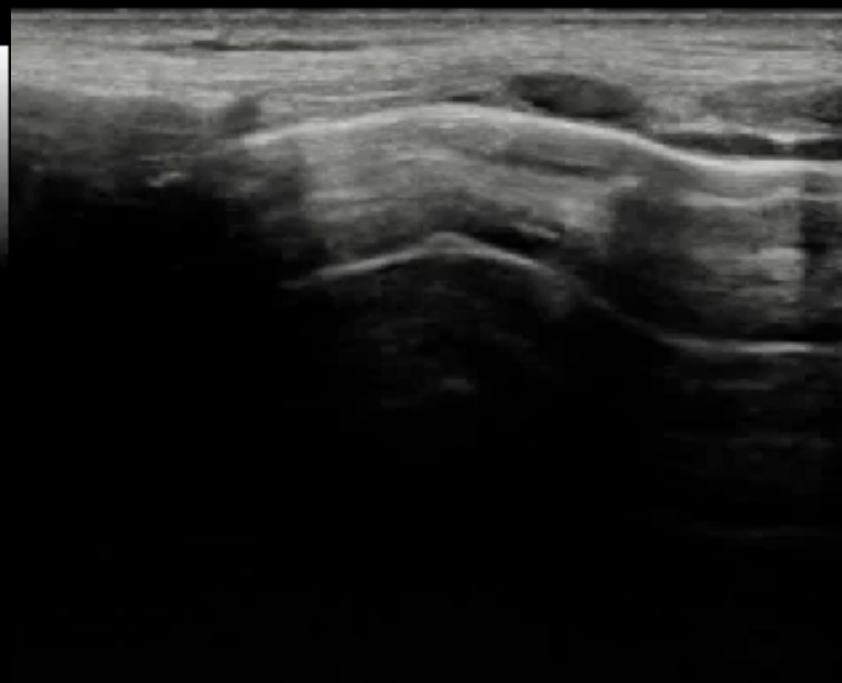
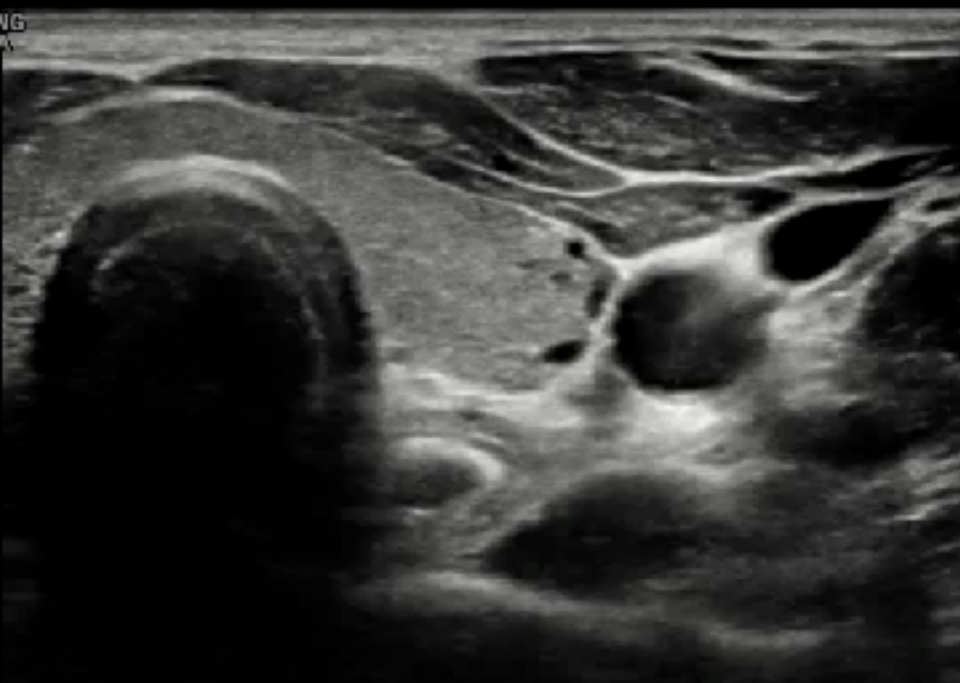




Airway Ultrasound

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

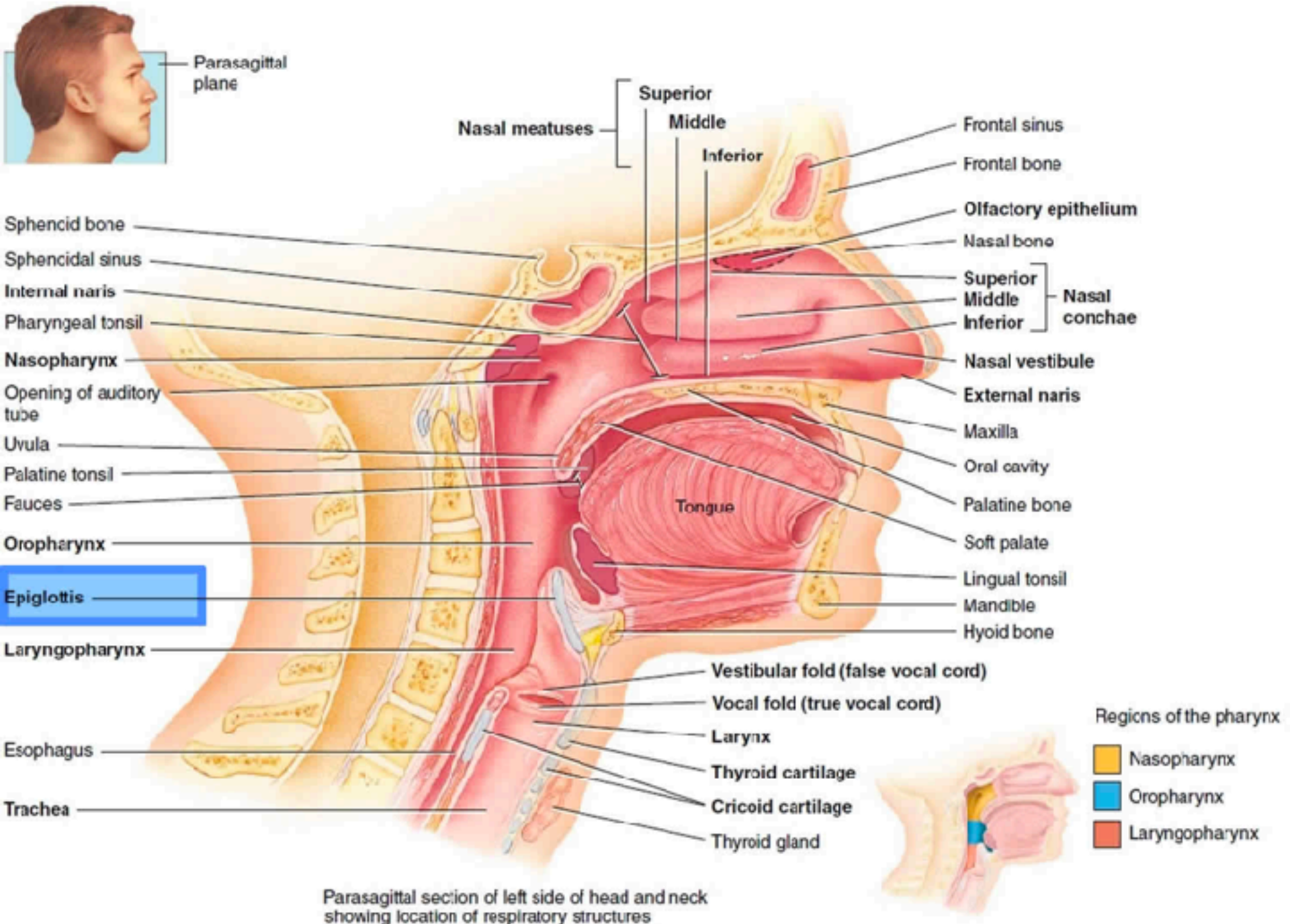
Hepatobiliary

Urinary tract

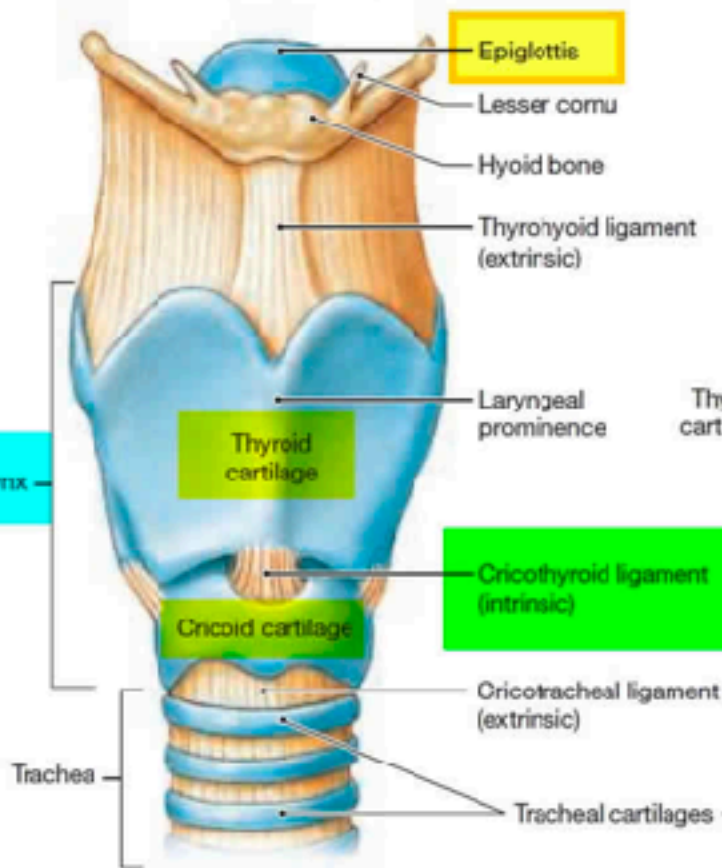
Pregnancy

Bowel

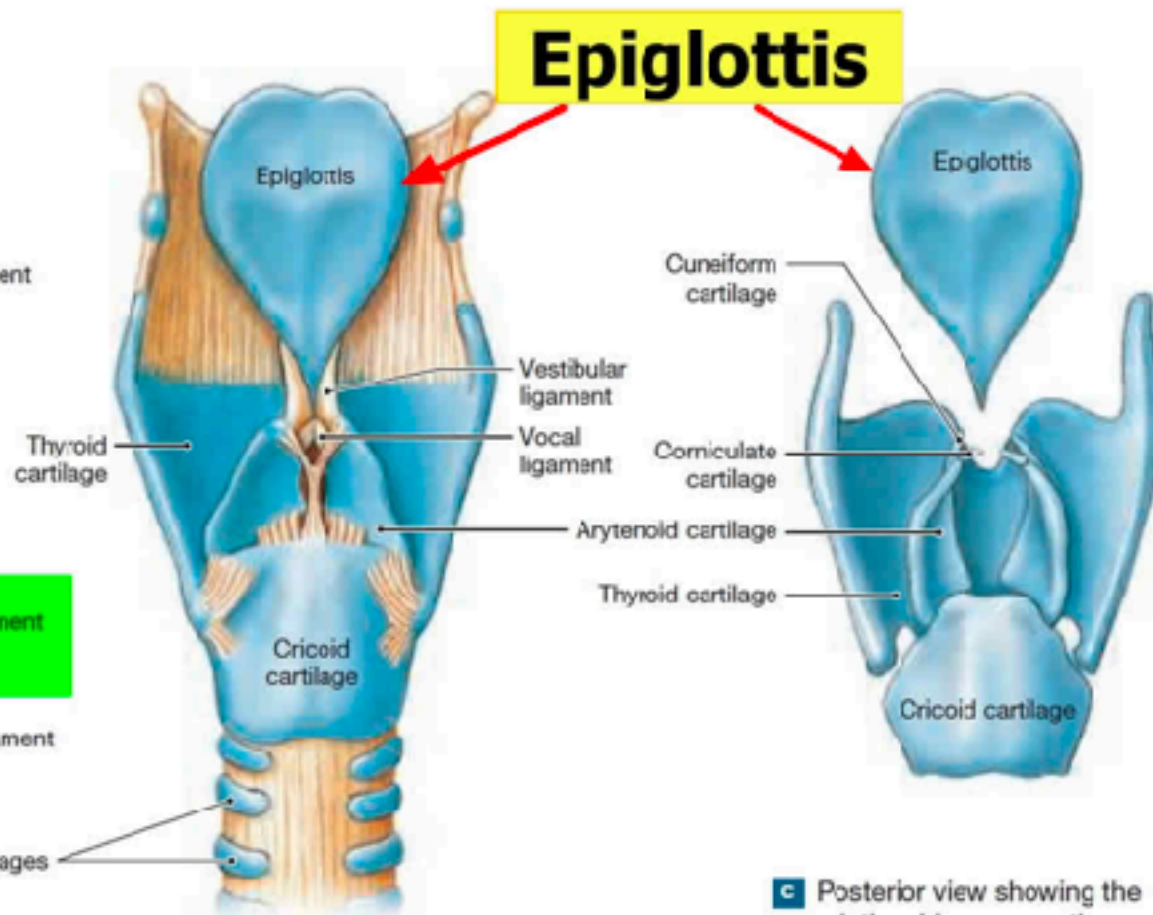
MSK



Anatomy of the Larynx

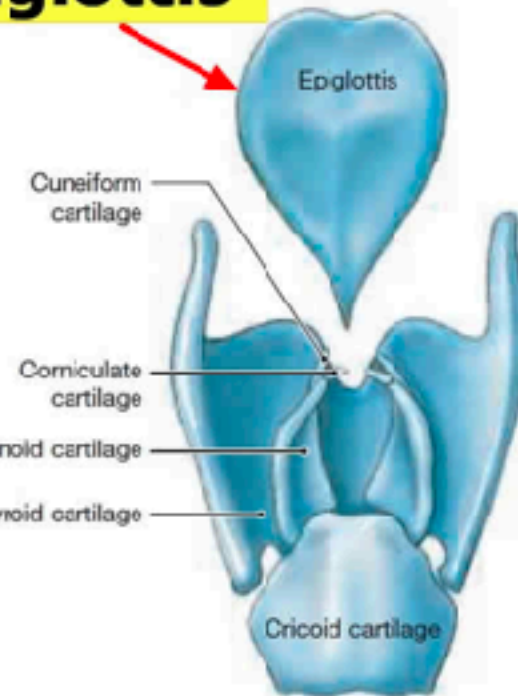


a Anterior view of the intact larynx



b Posterior view of the intact larynx

Epiglottis



c Posterior view showing the relationships among the individual laryngeal cartilages

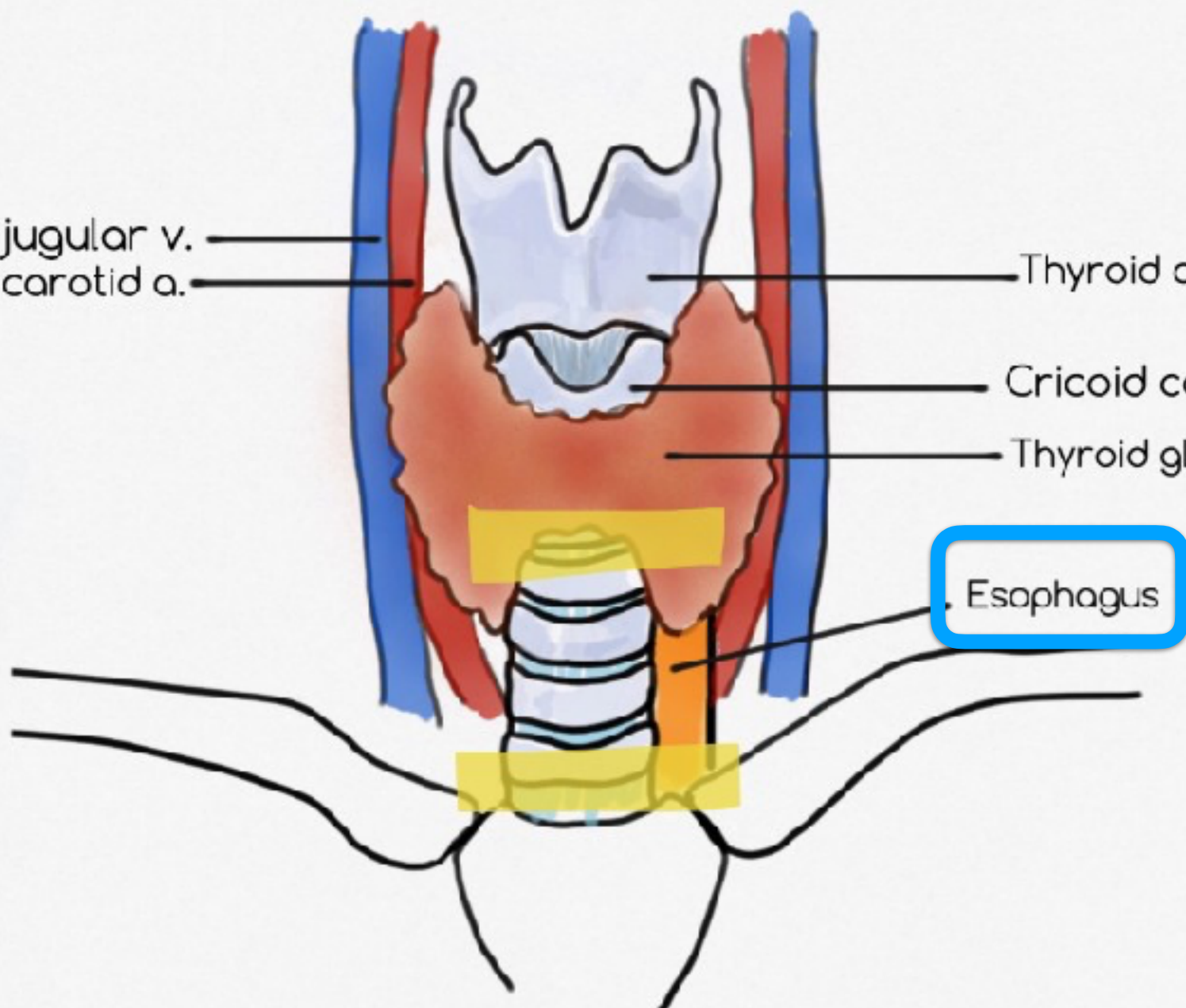
Internal jugular v.
Common carotid a.

