IL PUNTO SULLA TIP LOCATION: QUANDO E COME UTILIZZARE L'ECOCARDIOGRAFIA - IL PROGETTO ECHOTIP -

XII PICC DAY
BOLOGNA 3-4 DICEMBRE 2018

EMANUELE IACOBONE

ASUR MARCHE

OSPEDALE DI MACERATA

SERVIZIO DI ANESTESIA E RIANIMAZIONE

SIAARTI

PRO VITA CONTRA DOLOREM SEMPER

Buone pratiche cliniche SIAARTI

LE BUONE PRATICHE PER GLI ACCESSI VASCOLARI

Autori

Cerotto V, Vallati D, Montrucchio G, Capozzoli G, Brazzi L, Gori F

Controllo della punta	Riferimento	Limiti
RX Torace - Fluoroscopia	Tratto di vena compreso tra la carena e i due corpi vertebrali al di sotto della carena stessa	Ingrandimento atriale Varianti congenite atipiche
ECG Intracavitario	Ottenimento dell'onda P massimale	Fibrillazioni, flutter, tachicardia atriale parossistica
ECOCARDIO Transtoracico	Finestra sottocostale: visualizzazione della punta (possibile anche utilizzo di contrasto ecografico-CEUS)	Disponibilità e scarsa finestra ecografica (caratteristiche cliniche del paziente)
ECOCARDIO Transesofageo	Visualizzazione diretta della punta	Disponibilità, curva di apprendimento, invasività

