



# Ultrasound-Guided Umbilical Venous Catheter Insertion to Reduce Rate of Catheter Tip Malposition in Neonates: A Randomized, Controlled Trial: Correspondence

Arushi Yadav<sup>1</sup> · Jitendra Meena<sup>2</sup> · Jogender Kumar<sup>2</sup>

Received: 2 August 2022 / Accepted: 8 September 2022 / Published online: 21 September 2022  
© The Author(s), under exclusive licence to Dr. K C Chaudhuri Foundation 2022

*To the Editor:* We read the randomized, controlled trial on ultrasound-guided umbilical venous catheter (UVC) insertion in neonates with great interest [1]. We applaud the authors for a pertinent study in the current era that will contribute to reducing radiation exposure in neonates. The authors showed that ultrasound-guided UVC insertion significantly reduced the rate of catheter tip malposition. Index study considered plain radiographs as a gold standard which are less sensitive and specific than ultrasound in identifying catheter tip position. In a recent systematic review comparing radiographs with ultrasound for UVC tip position verification, the overall diagnostic sensitivity and specificity (with 95% CI) of plain radiographs were 0.90 (0.71–0.97) and 0.82 (0.53–0.95), respectively [2]. Therefore, the cases where the radiograph classified the tip position as too high or too low may be incorrect in many cases. Recent literature suggests ultrasound with saline contrast injection should be the gold standard for catheter tip localization [2, 3].

During ultrasound-guided UVC insertion, the tip is placed at the inferior cavoatrial junction, which a trained person can easily visualize. Hence, the chances of putting the catheter tip too high (into the right atrium) or too low is negligible, provided the tip is well visualized. In the index study, 7 of 11 neonates have either high-placed or low-placed UVC, probably due to poor visualization on ultrasonography (which is quite common). In such cases, saline contrast injection (popularly known as agitated saline contrast) can help localize the tip [4]. This technique was initially used to identify the cardiac shunts and has been recently used for identifying

central venous catheter tip position. Using agitated saline contrast might improve the successful UVC catheter placement rates, hence further improving the efficacy of ultrasound-guided catheter insertion.

## Declarations

**Conflict of Interest** None.

## References

1. Kaur A, Manerkar S, Patra S, Kalamdani P, Kalathingal T, Mondkar J. Ultrasound-guided umbilical venous catheter insertion to reduce rate of catheter tip malposition in neonates: a randomized, controlled trial. *Indian J Pediatr.* 2022. <https://doi.org/10.1007/s12098-022-04295-w>.
2. Cao J, Zhang Y, Yin Y, Liu Y. Accuracy of chest radiography compared to ultrasound for positioning the umbilical venous catheter in neonates: a meta-analysis and systematic review. *J Vasc Access.* 2021. <https://doi.org/10.1177/11297298211046755>.
3. Kumar J, Yadav A. Umbilical venous catheter position formula: best is yet to come! *Indian Pediatr.* 2019;56:607.
4. Upadhyay J, Basu S, Srivastava Y, et al. Agitated saline contrast to delineate central venous catheter position in neonates. *J Perinatol.* 2021;41:1638–44.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

✉ Arushi Yadav  
arushiy403@gmail.com

<sup>1</sup> Department of Radiodiagnosis, Ivy Hospital, Mohali, Punjab 160071, India

<sup>2</sup> Department of Pediatrics, Advanced Pediatric Center, Postgraduate Institute of Medical Education and Research, Chandigarh, India