

Popliteal Peripherally Inserted Central Catheter (P-PICC) Use in Neonates

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INTRODUCTION

- PICCs are widely used in the neonatal intensive care units (NICU).
- PICCs play an essential role in providing IV access to maintain administration of fluids, parenteral nutrition (TPN), and antibiotics to premature neonates.
- Multiple anatomical sites can be used for PICC placement.
- Complication rates vary depending on the PICC insertion site.
- There are a few published data on the use of Popliteal PICCs (P-PICC) in neonates.

Table 1 - Characteristics of Popliteal vs Non-popliteal PICCs

Characteristic	Popliteal (n=126)	Non-popliteal (n=1115)	p-value
Gestational Age (w), mean ± SD (range; median)	22.3 ± 0.89 (23-40.6; 31.5)	31.7 ± 0.32 (22.5-42; 31.5)	<0.001 ¹
Birth weight (kg), mean± SD (range; median)	1.19 ± 0.17 (0.33-3.9; 0.81)	1.83 ± 0.06 (0.31-5.07; 1.59)	<0.001 ¹
Day of life PICC placed (d), mean ± SD; (range; median)	16.43 ± 4.92 (1-234; 7)	24.58 ± 2.47 (1-302; 6)	0.46 ²
PICC dwell time (d), mean ± SD (range; median)	15.1 ± 2.35 (1-79; 10)	14.2 ± 0.87 (1-140; 10)	0.24 ¹

¹Unpaired t-test ²Mann-Whitney U test

CI = Confidence interval, w = weeks, d = days

RESULTS

- A total of 1241 PICCs were inserted in 784 neonates: 126 (10.2%) were P-PICCs and 1115 (89.8%) NP-PICCs.
- The average dwell time for P-PICCs was 15.1 days compared to 14.2 days for NP-PICCs (p = 0.24).
- P-PICCs were more likely to have complications (18.2%) compared to NP-PICCs (10.2%) (p = 0.01).
- Infectious complications for P-PICCs (5.5%) compared to NP-PICCs (1.61%) were significantly higher (p = 0.008).
- The time to infectious complication didn't significantly differ between the two groups (P = 0.14).
- For mechanical complications there was no significant difference between P-PICCs (11.5%) vs NP-PICCs (8.6%) (p = 0.17)
- P-PICCs were more likely to be placed in lower birth weight and lower gestational age neonates compared to NP-PICC group (p < 0.001)

MATERIALS & METHODS

- Retrospective chart review of PICCs
- All neonates admitted to a Level III NICU between 1/1/2016 and 12/31/2020.
- Demographic data, number of days with PICC (dwell time), and complications were gathered. Complications included infectious and mechanical.
- These data were compared between P-PICC and non-Popliteal PICCs (NP-PICC) using Chi-square (C), t-test (T), and Mann-Whitney U test (MW).
- IRB approval was obtained from Baptist Health/Wolfson Children's Hospital.

Table 2 - Complications of Popliteal vs Non-popliteal PICCs

Complications	Popliteal (126)	Non-popliteal (1115)	p-value ¹
Infectious	7/126 (5.5%)	18/1115 (1.61%)	0.008
Mechanical	16/126 (11.5%)	96/1115 (8.6%)	0.17
Total	23/126 (18.2%)	114/1115 (11.8%)	0.01

¹ = X² 2x2 contingency table

CONCLUSION

- There was a significantly higher rate in overall complications rate in P-PICCs compared to NP-PICCS.
- This difference was primarily due to higher number of infectious complications.
- The high complication rate may have been driven by the lower gestational age and birth weight of the neonates.
- Additional data are needed to confirm this finding.

