Combined short- and long-axis ultrasound-guided central venous catheterization | 1

Using the SLA approach significantly improved the success rate of internal jugular vein puncture performed by novice physicians on a manikin model, without increasing procedural duration” Takeshita et al (2017).

Abstract:

OBJECTIVES: Visualizing the needle tip using the short-axis (SA) ultrasound-guided central venous catheterization approach can be challenging. It has been suggested to start the process with the SA approach and then switch to the long-axis (LA); however, to our knowledge, this combination has not been evaluated. We compared the combined short- and long-axis (SLA) approach with the SA approach in a manikin study.

METHODS: We performed a prospective randomized controlled cross-over study in an urban emergency department and intensive care unit. Resident physicians in post-graduate years 1-2 performed a simulated ultrasound-guided internal jugular vein puncture using the SA and SLA approaches on manikins. Twenty resident physicians were randomly assigned to two equal groups: (1) one group performed punctures using the SA approach followed by SLA; and (2) the other performed the same procedures in the opposite order. We compared the
success rate and procedure duration for the two approaches. Procedural success was defined as insertion of the guide-wire into the vein while visualizing the needle tip at the time of anterior wall puncture, without penetrating the posterior wall.

RESULTS: Six resident physicians (30%) performed both approaches successfully, while 12 (60%) performed the SLA approach, but not the SA, successfully. Those who performed the SA approach successfully also succeeded with the SLA approach. Two resident physicians (10%) failed to perform both approaches. The SLA approach had a significantly higher success rate than the SA approach (P < 0.001). The median (interquartile range) procedure duration was 59.5 [46.0-88.5] seconds and 45.0 [37.5-84.0] seconds for the SLA and SA approaches, respectively. The difference of the duration between the two procedures was 15.5 [0-28.5] seconds. There was no significant difference in duration between the two approaches (P = 0.12).

CONCLUSIONS: Using the SLA approach significantly improved the success rate of internal jugular vein puncture performed by novice physicians on a manikin model, without increasing procedural duration. Further clinical trials are warranted to confirm the procedure’s utility in actual patients.

TRIAL REGISTRATION: UMIN Clinical Trials Registry UMIN000026199.

Full Text
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