

PICC-associated pericardial effusions and pleural effusions are rare but inherent risks and can occur at any time after insertion” Sertic et al (2017).

Abstract:

BACKGROUND: Peripherally inserted central catheters (PICCs) are increasingly used in neonates but perforations can result in devastating complications such as pericardial and pleural effusions. Identifying risk factors may guide surveillance and reduce morbidity and mortality.

OBJECTIVE: To determine the risk factors for PICC perforation in neonates.

MATERIALS AND METHODS: Retrospective case:control (1:2) study of neonates admitted between 2004-2014. Charts and imaging were reviewed for clinical and therapeutic risk factors.

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RESULTS: Among 3,454 PICCs, 15 cases of perforation (incidence 0.4%, 5 pericardial effusions, 10 pleural effusions) were matched to 30 controls, based on gestation and insertion date. Timing of perforations post-insertion was median 4 days for pericardial effusions and 21.5 days for pleural effusions. A risk factor for pericardial effusion was lower weight at PICC insertion compared with controls. There were no statistically significant differences between cases and controls in catheter material, insertion site, PICC size and lumen number. Among upper limb PICCs, pericardial effusions were associated with tip positions more proximal to the heart at insertion ($P=0.005$) and at perforation ($P=0.008$), compared with controls. Pleural effusions were associated with tip positions more distal from the heart at perforation ($P=0.008$). Within 48 h before perforation, high/medium risk infusions included total parenteral nutrition (100% cases vs. 56.7% controls, $P=0.002$) and vancomycin (60% cases vs. 23.3% controls, $P=0.02$).

CONCLUSION: PICC-associated pericardial effusions and pleural effusions are rare but inherent risks and can occur at any time after insertion. Risk factors and etiologies are

multifactorial, but PICC tip position may be a modifiable risk factor. To mitigate this risk, we have developed and disseminated guidelines for target PICC positions and routinely do radiographs to monitor PICCs for migration and malposition in our NICU. The increased knowledge of risk profiles from this study has helped focus surveillance efforts and facilitate early recognition and treatment.

Reference:

Sertic, A.J., Connolly, B.L., Temple, M.J., Parra, D.A., Amaral, J.G. and Lee, K.S. (2017) Perforations associated with peripherally inserted central catheters in a neonatal population. *Pediatric Radiology*. October 6th. .

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