Venipuntura ecoguidata nel bambino

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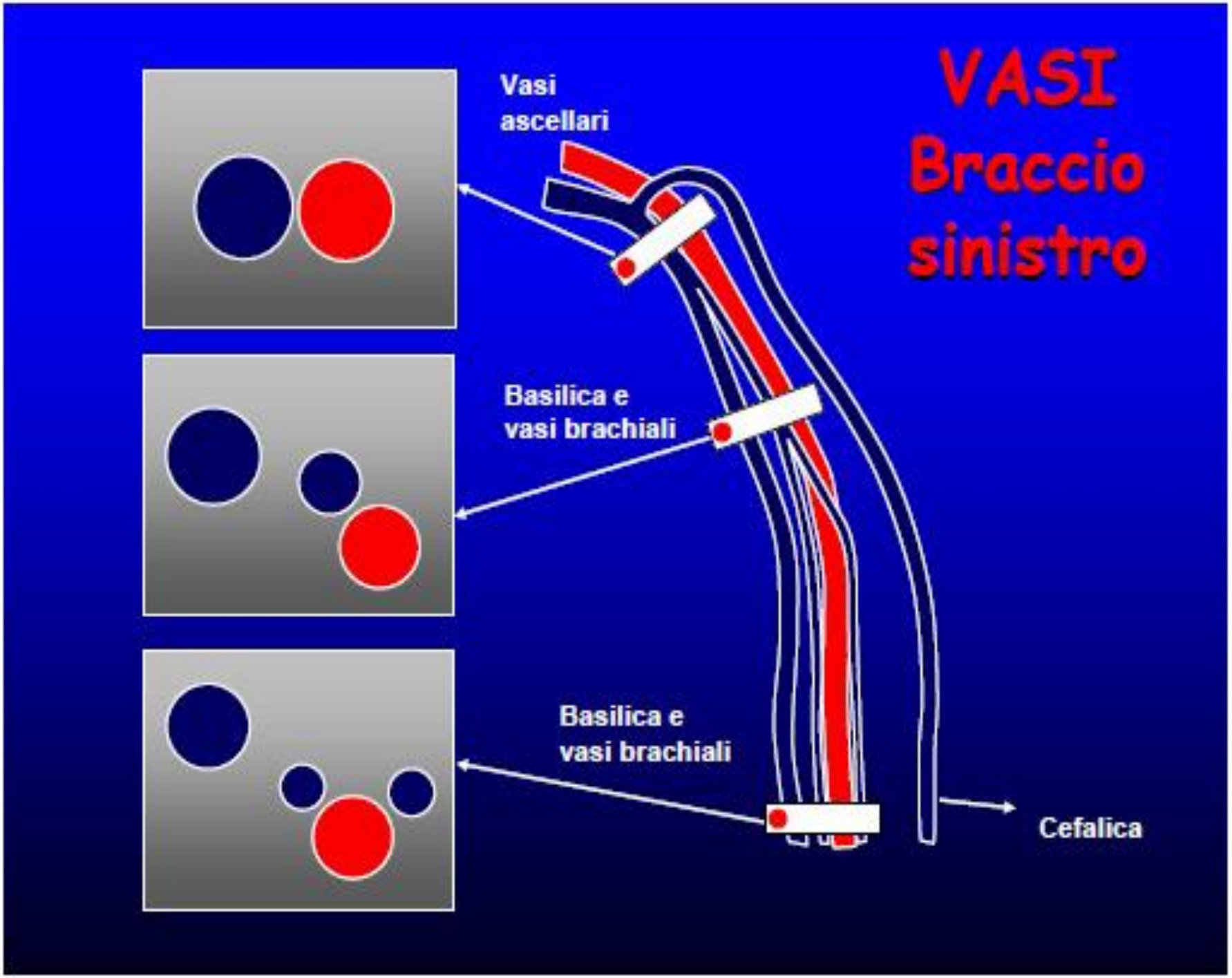
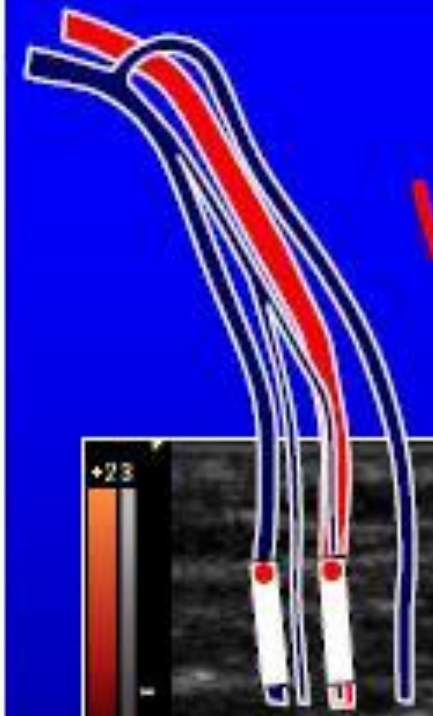
GAVePed, 24-26/06/2021

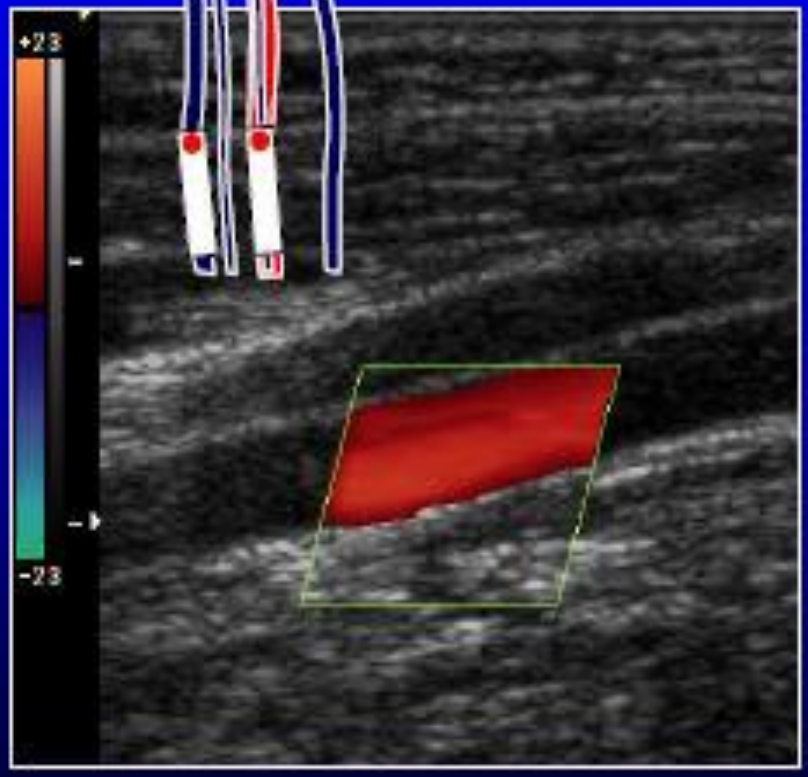
Accessi disponibili

- Vene nel braccio (basilica, cefalica, brachiale)
- Ascellare e succlavia
- Tronco anonimo
- Giugulare interna
- Femorale
- Safena


VASI
Braccio
sinistro
Vasi
ascellari
Basilica e
vasi brachiali
Basilica e
vasi brachiali
Cefalica

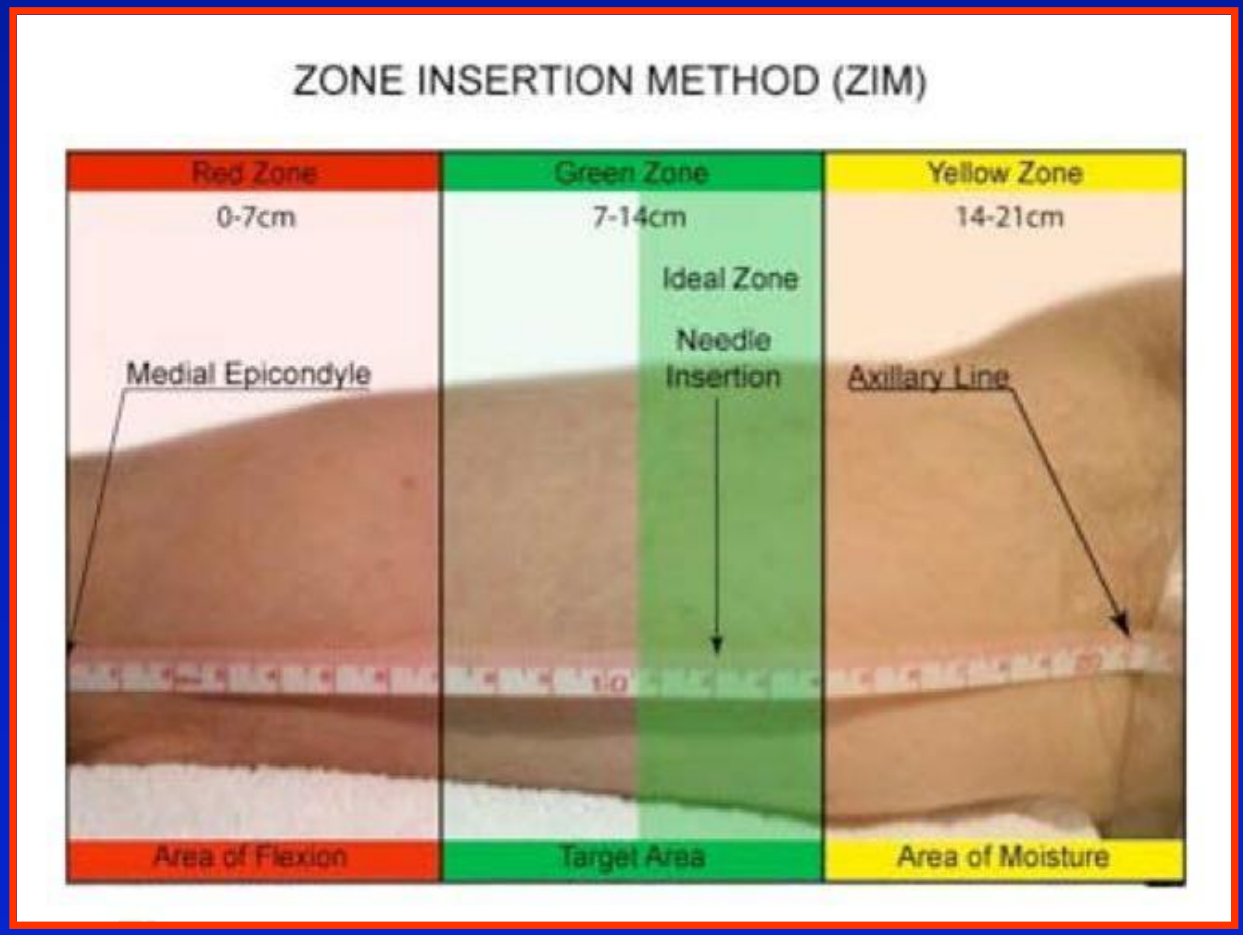
SCANSIONI
Vasi braccio sinistro





Per scegliere la vena:

- RaPeVA
  - Identificazione della vena più appropriata in termini di **calibro**, **profondità** e **zona** di Dawson


ZONE INSERTION METHOD (ZIM)
Red Zone
0-7cm
Green Zone
7-14cm
Ideal Zone
Needle Insertion
Yellow Zone
14-21cm
Medial Epicondyle
Axillary Line
Area of Flexion
Target Area
Area of Moisture

Calibro della vena

Diametro interno della vena: uguale o superiore al diametro esterno del catetere

Per cateteri 3Fr: vene di 3mm o più

Per cateteri 4Fr: vene di 4mm o più

Per cateteri 5Fr: vene di 5mm o più

Da Pittiruti M, 2019

Tassativo misurarla

Da Pittiruti M, 2019

Tecnica di venipuntura

- Per qualunque vena profonda del braccio:

VISUALIZZAZIONE IN ASSE CORTO

PUNTURA OUT-OF-PLANE

Asse corto: vantaggio della visione ‘panoramica’ delle strutture vascolari e nervose che circondano la vena.

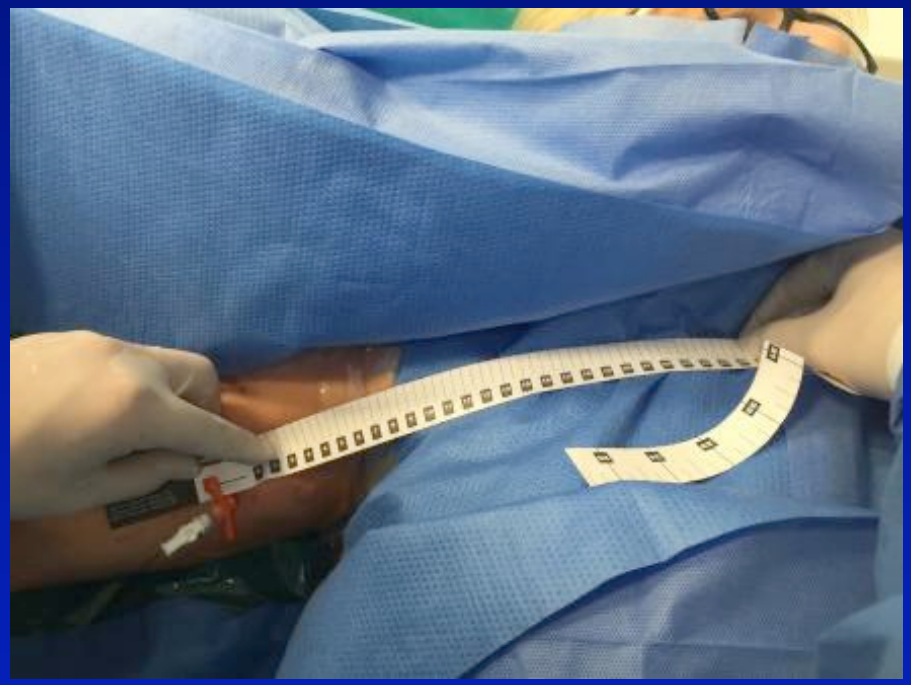
Da Pittiruti M, 2019

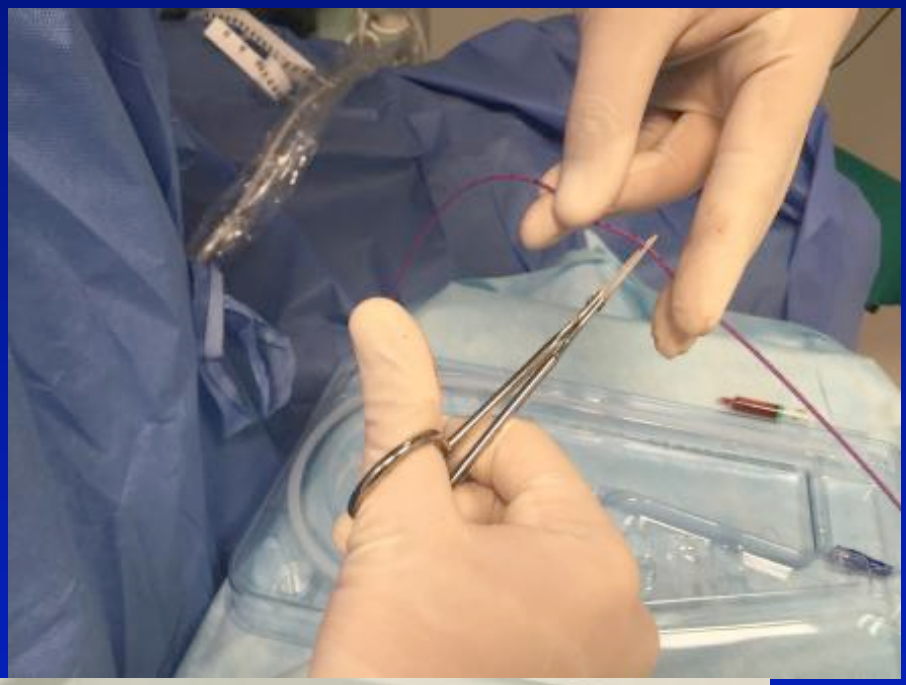
Puntura out-of-plane

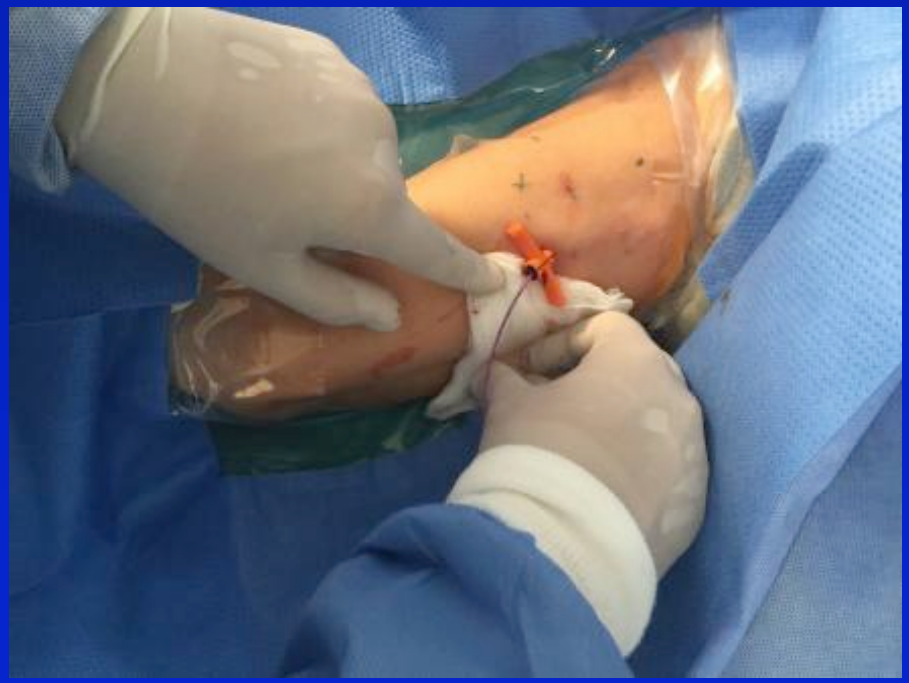
- **Puntura dinamica** con tilting progressivo della sonda
- Utilizzo eventuale della visione in **asse lungo per la visualizzazione della guida** **solo dopo** la puntura e l'incannulamento della vena

