This study aimed to determine a simple and practical method to predict the ideal CVC insertion depth after ultrasound-guided right internal jugular, or left or right supraclavicular puncture in pediatric patients” Yamamoto and Schindler (2019).

Abstract:

BACKGROUND: Several formulae or methods are reported to predict the ideal central venous catheter (CVC) insertion depth. However, they are complicated and often unsuitable in cases requiring rapid management.

AIM: This study aimed to determine a simple and practical method to predict the ideal CVC insertion depth after ultrasound-guided right internal jugular, or left or right supraclavicular puncture in pediatric patients.

METHOD: Pediatric patients with congenital heart diseases who underwent cardiovascular surgery between July 2015 and February 2018 in the German Pediatric Heart Center Sankt Augustin were enrolled. Body height, body weight, patient age (months), and CVC insertion depth were retrieved from the anesthesia records. Ideal CVC insertion depth was calculated by measuring the distance between the level of the carina tracheae and the CVC tip on the first postoperative chest radiograph. The relationships of body height, body weight, and patient age (months) to ideal CVC insertion depth for the right internal jugular, left supraclavicular, and right supraclavicular approaches were investigated.

RESULTS: Body height was the best parameter, providing the best coefficients of determination as well as the simplest relationship. Based on analysis for ideal CVC insertion depth for every 10-cm increase in body height, there was an ideal CVC insertion depth for each body height, independent of the anesthesiologist’s experience with the approach used. Whereas ideal CVC insertion depths for the right internal jugular vein approach and the left supraclavicular approach showed no significant difference, ideal CVC insertion depth for the right supraclavicular approach was significantly shorter than that of the other two approaches.

CONCLUSION: This study successfully determined a visually simple and practical bar graph to predict the ideal CVC depth inserted using only the real-time ultrasound-guided insertion
How to determine correct depth of central venous catheter insertion

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