Thyroid cartilage

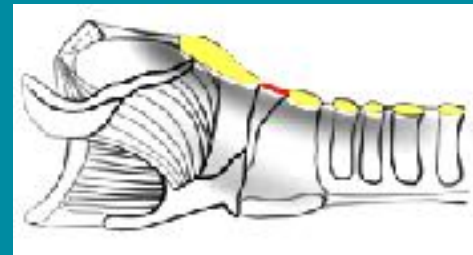
Cricoid cartilage

Thyroid gland

Esophagus



Airway POCUS



1



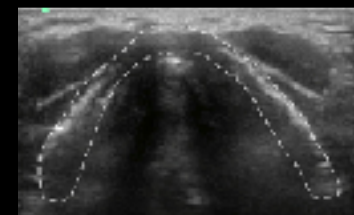
5



A



E



2



6



B



F



3



7



C



G



4



8



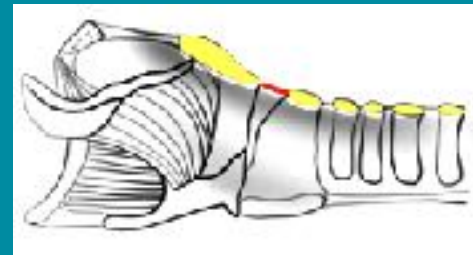
D



H



Airway POCUS



1



5



B



H



2



6



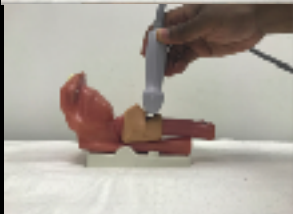
G



A



3



7



D



F



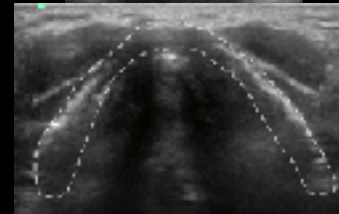
4



8

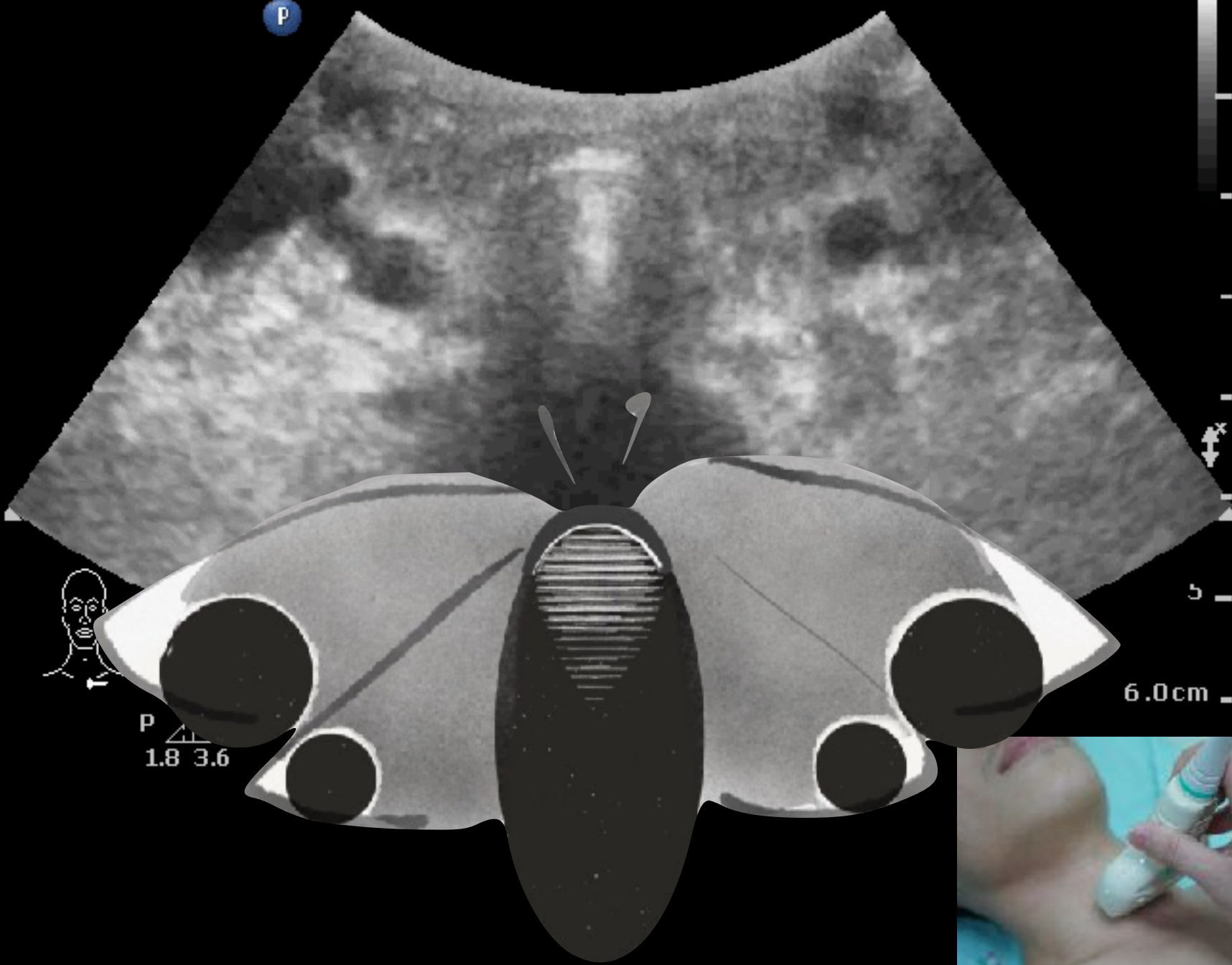


E

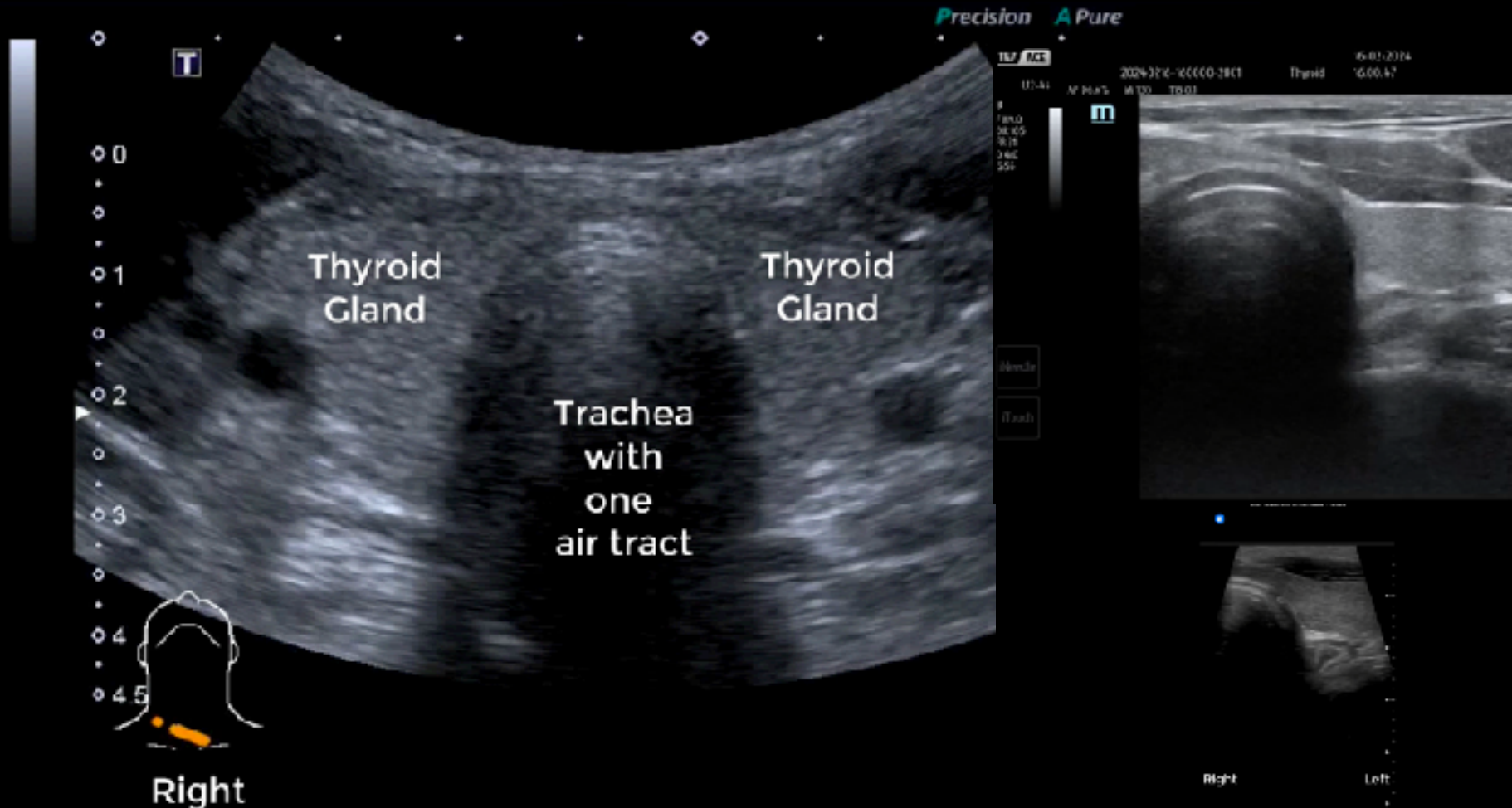


C





Airway (one tract)



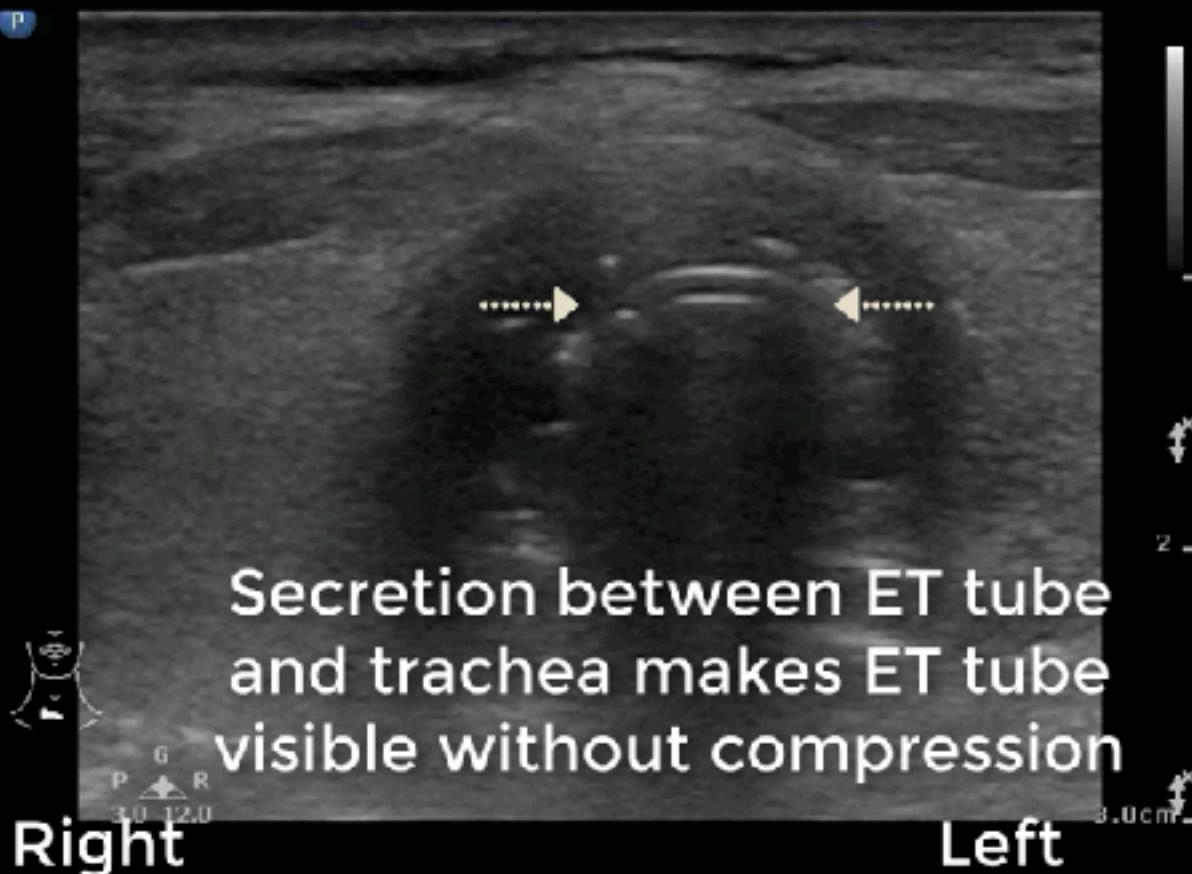
Airway & Esophagus

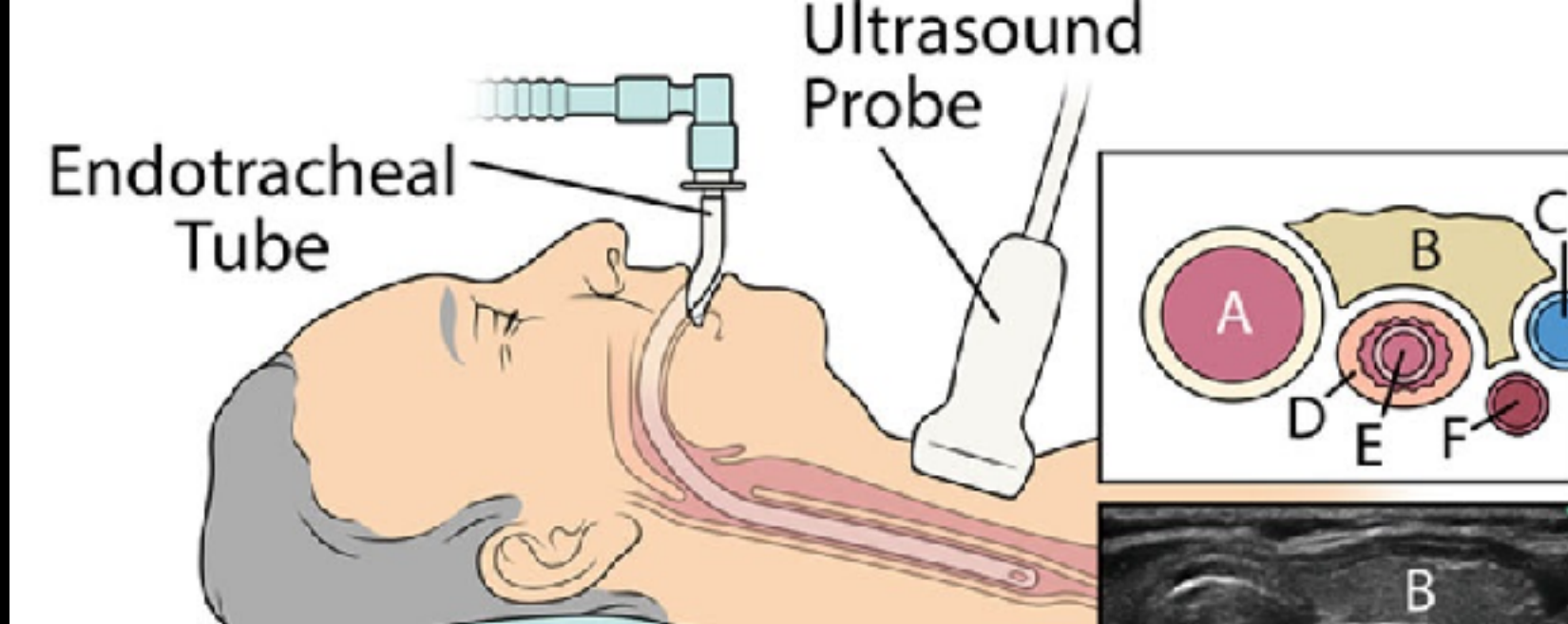


Airway (one tract)

Superficial P
L12-3
31 Hz
3.0cm

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





Superficial
L12-3
46 Hz
3.0cm
2D
Res
Gn 60
C 56
3/2/1

Tract 1
(Trachea)

Tract 2
(ET tube in
Esophagus)

