

COMMENT

Open Access



The cephalic vein access for use in intensive care unit: an alternative approach

Shouyin Jiang^{1*}, Yehua Shen² and Xiaogang Zhao¹

Dear Editor,

We thank Gawda and Czarnik for their interest in our report introducing the cephalic vein access in intensive care unit (ICU) for assisting hemodynamic monitoring and vasoactive support in a special condition [1]. They have raised four questions with regard to the reason for central venous catheter (CVC) replacement, optional cannulation site, risk of thrombotic complications, and the definition of obesity.

As everyone knows, it is important for severe trauma patients to establish an ideal location for central venous cannulation. Patients who have prolonged ICU length of stay may require multiple cannulations. Factors influencing the choice of cannulation site can include coagulation disorders, thrombocytopenia, skin condition, subcutaneous tissue thickness, state of or expected tracheotomy, and so on. Although it is not recommended to remove a CVC regularly, suspicion of catheter associated infection, catheter occlusion, local infection or catheter

displacement are factors to consider for catheter replacement for patients who still require CVC support. For our patient, decision for replacement of the central venous catheter was based on suspicion of bloodstream infection while she should require vasopressor support (nor-epinephrine 0.13 µg/kg/min) and invasive hemodynamic management. In our patient, the thick and edematous subcutaneous soft tissue (as showing in figure) made it difficult to choose an axillary vein route due to anticipated cannulation difficulty, although we are experienced in this procedure as we have practiced that for over 200 cases since 2021. Moreover, the state of tracheotomy and the short neck did not allow us to choose the internal jugular vein, this route may be associated with increased risk of catheter-related thrombosis (CRT) and line displacement, even with increased risk of injury to the common carotid artery.

We acknowledge the importance of the catheter to vessel ratio in real condition due to consideration of CRT [2]. A prospective multicenter study conducted in 28 intensive care units identified 16.9% incidence of CRT, with the internal jugular vein being the most common CRT found in the study [3]. However, the pathogenesis of CRT is multifactorial and complicated, with risk factors associated with the catheter per se, the vessel selected and the underlying co-morbidities and related treatments. Anatomically, the cephalic vein is approximately 6 mm in diameter [4]. Moreover, the measured diameter of the vein selected under ultrasound does not equal to the actual diameter, which can be influenced by volume state and vascular tension. According to the finding from our random ultrasound scanning, the diameter of cephalic vein in some patients would exceed 3 or even 4 mm, sometimes it could also be invisible. A rational

This comment refers to the article available online at <https://doi.org/10.1186/s13054-022-04031-y>.

This reply refers to the comment available online at <https://doi.org/10.1186/s13054-023-04321-z>.

*Correspondence:

Shouyin Jiang
jansoean@zju.edu.cn

¹ Department of Emergency Medicine, Second Affiliated Hospital, Zhejiang University School of Medicine, Key Laboratory of The Diagnosis and Treatment of Severe Trauma and Burn of Zhejiang Province, Zhejiang Province Clinical Research Center for Emergency and Critical Care Medicine, Research Institute of Emergency Medicine, Zhejiang University, Hangzhou 310009, China

² Department of Radiology, The Children's Hospital, Zhejiang University School of Medicine, National Clinical Research Center for Child Health, Hangzhou, China



© The Author(s) 2023. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

catheter management and antithrombotic strategies (such as ultrasound screening and refined anticoagulant plan) may be useful for CRT prophylactics. Lastly, obesity for Chinese is defined as body mass index (BMI) $\text{weight} \geq 28$ [5]. In general, the cephalic vein cannulation should not be considered as a routine procedure in ICU due to high anatomy variation, difficult process and time consuming. Where the ultrasound-guided center venous cannulation technique was mastered excellently, where the cephalic vein access can be considered on condition that sufficient evaluation is prepared.

Acknowledgements

Not applicable.

Author contributions

SJ, YS, and GZ designed the paper. All authors participated in drafting and reviewing. All authors read and approved the final version of the manuscript.

Funding

None.

Availability of data and materials

Not applicable.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Received: 12 May 2023 Accepted: 18 May 2023

Published online: 30 May 2023

References

1. Gawda R, Czarnik T. The cephalic vein catheterization: maybe yes, but when there is no alternative. *Crit Care*. 2023;27(1).
2. Spencer TR, Mahoney KJ. Reducing catheter-related thrombosis using a risk reduction tool centered on catheter to vessel ratio. *J Thromb Thrombol*. 2017;44(4):427–34.
3. Wu C, Zhang M, Gu W, Wang C, Zheng X, Zhang J, Zhang X, Lv S, He X, Shen X, et al. Daily point-of-care ultrasound-assessment of central venous catheter-related thrombosis in critically ill patients: a prospective multi-center study. *Intensive Care Med*. 2023;49(4):401–10.
4. Sansivero GE. Venous anatomy and physiology. Considerations for vascular access device placement and function. *J Intraven Nurs*. 1998;21(5 Suppl):S107–14.
5. Chen C, Lu FC. Department of Disease Control Ministry of Health PRC: The guidelines for prevention and control of overweight and obesity in Chinese adults. *Biomed Environ Sci*. 2004;17(Suppl):1–36.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.