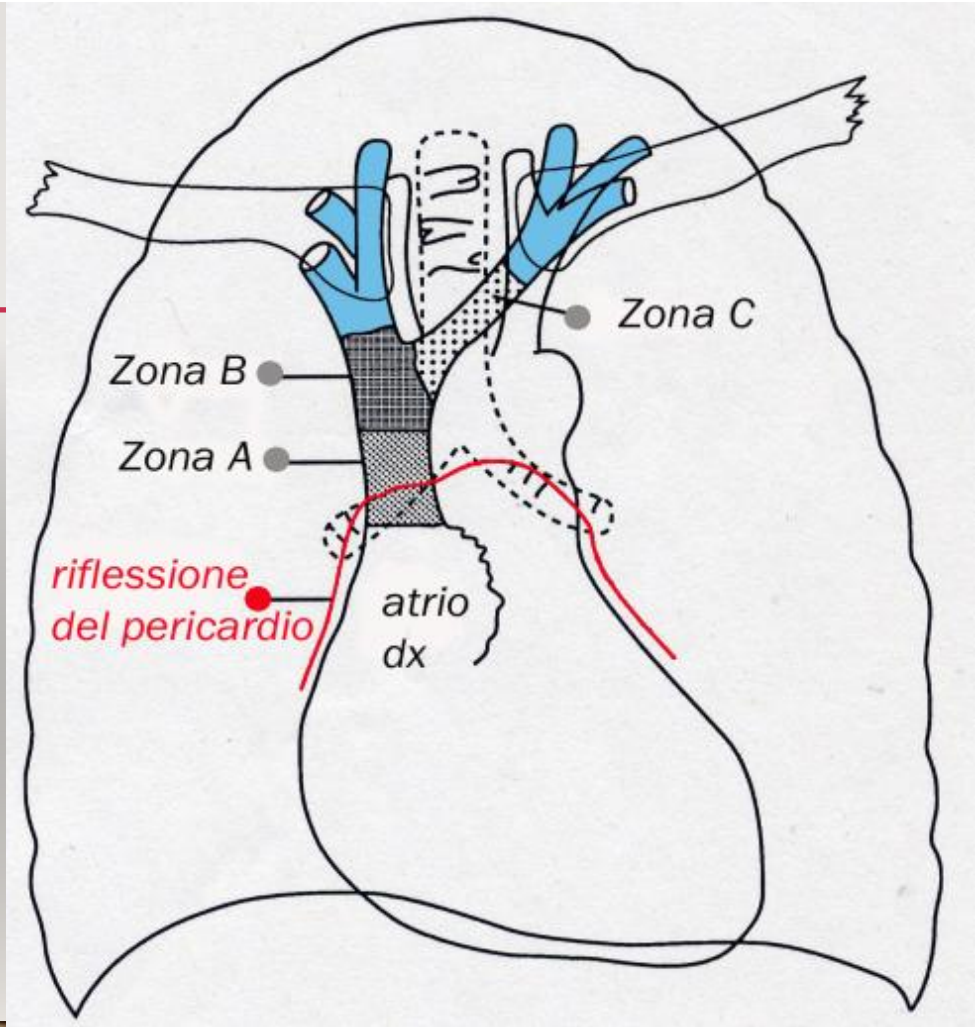
PROTOCOLLO ISP 2 - 2017

1) Esplorazione ecografica sistematica di tutte le vene del braccio e del collo (RaPeVA)
2) Igiene delle mani e utilizzo delle massime protezioni di barriera
3) Scelta della vena più appropriata in termini di posizione, profondità e di calibro
4) Apposizione di colla in cianoacrilato + fissaggio con sistemi sutureless
5) Chiara identificazione ecografica della arteria brachiale e del nervo mediano
6) Venipuntura ecoguidata
7) Controllo e direzionamento del catetere (tip navigation) mediante ecografia della regione sopraclaveare
8) **Controllo della posizione centrale della punta** (tip location) mediante il metodo dell'ECG intracavitario, nella variante modificata per i pazienti in fibrillazione atriale, eventualmente mediante **ecocardiografia transtoracica (CEUS: contrast enhanced ultrasonography)**

A) porzione inferiore della VCS e la porzione superiore dell'atrio dx

B) zona di giunzione tra vena anonima dx e sx e la porzione superiore della VCS

C) vena anonima sx prossimalmente alla VCS