Da Pittiruti M, 2019

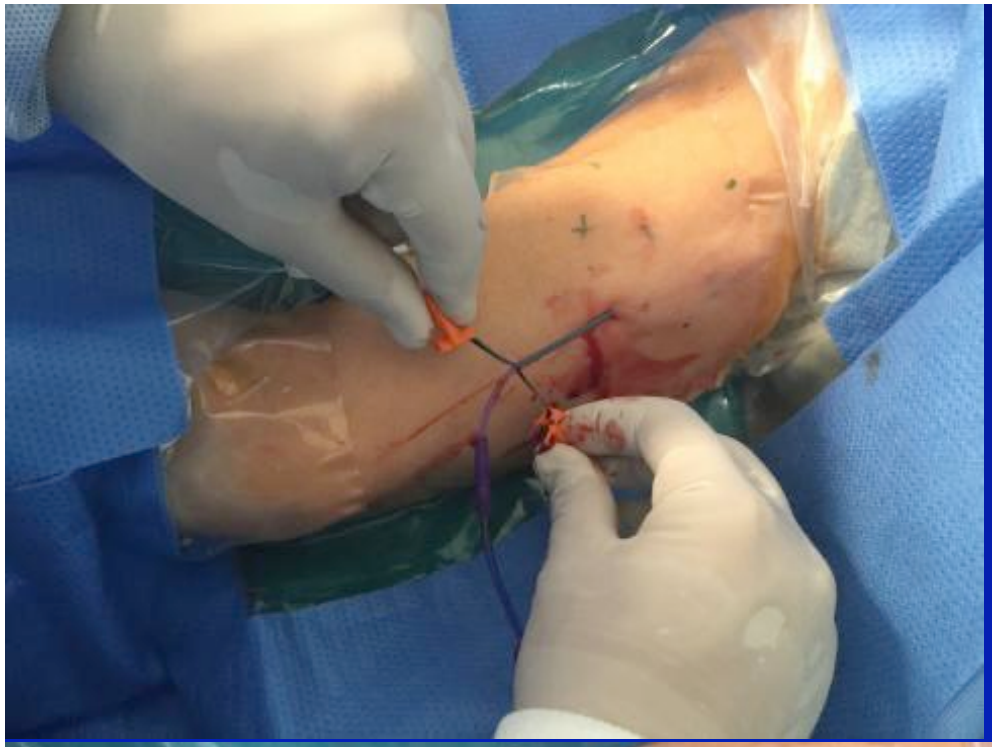
Da Pittiruti M, 2019







Da Pittiruti M, 2019




REMOVE
PowerPICC

Tunnelizzazione dei PICC:

- TUNNELLIZZAZIONE
  - Può espandere le indicazioni dei PICC:
    - Posizionamento in vene adeguate anche se molto prossimali

Da Pittiruti M, 2019


Yellow zone
Green zone

PICC tunnellizzati

Accessi disponibili

Ma quali accessi nel neonato e lattante sono veramente disponibili?

Topographical Anatomy of Central Venous System in Extremely Low-Birth Weight Neonates Less Than 1000 Grams and the Effect of Central Venous Catheter Placement

Clinical Anatomy, 2011

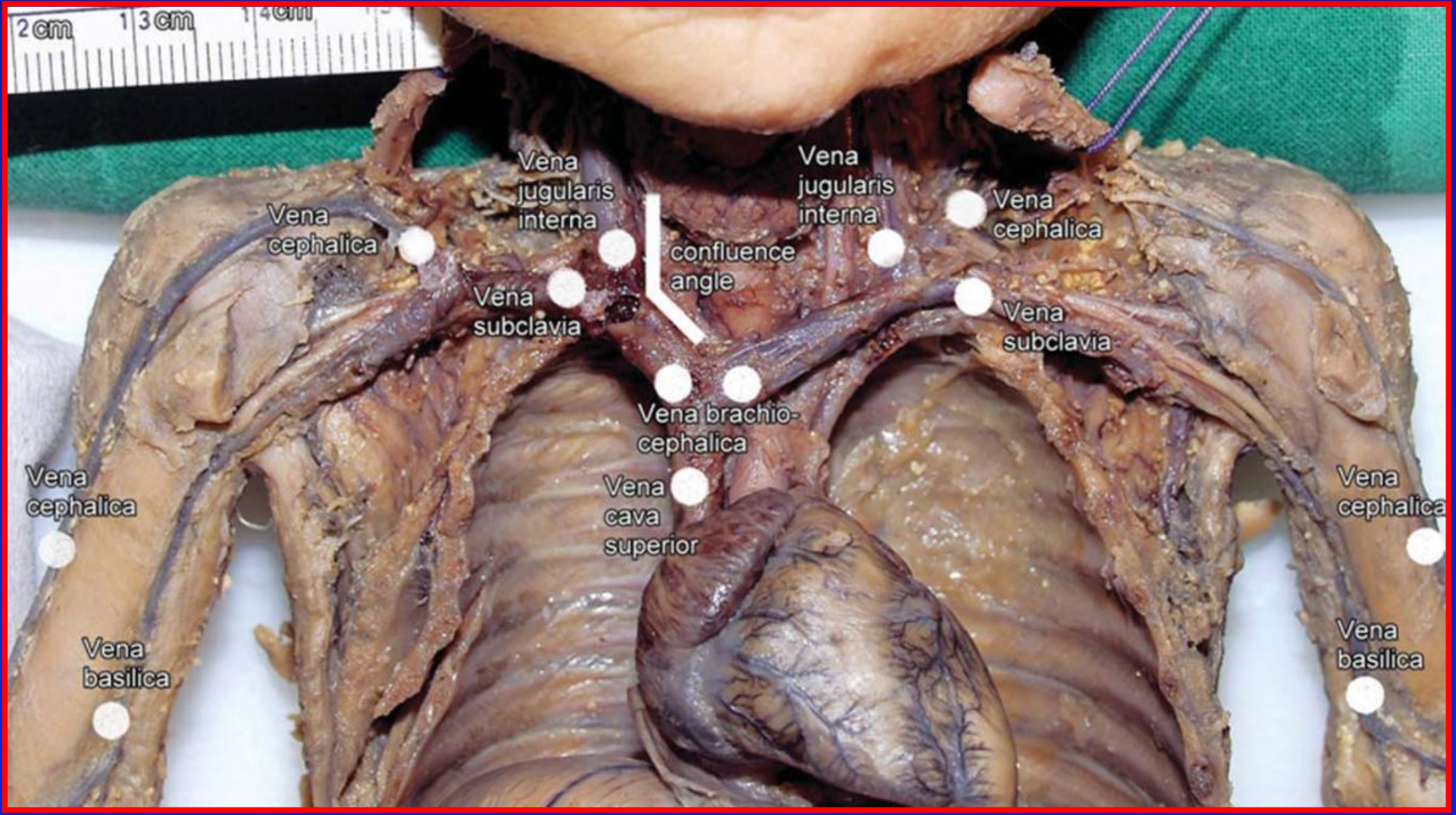


TABLE 3. Outer Diameter [mm] of the Internal Jugular Vein, Brachiocephalic Vein, Subclavian Vein, and Superior Caval Vein[a]

Preparation no.	Internal jugular vein [mm]		Brachiocephalic vein [mm]		Subclavian vein [mm]		Superior vena cava [mm]
	Right	Left	Right	Left	Right	Left	
1	5.3 ± 0.1	3.7 ± 0.2	3.9 ± 0.1	4.4 ± 0.2	2.7 ± 0.2	2.8 ± 0.2	4.6 ± 0.1
2	4.5 ± 0.1	4.2 ± 0.1	3.9 ± 0.2	4.6 ± 0.1	2.6 ± 0.2	3.1 ± 0.1	5.0 ± 0.1
3	3.7 ± 0.2	n.m.	3.2 ± 0.1	4.2 ± 0.2	2.9 ± 0.2	n.m.	3.9 ± 0.2
4	5.0 ± 0.2	4.7 ± 0.1	2.4 ± 0.1	3.5 ± 0.1	2.9 ± 0.1	2.4 ± 0.1	4.5 ± 0.1
5	3.7 ± 0.2	3.3 ± 0.2	3.4 ± 0.2	4.0 ± 0.1	2.9 ± 0.1	2.9 ± 0.2	4.3 ± 0.1
6	4.4 ± 0.1	3.9 ± 0.1	4.4 ± 0.2	4.5 ± 0.1	3.2 ± 0.2	2.1 ± 0.1	4.3 ± 0.1
7	3.2 ± 0.1	3.0 ± 0.1	2.9 ± 0.2	3.6 ± 0.2	2.7 ± 0.1	2.0 ± 0.2	3.1 ± 0.1
8	4.4 ± 0.2	4.0 ± 0.2	3.7 ± 0.2	4.2 ± 0.1	2.4 ± 0.1	2.6 ± 0.1	4.2 ± 0.2
9	2.8 ± 0.1	3.9 ± 0.1	2.2 ± 0.2	3.3 ± 0.2	1.7 ± 0.2	2.1 ± 0.1	3.0 ± 0.1
Mean ± SD	4.1 ± 0.8	3.8 ± 0.5	3.3 ± 0.7	4.0 ± 0.5	2.6 ± 0.4	2.5 ± 0.4	4.1 ± 0.7
	Not significant		$P < 0.005$		Not significant		

[a]The head is not rotated. Note, that the outer diameter increases closer to the heart. All data are given as means ± SD.

TABLE 4. Outer Diameter [mm] of the Basilic and Cephalic Veins[a]

Preparation no.	Basilic vein [mm]		Cephalic vein [mm]			
			Axillar		Cubital	
	Right	Left	Right	Left	Right	Left
1	0.9 ± 0.1	1.2 ± 0.2	1.4 ± 0.1	1.6 ± 0.1	1.3 ± 0.1	1.3 ± 0.1
2	n.m.	1.4 ± 0.1	1.3 ± 0.1	1.0± 0.1	1.3± 0.1	1.0± 0.2
3	1.5 ± 0.1	1.4 ± 0.1	1.3 ± 0.1	n.m.	1.5 ± 0.2	n.m.
4	1.3 ± 0.1	1.4 ± 0.1	n.m.	n.m.	n.m.	n.m.
5	n.m.	1.3 ± 0.1	n.m.	1.3 ± 0.1	1.1 ± 0.1	0.9 ± 0.1
6	1.4 ± 0.1	1.2 ± 0.1	1.8 ± 0.1	1.1 ± 0.1	1.4 ± 0.1	1.3 ± 0.1
7	0.9 ± 0.1	1.2 ± 0.1	n.m.	1.3 ± 0.1	1.0 ± 0.2	1.0 ± 0.1
8	1.1 ± 0.1	1.3 ± 0.2	1.3 ± 0.1	n.m.	1.2 ± 0.1	1.3 ± 0.1
9	0.8 ± 0.1	1.1 ± 0.1	n.m.	0.8 ± 0.1	1.0 ± 0.1	1.1 ± 0.2
Mean ± SD	1.1 ± 0.3	1.3 ± 0.1	1.4 ± 0.2	1.2 ± 0.2	1.2 ± 0.2	1.1 ± 0.2
	Not significant		Not significant		Not significant	

[a]The head is not rotated. All data are given as means ± SD.

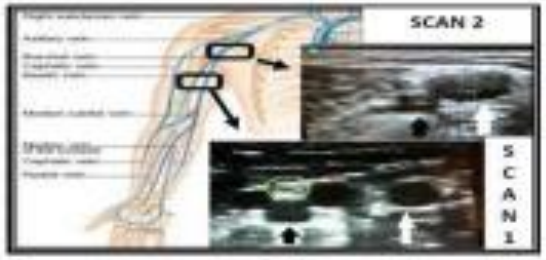
Protocollo studio V.E.E.I.N

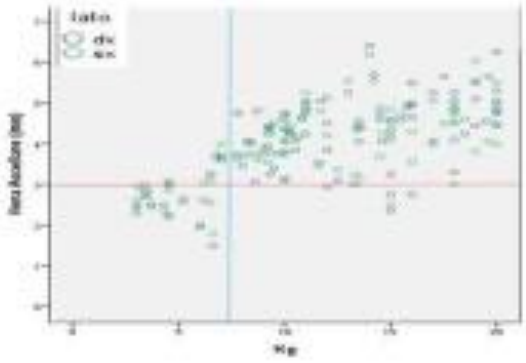
(Vascular Echographic Evalutation in Infants and Neonates)

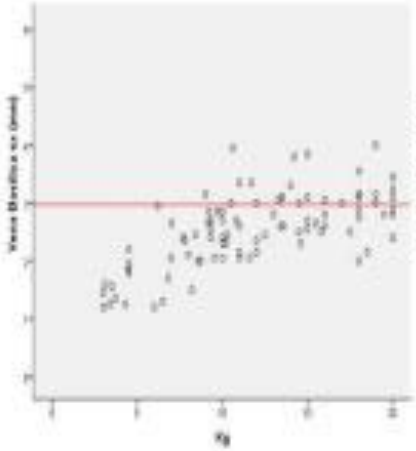
Obiettivo primario: misurazione delle vene profonde del braccio nei bambini sotto i 20 kg di peso

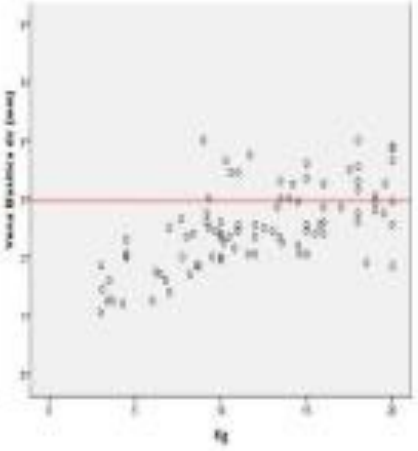
	BRACHIALE		BASILICA		CEFALICA		ASCELLARE	
	dx	sx	dx	sx	dx	sx	dx	sx
2,5 - 4 Kg	-	-	-	-	-	-	-	-
4,1 - 7 Kg	-	-	-	-	-	-	57	50
7,1 - 10 Kg	-	-	-	-	-	-	100	100
10,1 - 15 Kg	-	-	33	40	-	-	90	88
15,1 - 20 Kg	4	15	41	41	4	-	96	100

Tabella III. Percentuali di misurazioni ≥3 mm per ciascuna vena.









