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Complication rates for PICCs after rewire

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Statement of the Problem: Long term venous access is integral to the treatment and therapy of many pediatric patients. Complications with line function other than infection can often be remedied by exchanging the catheter over the wire for a new catheter, or rewire. This retrospective study was designed to analyze PICC complication rates after rewire, as compared to all newly placed PICCs.

Methodology & Theoretical Orientation: IRB approval allowed retrospective study at a large children's hospital of the electronic medical record and PACS system, which were queried for all PICCs placed from January 2014 through December 2014. Data points collected included catheter dwell time, reason for rewire, indication of PICC placement, and complications including infection, line malfunction and malposition. Outcomes were statistically analyzed using Fisher's exact test. Comparisons were made between the total PICC population and those patients that had their PICC exchanged over a wire.

Findings: A total of 1257 PICCs were placed during the study period with 157 patients having a rewire of their line. In all patients, the total complication rate and infection rate were 12.2% and 4.8% ($p < 0.001$) respectively, with early infection comprising 1.5% and late infection comprising 3.4%. In rewire patients, the total complication rate and infection rate were 44.6% and 14.6% ($p < 0.001$) respectively, with early infection comprising 3.8% and late infection 10.8%. The most common reasons for rewire were malposition (44.5%) and cracked catheter hub (17.8%). The two most common patient populations requiring rewire were oncology (33.1%) and TPN dependent short gut patients (33.1%). Average catheter dwell time in all patients was 39 days and in rewire patients was 59 days.

Conclusion & Significance: The overall complication rate for catheters after rewire was higher than the entire PICC population. This may be due to the same factors prompting rewire in the first place (ex., fibrin sheath causing recurrent occlusion; patient anatomy causing recurrent malposition). The infection rate was also higher. The rewire group had a higher proportion of multiple lumens, a longer dwell time and an increased proportion of the population receiving parenteral nutrition, all of which have been previously reported in the literature to increase infection rates. Despite this increased risk, we think that rewire still has a place in practice in a certain subset of patients, in order to preserve future venous access options in patients requiring long term central venous access (ex., TPN dependent, cancer).

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