

Introduction

- Thrombophlebitis associated with peripheral intravenous catheters (PIVCs) is a poorly described complication in the literature.¹⁻³
- Given limited accuracy of current assessment tools and poor documentation in the medical record, the true incidence and relevance of this complication is misrepresented.⁴⁻⁷
- We aimed to identify risk factors in the development of thrombophlebitis using an objective methodology coupling serial diagnostic ultrasound and clinical assessment.

Methods

Setting: Single-site, prospective observational cohort study.

Cohort: Adults in the ED with traditionally placed PIVC's and were being hospitalized with an anticipated length of stay greater than two days.

Methodology: Serial daily ultrasound evaluations and clinical assessments identified patients with asymptomatic and symptomatic thrombosis.

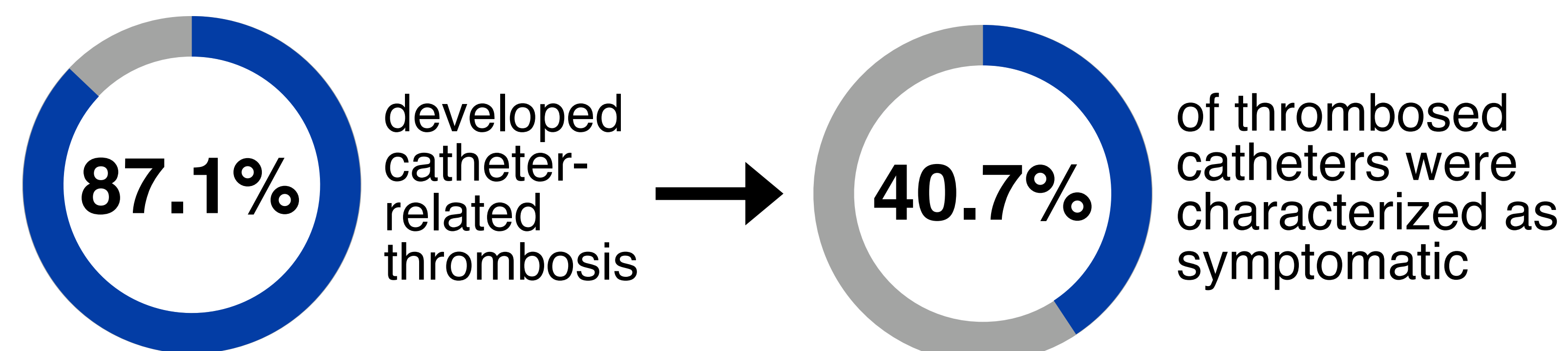
Statistics: Univariate and multivariate analyses were employed to identify risk factors for thrombophlebitis.

Aims and Objectives

The primary goal was to identify demographic, clinical, and PIVC related risk factors associated with thrombophlebitis.

Results

62 PIVCs were included between July and August 2020.

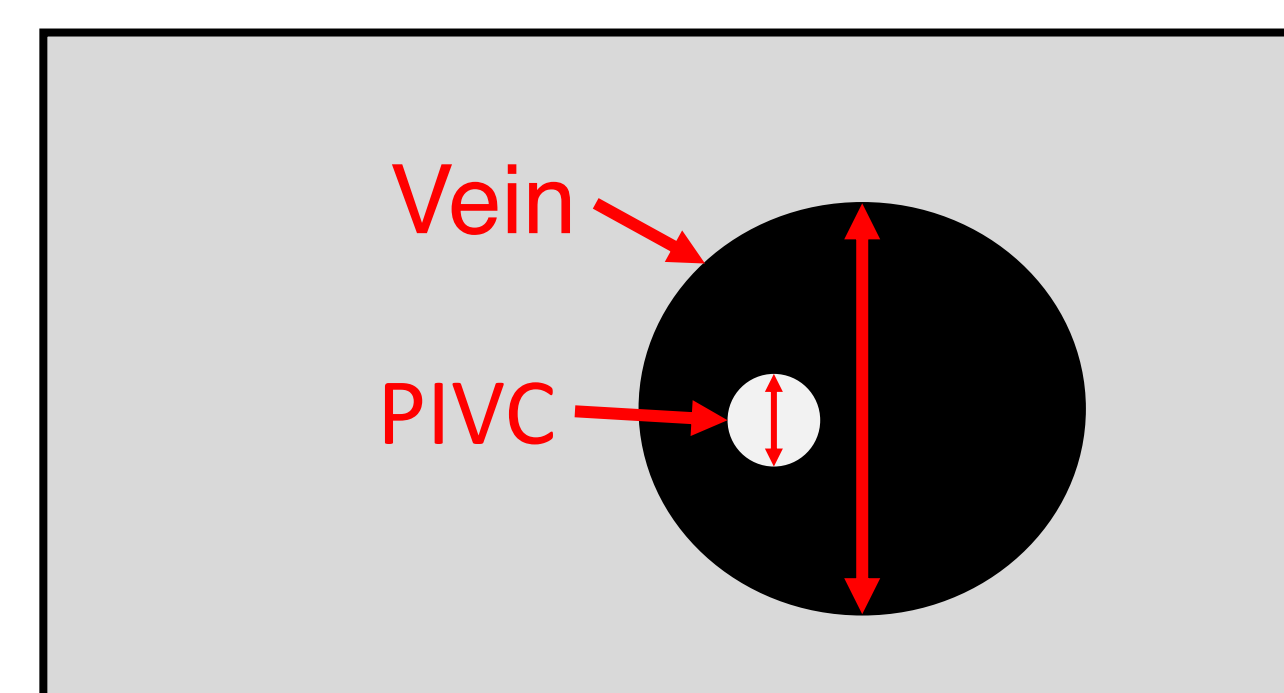


INCREASED LIKELIHOOD OF PHLEBITIS WAS ASSOCIATED WHEN...

