

The quantity of catheter residing in the vein is a key predictor of long-term functionality of US-guided IVs and is strongly associated with the hazard of failure within 72 hours” Pandurangadu et al (2018).

Abstract:

OBJECTIVE: Ultrasound (US)-guided peripheral IVs have a high failure rate. We explore the relationship between the quantity of catheter residing within the vein and the functionality of the catheter over time.

METHODS: This was a prospective, observational single-site study. Adult ED patients with US-guided IVs had the catheter visualised under ultrasound post-placement. IV placement time and catheter length residing in the vein was obtained. Exclusions included catheter not visualised, patient discharged from ED unless IV failed, <24 hour hospitalisation unless IV failed or patient self-removed IV. Inpatient follow-up occurred within 24, 48 and 72 hours from the IV placement time. Catheter functionality was noted. If the catheter failed, the time and reason for failure was documented.

RESULTS: 113 patients were enrolled; 27 were excluded. Of the 86 study subjects, 29 (33.7%) patients' IVs failed and 57 (66.3%) remained functional. Median time to IV failure was 15.6 hours. 100% of IVs failed when <30% of the catheter was in the vein; 32.4% of IVs failed when 30%-64% of the catheter was in the vein; no IVs failed when $\geq 65\%$ of the catheter was in the vein ($p < 0.0002$). The HR was 0.71 (95% CI 0.60 to 0.83), and for every 5% increase of catheter in vein, the hazard of the IV failing decreases by 29% ($p < 0.0001$).

CONCLUSION: The quantity of catheter residing in the vein is a key predictor of long-term functionality of US-guided IVs and is strongly associated with the hazard of failure within 72 hours. Catheter failure is high when <30% of the catheter resided in the vein. Optimum catheter survival occurs when $\geq 65\%$ of the catheter is placed in the vein.

Reference:

Pandurangadu, A.V., Tucker, J., Brackney, A.R. and Bahl, A. (2018) Ultrasound-guided



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