Case Report

Pulmonary Emboli Manifestation during Spinal Anesthesia for Cesarean Section in two Pregnant Women

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Abstract

Background: Pregnancy causes a small increase in risk of venous thromboembolism (VTE), but a large increase in concern upon presentation during cesarean section with symptoms of pulmonary embolism (PE). Pulmonary embolism clinical manifestations during spinal anesthesia could be misleading. We have presented 2 interesting cases of pregnant women underwent spinal anesthesia for cesarean section and manifested with non-specific clinical symptoms of PE during spinal anesthesia mistaken for high spinal scenarios.

Cases Report: Two young pregnant women candidate for cesarean section underwent spinal anesthesia. During surgery, patient grows chest discomfort and dyspnea. Anesthesiologist misleaded for high spinal but observed patients during surgery and in recovery. Further investigation detected pulmonary embolism which was further treated in ICU and patients were discharged subsequently.

Conclusion: Anesthesiologists cannot safely rule out pulmonary embolism during spinal anesthesia in cesarean section without additional testing, at least not in pregnant women with a relatively high risk of PE.

Keywords: Pulmonary emboli, spinal anesthesia, pregnancy

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Introduction

Pulmonary embolus is certainly a serious disease with high mortality rate and complicated diagnostic procedure. Pregnancy causes a small increase in risk of venous thromboembolism (VTE), but a large increase in concern upon presentation during cesarean section with symptoms of pulmonary embolism (PE)[1]. The incidence of pregnancy-associated PE is reported to be very low (0.023%) and occurred mainly in the postpartum period after cesarean section. However, its maternal mortality rate was significantly high (7.7%)[2]. However PE clinical manifestations during spinal anesthesia could be misleading. Therefore, immediate diagnosis and prompt treatment should be prioritized for improvement of survival rate.

CT angiogram is the gold standard for diagnosis of pulmonary emboli only in non-emergent situations[3]. However, this procedure could not be performed in emergent situations[4]. In pulmonary embolism (PE) without hemodynamic compromise, the prognostic value of right ventricular (RV) dysfunction as measured by echocardiography, computed tomography (CT) or biological (natriuretic peptides) markers has only been proved in small group of patient[5]. Other indicators such as ST-elevation in lead aVR are associated with a more severe course of acute pulmonary embolism (APE), especially in patients with intermediate-risk[6]. D-dimer or Fibrinogen

degredation product (FDP)[7] are not specific to indicate aggressive therapy and makes them a poor choice in even low clinical probability scenarios to rule out PE[8]. We have presented 2 intresting cases of pregnant women underwent spinal anesthesia for cesarian section and manifested with non-specific clinical symptoms of PE during spinal anesthesia mistakened for high spinal scenarios.

Cases Report

Case A:

A 32 year-old pregnant women with gravid 2/para 2 candidate for cesarian section for repeated cesarean underwent spinal anesthesia. Spinal anethesia were performed from lumbar space 3-4 by 14 mg Bupivacanie 0.5% injected through spinal needle gage 25. No sedative or analgesics were administered to the patient. During surgery, patient grows chest discomphort and retrosternal chest pain. Anesthesiologist suspected high spinal complication and started close monitoring and fluid therapy. Vital signs were for heart rate 120 and blood pressure 125/75 mmHg and oxygen saturation with pulse oxymetry 99%. Patient was kept in recovery room for 2 hours and ECG showed no changes other than sinus tachycardia. Thereafter patient was transferred to floor in stable status. Three days after discharge patient was admitted to Emergency department (ED) with pleuretic chest pain and dyspnea and swelling of left leg.

In past medical history she had no diabetes melitus, hypertention, ischemic heart disease, chronic pulmonary disease, or smoking. She had no drug history. Doppler sonography showed specific finding indicating deep venous thrombosis (DVT). Echocardiography findings showed enlargement and dysfunction of right ventricle (Table 1). Her further lab work ups in following days showed higher than normal level of D-dimer and Fibrinogen degradation product (FDP). His CT angiogram is depicted in figure 1, which indicated of large pulmonary emboli involving the left lung. Patient was transferred to Intensive care unit and started anticoagulant therapy for pulmonary emboli.

Case B:

A 24 year-old pregnant women with gravid 2/Abort 1 candidate for cesarean section for twin pregnancy underwent spinal anesthesia. Spinal anesthesia was performed with the similar method and drug mentioned above. During surgery, patient grow chest pain and dyspnea. With suspicion to high spinal, close monitoring , oxygen and fluid therapy was started. Vital signs were heart rate 110, and blood pressure 120/80 mmHg and oxygen saturation with pulse oxymetry 96%. She was transferred to ICU post-operative.