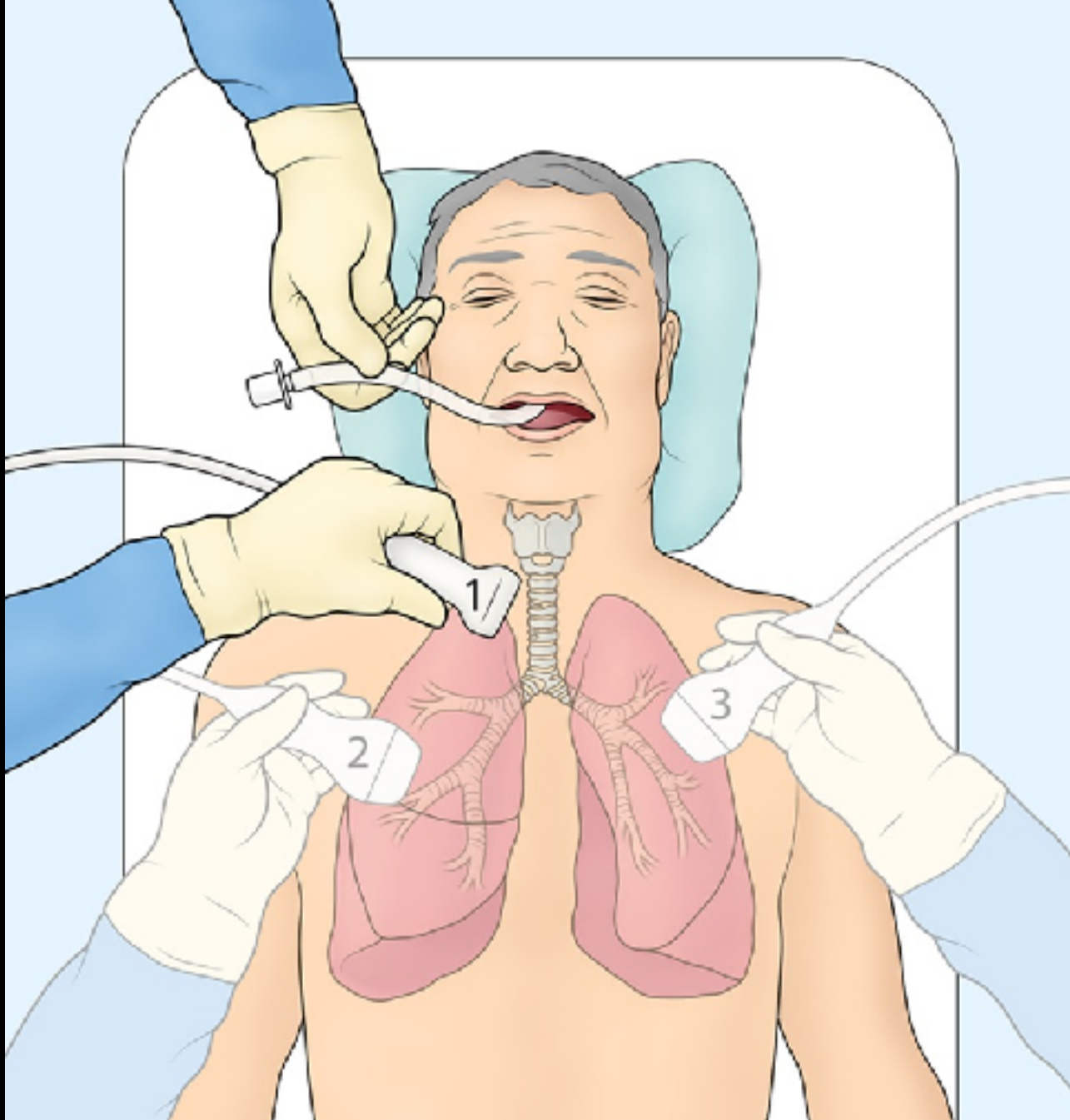


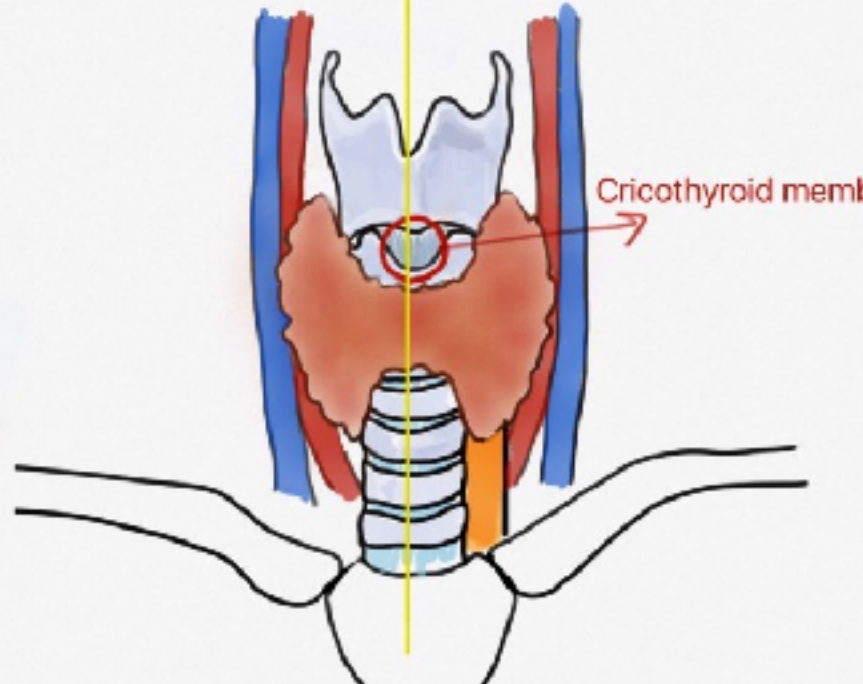
Right

Left

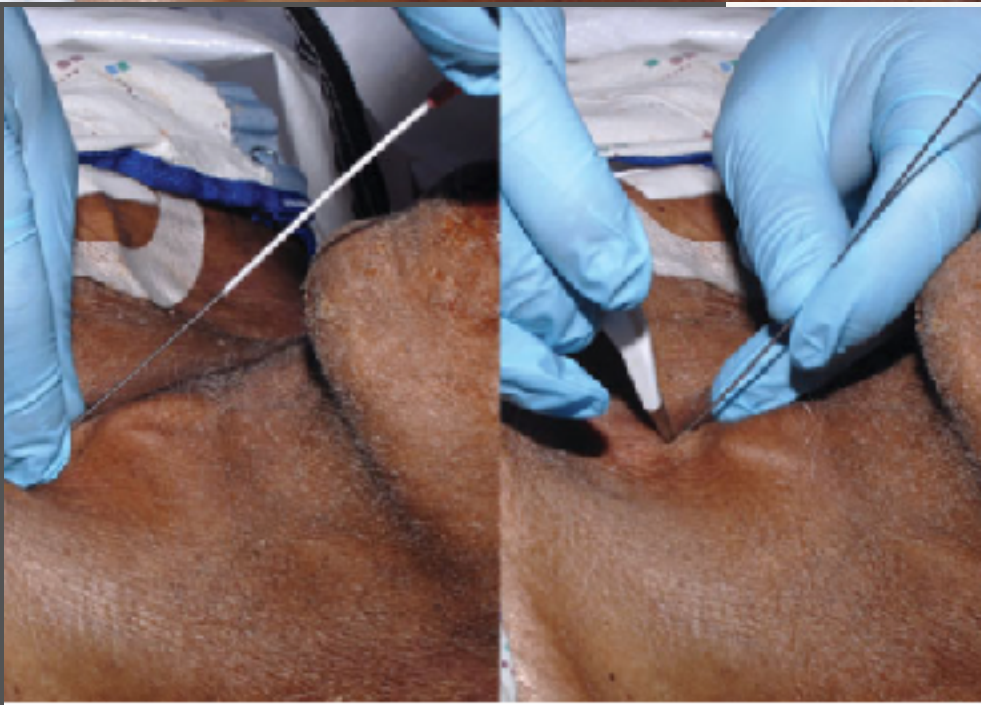


agus
acheal Tube
l Artery

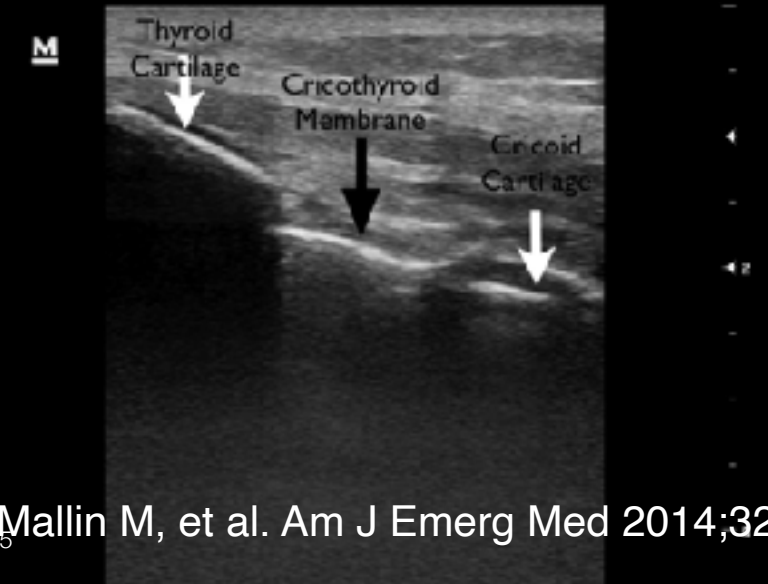




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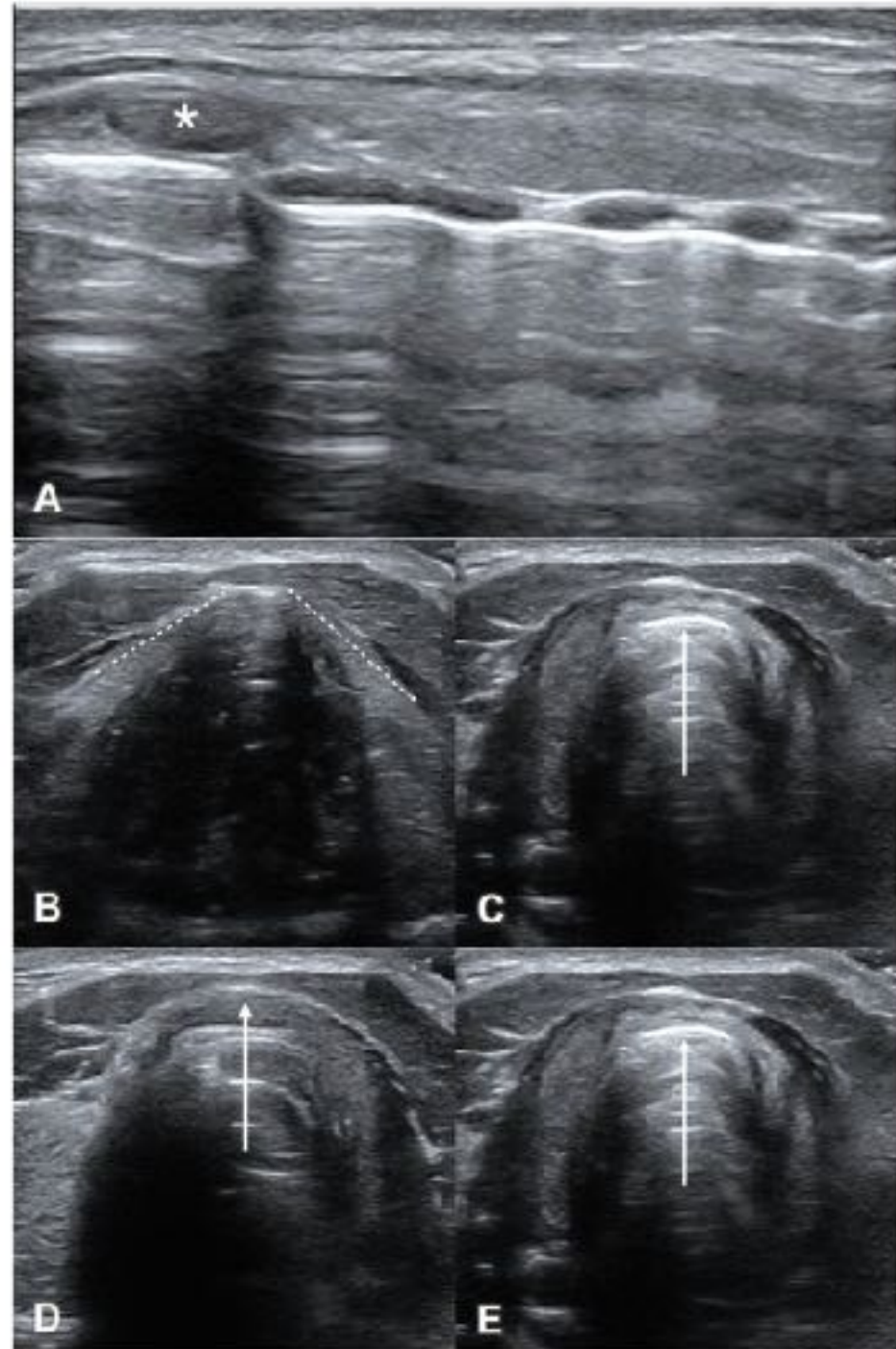
CTM localization prior to intubation



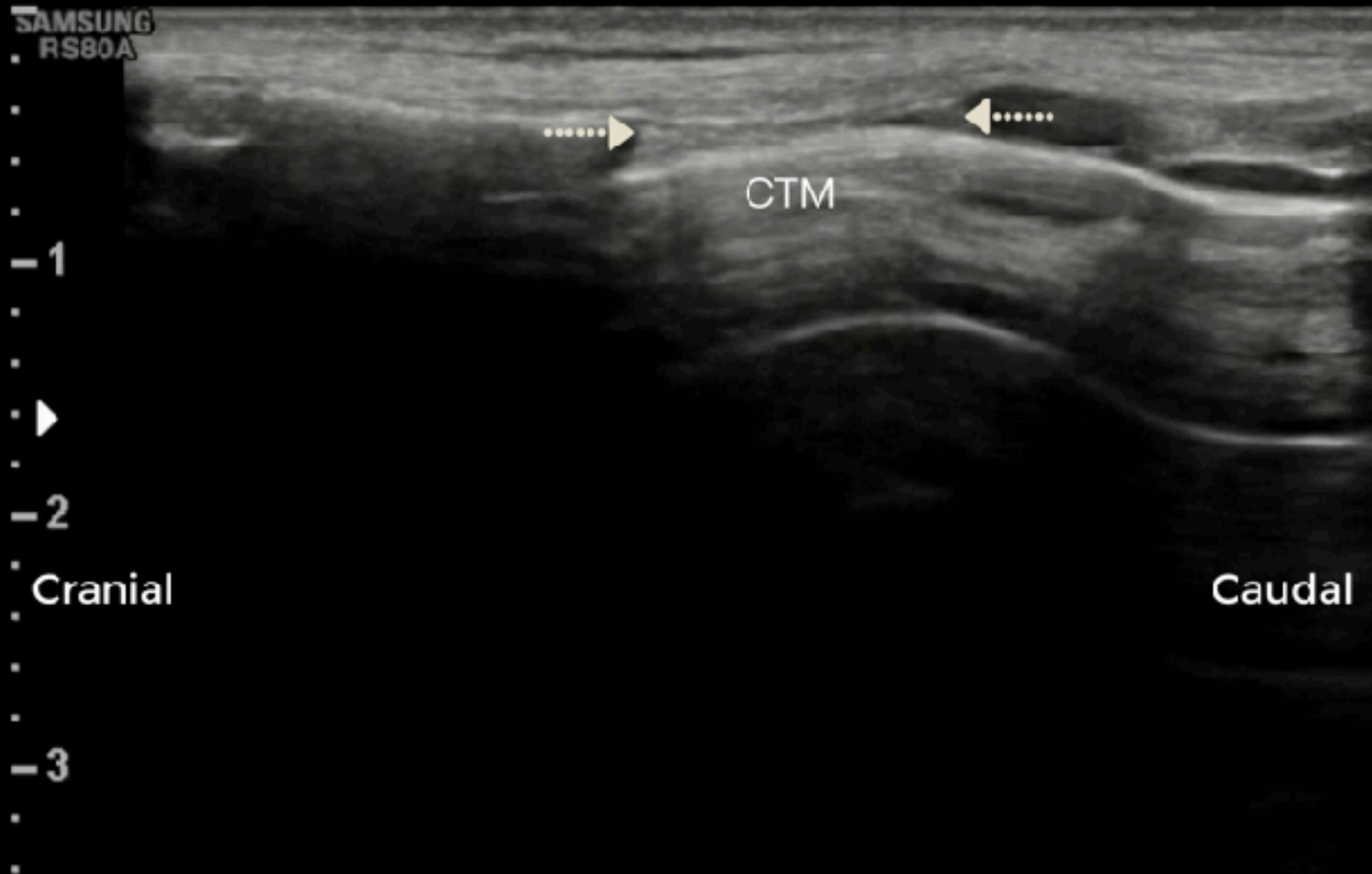
String of pearls

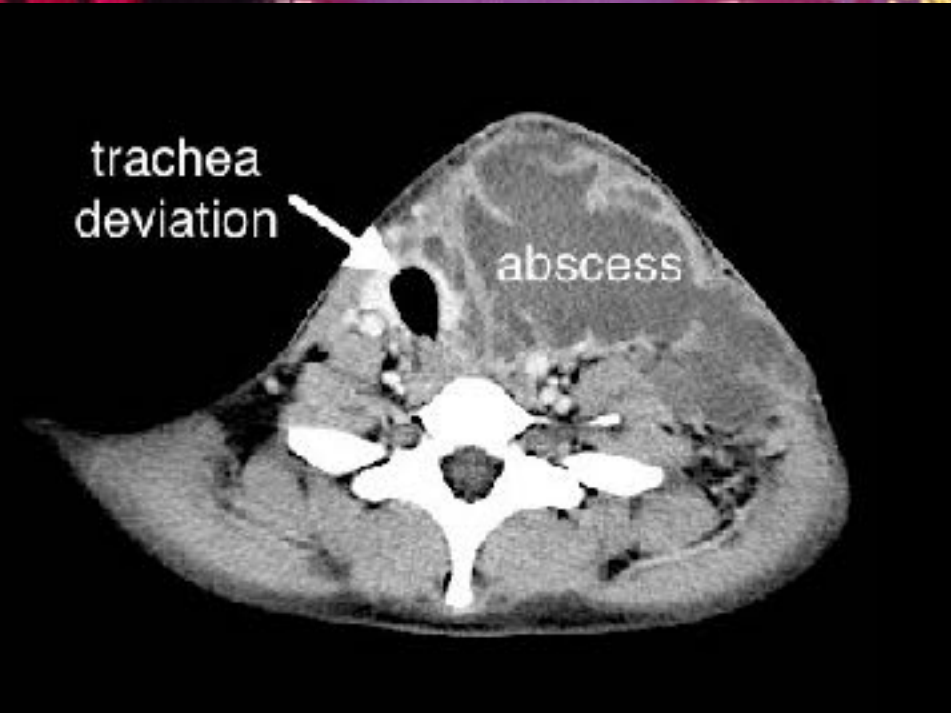
TACA protocol

(trachea - airline - cricoid - airline)