Ultrasound localization of central vein catheter and detection of postprocedural pneumothorax: An alternative to chest radiography*

The CXR in anteroposterior view of supine patients has poor sensitivity in identifying hidden PTX because the air initially distributes in the nondependent and medial parts of the chest, which are difficult areas to explore by CXR with the patient in a supine position (30). Only identify CVC tip misplacements. However, it must be considered that the junction of the SVC with the right atrium cannot be directly visualized using a bedside CXR (23). In addition, it has been

Table 3. Complication detection after central venous catheter insertion in 99 patients

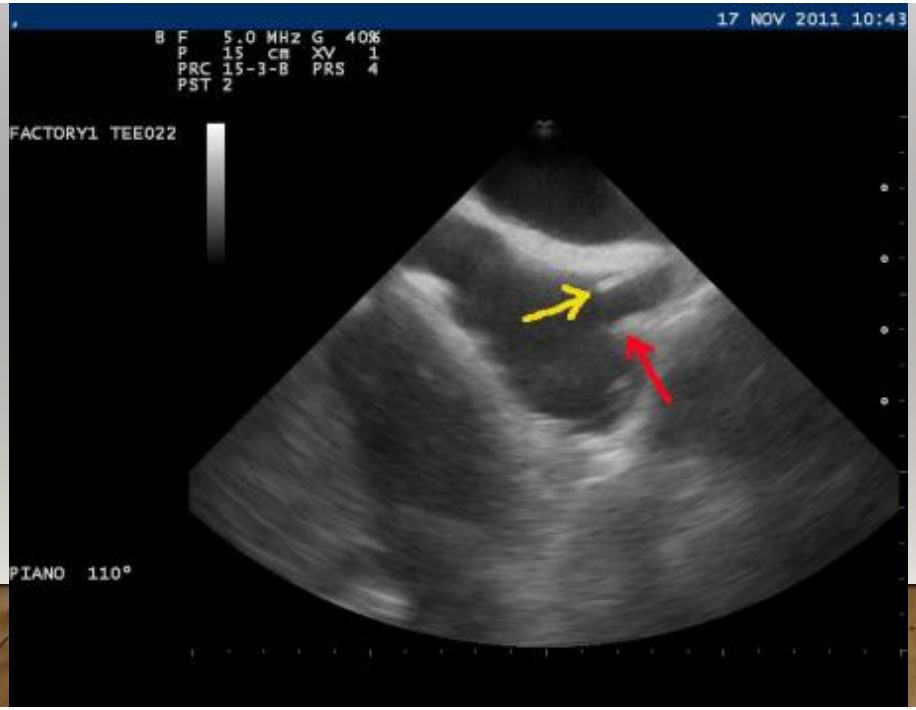
Variable	US	CEUS	US + CEUS	CXR
Internal jugular vein	4	—	4	4
Intracardiac (atrial) position	19	6	25	24
Inferior vena cava	0	0	0	0
Pneumothorax	4	—	4	2
Vein thrombosis	2	—	2	0

more, ultrasound examinations are safe for patients and physicians, in that they may avoid radiation exposure and they are less time-consuming, less expensive, and suitable for hemodynamically unstable patients. The use of CXR may be left

