

Pulmonary Embolism and PEA Arrest requiring VA ECMO following Roux-en-Y Gastric Bypass

Lee Vitiello, MD, Pratik Kothary, MD,

Department of Anesthesiology, Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY 11549



DONALD AND BARBARA
ZUCKER SCHOOL of MEDICINE
AT HOFSTRA/NORTHWELL®

Introduction

Pulmonary embolism is a potentially devastating post-operative complication. Because of this, incredible care is taken at all institutions to prevent perioperative venous thrombo-embolism with the use of models to stratify risk and protocols for prevention. However, even then, pulmonary embolism must remain on the differential if the patient does have acute perioperative cardiovascular or pulmonary derangements. As the anesthesiologist is often the first person to initiate treatment, it is important to understand hemodynamic goals when giving supportive care. It is equally important to know who to consult to determine further management. Many hospitals now have multidisciplinary teams known as Pulmonary Embolism Response teams that will aid in determining further therapies, which is especially helpful given the multitude of treatment modalities and expanding use of invasive procedures including embolectomies and mechanical circulatory support.

Case Report

A 38 year old female with a history of GERD, obesity, and a prior gastric sleeve presented for a laparoscopic revision of her sleeve gastrectomy due to severe reflux. Intra-operatively, the surgical team had difficulty with the revision due to dense adhesions and decided to convert to a Roux-en-Y gastric bypass. Overall, the procedure lasted nine hours, throughout which the patient remained hemodynamically stable. She was extubated and transported to PACU without incident. Upon reaching PACU, the patient became increasingly dyspneic and was found to be hypotensive. While oxygen therapy was being escalated, the patient went into PEA arrest. CPR was started, the patient was intubated, and ROSC was achieved after two rounds of compressions. The patient was started on high-dose norepinephrine to maintain hemodynamics. A TEE was placed which showed a massively dilated and hypokinetic right ventricle. No thrombus was seen in the proximal pulmonary arteries. The Pulmonary Embolism Response Team was activated and while they arrived, the patient was started on epinephrine with good hemodynamic effect allowing for significant down-titration of pressors. Since the RV remained hypokinetic and the patient was not a candidate for tPA, the patient was placed on veno-arterial ECMO. The patient was maintained on anticoagulation and inotropic support and was able to be successfully decannulated 4 days later with normal right ventricular systolic function prior to discharge.

