
GAVeCeLT
Gli Accessi Venosi Centrali a Lungo Termine

# Nuove sonde ecografiche per il posizionamento ‘bedside’

**Mauro Pittiruti**

# Requisiti di un ecografo per il posizionamento di PICC

- Semplice da usare
- Portatile
- Qualità della immagine sufficiente a visualizzare bene il nervo mediano

# Requisiti di un ecografo per il posizionamento bedside di PICC

- Particolarmente semplice da usare
- Particolarmente portatile (e leggero)
- Qualità della immagine sufficiente a visualizzare bene il nervo mediano
- 'keyboardless' (riduzione rischio di contaminazione)
- 'wireless' ?


Portatile – user friendly - keyboardless – ottima definizione

# Ancora più leggero e portatile


ID:
Patient:
SAVE
FREEZE
C
COLOR
Depth
2D
Overall
Gain
Near/Far
Gain
Reset
Depth3.9cm
End Study


FREEZE
SAVE
C
COLOR
Depth
2D
Overall
Gain
Near/Far
Gain
End Study

# Cosa si intende per ‘wireless’?

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2016

# A NEW WIRELESS ULTRASOUND PROBE FOR ULTRASOUND GUIDED CENTRAL VENOUS ACCESS

WoCoVA

4th World Congress on Vascular Access

# Introduction

Ultrasound (US) is considered mandatory for placement of central venous access devices (VAD), both for venepuncture and for early detection of potential complications.

We report our preliminary experience with a new US device equipped with a **wireless linear transducer** (Acuson Freestyle, Siemens), specifically made for US-guided procedures.


SIEMENS
2.5cm
G 15
No sonda
Salva
Scorri
Cine
Strum.
Testo
Stamp
ACUSON Freestyle
L13-5

# Methods

The US system we tested consists of a 5-13 MHz linear probe connected by wireless technology (8 GHz ultra wide band) to a compact, keyboard-less device.

The probe can be completely wrapped up in a sterile cover so to perform the procedure with maximal barrier precautions.

The main functions (gain, depth, freeze, save, etc.) can be operated either by controls built-in in the transducer or directly on the screen of the device.

# Methods (2)

We adopted this wireless system in **100** consecutive VAD placements (60 PICCs, 36 ports, 3 cuffed-tunneled catheters and 1 apheresis catheter).

US was used for US-guided puncture and cannulation of different veins (36 basilic veins, 16 brachial veins, 35 axillary-subclavian veins, 9 internal jugular veins, 3 brachio-cephalic vein and 1 femoral vein), for US detection of potential misplacement of the guidewire and/or of the catheter, as well as for ruling out pneumothorax by US scan of the pleura in the intercostal space.


SIEMENS
SCONOSCIUTO
2013.11.19.17.23.56
19-NOV-2013 06:36:24 PM
2.5cm
G 16
L13-5
V Vn supf
NG 10 SF 5
PP 5 55dB
SC 3
15 Hz
ANL 0.0 dB
mpostaz.
Paziente
Misura
Rivedi
ACUSON Freestyle

| Catheters | N° |
|---|---|
| PICCs | 60 |
| PORTs | 36 |
| Cuffed tunnelled catheters | 3 |
| Apheresis catheter | 1 |

| VEINS | N° |
|---|---|
| basilic | 36 |
| brachial | 16 |
| axillary-subclavian | 35 |
| internal jugular | 9 |
| brachio-cephalic | 3 |
| femoral | 1 |

# Results

All venepunctures were performed successfully.

The image quality was excellent and there was no delay in the data transmission to the screen.

The transducer was easy to handle and to use.

Visualization of needles, guidewires and catheters was optimal.

All operators reported an increased easiness in performing the US-guided maneuvers, due to the absence of the cable.

# Conclusions

Our experience suggests that this wireless US device might be specifically useful in US-guided procedures. Some of its potential advantages are:

- maximal flexibility in placing the device and the probe, as their connection is wireless;
- complete freedom of movement for the operator during the procedure;
- optimal compliance with the current recommendations for infection control.

# In realtà:

- Buona definizione
- Vantaggi della sonda ‘wireless’
- Scarsa portabilità

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2017

# A NEW PORTABLE WIRELESS DEVICE FOR ULTRASOUND-GUIDED VENIPUNCTURE

# Background

In previous studies, we used a US device which consists of a 5-13 MHz linear probe connected by wireless technology (8 GHz ultra wide band) to a keyboard-less display.

We had several advantages : freedom of movement; optimal compliance with infection control; maximal compliance of the operator (the maneuver was easier and faster if compared to conventional ultrasound devices).

Still, the keyboard-less display was not portable.

# Methods

We report our preliminary experience with **a new wireless US device which is completely and easily portable.**

The device can be completely wrapped up in a sterile cover so to perform the procedure with maximal barrier precautions.

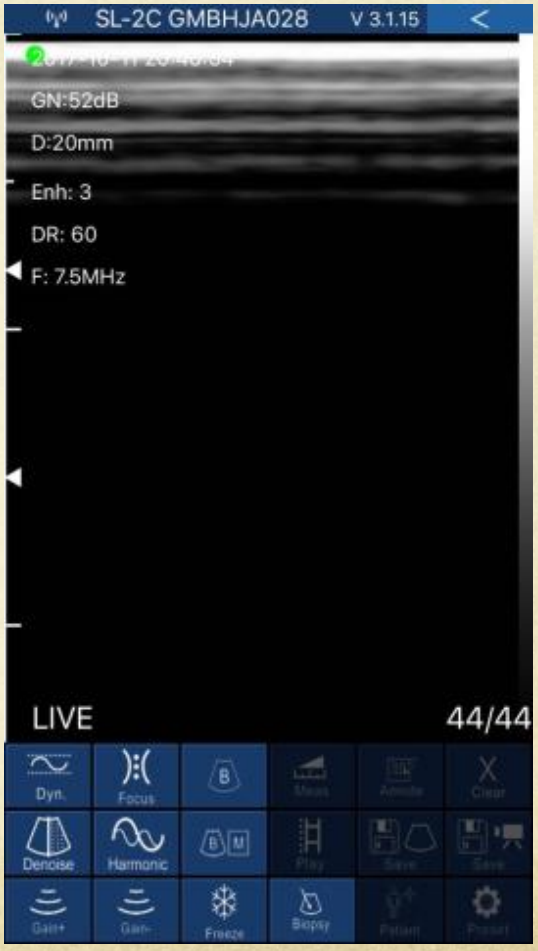
# A new portable wireless ultrasound device

