

Ecoscopia transtoracica e bubble test nel posizionamento dei PICC: quando e come.

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Regione
Lombardia



Case Report

**Bedside confirmation of a persistent left superior vena cava
based on aberrantly positioned central venous catheter on
chest radiograph**

N. Ghadiali^{1*}, L. M. Teo¹ and K. Sheah²

Brief Communication



Confirmation of endovenous placement of central catheter using the ultrasonographic “bubble test”

Ajit S. Baviskar, Khalid I. Khatib¹, Sanjeev Bhoi², Sagar C. Galwankar³, Harshad C. Dongare

Abstract

Insertion of central venous catheter (CVC) is the most common procedure to be performed in Intensive Care Units. Addition of ultrasonographic guidance to this procedure, which was initially performed blindly, has improved safety of this procedure. Confirmation of endovenous placement of CVC though, is tricky, as methods for confirmation are either operator dependent, time-consuming or not available at bedside. Prospective observational study was carried out to study feasibility of use of sonobubble test to confirm the presence of CVC within central vein. After insertion of CVC in the internal jugular, subclavian or axillary vein, a 10 ml bolus of shaken saline microbubble is injected through port of CVC, and opacification of right atrium is observed in xiphoid view on ultrasonography. The Sonobubble test was helpful for dynamic confirmation of endovenous placement of CVC and prevented complications such as arterial puncture and cannulation. We recommend its use following CVC insertion.

Keywords: Bubble test, central venous catheter, ultrasonography

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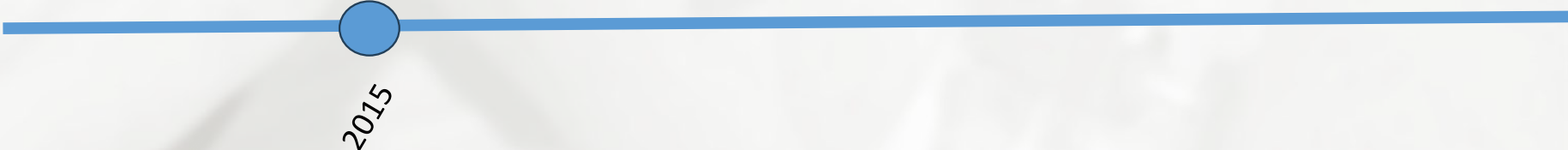
2010

ORIGINAL ARTICLE

Confirmation of correct central venous catheter position in the preoperative setting by echocardiographic “bubble-test”

M. MEGGIOLARO ¹, A. SCATTO ¹, A. ZORZI ², E. ROMAN-POGNUZ ¹
A. LAURO ³, C. PASSARELLA ¹, G. BONACCORSO ¹

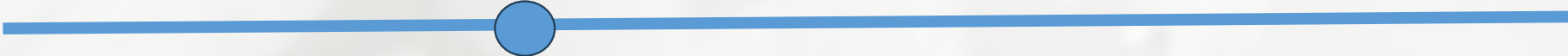
¹Division of Anaesthesiology and Intensive Care, University Hospital of Padua, Padua, Italy; ²Division of Cardiology, Department of Cardiac, Thoracic and Vascular Sciences, University of Padua, Padua, Italy; ³Division of Radiology, University Hospital of Padua, Padua, Italy



2015

Protocollo ISP-2 (SIP-2)

dell'ECG intracavitario, nella variante modificata nel caso di pazienti in fibrillazione atriale, eventualmente corroborato dalla *tip location* mediante ecocardiografia transtoracica (CEUS: *contrast enhanced ultrasonography*)



2017

Original research article

JVA | The Journal of
Vascular Access

Transthoracic echocardiography as bedside technique to verify tip location of central venous catheters in patients with atrial arrhythmia

**Emanuele Iacobone¹ , Daniele Elisei¹, Diego Gattari¹,
Luigi Carbone¹ and Giuseppe Capozzoli²**

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2020

ECHOTIP: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in adult patients

**Antonio La Greca¹, Emanuele Iacobone² , Daniele Elisei²,
Daniele Guerino Biasucci³ , Vito D'Andrea⁴ ,
Giovanni Barone⁵, Geremia Zito Marinosci⁶
and Mauro Pittiruti¹ **

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2021

The SIP protocol update: Eight strategies, incorporating Rapid Peripheral Vein Assessment (RaPeVA), to minimize complications associated with peripherally inserted central catheter insertion