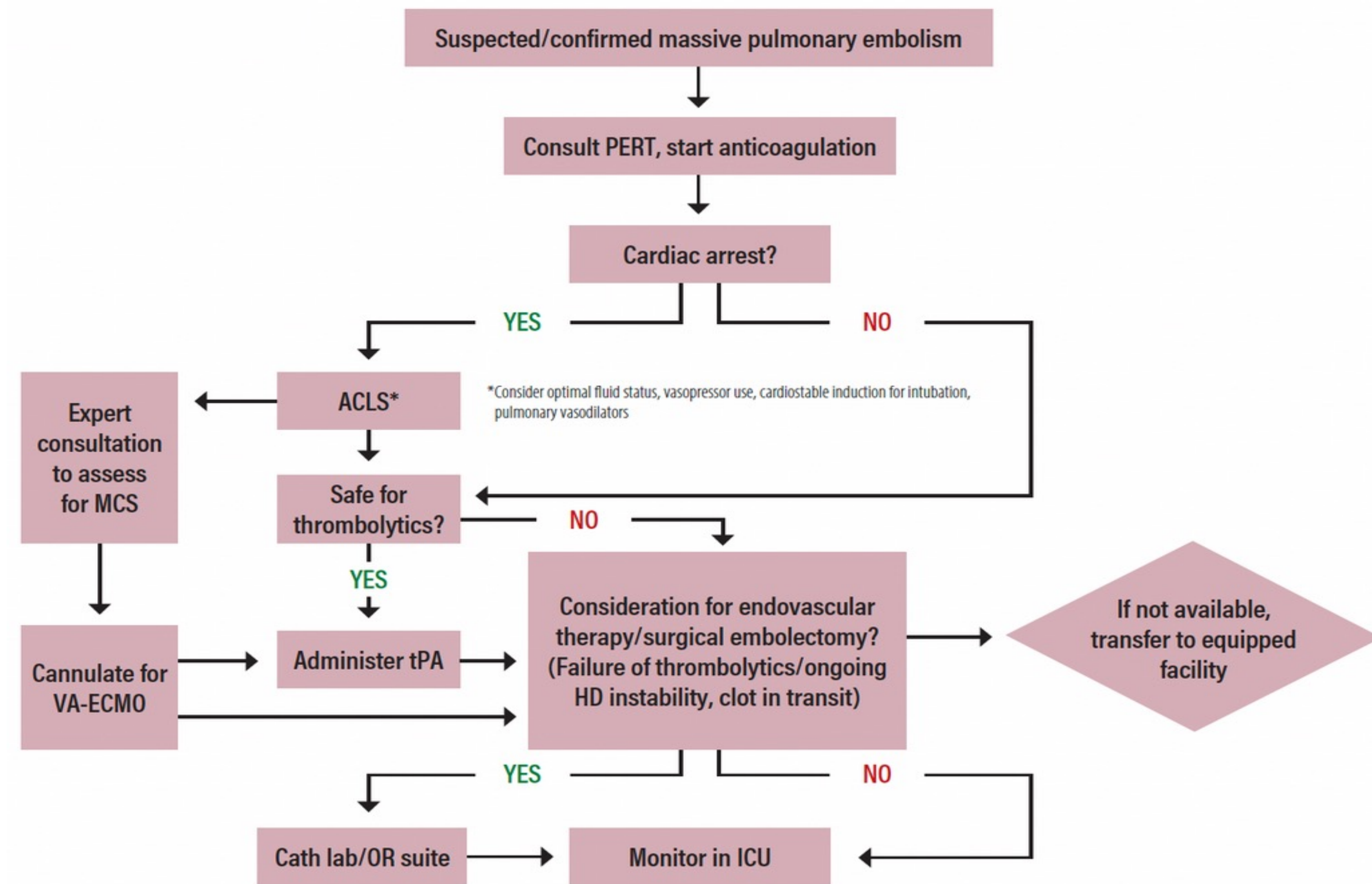


Figure 1. Massive PE Treatment Algorithm

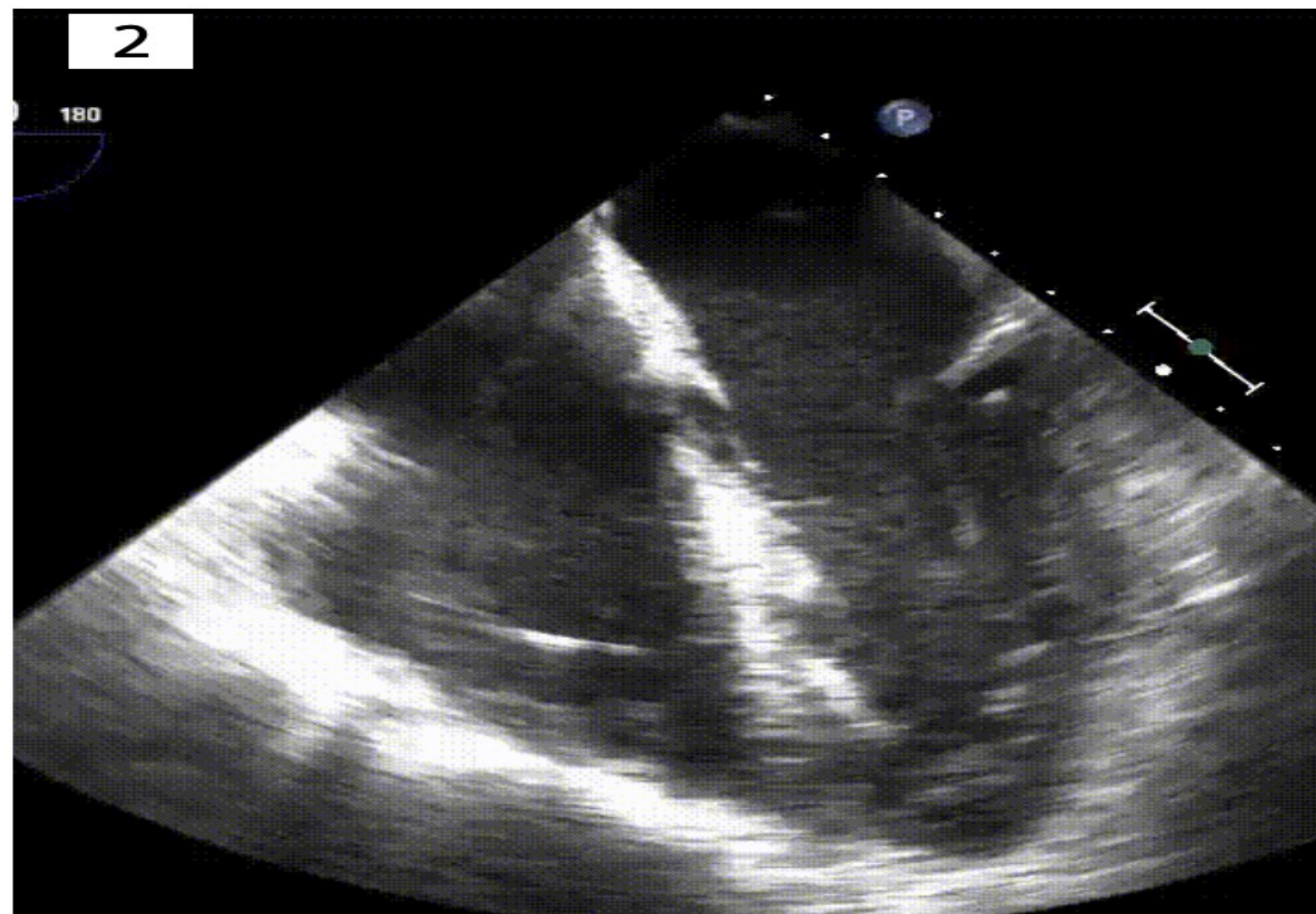


Figure 2. ME 4 Chamber View of a dilated and hypokinetic RV

Discussion

A large spectrum of clinical presentations can be seen in the setting of acute pulmonary embolism. Certain patients may present with symptoms of mild dyspnea while others as in our case may present in acute heart failure with progression to sudden cardiac arrest. Elevation in cardiac biomarkers and evidence of right ventricular dysfunction on echocardiography are associated with significantly increased risk for short term death and in-hospital mortality (Becattini et al 2016). It is paramount that the anesthesiologist can promptly recognize and assist with the treatment of massive and sub-massive PE in the perioperative setting. Despite the existence of risk scores and clinical guidelines, the use of Pulmonary Embolism Response Teams (PERT) has been crucial in improving the treatment offered for the management of complex PE patients. Timely consultation of a dedicated team to treat patients with life-threatening PE results in both expedited medical treatment and catheter interventions, as well as reductions in both ICU and overall length of hospital stay (Koslowsky et al, 2022).

Conclusion

