

The aim of this study was to develop a formula guiding the peripherally inserted central catheter (PICC) tip placement based on anatomical landmarks such as the upper arm, clavicle, and sternum as well as the patient's height, weight, and body mass index" Kang et al (2018).

Abstract:

BACKGROUND: The aim of this study was to develop a formula guiding the peripherally inserted central catheter (PICC) tip placement based on anatomical landmarks such as the upper arm, clavicle, and sternum as well as the patient's height, weight, and body mass index.

METHODS: Fifty-five patients who were scheduled to have PICCs were included in the study. We measured four distances along the passage of the PICC, which were as follows; the tip of the third finger to the middle of the elbow crease (Distance A), the middle of the elbow crease to the acromion process (Distance B), the acromion process to the sternal head of the clavicle (Distance C), and the sternal head of the clavicle to the end of the xiphoid process (Distance D). The lengths from the elbow creases to their carina bifurcations as determined by fluoroscopy during PICC insertions were recorded and used as reference.

RESULTS: The formula for determining PICC depth based on the four distances was determined by regression analysis. The optimal formula was determined to be $25.3 + 0.5 * (\text{Distance C}) + 0.6 * (\text{Distance D})$ which yielded an R2 value of 0.3.

CONCLUSIONS: The formula proposed for proper depth of the adult, $25.0 + 0.5 * (\text{clavicle length}) + 0.6 * (\text{sternum length})$ for PICC insertion can be used to place the tip at the carina bifurcation level. The distance from elbow crease to catheter insertion point should be added to the length generated by this formula.

Reference:

Kang, S.S., Shin, Y.S., Lee, S.Y. and Kim, H. (2018) Simplified equation for determining proper depth of peripherally inserted central catheter in relation to anatomical landmarks. Korean Journal of Anesthesiology. April 24th. .

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