Da Pittiruti M, 2019

Peculiarità neonato e ≈ lattante

- Vene nel braccio (basilica, cefalica e brachiale) raramente > 3 mm
- Ascellare e succlavia 3-5 mm
- Tronco anonimo > 5 mm
- Giugulare interna > 5 mm
- Vena femorale di calibro ca 3 mm

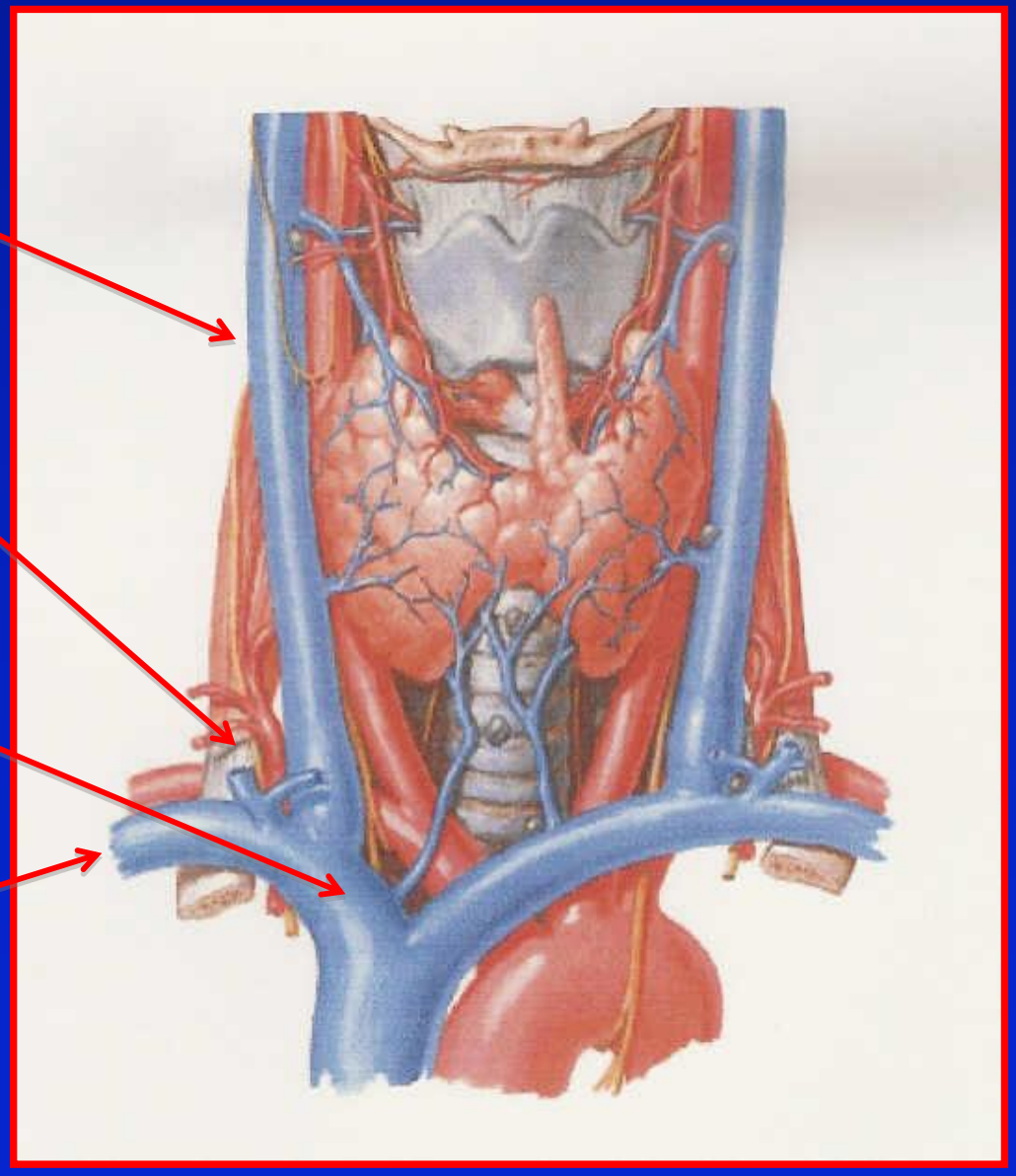
Vie per accesso venoso centrale

V. Giugulare Int

V. Giugulare est

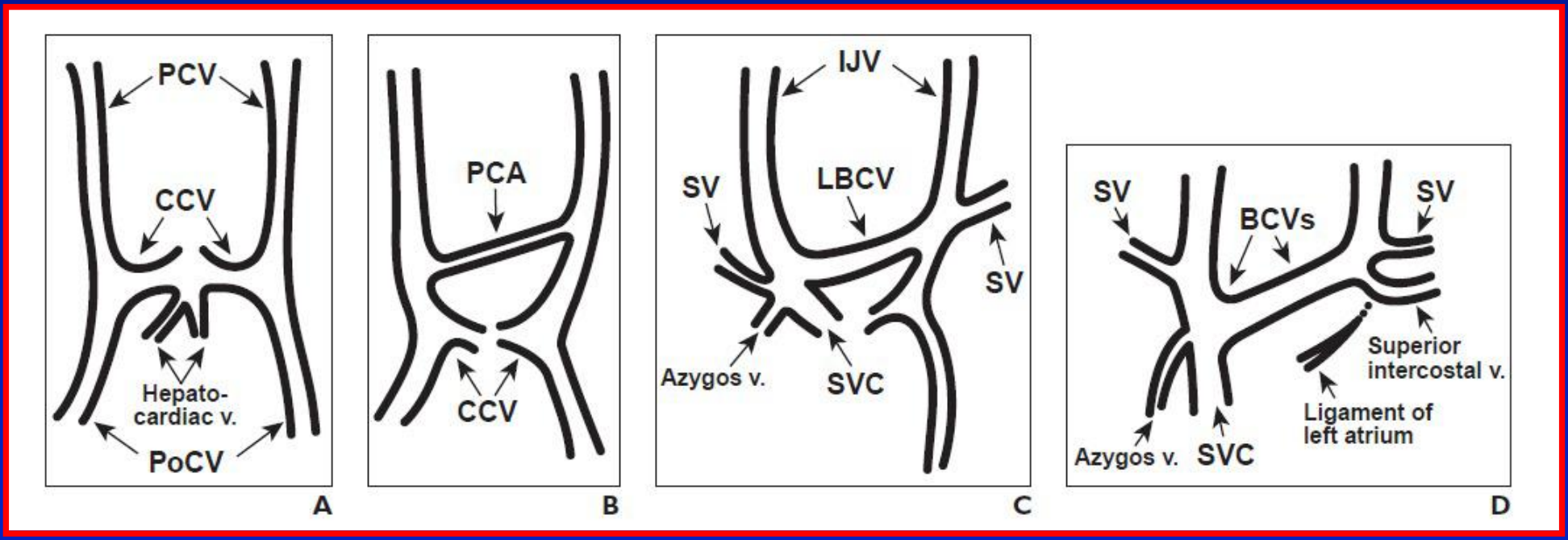
V. Anonima

Arto superiore



CICC

Vie per accesso venoso centrale



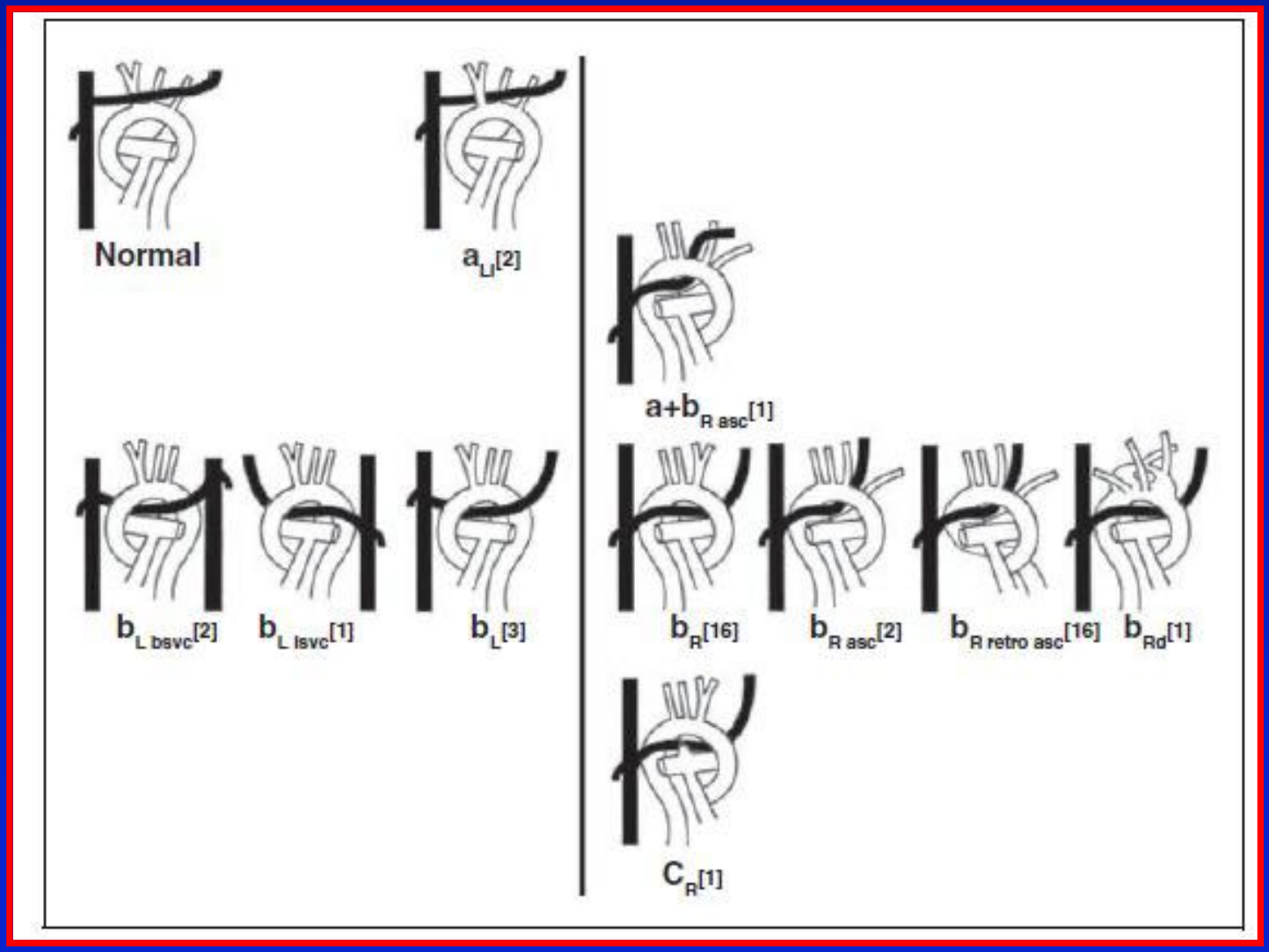
Frequenti anomalie anatomiche

Essenziale il riconoscimento preventivo

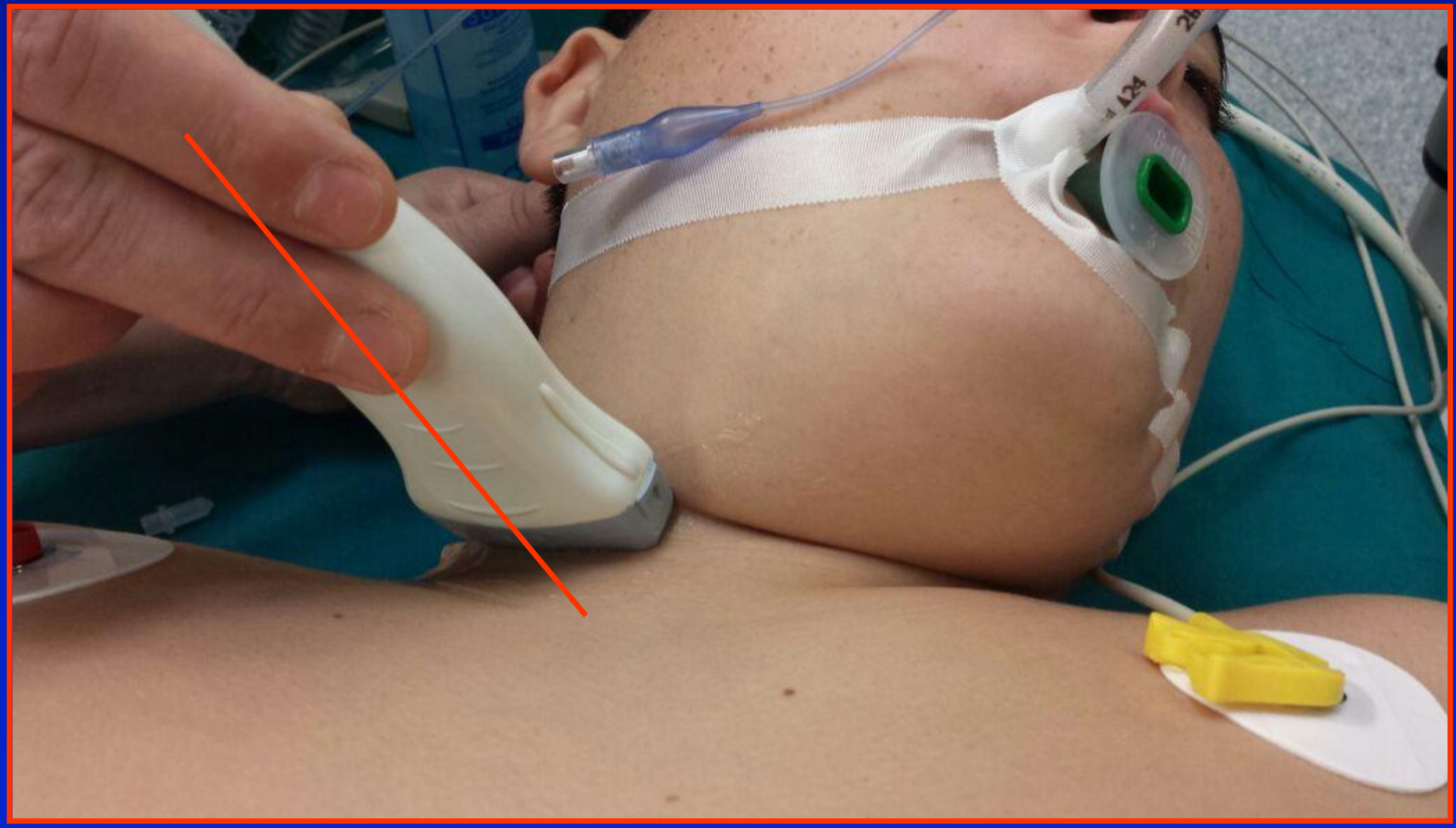
Ecocardio in ogni neonato con sospetta cardiopatia?

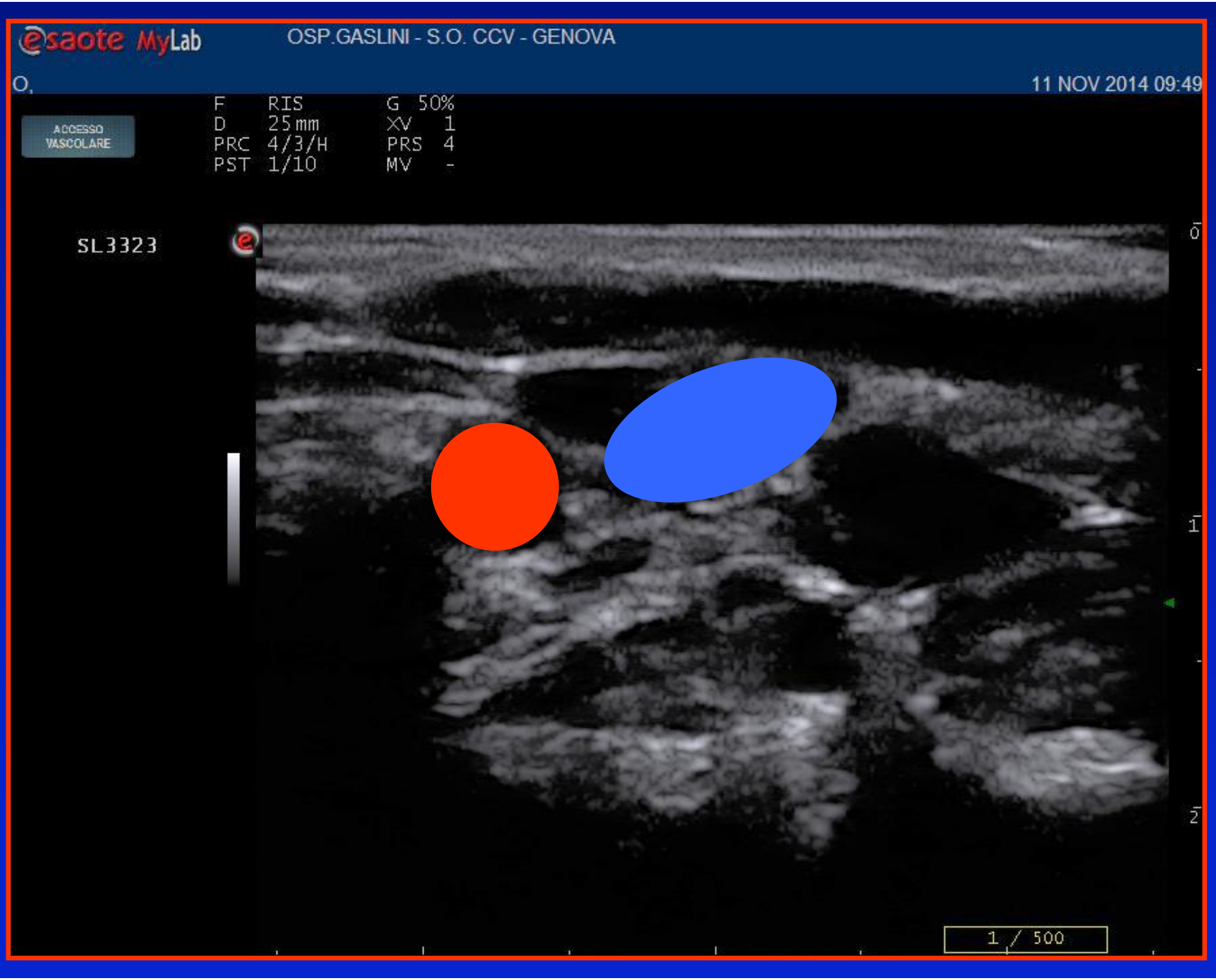
Ecocardio in ogni caso di posizionamento CVC a sin?