Fabrizio Brescia¹ , Mauro Pittiruti² ,
Timothy R Spencer³  and Robert B Dawson⁴

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2022

Consensus GAVeCeLT-IVAS sulla tip location



2025

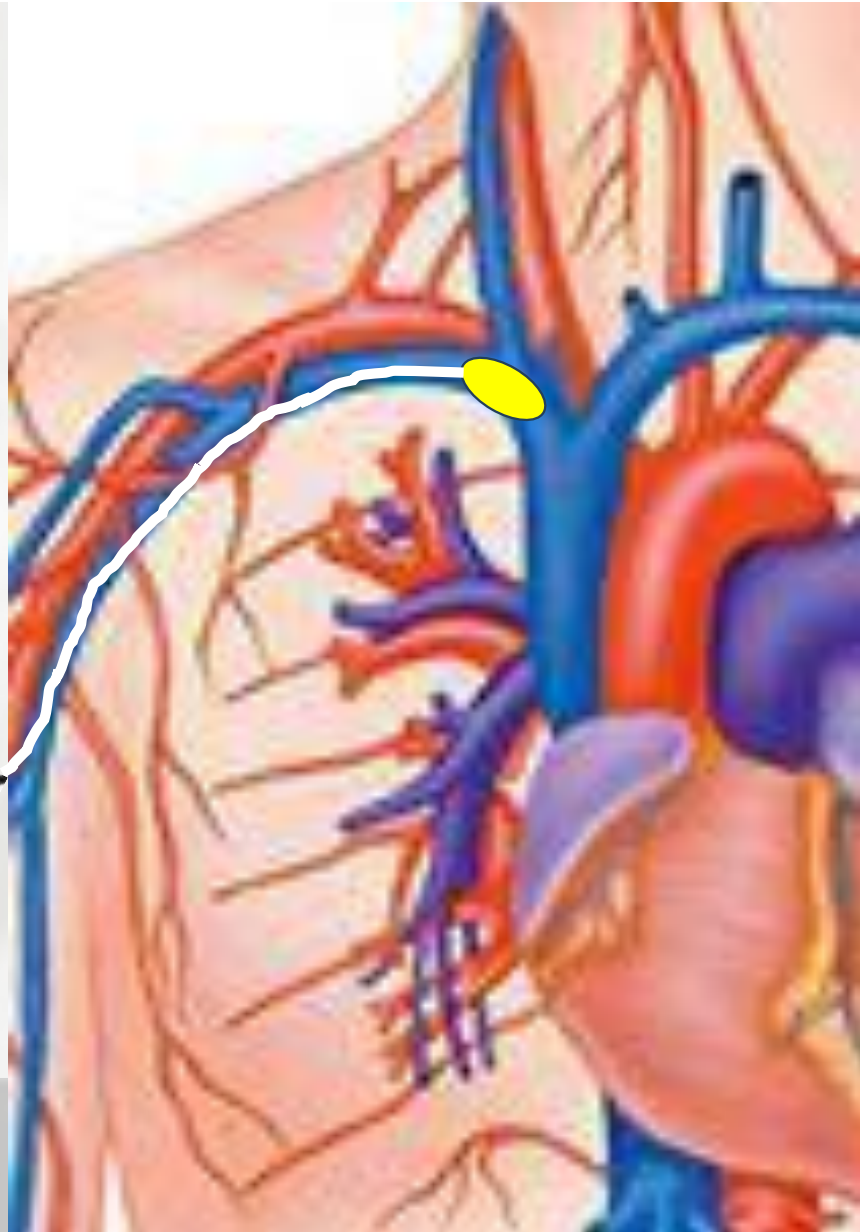
I metodi ecoscopici di tip location intraprocedurale sono indicati come **prima opzione** nelle seguenti situazioni:

