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WHY DO PORTS GET STUCK? A CASE-CONTROL STUDY

Jennifer Crook¹, Lindsay J. Talbot, MD², Andrew M. Davidoff, MD², James Hoffman³, Andrew J. Murphy², Zhaohua Lu², Xiaoqing Wang, PhD², Nan Henderson³, Kimberly Proctor³, Vinod Maller¹, Hasmukh Prajapati¹, Robert Gold¹, Abdelhafeez Abdelhafeez³

¹University of Tennessee Health Science Center, ²St. Jude Children's Research Hospital, Memphis, TN, USA, ³St. Jude Children's Research Hospital

Purpose

We sought to identify clinical features associated with difficult subcutaneous port removals in children.

Methods

Ports placed between April 2014-September 2017 at our institution were prospectively tracked for difficult removals. Ports with extreme (guidewire to facilitate removal, catheter breakage, near-catheter breakage, endovascular intervention) or moderate (dissection to the vessel wall, counter incision, or abnormally strong traction) resistance during removal were identified. A case-control analysis was performed. Patients with stuck ports (cases) were compared to gender and age-matched controls in a ratio of 1:3. Logistic regression determined the association between case/control status and clinical features adjusting for biological sex and age as covariates. Multiple testing correction was performed by determining the false discovery rate. A two-sided significance level of adjusted $p < 0.05$ was used.

Results

57 stuck ports (28 extreme and 29 moderate; 10 endovascular intervention) and 171 controls were analyzed. Stuck ports were associated with a diagnosis of acute lymphoblastic leukemia (86% cases versus 22.2% controls; $p < 0.001$) and a longer placement duration (median 2.6 years [interquartile range (IQR) 2.5-2.6] versus 0.8 years [IQR 0.5-1.4]; $p < 0.001$). Procedural and device features associated with stuck ports included subclavian access (71.9% cases versus 48.5% controls; $p=0.0126$), placement by a surgeon versus an interventional radiologist (80.7% cases versus 58.5% controls; $p=0.0162$), a polyurethane versus silicone catheter (96.5% cases versus 79.9% controls; $p=0.001$), and a rough catheter appearance at removal (92.6% cases versus 9.4% controls; $p < 0.0001$). Prior lines, TPN, catheter-associated DVT, and bacteremia episodes were not associated with stuck ports.

Conclusion

Polyurethane central venous catheters placed for the two-year treatment of acute lymphoblastic leukemia may become difficult to remove. This constellation of factors warrants more extensive preoperative discussion of risk, endovascular backup availability, and scheduling for longer operating room time. Internal jugular placement of a silicone central venous catheter may be preferential in this patient population.