Varianti del tronco anonimo



Rapid Central Vein Assessment (RaCeVA)

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D 25 mm XV 1
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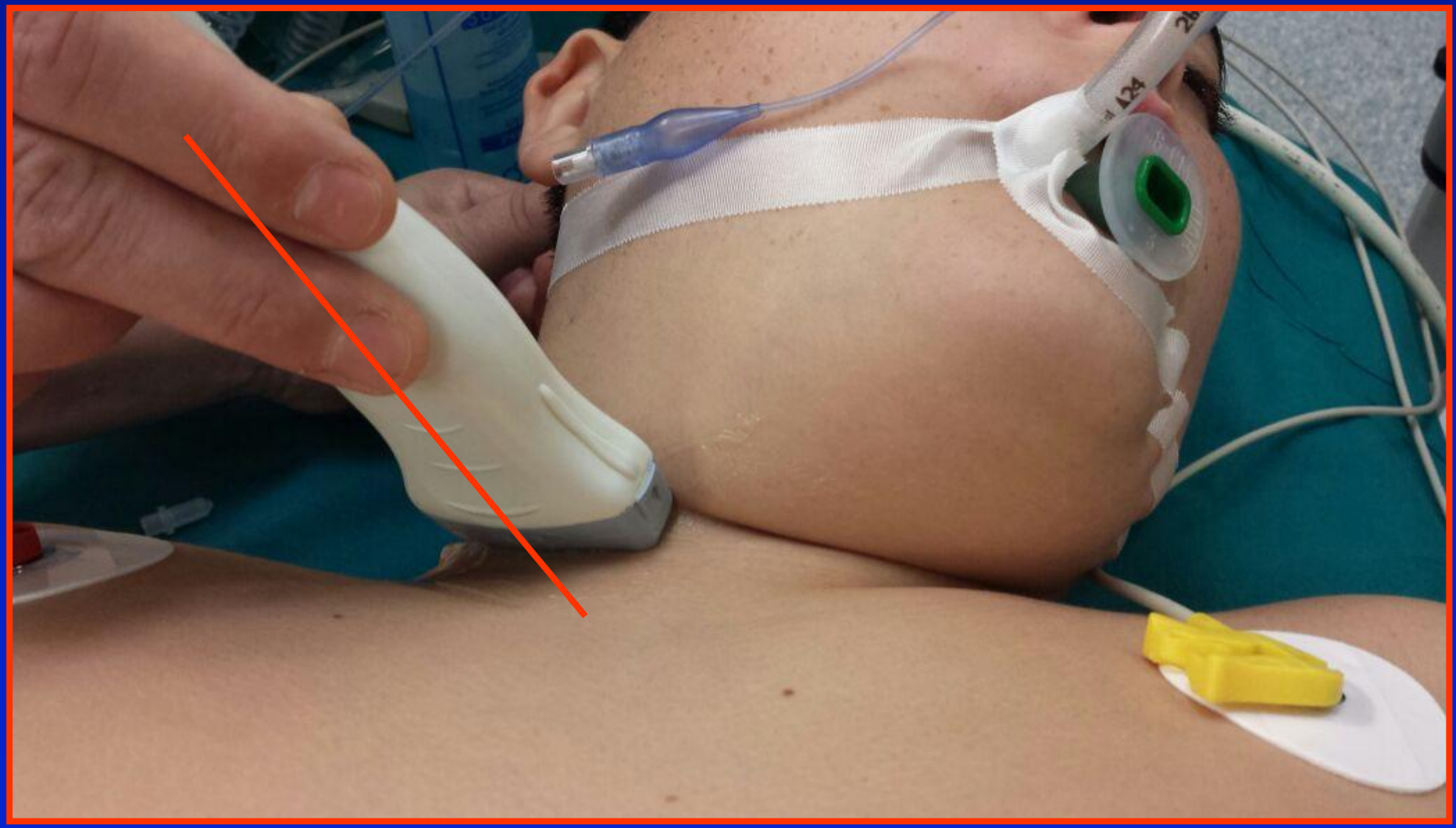
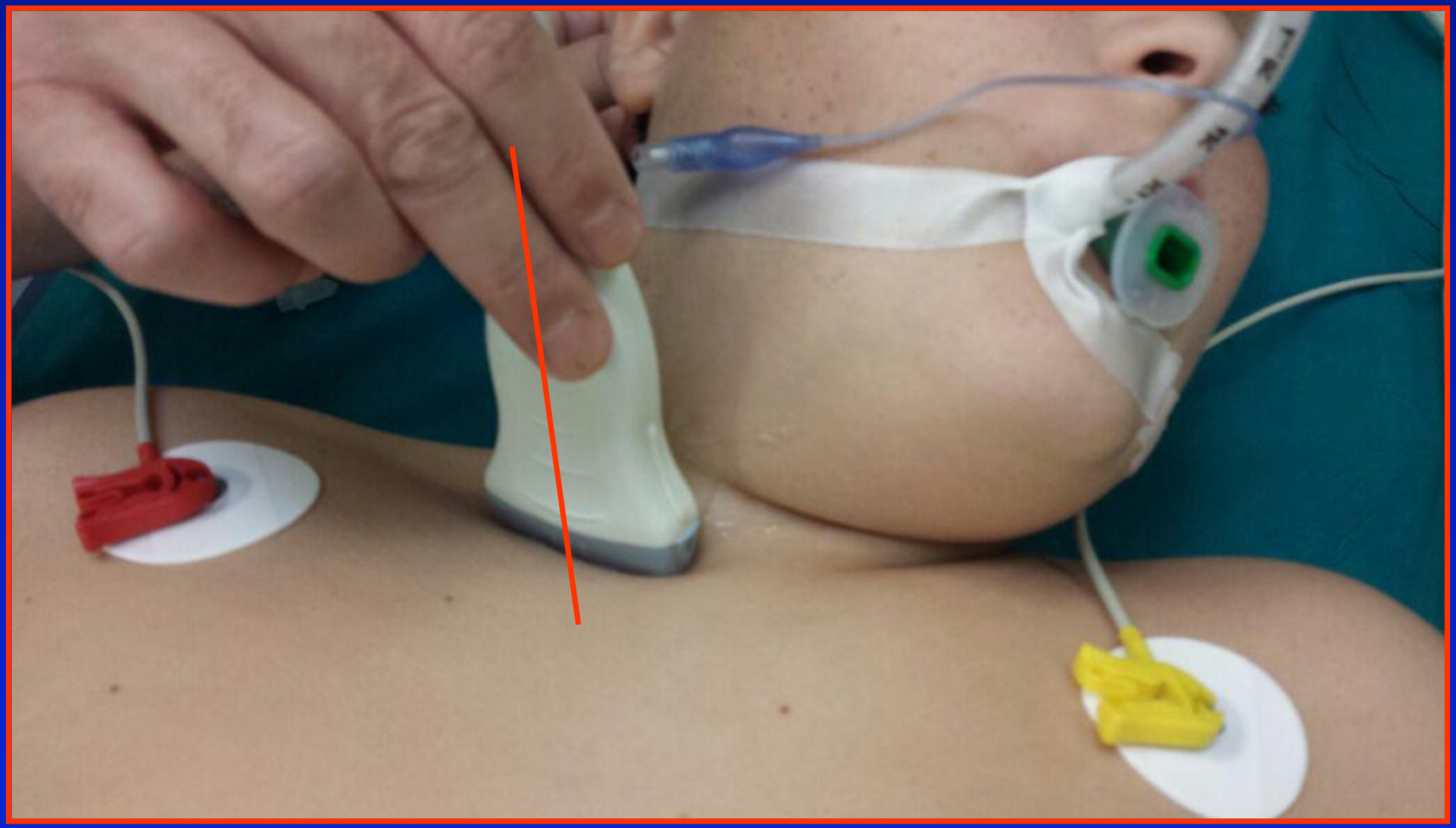
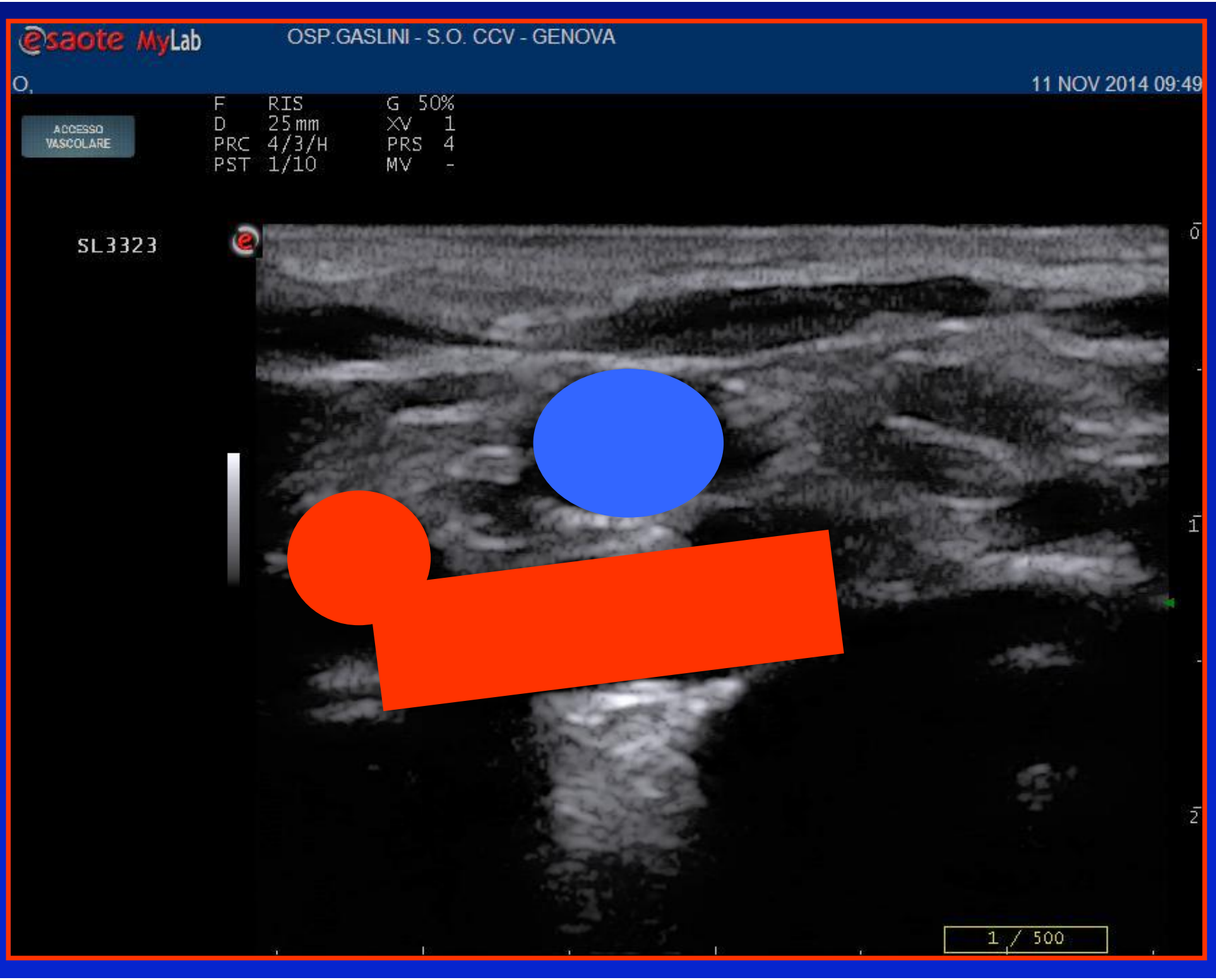
PST 1/10 MV -
SL3323
1 / 500



