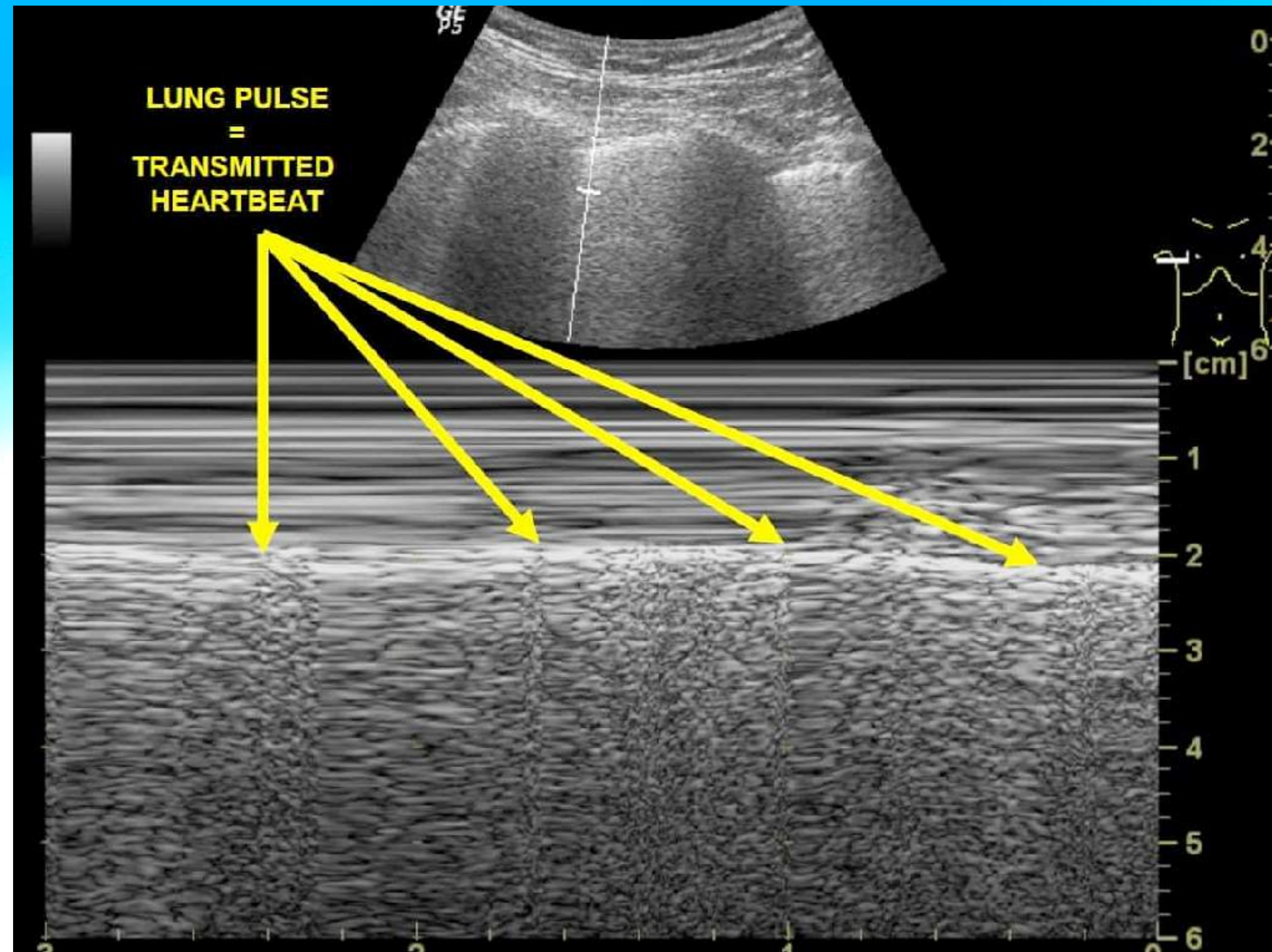
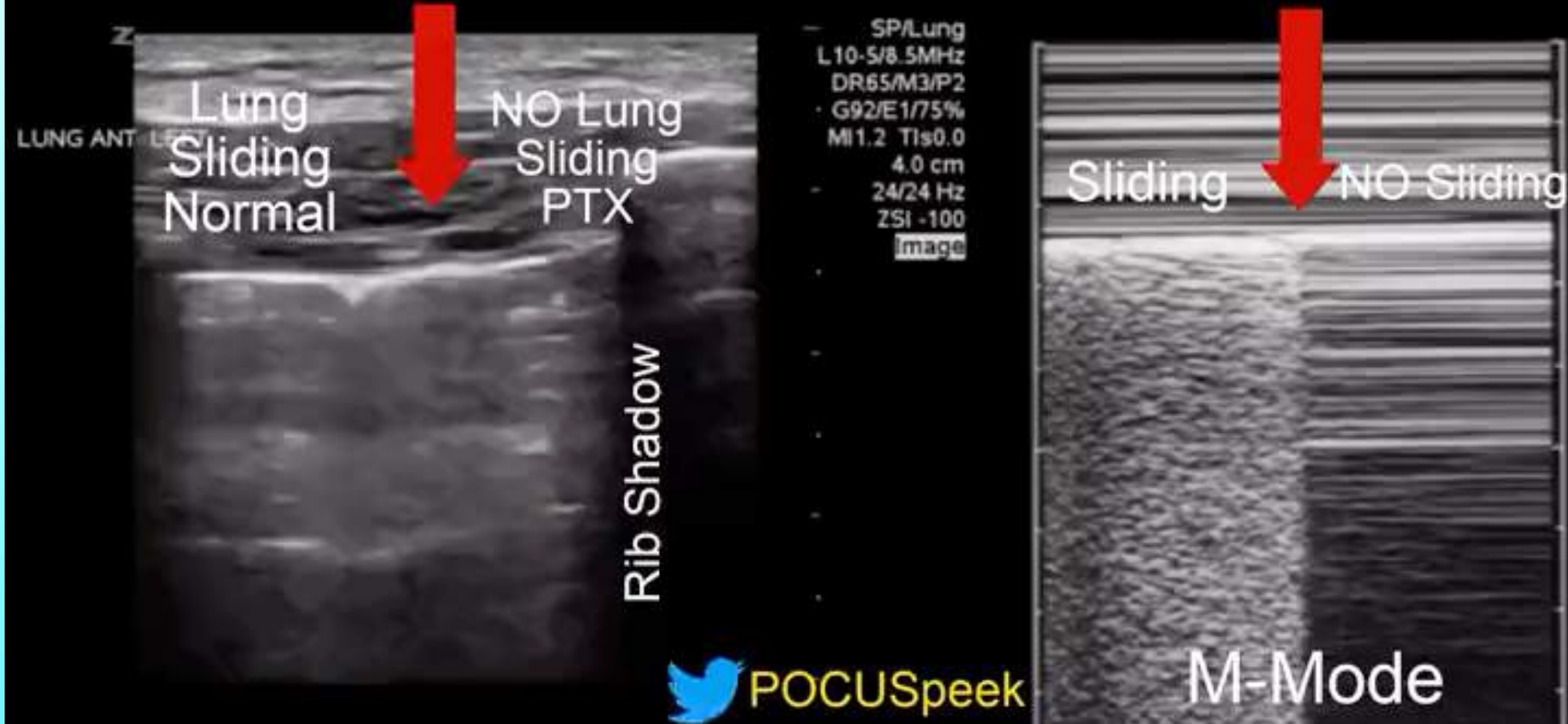


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Lung POINT of PNEUMOTHORAX



Funzione diaframmatica

54% normale
range 42-78%

- * **sonda lineare:**
B-mode ed M-mode
valutazione
ispessimento
diaframmatico sulla
ZAP (torace infero-
laterale)

- * **sonda convex:**
B-mode ed M-mode
valutazione
escursione cupola
diaframmatica su linea
medioclaveare o
ascellare ant.

	M	F
quiete	1,8cm	1,6cm
resp. prof.	7cm	5,7cm
sniffing	2,9cm	2,6cm

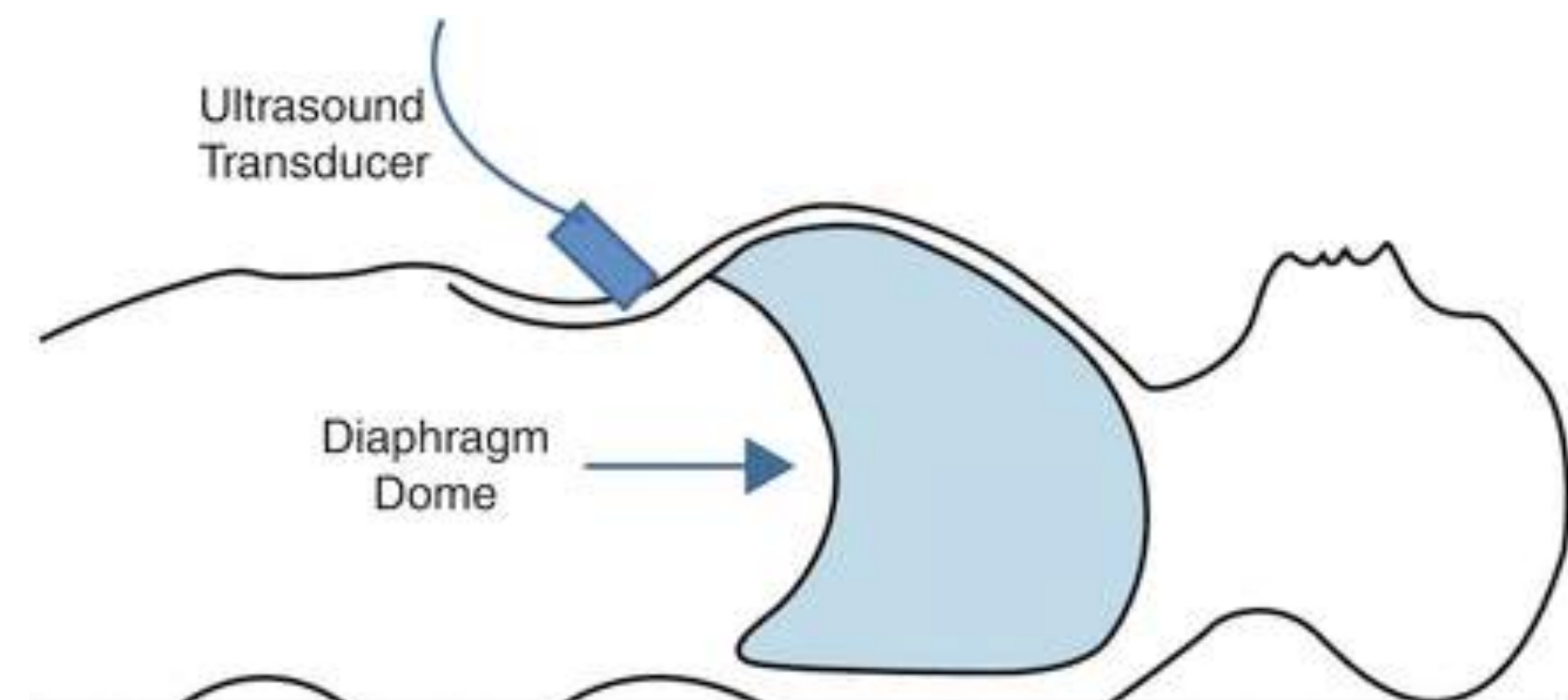
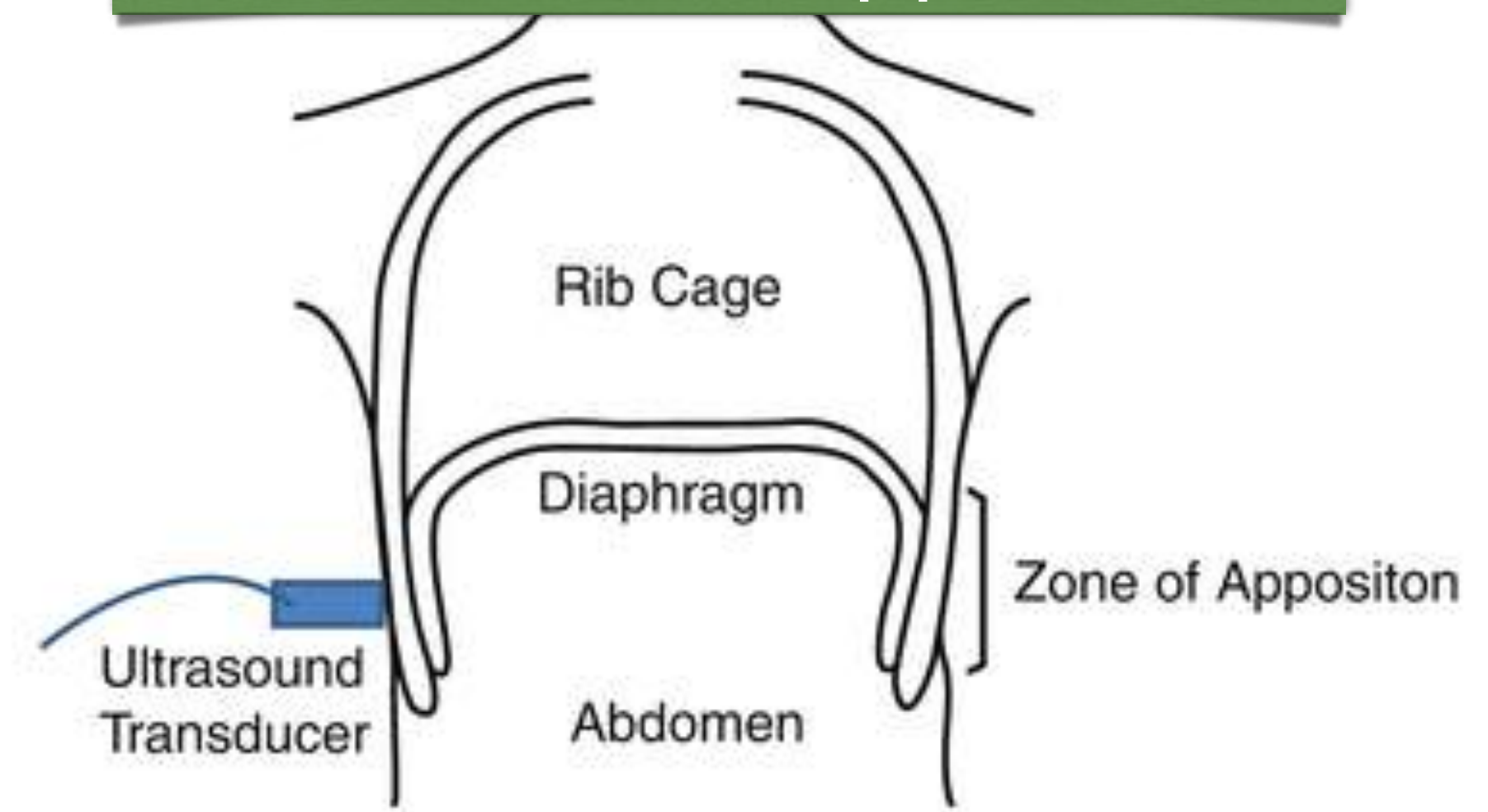


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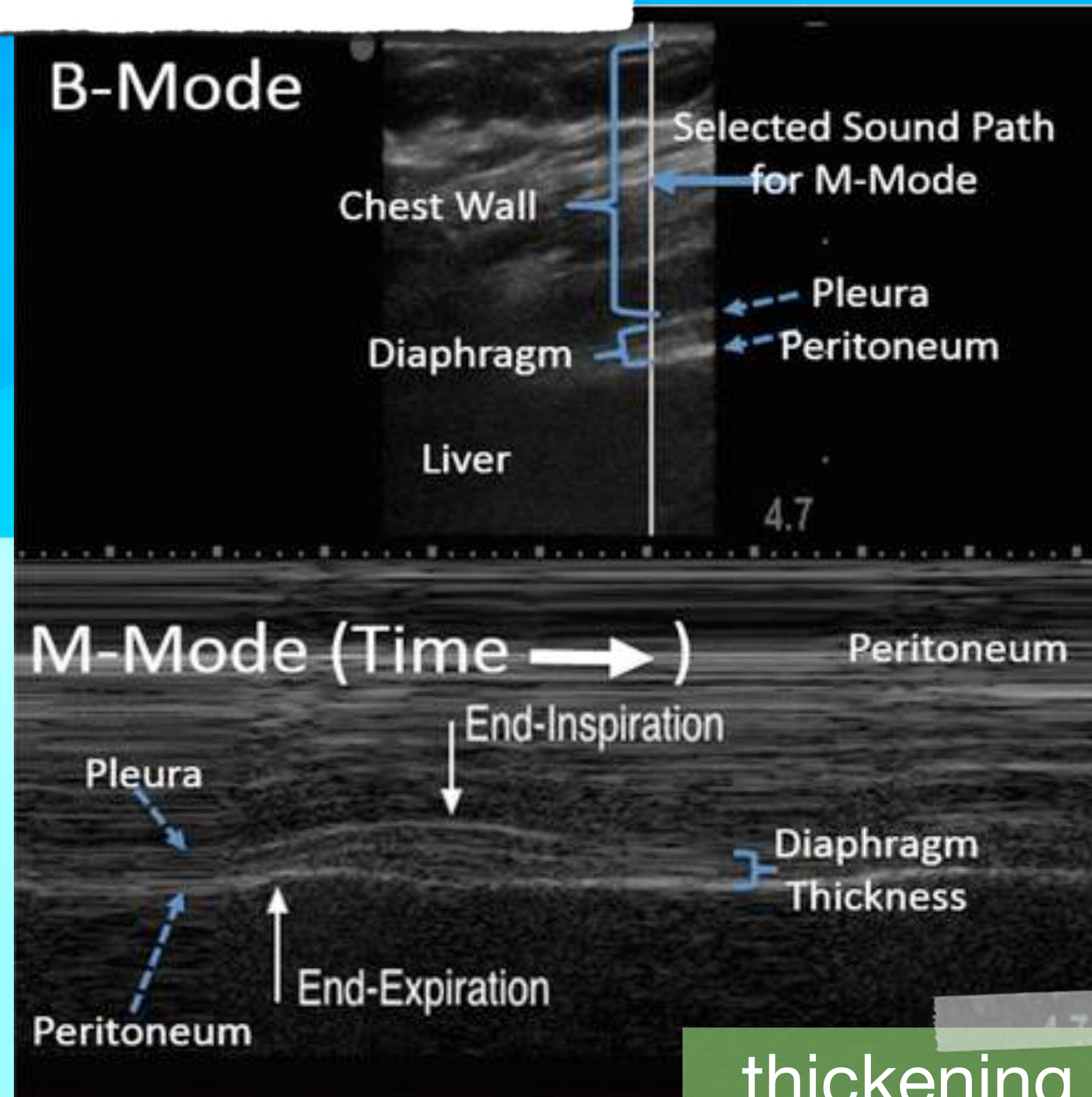
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ZAP = Zona di Apposizione

