



## LETTER TO EDITOR

# Ultrasound-assisted mark for internal jugular vein catheterization



Dear Editor,

We read with great interest the article written by Ahn et al. about the internal jugular vein (IJV) catheterization.<sup>1</sup> In this article, when the needle is inserted at the apex of the anatomical triangle formed by the sternocleidomastoid (SCM) muscles and the clavicle and directed towards the ipsilateral nipple for IJV catheterization, it crosses the course of the IJV at an average angle of 16°, and the apex is medial to the center of the IJV by an average of 0.5 cm. This provides the rationale that the ipsilateral nipple used as a directional guide for needle advance during catheterization of the IJV. The authors thought this insertion angle may help increase success rate of anatomical approach, while decreasing the risk of puncturing the common carotid artery (CCA).

However the CCA is directly below the IJV in approximately 8–21% of patients,<sup>1,2</sup> and the angle of the triangle is significantly greater in females compared to male, while large and/or sagging breasts make nipple unreliable as a direction. Further more, the operator may be 'blind', because the breast was covered during catheterization. So it is necessary to find more reliable direction point for catheterization.

Despite ultrasound guided catheterization recommended by guideline, portable ultrasound might not be available sometimes, especially in resource-poor areas. As immobile ultrasound is available in all hospitals, which make marking which make marking IJV with ultrasound possible. We suggest a modified-mark-guided catheterization, which contains 2 steps:

Step 1. Mark the center of the IJV at the level just above the clavicle as direction for catheterization.

Step 2. Palpate the lateral side of CCA in anatomic triangle as needle insertion point.

Static ultrasound is used only for marking the IJV insu-pra-clavicular, where the relationship between IJV and

mark does not change when the head rotates. We have been using this approach for IJV catheterization in our center for 4 years. It is safe, easy to maneuver and superior to a land-mark guide technique. As the mark provides a real site of IJV, it may theoretically increase confidence for operators, reduce the procedure duration and complication rate. Because CCA lies posterior and slightly lateral to IJV, we suggest that the line connecting needle insertion point and mark deviate from, not to the longitudinal axis of the trunk.

## Conflict of interest

All the authors declared no competing interests.

## Acknowledgement

Our research is funded by Zhejiang provincial science and Technology Department (2016ZQ028) and Zhejiang Provincial Administration of traditional Chinese Medicine (2016C33126).

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.asjsur.2018.09.015>.

## References

1. Ahn S, Ryu HG, Koo CH, Choi S, Lee JH, Jang IK, et al. Validation of the ipsilateral nipple as the needle directional guide during right internal jugular vein catheterization: a prospective observational study. *Asian J Surg.* 2019;42:362–366.

<https://doi.org/10.1016/j.asjsur.2018.09.015>

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2. Lin BS, Kong CW, Tarng DC, Huang TP, Tang GJ. Anatomical variation of the internal jugular vein and its impact on temporary haemodialysis vascular access: an ultrasonographic survey in uraemic patients. *Nephrol Dial Transplant*. 1998;13: 134–138.

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28 June 2018