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D 25 mm
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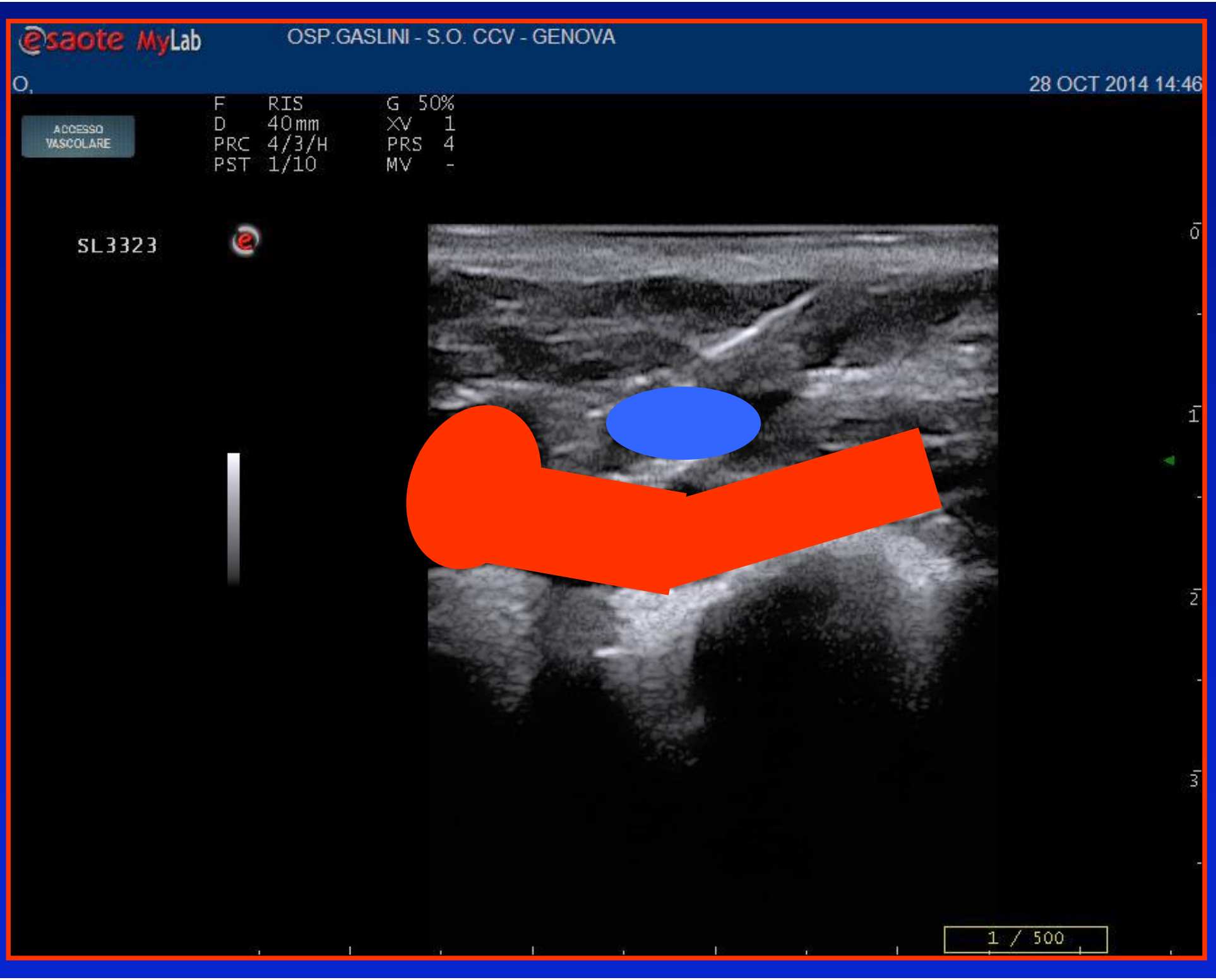
PST 1/10
G 50%
XV 1
PRS 4
MV -
SL3323
1 / 500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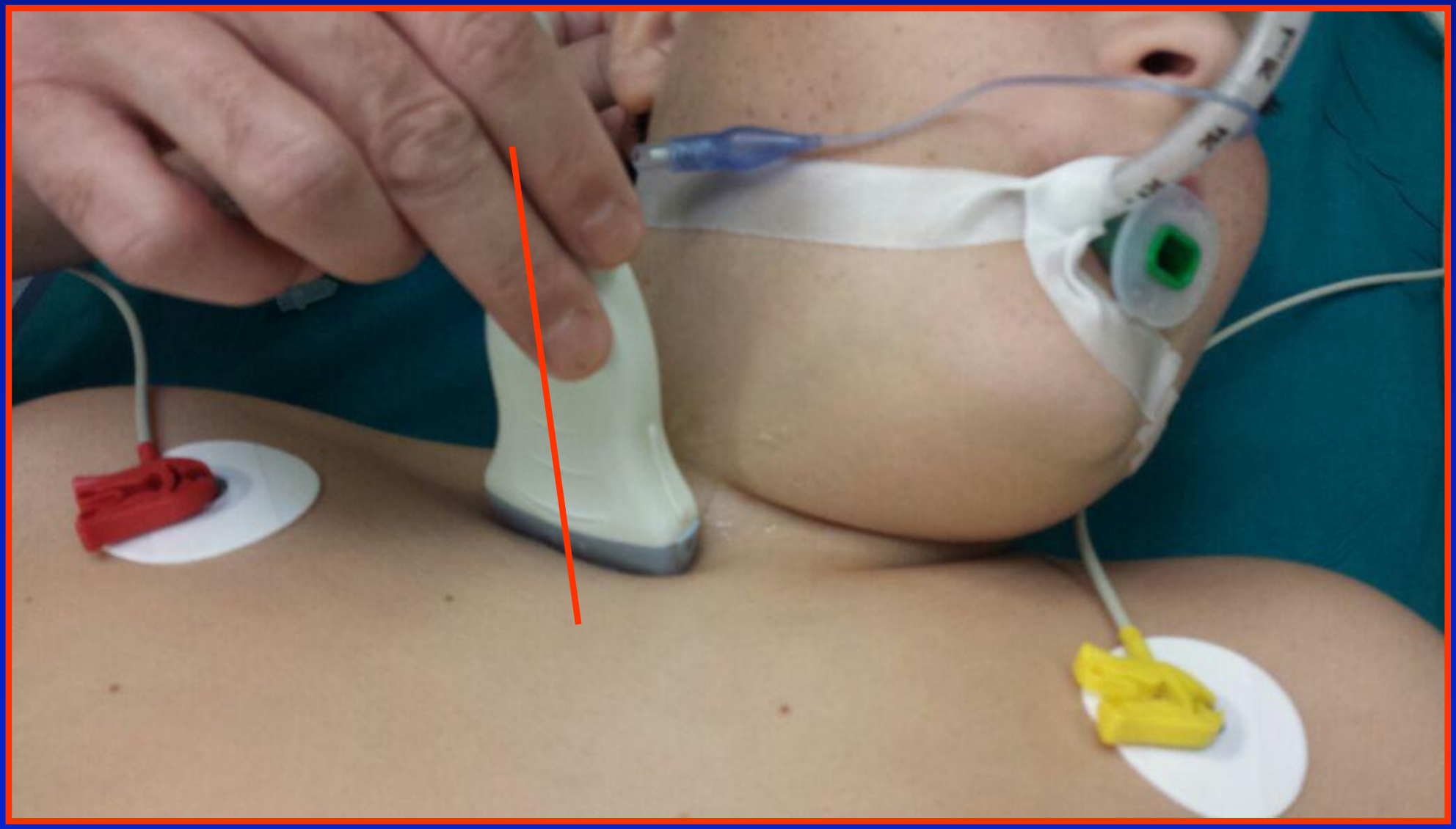
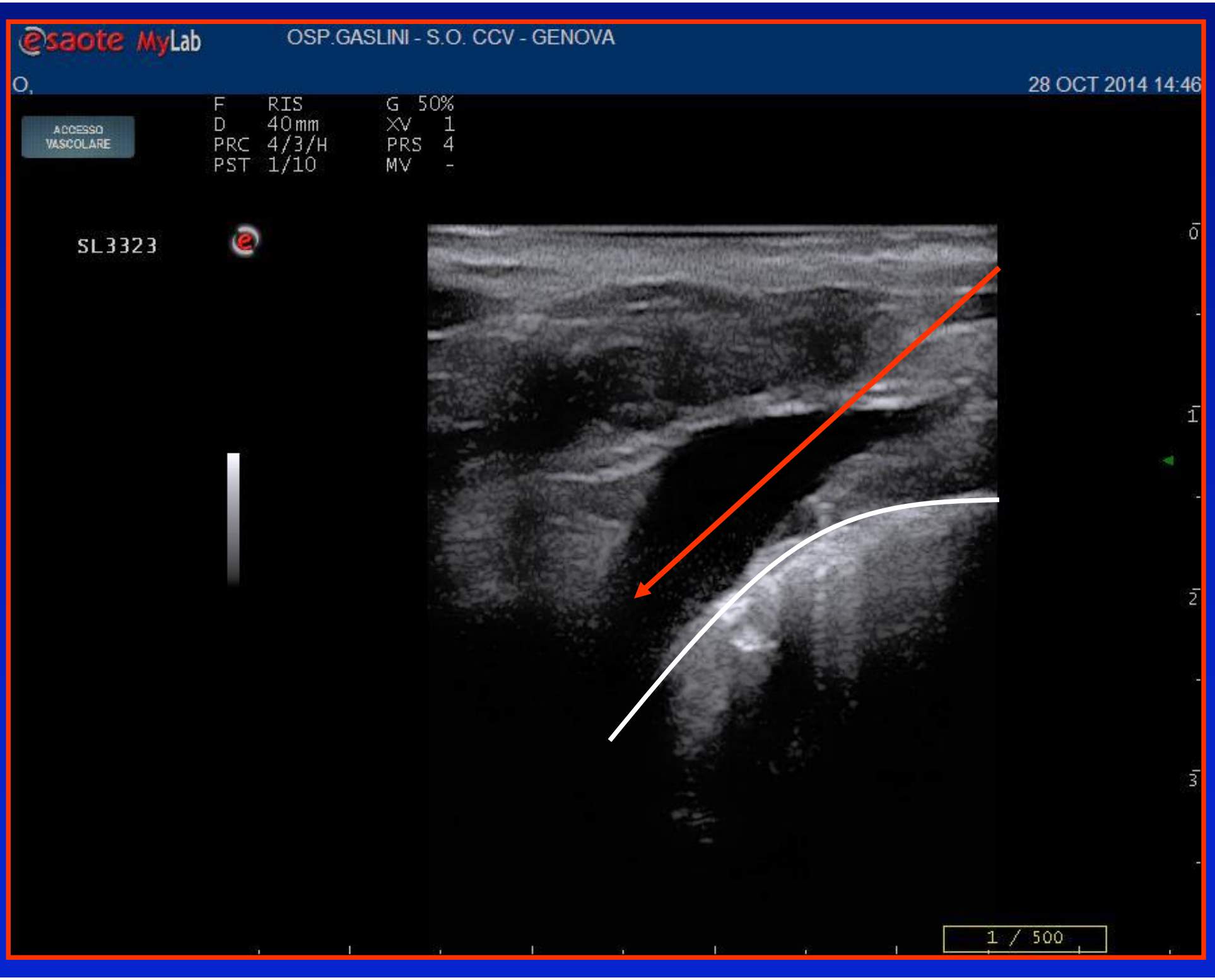
PST 1/10
G 50%
XV 1
PRS 4
MV -
SL3323
1 / 500

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D 40mm
PRC 4/3/H
PST 1/10
G 50%
XV 1
PRS 4
MV -
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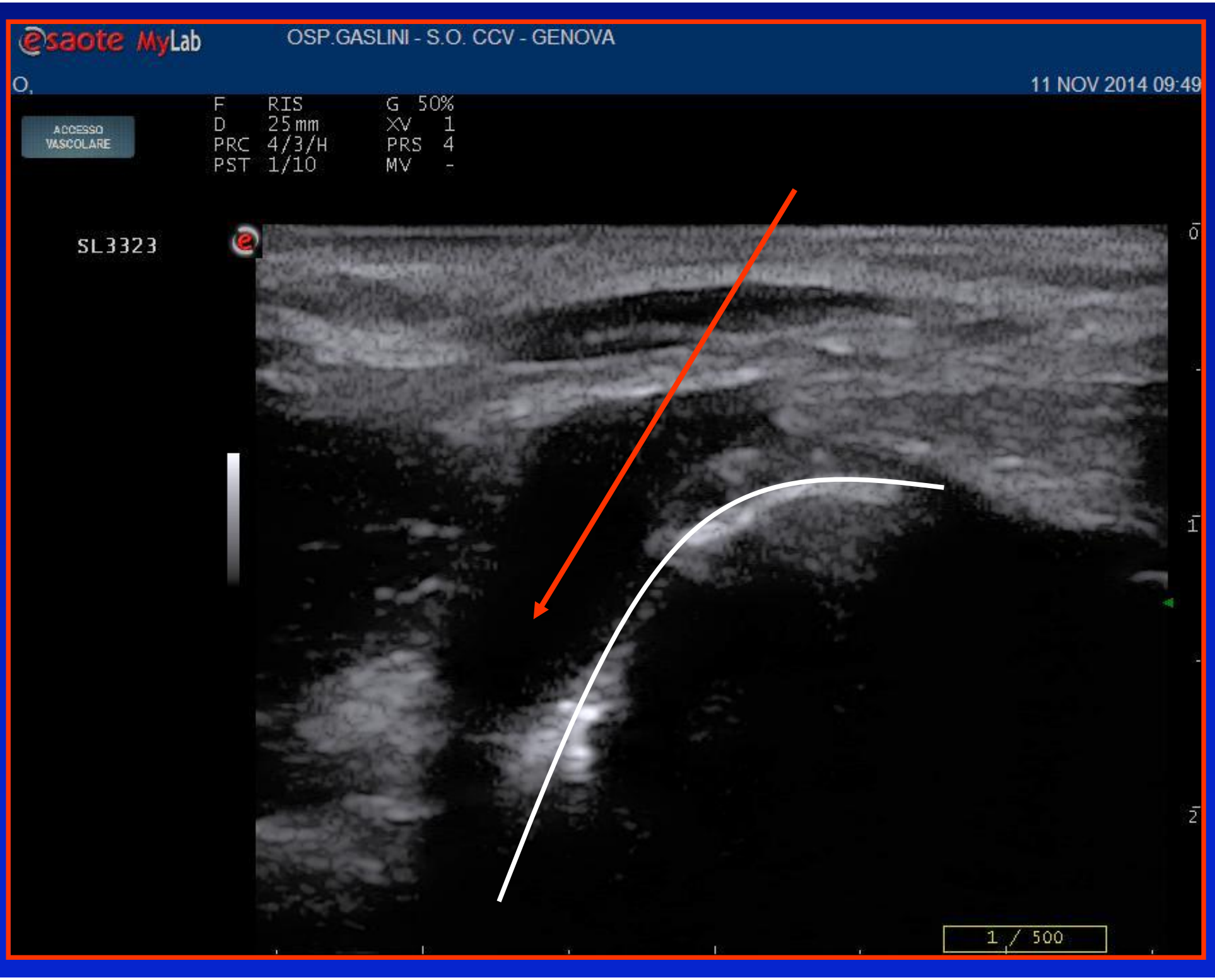
1 / 500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G 50%
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PRS 4
MV -
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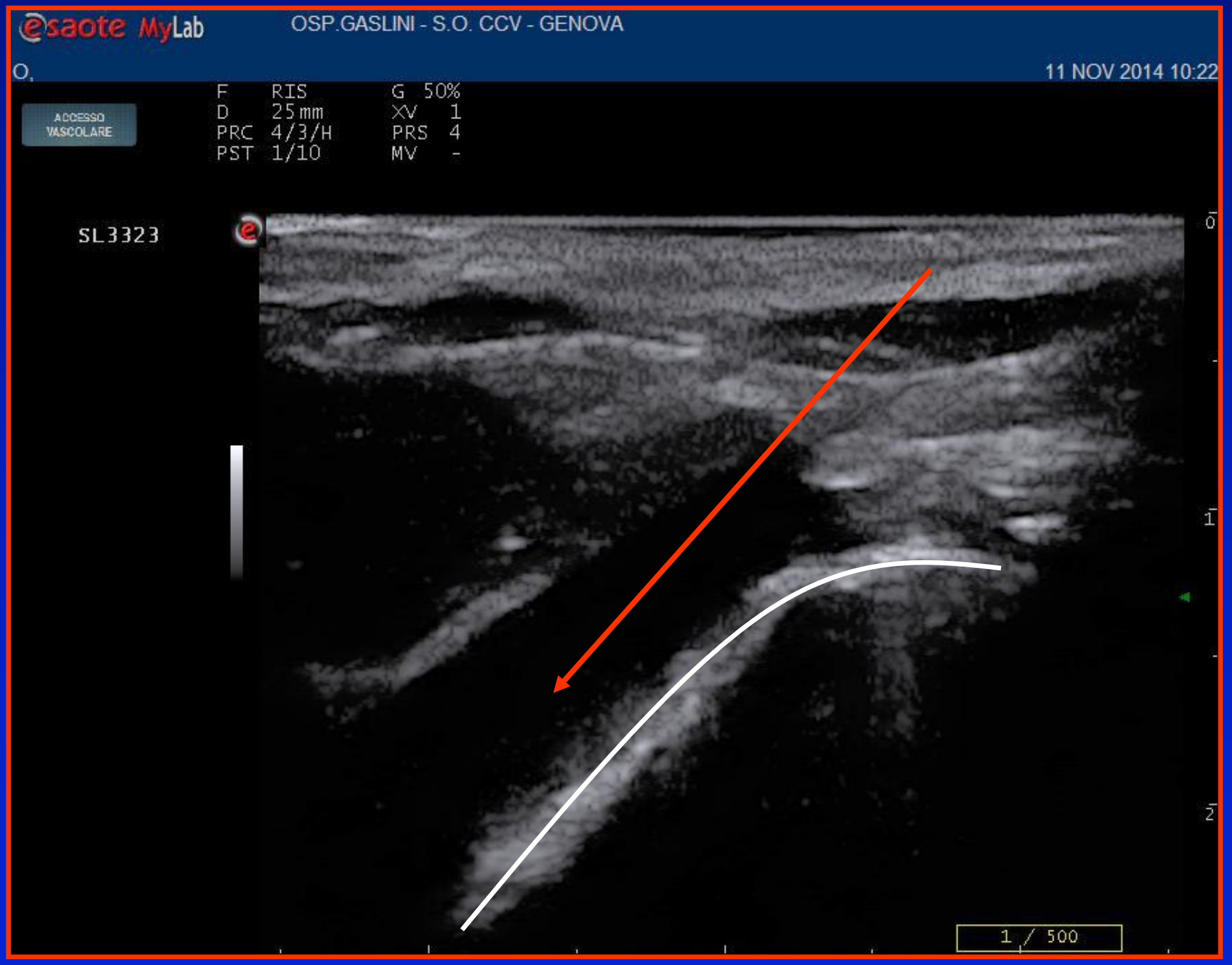
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PRS 4
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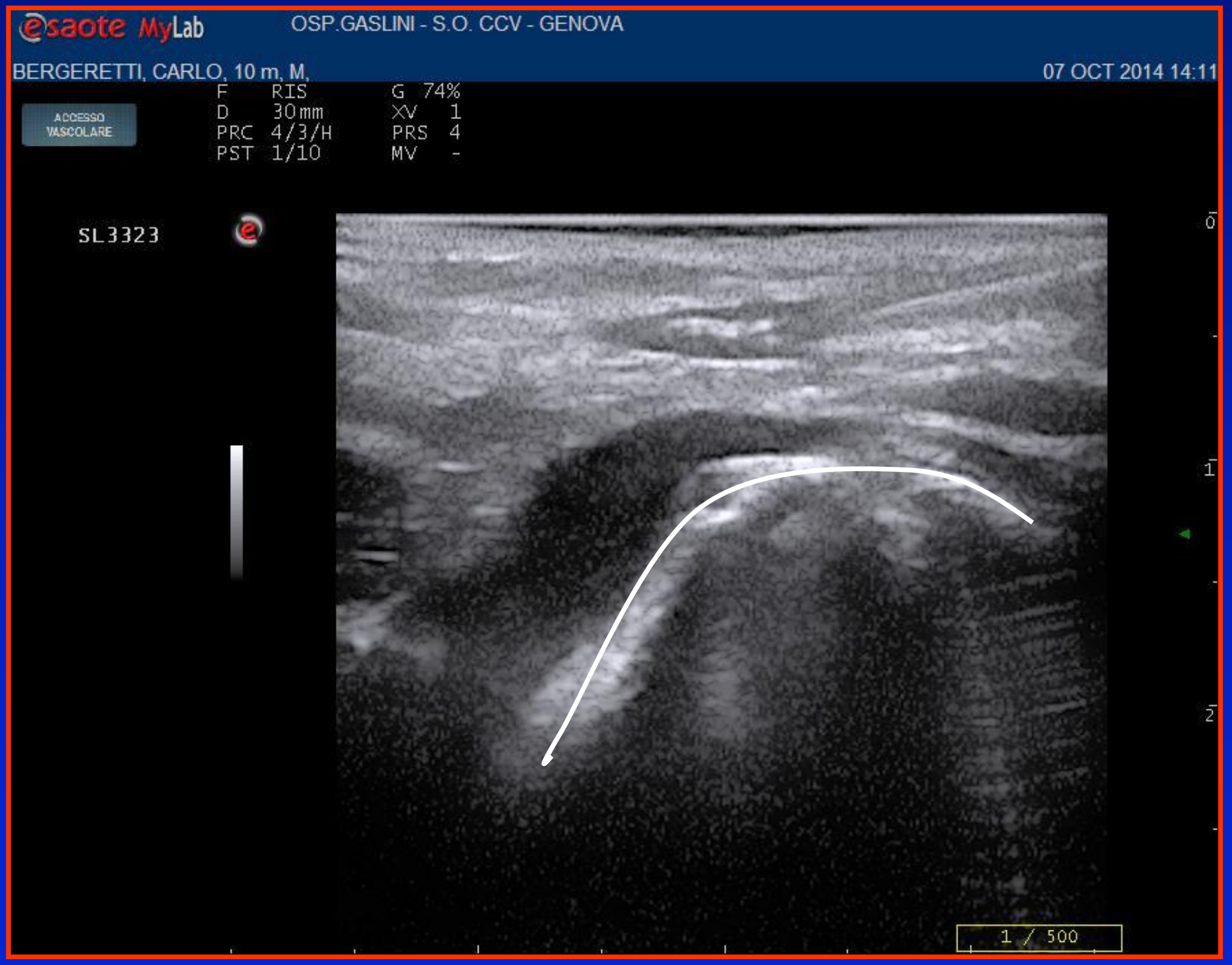
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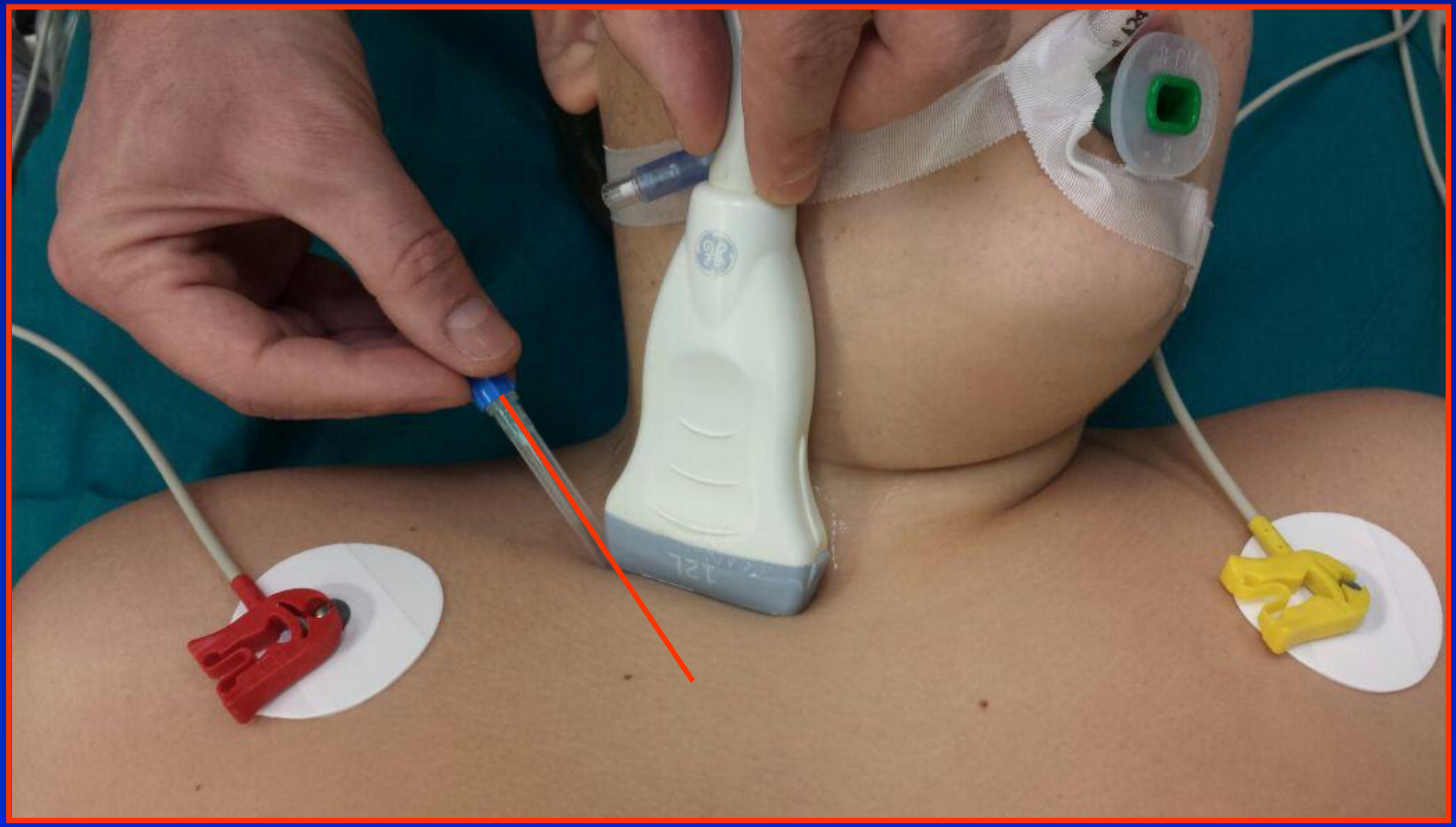
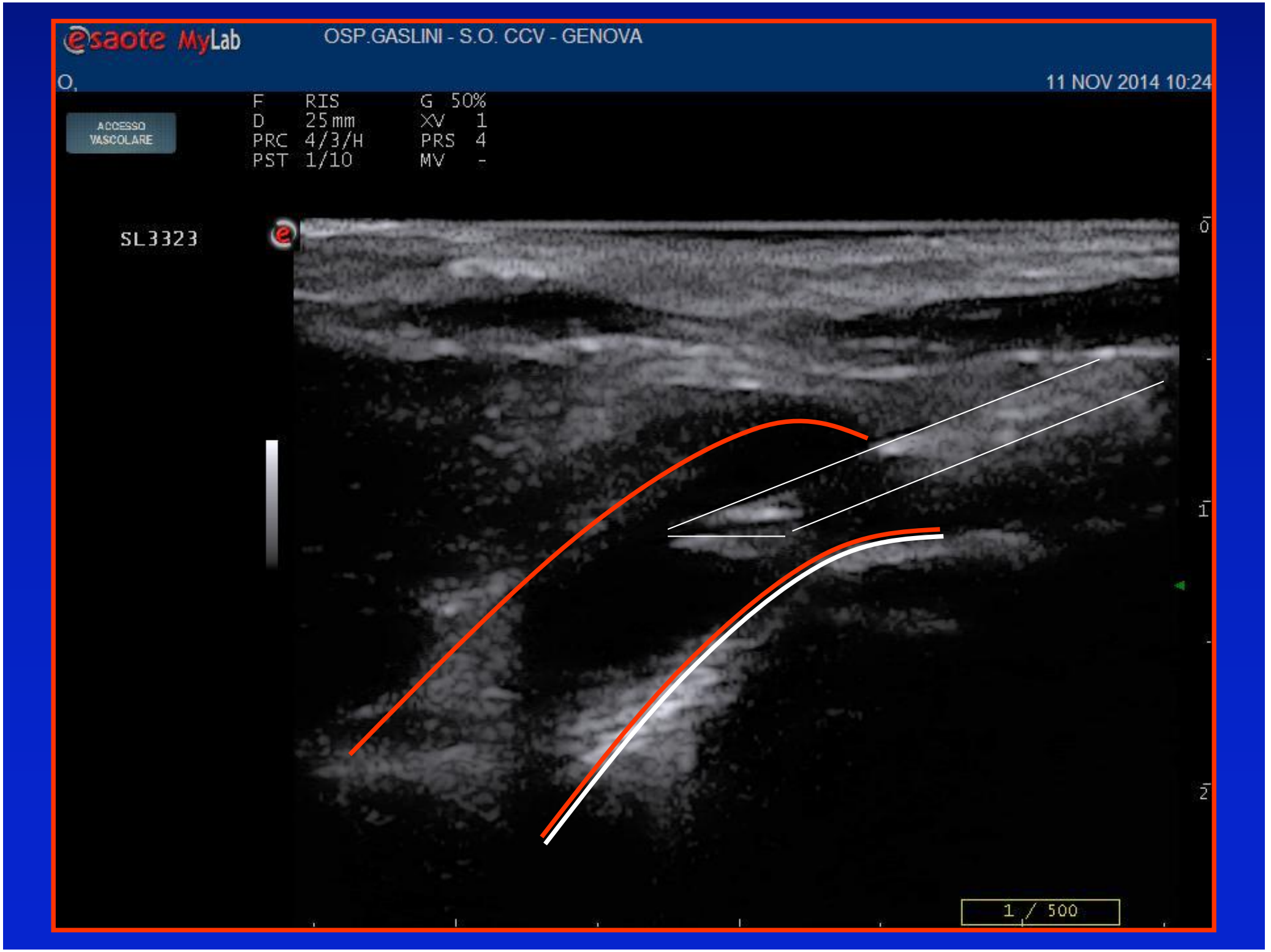
PST 1/10
G 74%
XV 1
PRS 4
MV -
SL3323
1 / 500

