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CASE REPORTS

Pulmonary embolism confounded with COVID-19 suspicion in a catatonic patient presenting to anesthesia for ECT: a case report

B. Naveen Naik [a], Nidhi Singh [a], Ashish S. Aditya [a], Aakriti Gupta [a,*], Nidhi Prabhakar [b], Sandeep Grover [c]

[a] *Postgraduate Institute of Medical Education and Research (PGIMER), Department of Anaesthesia and Intensive Care, Chandigarh, India*
[b] *Postgraduate Institute of Medical Education and Research (PGIMER), Department of Radiodiagnosis and Imaging, Chandigarh, India*
[c] *Postgraduate Institute of Medical Education and Research (PGIMER), Department of Psychiatry, Chandigarh, India*

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Abstract Catatonic patients may develop deep vein thrombosis (DVT) and pulmonary embolism (PE) due to prolonged periods of immobility. These life-threatening conditions demand prompt recognition and management. We describe the case of a patient with catatonia who presented to anesthesia for electroconvulsive therapy (ECT) at the outset of the current coronavirus disease 2019 pandemic. She complained of breathing difficulty and was suspected to have COVID-19 infection. On further evaluation, she was found to have DVT and PE and required oxygen therapy and intensive care management. The diagnostic delay in our patient would have probably not occurred, had it not been for the existing pandemic situation.

Introduction

Catatonia is a complex condition characterized by significant psychomotor disturbances including motor immobility. Due to immobility, these patients are at risk of several life-threatening complications such as deep venous thrombosis (DVT), pulmonary embolism (PE), aspiration pneumonia, and even death.[1–4] Patients with catatonia may occasionally present to the anesthesiologist for electroconvulsive therapy (ECT) sessions. These patients may have pre-existing undiagnosed DVT or may already be on anticoagulation for the same reason. More importantly, during the coronavirus

* Corresponding author.
E-mail: aakriti1988.ag@gmail.com (A. Gupta).

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(COVID-19) pandemic, the symptoms of DVT and PE may be mistaken for COVID-19 infection, which may delay the diagnosis and increase the risk of morbidity and mortality in such patients. We describe a case in which PE in a patient with catatonia was confused with COVID-19 infection. This report intends to make the clinicians dealing with such patients cognizant of this kind of diagnostic fallacy. Written informed consent was obtained from the patient for the publication of this case report.

Case description

A 61-year-old female, diagnosed with catatonia secondary to severe depression, on pharmacological treatment, was admitted for further management. On admission, she complained of difficulty in breathing. She was evaluated as a COVID-19 suspect by the Severe Acute Respiratory Infections (SARI) team of the hospital. Her vitals were as follows: pulse rate of 89 bpm, blood pressure of 130/80 mmHg, respiratory rate of 16 breaths/minute, oxygen saturation of 98% on room air and temperature of 36.5 °C. Chest auscultation revealed the presence of normal vesicular breath sounds. Her complete blood count and chest X-ray were within normal limits. Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) test for COVID-19 infection was found to be negative. After the initial workup, she underwent an uneventful ECT session under general anesthesia. However, two days after the first ECT session, she developed fever (38 °C) and desaturation up to 90% on room air. An electrocardiogram (ECG) showed sinus tachycardia with a heart rate of 150 bpm. Chest auscultation and chest X-ray revealed no abnormality. The differential diagnoses considered included lower respiratory tract infection, myocardial infarction, congestive heart failure, and venous thromboembolism. Antipyretics and tablet augmenting was started. However, the fever spikes, tachypnea, and tachycardia persisted. A sepsis workup was negative with sterile blood and urine culture reports. The values of serum myoglobin, CK-MB (creatine kinase myocardial band) and BNP (B-type Natriuretic peptide) were within normal limits, hence the possibility of a cardiac event was deemed highly unlikely. The d-dimer value came out to be 3,900 $ng.mL^{-1}$ (normal value: < 250 $ng.mL^{-1}$). This exceedingly high value raised a suspicion of DVT. A compression ultrasound, echocardiography, and Computed Tomography Pulmonary Angiography (CTPA) was planned. The compression ultrasound revealed the right popliteal vein to be non-compressible suggestive of thrombosis. Echocardiography revealed normal heart function. CTPA scan revealed the presence of pulmonary thromboembolism with thrombi in the right pulmonary artery and segmental branches of both right and left pulmonary arteries. There were areas of lung atelectasis in the right lower lobe. Upper abdomen sections showed contrast reflux in inferior vena cava, which is an indirect sign of increased right ventricular pressure (Figure 1). The patient was transferred to the respiratory intensive care unit (RICU) of the hospital. Oxygen supplementation by ventimask and subcutaneous therapeutic dose of low molecular weight heparin was initiated. No thrombolysis was required. The patient was discharged home after the resolution of thromboembolism and improvement of her psychiatric condition with further ECT sessions and pharmacotherapy.

