Pressure infusion bag----"One size fits all" positioning tool for central venous access and brachial plexus blocks: A novel yet effective technique

Sir,

Positioning of the patient is an important prerequisite for central venous cannulation (CVC) and to perform the brachial plexus blocks (BPB) in the operation theater. The success rate for CVC via the subclavian veins is good in experienced hands using optimal positioning. However, there are occasions when the procedure may become technically challenging without proper positioning as in obese patients, collapsed veins or a difficult anatomy. Proper positioning is therefore required for both the landmark technique and ultrasound-guided technique of CVC to increase the success of cannulation and decrease complications. Similarly, success rates in BPB are higher and there are fewer complications if the patient is positioned properly, with either the landmark technique or with use of ultrasound or peripheral nerve stimulator guidance. Similarly, proper positioning is essential for percutaneous tracheostomies and other procedures performed over the neck region.

Commonly available, inexpensive, readily available positing adjuncts such as intravenous fluid bottles of various sizes or small pillow, towel rolls, folded sheets of various sizes are placed below the shoulder to make the field more prominent for ease of these procedure. Commercially available cylindrical gel pads or bolsters of various sizes are also used to achieve a proper position. A commonly encountered problem with the use of these devices is that, after the patient is draped for the procedure or during the procedure, the towel roll or pillow used is found to be too low or too high, and this results in having to break sterility to reposition the patient. We have found that the readily available alternative to such devices is a pressure infusion bag with its specially designed cuff and bladder device that is used for rapid infusion of sterile parenteral fluids. Commonly available 1000 cc pressure bags are appropriate for majority of the patients as per the patient habitus. The advantage of this device is that the anaesthesiologist can achieve optimal positioning in a strict aseptic manner, with the help of an assistant controlling the tri-way valve and bladder to alter the height of the infusion bag by increasing and decreasing the air inside the bag, even after preparation and draping. The bag is inflated fully upto 300 mmHg with the bladder to provide a cushion between scapulae to facilitate the access to the subclavian vein for CVC and for BPB in supine position [Figure 1]. Horizontal placement under the shoulders makes the brachial plexus more prominent and superficial, while vertical placement between the shoulder blades works well for subclavian vein catheterisation.

Orientation of needle tip and knowledge of complex vascular and neural anatomy by using mind-eye visualisation along with optimal positioning, comprises the essence of success and reduces complication during CVC, and increases the anaesthesiologist's capability to perform difficult cannulation.[1] The classical position for subclavian vein cannulation reported in the literature is the 'retracted' shoulder position, where a rolled sheet or towel or plastic intravenous fluid bottle

Figure 1: Showing inflated pressure infusion bag as cushion between scapulae with an assistant controlling the tri-way valve and bladder to alter the height of the patient

is placed longitudinally beneath the thoracic spinal column between the scapulae to allow the shoulder to fall backward into retracted position.[2,3] Positional manoeuvers affecting the head and shoulders can affect the caliber and anatomic correlation of the veins in relation to local structures during CVC. Numerous studies have recommended diverse positions of the shoulder to ease puncture of the subclavian vein without causing any complications. Exposing the clavicle more prominently with increasing the height of the shoulder and by downward traction on the ipsilateral arm can also help in challenging cases of subclavian vein cannulation.[4]

Due to its wide availability, low cost and easy handling, this lightweight pressure infusion bag provides optimal positioning and stabilisation while maintaining asepsis throughout the procedure. This is an ideal device that can be used as an adjustable one-size-fits-all positioning tool, and is a simple yet effective alternative to commonly used pillows, towel rolls, intravenuos fluid bottles, or gel pads and bolsters.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

Bhavna Hooda, Shalendra Singh, Kiran S, Deepak Dwivedi

Department of Anaesthesiology and Critical Care, Armed Forces Medical College, Pune, Maharashtra, India

Address for correspondence:
Dr. Shalendra Singh,
Department of Anaesthesiology and Critical Care, Armed Forces Medical College, Pune - 411 040, Maharashtra, India.
E-mail: drsinghafmc@gmail.com

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