Correction of a Malpositioned Central Venous Catheter using Point-of-care Transthoracic Echocardiography

Sir,

A 75-year-old gentleman underwent combined aortic valve replacement and coronary artery bypass grafting surgery for severe aortic stenosis with triple-vessel coronary artery disease. Before anesthetic induction, a triple-lumen central venous catheter (CVC) and an 8.5-Fr single-lumen venous sheath were inserted uneventfully in the right internal jugular vein (IJV) under ultrasound (US) guidance following the confirmation of the presence of both the guidewires within the IJV lumen. On postoperative chest X-ray (CXR), however, the terminal 6-cm portion of the CVC was found to be looping back from the junction of the brachiocephalic veins toward the ipsilateral IJV [Figure 1a]. Although there was no problem with the infusion of fluid and inotropes through the lumens and there was only a minimal resistance in backflow, as the patient needed accurate central venous pressure and central venous oxygen saturation monitoring (which requires tip of the CVC to be in the distal portion of superior vena cava [SVC]) for assessment and management of hemodynamics and cardiac output (as the patient had poor left ventricular ejection fraction), decision to reposition the CVC was undertaken.

After strict aseptic preparation of the insertion site and sterile draping, the CVC was unfixed from the skin fixation site and was carefully withdrawn by 6 cm. A sterile guidewire was passed through its distal lumen carefully while holding the catheter stable. A point-of-care transthoracic echocardiography (TTE) was performed simultaneously through the subcostal region. The guidewire was advanced till its passage through the SVC into the right atrium (RA) could be observed in the subcostal bicaval view [Figure 1b]. Thereafter, the CVC was advanced over the guidewire and refixed at the same 15-cm mark, where it was fixed previously. A CXR done afterward confirmed proper position of the CVC tip within SVC [Figure 1c]. Although passing a guidewire through the distal port of an in situ CVC is controversial, the same was undertaken as the risk of significant bacterial colonization of the CVC was minimal within such a few hours’ time. We also tried to avoid inserting a fresh CVC, as the procedure can itself cause complications.

Malposition of CVC is a widely reported phenomenon. Although the use of real-time US guidance during CVC insertion is standard of care nowadays, it cannot ensure malposition of the distal portion of the CVC, as was in our case. Different imaging techniques have also been described to correct the malposition of CVC, such as injecting saline through the distal lumen under fluoroscopic guidance. We, however, utilized a simple point-of-care TTE-guided technique, which enabled us to successfully reposition the CVC at bedside within a short time, without need of transferring the patient to catheterization laboratory. Although the use of subcostal bicaval view for detecting the passage of guidewire to RA during CVC insertion has been described, it is not a standard practice in our institution and hence was not performed during initial placement of the CVC. However, the technique could be used successfully, without any difficulty, to reposition the malpositioned catheter.

We, therefore, found that apart from the already described role of the TTE-guided technique in ensuring correct positioning of CVC during insertion, it can be used as a simple, bedside tool for repositioning a malpositioned CVC as well.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.
Letters to Editor

Indranil Biswas, Imran Hussain Bhat, Sunder Lal Negi

Department of Anaesthesia and Intensive Care, Cardiac Anaesthesia Unit, Postgraduate Institute of Medical Education and Research, Chandigarh, India

Address for correspondence: Dr. Indranil Biswas, Room No. 4016, Advanced Cardiac Centre, Postgraduate Institute of Medical Education and Research, Chandigarh - 160 012, India. E-mail: hreesheekombarta@gmail.com

Submitted: 17-Jul-2018
Revised: 28-Aug-2018
Accepted: 16-Sep-2018
Published: 07-Apr-2020

References

1. Gibson F, Bodenham A. Misplaced central venous catheters: Applied anatomy and practical management. Br J Anaesth 2013;110:333-46.

2. Troianos CA, Hartman GS, Glas KE, Skubas NJ, Eberhardt RT, Walker JD, et al. Guidelines for performing ultrasound guided vascular cannulation: Recommendations of the American Society of Echocardiography and the Society of Cardiovascular Anesthesiologists. J Am Soc Echocardiogr 2011;24:1291-318.

3. Gautam PL, Kundra S, Jain K, Monga H. Repositioning of misplaced central venous catheter with saline injection under C-arm imaging. J Clin Diagn Res 2015;9:UD01-2.

4. Hartnell GG, Gates J, Suojanen JN, Clouse ME. Transfemoral repositioning of malpositioned central venous catheters. Cardiovasc Intervent Radiol 1996;19:329-31.

5. Arellano R, Nurmohamed A, Rumman A, Milne B, Tanzola R. Point-of-care transthoracic echocardiography as an alternative to transesophageal echocardiography to confirm internal jugular guidewire position. Can J Anaesth 2012;59:103-4.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online

Quick Response Code: Website: www.annals.in

DOI: 10.4103/aca.ACA_141_18

How to cite this article: Biswas I, Bhat IH, Negi SL. Correction of a malpositioned central venous catheter using point-of-care transthoracic echocardiography. Ann Card Anaesth 2020;23:247-8.

© 2020 Annals of Cardiac Anaesthesia | Published by Wolters Kluwer - Medknow