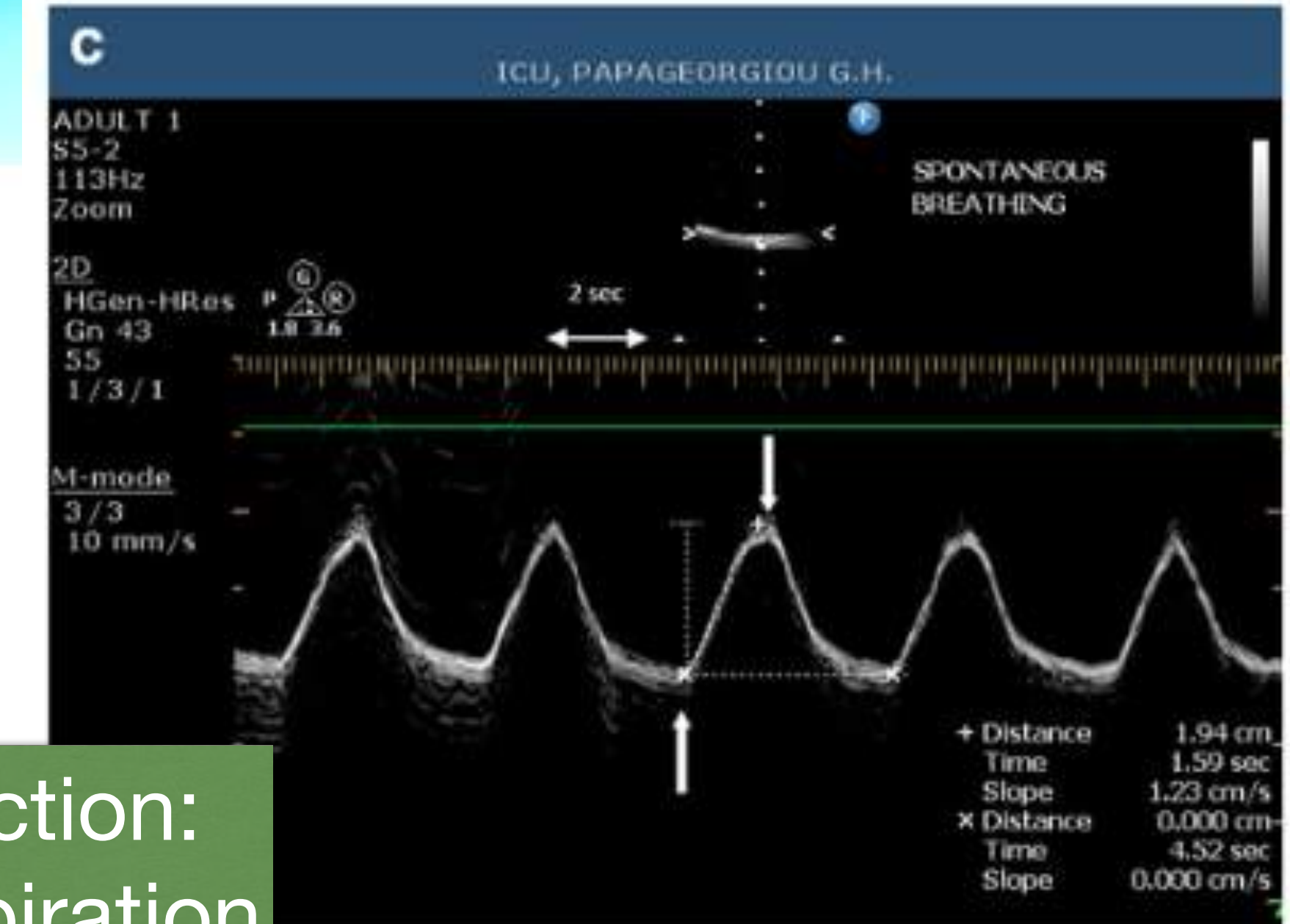
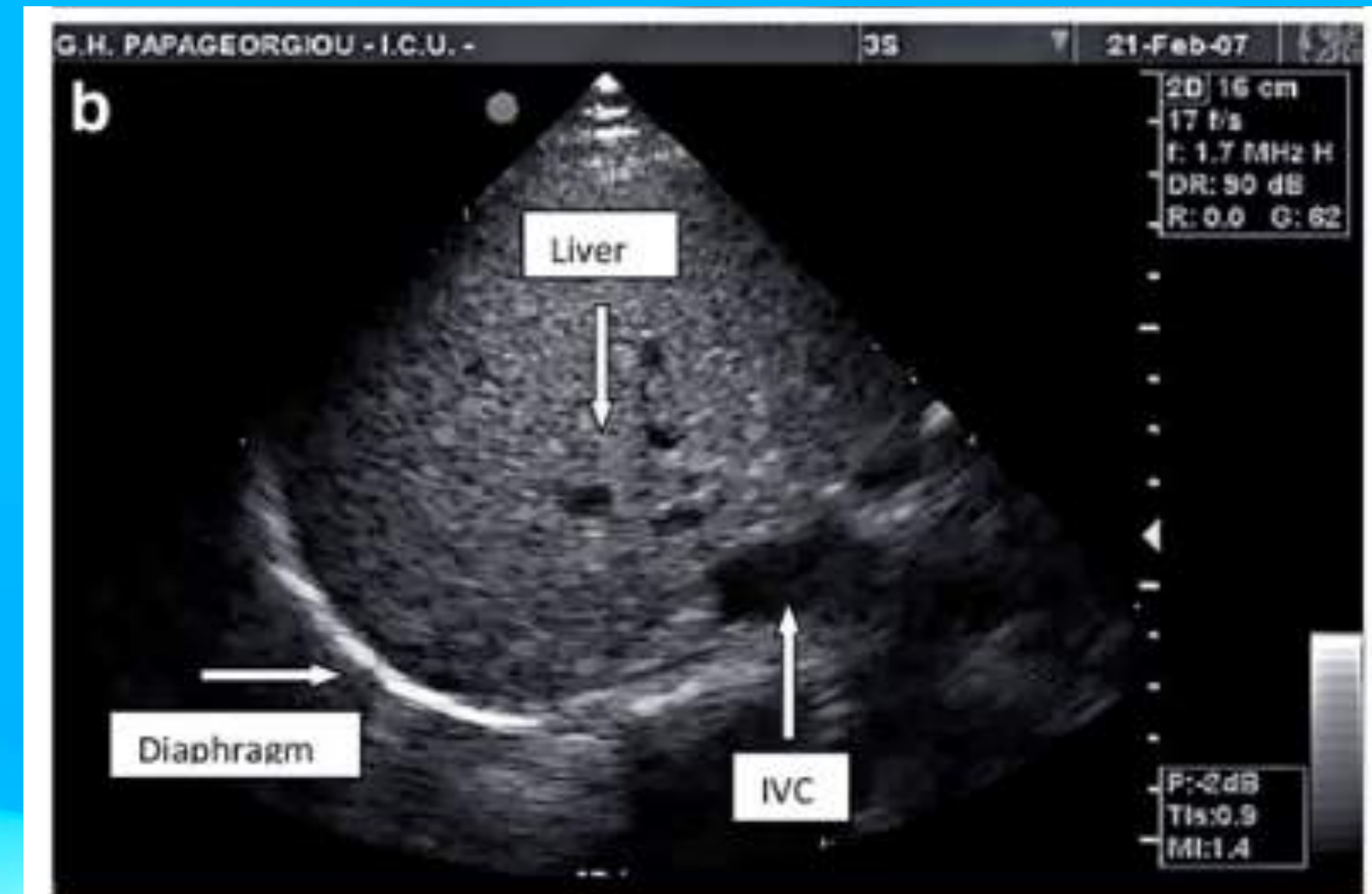


Dimitrios Matamis
Eleni Sollemezi
Matthew Tsagourias
Evangelia Akoumianaki
Saoussen Dimassi
Filippo Boroli
Jean-Christophe M. Richard
Laurent Brochard

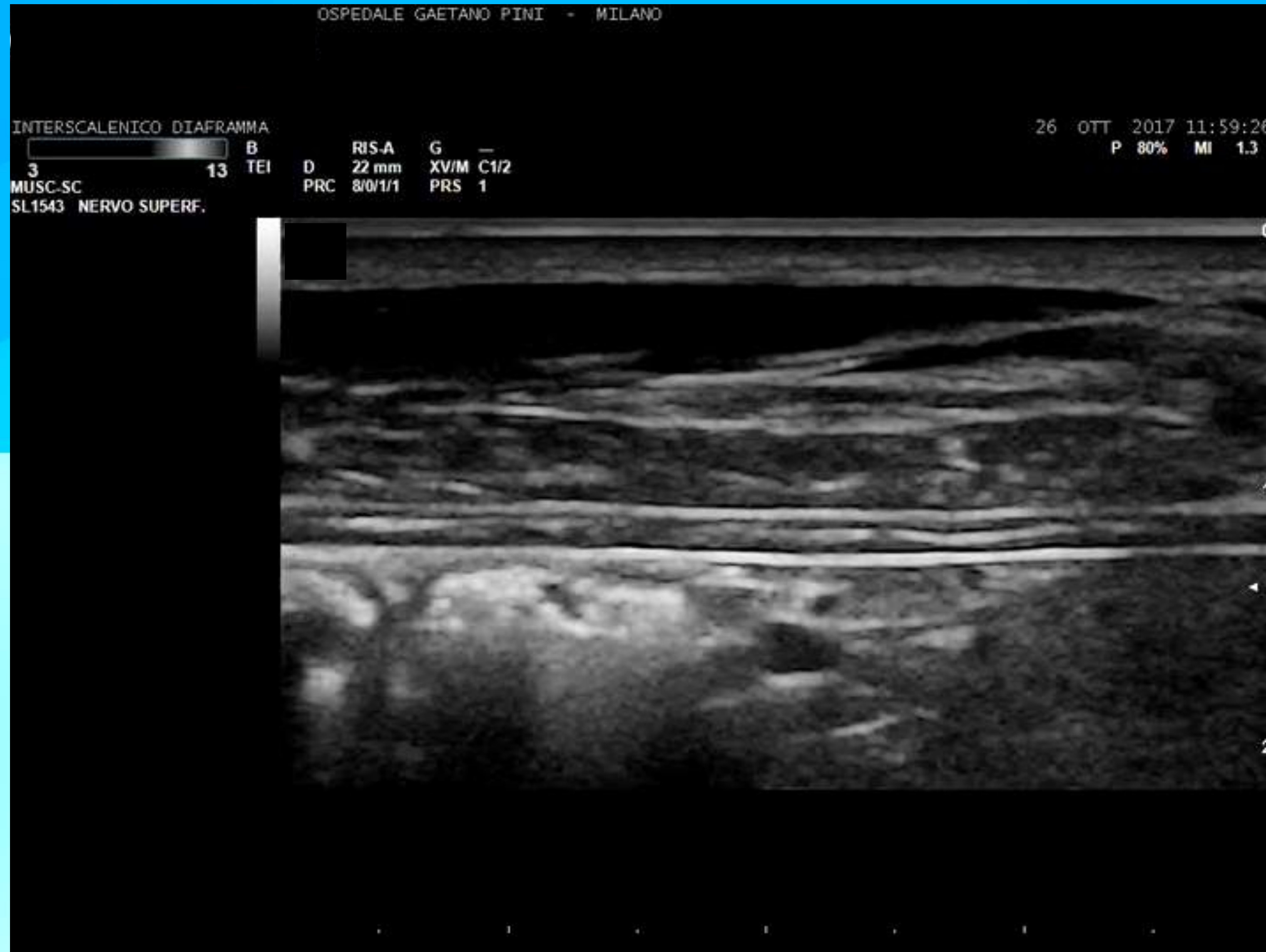
Sonographic evaluation of the diaphragm in critically ill patients. Technique and clinical applications



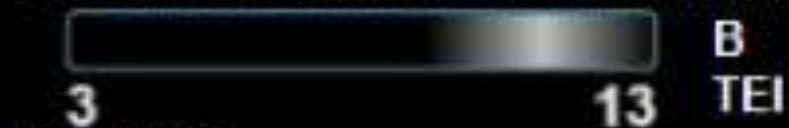
thickening fraction:
 $\Delta t_{di} / t_{di} \text{ end expiration}$
 $\times 100$



Prima del blocco del frenico



INTERSCALENICO DIAFRAMMA

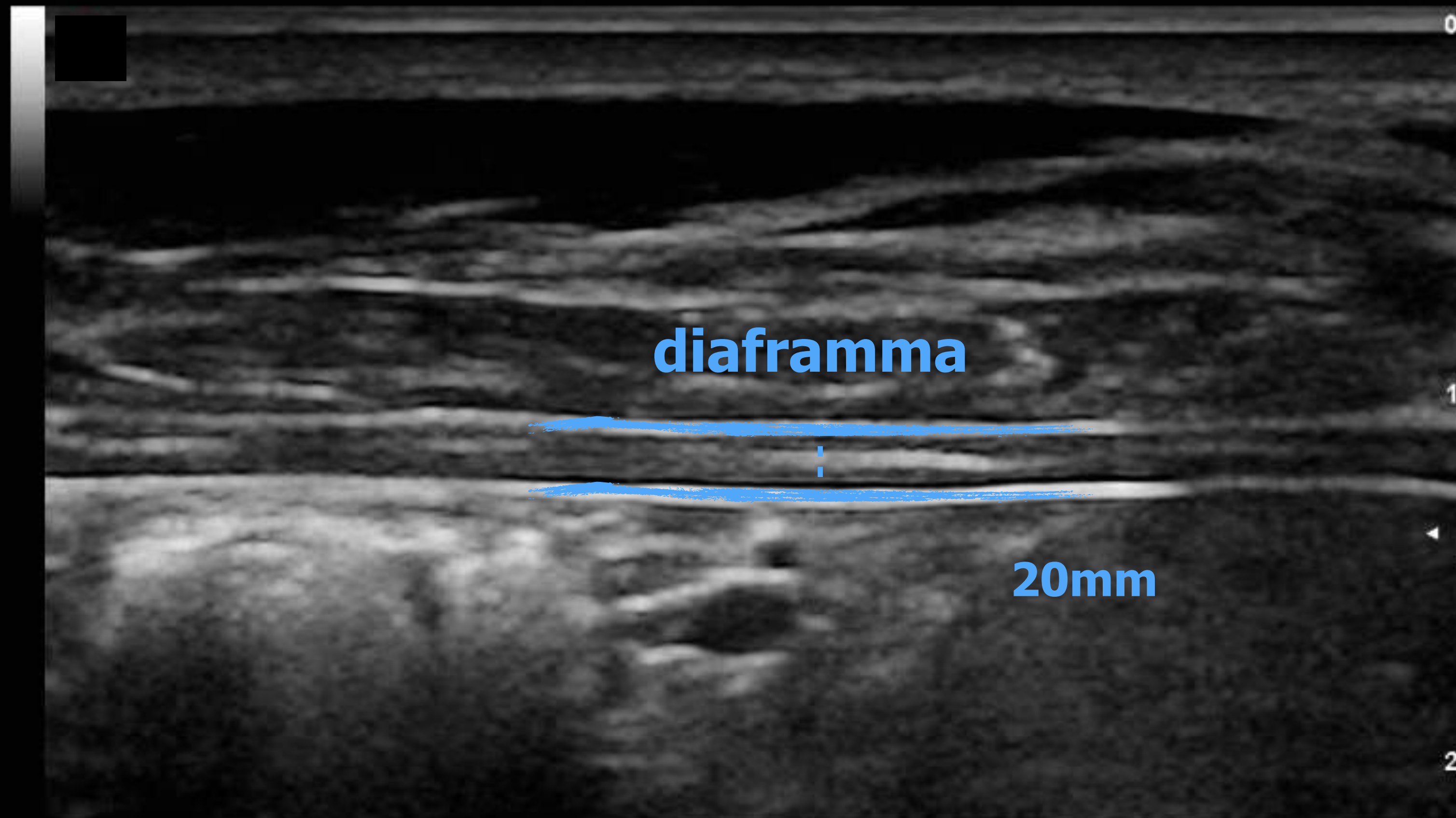


3
MUSC-SC
SL1543 NERVO SUPERF.

B
TEI

D RIS-A G
22 mm XV/M C1/2
PRC 8/0/1/1 PRS 1

26 OTT 2017 11:59:26
P 80% MI 1.3

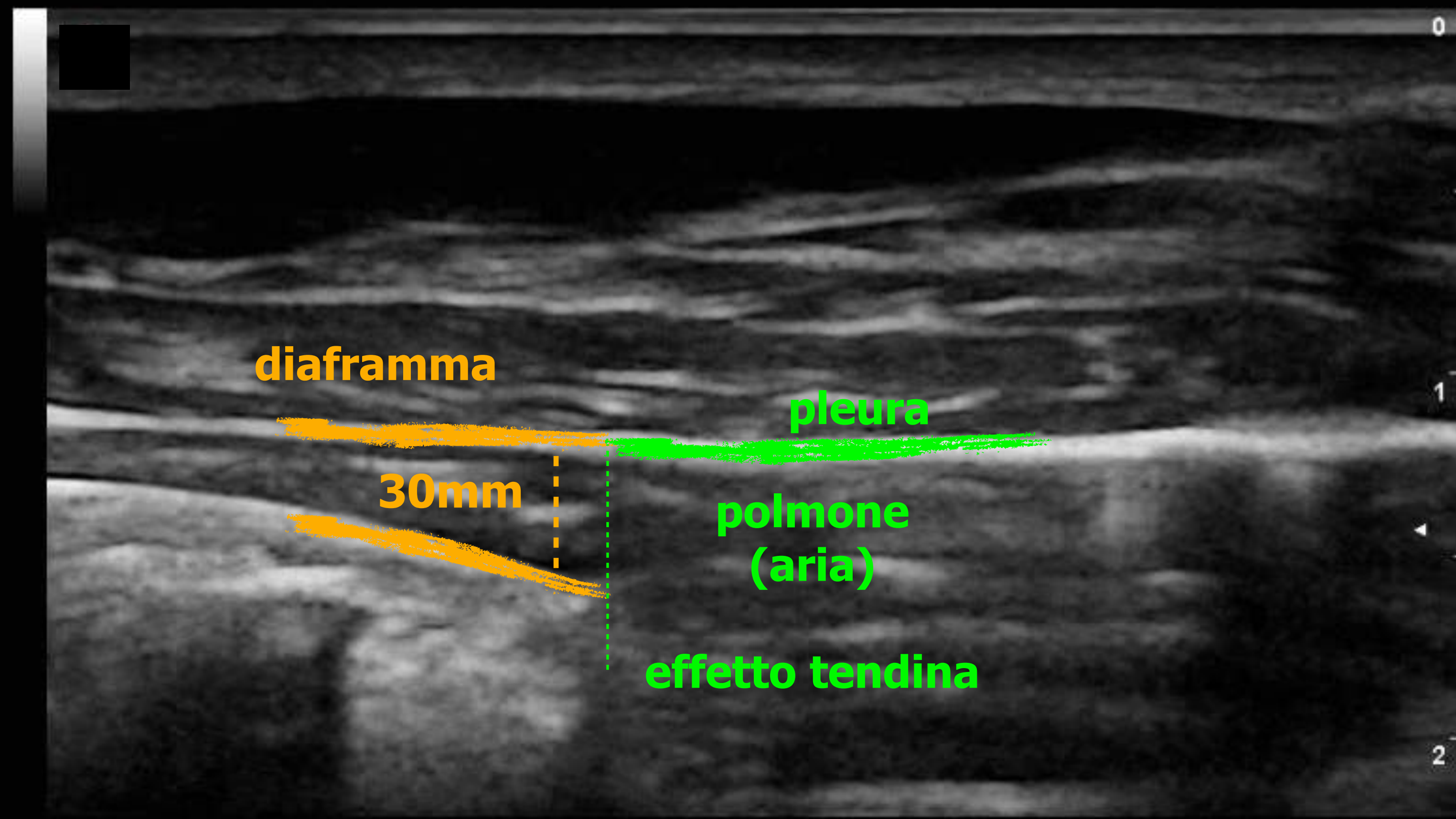


INTERSCALENICO DIAFRAMMA

3 13 B TEI
MUSC-SC
SL1543 NERVO SUPERF.

RIS-A G —
D 22 mm XV/M C1/2
PRC 8/0/1/1 PRS 1

26 OTT 2017 11:59:26
P 80% MI 1.3



Dopo il blocco



C - Circulation

Post Spinal Hypotension


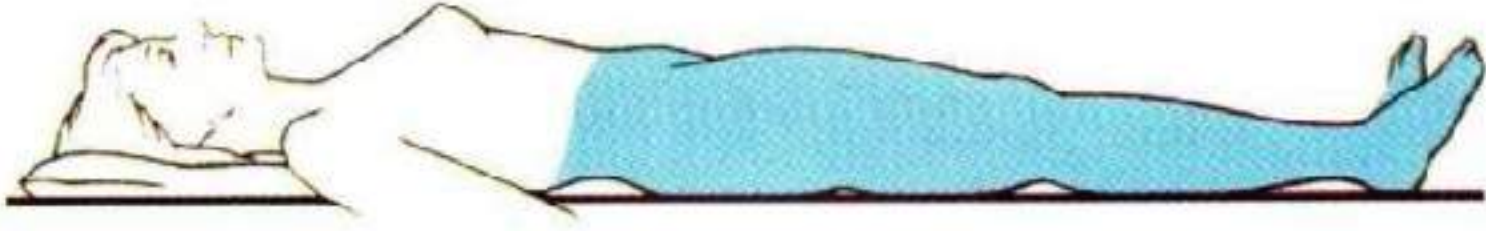
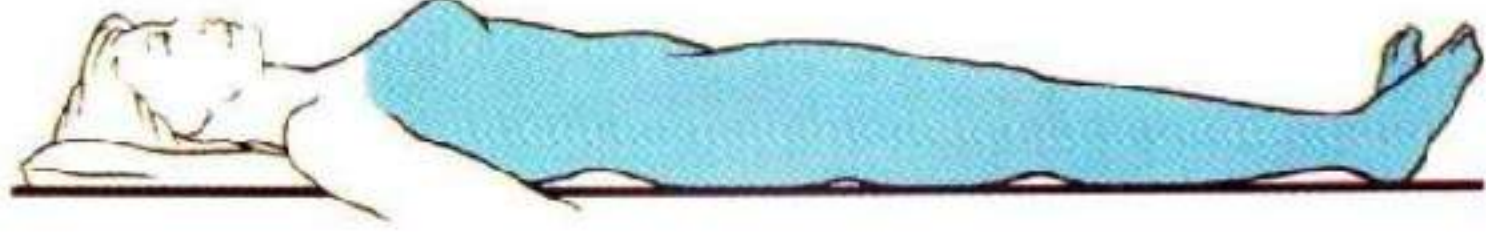
PSH o SAIH



