Superior Vena Cava Perforation Identified During Thoracoscopic Esophagectomy – A Case Report

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01 INTRODUCTION

Central venous catheterization is routinely performed for major thoracoabdominal surgeries but carries rare, potentially life-threatening mechanical complications such as vascular perforation.

While ultrasound guidance significantly reduces these risks, it does not completely eliminate vascular injury.

We describe a rare intraoperative superior vena cava (SVC) perforation identified and managed during the thoracoscopic phase of a three-stage esophagectomy.

02 CASE PRESENTATION

A 50-year-old female with history of progressive dysphagia (BMI 15 kg/m², severe malnutrition) diagnosed with T3N0M0 squamous cell carcinoma of the Esophagus. She had no known co-morbidities. She was scheduled for an elective minimally invasive three-stage esophagectomy and replacement of a feeding jejunostomy under general anesthesia.

CVC INSERTION

A CVC of 7 Fr size with length of 20 cm was inserted into the right IJV under ultrasound guidance. (requiring two attempts; the first attempt mistakenly withdrew the guidewire with the needle). The insertion depth was 13 cm. USG visualized the guidewire inside the vein before dilatation. Blood flow was limited in the distal port, while in the other two ports, blood flow was adequate. CVP waveform was not obtained for confirmation of intravascular catheter position.

03 INTRAOPERATIVE FINDINGS & REPAIR

During the VATS phase, minimal bleeding was noted; suctioning revealed the CVC tip breaching the SVC wall and protruding into the thoracic cavity while the patient remained hemodynamically stable.

04 MANAGEMENT & OUTCOMES

To prevent uncontrolled hemorrhage, the catheter was not removed blindly; the perforation was repaired under direct thoracoscopic vision using polypropylene sutures following controlled catheter withdrawal.

A new CVC was safely placed in the right femoral vein at the end of surgery.

Total duration of surgery was approx. 5 hours and 30 minutes. The patient was extubated in the OR, managed in the HDU for three days, and experienced an uneventful recovery with no long-term complications

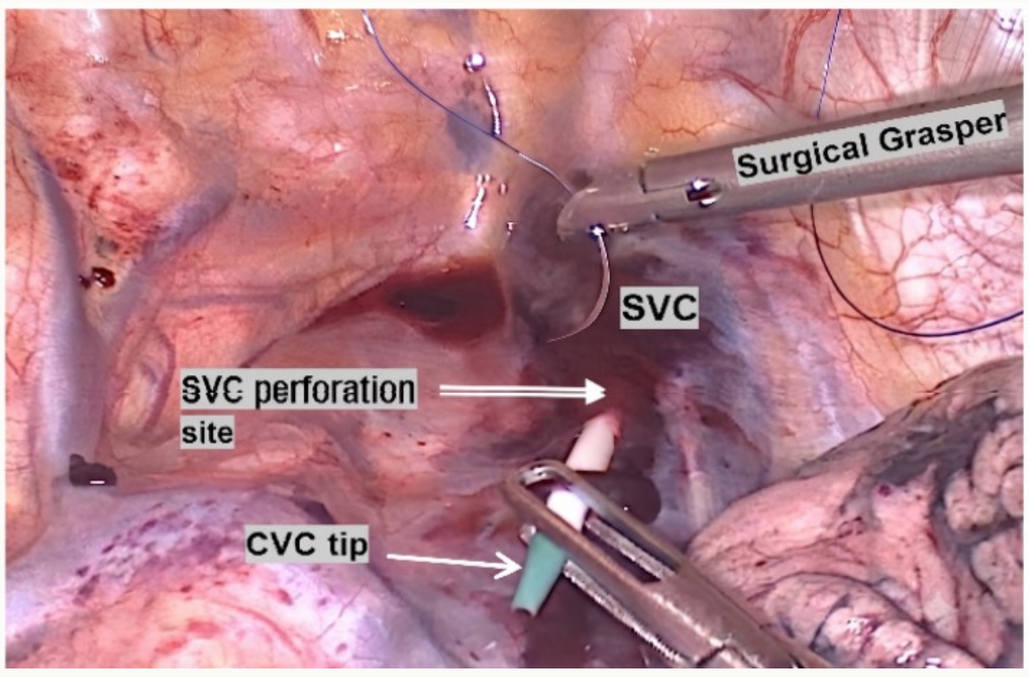


FIG. 1 Thoracoscopic view: CVC tip protruding through the SVC wall, with the perforation site identified

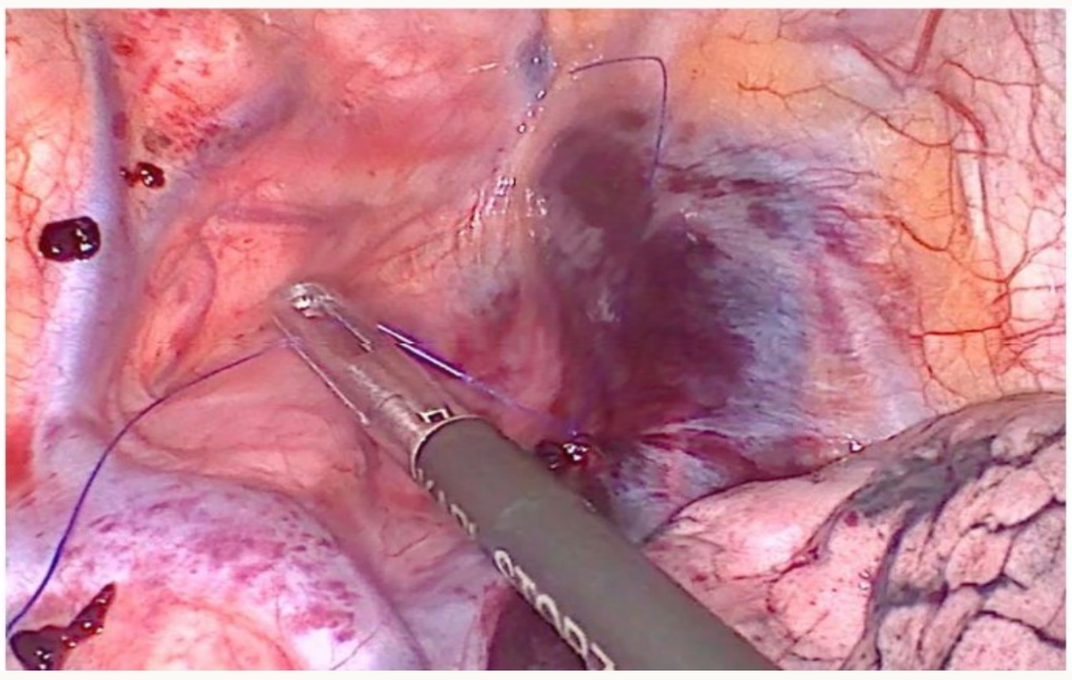


FIG. 2 Evidence of repair: the perforation closed with polypropylene sutures after controlled catheter withdrawal.

05 CONCLUSION

Superior vena cava perforation is a rare, life-threatening complication of central venous catheterization that demands early detection. USG guidance reduces but does not completely eliminate the risk of vascular injury.

Intraoperative identification during thoracic surgery allows for safe, controlled management under direct vision rather than blind catheter removal.

Risks can be minimized through optimal patient positioning, using appropriate catheter size, careful dilator advancement, and comprehensive training in ultrasound-guided techniques.

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