



Robust point-of-care ultrasound curriculum promotes early identification of perioperative pulmonary embolism



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Introduction

Pulmonary embolism (PE) is a rare but catastrophic perioperative complication which often presents with non-specific hemodynamic and ventilatory findings. Early diagnosis can be challenging with competing potential causes of hemodynamic instability. Point-of-care ultrasound (POCUS), when integrated into a robust training curriculum, can aid in rapid identification of life-threatening cardiopulmonary pathologies. We present two cases highlighting how perioperative POCUS facilitated early recognition of massive PE.

Cases Description

Case 1 includes a 74-year-old male with significant comorbidities including coronary artery disease, previous myocardial infarction, end-stage renal disease, type 2 diabetes mellitus, hypertension, obesity, and smoking, who presents for multilevel cervical spine decompression and fusion. The case was uneventful, except for increasing pressor requirements and low end tidal CO2. A quick bedside transthoracic echocardiogram revealed right-sided chamber dilation and a large mobile thrombus. A pulmonary embolism alert was issued. Unfortunately, the patient went into cardiac arrest, veno-arterial ECMO was initiated, and the patient then went to the ICU. Eventually, a thrombectomy was performed, and he was decannulated.

Case 2 includes a 59-year-old morbidly obese male smoker, who presented for an open reduction and internal fixation of a tibial plateau fracture. Surgery itself was uneventful, but on the way to the post-anesthesia care unit, the patient became more hypoxic despite supplemental oxygen. All four extremities were cold and mottled. As he destabilized further, prompt cardiac ultrasound revealed dilated right-sided chambers with significant thrombus. Upon emergent transport to the ICU, the patient was intubated, arrested, resuscitated, and VA-ECMO was initiated. The patient underwent a thrombectomy for his saddle pulmonary embolism. Three days later, the patient was decannulated.

Materials and Methods

Presented here is a retrospective analysis of two high-risk surgical patients experiencing perioperative hemodynamic instability accompanied with nonspecific ventilatory changes. In both cases, providers trained through a formal POCUS curriculum were able to identify thrombus within the right side of the heart and promptly initiate PE-alerts.