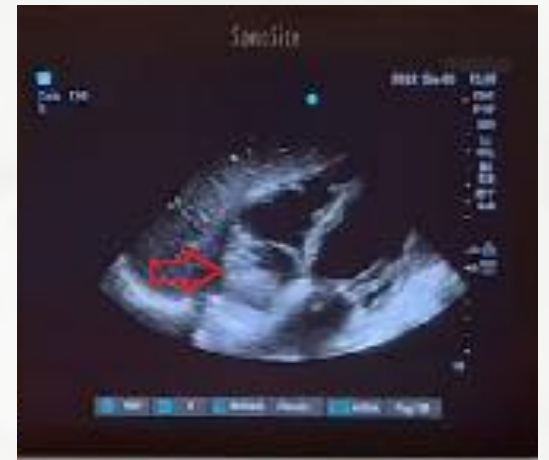
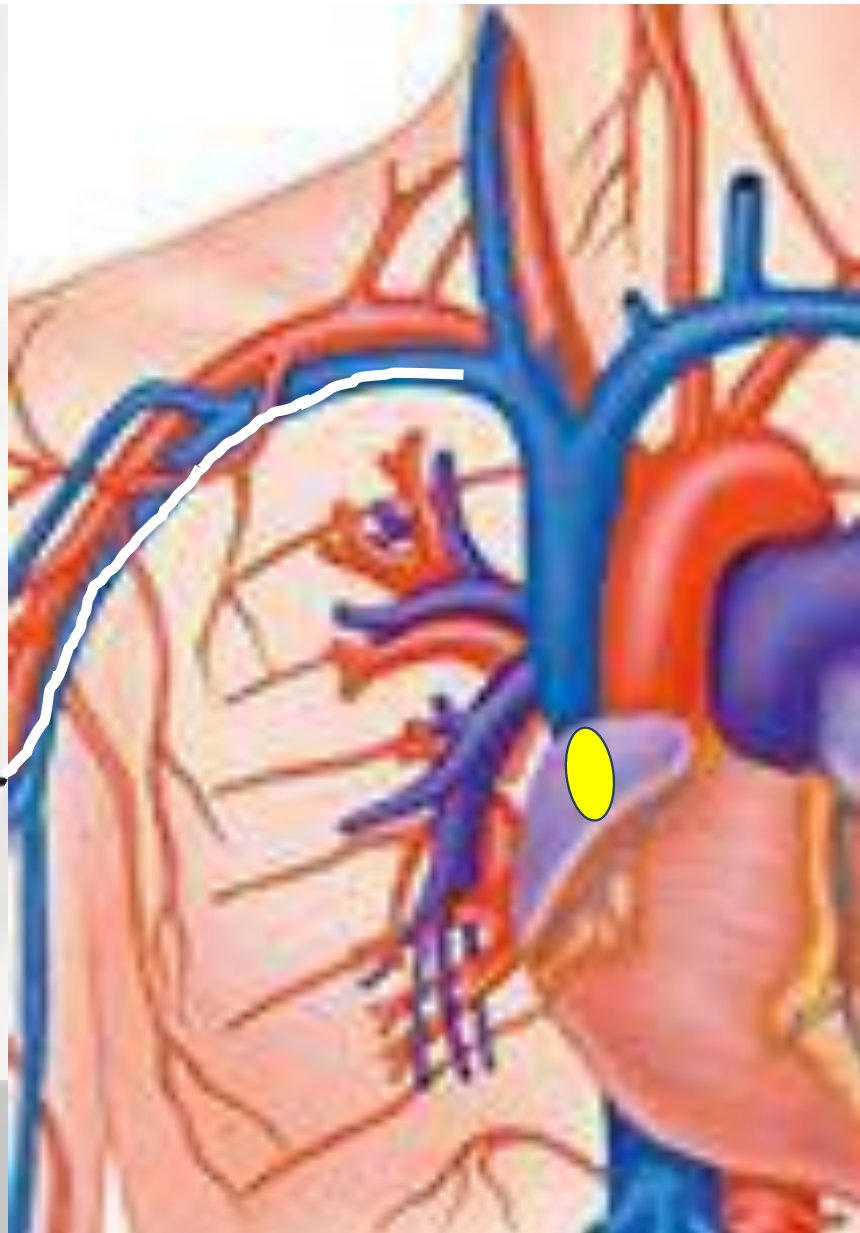
...per qualunque FICC o FICC-port, ovunque sia programmata la posizione della punta (o in atrio destro o alla giunzione tra cava inferiore e atrio destro o nella cava sottodiaframmatica)...

