

Right internal jugular vein access for central venous catheterization in a prone COVID-19 patient

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To the editor,

Intensive Care Unit (ICU) practice has evolved radically in the last year, to face the constant number of critical COVID-19 patients with multiple comorbidities, who required intensive treatment, intubation and mechanical ventilation. In the advanced stage of the disease, patients could benefit from prone positioning, to increase oxygenation, and gas exchange.

The presence of a central venous catheter (CVC) is mandatory in ICU critical patients, due to the need of administration of amine, parenteral nutrition, and drugs harmful for the peripheral veins. Pittiruti et al.¹ and Vailati et al.,² in their recent recommendations, have focused on the importance of central access management in COVID-19 patients. As suggested by the recommendations, we usually use a four lumen CICC placed in the axillary vein to promptly assure a safe and stable vascular access, in all the COVID-19 patients admitted to our ICU.

We report the case of a 75-year-old man, with a history of hypertension, chronic obstructive pulmonary disease, diabetes mellitus, and gastrointestinal cancer, who developed a severe form of COVID-19 and required mechanical ventilation and long pronation to maintain adequate level of blood oxygenation. On admission, he already had a three-lumen femoral inserted central catheter (FICC) in the right femoral vein well-functioning, so we decided, when he was admitted, to use this central line for amine administration and therapy. Due to the shortage of subcutaneous anchorage system in our hospital during the pandemic period, the FICC was secured with a sutureless system. During the prone positioning maneuvers, unfortunately, a displacement of the CVC occurs, so we needed to place a new central catheter to continue the life-saving drug administration. After a rapid ultrasound evaluation, the placement of a peripherally inserted central catheter (PICC) was considered an unsafe

solution, due to the swelling of the patient's arms and the absence of a suitable peripheral arm's vein.³

Another ultrasound evaluation was performed, to understand if a new central vein catheter could be a possible solution; due to the prone position, only the first two steps of the RaCeVA (Rapid Central Veins Assessment) protocol⁴ were feasible, exploring the mid and the base of the neck. The internal right jugular vein was found to be suitable, also thanks to the position of the patient, who had the face turned to the right side and, consequently, the right side of the neck exposed. In the unstable COVID-19 patient, a central catheter placed in the internal jugular vein has been found a safe solution also by Jasinski et al.⁵ in their protocol for central venous access in patients with coronavirus disease 2019; moreover, Yang and Ng,⁶ successfully placed a temporary dialysis catheter in the internal jugular vein in a prone COVID-19 patient. The ultrasound image obtained is showed in Figure 1.

After these evaluations, with a sterile technique, the right internal jugular vein was percutaneously cannulated with a short-axis in-plane approach, thanks to a linear high-frequency ultrasound probe guide, and a metallic guidewire was advanced through the needle; after that, the sheath dilator was inserted over the guidewire. A four-lumen central catheter was then placed inside the internal jugular vein over the guidewire and was advanced to reach the cavo-atrial junction. The intracavitary electrocardiography method was used to precisely determinate the correct position of the tip and the

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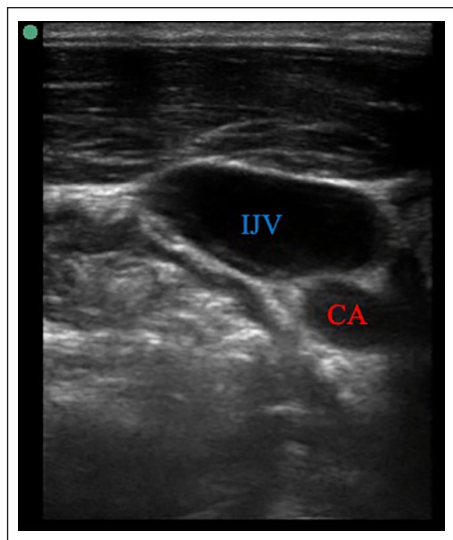


Figure 1. Ultrasound image of the right internal jugular vein in a prone COVID-19 patient.

IJV: internal jugular vein; CA: carotid artery.

length of the catheter (17 cm). After observing blood reflux from all the lumens, in temporary absence of subcutaneous anchorage system, the catheter was secured with three silk stitches and medicated with a sterile dressing, to ensure that the new CVC would not suffer from a dislocation during supination and pronation maneuvers. No complication or excessive bleeding was encountered during the entire procedure. A chest X-ray taken for other medical reasons after the supination of the patient further confirmed the correct position of the catheter tip.

This case demonstrate the possibility to safely place a four lumen CVC in the internal jugular vein in a prone COVID-19 patient, solving a potential problem without interrupting patient's therapy administration and maintaining the prone position. Further studies are needed to define

a precise protocol to place central catheter when the patient does not lie in supine position.

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