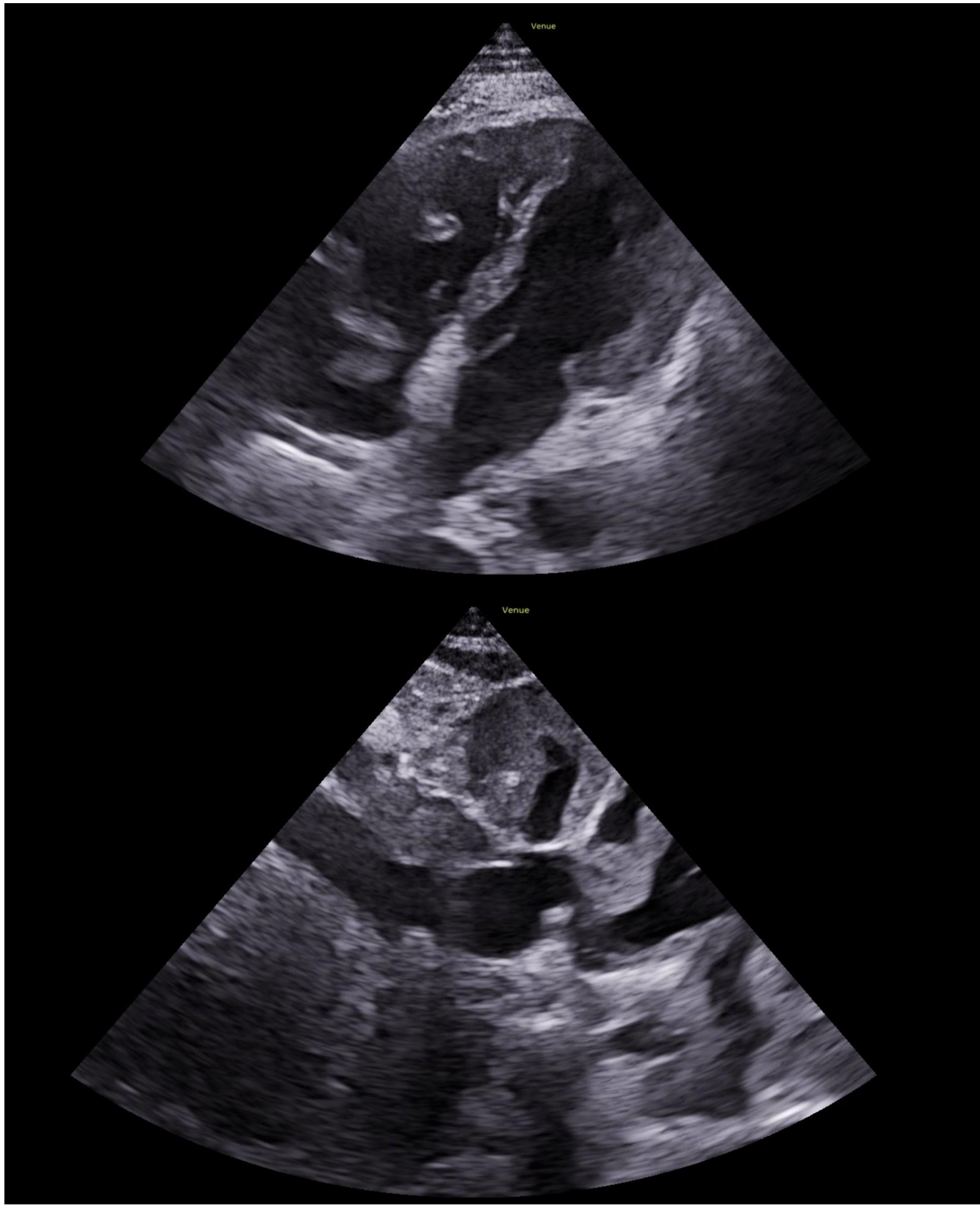
Discussion

These two cases illustrate the diagnostic value of POCUS in identifying PE in the perioperative period. Rapid utilization of this non-invasive diagnostic modality resulted in the visualization of intracardiac thrombus, expedited multidisciplinary coordination, and life-saving interventions.

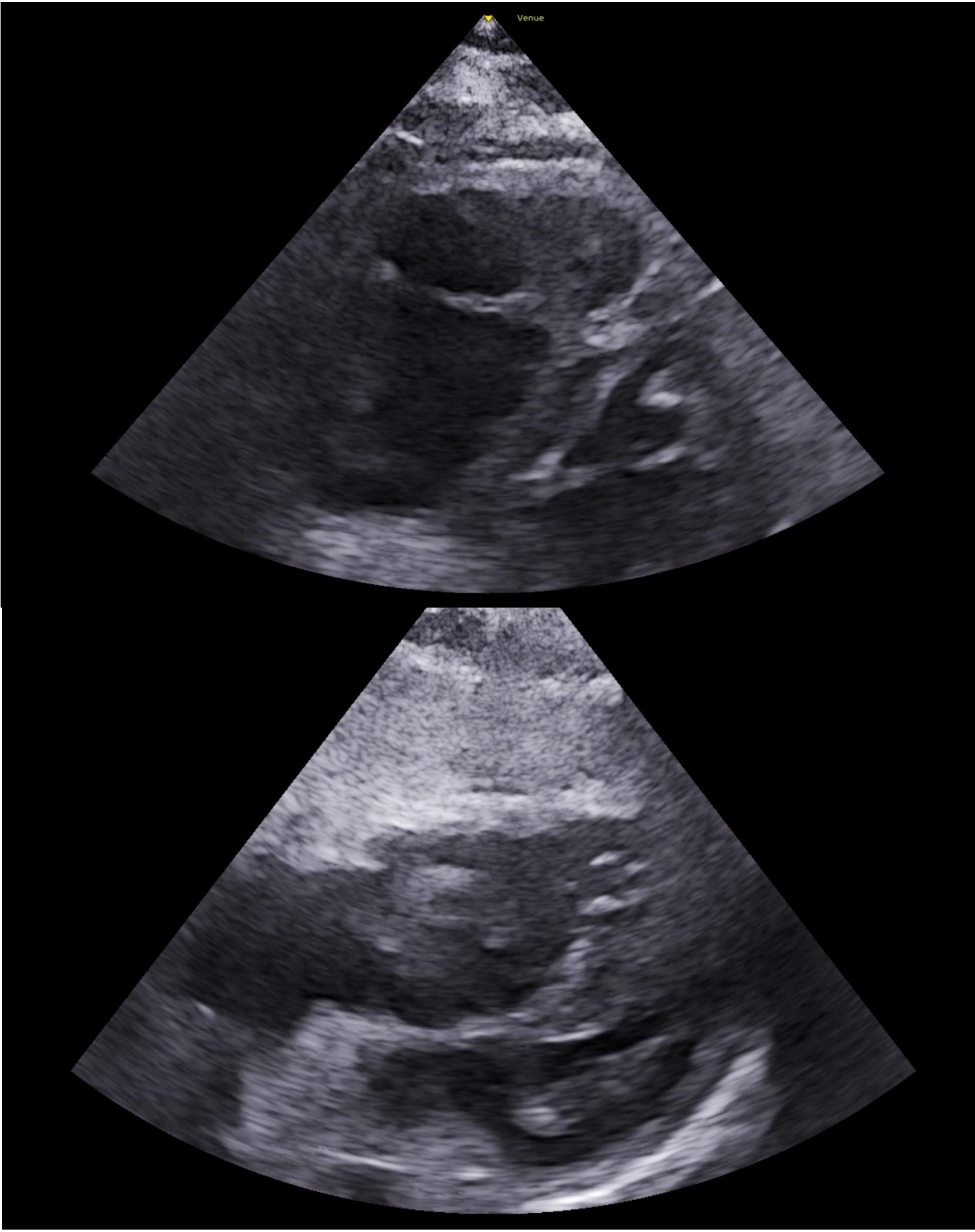
Conclusion

Timely use of POCUS in these cases highlights the direct impact of a robust, structured curriculum that empowers anesthesiologists to acquire and interpret focused cardiac images under emergent conditions.

Case 1



Case 2



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