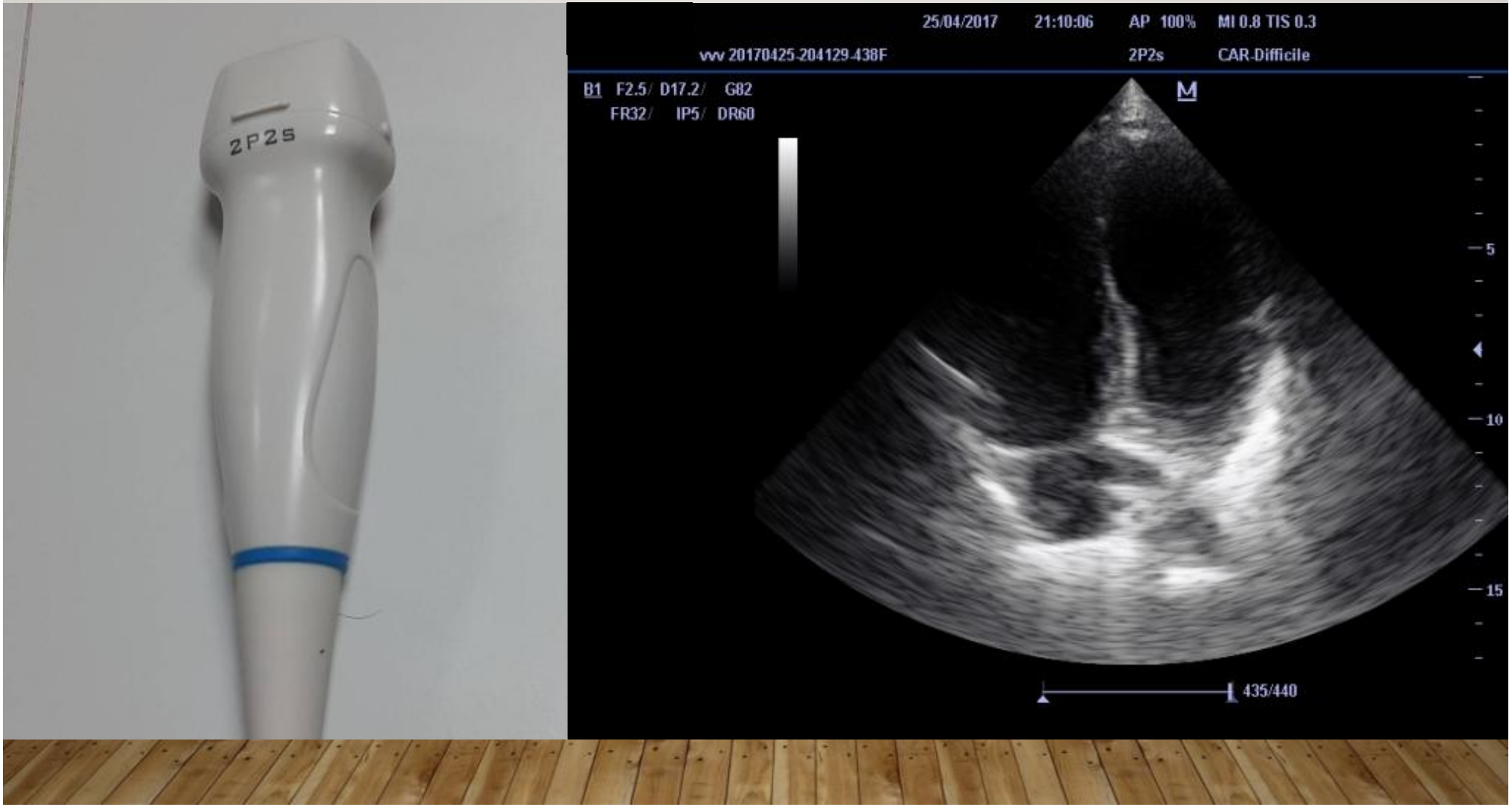
Crit Care Med 2010; 38:533–538

CRITICAL CARE

Transoesophageal echocardiographic evaluation of central venous catheter positioning using Peres' formula or a radiological landmark-based approach: a prospective randomized single-centre study†



