Targeting the Venous Confluence of Pirogoff for Central Venous Cannulation Insertion, When Internal Jugular Vein Cannulation is Difficult: A Three-Step Approach

Sir,

Central venous cannulation (CVC) is a commonly performed procedure in emergency, critical care and perioperative period. The use of ultrasound (US) guidance for CVC increases the overall success rate of cannulation by 71% compared to the landmark technique.[1]

A commonly encountered difficulty during US-guided cannulation is the small lumen of the vessel (especially internal jugular vein) in patients who are volume deficient or have a history of multiple cannulations.

In such scenarios, both needle puncture and passage of guide wire become cumbersome. The incidence of the narrow lumen of internal jugular vein (IJV) is 1% on the right side and 8% on the left side.[2] A novel technique used when the IJV has a small lumen (<0.7 cm) and subclavian puncture is contraindicated is cannulating at the venous confluence of three vessels, i.e., IJV, subclavian vein (SCV), and brachiocephalic vein (BCV) known as the "Pirogoff" confluence.[3] We describe a case where a linear array US probe was used to identify the venous confluence of "Pirogoff" in three simple, quick, and important steps to obtain successful venous cannulation.

US assessment of IJV was done using a portable US Sonosite Micromax machine with 7.5 MHz linear array (vascular) probe. The probe was placed in sagittal plane at the level of cricoid cartilage to obtain short axis view of the IJV. IJV was found to have a narrow lumen on both sides [Figure 1]. Further, it was decided to go for the supraclavicular approach for cannulation.

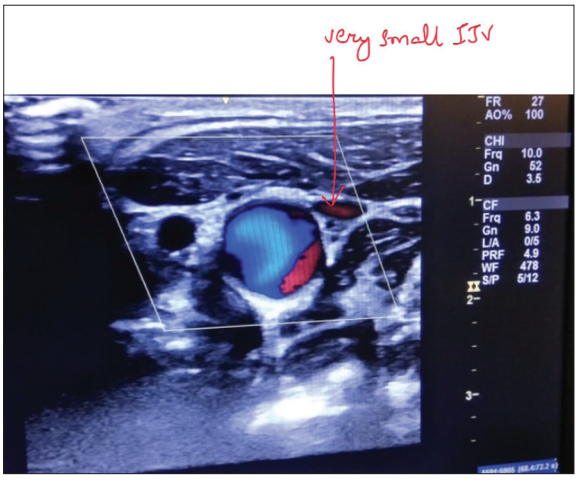

Figure 1: Ultrasonographic image of showing a small sized internal jugular vein and carotid artery

Moving the USG probe further downward confluence of the three vessels was identified [Figure 2].

The three steps followed in sequence included:

1. Identification of the confluence of the vessels
2. Doppler assessment as both the SCV and SCA lie adjacent to each other
3. Identification of the valves in the veins (confluence of SCV with BCV) seen as hyperechoic structures moving within the vessel lumen.

These three steps helped in identification of vessels correctly and differentiating a vein from artery. This is of great importance here due to the close proximity of vein and artery and as also because vessels are of a larger caliber.

Although brachiocephalic vein cannulation has been recommended in pediatric patients[4] this approach can also be used in adult patients in whom the anatomy of IJV is difficult or not well identified.

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Conflicts of interest

There are no conflicts of interest.

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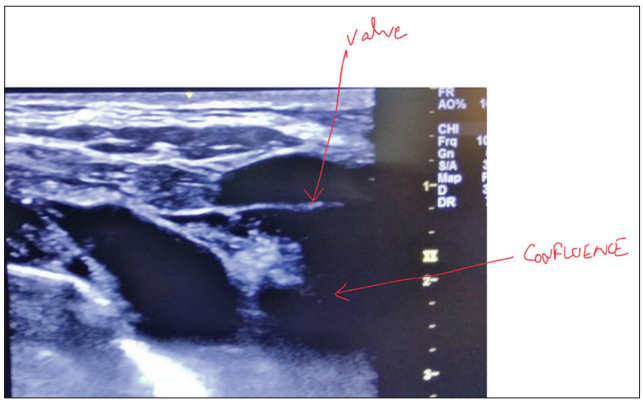

Figure 2: Ultrasonographic image of the confluence of subclavian vein and brachiocephalic vein as labeled. Along with valve seen at junction of subclavian vein and brachiocephalic vein

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