

## Ultrasound-guided and radiographic monitoring-assisted peripherally inserted central catheterization

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To the Editor:

Although the first approach to central venous catheterization (CVC) under general anesthesia would generally be the right internal jugular vein, this procedure is dangerous when patients are receiving anti-coagulant therapy or have low platelet counts. We also note that, in the trendelenburg position, the left internal jugular vein cannot be dilated, and the approach via the left internal jugular vein is also dangerous for thoracic duct puncture. Central catheters have been peripherally inserted via the basilic vein since the 1970s [1]. The advantages of peripherally inserted central catheters (PICCs) are low complication rates, easy access, reduced overall nursing required for i.v. maintenance, and low cost [2]. Perioperative insertion of a PICC via the basilic vein would therefore confer some advantages, and ultrasound-guided and radiographic monitoring-assisted insertion adds more safety and provides optimal management. We therefore performed a clinical trial of perioperative PICC insertion under ultrasound guidance and radiographic monitoring.

Fourteen patients scheduled for surgical repair of abdominal aortic aneurysms were prospectively enrolled.

The basilic vein in the upper arm was visualized using a 4-F Groshong catheter<sup>®</sup> (Medicon, Osaka, Japan) and a 6- to 13-MHz ultrasound probe (Vivid i<sup>®</sup>; GE Healthcare Japan, Tokyo, Japan). The position of the PICC tip was also confirmed by radiographic monitoring. Briefly, either the right or left upper arm was rotated 90° and then a 14-G cannula was inserted into the vein under real-time ultrasound guidance with a jobbing motion. When blood backflowed from the vein, the PICC was directly inserted into the basilic vein. The PICC was then advanced or withdrawn under radiographic monitoring to reach the preferred site location. Forceful aspiration was added to obtain blood return after the removal of the guidewire in the PICC. An additional catheter was cut and a sterile dressing was positioned over the external portion of the PICC.

The mean age of the patients was 71 years (range 55–82). The tip of the PICC was successfully positioned in 11 (78.6 %) of the 14 patients but became dislodged in 3 (21.4 %) patients. The PICC tip was not advanced to the superior vena cava. Serious complications, such as infection, accidental puncture of an artery, or injury of median nerve, did not occur during PICC insertion in any patient.

We had perioperatively inserted a CVC under landmark or ultrasound guidance; therefore, the question arose as to what should be done when a CVC could not be inserted via the right internal jugular vein. Goldfarb and Lebrec [3] described difficulties with cannulation from the left internal jugular vein. However, both long- and short-term PICC placement in infants and children has proven safe and effective [4], although the PICC tip can quite frequently become dislodged. Thus, ultrasound guidance and radiographic monitoring are important. Fricke et al. [5] reported that PICC placement was more successful with than without radiographic monitoring. The PICC tip became dislodged in three of our patients in whom the right basilic

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vein was the approach. Although the approach via the left basilic vein may be optimal, further study is required to clarify this issue.

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