A simple clinical method to detect mal-positioning during subclavian venous cannulation

Sir,

Mal-positioning of the central venous catheters following subclavian venous cannulation is a common problem and its incidence can be as high as 9.1%.[1] Even the experienced operators can cause significant number of mal-positions.[2] Worldwide anesthesiologists practice various maneuvers for preventing this complication. Maneuvers like keeping the bevel of the introducer needle facing caudally and introducing the guide-wire with its open side of J tip facing heart are commonly practised.

We tried occluding the right internal jugular vein (IJV) while introducing the guide-wire through the right subclavian vein, to prevent guide-wire entering the internal jugular vein. Though, our "occluding maneuver" didn't prevent the guide-wire entering IJV, the movement of guide wire inside IJV was perceived unmistakably by the occluding fingers. We withdrew the wire, rotated the needle and reintroduced the wire. We repeated this process until; we didn't feel any guide-wire movement in ipsilateral IJV. Post-procedure chest X-ray showed catheter tip in superior venacava right atrium junction.

We prospectively, compared this palpating for guide-wire method with vascular ultrasound (as gold standard) for identifying mal-positioning in twenty right subclavian cannulations in adult patients. Vascular ultrasound was used to detect the presence of guide wire in IJV, after the observations using "palpating for guide wire technique" were finalised and recorded. The incidence of mal-positioning in to the right IJV was 10% (2 out of 20). In both the patients, mal-positioning was identified by this method which was later confirmed by vascular ultrasound. There was no false positive observation. Thus, in this pilot study, we found that this method had 100% sensitivity and specificity in detecting guide wire entering the right IJV and it could be done easily by a single operator, avoiding the need for one additional person to scrub.

Vascular ultrasound can easily detect guide-wires entering IJVs and echocardiography especially trans-oesophageal can confirm correct placement of central venous catheter. But, they are not universally available and one has to relay on clinical skills. "Saline flush test" has been shown to be 100% sensitive and specific in identifying catheters mal-positioned in IJVs.[3] However, it can be done only after threading the catheter and removing the guide wire. Instead, if we are able to identify mal-position at an early stage of the procedure that is while passing guide wire itself, it will be more useful and time conserving.

We recommend palpating for the guide-wire in the neck, while passing the guide-wire in all subclavian venous cannulations to prevent mal-positioning in to the internal jugular veins. However, the possibility of guide-wire entering the opposite side subclavian vein can't be ruled out by this technique.

G. Arimanickam, K. Gopalakrishna[1]
Department of Anaesthesiology, Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum, [1]Department of Neuroanaesthesiology, National Institute of Mental Health and Neuro Sciences, Bangalore, India

Correspondence:
Dr. G. Arimanickam,
Department of Anaesthesiology, B-201, SCTIMST Hostel, Medical College Post, Trivandrum - 695 011, Kerala, India.
E-mail: drarimanickam@gmail.com

References

1. Pikwer A, Bååth L, Davidson B, Perstoft I, Akeson J. The incidence and risk of central venous catheter malpositioning: A prospective cohort study in 1619 patients. Anaesth Intensive Care 2008;36:30-7.
2. Schummer W, Schummer C, Rose N, Niesen WD, Sakka SG. Mechanical complications and malpositions of central venous cannulations by experienced operators. A prospective study of 1794 catheterizations in critically ill patients. Intensive Care Med 2007;33:1055-9.
3. Rath GP, Bithal PK, Toshniwal GR, Prabhakar H, Dash HH. Saline flush test for bedside detection of misplaced subclavian vein catheter into ipsilateral internal jugular vein. Br J Anaesth 2009;102:499-502.