"Multivariate analysis on complications of central venous access devices in children with cancer and severe disease influenced by catheter tip position and vessel insertion site" Hofmann et al (2020).

Abstract:

CONTEXT: Reliable long-term central venous access device (CVAD) is essential for the management of pediatric patients with cancer or chronic diseases. However, there is no general consensus for optimal catheter tip location and vessel insertion site in children. OBJECTIVE: This single center study analyzes the risk of complications associated with long-term upper body CVAD and evaluates them with respect to catheter tip location as well as vessel insertion site. DESIGN: Pediatric patients who received long-term upper body CVAD from January 2008 through April 2017 and underwent radiographic documentation of the tip location were retrospectively included in the study. Data on demographics, catheter tip location on chest x-ray, intraoperative vessel insertion sites and postoperative complications were analyzed. Catheter tip location was categorized as “high” (above the right mainstem bronchus), “medium” (at the level of the bronchus), and “low” (below the right mainstem bronchus). Distance to the carina was measured as well. RESULTS: A total of 396 patients, 74.7% suffering from cancer were included in our study (mean age 6.3 ± 0.3 years). Complications occurred in about one fourth of all patients. Catheter-related blood stream infections (BSI) (n = 40, 36.4%) were most prevalent, but catheter tip position or vessel insertion site had no impact on the risk of infections. Dislodgement (n = 27, 24.6%) and occlusion (n = 11, 10.0%) were more frequent in “high” positioned catheter tips. While there was one patient who developed arrhythmia, no case of cardiac perforation, and in particular,
no catheter-related death was recorded in our series. The vessel insertion site seemed to have no influence on the complication frequency of CAVDs. CONCLUSION: The catheter tip position seems to have an impact on the catheter-related complication profile in children. To avoid complications, we recommend avoiding a “high” localization of the catheter tip above the right main bronchus. “Low” catheter tip placement was associated with the lowest dislocation rate. Given the overall low complication rate, insertion and use of CVADs in children can generally be considered as safe.

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