



Abstract ID: 4407484

Submission Type: Scientific Papers

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Primary Category: Vascular/Interventional

Secondary Category: Venous access

02) First Human Clinical Trial of the Sonic Flashlight – Guiding Placement of Peripherally Inserted Central Catheters.

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PURPOSE

Perform the first clinical trial on human subjects using the Sonic Flashlight (SF) to guide placement of Peripherally Inserted Central Catheters (PICCs).

METHOD AND MATERIALS

The SF prototype is an ultrasound (US) display device currently under development that replaces the traditional US monitor by using a half-silvered mirror to reflect real-time US images into the body. Looking through the half-silvered mirror on the SF, the US image appears to float beneath the skin, exactly where it is being scanned. The SF merges the US image, probe, needle, operator's hands, and patient into the same field of view, making procedures more intuitive. In contrast, hand-eye coordination is displaced during conventional US (CUS) guided procedures, forcing the operator to look away from the field to see the US screen. We have previously shown that, compared to CUS, vascular access in phantoms with the SF is faster and easier for experienced US users, as well as faster to learn for US novices. The current SF prototype consists of a 10MHz US system (Terason, Burlington, MA) fitted with a small flat-panel display (AM550L OLED, Kodak, Rochester, NY) and a 20x50x1mm half-silvered mirror to the probe. A standard sterile clear probe cover (BARD, Murry Hill, NJ) was used. Fifteen patients needing PICCs were enrolled in this study. While scanning the upper arm of each patient with the SF, the basilic and brachial vein, and brachial artery were identified on the in situ US image. A 21ga needle was guided into the basilic or brachial vein. The number of punctures, vein accessed, and reason for a failed attempt were recorded.

RESULTS

The vessels were clearly visualized in situ using the SF. The needle was easily aimed and inserted into the basilic or brachial vein, and the needle tip visualized at its expected location. Successful access was obtained in all 15 subjects: 13 on the first attempt, and 2 on the second attempt. Image blurriness was encountered during 3 procedures due to inconsistent optical properties of the probe cover.

CONCLUSION

This study shows that venous access can safely be obtained using the SF. We are pursuing further clinical trials for other central veins as well as alternative probe covers.

Disclosures:

No Disclosure: Wilson Chang, Nikhil Amesur, Albert Zajko, David Wang,

The Sonic Flashlight has been patented by George Stetten through the University of Pittsburgh.: George Stetten

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