

...we conducted a systematic review and meta-analysis to determine whether ultrasound guidance of subclavian vein catheterization reduces catheterization failures and adverse events compared to the traditional “blind” landmark method” Lalu et al (2015).

Reference:

Lalu, M.M., Fayad, A., Ahmed, O., Bryson, G.L., Fergusson, D.A., Barron, C.C., Sullivan, P. and Thompson, C. (2015) Ultrasound-Guided Subclavian Vein Catheterization: A Systematic Review and Meta-Analysis. *Critical Care Medicine*. 43(7), p.1498-1507.

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Abstract:

Objective: Although ultrasound guidance for subclavian vein catheterization has been well described, evidence for its use has not been comprehensively appraised. Thus, we conducted a systematic review and meta-analysis to determine whether ultrasound guidance of subclavian vein catheterization reduces catheterization failures and adverse events compared to the traditional “blind” landmark method. All forms of ultrasound were included (dynamic 2D ultrasound, static 2D ultrasound, and Doppler).

Data Sources: Medline, Embase, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and CINAHL (from inception to September 2014).

Study Selection: Randomized controlled trials of ultrasound compared to landmark technique for subclavian catheterization in adult populations were considered. Outcomes of interest included safety and failure of catheterization.

Data Extraction: Adverse event data were analyzed according to Peto’s method and expressed as odd ratios and 95% CIs. Failure of catheterization was analyzed with inverse variance random effects modeling and expressed as risk ratios and 95% CI.

Data Synthesis: Six hundred and one studies were reviewed and 10 met inclusion criteria (n = 2,168 participants). Six used dynamic 2D ultrasound (n = 719), one used static 2D ultrasound (n = 821), and three used Doppler-guided insertion techniques (n = 628). Overall complication rates were reduced with ultrasound use compared to the landmark group (odd

ratio, 0.53; 95% CI, 0.41-0.69). Subgroup analysis demonstrated that dynamic 2D ultrasound reduced inadvertent arterial puncture, pneumothorax, and hematoma formation. No difference in failure of catheterization was noted between the ultrasound group and the landmark method (risk ratio, 0.85; 95% CI, 0.48-1.51). Subgroup analysis of dynamic 2D ultrasound demonstrated a significant decrease in failed catheterization (risk ratio, 0.24; 95% CI, 0.06-0.92).

Conclusions: Ultrasound-guided subclavian catheterization reduced the frequency of adverse events compared with the landmark technique. Our findings support the use of dynamic 2D ultrasound for subclavian catheterization to reduce adverse events and failed catheterization.

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