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RESEARCH ARTICLE

CATHETER DIRECTED THROMBOLYSIS IN SUBMASSIVE PULMONARY EMBOLISM IN CANCER PATIENT

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ABSTRACT

A submassive pulmonary embolism (SPE) is an acute pulmonary embolism without hypotension but with evidence of either right ventricular dysfunction or elevated troponin levels (1). Catheter-directed thrombolysis (CDT) is a class 2C recommendation by the American College of Chest Physicians for the management of massive pulmonary embolism (MPE) and SPE (2). CDT is safe in cancer patients with deep venous thrombosis but not reported in SPE (3). Here, we describe a case demonstrates the efficacy and safety of CDT use in SPE in active cancer patient to increase physicians' awareness. To the best of our knowledge, we couldn't find any similar cases reported in the literature.

INTRODUCTION

A 40-year-old female presented to the emergency department complained of a sudden onset of chest pain , palpitations and shortness of breath for one day. She had minimal invasive McKeown Esophagectomy for esophageal squamous cell carcinoma two months prior to her presentation. Postoperatively she had segmental pulmonary embolism (PE) and she was on enoxaparin 1mg/kg twice daily. She stopped enoxaparin for 20 days. She was on ethinyl estradiol for menorrhagia. Initial evaluation was notable for tachycardia 133 beats/min, tachypnea (respiratory rate of 25 breaths/min) , and oxygen desaturation 99 % in room air. Blood pressure was normal at 100/59 mm Hg. On examination, heart sounds S1 and S2 were normal, without added sounds. Breath sounds were decreased bilaterally, and no lower limbs swelling. The patient's laboratory results were notable for a hemoglobin of 8.5 g/dL (12.1- 15.1 g/dL for female), white blood cells, platelets and lactate were normal. Troponin was (56 ng/L) normal values are below 14ng/L. Electrocardiography showed sinus tachycardia. Computed tomography angiography (CTA) demonstrated a saddling bilateral PE with signs of right-sided heart strain, right ventricle /left ventricle ratio RV/LV >1. Lower extremity Doppler ultrasonography demonstrated acute DVT in mid part of left femoral vein to popliteal vein. Transthoracic echocardiography (echo) demonstrated the right ventricle is moderately dilated. Hypokinesis of right ventricular wall at the base and mid segments. Sparing of the apical segment (McConnell's sign).

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The right ventricular systolic function is mild to moderately reduce. There is moderate to severe tricuspid regurgitation. Right ventricular systolic pressure is elevated at 50-60mmHg. Left ventricular systolic function is normal. Ejection fraction = 55%. IV unfractionated heparin (UFH) was initiated. Based on the patient's tachycardia, tachypnea, increasing troponin and findings of CTA and echo, this patient at risk of impending hemodynamic instability. Following appropriate patient counseling and informed consent, bilateral pulmonary arteries catheter-directed tissue plasminogen activator (tPA) through an ekosonic Endovascular System (EKOS) catheter were used by interventional cardiologist. The patient remained in the intensive care unit for close monitoring and continuation of IV UFH , switched to enoxaparin 1mg/kg twice daily. She was discharged home on apixaban 5mg twice daily. No history of bleeding and repeated echo showed normal size and function of the right ventricle.

DISCUSSION

SPE in a cancer patient can progress to MPE. SPE has been associated with an increased risk of chronic thromboembolic pulmonary hypertension (CTEPH). Systemic meta-analyses have confirmed that systemic thrombolysis reduces the rate of clinical deterioration (4). CDT can rapidly decrease RV strain in patients within 48 h of their admission and reduce the volume of thrombi in their pulmonary arteries (5). CDT in SPE is associated with significantly lower in-hospital, 30-day, and 90-day mortality and a tendency toward lower 1-year mortality with similar bleeding rates compared with systemic anticoagulation (6). Three prospective studies analyzed the short-term safety and efficacy of CDT in the setting of SPE and

confirmed that CDT effectively lyses thrombi and rapidly restores RV function (7-8). The rates of intracranial hemorrhage, major bleeding, and minor bleeding with CDT are lower than those seen in trials of systemic thrombolysis (9). CDT in cancer patients with deep venous thrombosis (DVT) is safe (3). Patients with SPE who underwent Ultrasound-assisted Thrombolysis (USAT) had significant decrease in main pulmonary artery pressure. The procedure was technically successful in patients with a 30-day mortality rate of 0% and 0% readmission rate for PE at 30 days after discharge (10). Patients undergoing USAT had similar pulmonary arterial thrombus reduction compared with those undergoing SCDT, using comparable mean lytic doses and durations of lysis. (11). In conclusion, this case demonstrates the efficacy and safety of CDT use in SPE in cancer patient. To the best *of our knowledge*, we couldn't find any similar cases reported in the literature.

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