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PRS 4
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SL3323
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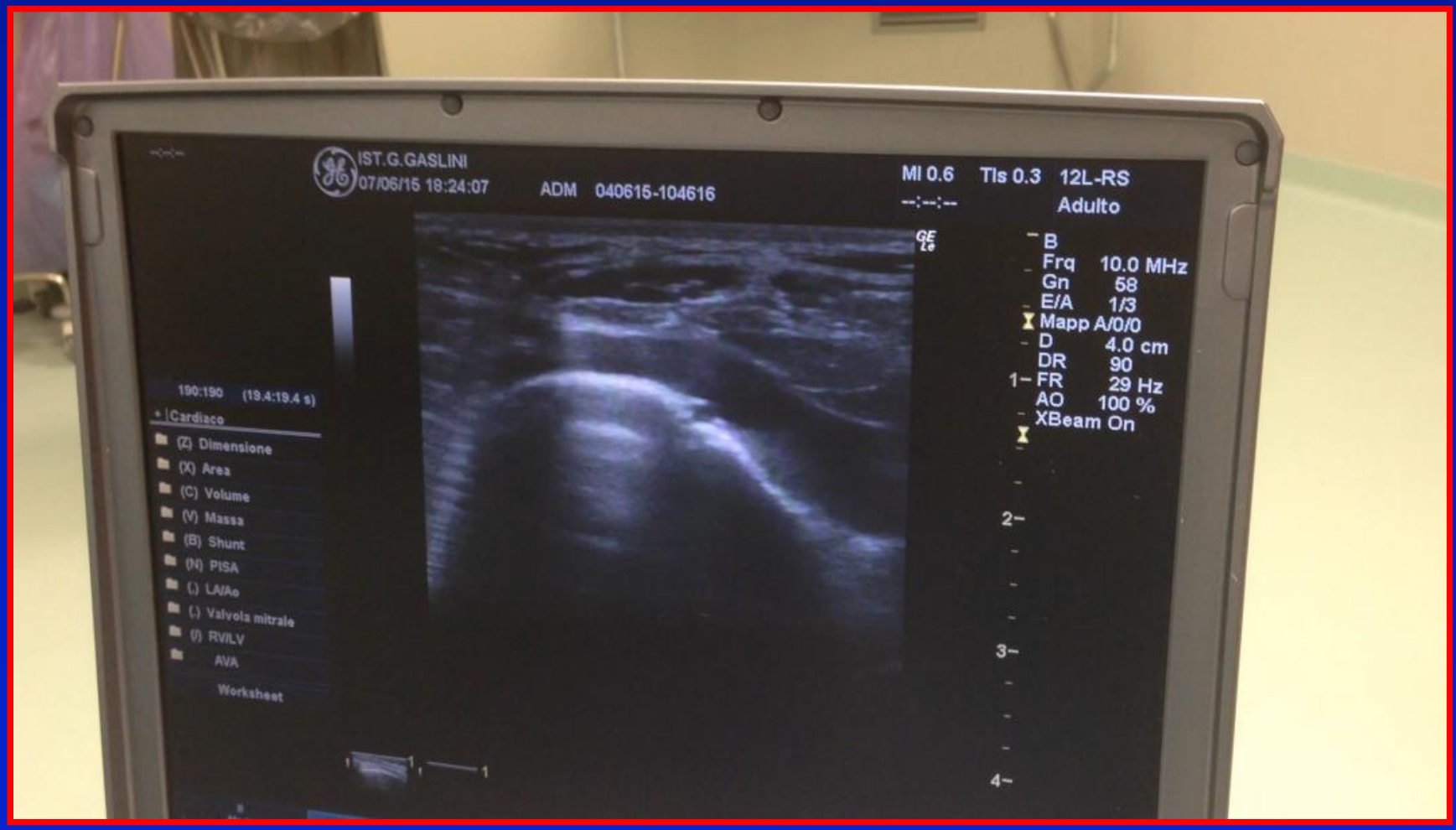
1
2
1 / 500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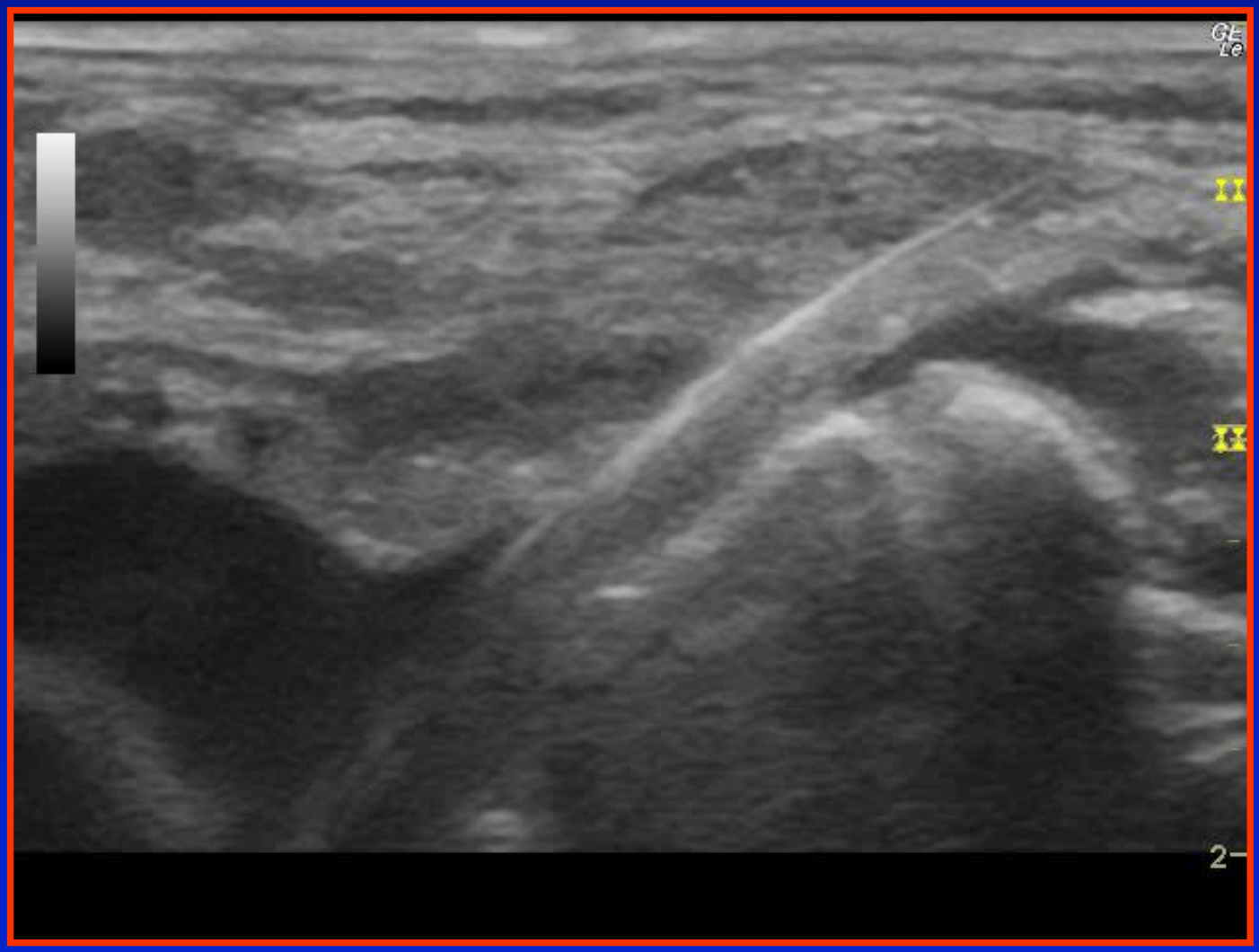
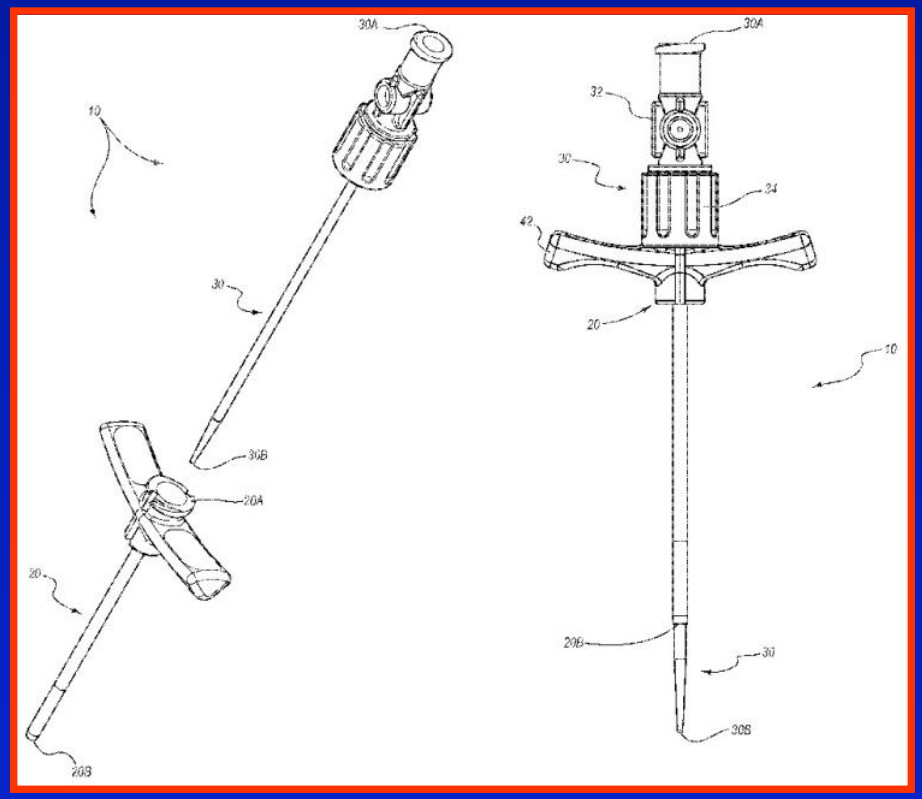
Adulto
B
Frq 10.0 MHz
Gn 58
E/A 1/3
Mapp A/0/0
D 4.0 cm
DR 90
FR 29 Hz
AO 100 %
XBeam On
190:190 (19.4:19.4 s)
Cardiaco
(Z) Dimensione
(X) Area
(C) Volume
(V) Massa
(B) Shunt
(N) PISA
(,) LA/Ao
(,) Valvola mitrale
(/) RVILV
AVA
Worksheet
1
2
3
4


