

Delayed onset of massive hemothorax complicating percutaneous internal jugular vein cannulation

Sir,

Percutaneous central venous cannulation (CVC) has become a routine procedure for critically ill patients. New catheter materials and design have improved the positioning technique, but major complications are still present in up to 11% of insertions.^[1] A case of delayed massive hemothorax complicating percutaneous internal jugular vein cannulation in a patient with a lower rectal adenocarcinoma is reported. An 85-year-old man was admitted to the ICU postoperatively (immediately) because of acute respiratory insufficiency and weaning failure. A total mesorectal excision technique with sphincter saving was performed. Before the operation, an 18-g triple-lumen catheter was inserted in the left internal jugular vein (median approach) and placed without difficulty, using the Seldinger technique. A maximal sterile barrier precaution during insertion, including cap and mask for nurse and physician; sterile gloves and gown for the physician; and a large drape were the standard preventative measures taken before the procedure. The solution for skin preparation was povidone iodine. He was sedated and mechanically ventilated. His blood pressure was 140/75 mmHg and pulse rate 103/min. The coagulation profile was within normal limits. A chest radiograph showed right lower lobe pneumonia as well as the correct positioning of the catheter in the superior vena cava.

During the following days, the patient remained stable and weaning efforts began. On the fourth day of ICU stay, the patient suddenly collapsed. His blood pressure dropped to 60/40 mmHg, and he was unresponsive to fluid and inotropic administration. The heart rate increased (135/min). Breath sounds from the right-upper chest decreased and the O₂ sat was 90% on FiO₂ 1. A significant drop in hemoglobin to 5 g/dl (10.5 g/dl postoperatively) was noted. Ultrasonography revealed a widespread left-sided pleural effusion of homogenous

echoic appearance, consistent with massive left hemothorax. Chest tube drainage revealed 2,000 ml of fresh blood, directly followed by 1,200 ml within the next 12 h. The cannula was removed from the internal jugular vein. Four units of blood and fresh frozen plasma were provided. The patient responded with rising BP and improving oxygen saturation to 97% on FiO₂ 0.4. During the next 3 days, 400 ml of pleural fluid were drained. The chest tube was removed on the sixth day of hospital stay, and the x-ray showed complete resolution of pleura.

Hemothorax is a major complication of CVC. It occurs mainly as a result of perforation of the superior vena cava (SVC) and is commonly described as an early complication during or immediately after catheter placement in the subclavian or the internal jugular vein.^[2] However, delayed onset hemothorax complicating internal jugular cannulation is not frequently reported. The actual incidence and frequency of this injury are unknown because cases are probably underreported.^[3]

A late perforation of SVC, the erosion theory from the catheter tip, is a possible explanation of delayed hemothorax in our patient.^[4] Additionally, the improvement of his condition by supportive treatment made the possibility of subclavian artery perforation unlikely. The predisposition of left-sided catheters to perforate probably derives from the horizontal orientation of the left compared to the right brachiocephalic vein. These catheters must make an abrupt turn into superior vena cava. When the catheter is positioned horizontally before making that turn, the catheter stiffness provides a perpendicular assault on the lateral wall of the superior vena cava, particularly during coughing. It is possible that an abrupt increase in blood pressure during weaning procedure might have disrupted the intima of the vessel generating hemothorax. Catheter removal led to an

uneventful recovery.

Our case demonstrates that massive hemothorax could be a late complication of catheter insertion and emphasizes the necessity of continued alertness on the part of critical care physicians to avoid CVC complications.

Alex P. Betrosian, Frantzeska Frantzeskaki

Hippokration General Hospital, Intensive Care Unit, Athens, Greece

Correspondence:

Alex P. Betrosian, Hippokration General Hospital, Intensive Care Unit, Vas. Sofias 114, 11527, Athens, Greece. E-mail: abetrosian@netscape.net

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