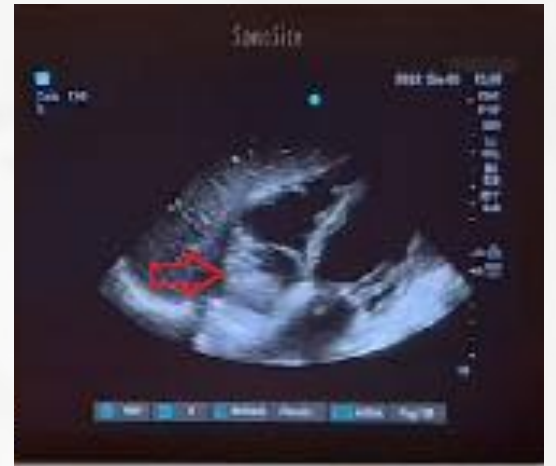
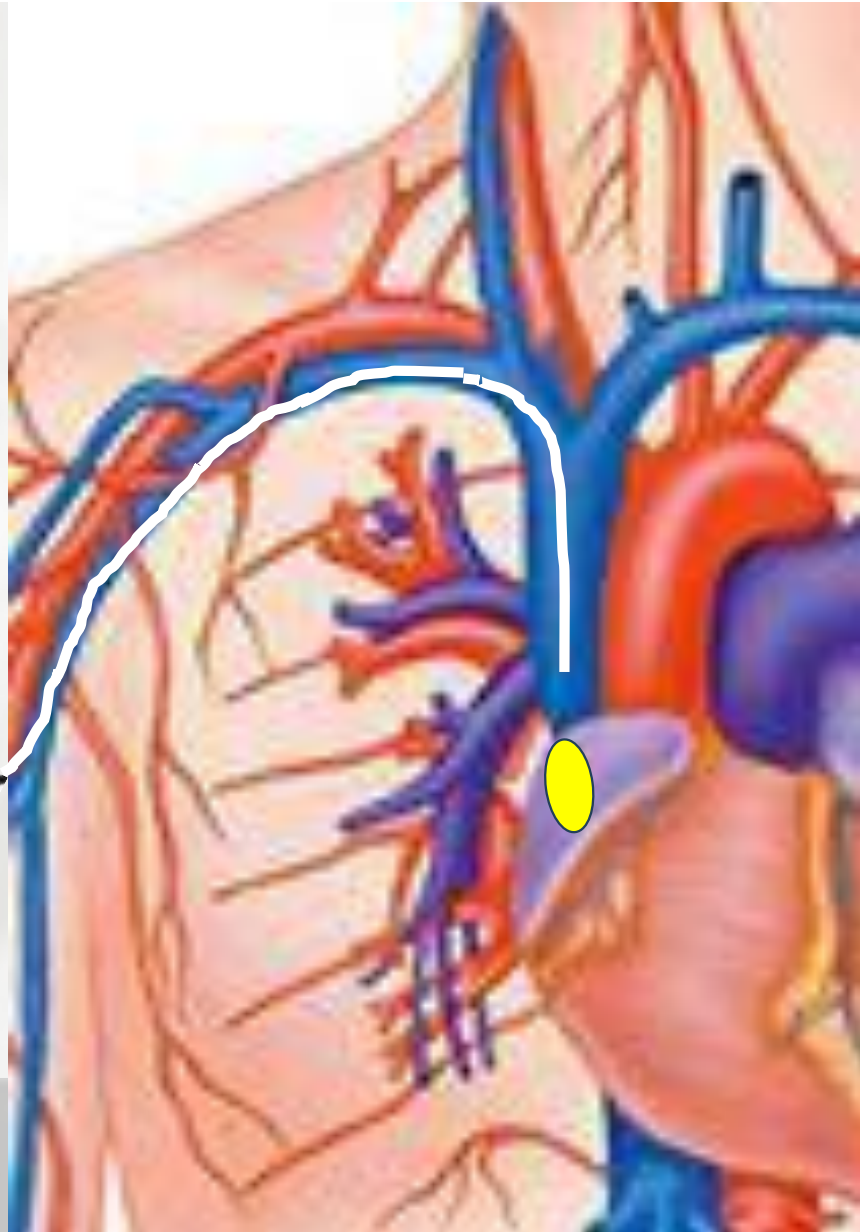
...per qualunque CICC, PICC, chest-port o PICC-port, nel caso che il metodo ECG-IC abbia limiti di applicabilità e/o fattibilità, oppure come integrazione del metodo ECG-IC in casi in cui la interpretazione sia incerta...



Come creare le microbolle?









ECHOTIP: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in adult patients

Antonio La Greca¹, Emanuele Iacobone² , Daniele Elisei²,
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and Mauro Pittiruti¹ 

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(b) ECHOTIP protocol for PICCs.