esaote MyLab
AZIENDA OSP.DI ALESSANDRIA
VENOSO LA332
TEI
ORIENT
FREQUENZA
RANGE DIN
FUOCHI
INVERTI
esaote

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10
20B
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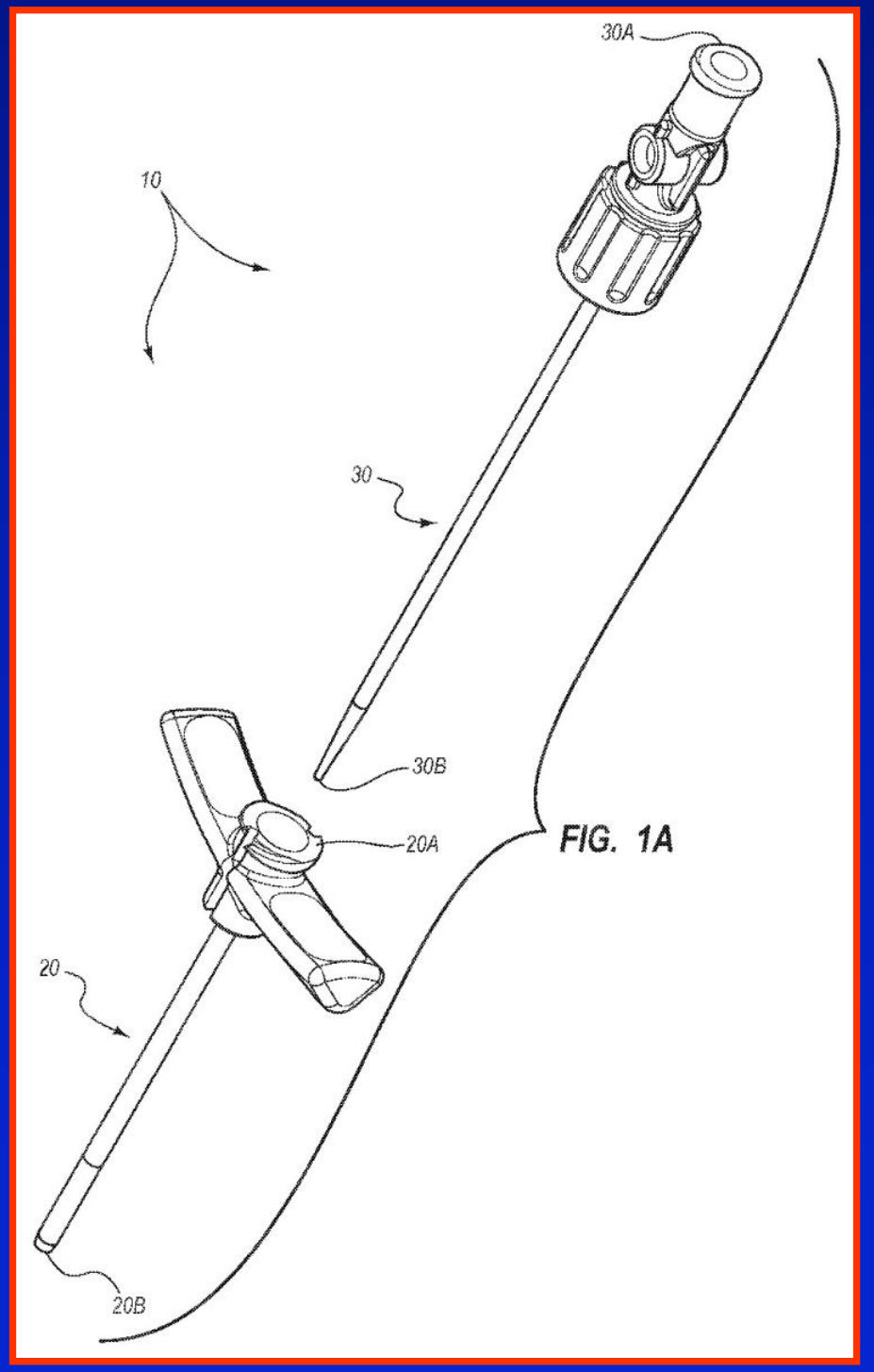
30B


30A
10
30
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20A
20
20B

FIG. 1A

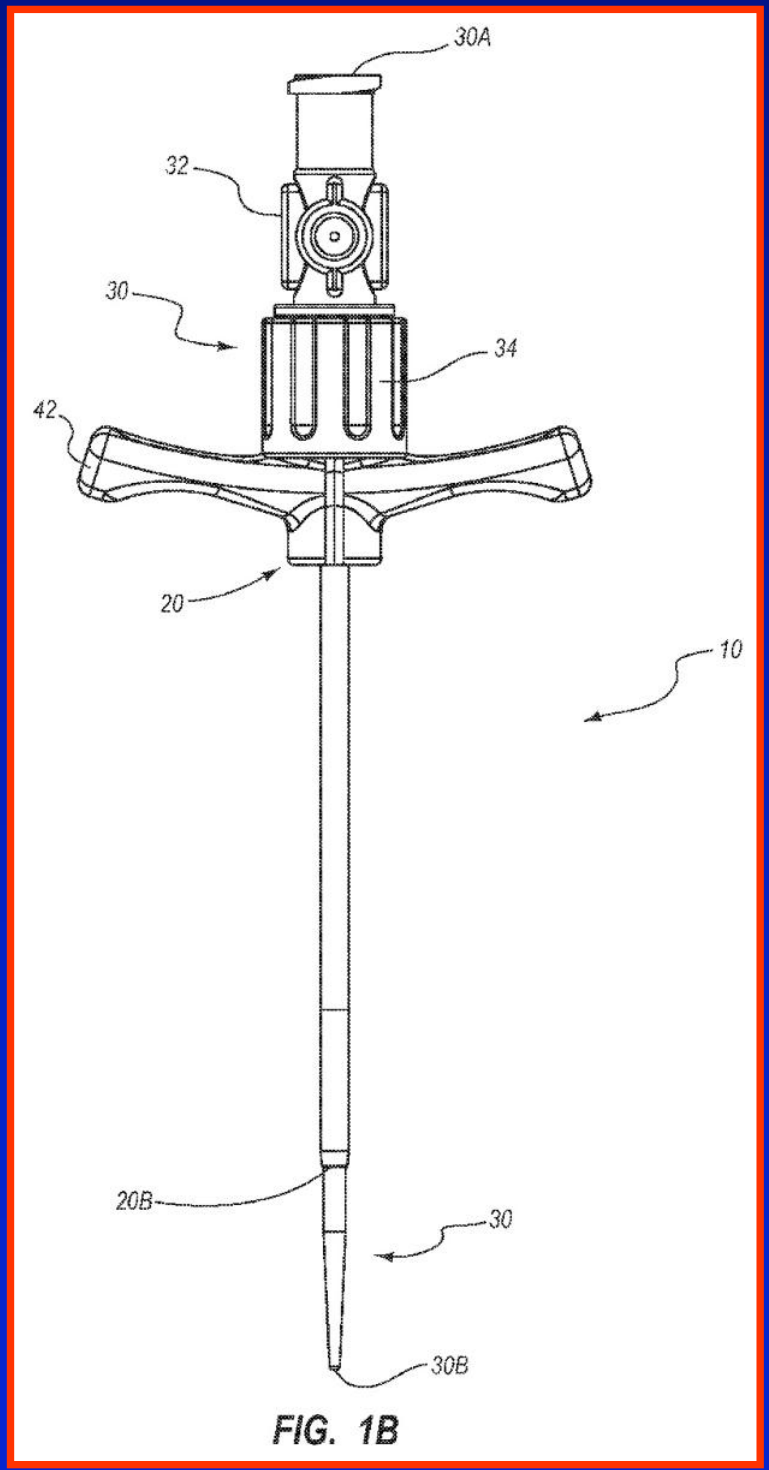


FIG. 1B

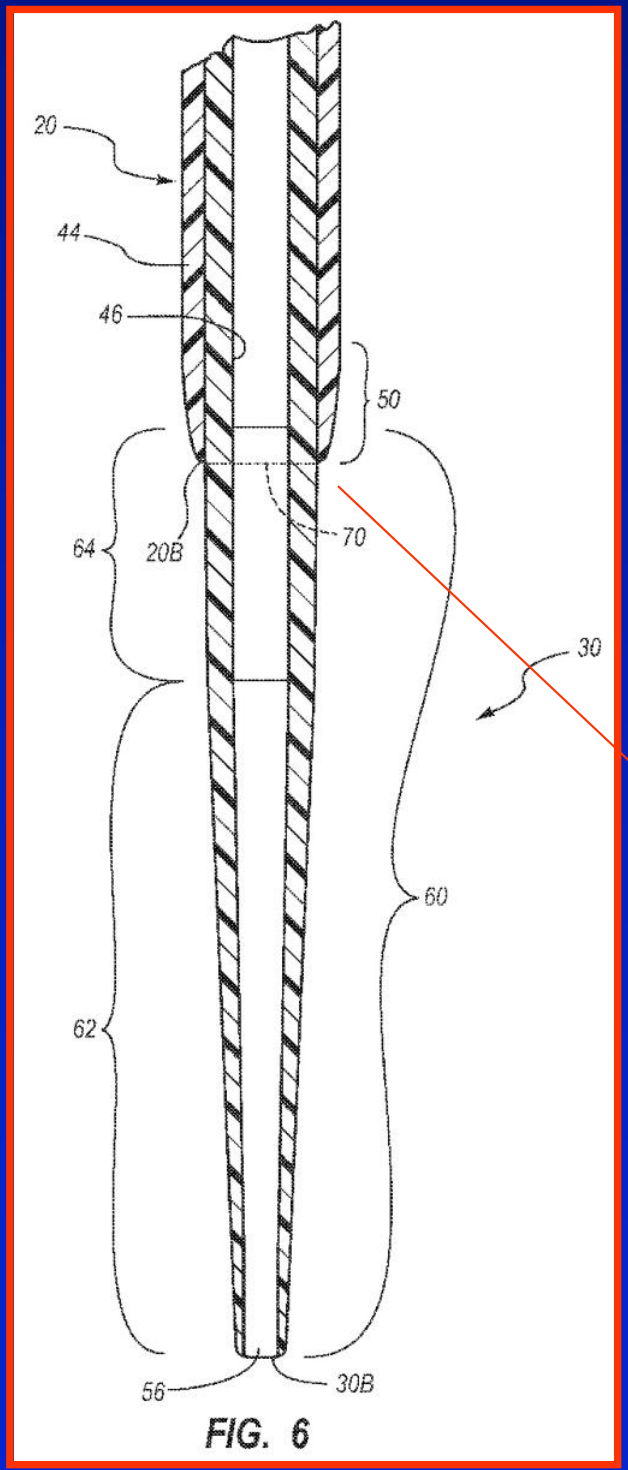


FIG. 6

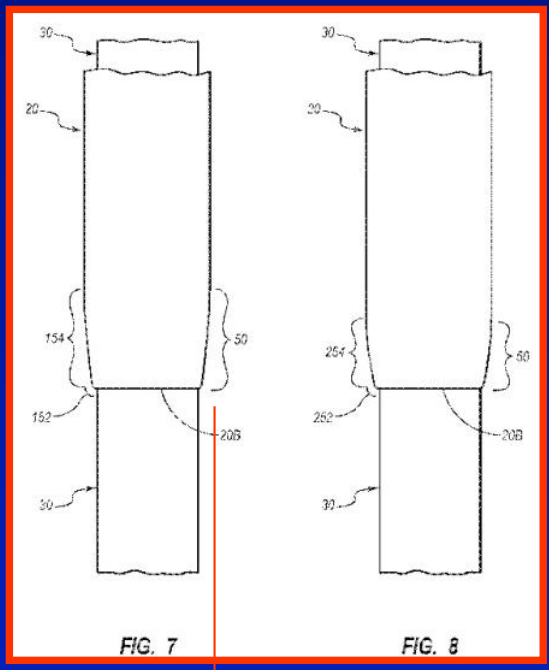
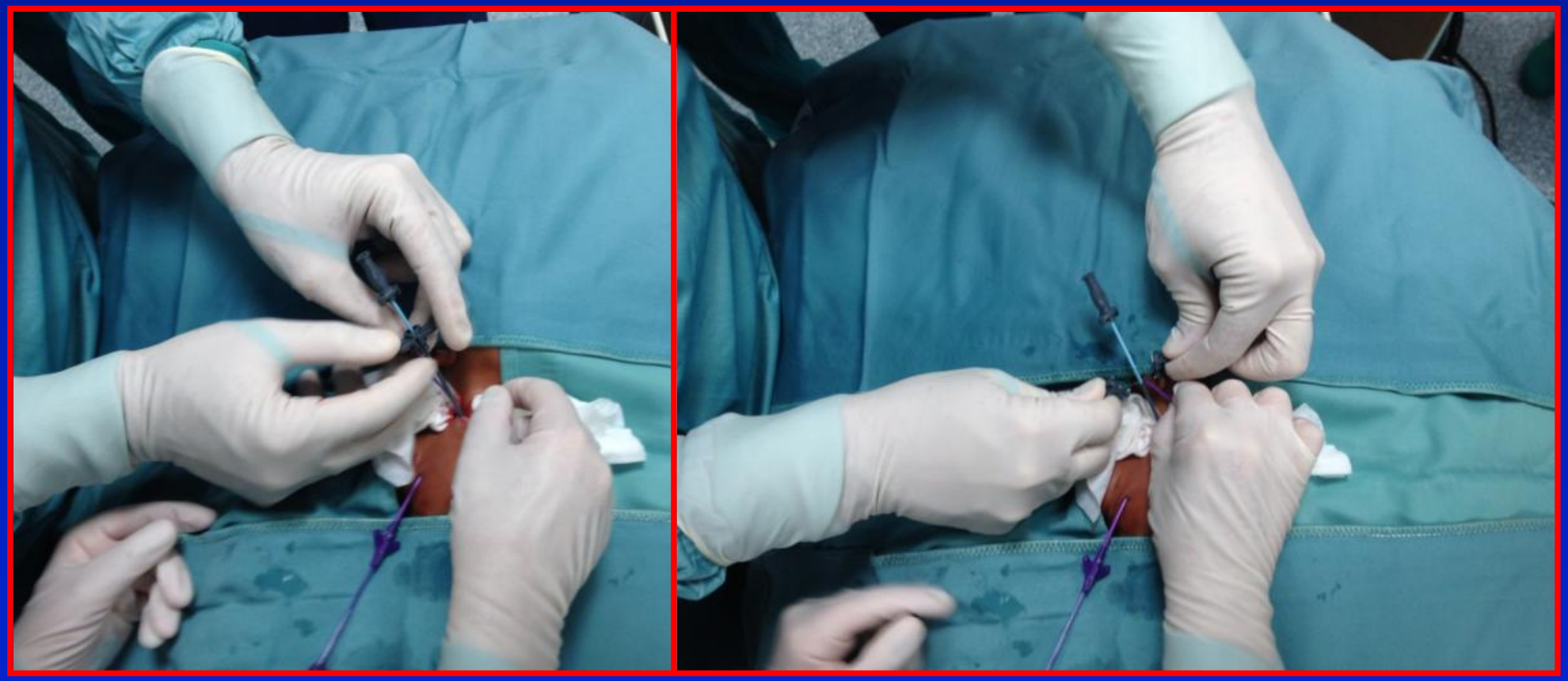


FIG. 7 FIG. 8

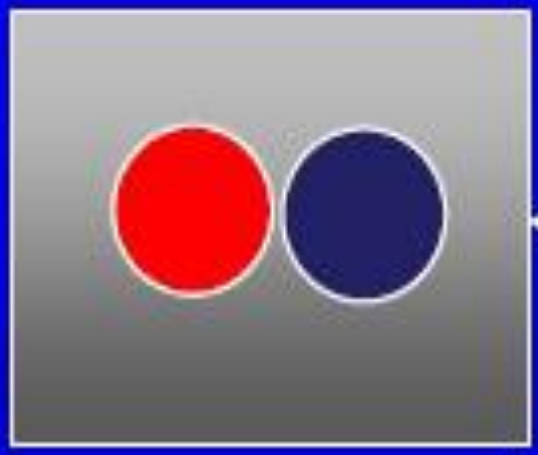
Controllare integrità dell'introduttore, SEMPRE



FICC

- Visualizzazione eco in asse corto
- Puntura "*out of plane*"
- Rischio trombosi
- Rischio infettivo
- Limitati all'emergenza o in caso di mancanza di accessi alternativi
- Soluzione "ponte" per CICC o PICC
- ...meno possibili...