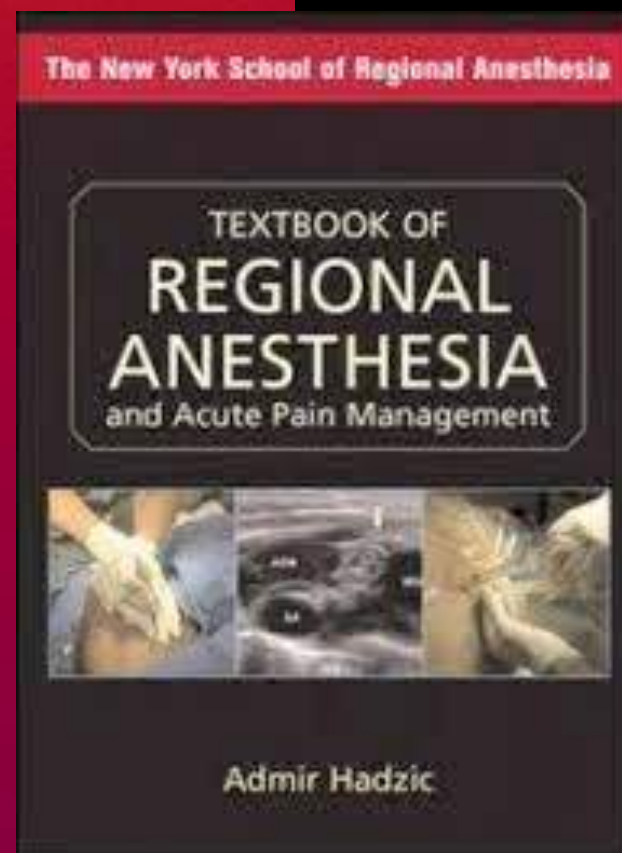
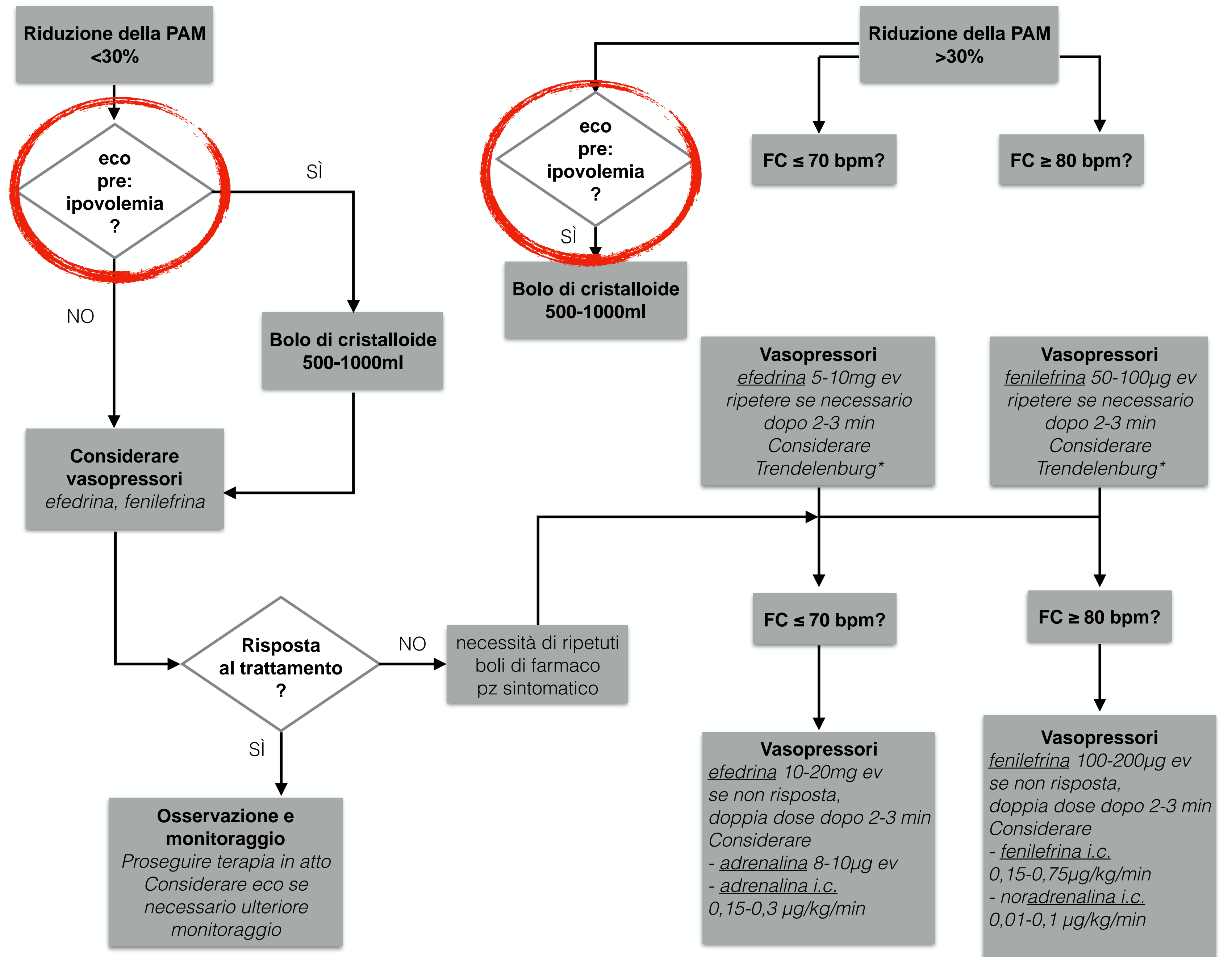
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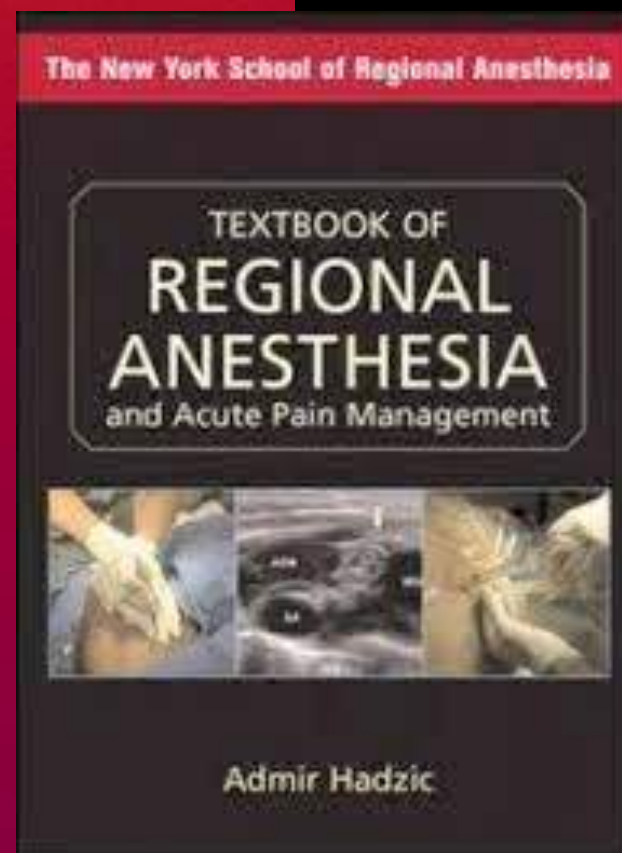
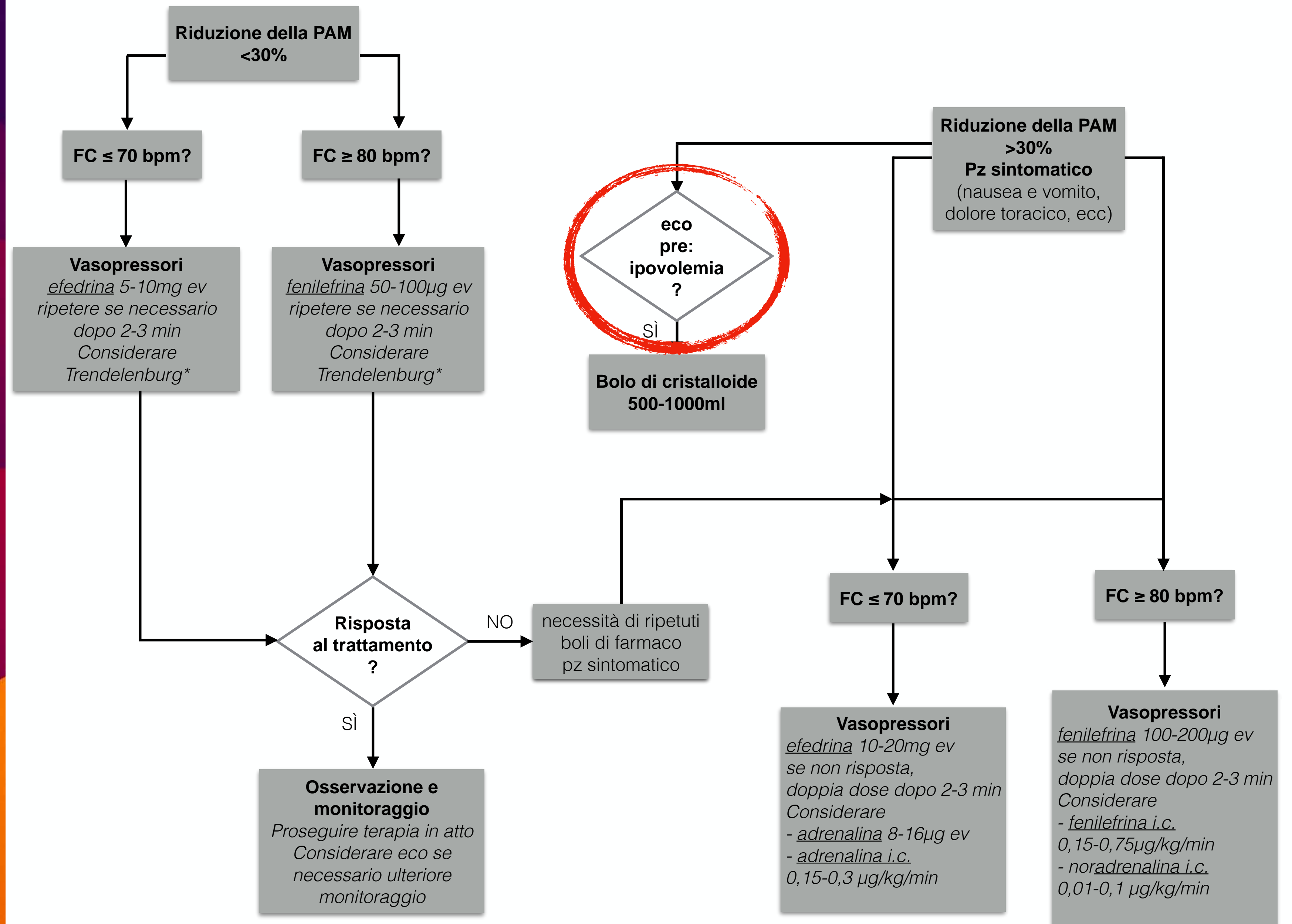
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	PR	HR	CO	VR	C	MAP
	NC	NC	NC	NC	NC	NC
	↓	↕	↕	NC	NC	↓
	↓	↓	↓	↓	↓	↓

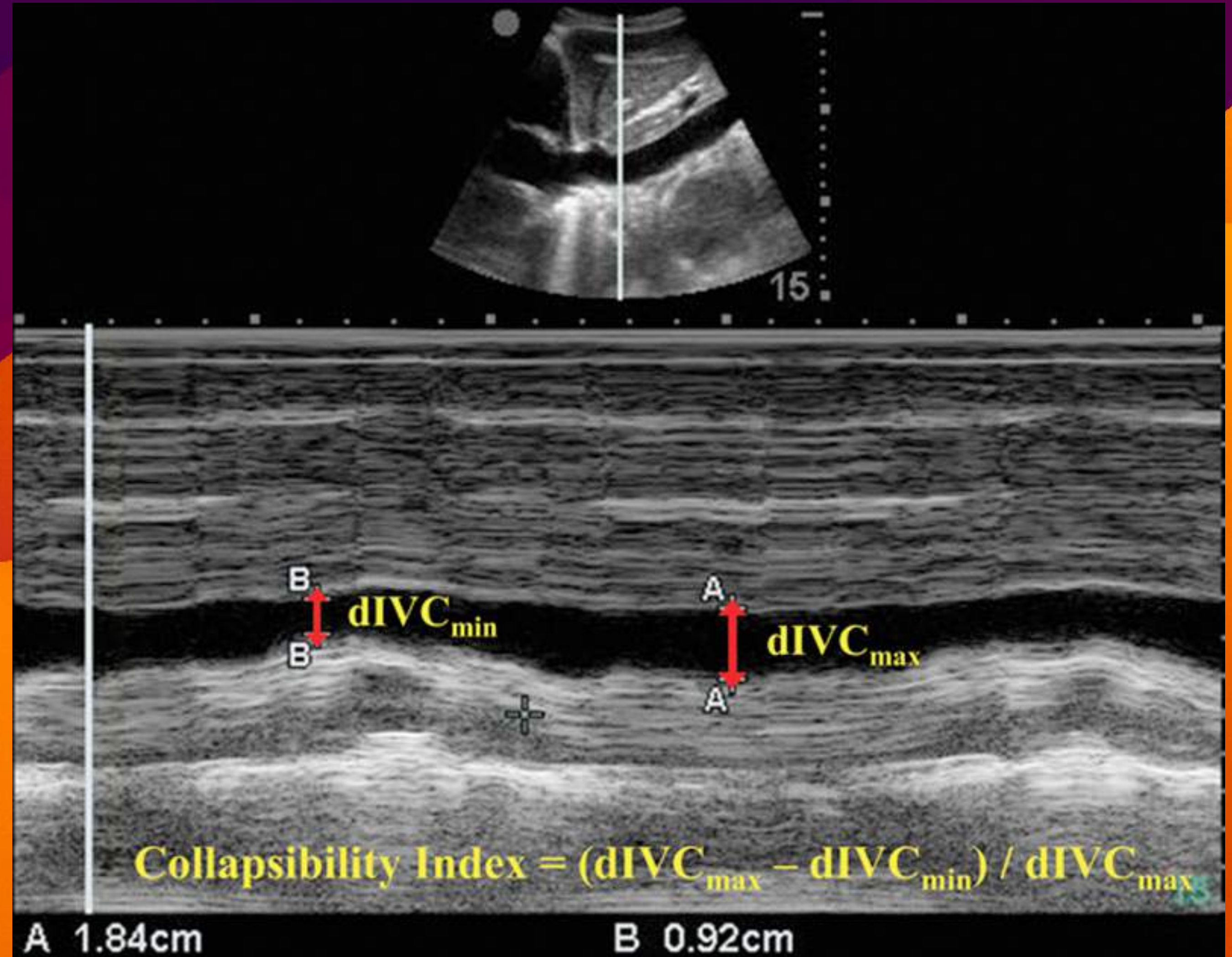
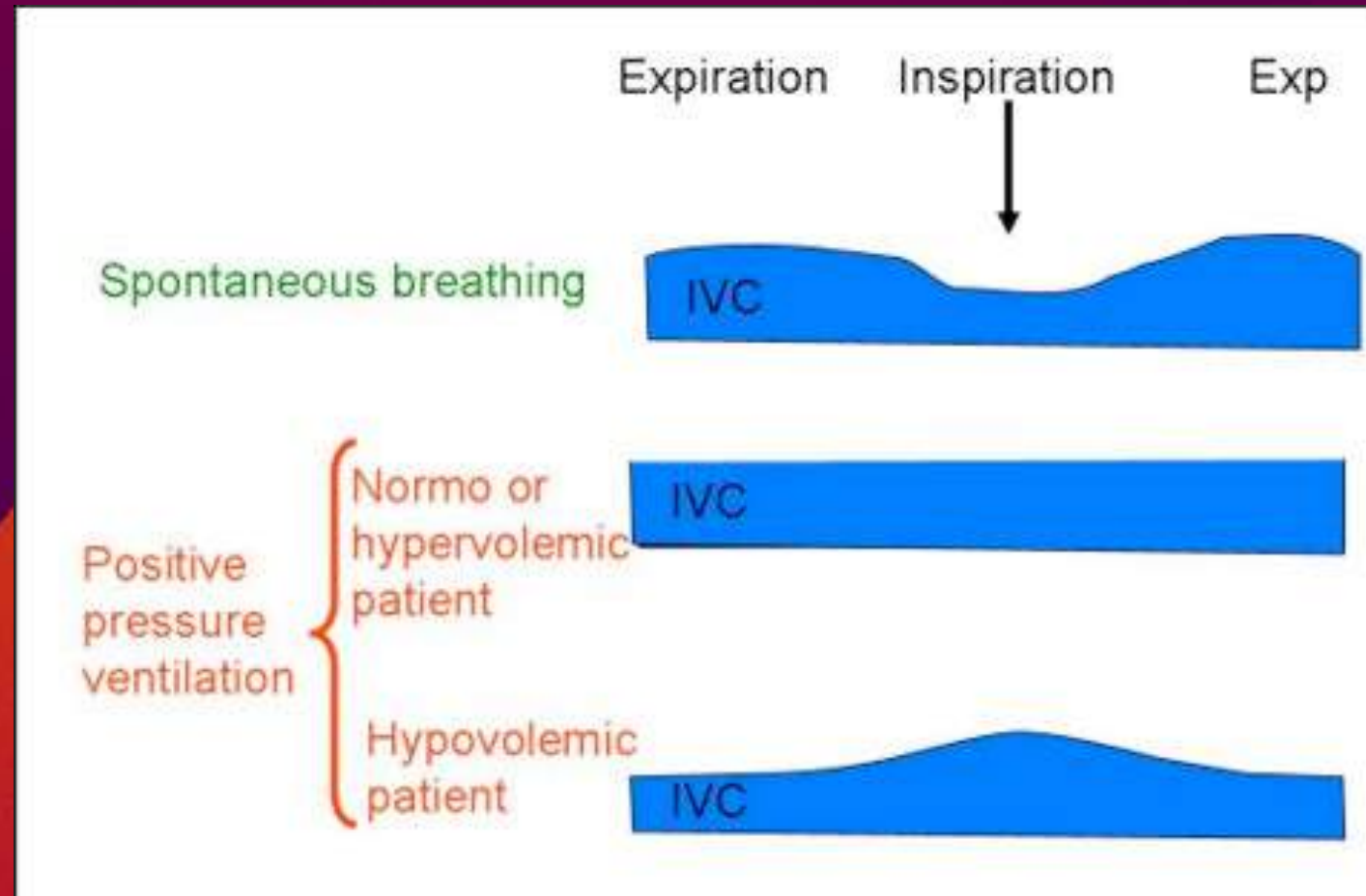
trattamento della PSH in paziente non cardiopatico



trattamento della PSH in paziente cardiopatico



Valutazione stato del circolo



Correlations Between IVC Size and CVP

Inferior vena cava size (cm)	Respiratory change	Central venous pressure (cm H ₂ O)
<1.5	Total collapse	0-5
1.5-2.5	>50% collapse	6-10
1.5-2.5	<50% collapse	11-15
>2.5	<50% collapse	16-20
>2.5	No change	>20

Fluid responsiveness

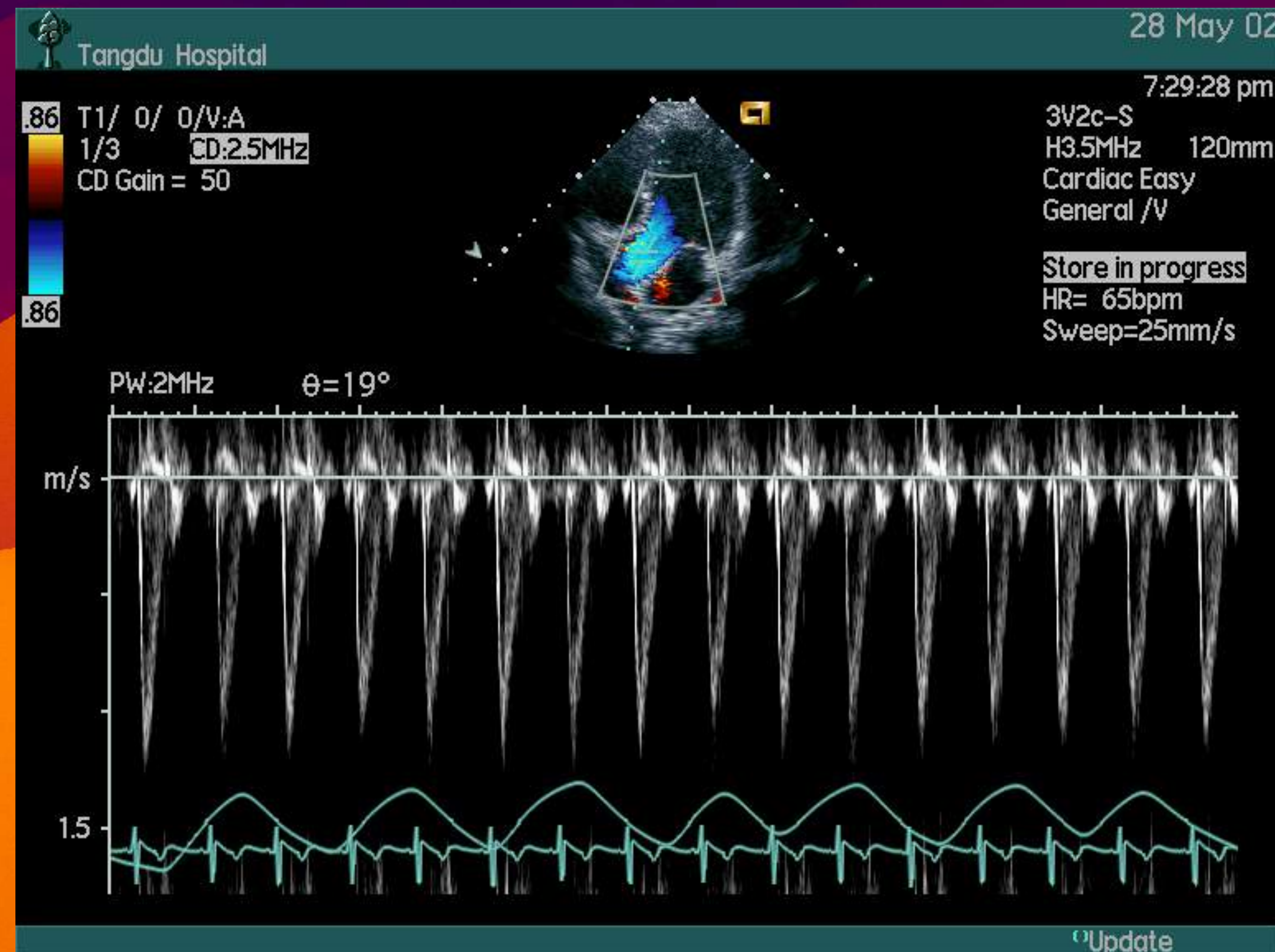
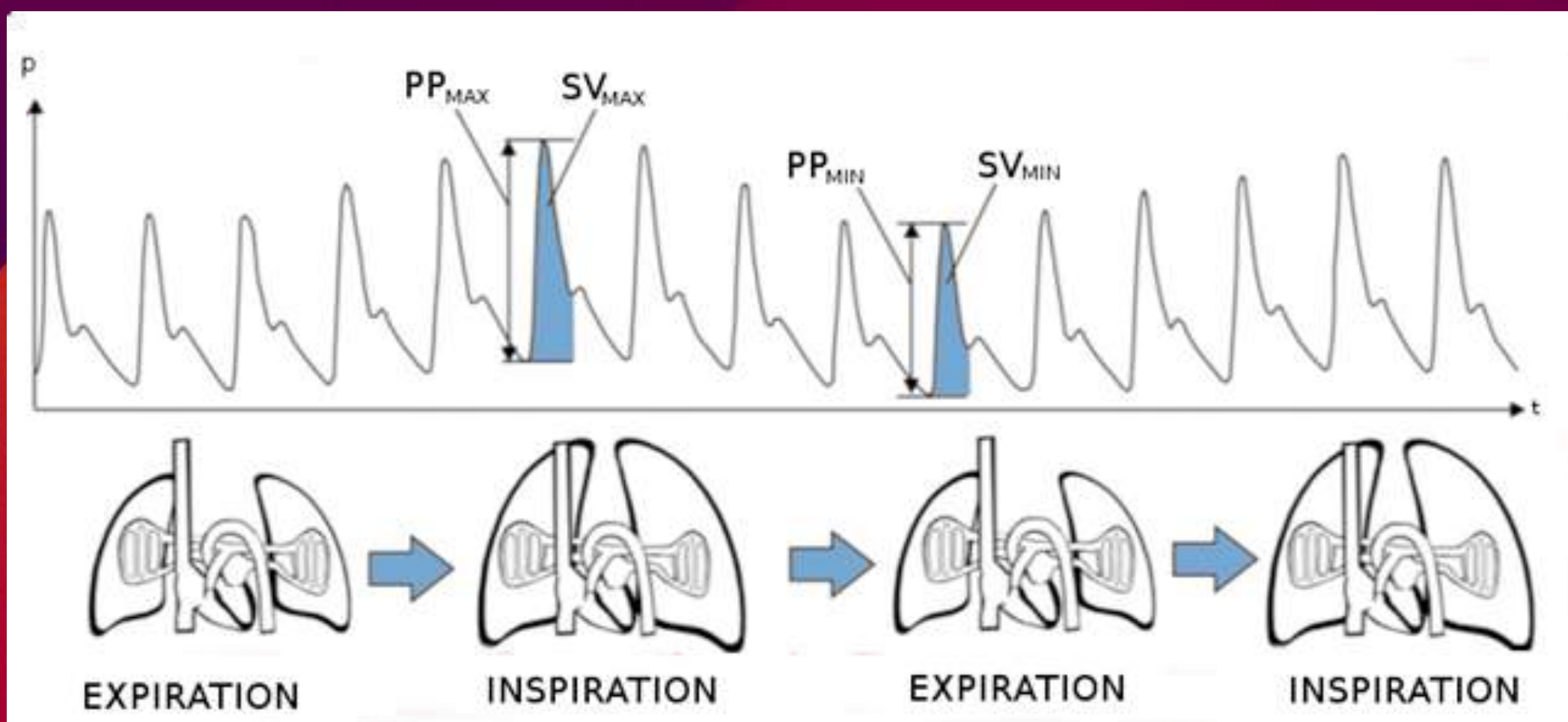
Stroke volume variation