	Probe	Technique
Tip navigation	7–12 MHz linear probe	Visualization of the deep veins of the arm and of the infra/supraclavicular area according to RaPeVA and RaCeVA
Tip location	2–6 MHz sectorial probe As alternative option: 3–8 MHz convex probe	Immediate visualization (<2 s) of bubbles in RA after flushing First option: subcostal views (four-chamber or bi-caval) Second option: four-chamber apical view

ECHOTIP: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in adult patients

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visualized, the immediate appearance of the bubbles soon after injection (less than 2 s) proves that the tip is in the proximity of the RA. This cut-off limit of 2 s

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Confirmation of correct central venous
catheter position in the preoperative setting
by echocardiographic “bubble-test”

M. MEGGIOLARO ¹, A. SCATTO ¹, A. ZORZI ², E. ROMAN-POGNUZ ¹
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attached to the syringe plunger (Figure 2). In all these patients, a cut-off value of 500 ms correctly classified the CVC position. We acknowledge

Transthoracic echocardiography as bedside technique to verify tip location of central venous catheters in patients with atrial arrhythmia

Emanuele Iacobone¹ , Daniele Elisei¹, Diego Gattari¹,
Luigi Carbone¹ and Giuseppe Capozzoli²

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study; in fact, our mean time of appearance was 0.89 ± 0.33 s for CICC's, and 1.1 ± 0.2 s for PICC's. Our

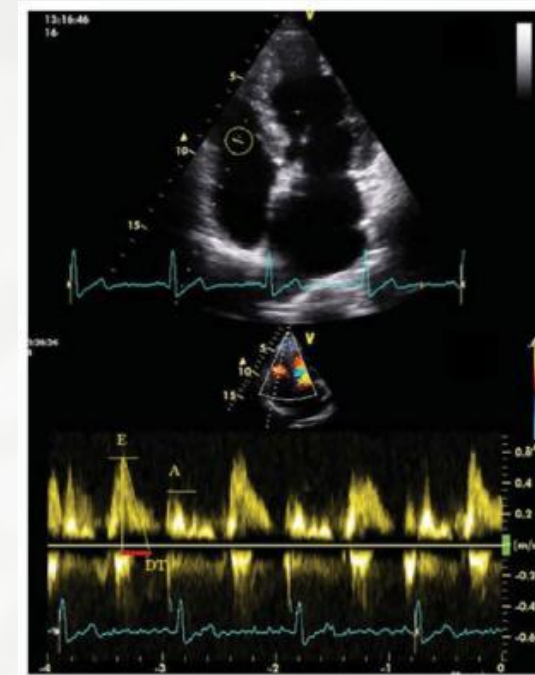
CAJ in patients with atrial arrhythmia. When the tip is in the correct position, the appearance of bubbles in the right atrium is immediate, and the time from the injection is much fewer than 2 s. Tip location by TTE can also be

Pulsed-wave Doppler for ultrasound-based tip location using bubble test: A pilot study

Antonio Gidaro¹ , Francesco Casella¹, Chiara Cogliati¹,
Antonio La Greca², Francesca Lugli¹, Chiara Trione¹,
Maria Calloni¹, Chiara Melchionda¹, Federica Samartin¹,
Emanuele Salvi¹ and Elisa Ceriani¹

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MBT-PW was recorded within the first heart beat after microbubble infusion in all patients, with a measured time lapse between infusion and MES detection **lower than 1 s**. Intraclass correlation coefficient of 1 for number



Contrast enhanced ultrasound as a new tool to estimate the performance of midline catheters in the single patient

Antonio Gidaro^{ID}, Francesco Casella, Francesca Lugli, Chiara Cogliati, Maria Calloni, Federica Samartin, Nicola Brena and Guido Pace