TACA protocol + String of pearls

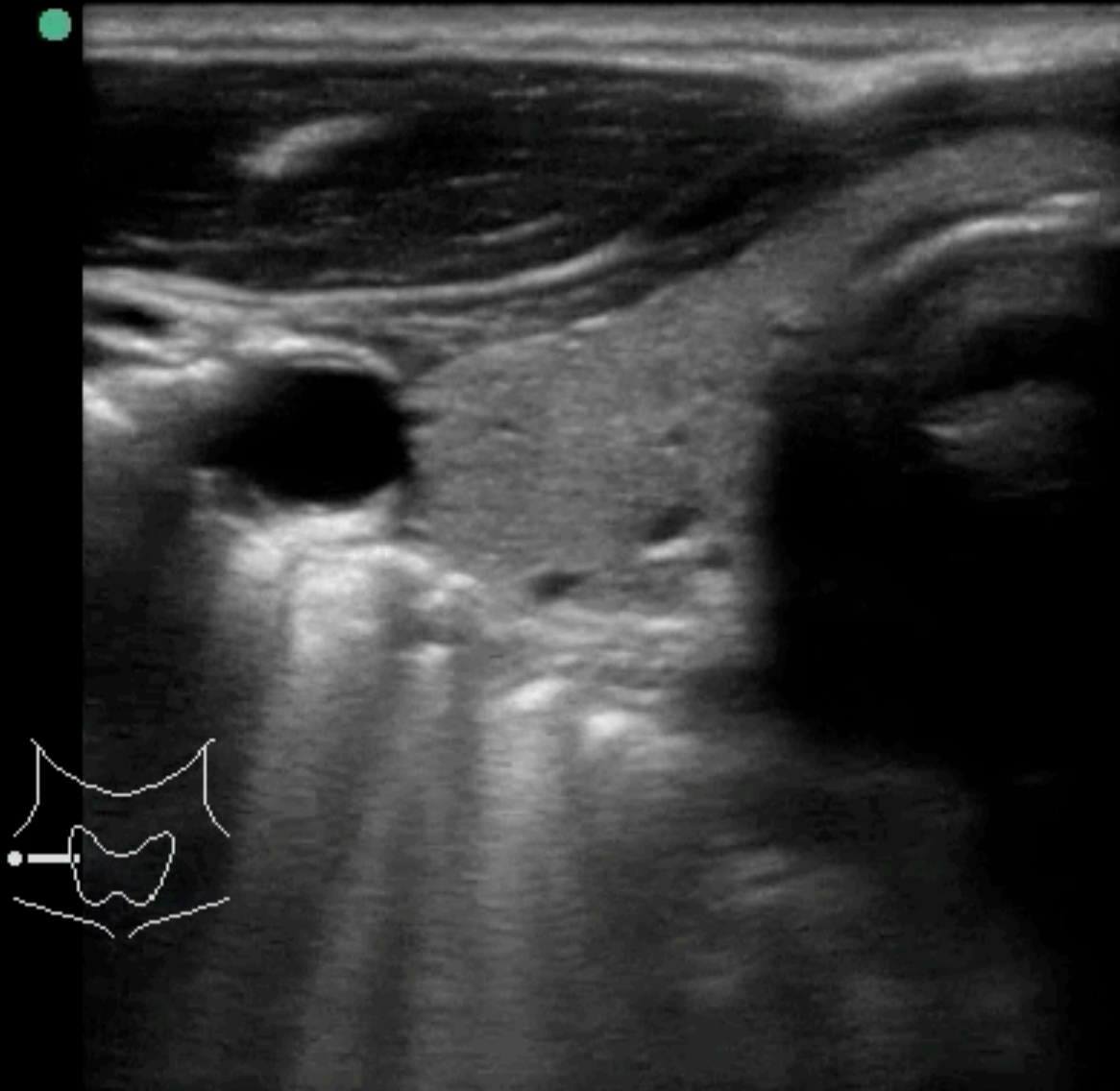




4cm

Subcutaneous emphysema

Gen
S MB



SmP
HFL



40%

MI
0.7

TIS
0.1

A

B



4.0

Stridor & dyspnea

Abd Gen
C5-1
64 Hz
5.0cm

2D

HGen
Gn 90
C 56
3 / 3 / 3



U
P R
1.8 3.6

5.0cm

Laryngeal tumor

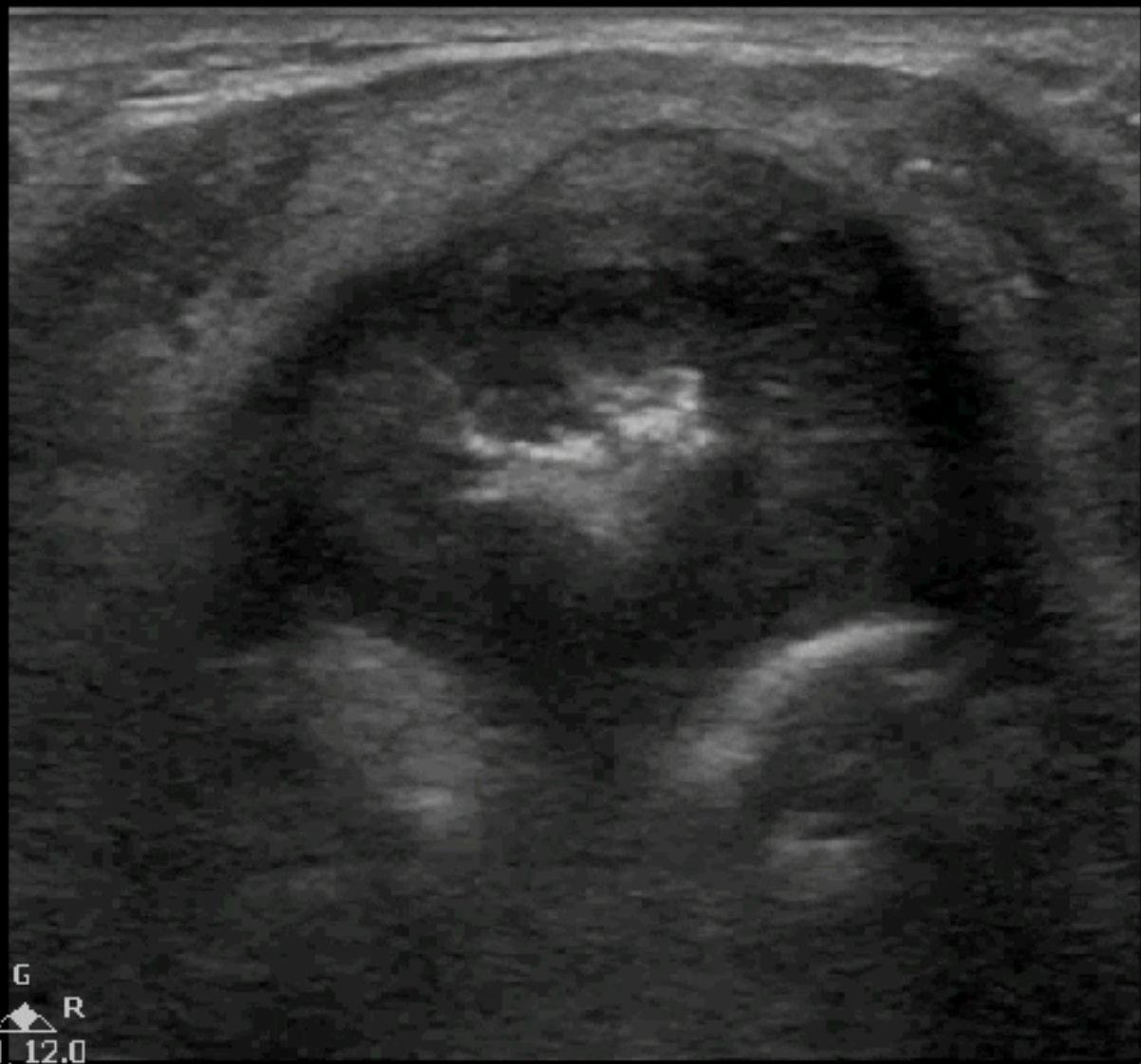
Superficial
L12-3
31 Hz
3.5cm

P

2D
Gen
Gn 93
C 52
4/3/2



G
P R
3.0 12.0



3.5cm

Cricothyroidotomy ?