VASI INGUINE

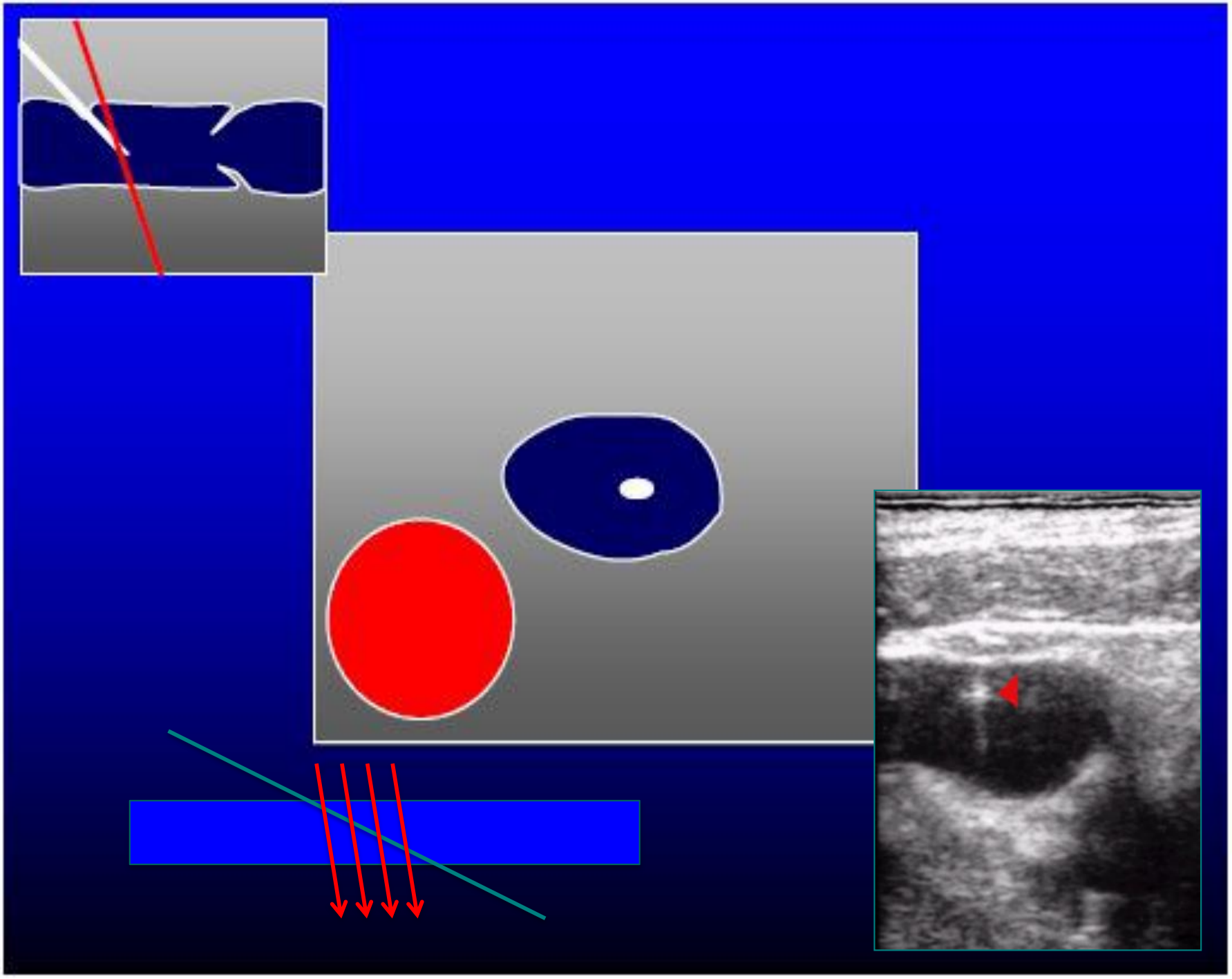


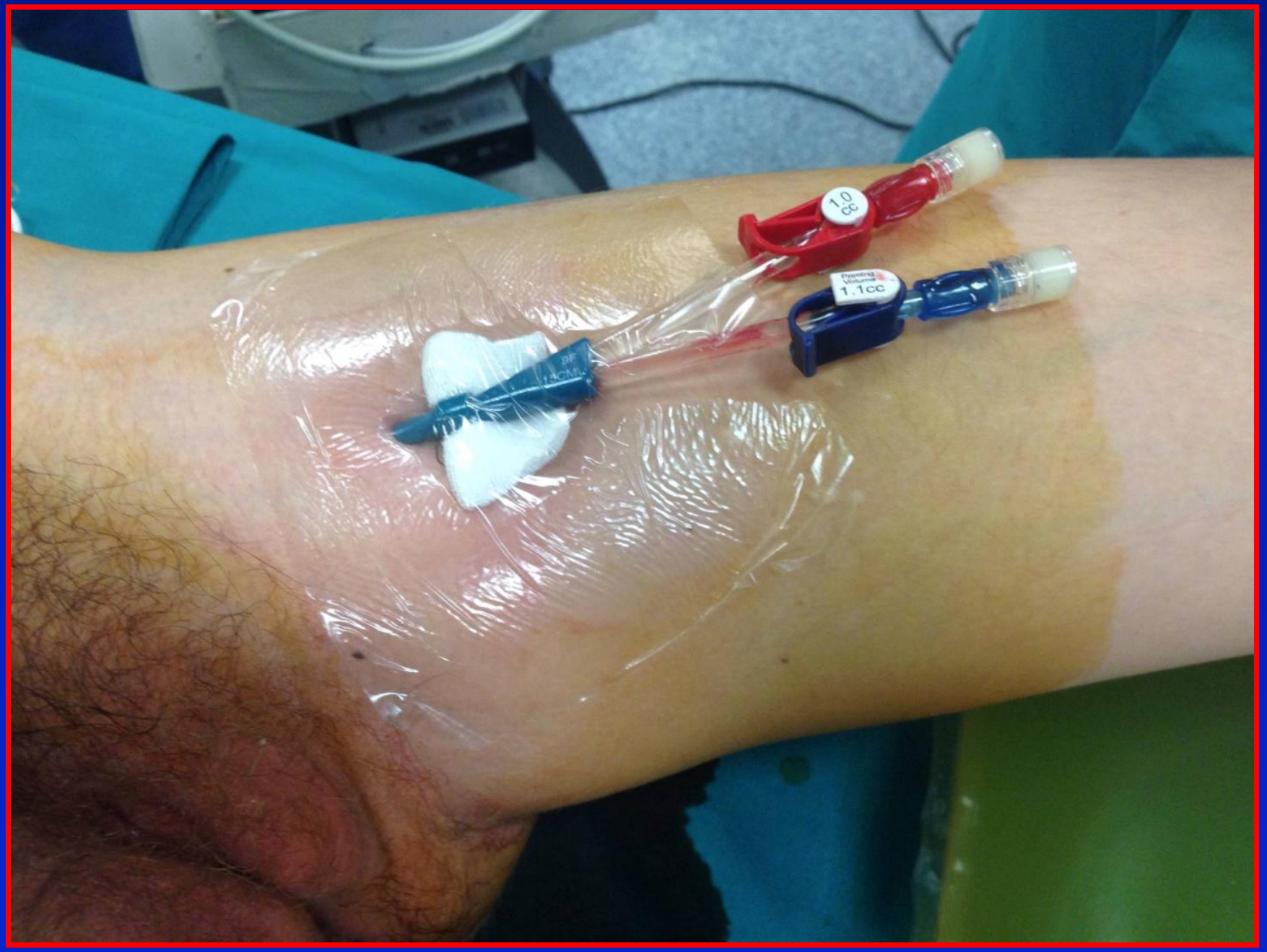
Femorale comune

Grande safena

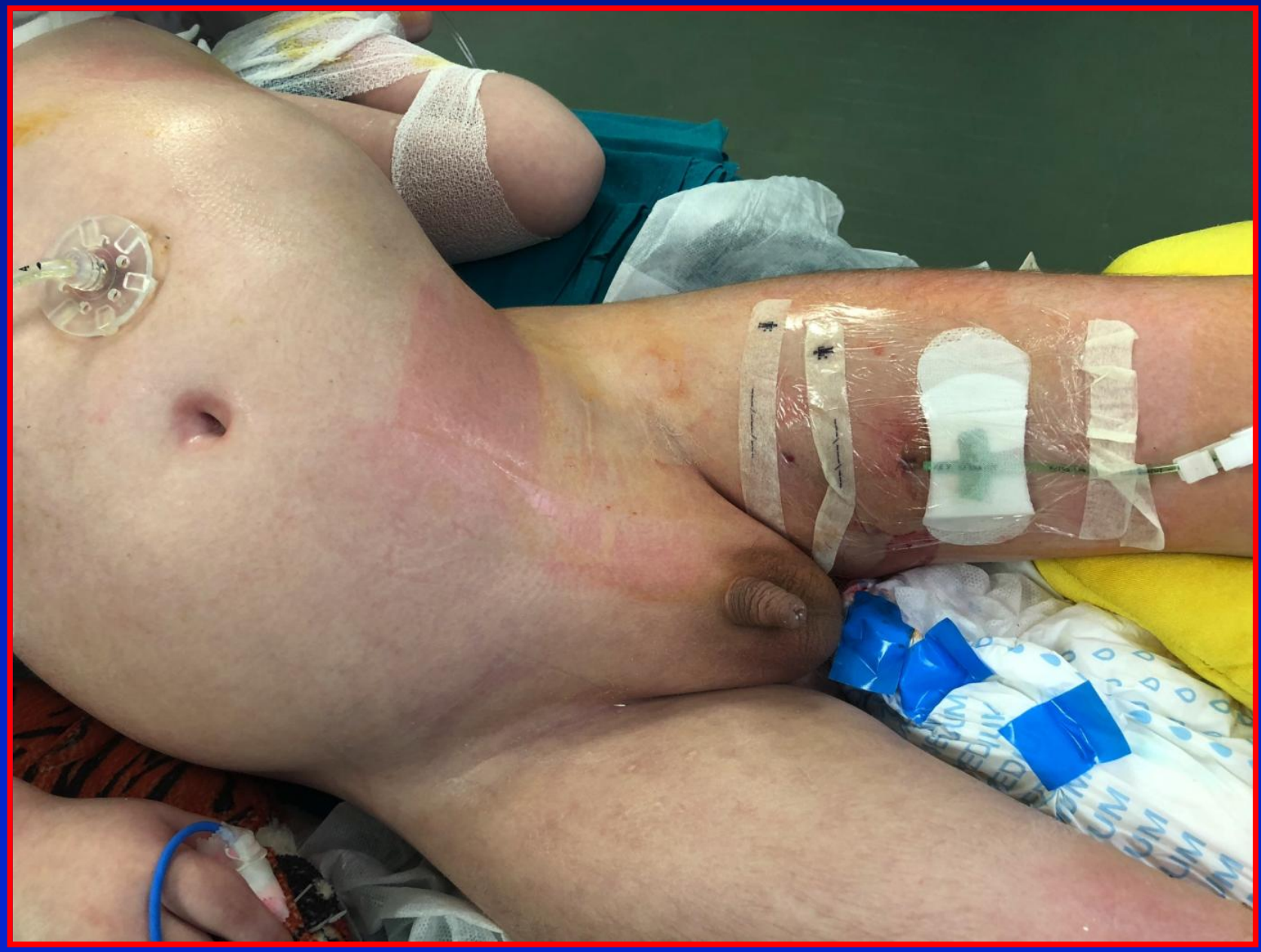
Biforcazione femorale

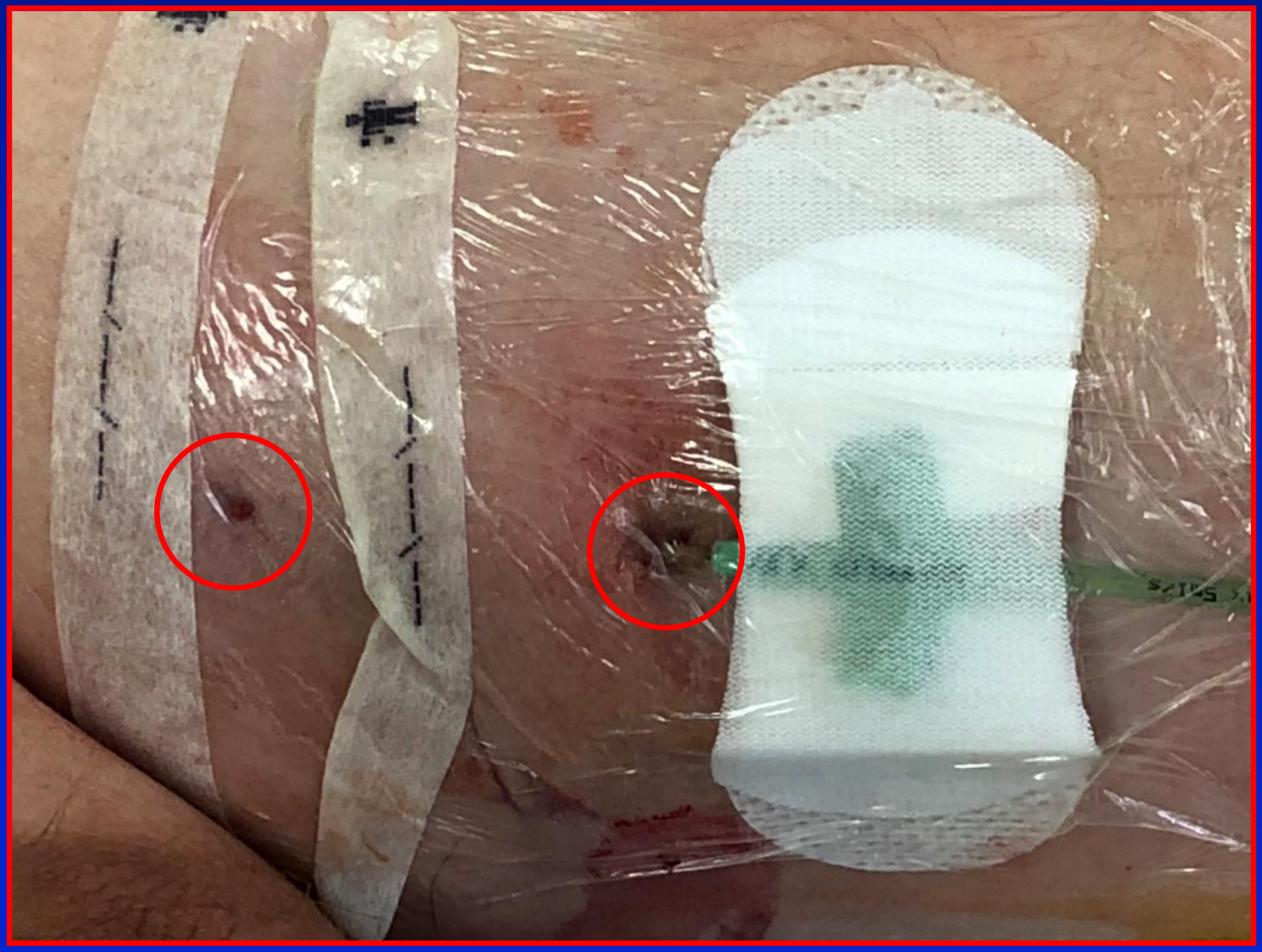
Femorale superficiale




1.0
cc
1.1cc


REMOVE with ALCOHOL





Conclusioni

- RAPEVA e RACEVA cruciali nel bambino
- Sede di puntura, scelta della vena
- Fondamentale sede di emergenza del catetere
- Neonato e lattante – CICC (BCV approccio migliore)
- Bambino sopra i 20 Kg – PICC
- Fra i due limiti, scelta ponderata
- FICC opzione valida ma limitata a casi selezionati
- Risparmio del patrimonio venoso
- Towards zero complication rate


GRAZIE