- It consists of a linear probe (26mm, 10-14 Mhz or 38mm, 7.5-10 Mhz) with an in-built router
- The images are sent to smartphone or a tablet (equipped with a specific app), by a wi-fi field created by the probe/router itself

Probe + mini-ipad

# You can use it with your smartphone





# Results (1)

**50** consecutive VAD placements (28 PICCs, 22 ports, 10 CICCs) in adults and in children.

The 10-14Mhz probe US was used for US-guided puncture and cannulation of arm veins in adults and children (28 PICCs) and of central veins in children (5 CICCs).

The 7.5-10Mhz probe was used for central venipuncture in adults (22 ports, 5 CICCs).

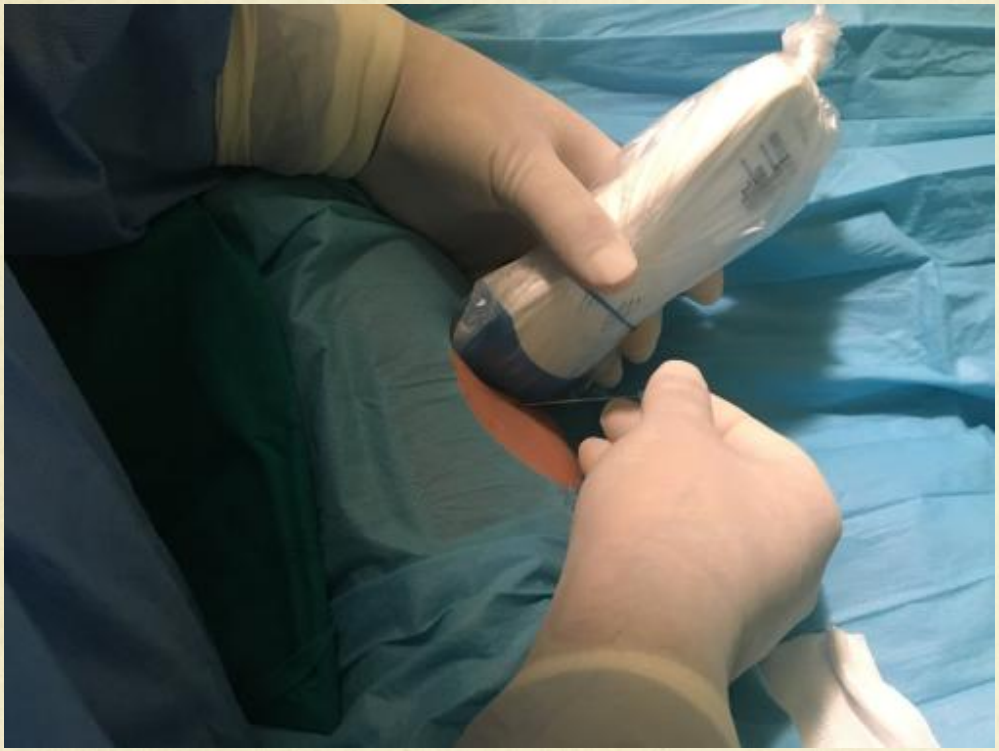
# Results (2)

All venepunctures were performed successfully.

US detection of potential misplacement of the guidewire and/or of the catheter, as well as ruling out pneumothorax by US scan of the pleura in the intercostal space, were performed with the same probe.

The image quality was excellent and there was no delay in the data transmission to the screen. The transducer was easy to handle and to use. Visualization of needles, guidewires and catheters was optimal.

# PICC insertion



# CICC insertion in adult


# CICC insertion in infant

# US-guided tip navigation


PICC visualized in the brachiocephalic vein (right direction!)

# Advantages

This new device has all of the advantages of the previous models of wireless ultrasound and – in addition:

(a) it is completely portable

(b) data, images and videos are easily stored on a smartphone or a tablet

(c) it is less expensive than any other wireless US device.

All the advantages of the previous models of wireless ultrasound…

+

completely portable !

# The advantage of wireless US + wireless intracavitary ECG

# Present indications

Ideal for **bedside** placement of central lines

- PICC
- CICC
- FICC
- Both in adults and in children

Ideal for PICC and Midline placement **at home**

# Present indications (2)

**Linear probe 38mm,**

**7.5-10 Mhz**

- **CICC in adults**
- **FICC in adults**

# Present indications (3)

**Linear probe 26mm,**

**10-14 Mhz**

- **PICC and Midline**
- **CICC in children**

# Future indications (1)

A microconvex probe is now available: ideal for bedside **tip location by echocardiography** in children and neonates.

# Future indications (2)

A linear color doppler probe is also available: ideal for **ruling out late complications** such as catheter-related venous thrombosis

# CONCLUSION

# The future ?

One portable wireless device which would include the technology necessary for:

(a) **ultrasound guidance**

(b) ECG-based and/or US-based **tip navigation**

(c) ECG-based and/or US-based **tip location**

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**Grazie dell'attenzione**

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