Superficial

-3

Hz

5cm

n

93

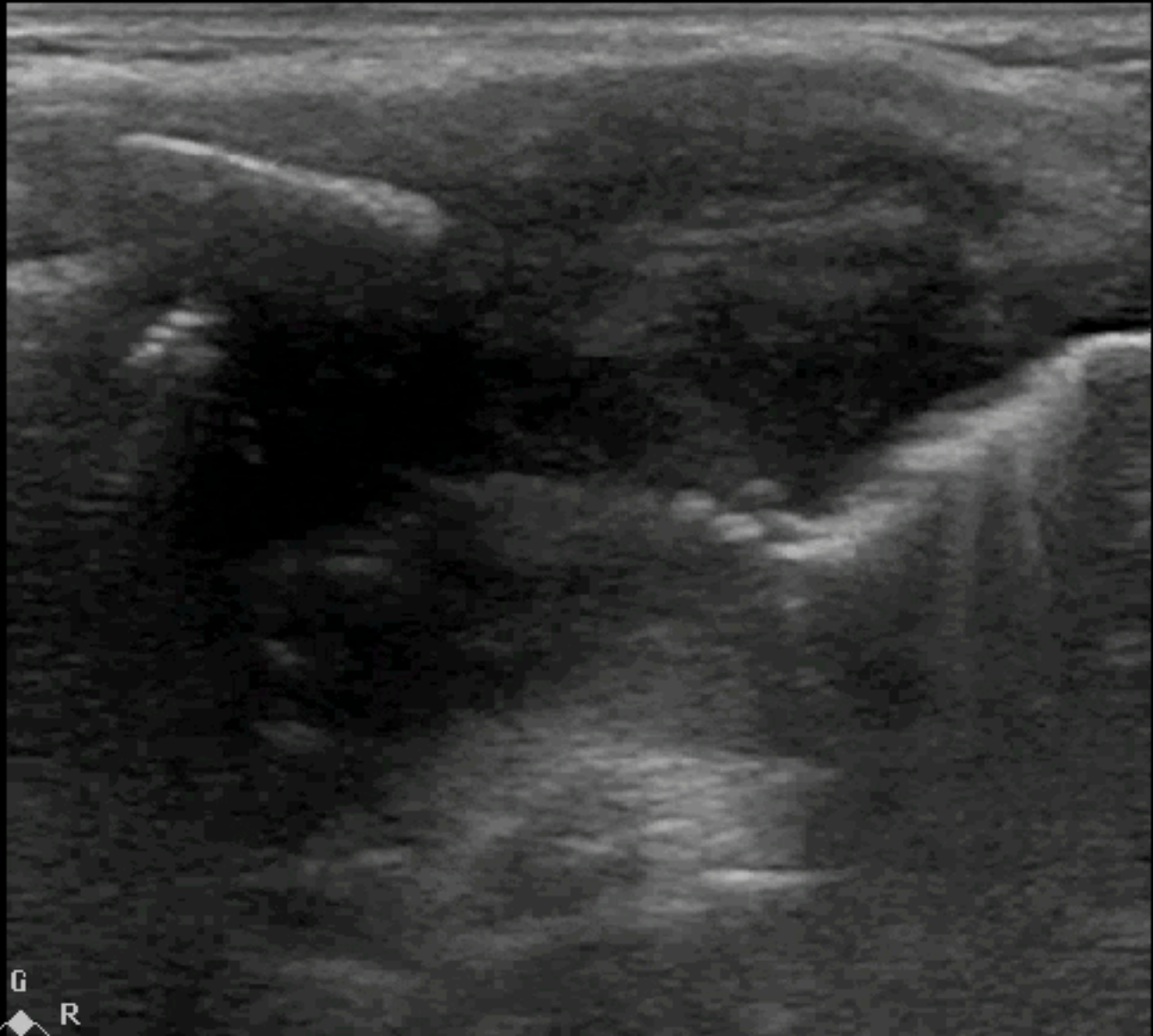
52

3/2

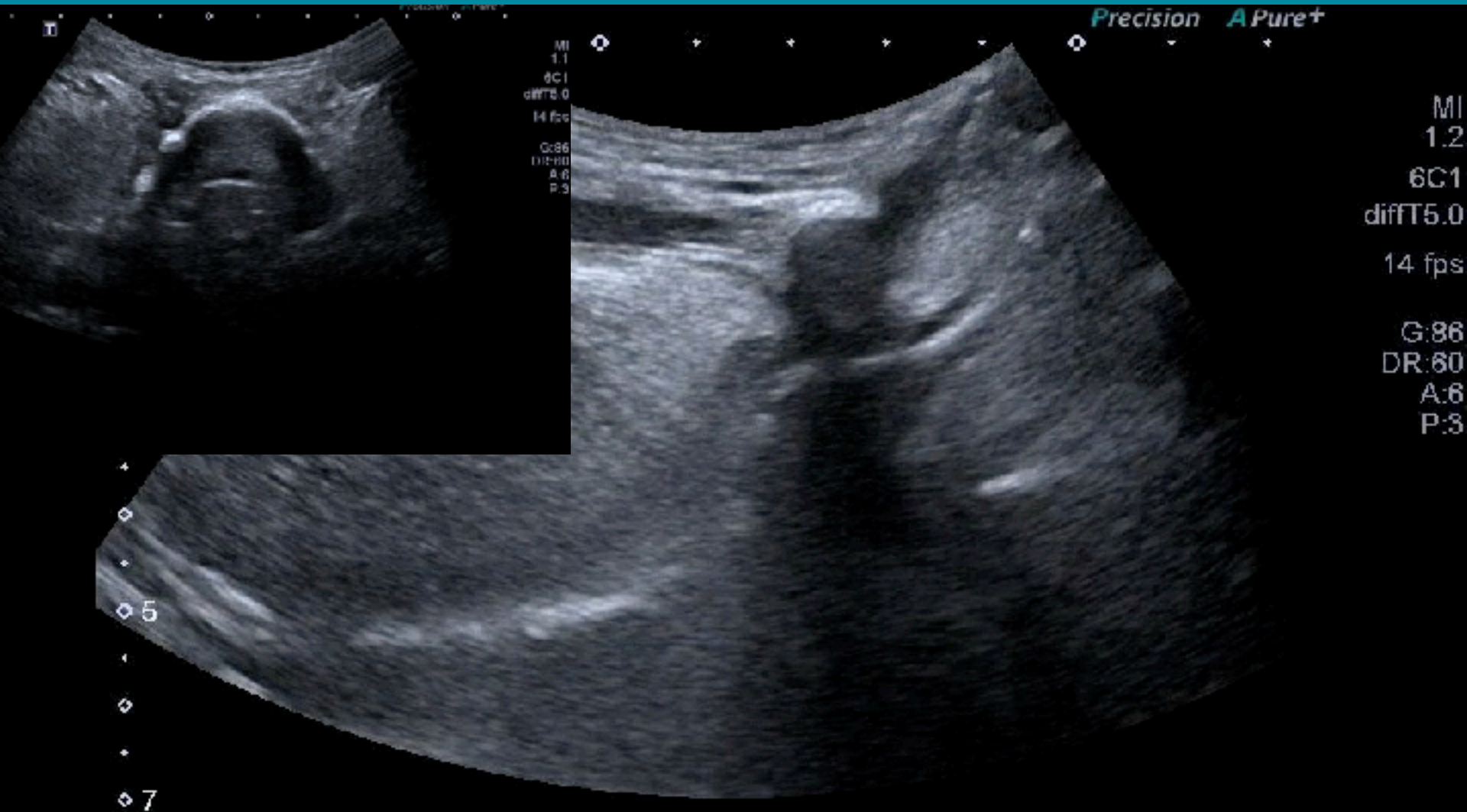
P



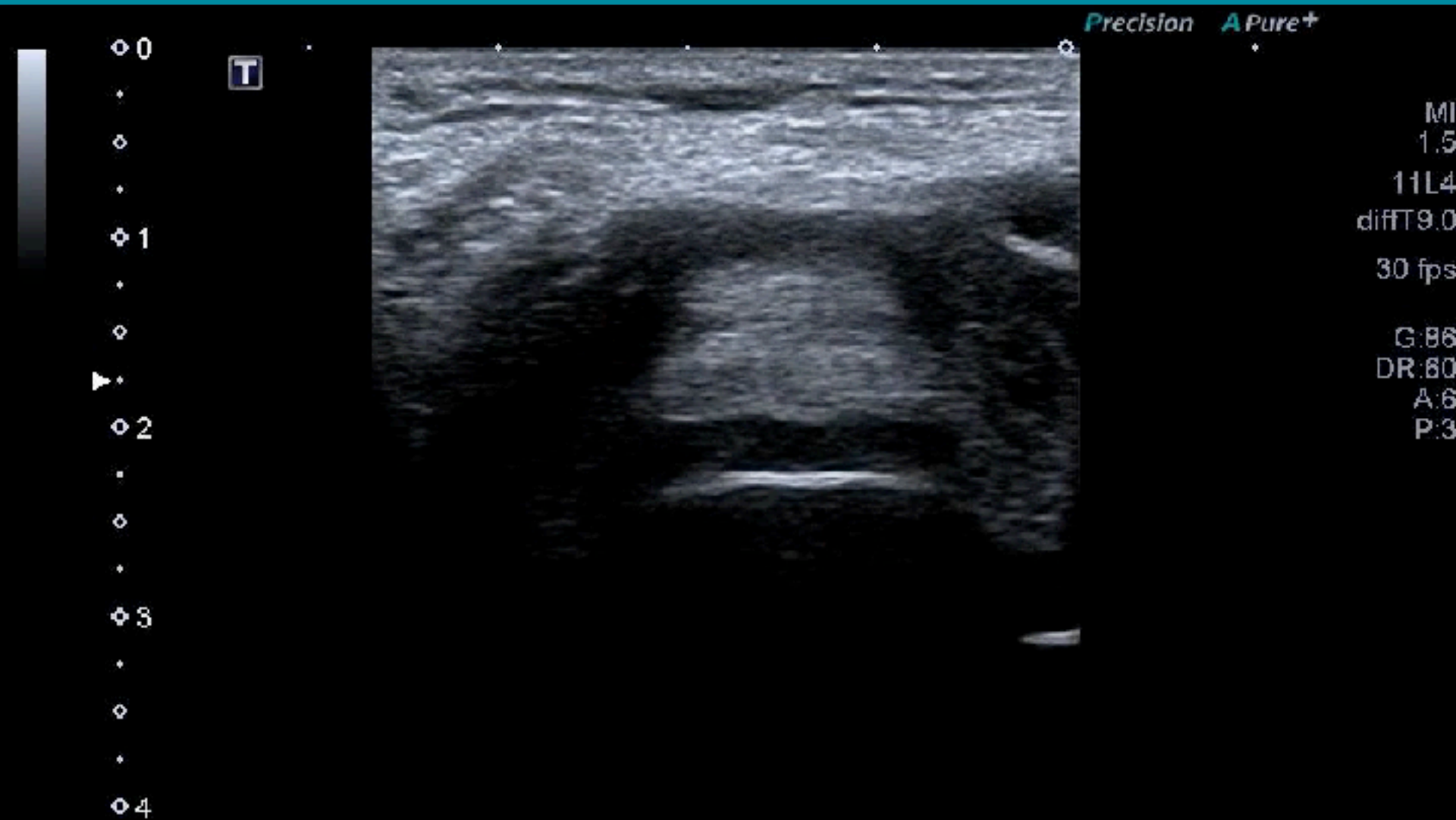
P G R



Hyoid bone: landmark for epiglottitis

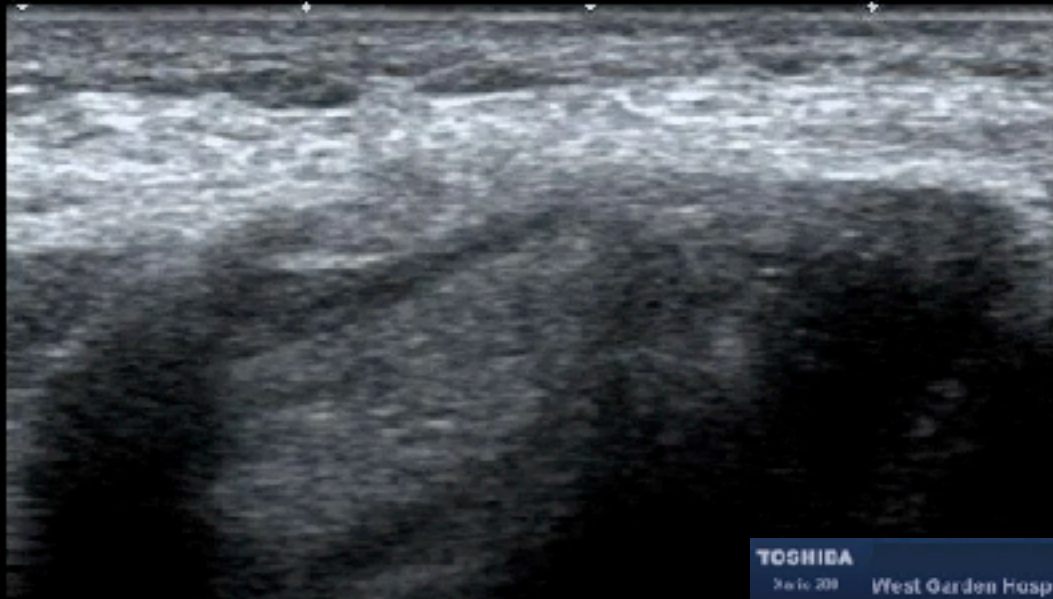


Epiglottis



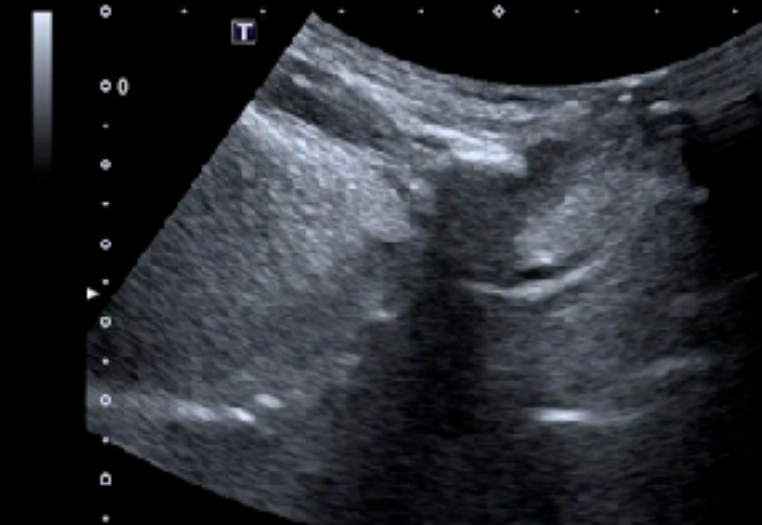
Landmark: hyoid bone

Epiglottis



MI
1.5
11L4
diffT9.0
30 fps
G:92
DR:60
A:5
P:1

TOSHIBA
Date: 201 West Garden Hospital MSK 3 313



Landmark: hyoid bone

Epiglottitis



mindray

1101577031

14/10/2022

11:10:51

AP 92.0% MI 0.6 IIS 0.3

C5-2s

Adult ADD

M7

H1

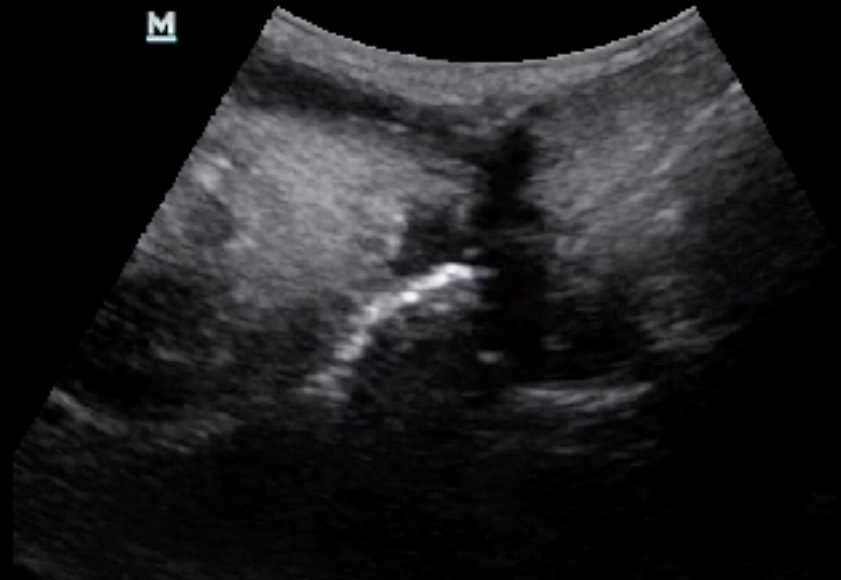
11/10/2022

C51