British Journal of Anaesthesia, 118 (2): 215–22 (2017)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REVIEW Open Access

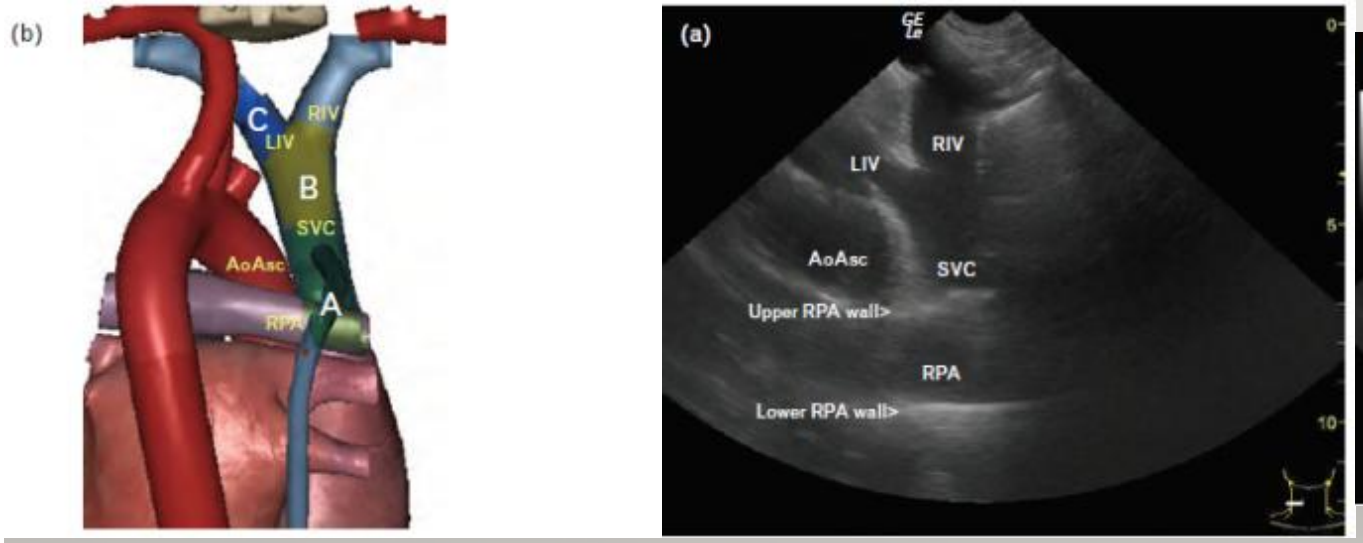
Bedside ultrasound to detect central venous catheter misplacement and associated iatrogenic complications: a systematic review and meta-analysis

- VISIONE DELLA GUIDA E DELLA PUNTA DEL CATETERE CON ECOGRAFIA SOPRACLAVICOLARE CON SONDA MICROCONVEX
- ECOGRAFIA VASCOLARE E TTE
- TTE E CEUS
- ECOGRAFIA VASCOLARE + TTE con CEUS

Smit *et al. Critical Care* (2018) 22:65

Ultrasound confirmation of central venous catheter position via a right supraclavicular fossa view using a microconvex probe