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SAM

Systolic Anterior Motion



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Table 2 Common abnormalities of the mitral valve apparatus in hypertrophic cardiomyopathy

Mitral valve structure	Common abnormalities
Valvular	<ul style="list-style-type: none">Elongated mitral valve leaflets (both anterior and posterior)Increased mitral tenting volumeIncreased distance from coaptation point to anterior leaflet tip (“residual leaflet”)Smaller coaptation-septal distance (C-sept distance)Papillary muscle hypertrophy
Papillary muscles	<ul style="list-style-type: none">Increased number of papillary musclesDisplacement and abnormal papillary muscle insertionShorter interpapillary muscle distance
Chordal apparatus	<ul style="list-style-type: none">Shortened and fibrotic chordae tendinae

Systolic anterior motion of the mitral valve in hypertrophic cardiomyopathy: a narrative review

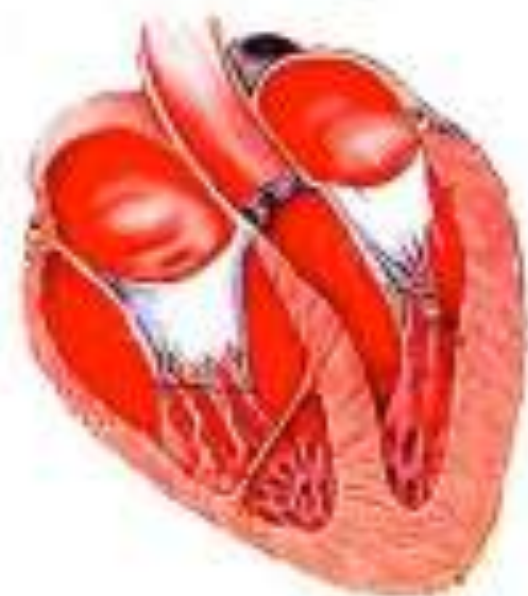
Sarah A. Guigui^{1,2}, Christian Torres², Esteban Escolar^{2,3}, Christos G. Mihos^{1,2}

SAM

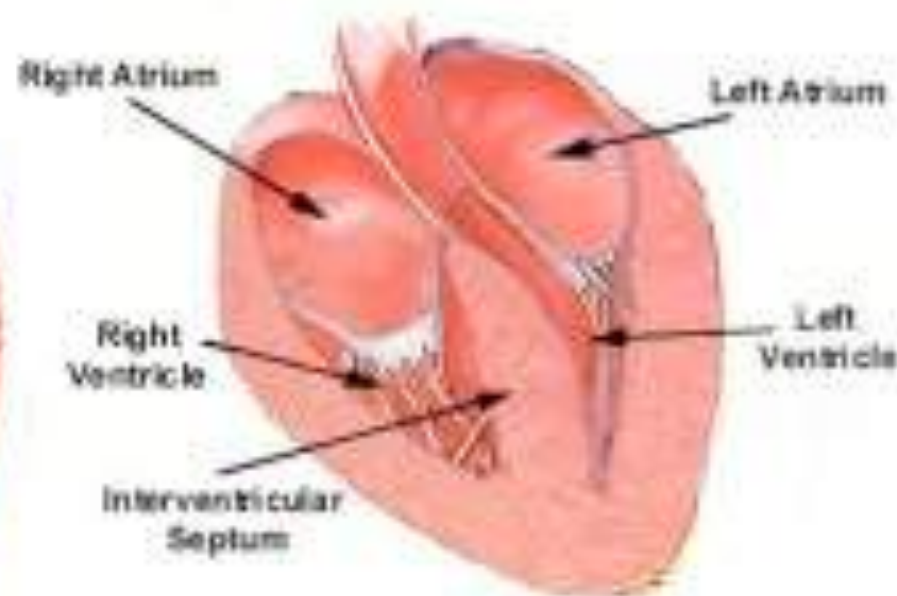
Systolic Anterior Motion



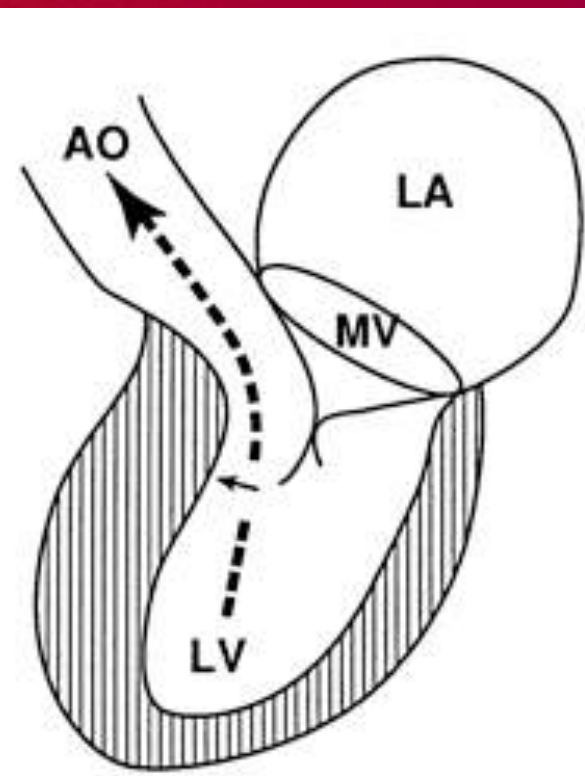
Hypertrophic Cardiomyopathy



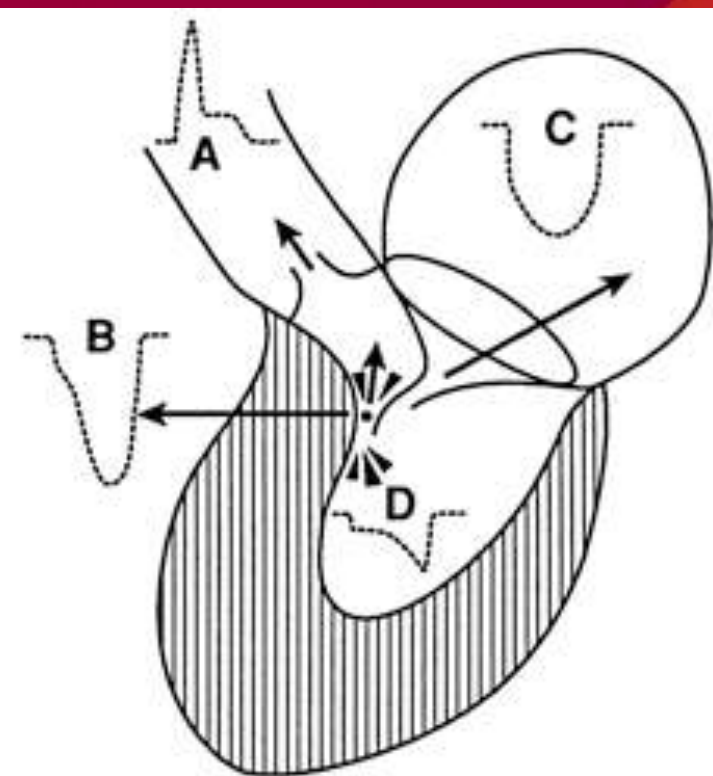
Normal Heart



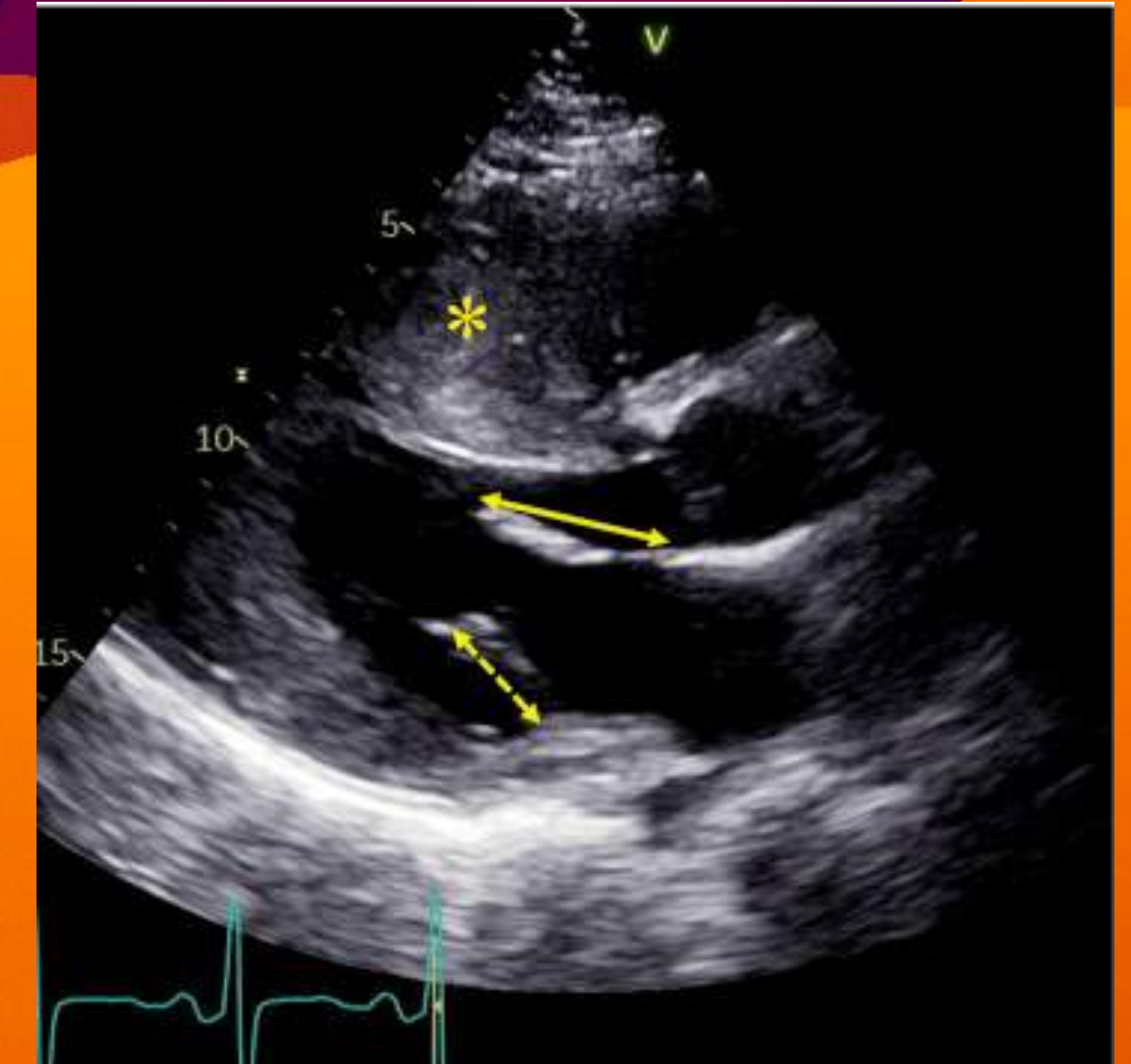
Hypertrophied Heart



EARLY
SYSTOLE



MITRAL LEAFLET-
SEPTAL CONTACT



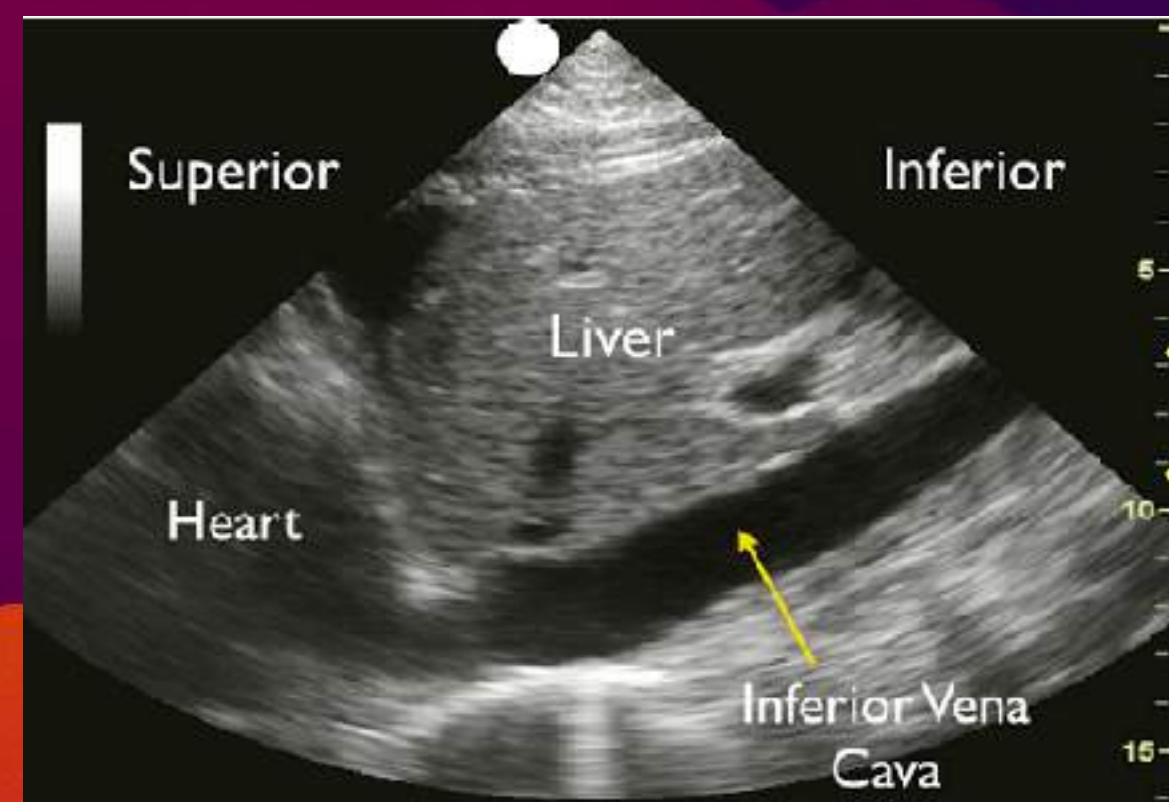
Stato ipotensivo



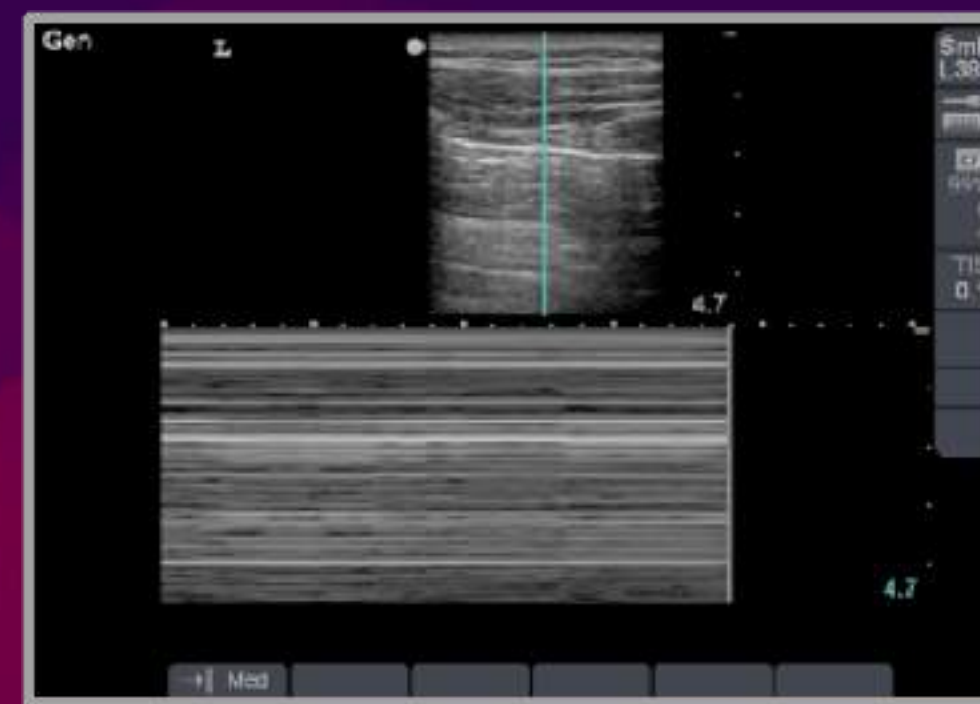
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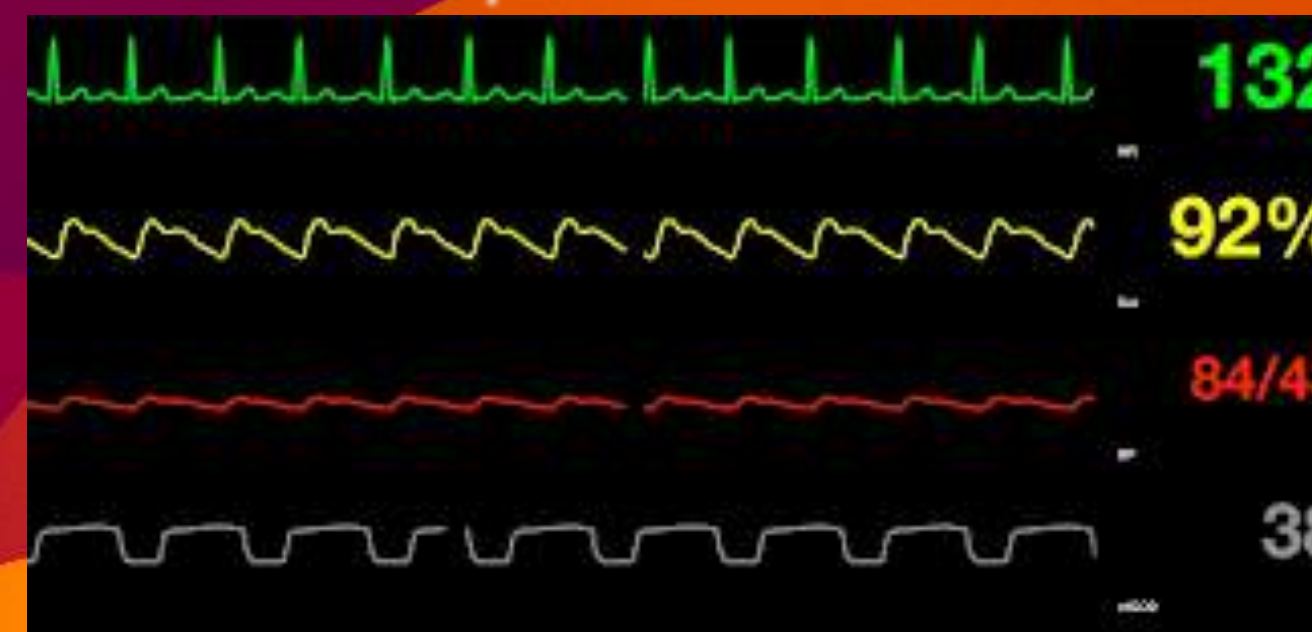
volemia?



polmone?



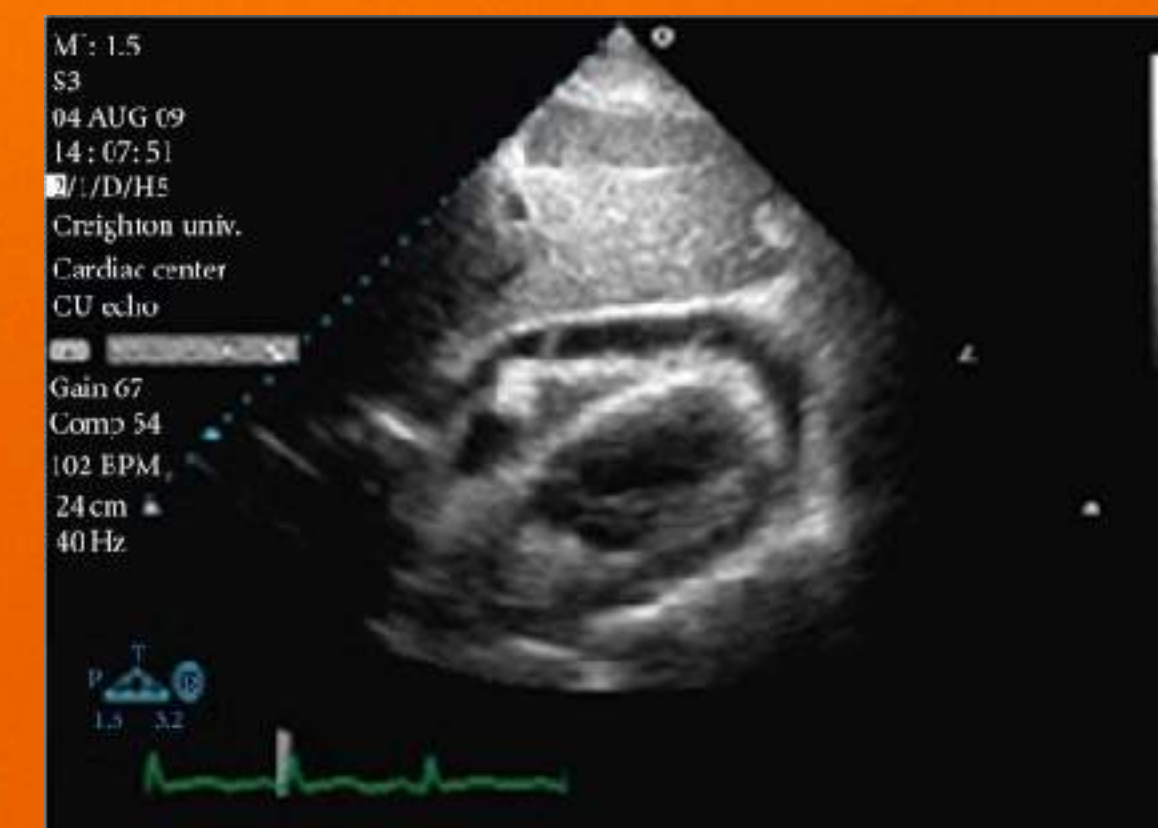
resistenze periferiche?



contrattilità?



cuore destro?



versamenti?