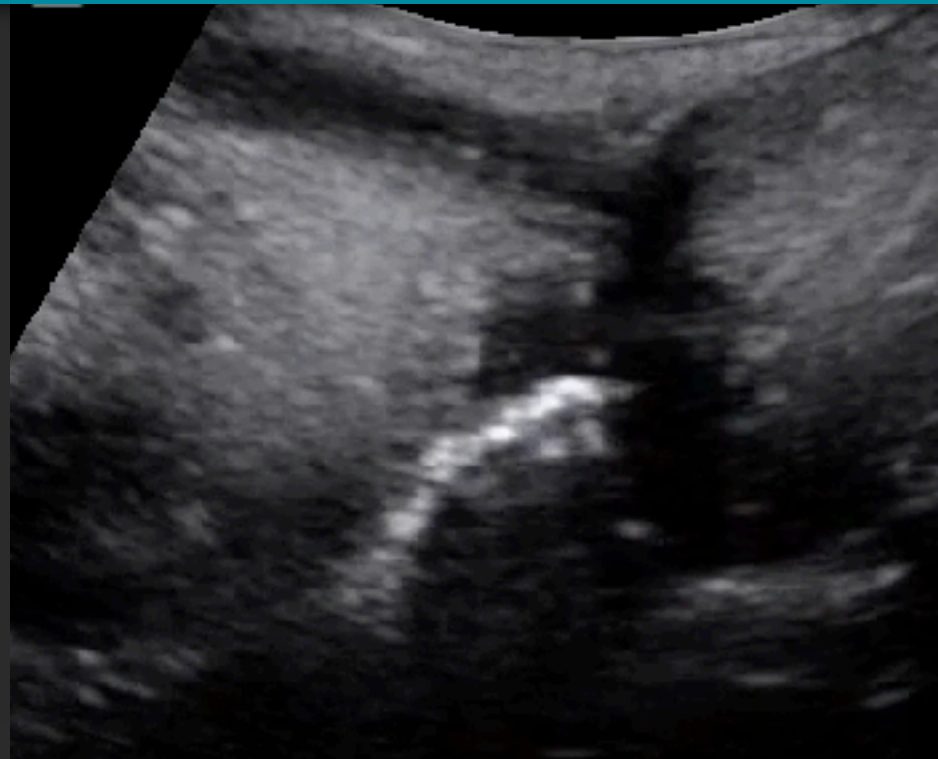
IP1



M



Acute epiglottitis



Vocal cords

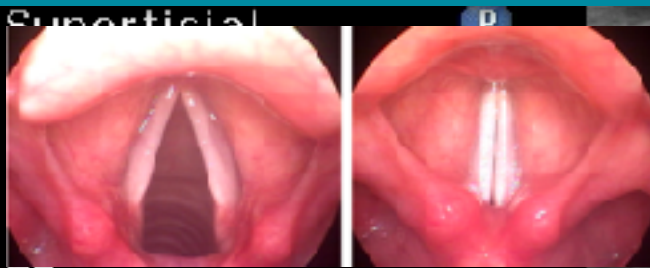


G
P R
0.0 12.0

0.5cm

Landmark: thyroid cartilage

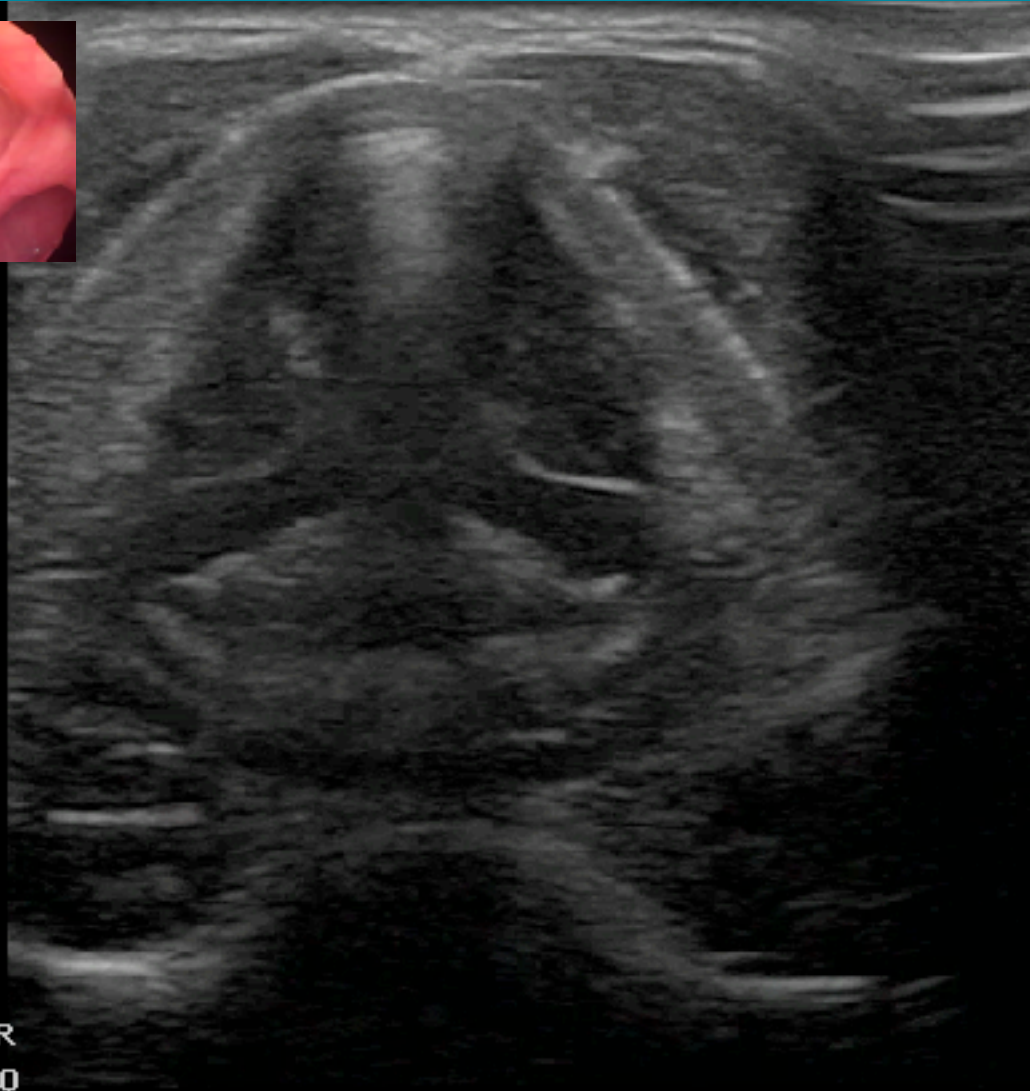
Phonation



Res
Gn 100
C 56
3/2/1

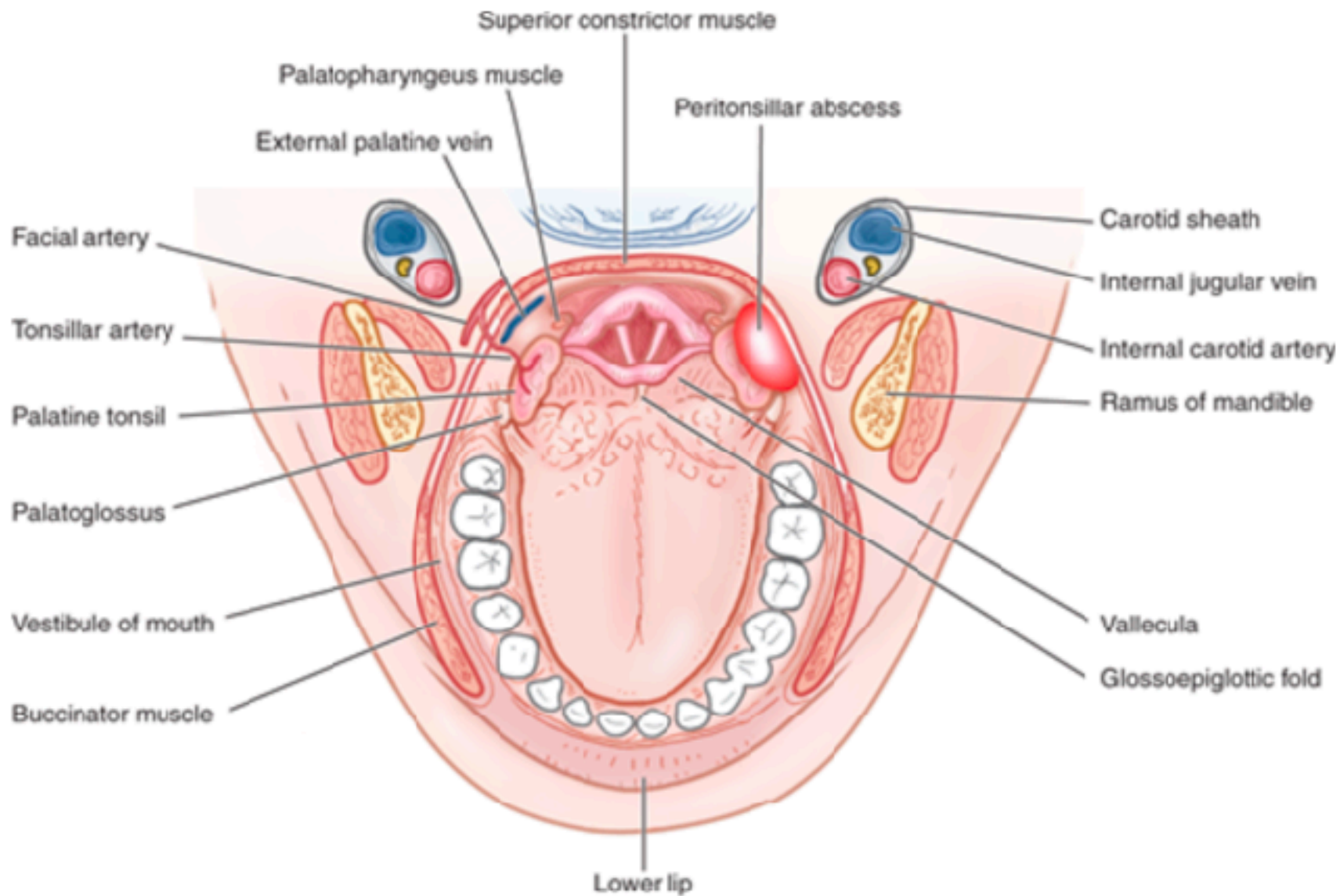


G
P R
3.0 12.0



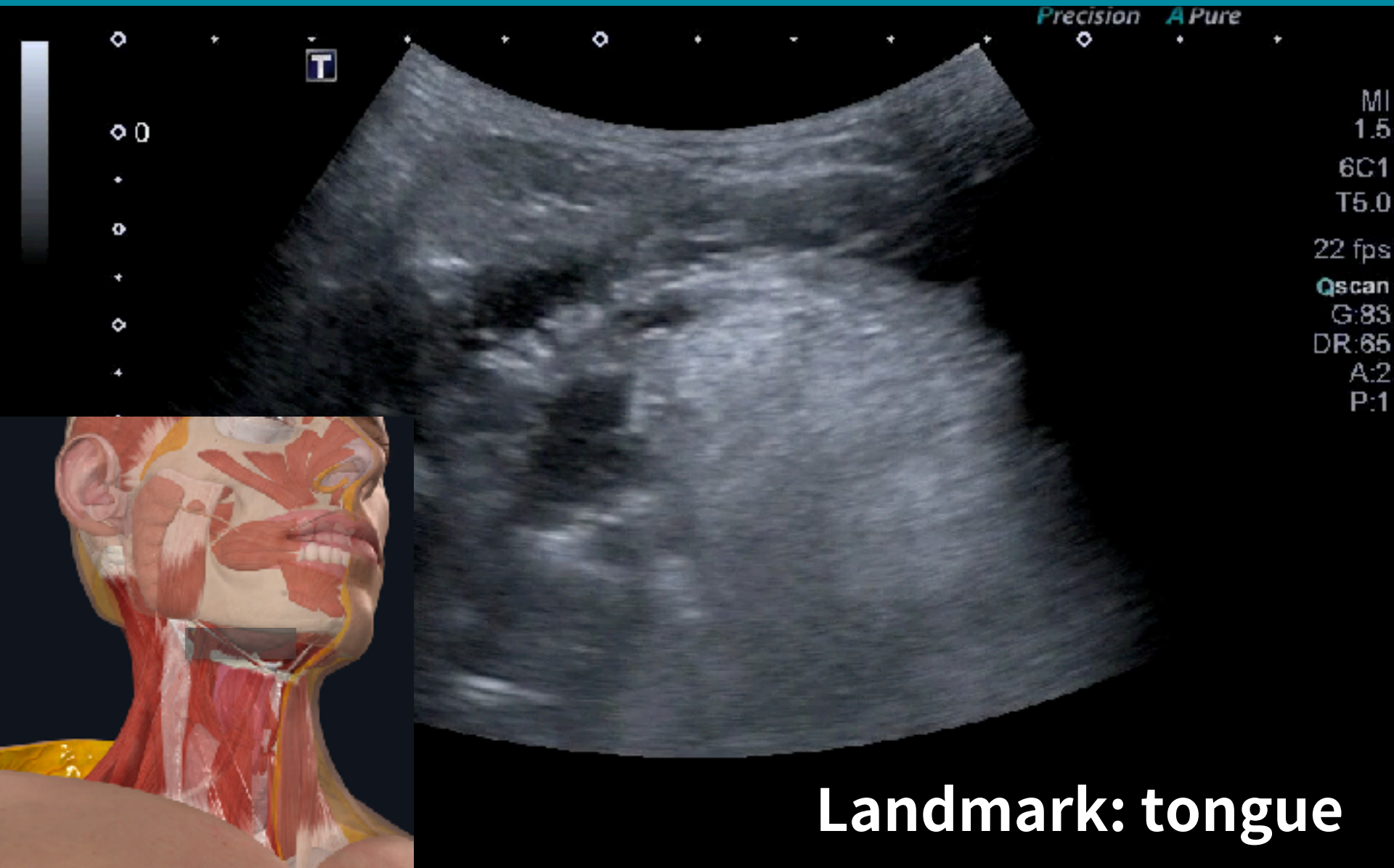
4.0cm

Landmark: thyroid cartilage

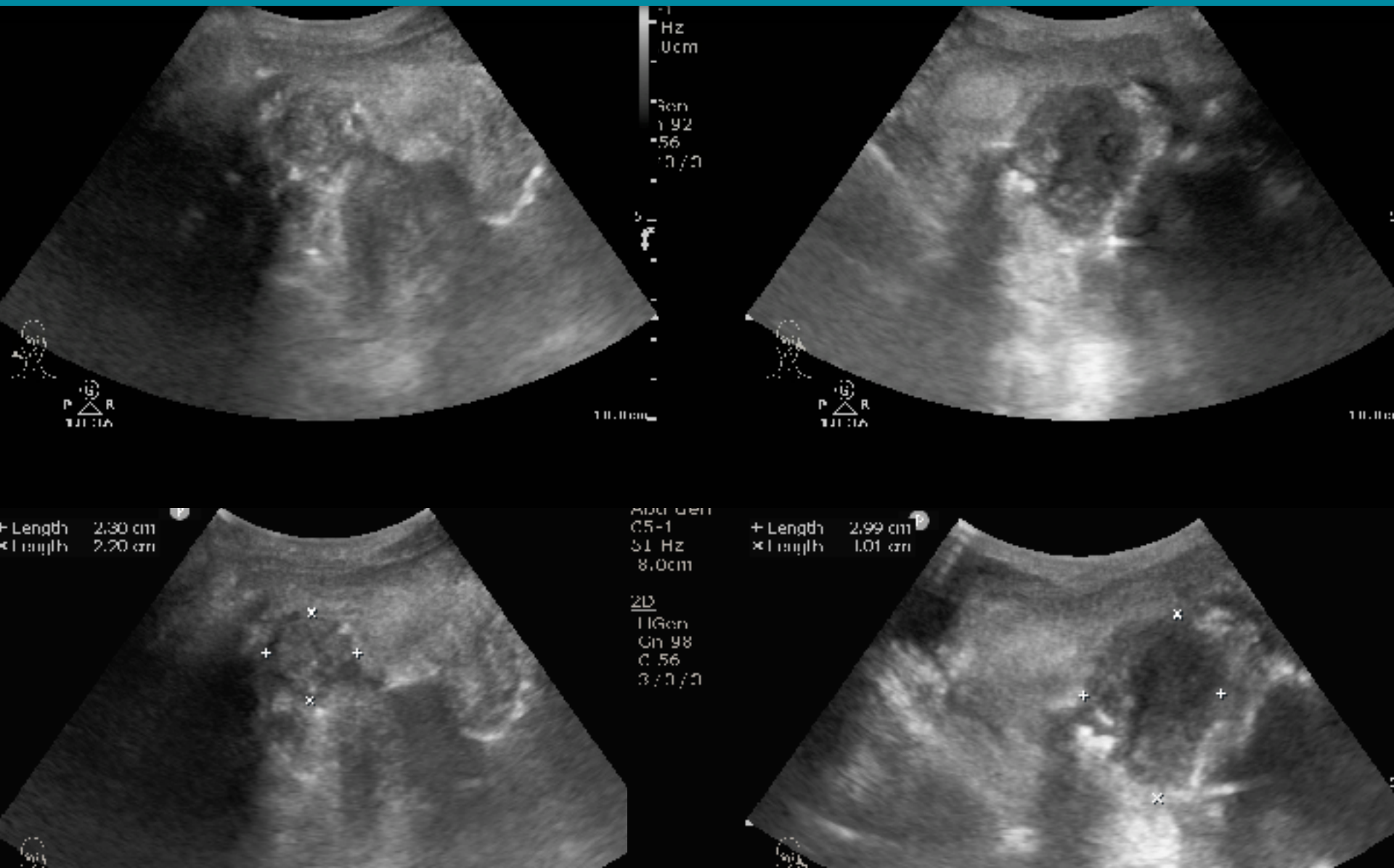


Source: Tintinalli ET: Emergency Medicine Procedures, Second Edition: www.accessmedicine.com
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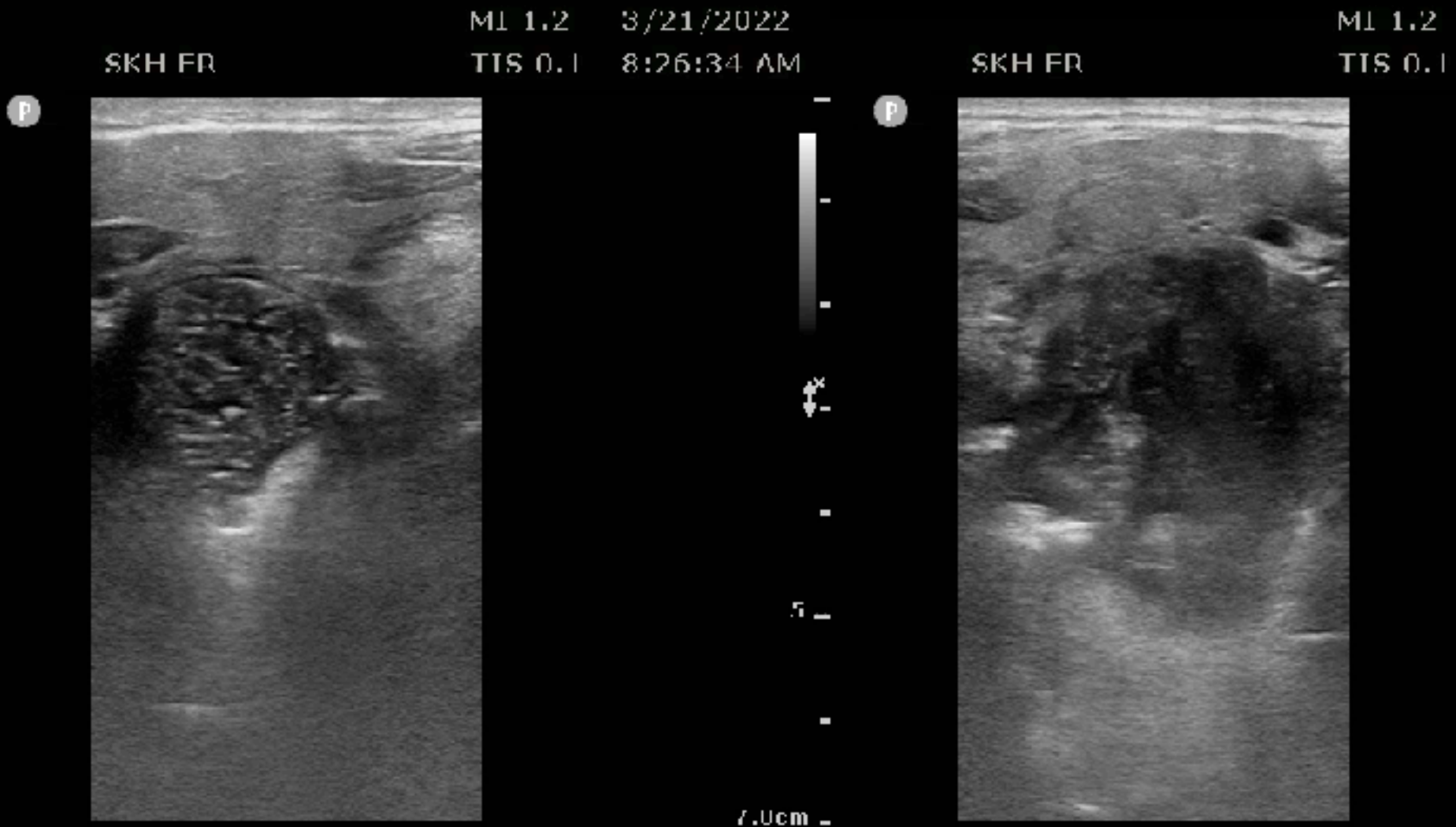
Tonsil



