



Needle Guide Contributes to Overcoming Pitfalls Associated with CVC

Three-step Method for Ultrasound-Guided Central Vein Catheterization

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Summary and Methods

A clinical study approved by the Chiba Medical Center Ethical Committee was performed to test a three-step method designed to overcome pitfalls associated with ultrasound-guided long-axis central vein catheterization (LAX-IP). Identified pitfalls of this technique include veins that curve and are challenging to approach, utilizing free-hand needling technique requires specific skills and training and lastly, identifying the true center of the view in LAX-IP is challenging with 2D imaging.

Nine operators underwent one hour of training prior to performing 100 central vein catheterizations following the three-step method of: 1) identifying a straight portion of the infraclavicular axillary vein in transverse, 2) using a needle guide to decrease the training required for appropriate needle handling and 3) demonstrating the LAX-IP view of the vein by sweeping through the vessel using the "side-swing" scanning technique.

Discussion and Results

The use of the Infiniti™ needle guide contributed to keeping the needle shaft and tip in-plane during the procedure while preventing "side-lobe" artifact. The amount of training required to effectively keep the needle in view during real-time guidance was minimal due to the use of the needle guidance method.

Results suggest the method is quickly learned by operators regardless of experience level. Success rate for catheterization was 100% with a median of one puncture per patient. Complication rate related to the procedure was zero.

Conclusions

The authors reported study limitations in establishing the safety of the three-step method technique. Additional clinical trials are needed.

The study's findings suggest the Infiniti needle guide:

- decreases required training for appropriate needling technique
- improves the user's ability to maintain the needle in the ultrasound beam plane, which can eliminate the "side-lobe" artifact.

Author Commentary

"Improved needle visibility may relate to successful ultrasound-guided central vein catheterization. However, a clear image of the needle in the longitudinal view does not guarantee that the needle is in the plane of the ultrasound beam, because image clarity depends on the operator's subjective impression. Therefore, another strategy is needed to maintain the needle in the ultrasound beam plane. One approach is to use a needle guide, which can eliminate the side-lobe effect."

