

LETTER TO THE EDITOR

Open Access



Malposition of right internal jugular vein cannulation into left brachiocephalic vein

G. Sanjeev¹, D. Subha² and D. Divya^{1*}

Sir,

The catheter malpositioning into contralateral brachiocephalic vein is a rare presentation. So far to our knowledge, this has not been reported. Hence, we report this catheter misinsertion into other veins which cannot be easily identified from a successful central venous cannula (CVC) insertion as there is no difference in the colour and pulsation of the regurgitated blood flow (Wang et al. 2016). The patient in her sixties was admitted to the ICU for immunoglobulin infusion after being diagnosed with Guillain barre syndrome. Right internal jugular vein (IJV) cannulation was performed under strict aseptic conditions using Selinger's technique. With ultrasound assistance, the IJV was punctured and the guide wire location was confirmed with ultrasound. Guide wire insertion was smooth without any resistance. Backflow was present in all three lumens. A chest X-ray was taken after catheter insertion to establish its position (Fig. 1). The catheter tip was found to be in the contralateral brachiocephalic vein (confirmed by the radiologist). It was partially removed and then under strict aseptic precaution, the guidewire was once again inserted and adjusted. The possible course of the catheter is shown in Fig. 2.

The ipsilateral and contralateral internal jugular veins, as well as the opposite subclavian vein (SCV),

are popular sites for misplaced catheters. A study by Maddali et al. found that 4% of the patients had the central venous catheter tip in a malposition in the right IJV group and in the left IJV group 22.3% of patients had malposition (Maddali et al. 2022). On radiography, Pikwer et al. showed a 3.3% overall incidence of catheter tip mispositioning (Pikwer et al. 2008). Right IJV cannulation with a figure of eight appearances that is not in the proper place has been reported (Solanki et al. 2015).

Catheter malpositioning into contralateral brachiocephalic vein is a rare presentation. The longer the left brachiocephalic vessel, the more oblique path to the heart, and the location of the small tributaries is thought to be the causes of the elevated risk of malpositioning left IJV (Gibson and Bodenham 2013). Following CVC placement, congenital variants are frequently found by chance during imaging. Even though they do not cause any symptoms, they can make it challenging to determine the CVC tip's radiologic location.

The correct placement of the CVC tip is important in obtaining accurate central venous pressure (CVP) measurements. Inaccurate CVP measurements and inability to obtain an ideal waveform tracing are suggestive of a misplaced location of the catheter tip (Agrawal et al. 2010).

Ambesh and colleagues found that during SCV cannulation, manual compression of the IJV resulted in a clear increase in transduced pressure if the catheter tip was misplaced into the IJV and successfully prevented the passage of the guide wire into the IJV (Ambesh et al. 2002).

*Correspondence:

D. Divya
ddiviyambbs@gmail.com

¹ Department of Anaesthesiology, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth University, Pondicherry, India

² Department of Anaesthesiology, ESIC Medical College Hospital, K.K Nagar, Chennai, India



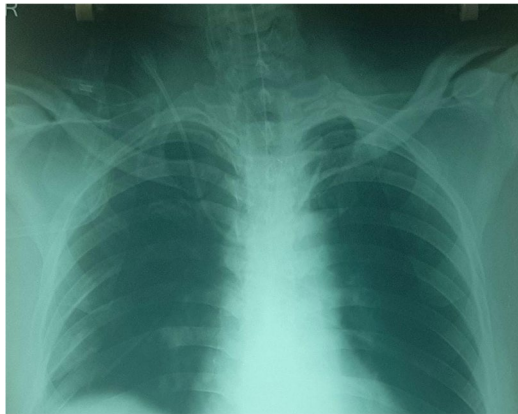


Fig. 1 Right IJV misposition into left brachiocephalic vein

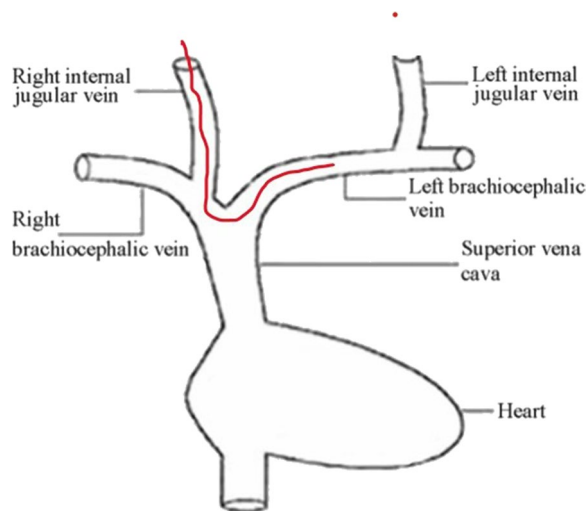


Fig. 2 Course of right IJV catheter (shown in red)

The take-home message from this case is that although routine use of ultrasound-guided insertion of CVC and training in ultrasound-guided insertion will reduce failure and complications, such techniques do not eliminate the risk of malposition altogether. Sound clinical judgement and radiological assessment are still necessary to confirm the correct placement of the central venous catheter tip.

Abbreviations

IJV	Internal jugular vein
SCV	Subclavian vein
CVC	Central venous catheter
CVP	Central venous pressure

Acknowledgements

Not applicable.

Authors' contributions

The authors SG, SD, and DD have drafted the work. All authors have read and approved the manuscript.

Funding

Not applicable.

Availability of data and materials

Not applicable.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Written informed consent for publication was obtained from the patient.

Competing interests

The authors declare that they have no competing interests.

Received: 19 March 2023 Accepted: 28 October 2023

Published online: 07 November 2023

References

- Agrawal P, Gupta B, D'Souza N (2010) Coiled central venous catheter in superior vena cava. *Indian J Anaesth* 54(4):351
- Ambesh SP, Dubey PK, Matreja P, Tripathi M, Singh S (2002) Manual occlusion of the internal jugular vein during subclavian vein catheterization: a maneuver to prevent misplacement of catheter into internal jugular vein. *Anesthesiology* 97(2):528–529
- Gibson F, Bodenham A (2013) Misplaced central venous catheters: applied anatomy and practical management. *Br J Anaesth* 110(3):333–346
- Maddali MM, Al Aliyani KRS, Arora NR, Sathiya PM (2022) Central venous catheter tip malposition after internal jugular vein cannulation in pediatric patients with congenital heart disease. *J Cardiothorac Vasc Anesth* 36(8):2483–2487
- Pikwer A, Bååth L, Davidson B, Perstoft I, Akesson J (2008) The incidence and risk of central venous catheter malpositioning: a prospective cohort study in 1619 patients. *Anaesth Intensive Care* 36(1):30–37
- Solanki S, Thota R, Patil V (2015) Malpositioning of right internal jugular central venous catheter into right external jugular vein forming "figure of 8." *Ann Card Anaesth* 18(3):414
- Wang L, Liu ZS, Wang CA (2016) Malposition of central venous catheter: presentation and management. *Chin Med J (engl)* 129(2):227–234

Publisher's Note

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

Submit your manuscript to a SpringerOpen® journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► [springeropen.com](https://www.springeropen.com)