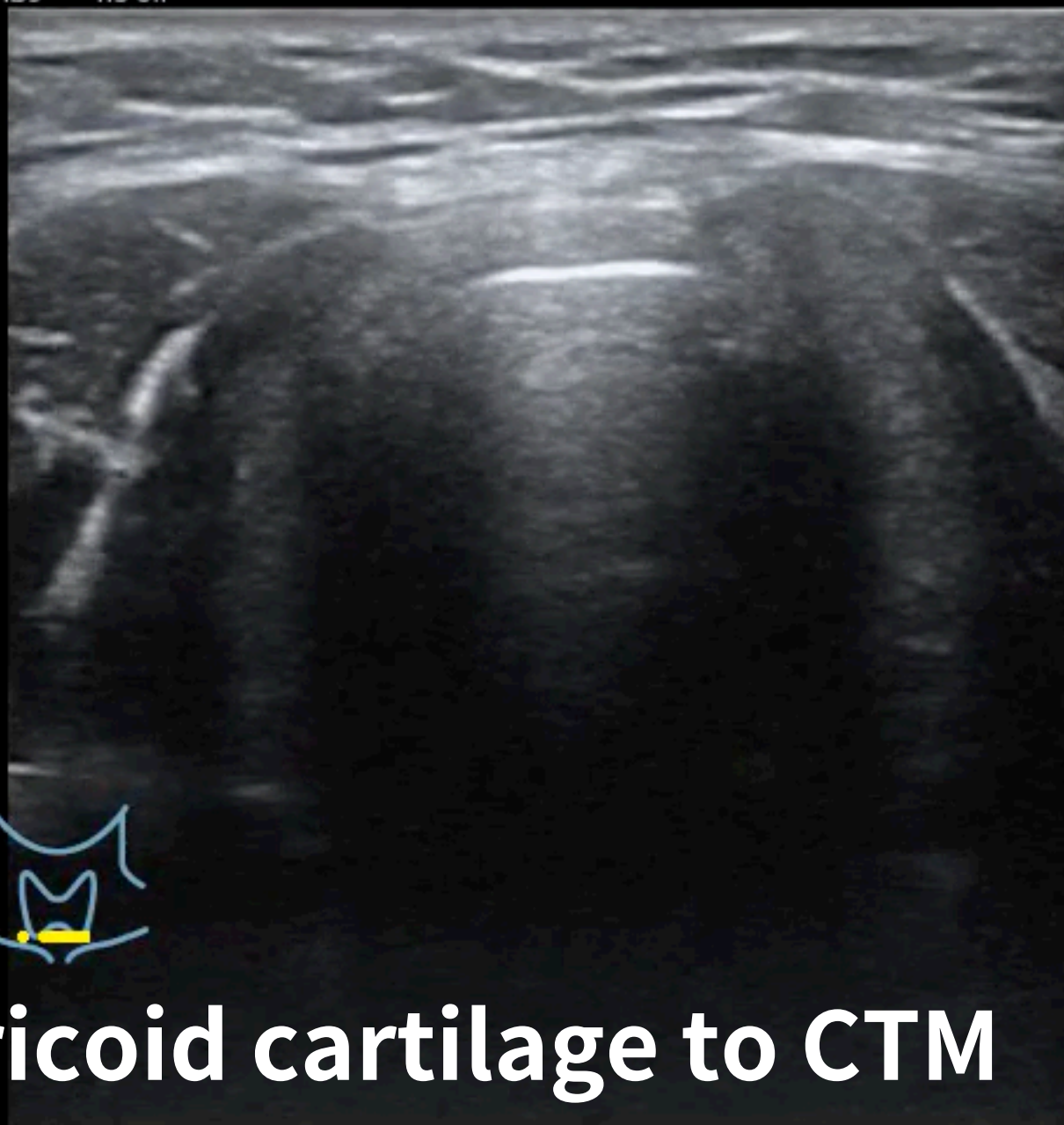
26M, severe left throat pain



Peritonsillar abscess



B
FH9.0
DR105
FR31
D 4.0
G 61



0

-1

-2

-3

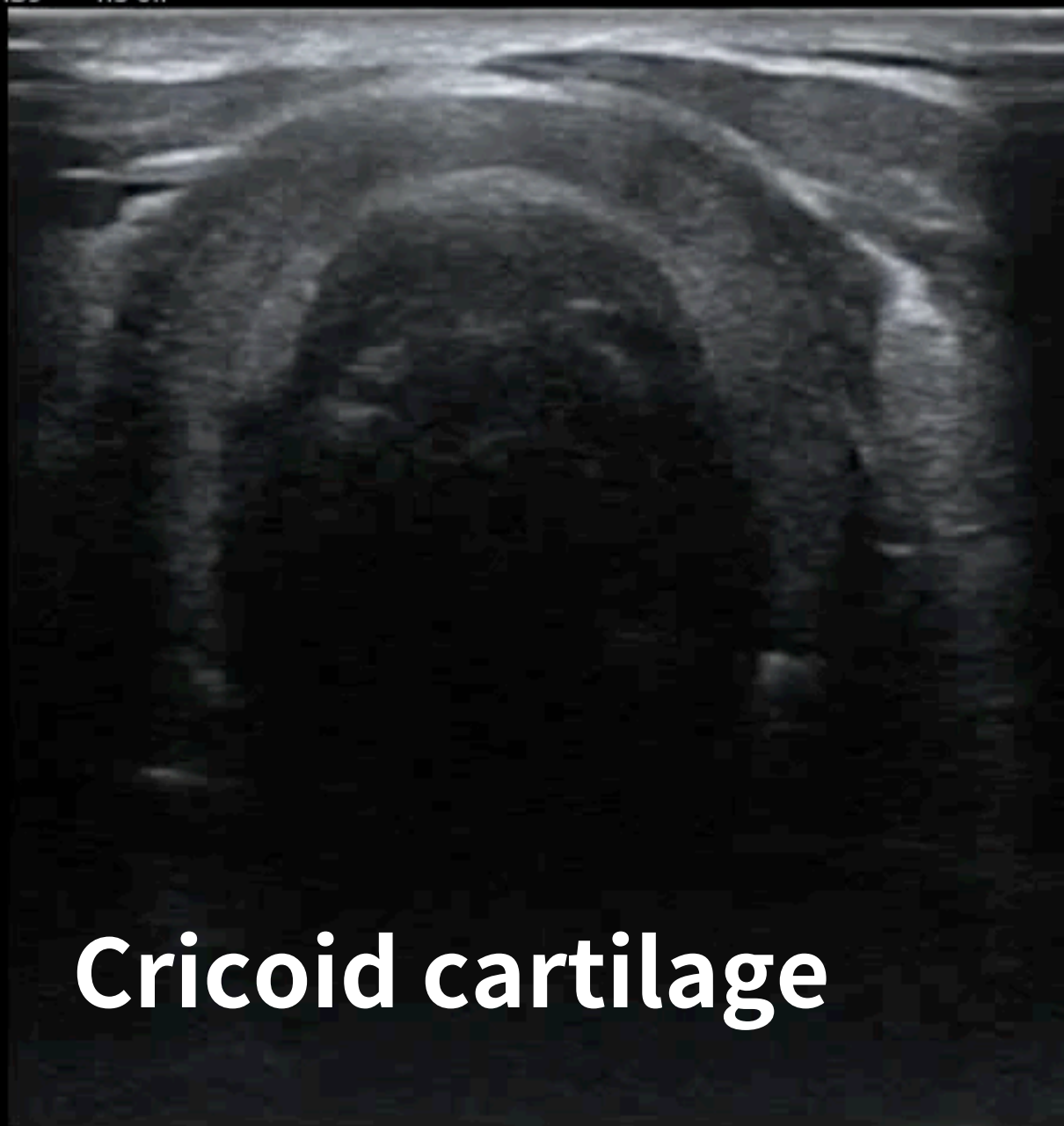
-4

iNeedle

iTouch



Cricoid cartilage to CTM



Cricoid cartilage

iNeedle

iTouch

B
FH9.0
DR 105
FR 31
D 2.5
G 69

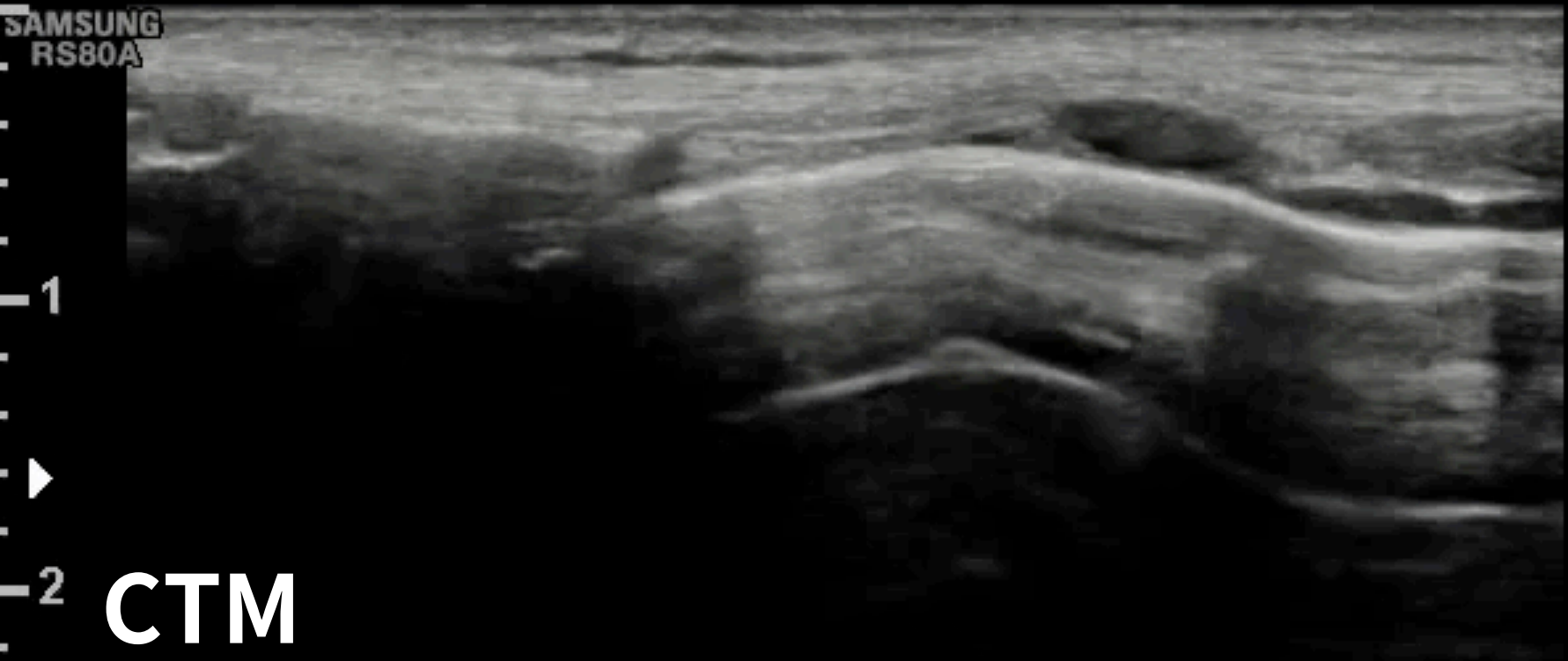


iNeedle

iTouch

CTM: cricothyroid membrane

SAMSUNG
RS80A



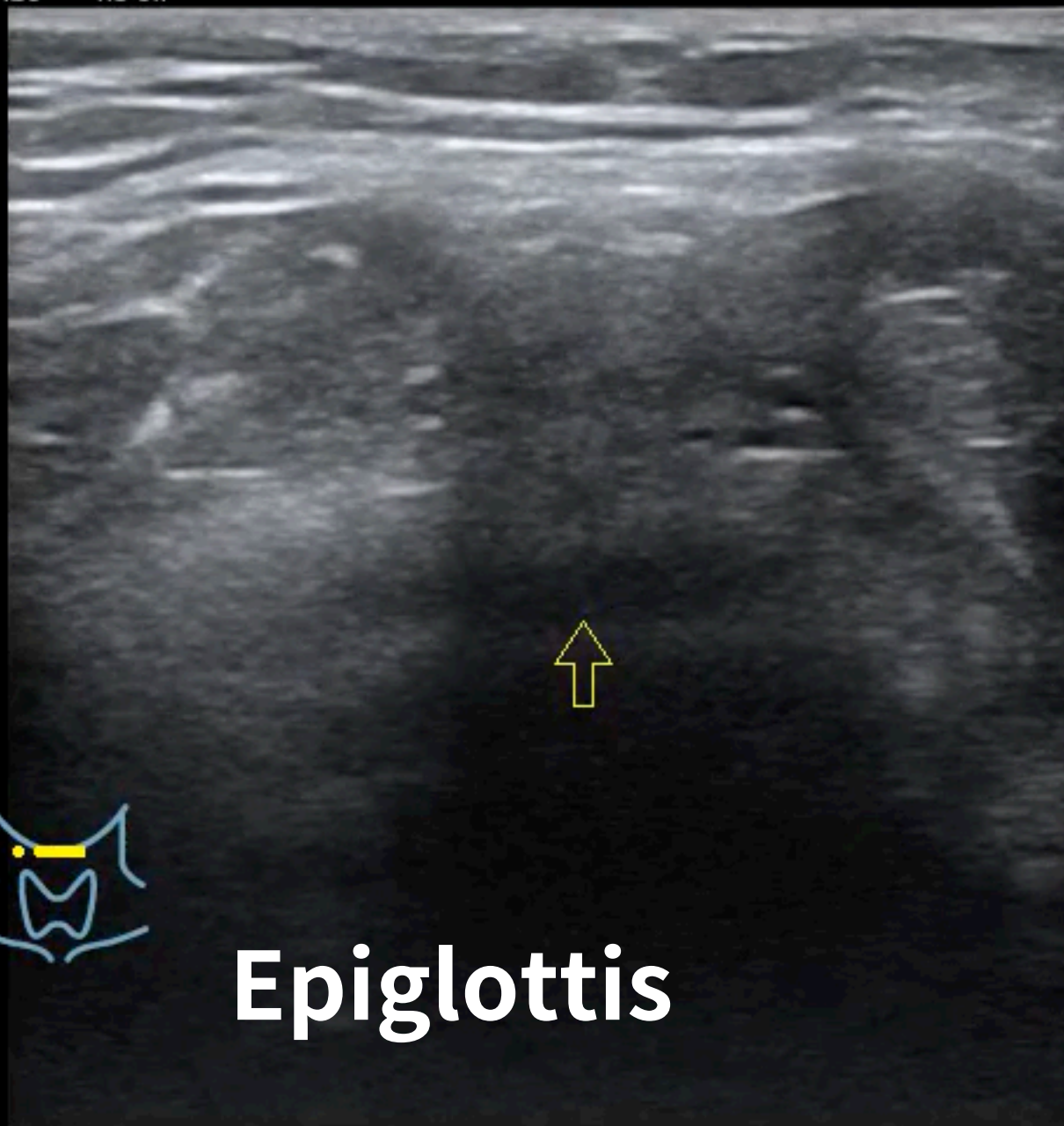
CTM

Hyoid bone

Cricoid cartilage

Thyroid cartilage

B
FH9.0
DR 105
FR 31
D 4.0
G 58



-0

-1

-2

-3

-4

iNeedle

iTouch

Epiglottis



iNeedle

iTouch



Epiglottis

-0

-1

-2

-3

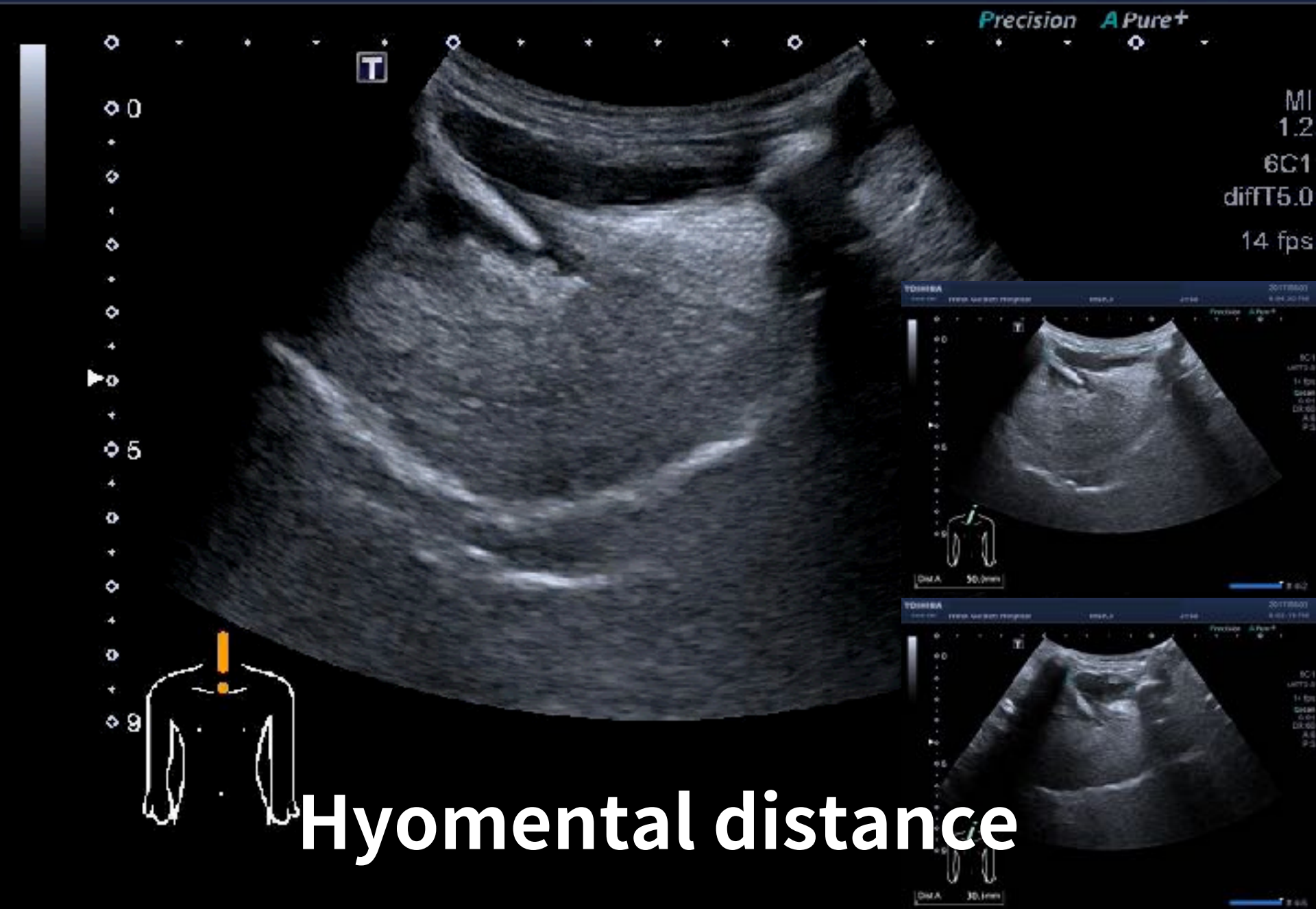
-4

Superficial
L12-3
46 Hz
3.5cm

2D
Gen
Gn 91
C. 35
3/2/1



Trachea
Esophagus
Vertebral body
Vertebral artery



TE7 Ultrasound System

21-02-2018

20180222-093252-34EA

Superficial

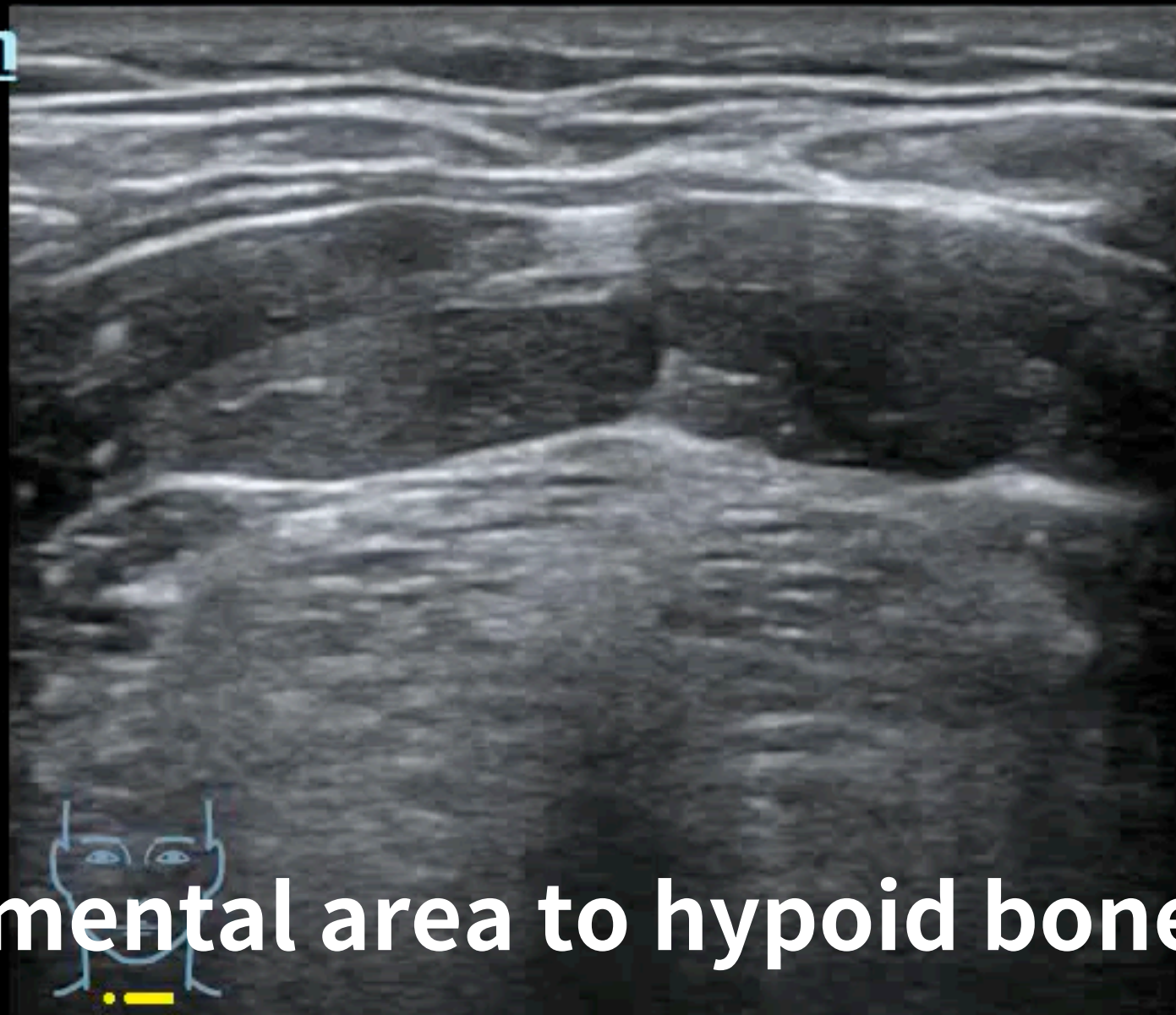
08:36:33

L12-4s
MI 1.4
TIS 0.1

AP 96.6%



B
FH10.0
DR 100
FR 31
D 3.5
G 59



-0

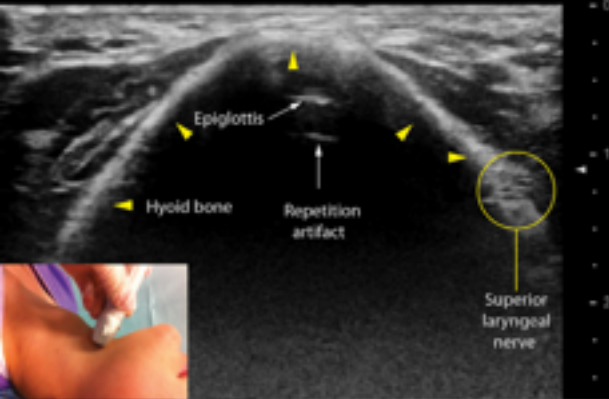
-1

-2

-3

Submental area to hypoid bone





0000-28C1 Thyroid 16-02-2024 16:08:12



iNeedle

iTouch

Hyoid bone to epiglottis

L12-4s

AP 96.6%

MI 135

TIS 0.1

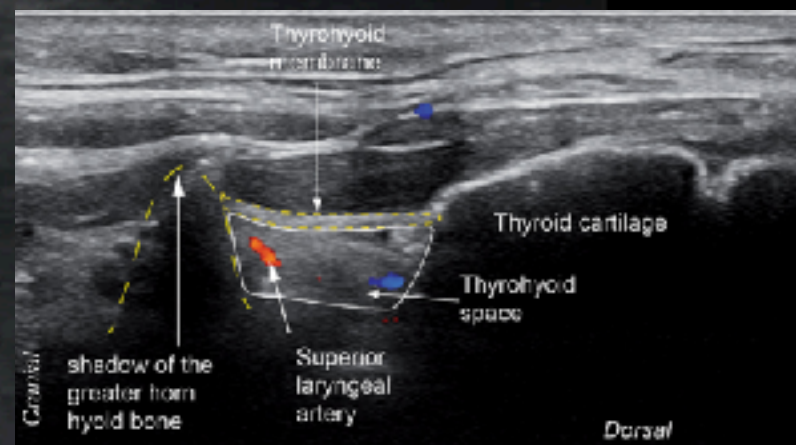
B

FH9.0
DR105
FR31
D 4.0
G 69

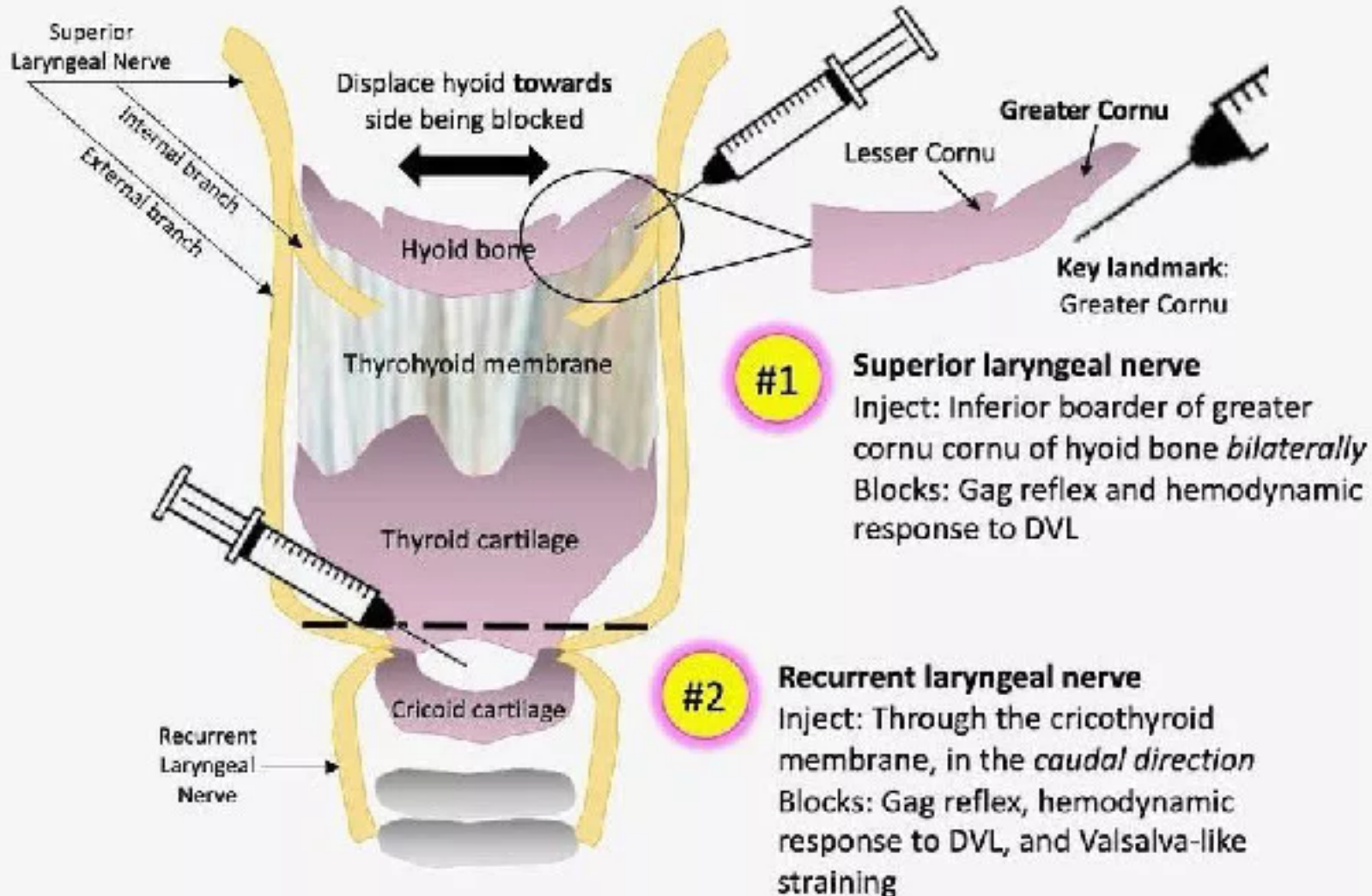


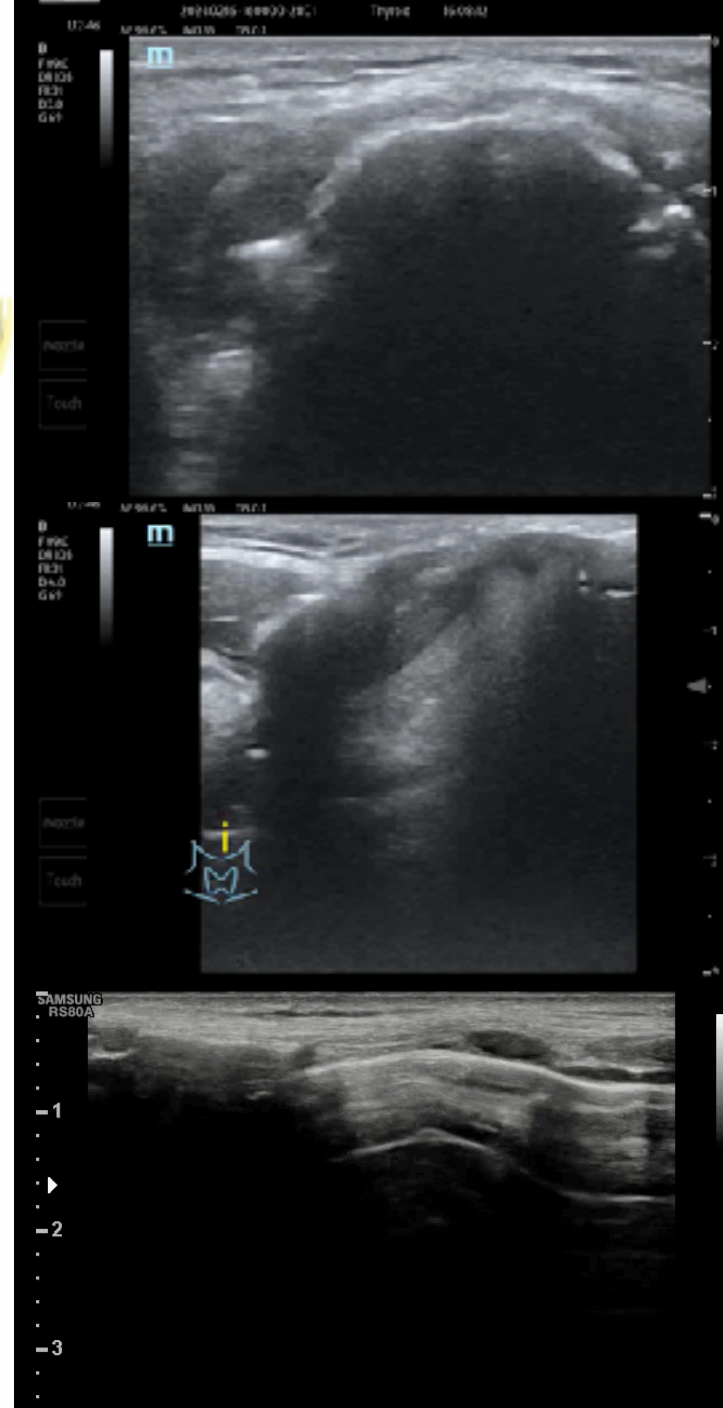
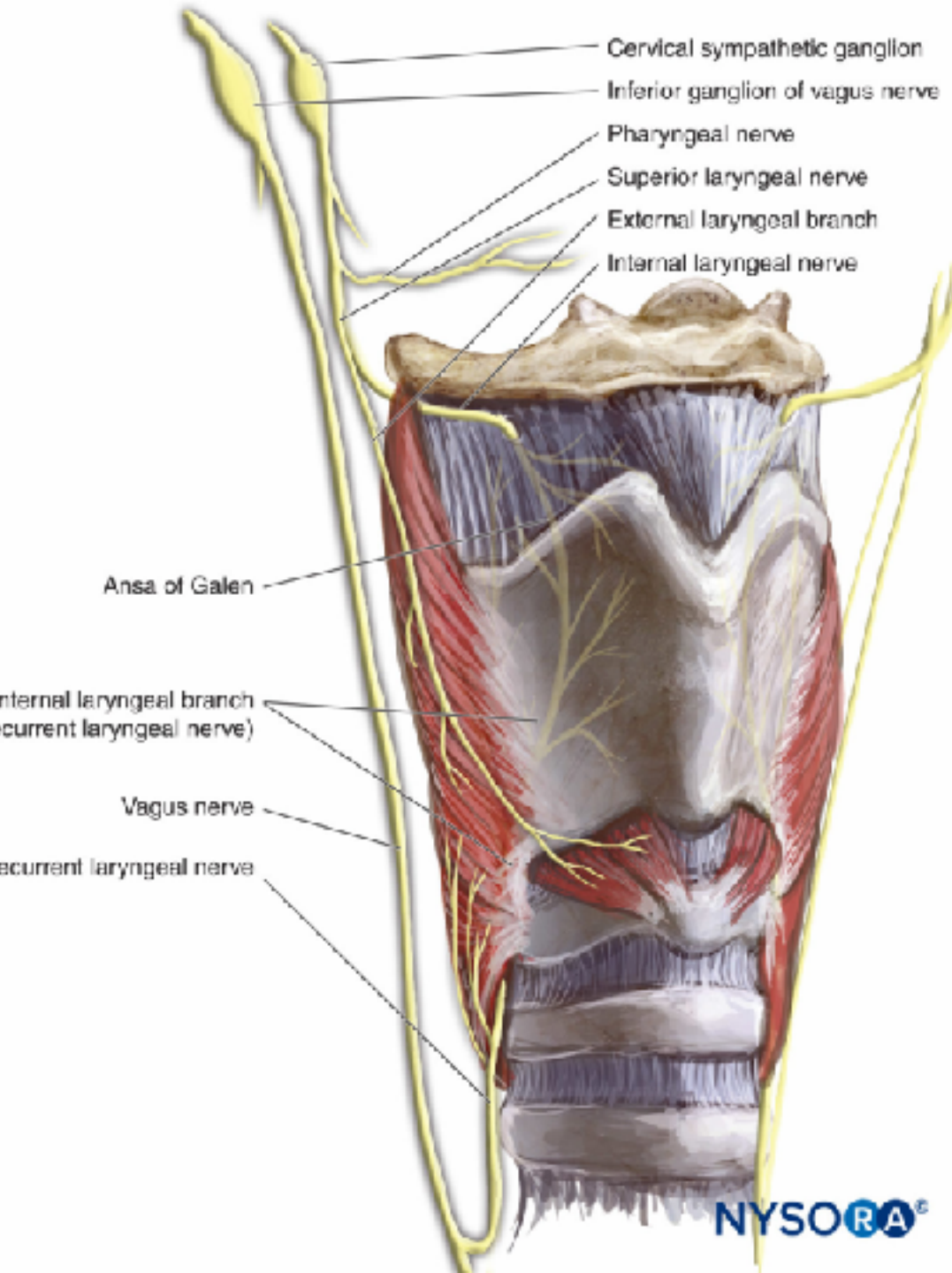
iNeedle