Funzionalità cardiaca

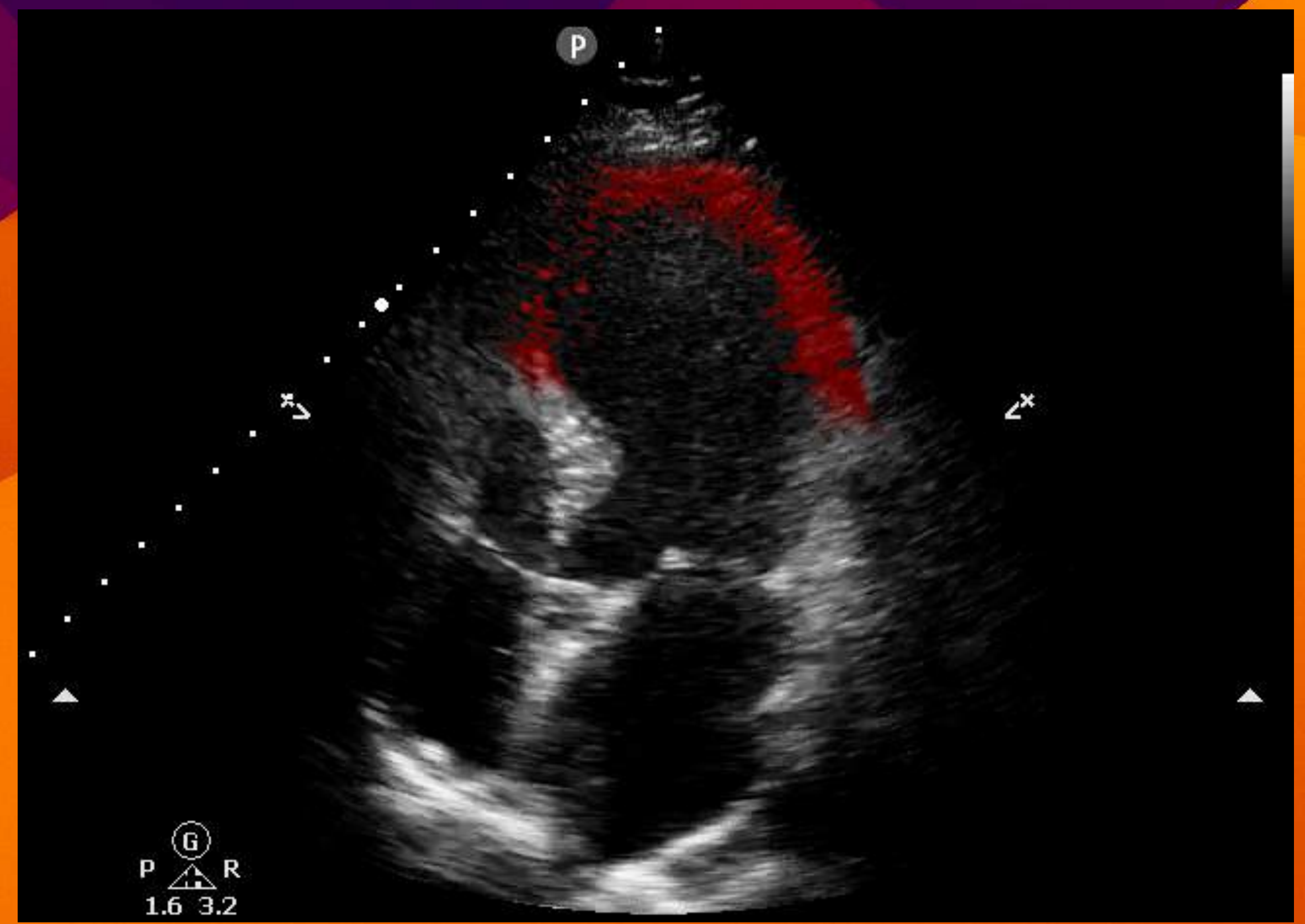
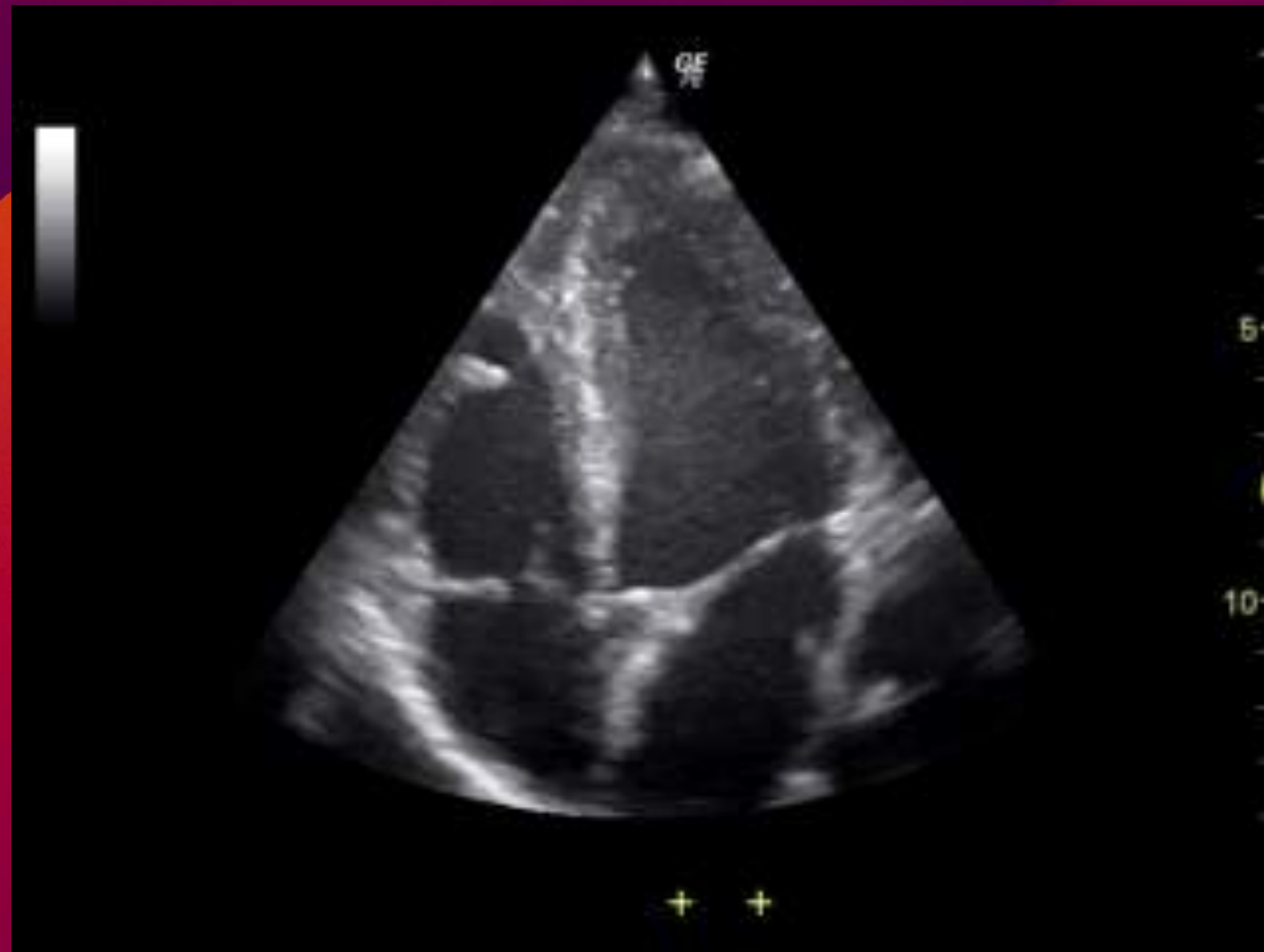
LAST but not least



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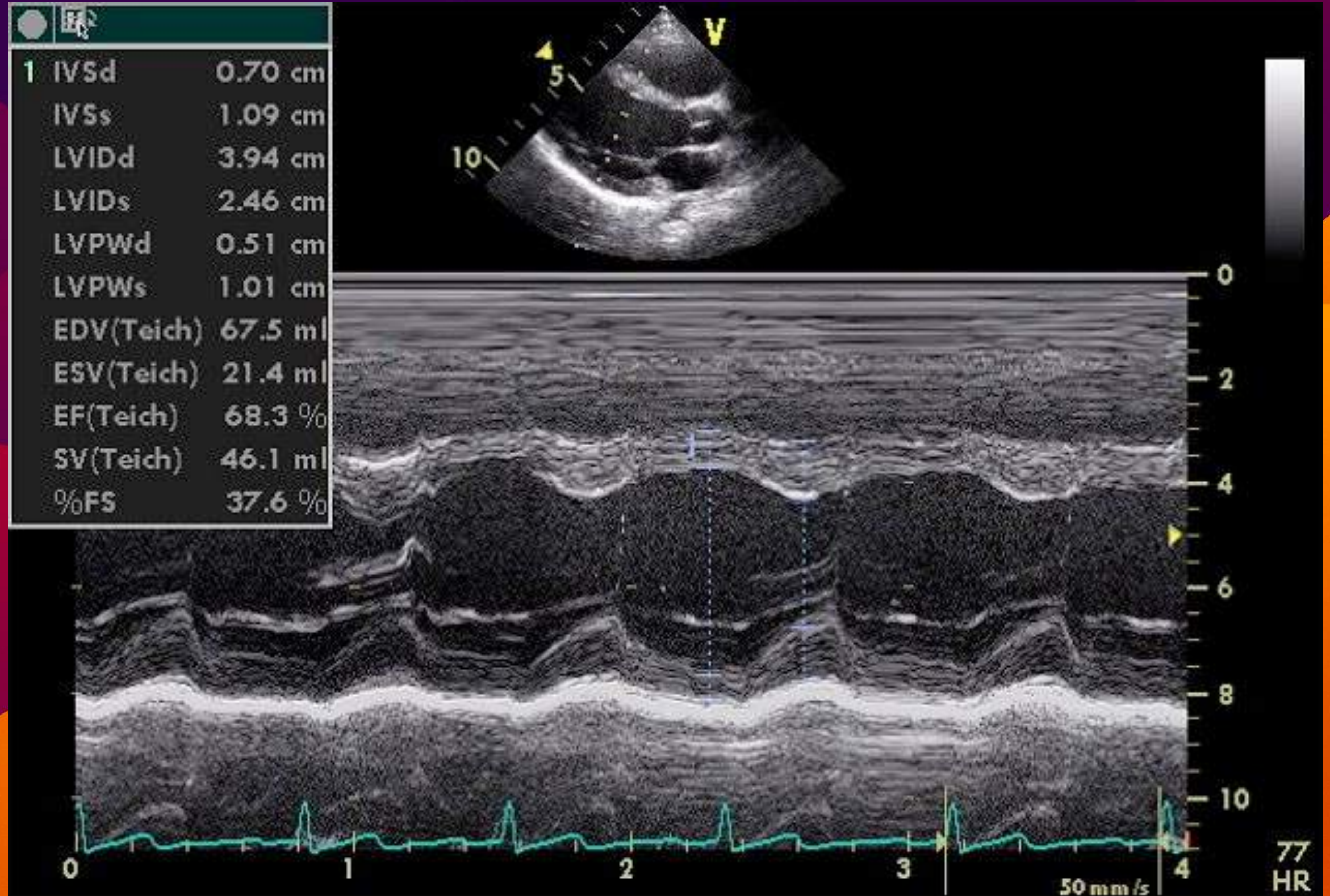


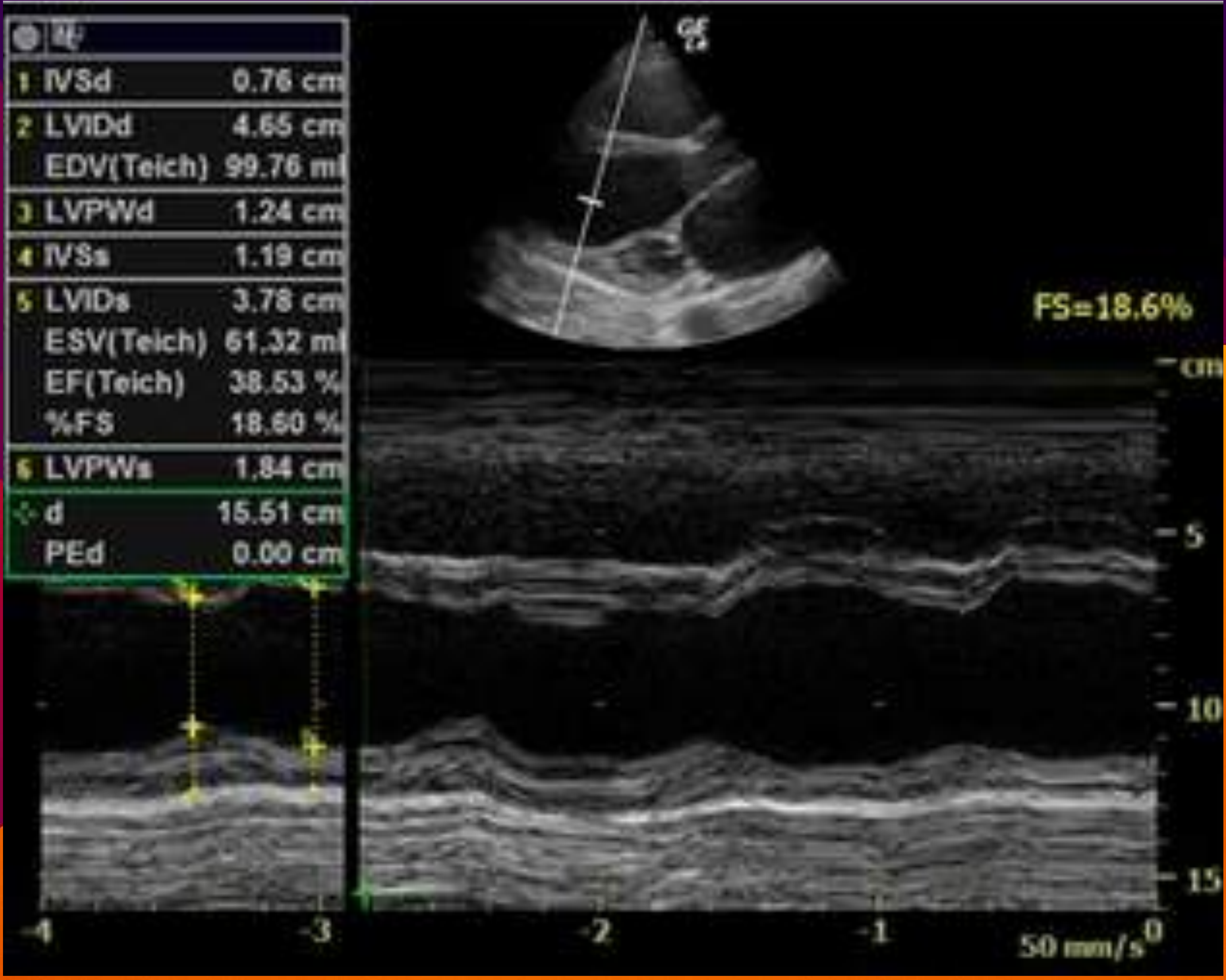
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$$FE = FS \times 2$$

$$FS = \frac{(LVEDD - LVESD)}{LVEDD} \times 100$$



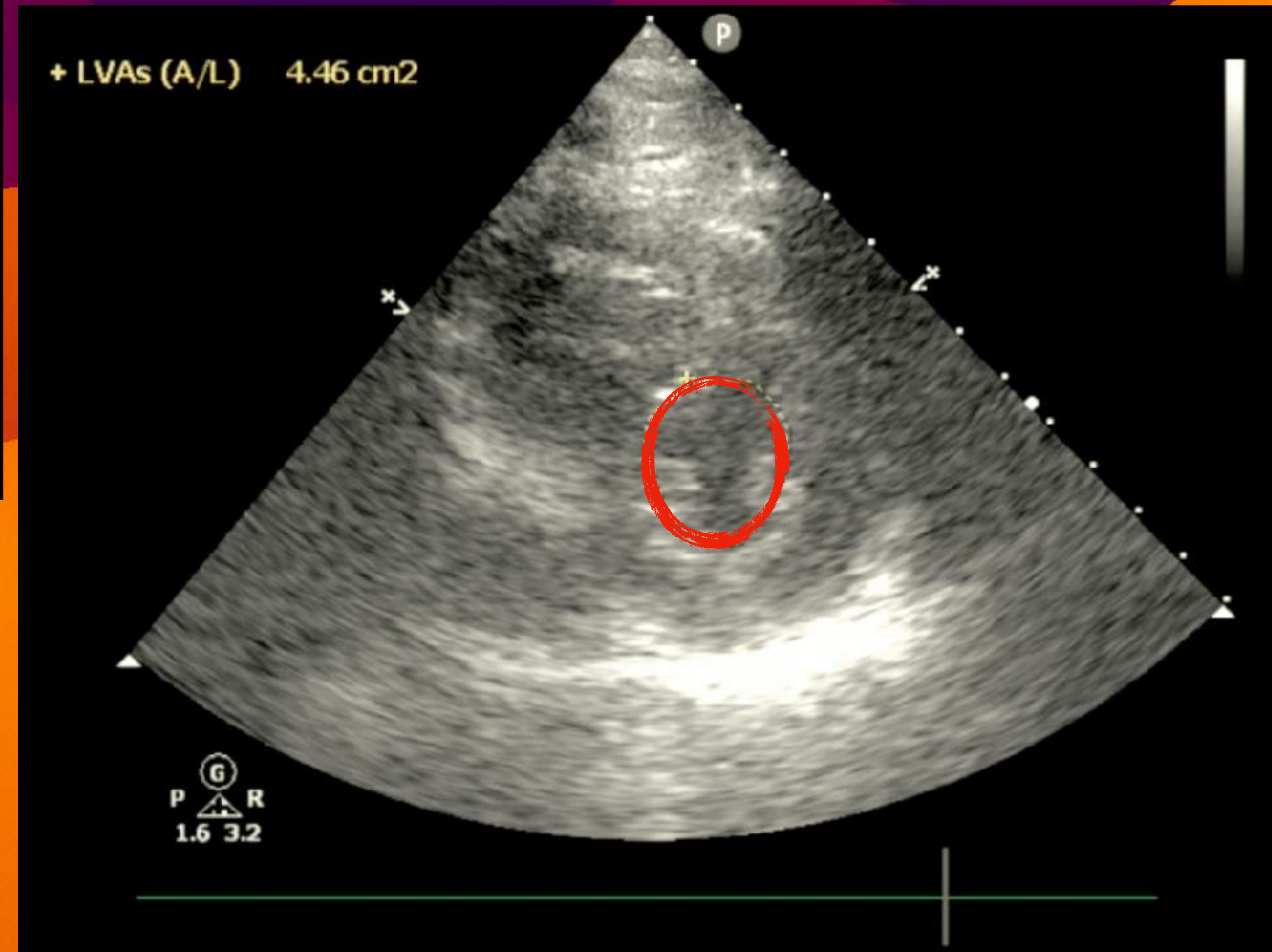
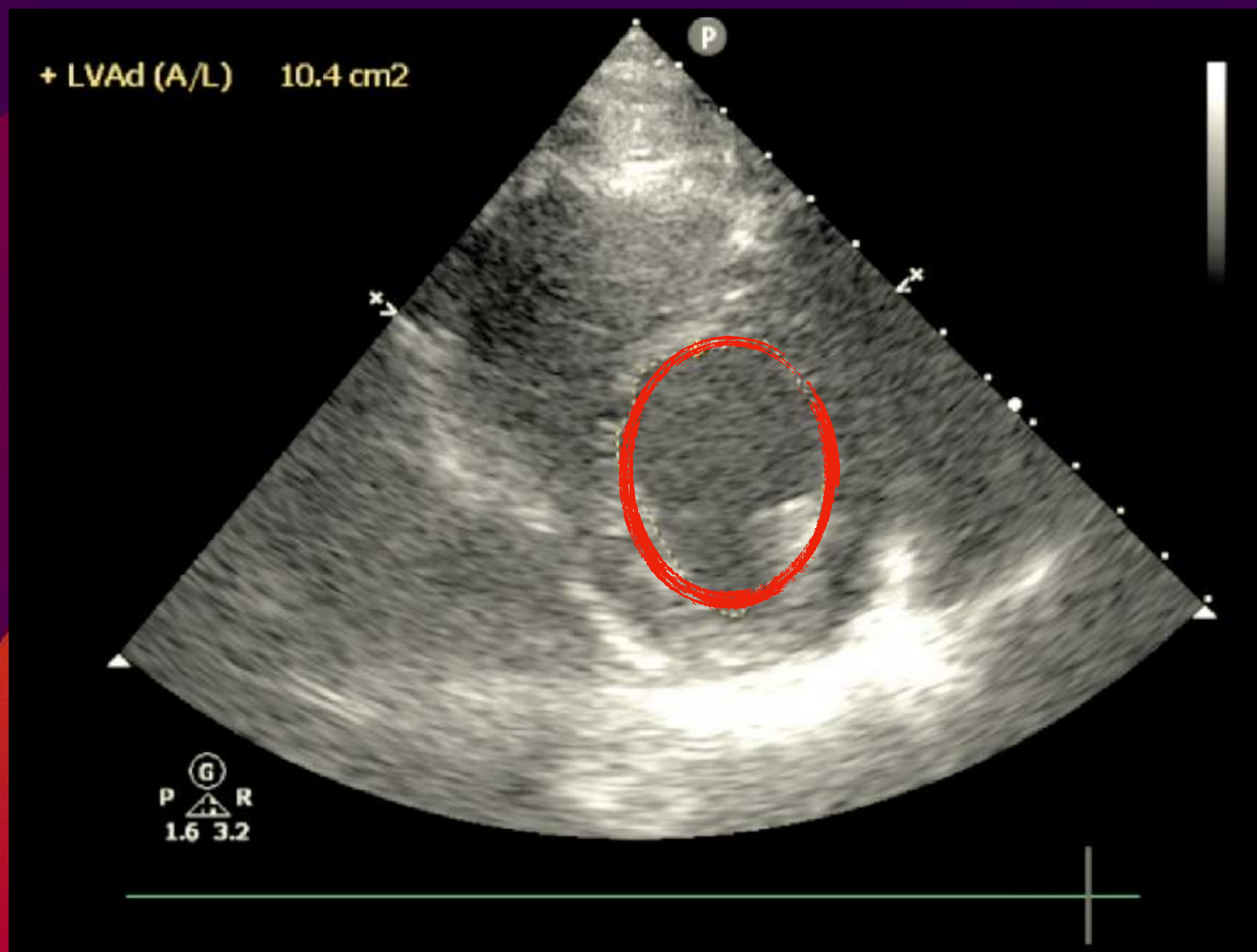




