

"The external anatomical landmark and the radiological landmark have been introduced to provide estimation of the depth of right internal jugular venous catheter during insertion" Samerchua et al (2020).



### Abstract:

**BACKGROUND:** The external anatomical landmark and the radiological landmark have been introduced to provide estimation of the depth of right internal jugular venous catheter during insertion. **AIMS:** This study aimed to compare the accuracy, agreement and reliability of the external anatomical landmark and the radiological landmark, confirmation being by transesophageal echocardiography. **METHODS:** This prospective observational study was conducted in children ages 1-15 years. The catheter was placed at the superior vena cava and the right atrium junction guided by transesophageal echocardiography. The catheter depth derived from the transesophageal echocardiography, the external anatomical landmark and the radiological landmark was recorded. The optimal zone of the catheter tip was 5 mm below and 10 mm above the superior vena cava and the right atrium junction. Accuracy was assessed by the difference between the transesophageal echocardiography and the external anatomical landmark or the radiological landmark. Agreement with Bland-Altman plots and correlation were tested. **RESULTS:** Eighty participants, median age of three years were enrolled. The median (IQR) differences between the depth of the transesophageal echocardiography and the external anatomical landmark or the radiological landmark were 0.30 (0, 0.70) and 0.10 (-0.20, 0.90) cm respectively. Bland-Altman plots demonstrated good agreement between the depths. The catheter tips were located in the optimal zone more

frequently with the external anatomical landmark than the radiological landmark (94.7% VS 64.5%). The external anatomical landmark showed a stronger correlation to transesophageal echocardiography than the radiological landmark ( $r = 0.95$  VS  $0.83$ ). **CONCLUSION:** Both the external anatomical landmark and the radiological landmark enabled accurate estimation of the central venous catheter depth close to the superior vena cava and the right atrium junction. The external anatomical landmark is of more potential use than the radiological landmark in clinical practice.

Methods for determining central venous catheter depth in children

Optimal depth of central venous catheters in neonates

Options for fractured central venous catheter retrieval

**Reference:**

Samerchua, A., Kongwatmai, K., Boonsri, S., Pipanmekaporn, T., Bunchungmongkol, N., Sukhupragarn, W. and Visrutaratana, P. (2020) A Comparison of the External Anatomical Landmark and the Radiological Landmark for Obtaining the Optimal Depth of a Right Internal Jugular Venous Catheter in Pediatric Cardiac Patients. *Paediatric Anaesthesia*. February 3rd. doi: 10.1111/pan.13836. .

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