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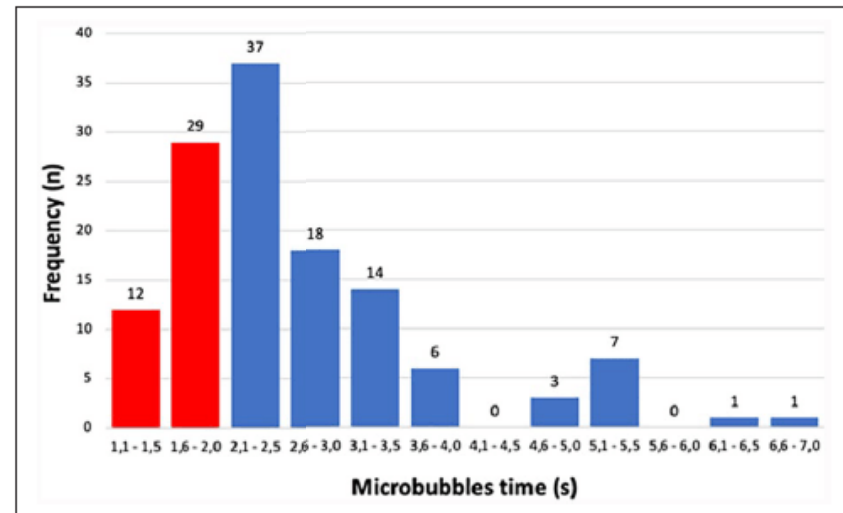
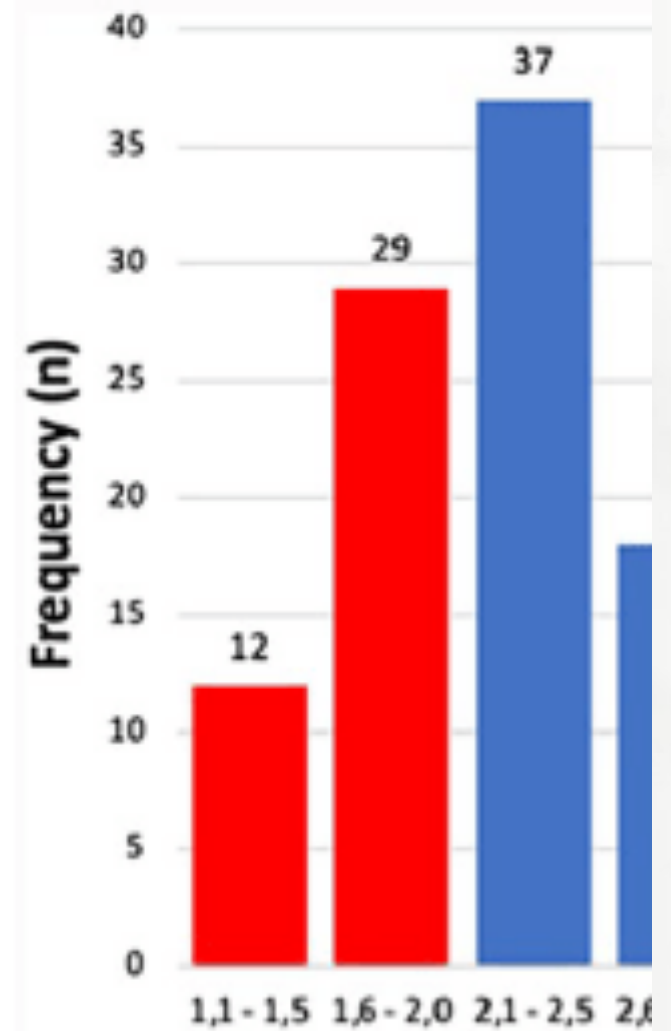
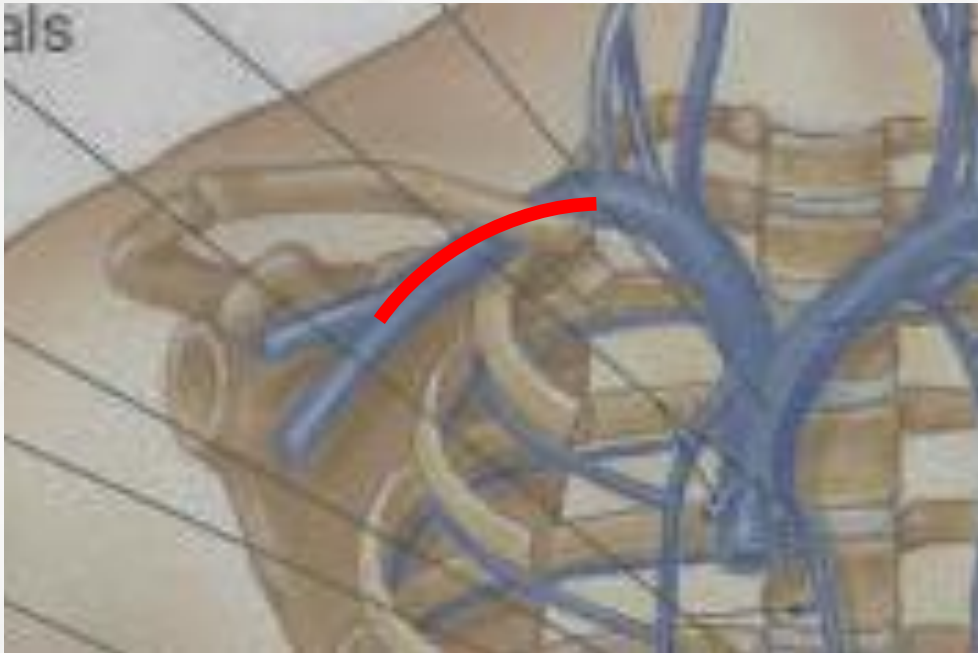