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$$\text{FAC\%} = \frac{(\text{LVEDA} - \text{LVESA})}{\text{LVEDA}} \times 100$$

$$\text{FAC\%} = 35-65\%$$

Bone Cement Implantation Syndrome

- ↓ Resistenze vascolari periferiche
- ↑ Resistenze vascolari polmonari
- Embolizzazione polmonare
- Istamina
- ↓ CO
- deficit contrattile



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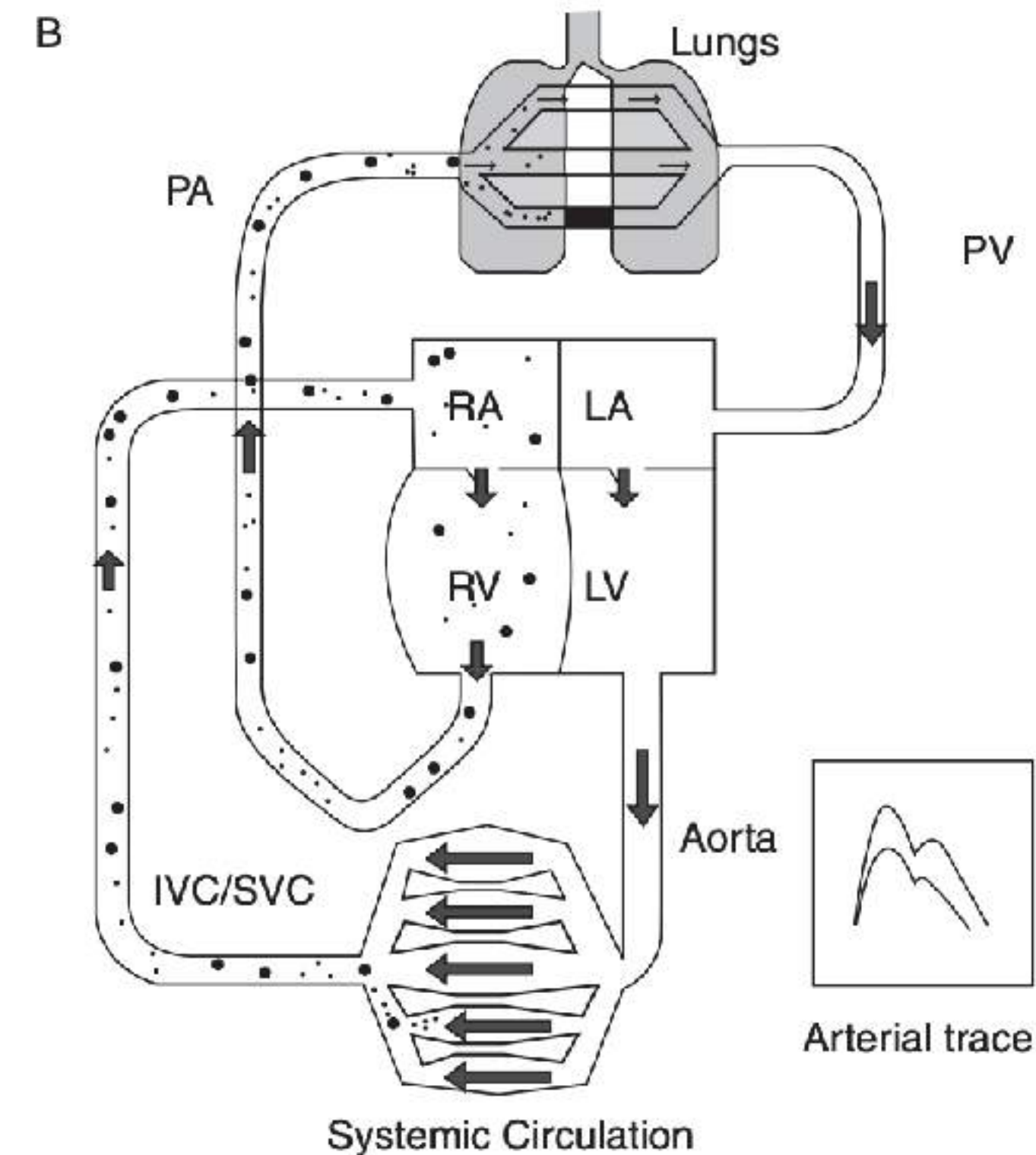


Fig 4 (A) Normal circulation, and (B) proposed combined model with peripheral vasodilatation, reduced venous return, increased pulmonary vascular resistance and pulmonary embolization, reduced cardiac output, reduced systemic vascular resistance (allowing some counter increase in cardiac output due to reduced afterload) and hypoxia from both the emboli and the pulmonary effects of histamine.

British Journal of Anaesthesia 102 (1): 12–22 (2009)
doi:10.1093/bja/aen328

BJA

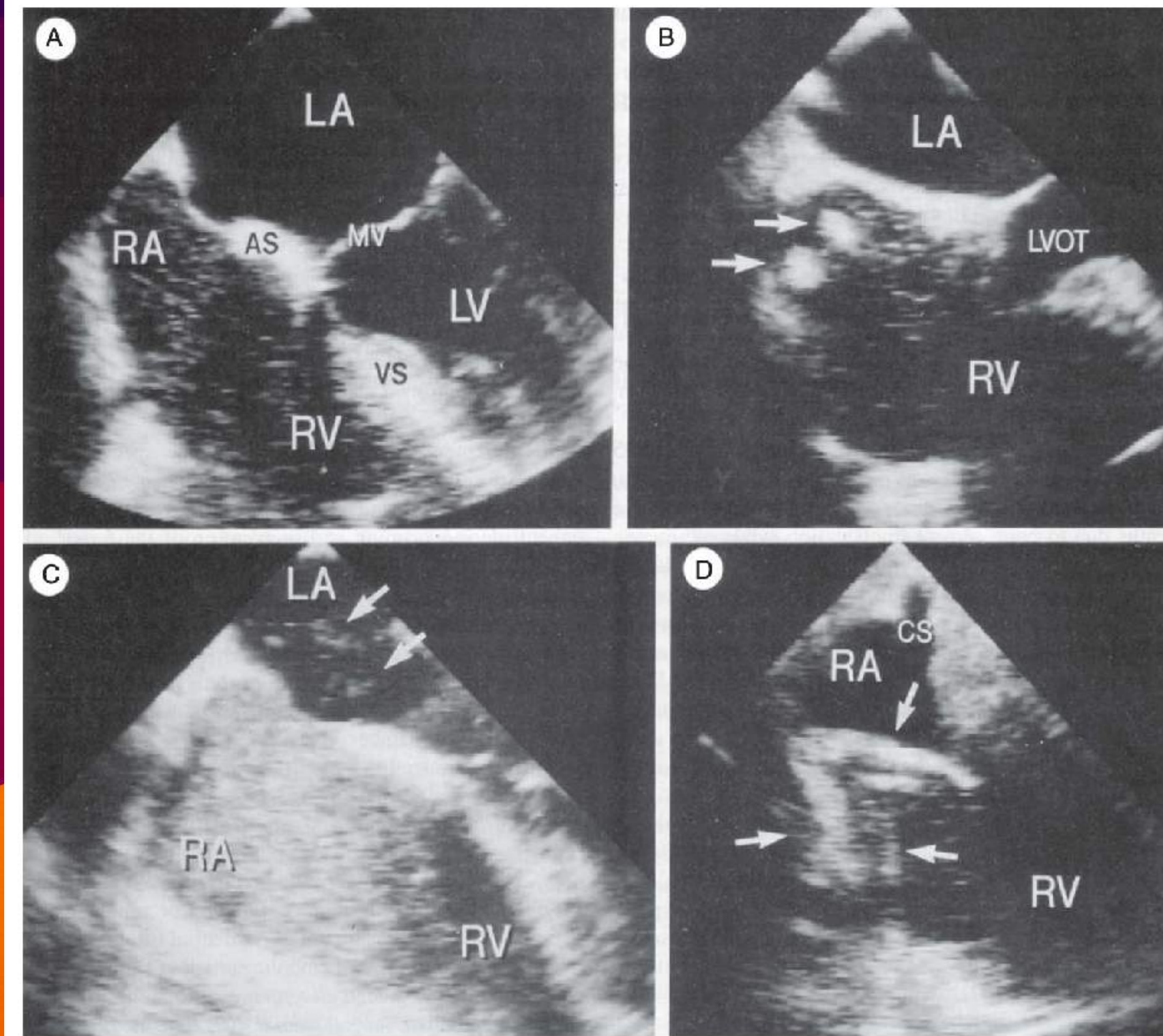
Bone cement implantation syndrome

A. J. Donaldson¹, H. E. Thomson¹, N. J. Harper^{2*} and N. W. Kenny³

¹Department of Anaesthesia, University Hospital of South Manchester, Southmoor Road, Manchester M23 9LT, UK. ²Department of Anaesthesia and ³Department of Orthopaedic Surgery, Manchester Royal Infirmary, Oxford Rd, Manchester M13 9WL, UK



SNOW FLURRY

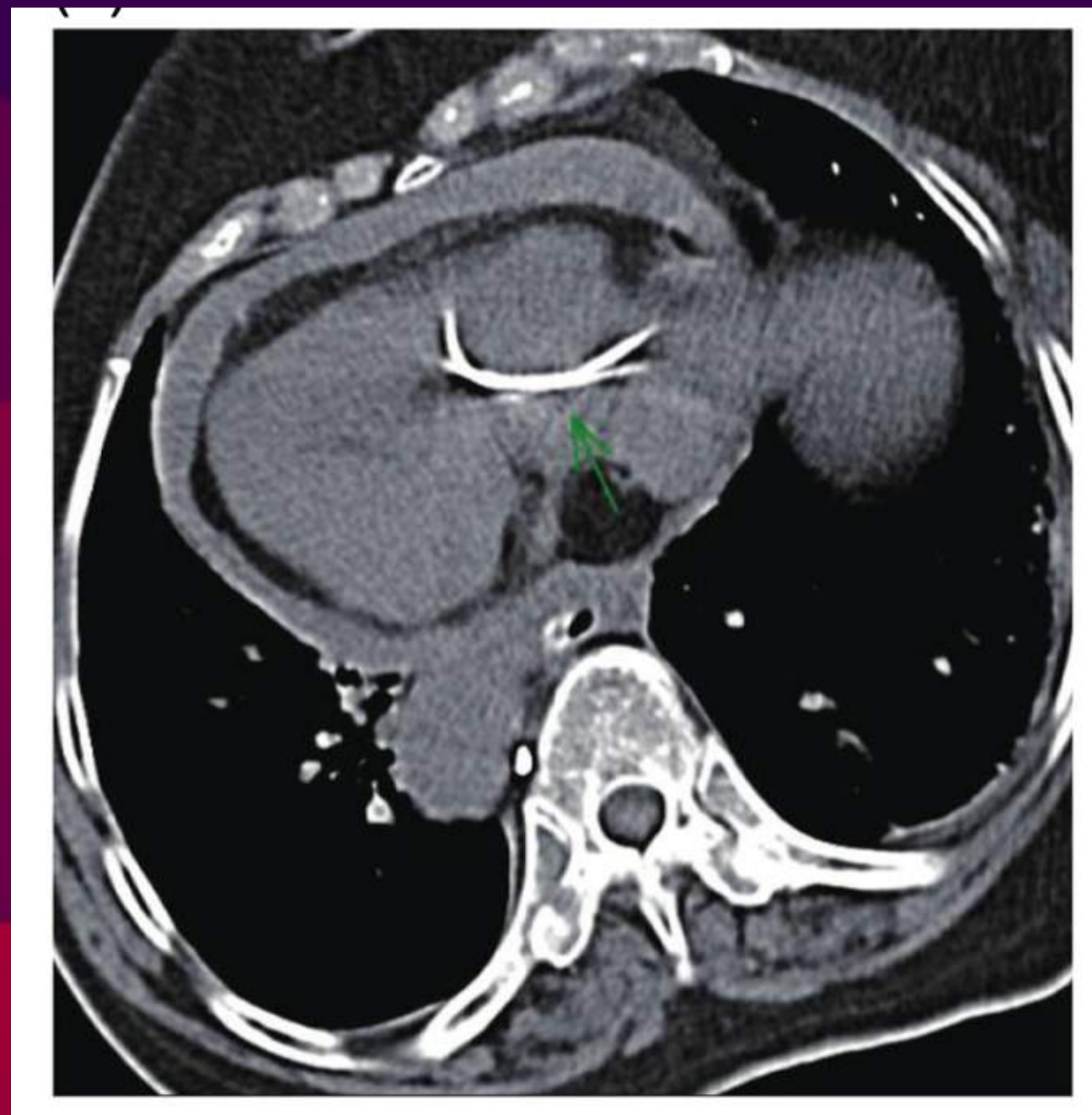




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CASE REPORT

JOURNAL OF
CARDIAC SURGERY WILEY

Bedside echocardiography for diagnosis of intracardiac cement embolism after percutaneous vertebroplasty: A case report

Panpan Yin | Junli Hu | Shaochun Wang | Guiling Sui | Guozhen Yuan |
Dongchen Fan

Sindromi compartimentali Normale



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Doppler ultrasonography of the lower
extremity arteries: anatomy and
scanning guidelines

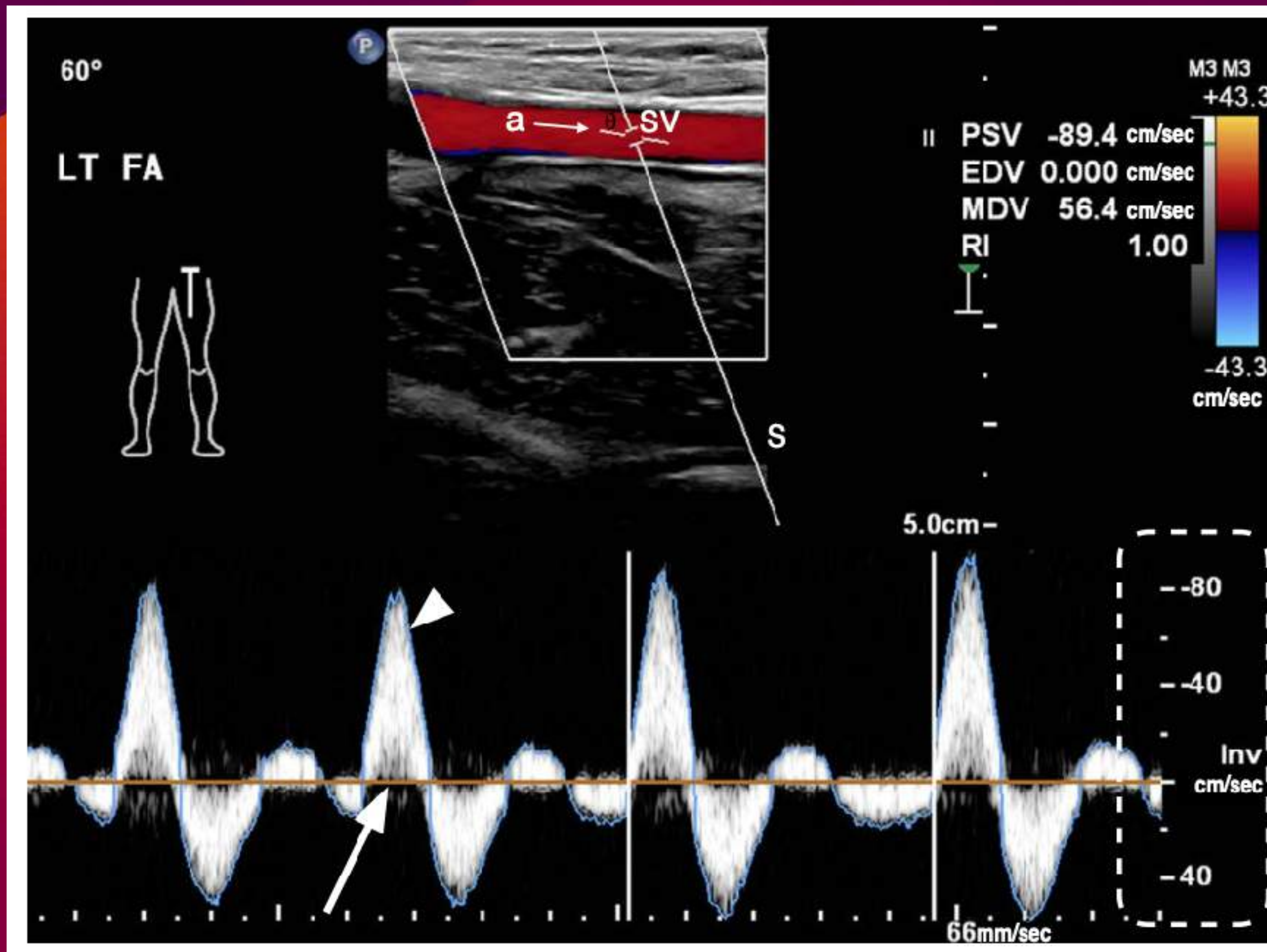
ULTRA
SONO
GRAPHY

Ji Young Hwang

Department of Radiology, Ewha Womans University School of Medicine, Seoul, Korea

REVIEW ARTICLE

- Doppler Pulsato (velocità ridotte)
- onda trifasica
- sistemi ad alte resistenze periferiche
- onda diastolica **POSITIVA**