≥33.3%

catheter diameter relative to vein diameter

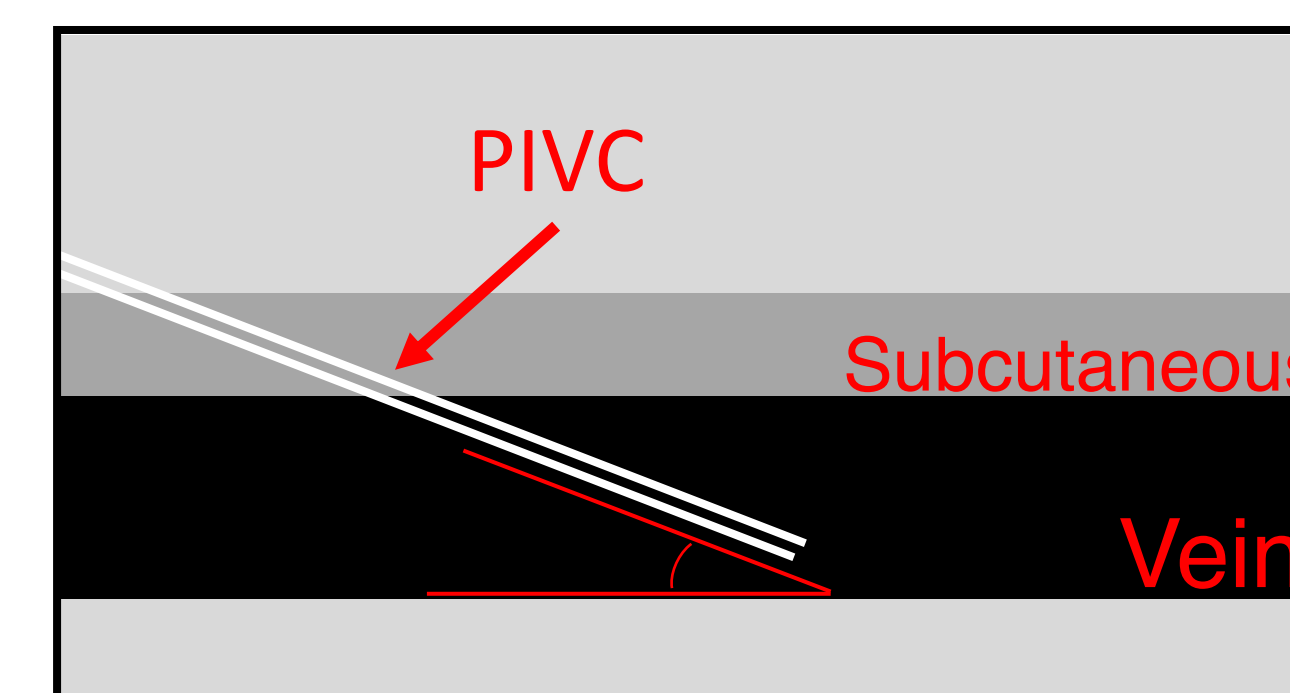
[AHR=5.41 (1.91, 15.4) p=0.0015]



≥5°

angle of distal tip of catheter against vein wall

[AHR=4.39 (1.39, 13.8) p=0.0116]



Conclusions

- Our study found that the increased proportion of catheter relative to vein size and steeper catheter tip angle increased the risk of thrombophlebitis.
- Catheter size relative to vein size is a modifiable factor that should be considered when inserting PIVCs.
- Additional larger prospective investigations using objective methodologies are needed to further characterize complications in PIVCs.

References

1. Alexandrou E, Ray-Barruel G, Carr PJ, et al. Use of Short Peripheral Intravenous Catheters: Characteristics, Management, and Outcomes Worldwide. *Journal of Hospital Medicine*. 2018;13(5):1-7. doi:10.12788/jhm.3039
2. Helm RE, Klausner JD, Klemperer JD, Flint LM, Huang E. Accepted but Unacceptable: Peripheral IV Catheter Failure. *Journal of Infusion Nursing*. 2015;38(3):189-203. doi:10.1097/NAN.0000000000000100
3. Ray-Barruel G, Xu H, Marsh N, Cooke M, Rickard CM. Effectiveness of insertion and maintenance bundles in preventing peripheral intravenous catheter-related complications and bloodstream infection in hospital patients: A systematic review. *Infection, Disease & Health*. 2019;24:152-168. doi:10.1016/j.idh.2019.03.001
4. Gorski LA, Stranz M, Cook LS, et al. Development of an Evidence-Based List of Noncytotoxic Vesicant Medications and Solutions. *Journal of Infusion Nursing*. 2017;40(1):26-40. doi:10.1097/NAN.0000000000000202
5. Yagnik L, Graves A, Thong K. Plastic in patient study: Prospective audit of adherence to peripheral intravenous cannula monitoring and documentation guidelines, with the aim of reducing future rates of intravenous cannula-related complications. *American Journal of Infection Control*. 2017;45(1):34-38. doi:10.1016/j.ajic.2016.09.008
6. Johansson ME, Pilhammar E, Khalaf A, Willman A. Registered Nurses' Adherence to Clinical Guidelines Regarding Peripheral Venous Catheters: A Structured Observational Study. Vol 5.; 2008.
7. Fakhri MG, Jones K, Rey JE, et al. Peripheral venous catheter care in the emergency department: Education and feedback lead to marked improvements. *American Journal of Infection Control*. 2013;41(6):531-536. doi:10.1016/j.ajic.2012.07.010

Acknowledgements

Special thanks to Dr. Shirley Qu.