Figure 3. Distribution of the measured microbubbles times. Red columns represent MCs with a MBT <2s.

midline catheters



Impact of distance of the catheter tip from cavo-atrial junction on bubble test (delay) time: A prospective study

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Elli Stefano¹, D'amata Dario², Cavalli Silvia², Cambiagli Gloria²,
Giorgianni Mariavittoria³, Marino Francesco⁴, Pozzoli Jessica⁵, Russo Mario⁶,
Lucchini Alberto¹, Foti Giuseppe¹, Pozzi Matteo¹ and Giani Marco¹

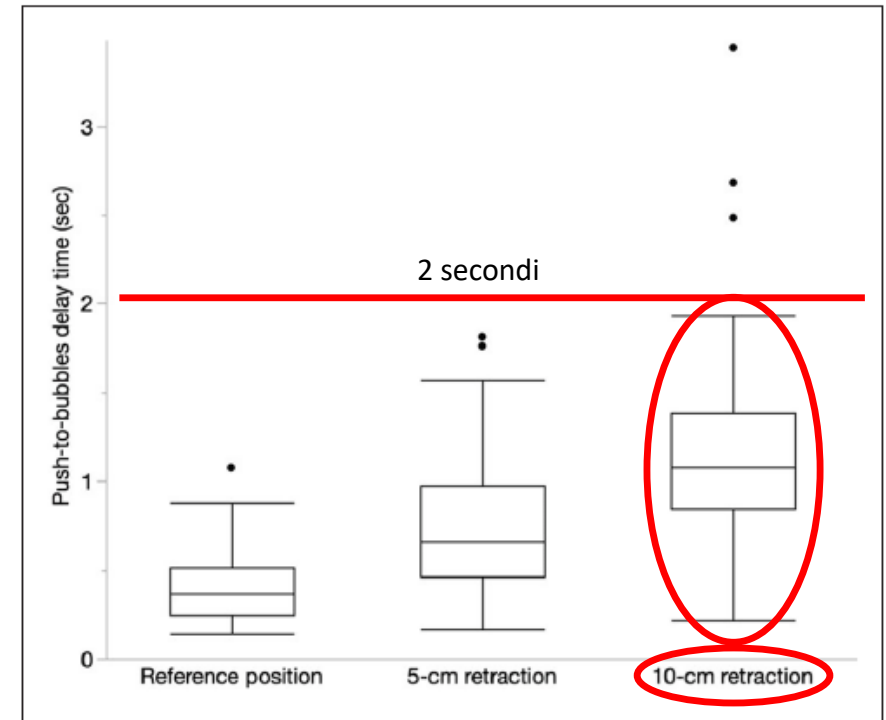


Figure 3. Push-to-bubbles delay times at the different locations. P0, cavo-atrial junction (CAJ); P1, 5-cm retraction from CAJ; P2, 10-cm retraction from CAJ.

Attenzione!

Se il flush arriva immediatamente e in maniera uniforme (flusso laminare): OK

Se il flush sembra formarsi dall'interno dell'atrio dx (flusso turbolento): il catetere è già in atrio

Cambia l'oggetto della ricerca... ...la tecnica è matura

Original research article

JVA | The Journal of
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Development of an educational program for ultrasound-based tip location during placement of PICC-port to improve the competence of specialized nurse

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**Yan Shen¹ , Xingmei Zhou¹, Jiaqi Yu¹, Jian Chang², Xin Li³,
Xianrui Li³ and Huiyan Zhang³**

Take home messages

Stay tuned on JVA

Fidati solo del flush «immediato» (ma non turbolento)

Scacco matto a Rx torace



Grazie

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stefanomariaelli@gmail.com