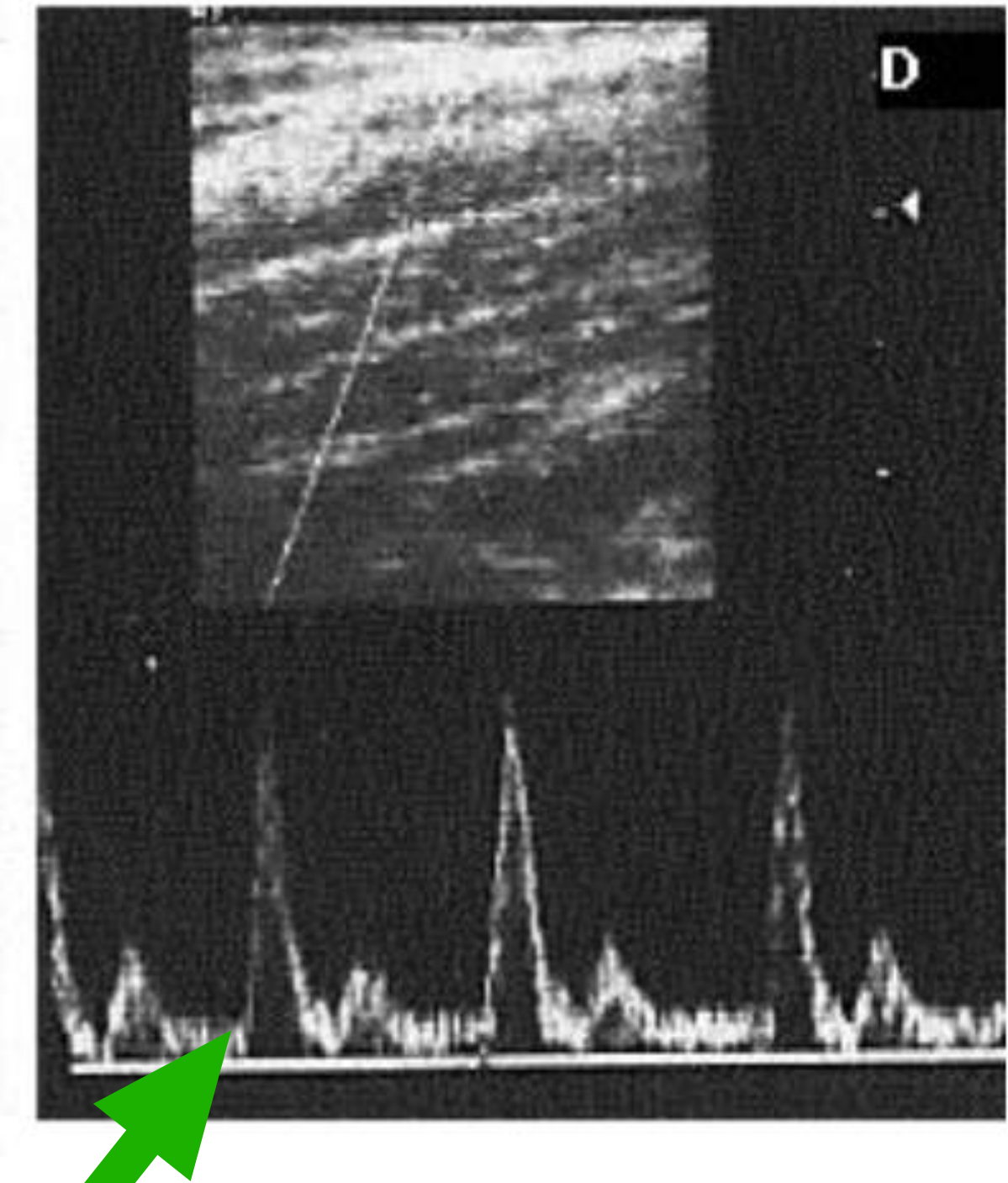
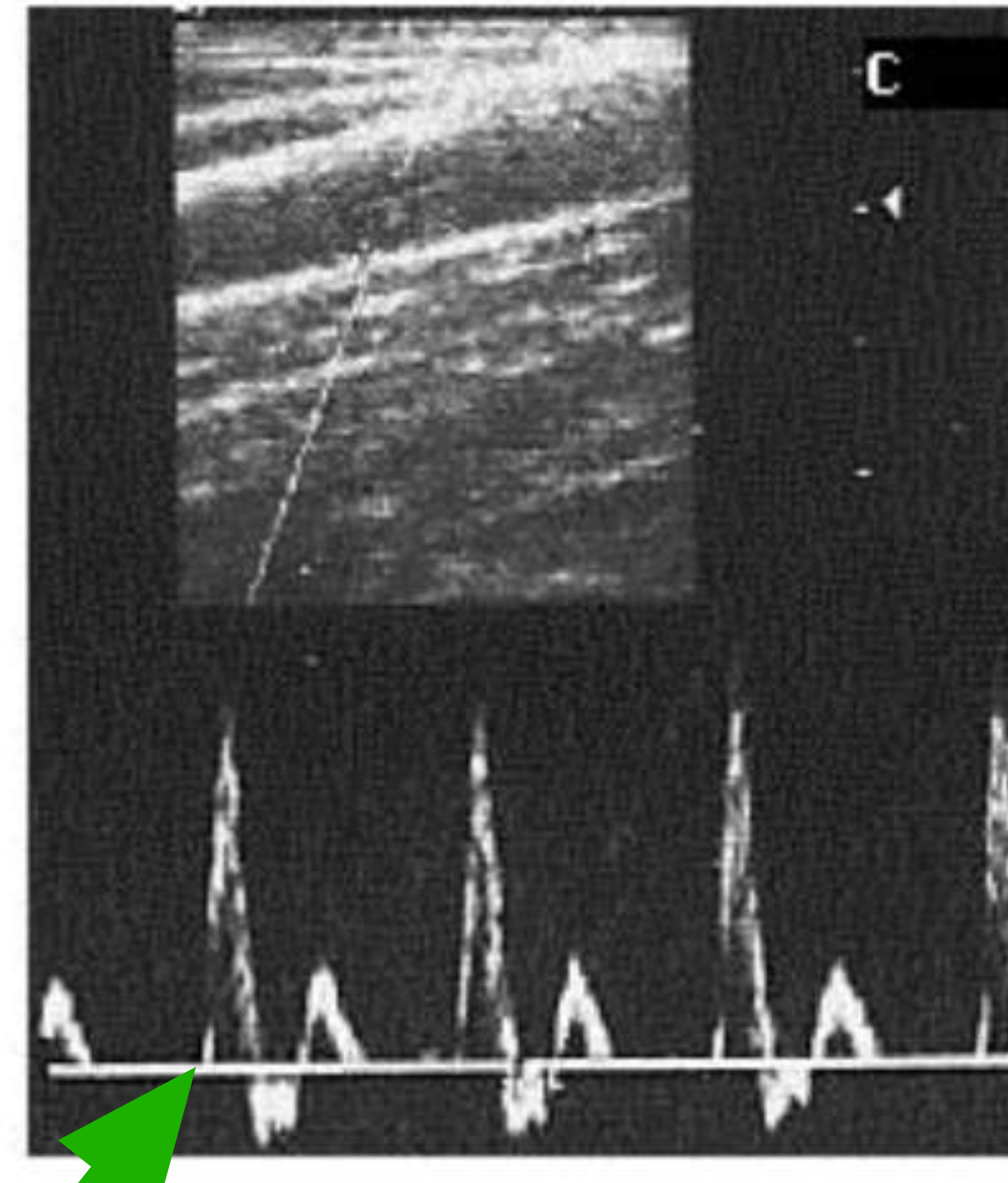
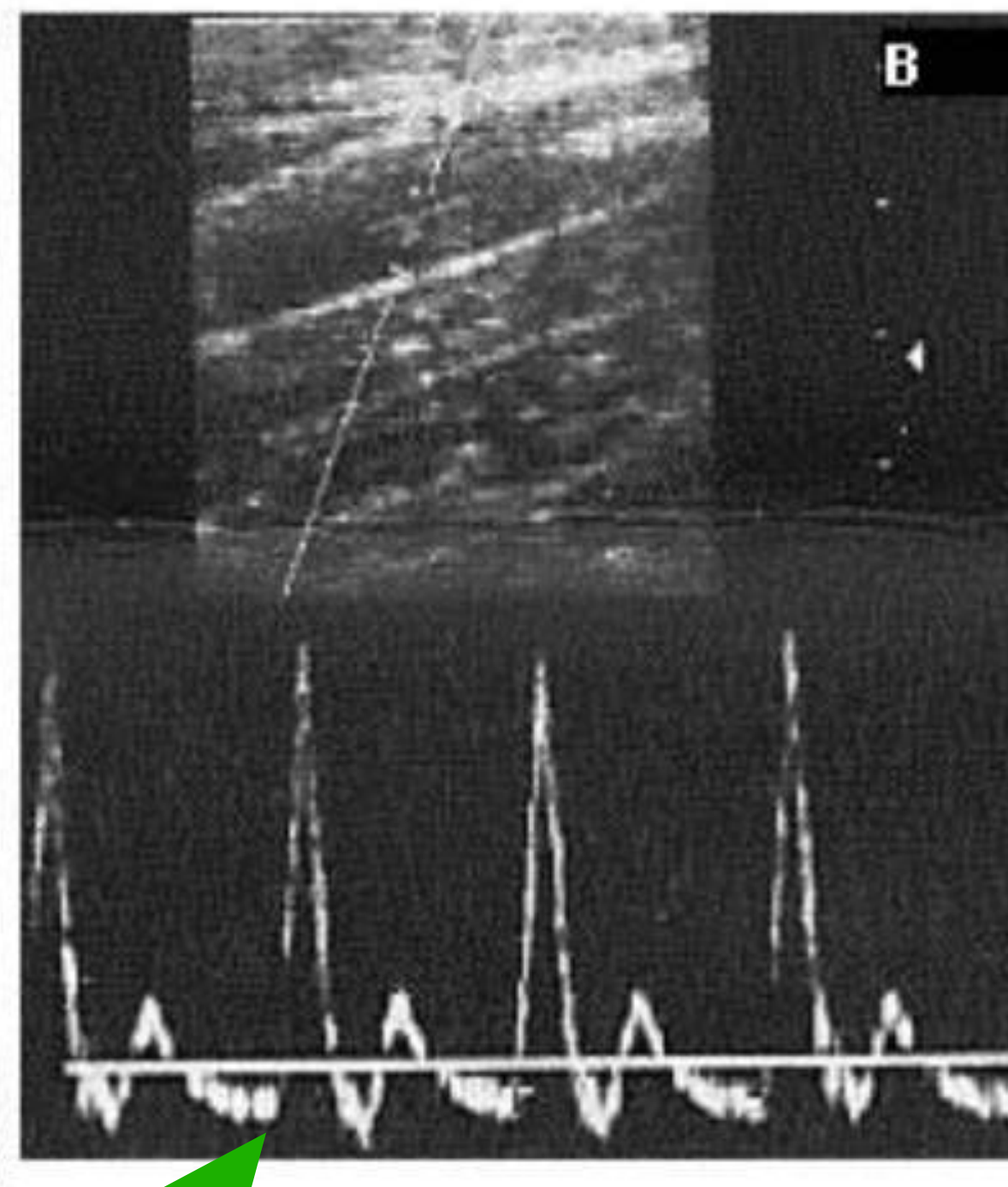
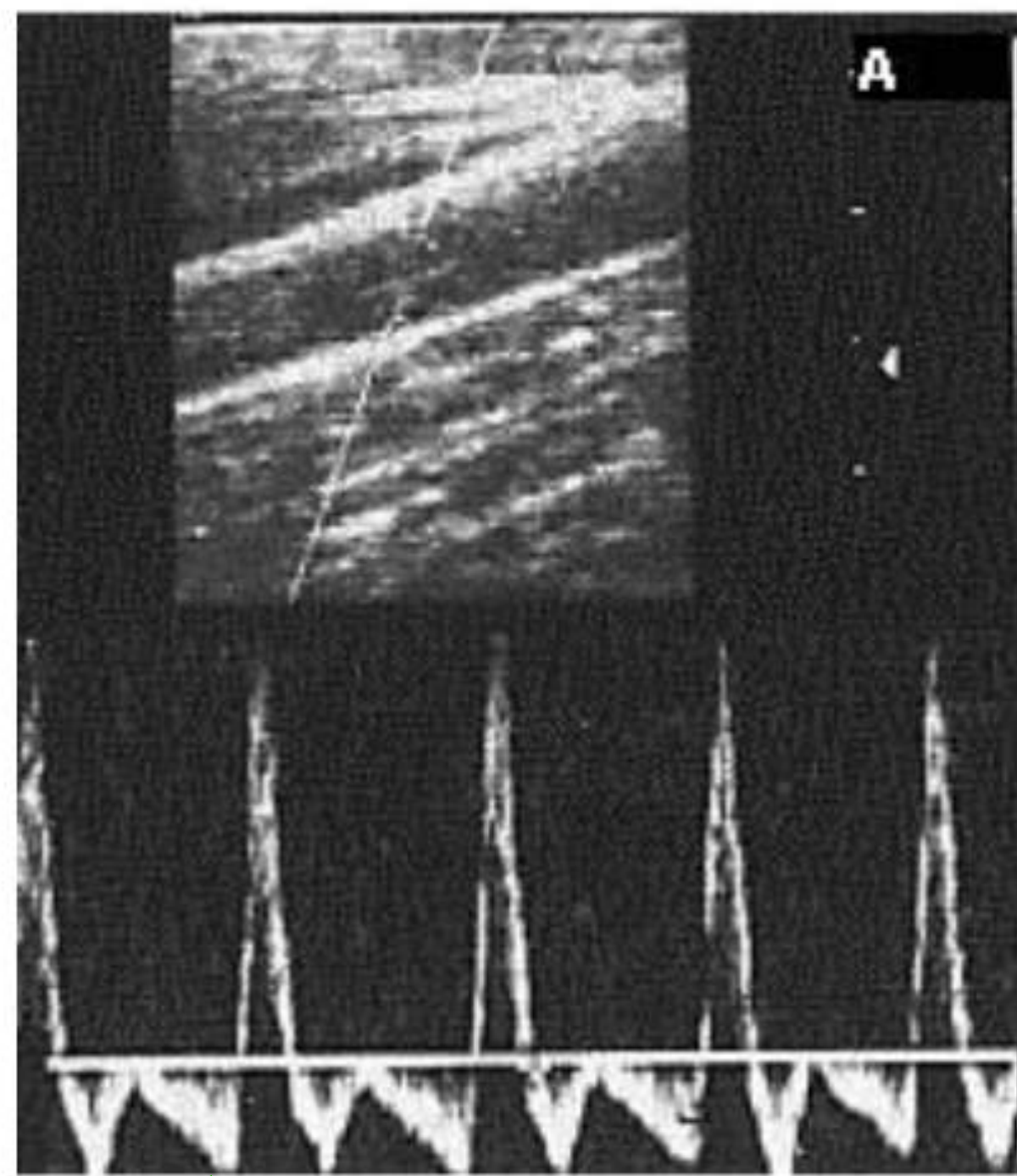
Pressioni di compressione



State of the Art Safety Standards in RA
THE EUROPEAN SOCIETY OF REGIONAL
ANAESTHESIA & PAIN THERAPY



European Society of
Regional Anaesthesia
& Pain Therapy
ESRA ITALIA



pari a PAD

pari a PAM

assente

pari a 40mmHg

**ATTENZIONE AL
TRIFASICO!!**

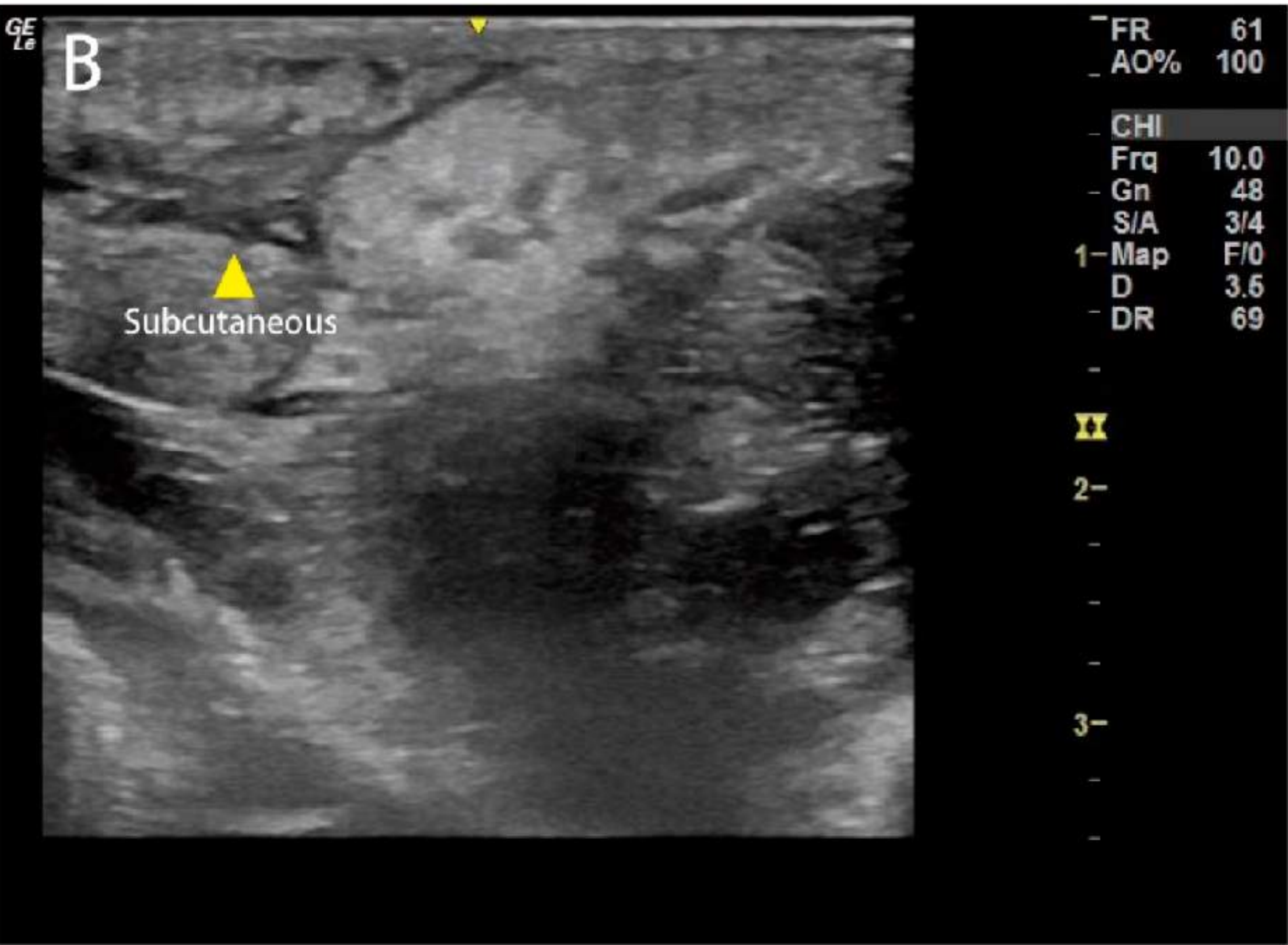
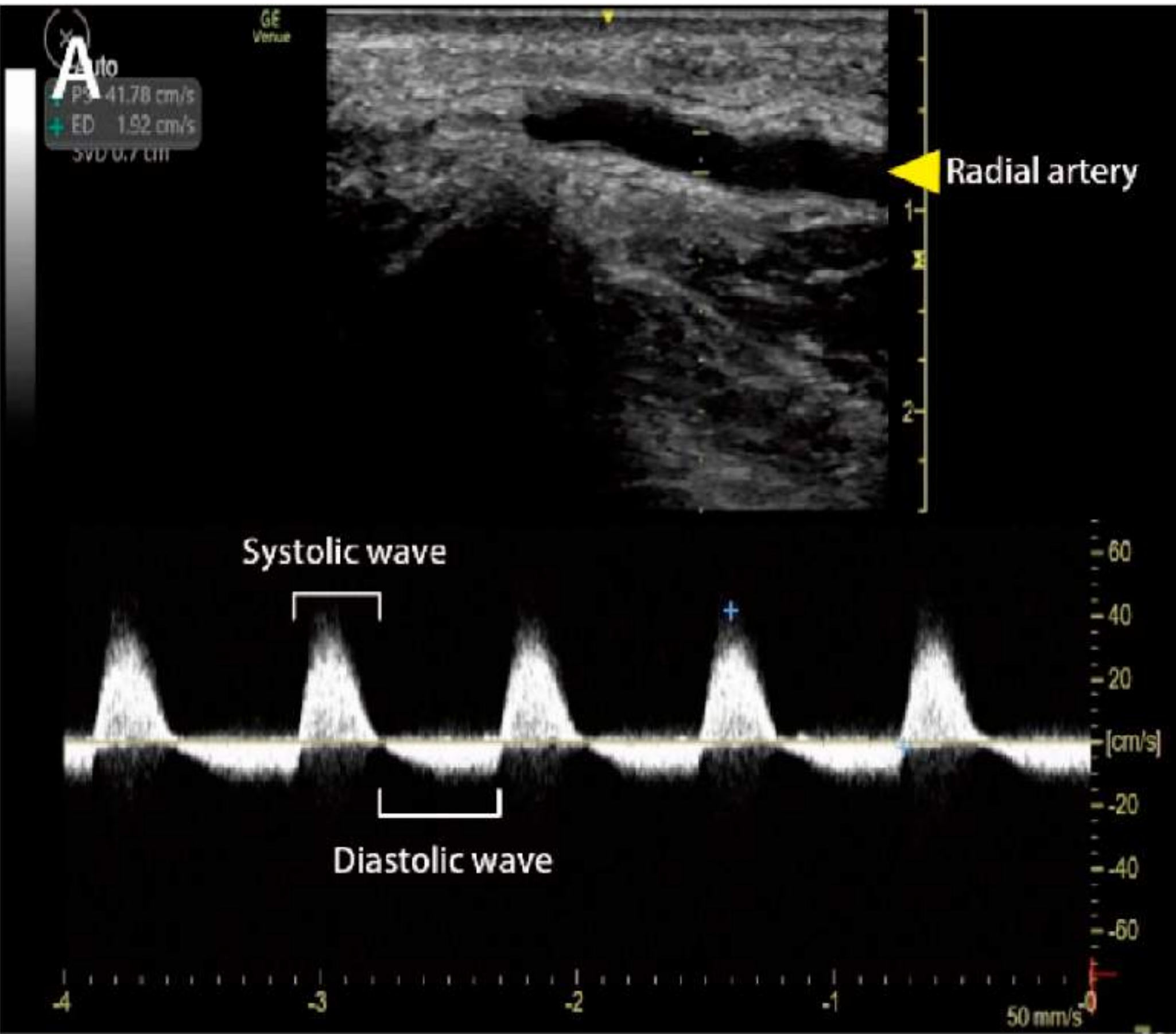
The Ochsner Journal 13:500-506, 2013
© Academic Division of Ochsner Clinic Foundation

**Pulsed Doppler in Simulated Compartment Syndrome:
A Pilot Study to Record Hemodynamic Compromise**

Santiago Mc Loughlin, MD,* Mario Jorge Mc Loughlin, MD,*† Francisco Mateu, MD*



DRAF - Diastolic Retrograd Arterial Flow



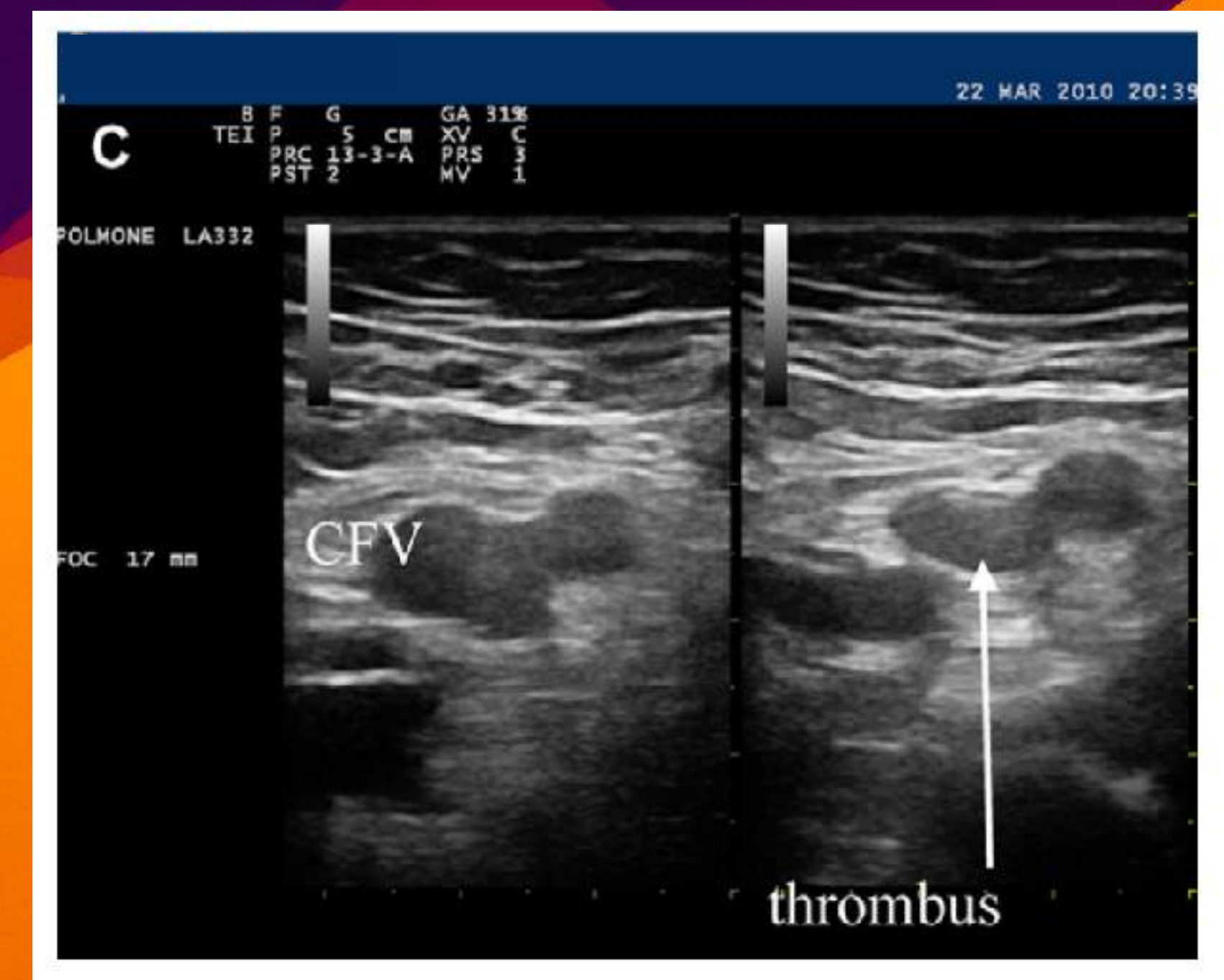
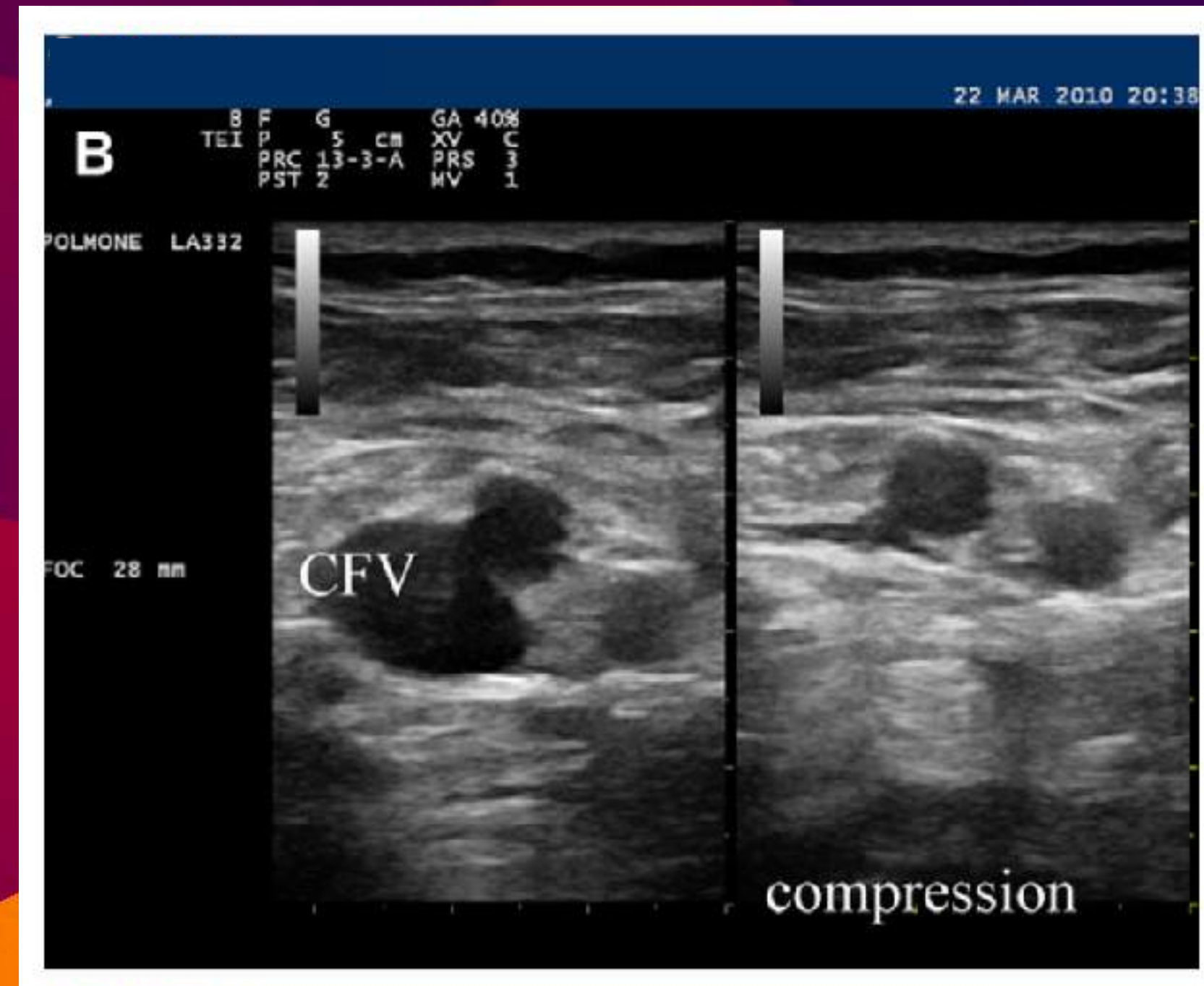
TVP e CUS



