1314696 - TRANSTHORACIC ECHO TO CONFIRM INTERNAL JUGULAR GUIDE WIRE POSITION

Aliya Nurmohamed¹, Amir Rumman¹, Ramiro Arellano¹, Brian Milne¹, Robert Tanzola¹

1. Anesthesiology, Queen's University, Kingston, ON, Canada

Introduction: Errors in placement of central lines can result in serious injury or death should cannulation occur without appropriate venous placement. Confirmation of an appropriately placed guide wire in the central venous system by ultrasound is recommended prior to dilation and cannulation over the wire(1). Although transesophageal echocardiographic (TEE) confirmation of the guide wire in the superior vena cava or right atrium (RA) can definitively verify placement, it is invasive and not readily available(2). Transthoracic echocardiography (TTE) is a more common modality and, if reliable, could serve as an alternative to TEE. This study investigates the effectiveness of limited TTE in detecting the guide wire and blood contrast in the RA, two markers of successful right internal jugular (RIJ) cannulation.

Methods: Approval was obtained from the Research Ethics Board. Patients undergoing cardiac surgery who required a RIJ central line and TEE monitoring were recruited for the study. Patients with severe aortic stenosis or contraindications to TEE were excluded. After induction of anesthesia and intubation, a RIJ 9 French introducer was placed using the Seldinger technique. Simultaneously, TTE views of the RA were obtained in the subcostal or apical 4-chamber views. To confirm appropriate venous access, blood was aspirated once venous puncture was made and quickly re-injected to produce contrast (bubbles). The contrast was observed transiting through the RA on TTE. The 0.89 mm guidewire was advanced and observed entering the RA. Images were collected and stored from either or both views and the rates of detection of the bubbles and wire were noted. Baseline demographic data and optimal patient position to obtain TTE views were also collected.

Results: To date, 85 patients have been recruited for the study. The RA was adequately visualized in 80/85 patients (94.1%) in the apical, the subcostal or both views. Among these patients, bubbles could be visualized in 77/80 patients (96.3%) in either or both views. The wire was visualized in the RA in 76/80 patients (95.0%) in either or both views. Adequate views of the RA were achieved in the Trendelenburg position in 61/80 patients (76.3%) while 19/80 patients required the supine position. In patients in whom the wire was seen, the mean BMI was 28.5 vs. 33.6 in patients in which it was not seen (p=0.0088).

Discussion: According to recent consensus guidelines, real-time ultrasound should be used for confirmation of successful vessel cannulation and TEE imaging of the guide wire can provide definitive confirmation of placement into the central venous system(1). In contrast to TEE, TTE is noninvasive and its use in critical care and emergency settings is becoming routine. This makes it a more practical means to visualize the guide wire in the heart and great vessels. The results of this study suggest that TTE identification of blood contrast and direct visualization of the guide wire can serve as an alternative and effective means to confirm central line venous access prior to dilation and cannulation of the RIJ. When adequate views of the right atrium are obtained in either the 4-chamber or subcostal views, the detection rate of the contrast and the guide wire is very high. TTE may serve as a useful tool in the vast majority of patients.