Eur J Anaesthesiol 2015; **32**:29–36



ECOGRAFIA VASCOLARE + TTE

Can J Anesth/J Can Anesth (2014) 61:340–346

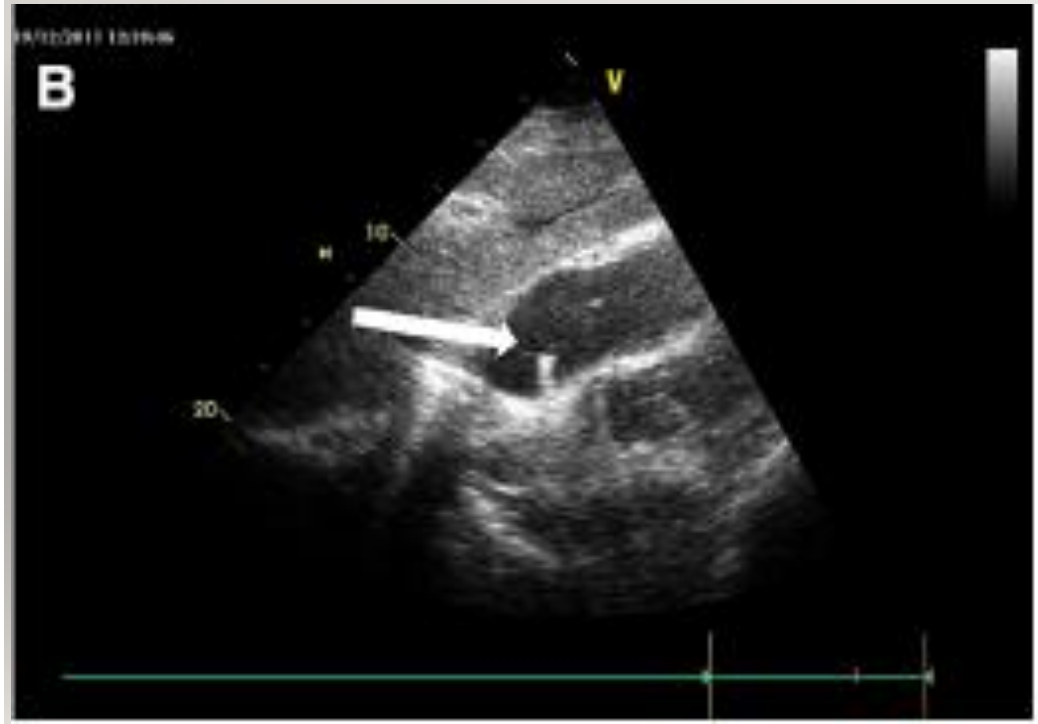
Intensive Care Med (2013) 39:1932–1937

Intern Emerg Med (2013) 8:173–180

Journal of Surgical Research **163**, 155–161 (2010)

The utility of transthoracic echocardiography to confirm central line placement: An observational study

Can J Anesth/J Can Anesth (2014)

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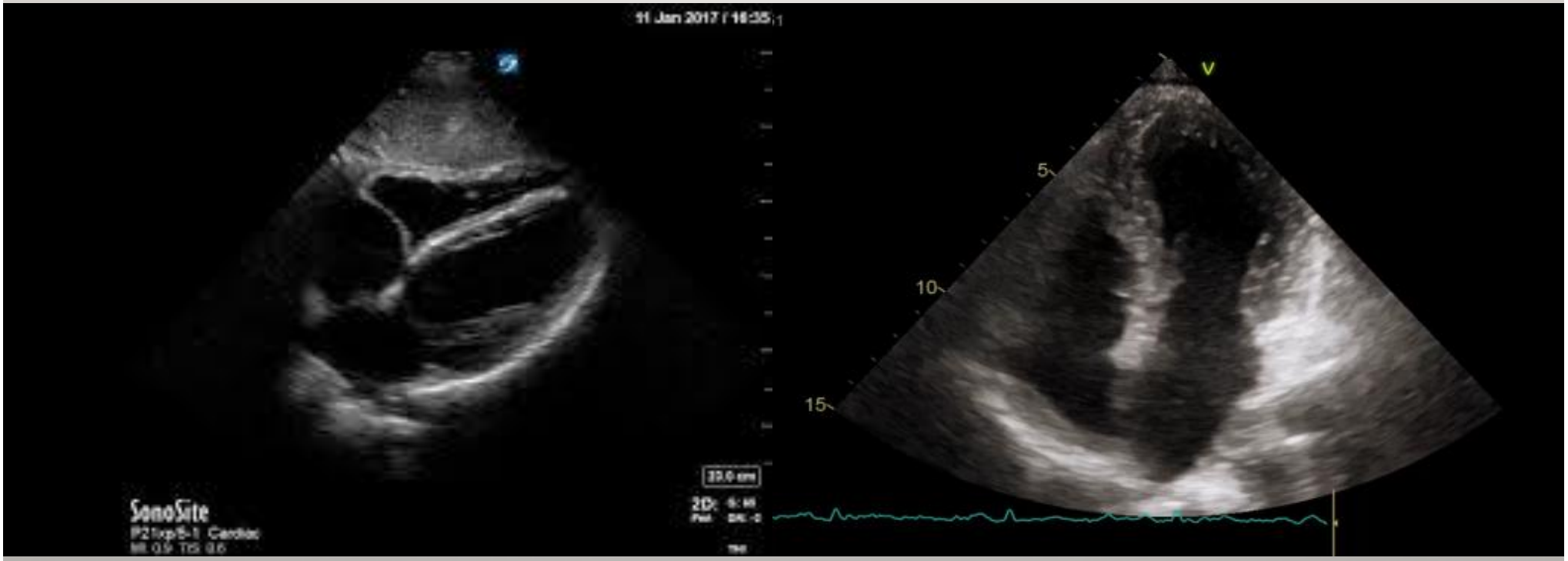