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ANAESTHESIA & PAIN THERAPY



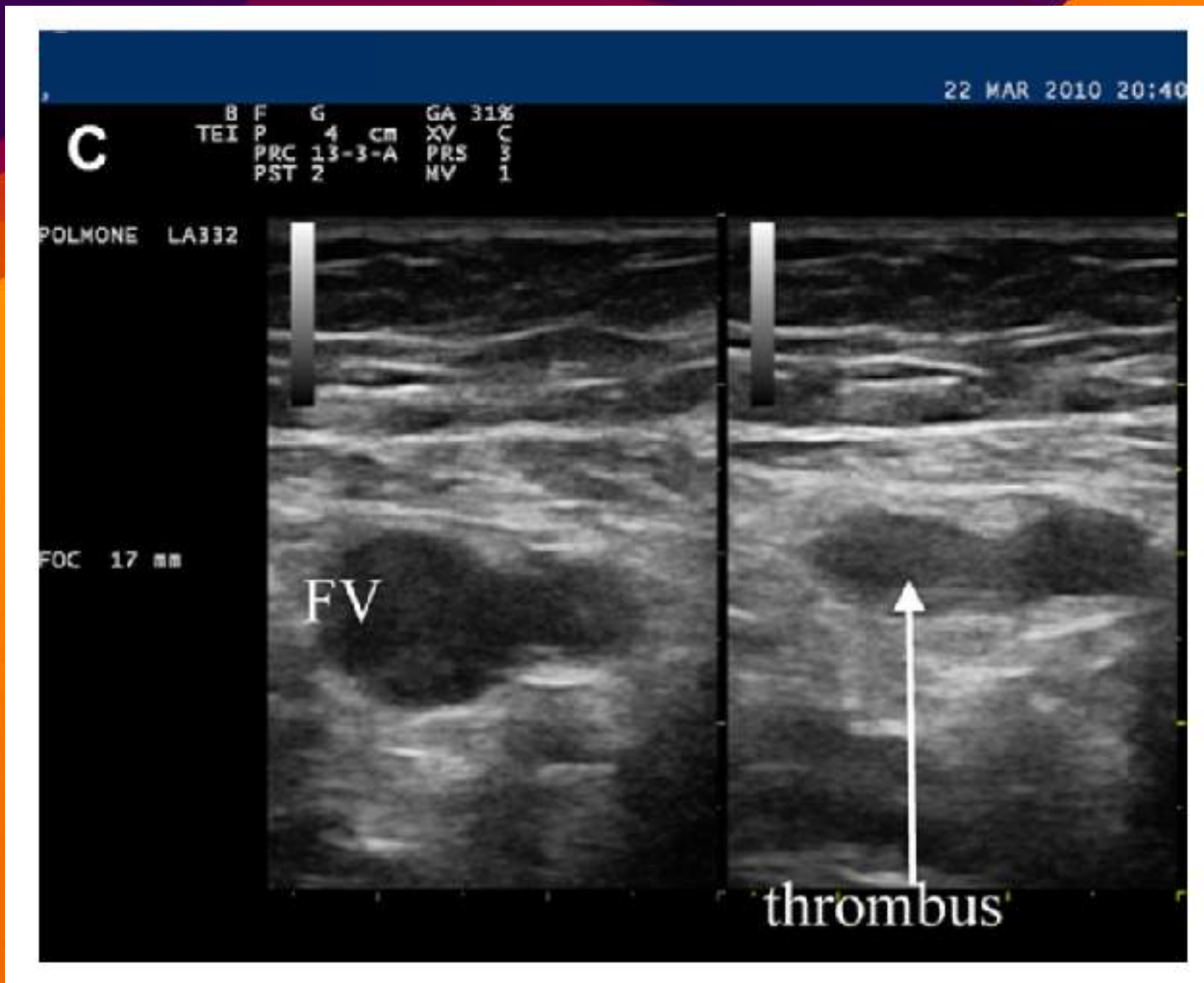
European Society of
Regional Anaesthesia
& Pain Therapy
ESRA ITALIA



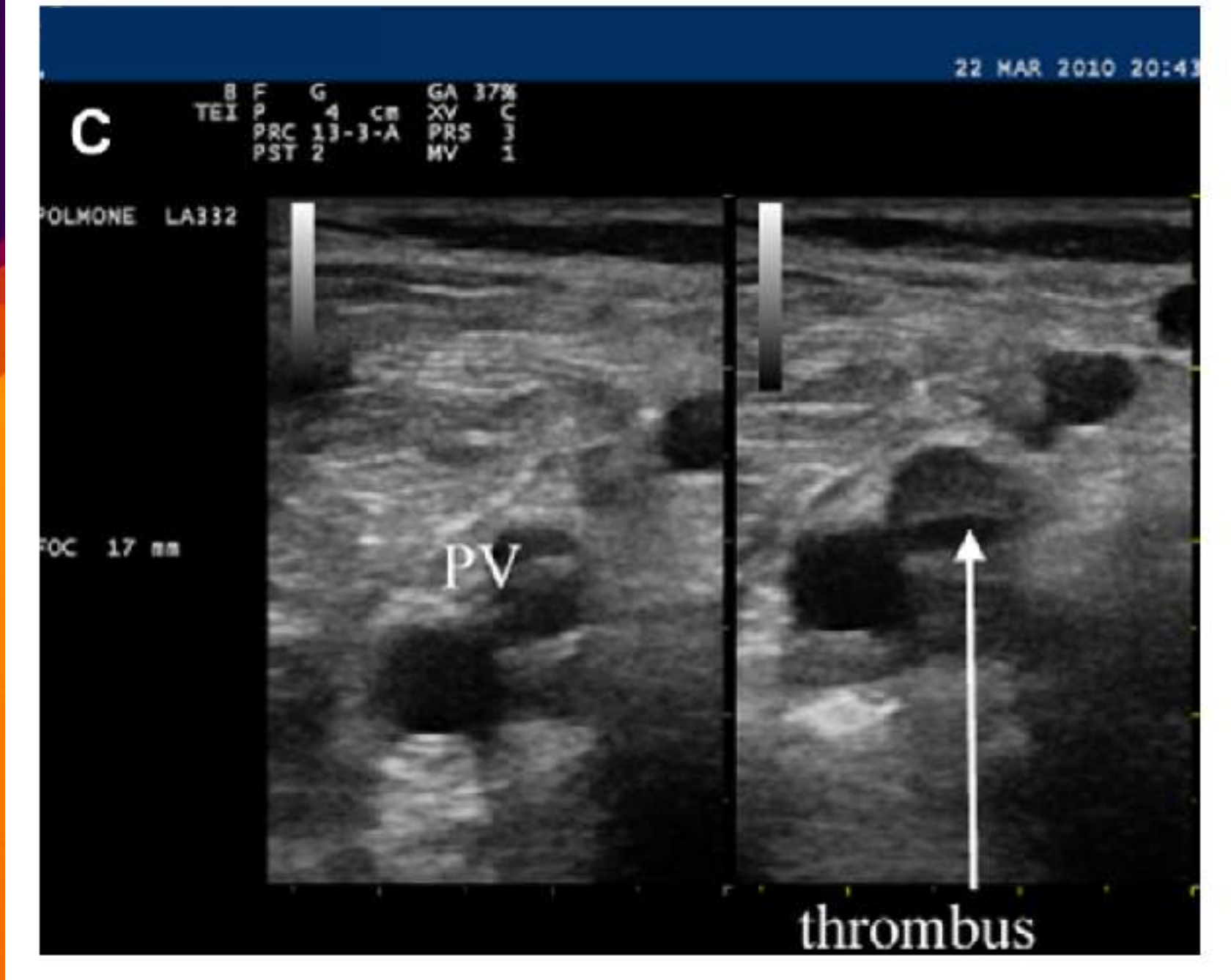
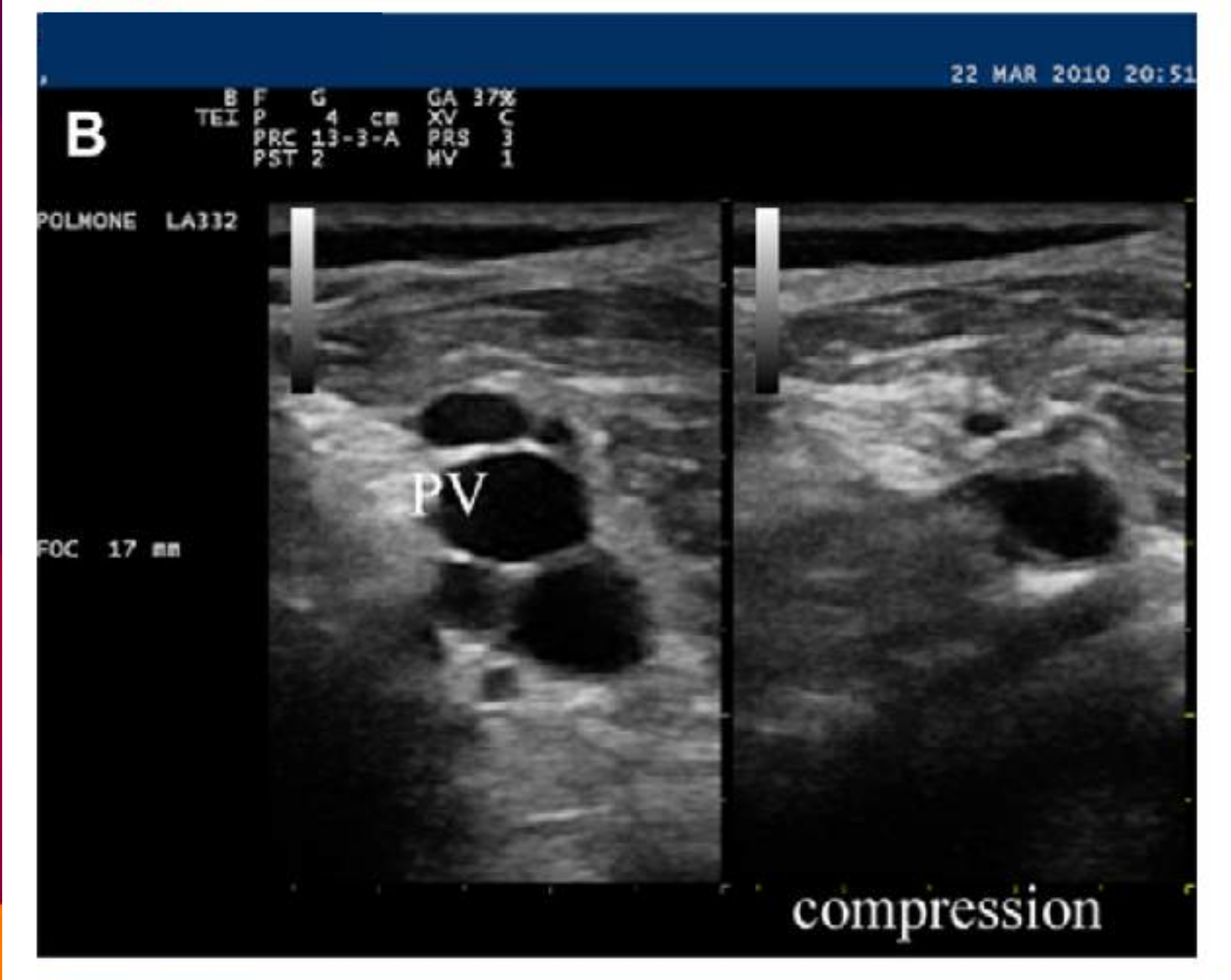
**Extended Compression Ultrasound Performed by
Emergency Physicians: A Modified Compression
Ultrasound Examination to Detect Superficial and
Deep Lower Limb Thromboses in the Emergency
Department**

Alfredo Barillari ^{1*}, Giovanni Barillari ², Samantha Pasca ²

femorale comune



femorale superficiale



poplitea



grande e piccola safena

D - Diuresis....?

Valutazione POUR

Post Operative Urinary Retention



Anestetici locali:

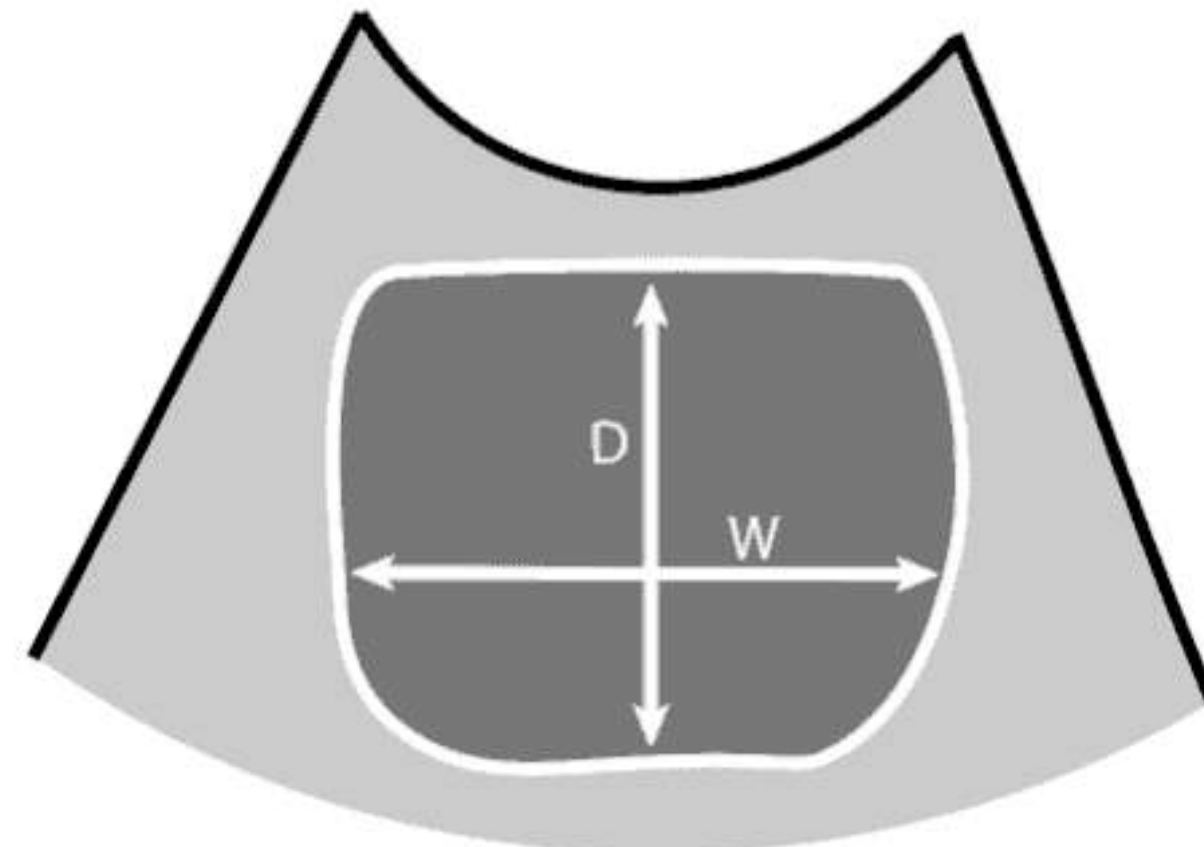
- disfunzione detrusore più lunga di blocco motorio (es: bupivacaina iperbarica 462min vs 233min)
- minzione quando blocco < S3

Oppioidi intratecali:

- disfunzione del detrusore dose-relata
- disfunzione anche >24h

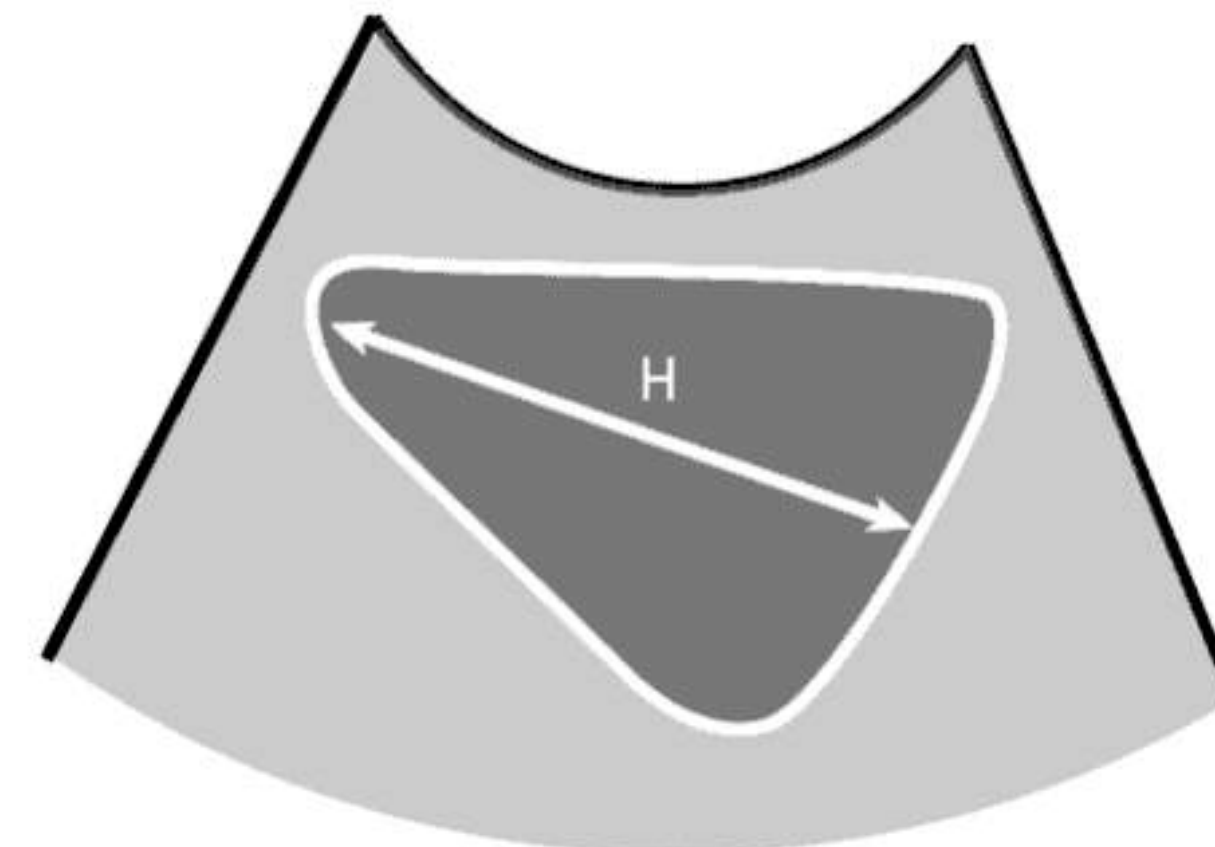
$$\text{Bladder Volume} = \text{Width} \times \text{Depth} \times \text{Height} \times 0.7^*$$

Transverse View



W = Width
D = Depth

Longitudinal View



H = Height



*0.7 is the correction coefficient. This value depends on the shape of the bladder

REVIEW ARTICLE/BRIEF REVIEW

Neuraxial anesthesia and bladder dysfunction in the perioperative period: a systematic review

Anesthésie neuraxiale et dysfonction vésicale en période périopératoire: une revue systématique

Stephen Choi, MD · Padraig Mahon, MD ·
Imad T. Awad, MBChB



**torniamo
al futuro!**

chiara.bajocco@gmail.com