Implementation of a multidisciplinary pulmonary embolism response team is associated with improved clinical outcomes in patients with acute PE. Reduction in major bleeding events, vasopressor requirements, and 30-day in hospital mortality have been highlighted as benefits across institutions with organized PERTs (Russell et al, 2023). This case report not only emphasizes prompt diagnosis of PE by the anesthesiologist but also the importance of care coordination by the anesthesiologist in the setting of acute PE.

REFERENCES

1. Becattini C, Agnelli G. Risk stratification and management of acute pulmonary embolism. Hematology Am Soc Hematol Educ Program. 2016 Dec 2;2016(1):404-412. doi: 10.1182/asheducation-2016.1.404. PMID: 27913508; PMCID: PMC6142437
2. Koslowsky J, Kakkar A, Faillace RT, Sokol SI. Pulmonary Embolism Response Team (PERT) - A New Paradigm for the Treatment of Pulmonary Embolism. Curr Pharm Des. 2022;28(7):535-549. doi: 10.2174/1381612827666211115153910. PMID: 34781864.
3. Russell et al. Effect of pulmonary embolism response team on the management and outcomes of patients with acute pulmonary embolism. Journal of Vascular Surgery: Venous and Lymphatic Disorders 2023 June 2.
4. Xenos ES, Davis GA, He Q, Green A, Smyth SS. The implementation of a pulmonary embolism response team in the management of intermediate- or high-risk pulmonary embolism. J Vasc Surg Venous Lymphat Disord. 2019 Jul;7(4):493-500. doi: 10.1016/j.jvs.2018.11.014. Epub 2019 Mar 29. PMID: 30930079.