Immagine sottocostale

Immagine apicale 4 camere

Real-time ultrasound-guided placement of peripherally inserted central venous catheter without fluoroscopy

Vasc Access. 2018 Nov;19(6):609-614.

Table 3. Tip malposition found by ultrasonography and X-ray.

Total number of tip malpositions found by ultrasonography	78
Strayed into ipsilateral internal jugular vein	74
Coiled in subclavian vein	4
Detection rate of tip malposition with ultrasonography	82.1% (78/95)
Total number of tip malpositions after X-ray	17
Coiled in subclavian vein	7
Strayed into internal jugular vein	6
Inserted too distal (in right atrium)	2
Strayed into contralateral subclavian vein	2
Success rate (%) of ultrasound-guided tip navigation	98.2% (937/954).
Success rate (%) of ultrasound-guided tip location	98.0% (935/954).
Adjustment rate (%) after X-ray	1.8% (17/952)
Final success rate (%) of PICC placement	99.8% (952/954)

Central Vascular Catheter Placement Evaluation Using Saline Flush and Bedside Echocardiography

Anthony J. Weekes, MD, David A. Johnson, MD, Stephen M. Keller, MD, Bradley Efune, MD,

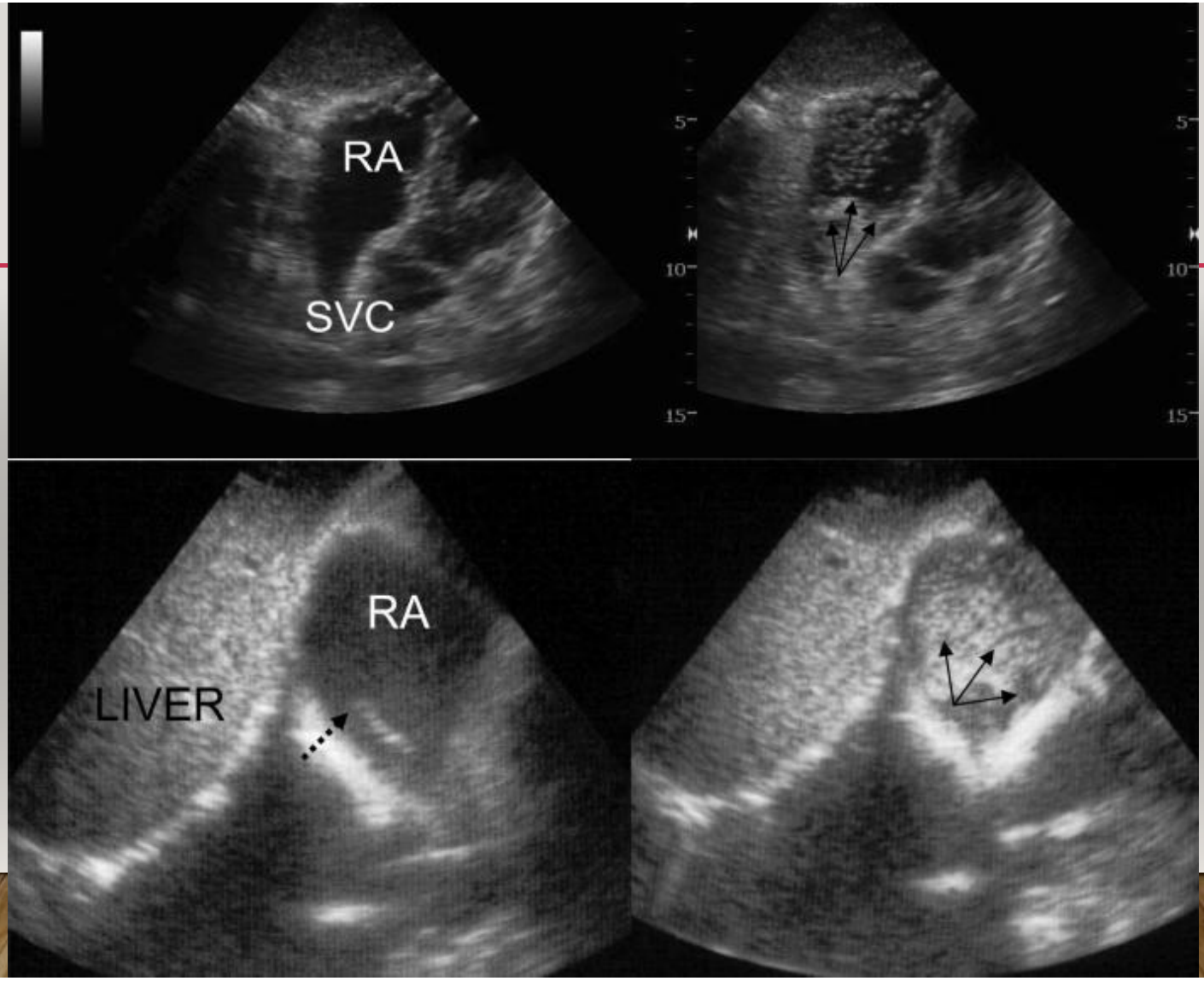
The bubble study: ultrasound confirmation of central venous catheter placement☆,☆☆,★,★★

Petra E. Duran-Gehring, MD [a,*], Faheem W. Guirgis, MD [a], Kristin C. McKee, DO [a], Susan Goggans, MD [a],

Contrast enhanced ultrasound vs chest X-ray to determine correct central venous catheter position

Francesca Cortellaro, MD [a,*], Luca Mellace, MD [a], Stefano Paglia, MD [a], Giorgio Costantino, MD [c],

Agitated saline bubble–enhanced ultrasound for the positioning of cuffed, tunneled dialysis catheters in patients with end-stage renal disease


RA
SVC
5
10
15
5
10
15
RA
LIVER

ECOGRAFIA VASCOLARE + TTE + CEUS

(Crit Care Med 2010; 38:533–538

(Minerva Anestesiol 2015;81:989-1000)

