Case Reports and Reviews

Case Report

Subsegmental Pulmonary Embolism Post Cesarean Section: A Case Report

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Abstract

Diagnosing pulmonary embolism during pregnancy and the postpartum period can indeed be challenging due to overlapping symptoms with normal pregnancy changes. It's important for healthcare providers to maintain a high index of suspicion and use appropriate diagnostic tools, such as imaging studies like CT pulmonary angiography or ventilation-perfusion scans, while considering the maternal and fetal risks involved in the diagnostic process. We report a case of postpartum subsegmental pulmonary embolism. .

Introduction

Complications during pregnancy and the puerperium vary in severity, potentially posing risks to either the mother, baby, or both. Among the most critical complications is pulmonary embolism, wherein a blood clot obstructs a lung artery [1]. During pregnancy, physiological changes can induce hypercoagulability, which serves as a protective mechanism against hemorrhage but also elevates the risk of maternal morbidity and mortality due to thromboembolic disease. These embolic events often manifest during or shortly after labor and delivery and, if left untreated, can prove fatal for the mother [2]. When compared to vaginal delivery, the likelihood of developing pulmonary embolism nearly doubles with cesarean section.

Despite it being an extremely rare disorder, with only a few documented cases, prompt diagnosis and intervention remain crucial due to the substantial risks of morbidity and mortality associated with delayed treatment. Establishing a diagnosis of PE can be difficult as patients may exhibit similar signs to those of pregnancy or other conditions such as amniotic fluid embolism and cardiomyopathy.

We describe a case of a 33-year old female patient who presented four days post c-section with severe headache, shortness of breath, and peripheral edema caused by pulmonary embolism [3].

Case presentation

A 33-year-old Egyptian female, G2P2, presented 4 days post cesarean section with severe headache, palpitations, shortness of breath, and bilateral lower leg edema. Patient measured blood pressure at home and was found to be 155/96. Review of systems were unremarkable, patient denied having any blurring of vision, chest pain or epigastric pain. Her past medical history was notable for Asthma on PRN medications and two episodes of ovarian torsion that resolved spontaneously, not requiring any surgical intervention. Her routine medications were enoxaparin 4000IU post cesarean only. She has no known allergies.

On examination, patient was vitally stable, with a blood pressure of 155/96. On cardiac examination, patient had a pansystolic murmur grade 3/6 over the apex with propagation to the axilla and pansystolic murmur 3/6 over the tricuspid area that increases with inspiration. She had bilateral equal air entry and had mild bilateral lower pitting edema.

In the Emergency Department, patient was given Labetalol 100 mg, magnesium sulphate 4 gram in 500 ml ringer lactate over 30 minutes. Investigations in the ED that were ordered revealed an elevated D-dimer of 4973 ng/mL (normal 0.00-500.00 ng/mL), uric acid of 7.4 mg/dL (normal 2.4-5.7 mg/dL) and ALT/SGPT was 52.0 U/L (normal 10.0-35.0). Cardiac enzymes and urinalysis were normal. ECG done showed T-wave inversions in leads V1, V2, V3 and V4. Due to high D-dimer, lower limb doppler was done and results were negative. CTPA was done along with a chest x-ray that both revealed bilateral mild pleural effusion and no evidence of pulmonary embolism.

Due to her presenting symptoms and examination findings, patient was seen by a cardiologist, who had requested an echocardiography. Echo done showed mild thickness and redundant both leaflet of mitral

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valve with mild to moderate mitral regurgitation and moderate tricuspid regurgitation with moderate pulmonary hypertension. Patient had normal left ventricular size with Ejection Fraction >55%. According to the findings, the management plan of this patient consisted of labetalol 200mg Q12 and amlodipine 5 mg once daily, as well as enoxaparin 40 mg in the morning and 20 mg at night.

A week after the patient's discharge, repeat labs and echocardiography was done. It showed complete resolution of findings, and patient had improved drastically with no active complaints. Currently, a month post admission, patient is stable and blood pressure is well controlled on amlodipine 5 mg every other day.

Discussion

Pregnancy is a hypercoagulable state which increases the risk of developing pulmonary embolism (PE) and venous thromboembolism (VTE). The risk is increased in high-risk groups which includes advanced maternal age, the use of artificial reproductive technology, cesarean deliveries, and obesity [4]. Cesarean section was the most prevalent risk factor among women who had venous thromboembolism during the postpartum and antenatal periods [5]. Thromboprophylaxis is used to prevent VTE in patients who are at risk. This can3 be achieved by using either mechanical or pharmacological methods. Starting patients on anticoagulation early in case of suspected PE may be lifesaving and crucial to prevent catastrophic sequalae [6]. The diagnosis of suspected PE includes compression lower limbs ultrasound in case of signs and symptoms of deep vein thrombosis (DVT). If the does not have symptoms of DVT, then a ventilation/perfusion (V/Q) scan or multidetector computed tomography pulmonary angiogram (MDCT-PA) should be done. In case immediate imaging is unavailable, the patient should still be started on full dose anticoagulation. In hemodynamically stable patients, low molecular weight heparin (LMWH) or unfractionated heparin (UFH) are first line treatment options and they're both safe to use even during pregnancy [7]. In case of life threatening VTE, systemic thrombolysis can be used [8].

The patient described in this case report exhibited symptoms suggestive of subsegmental pulmonary embolism (SSPE) following a cesarean delivery. The identification of SSPE potentially elucidated the observed pulmonary hypertension and tricuspid regurgitation detected via echocardiography. Despite this, the computed tomography pulmonary angiography yielded negative results, possibly due to the limitations in sensitivity and specificity associated with detecting subsegmental pulmonary embolism. CTPA performed in patients within minutes in suspected PE, has a high sensitivity and specificity, ranging between 96% and 100% and between 89% and 98% respectively [9]. However, according to a study published in 2010, it stated that the rate of subsegmental PE diagnosis was 4.7% [95% confidence interval (CI): 2.5-7.6] and 9.4 (95% CI: 5.5-14.2) in patients that underwent a single- and multiple-detectors CTPA, respectively [10]. In addition, it is important to note that the utilization of multiple-detector computed tomography pulmonary angiography (CTPA) has elevated the incidence of reported subsegmental filling defects in patients suspected of having pulmonary embolism (PE). However, it remains unclear whether these reported filling defects on CTPA accurately correspond to true subsegmental pulmonary embolism (SSPE) observed on pulmonary angiography or if they are merely artifacts [11]. Moreover, patients who present with SSPE usually have milder presentations than the patients who present with embolism in central pulmonary arteries [12]. The diagnostic process was supported by the patient's clinical presentation, symptoms, echocardiographic findings, and significant improvement with anticoagulation therapy. Moreover, the significant elevation in D-dimer is more in keeping with clotting in the pulmonary artery, especially since there were no signs or symptoms of DVT and a normal doppler scan of both lower limbs. Conversely, it could be argued that systolic hypertension might have been the underlying cause of her symptoms. However, systolic hypertension typically manifests with mitral regurgitation rather than tricuspid regurgitation and pulmonary hypertension, as observed in this case.

Patients who develop subsegmental pulmonary embolism should be monitored for recurrent venous thromboembolism [13].

Conclusion

The case outlined in this report portrays the significance of maintaining a high clinical suspicion level. Despite a negative result from the computed tomography pulmonary angiography (CTPA), the patient's clinical presentation, along with the D-dimer findings and echocardiography results, strongly indicate a potential subsegmental pulmonary embolism. Swift identification and prompt initiation of treatment are vital for achieving the best possible outcome in the patient's condition.

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