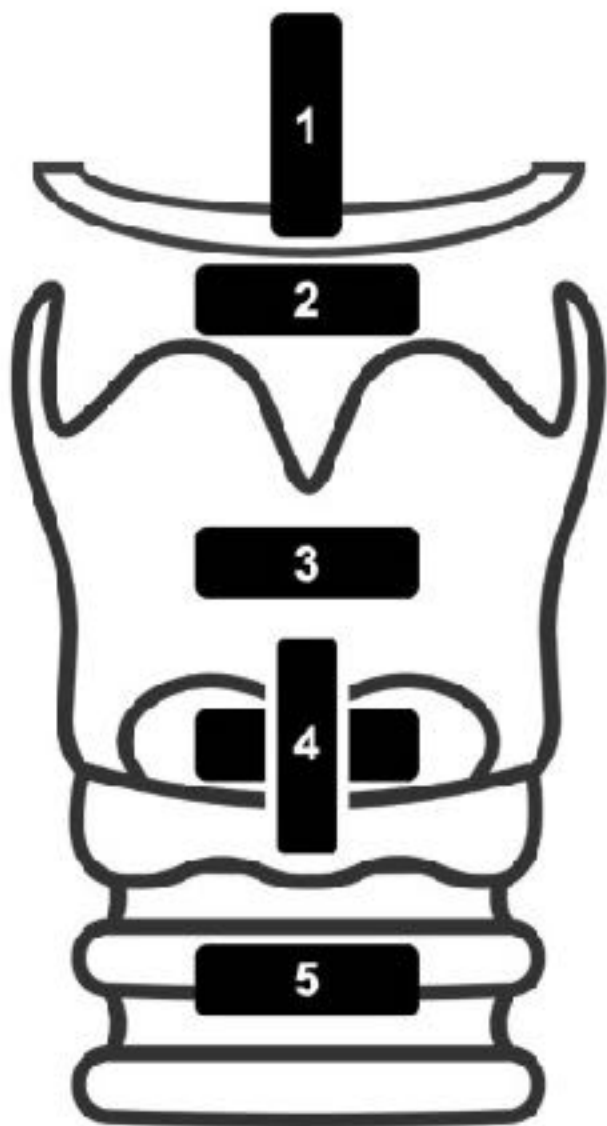
iTouch



Laryngeal Nerve Block







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**



01-171608-34EA

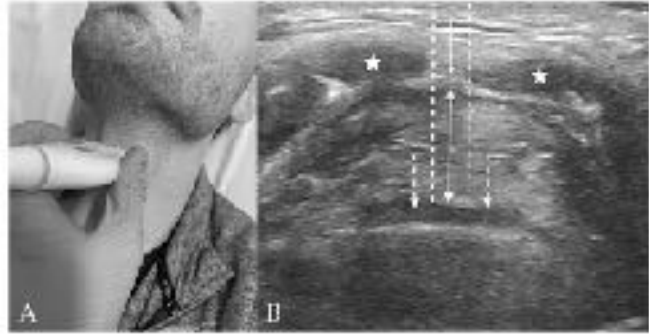
ABD

01-03-2018

17:05:26

DR 120
FR 35
D 8.0
G 50

Suprahypoid view



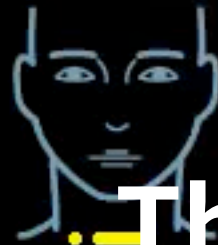
917-34EA

MSK1

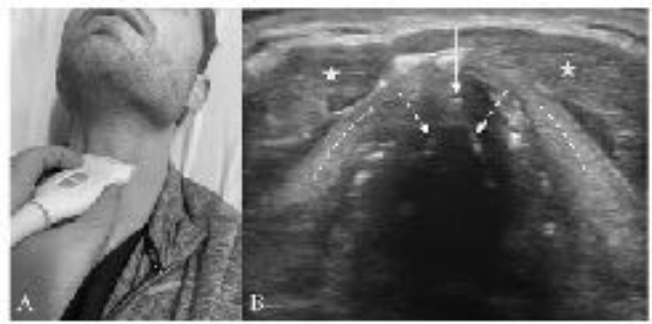
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10:43:32

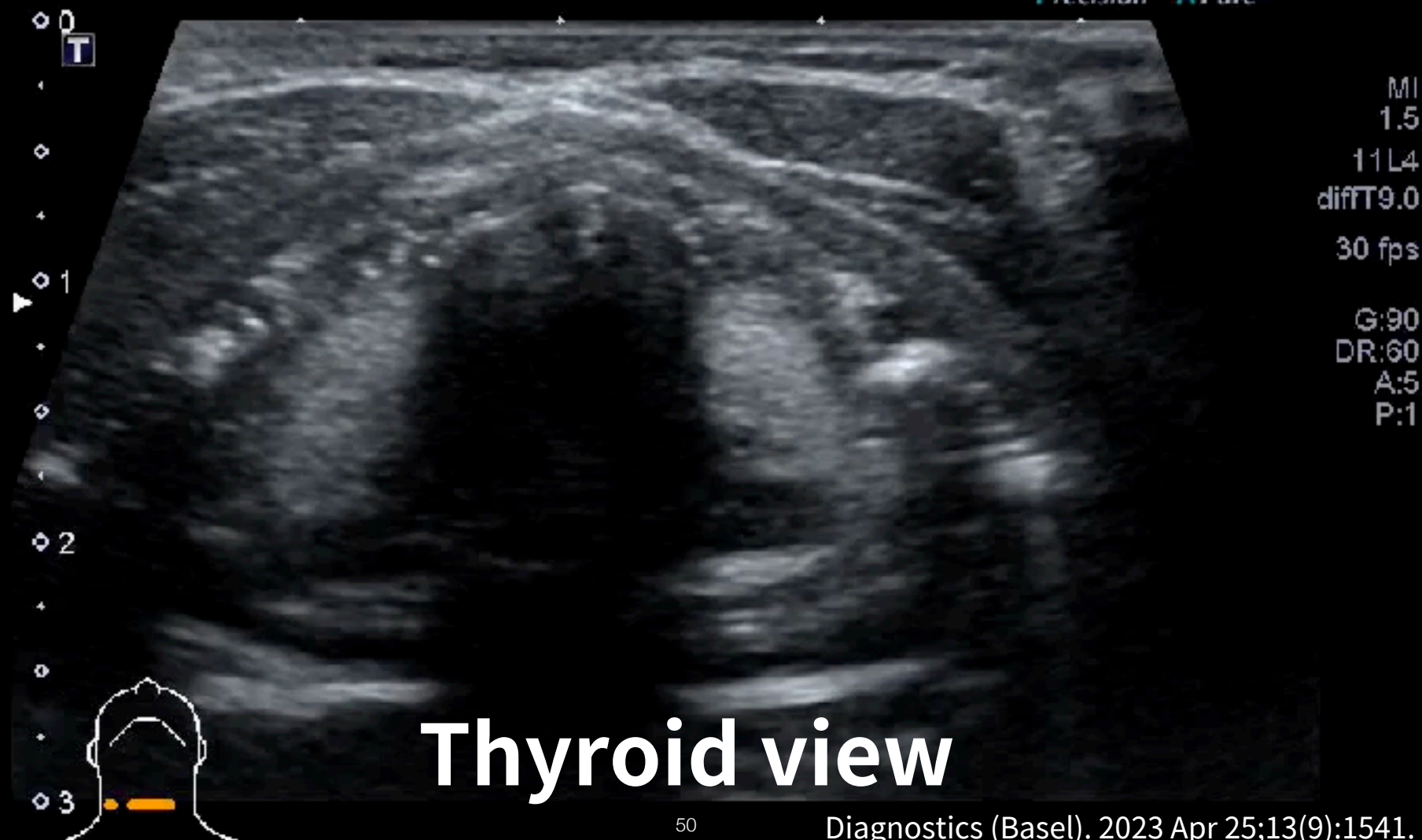
DR 110
FR 27
D 4.0
G 46



Thyroid view

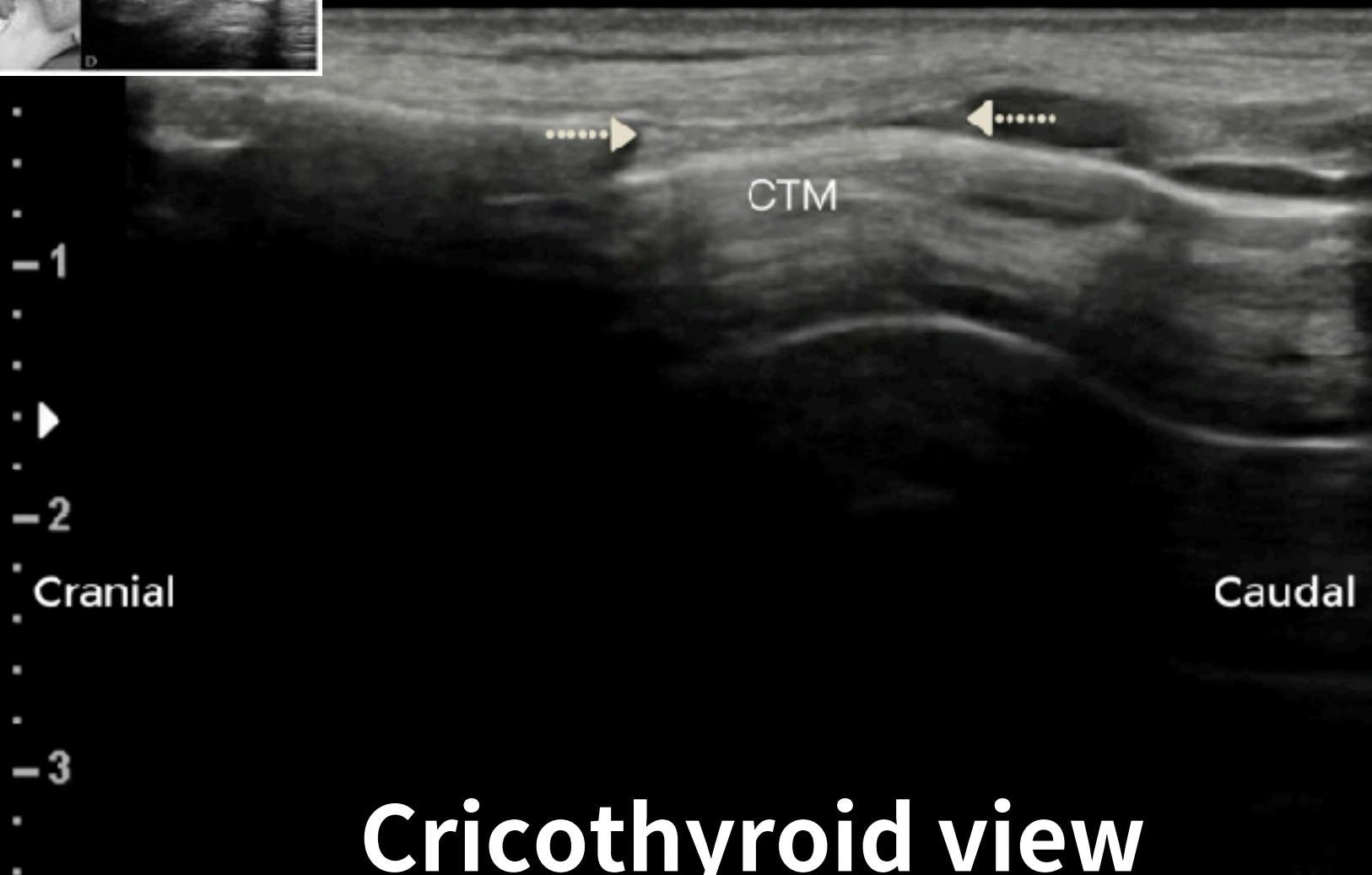


Precision A Pure+





ts / FPS40 / MI0.96 / TI0.1 / 01-09-2016 10:32:09 AM
/P90/2.7/Frq Pen./3.5cm



Cricothyroid view



Adult ABD

13-12-2024

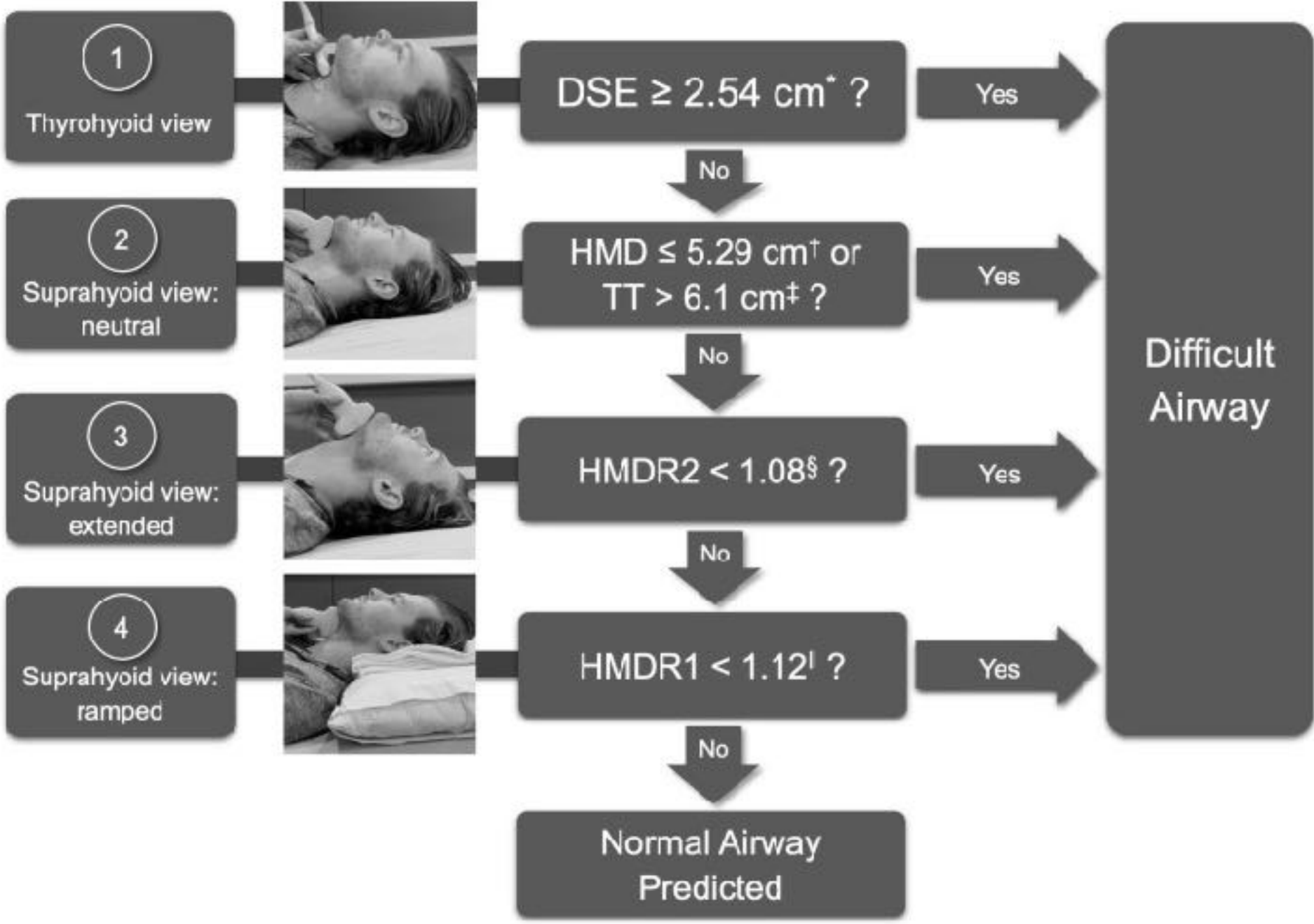
16:18:58

C5-2s AP 96.6% MI 0.97 TIS 0.4

B
FH5.0
DR 130
FR 30
D 8.0
G 58



Suprasternal view



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 ^{1,2,3,4} 

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Anaesthesia Critical Care & Pain Medicine

journal homepage: www.elsevier.com



Review article

Ultrasonography for airway management

Paul J. Zetlaoui

