

We propose confirmation of the guidewire in the brachiocephalic vein with ultrasonography as a more reliable method of confirming proper guidewire placement” Bowdle et al (2016).

Abstract:

BACKGROUND: Imaging the guidewire with ultrasonography in the internal jugular vein during central venous catheterization often is used to verify proper guidewire placement and to aid in prevention of inadvertent arterial catheterization. It is known, however, that inadvertent arterial catheterization can occur despite imaging the guidewire in the internal jugular vein because the guidewire may continue through the far wall of the internal jugular vein and into an adjacent artery. We propose confirmation of the guidewire in the brachiocephalic vein with ultrasonography as a more reliable method of confirming proper guidewire placement.

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METHODS: A prospective feasibility study of 200 adult cardiothoracic surgery patients undergoing internal jugular vein catheterization was performed to determine whether the guidewire could be imaged with ultrasonography in the brachiocephalic vein. The guidewire was imaged in the internal jugular vein in a short-axis view, and the transducer was then angled caudally under the clavicle, following the guidewire into the brachiocephalic vein.

RESULTS: The right internal jugular vein was catheterized in 193 patients and the left internal jugular in 7 patients. The brachiocephalic vein was successfully imaged in all but 2 patients. In 3 patients, the guidewire could not be clearly identified in the brachiocephalic vein because of interference from the leads of a heart rhythm device (pacemaker or defibrillator) or preexisting catheter. In 2 patients, the guidewire was not seen initially in the brachiocephalic vein because of coiling in the internal jugular vein, and in 1 patient because of the guidewire passing into the right subclavian vein, but all 3 were subsequently imaged in the brachiocephalic vein after repositioning.

CONCLUSIONS: During internal jugular vein catheterization, the brachiocephalic vein was imaged with ultrasonography in 99% of patients (the lower 1-sided 99% confidence limit is 96%). The guidewire was imaged in the brachiocephalic vein in all cases except when leads from a heart rhythm device caused interference, although in some patients with leads, the guidewire could be imaged without difficulty. The absence of the guidewire from the brachiocephalic vein was indicative of a malpositioned guidewire.

Reference:

Bowdle, A., Jelacic, S., Togashi, K. and Ferreira, R. (2016) Ultrasound Identification of the Guidewire in the Brachiocephalic Vein for the Prevention of Inadvertent Arterial Catheterization During Internal Jugular Central Venous Catheter Placement. *Anesthesia and analgesia*. August 9th. .

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