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Patient with lower extremity deep vein thrombosis and pulmonary embolism with right ventricular strain who suffered a cardiac arrest (PEA) during an interventional radiology procedure to remove the clot.

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BACKGROUND

Pulmonary embolism (PE) affects 300,000 to 600,000 individuals in the U.S. each year resulting in 60,000–100,000 deaths ranking PE as one of the major causes for in hospital mortality and morbidity. Massive PE characterized by circulatory collapse is associated with 3 fold increased inpatient mortality. For patients with massive PE, systemic thrombolysis is considered to be the standard of care. Data support that catheter-directed thrombolysis (CDT) can facilitate thrombus dissolution through the infusion of a high concentration of thrombolytic agents directly to the thrombus, resulting in shorter infusion times and lower thrombolytic doses.

Ultrasound-accelerated catheter-directed thrombolysis is a recent treatment advance in which pulmonary artery thrombolytic therapy is delivered through an infusion catheter that emits ultrasound energy to accelerate the thrombolytic cascade. This treatment is achieved using the EkoSonic® Endovascular System (EKOS Corporation; Bothell, WA), which is approved by the US Food and Drug Administration for pulmonary artery infusion. Limited data suggest that EKOS can be successful in achieving complete thrombolysis (100%) but at the same time intra operative migration of clots causing acute PE is still a major concern.

Here we present a case report of patient with DVT and PE who had acute PE during follow up lower extremity thrombolysis procedure, who was successfully resuscitated.

CASE REPORT

63 years old female presented with left lower extremity swelling and pain 3 weeks following abdominoplasty. CT scan demonstrated extensive acute left common iliac vein / common femoral vein thrombosis, pulmonary embolism, right ventricular strain. The patient underwent (CDT) catheter directed thrombolysis (EKOS) for the DVT and returned the next day for a repeat lower extremity venogram to assess any residual thrombus and thrombectomy and angioplasty or stent placement if needed.

The patient was placed in prone position, spontaneously breathing with monitored anesthesia care. The patient had significant residual thrombus post CDT so the operator performed mechanical thrombectomy using the Cleaner device (Argon Medical) which is a rotatory thrombectomy device. During the procedure, patient started coughing, desaturating and decompensated within few minutes and became unresponsive and PEA arrest. The patient was turned supine immediately, intubated and CPR was initiated by the anesthesiologists. The patient recovered a palpable
pressure after 16 minutes. Epinephrine and fluid boluses were given to support hemodynamics. Repeat CT pulmonary angiogram demonstrated interval development of small RUL and RLL pulmonary infarcts.

The patient was transferred to ICU, remained sedated, intubated with vasopressors to support hemodynamics. Hypothermia protocol was initiated. She was successfully weaned off ventilator support and extubated 4 days later. She was discharged home 13 days following the event, with IVC filter in place and Apixaban therapy.

SUMMARY (Discussion/ Conclusion)

The patient in this case scenario had significant residual thrombus post CDT so the operator performed mechanical thrombectomy using the rotatory thrombectomy device. This resulted in a thrombus fragmenting off and causing an acute PE, in this patient who already had a known low risk PE. The combination of the two likely caused the PEA arrest.

We have performed several CDT procedures at our institution with this case being the single morbidity. The patient’s presentation (cough, desaturation) can be confused with other clinical situations such as her baseline asthma. High clinical suspicion is warranted when the patient undergoing CDT procedure shows signs of deterioration. In this patient who had PE and right ventricular strain at baseline, close communication with the radiologist and anesthesiologist played a vital role in early intervention of PE. Whether this patient would have benefitted (in avoiding desaturation/ bradycardia) if she was intubated from the beginning (especially in prone position) is debatable. We perform these procedures under MAC. General anesthesia offers certain advantages, but careful assessment on individual patient basis, early intervention and preparedness to conduct CPR is the key element in managing these patients. In this patient, CPR was begun immediately and so the patient was never deprived of some blood flow to the vital organs. The patient’s excellent recovery was attributed to the early recognition of the acute pulmonary embolism and initiating immediate resuscitative efforts.