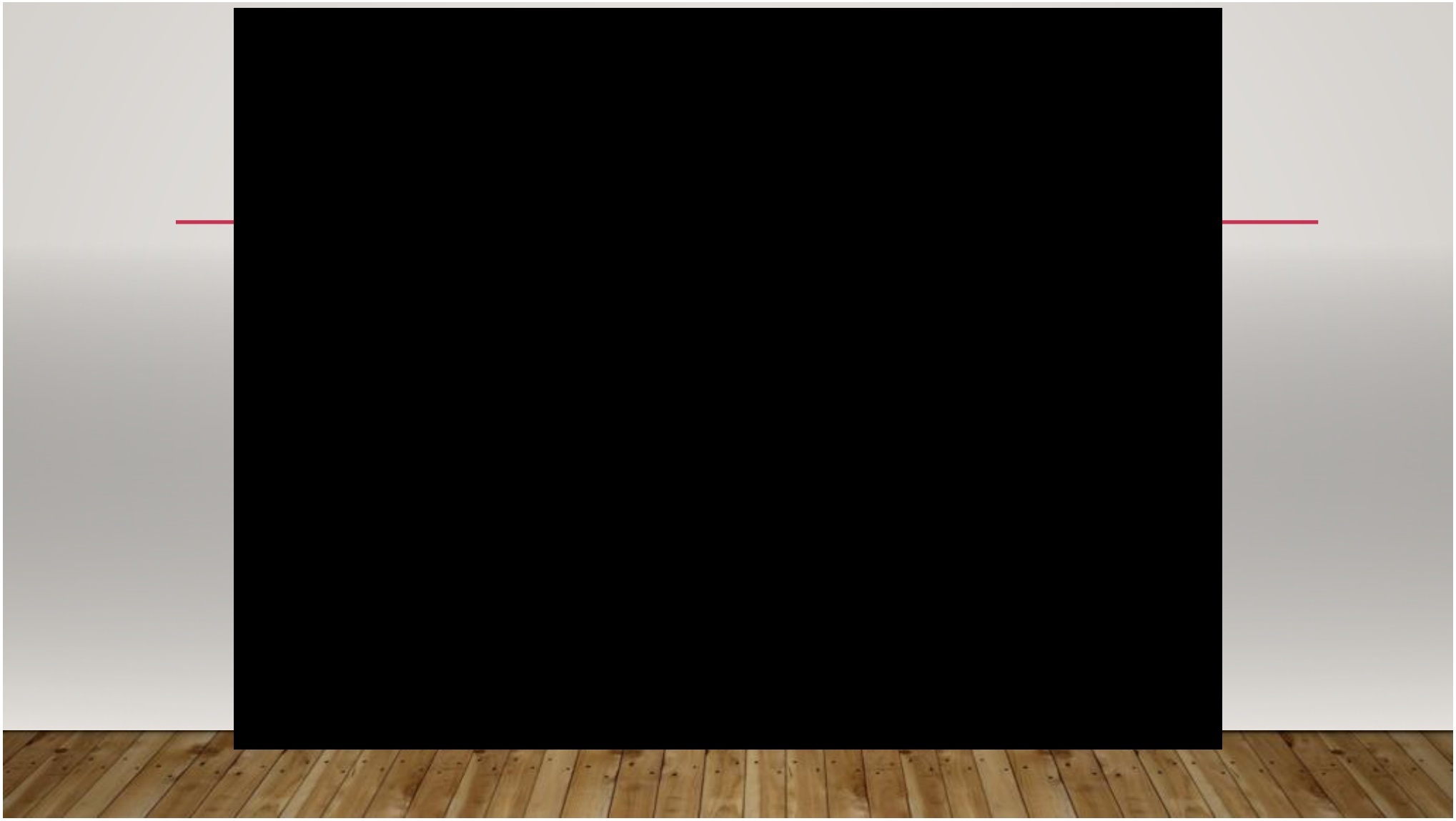
REVIEW Open Access

Bedside ultrasound to detect central venous catheter misplacement and associated iatrogenic complications: a systematic review and meta-analysis

Smit et al. Critical Care (2018)

Table 2 Outcomes regarding feasibility, prevalence, accuracy parameters, and time to measurement of included studies

Study	Feasibility	Prevalence of pneumothorax (%)	Prevalence of malposition (%)	Specificity (95% CI)[1]	Sensitivity (95% CI)[2]	Mean time for US (min) (±SD)[4] [IQR]	Mean time for CXR performance (min) (±SD)[4] [IQR]	Mean time for CXR interpretation (min) (±SD)[4] [IQR]
All studies (2548)	96.8%	1.1%	6.8%	98.4 (97.8–99.5)	68.2 (54.4–79.4)	2.83 (95% CI: 2.77–2.89)	34.7 (95% CI: 32.6–36.7)	46.3 (95% CI: 44.4–48.2)
Supraclavicular ultrasound (76)	94.6%	–	0%	100 (94.4–100)[3]	–			
TTE and CEUS (1195)	97.7%	1.4%	6.8%	98.9 (96.1–99.7)	68.7 (61.7–96.4)			
Vascular ultrasound and TTE (729)	98.1%	0.8%	3.4%	99.0 (96.5–99.7)	96.1 (79.7–99.4)			
Vascular ultrasound, TTE and CEUS (548)	93.3%	1.4%	12.3%	98.6 (96.1–99.5)	56.2 (32.8–77.1)			



PROGETTO ECHOTIP

ATALE – PEDIATRICO – ADULTO

ZIONE DELLA PUNTA

- ESPERI
- TECNI


GRAZIE