

Abstract:

Purpose: The key landmark for tip position of a central venous catheter (CVC) is the SVC-RA junction. In adults, localization of the SVC-RA junction may be assessed as a function of vertebral body units (VBU) below the carina during CVC placement. We investigated the relationship between the SVC-RA junction and the carina in children.

Materials and methods: 584 CT scans of 0-18 years were analyzed. The carina was marked automatically by software while the SVC-RA junction and vertebrae were marked manually. The SVC-RA junction to carina (JC) distance was the primary study measurement reported in both VBU and mm.

Results: The data show an average JC distance of 1.25 VBU for 0-1 year, 1.27 VBU for 1-4 years, 1.34 VBU for 4-9 years, 1.53 VBU for 9-15 years, and 1.64 VBU for 15-18 years. A positive relationship between weight and JC distance was also demonstrated.

Conclusion: JC distance is a useful predictor of SVC-RA junction location in children. Significant relationships were shown between JC distance and both age and weight. Due to small differences between age groups, however, average JC distance for all comers (1.48 VBU, 95% CI 0.7 - 2.3) can be used for SVC-RA junction identification in CVC placement.

Reference:

Hirschl JR, Gadepalli SK, Derstine BA, et al. CT validation of SVC-RA junction location for pediatric central line placement: is vertebral bodies below the carina accurate? . *Pediatr Surg Int.* 2020;10.1007/s00383-020-04712-1. doi:10.1007/s00383-020-04712-1