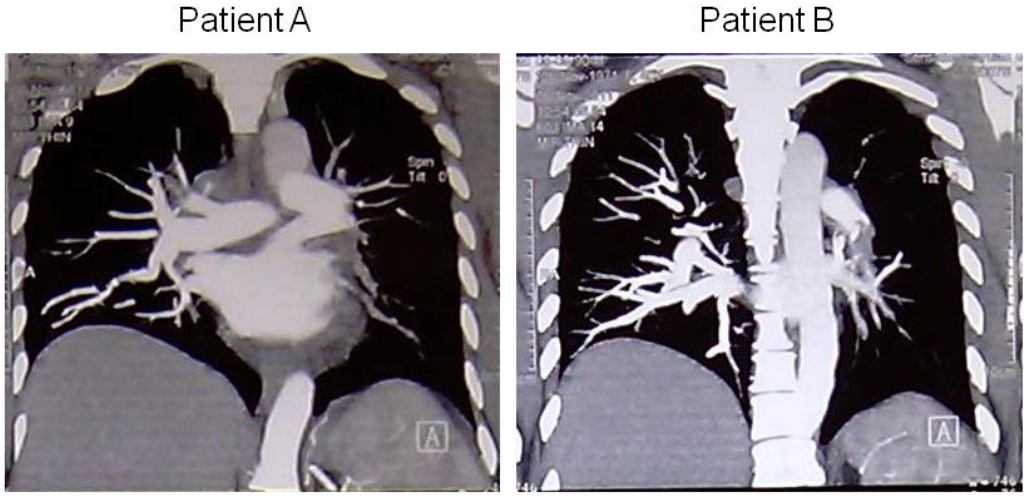

Figure 1. CT angiogram in both patients is depicted in this figure. Patient A: a large filling defect is seen in left pulmonary artery, which extends to its basal branches of lower lobe artery. Patient B: Filling defect in left apical pulmonary artery branches of apical and upper lobe artery. Findings in both patients are indicative of large pulmonary emboli involving the left lung.

Table 1: Echocardiogram in both patients indicated severe right ventricular enlargement.

	Patient A	**Patient B**
RV	Severe enlargement and dysfunction	Severe enlargement and dysfunction
RA	Severe RA enlargement	Severe RA enlargement
Tricuspid	Severe TR	Moderate TR
PAP	70-75 mmhg	85 mmhg
LVEF	50%	60%

*RV: right ventricle; RA: right atrium; TR: tricuspid; PAP: pulmonary artery pressure; LVEF: left ventricle ejection fraction

In past medical history she had Antithrombin III deficiency. In drug history she was taking Enoxaparin and Aspirin prophylaxis. In Doppler sonography she had no sign of deep vein thrombosis (DVT). Her echocardiography showed an acute right ventricular (RV) enlargement and dysfunction (Table 1). Her lab work ups in following days showed higher than normal level of D-dimer and Fibrinogen degredation product (FDP). Her CT angiogram is depicted in figure 1, which indicated of large pulmonary emboli involving the left lung. She was treated for pulmonary emboli and was discharged on warfarin.

Discussion

Pulmonary emboli (PE) are one of the most fatal emergency situations with sudden onset dyspnea and chest pain. Occurrence of PE is not that common during spinal anesthesia in a previously ambulate patient. Diagnosis of PE during spinal anesthesia needs a high grade of suspicion. In addition, its nonspecific symptoms could easily misguide anesthesiologist to high spinal complication of spinal anesthesia.

Implementation of evidence-based clinical decision supporting the diagnosis of PE during spinal anesthesia definitely requires to first rule out high spinal diagnosis accompanied with high suspicion to PE[9]. The difficulty of diagnosis of PE during cesarean section in spinal anesthesia is a real dilemma for anesthesiologists. This seemingly low figure must be viewed in the light of high prevalence of high spinal in pregnant women with the same nonspecific symptoms such as chest pain, or dyspnea. The incidence of pregnancy-associated PE is reported to be very low (0.023%) and occurred mainly in the postpartum period after cesarean section[10]. However, one important stall for attention to PE in spinal anesthesia during cesarian section (CS) is that pregnancy is a risk factor for DVT and hyper coagulable state. Maternal age, grandmultiparity, pregnancy-related hypertension, CD, obesity, stillbirth and peripartum hysterectomy are independent risk factors for the development of VTE[11].

On the other hand, clinicians are still looking into diagnostic tools such as lab data, electrocardiographic (ECG) pattern, chest x ray for rapid assessment of acute PE and aggressive treatment planning[12,13]. Although RV dysfunction assessed by CT angiogram has been suggested to be associated with an increased risk of mortality particularly in patients with hemodynamically stable PE[14], but in our cases rapid diagnosis of such RV dysfunction in echocardiography suggested PE.

The clinical bottom line of previous studies was that a negative D-dimer result was considered sensitive enough to rule out pulmonary embolism in women who were in the first two trimesters of pregnancy[15]. In our scenarios both patients were presented with past medical history of pregnancy and clinical signs and symptoms of acute PE. Our rapid evaluations including Doppler sonography of legs were not highly conclusive to initiate rapid aggressive treatment; however echocardiography finding of sudden right ventricular enlargement and dysfunction suggested acute PE. Both patients had no hemodynamic instability, and they were treated with anticoagulation therapy. Interestingly, after course of therapy they showed remarkable improvement in their symptoms.

Conclusion

In conclusion, our results indicate that anesthesiologists cannot safely rule out PE during spinal anesthesia in cesarean sections without additional testing, at least not in pregnant women with a relatively high risk of PE.

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