The lower superior vena cava (SVC), near its junction with the right atrium (RA), is considered the ideal location for the central venous catheter tip to ensure proper function and prevent injuries” Ahn et al (2017).

Abstract:

BACKGROUND: The lower superior vena cava (SVC), near its junction with the right atrium (RA), is considered the ideal location for the central venous catheter tip to ensure proper function and prevent injuries. We determined catheter insertion depth with a new formula using the sternoclavicular joint and the carina as radiological landmarks, with a 1.5 cm safety margin. The accuracy of tip positioning with the radiological landmark-based technique (R) and Peres’ formula (P) was compared using transoesophageal echocardiography.

METHODS: Real-time ultrasound-guided central venous catheter insertion was done through the right internal jugular or subclavian vein. Patients were randomly assigned to either the P group (n=93) or the R group (n=95). Optimal catheter tip position was considered to be within 2 cm above and 1 cm below the RA-SVC junction. Catheter tip position, abutment, angle to the vascular wall, and flow stream were evaluated on a bicaval view.
RESULTS: The distance from the skin insertion point to the RA-SVC junction and determined depth of catheter insertion were more strongly correlated in the R group [17.4 (1.2) and 16.7 (1.5) cm; r=0.821, P<0.001] than in the P group [17.3 (1.2) and 16.4 (1.1) cm; r=0.517, P<0.001], with z=3.96 (P<0.001). More tips were correctly positioned in the R group than in the P group (74 vs 93%, P=0.001). Abutment, tip angle to the lateral wall >40°, and disrupted flow stream were comparable.

CONCLUSIONS: Catheter tip position was more accurate with a radiological landmark-based technique than with Peres’ formula.

CLINICAL TRIAL REGISTRATION: Clinical Trial Registry of Korea: https://cris.nih.go.kr/cris/index.jsp KCT0001937.

Reference:


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