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Letter to the Editor
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The Reverse Cannula: A Novel Technique of Withdrawing Blood

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The Editor,

Intravenous cannulation is a technique which anesthesiologists do often in their daily practice. It is a technique in which a cannula is placed inside a vein to provide venous access. It allows sampling of blood, fluids, medications, parenteral nutrition, chemotherapy as well as blood products.

Intravenous cannula can be used to take blood samples even if it is inside the vein as cannula is just a plastic device inside the vein and there is no risk of "blowing" the vein by the needle once the cannula is inside especially in case of a difficult cannulation or a very small vein.

Antegrade catheters are placed with the catheter end pointing towards the direction of blood flow towards the heart while in retrograde or reverse cannulation, the catheter end is pointed away from the direction of venous blood flow [1].

When antegrade intravenous cannulation is done, the needle ends up blocking most of the flow of the vein and so it is very hard to take good quantity of blood as the flow gets decreased. On contrary to it, when we insert a cannula in backward direction, all the blood gets straight into the cannula without any obstruction.

Reverse or retrograde cannulation is a novel technique of doing a cannulation in backward direction. It is not practiced routinely, but it acts as a saviour when there is difficulty in taking blood samples like in patients on chemotherapy or in critically ill patients.

Reverse cannulation also delays the clot formation around the catheter by creating impact pressure zones and avoiding wake effect zones. It creates an impact pressure zone at the tip of the retrograde catheter and at the angle between the catheter and the wall of the vein. Whereas in case of antegrade catheter insertion, there is creation of wake effect zones with stasis of blood at the tip of the catheter as well as the angle between the catheter and wall of the vein. Thereby, creating impact pressure zones and avoiding wake effect zones, blood stasis and thrombosis are decreased and delayed [2,3].

El Shafei *et al*., examined the use of retrograde ventriculojugular and retrograde ventriculosins shunt against the direction of blood flow and concluded that there was decreased incidence of venous thrombosis due to minimized stasis around the catheter and the vein wall as the catheter was inserted in a retrograde direction to blood flow [2].

Abdelaal Ahmed Mahmood *et al*., also concluded that reverse cannulation not only prolongs the time of onset of thrombus formation, but also delays thrombus propagation by extending the time needed for the formed thrombus to reach the catheter tip, and thus increasing the lifespan of catheters as compared to antegrade cannulation [4].

Sometimes, in case of Modified Bier's block, the normal way of injecting lidocaine in the proximal direction is not acceptable to completely anesthetize distal limbs in spite of waiting for a long time. The suspected causes may be spreading of lidocaine to a limited region or leaking to the interosseous venous plexus. However, retrograde insertion of a catheter and injecting lidocaine in the distal direction of the region may help and the anesthetic effects of lidocaine appears immediately without any side effects [5].

To conclude, reverse cannulation may be practiced in ICU settings to decrease the need of multiple pricks to withdraw blood samples, or in patients on chemotherapy where intravenous cannulation is often tricky due to superficial and tiny veins. Reverse cannulation also delays the onset of thrombosis. Also, it should be attempted only under supervision and with the consent of the patient as it is a novel technique.

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