Discussion

Venous thrombosis is caused by the presence of one or more contributing factors of the Virchow's triad: endothelial damage, venous stasis, and hypercoagulability.[5] Catatonic

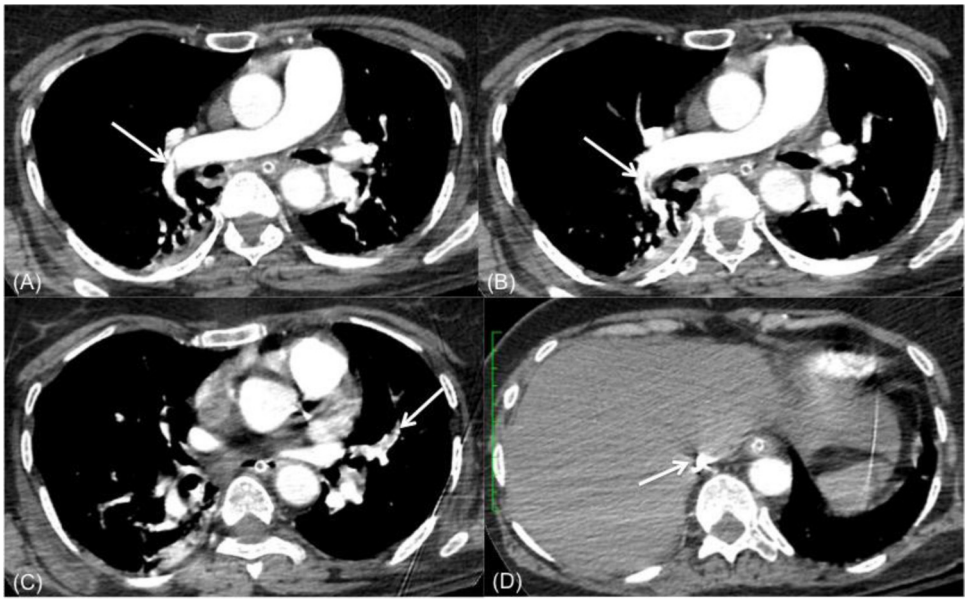

Figure 1 Computed Tomography (CT) pulmonary angiography study showed pulmonary thromboembolism. (a, b, c) Axial CT sections showing linear hypodense filling defects suggestive of thrombi in right pulmonary artery extending to right descending pulmonary artery and in segmental branch of left pulmonary artery (arrows). Areas of lung atelectasis were also noted in right lower lobe. (d) Axial CT sections of upper abdomen show contrast reflux in inferior vena cava (arrow).

patients are susceptible to venous stasis because of prolonged inactivity and dehydration, thus being at high risk for DVT and PE.[3] ECT has been established as the most effective treatment for catatonia accompanied by motor inhibition.[6] There are specific concerns for ECT in such patients. Firstly, ECT might increase the risk of PE in such patients due to the possible mobilization of thrombi.[2] Secondly, there is a theoretical risk of major bleeding episodes like cerebral hemorrhage during ECT among patients already receiving anticoagulant therapy for diagnosed DVT and PE.[7] Thirdly, PE may mimic clinical features of COVID-19 infection, as was the case in our patient.

The world is facing a rapidly expanding pandemic of lower respiratory tract infection by a novel coronavirus SARS-CoV-2 (severe respiratory syndrome coronavirus 2) since December 2019. COVID-19 infection manifests with a wide spectrum of symptoms including fever, fatigue, cough, shortness of breath, pneumonia, septic shock, and multiorgan dysfunction.[8]

Owing to the considerable overlap between the manifestations of the two conditions, an anesthesiologist must obtain a meticulous history and conduct a detailed examination of these patients prior to the procedure. Motor activity should be encouraged in these patients and adequacy of hydration must be assessed. We can consider application of elastic compression stockings or intermittent pneumatic compression devices in high-risk patients. One should specifically look for signs of DVT, like swelling, tenderness, pitting edema, and prominent superficial veins, and signs of PE, such as breathlessness, tachycardia, tachypnea, raised jugular venous pressure, and chest pain. In patients with diagnosed DVT, cardiac function and presence and location of DVT must be evaluated before start of an ECT session. There is higher risk of development of PE in patients with proximal DVT (DVT in veins above the knee) compared to patients with distal DVT (DVT in veins below thee knee).[9] Also, anticoagulants must be adjusted prior to the procedure. These patients should be monitored in a high dependency unit (HDU) after the procedure owing to risk of PE and bleeding episodes.

This patient population presents unprecedented challenges during the COVID-19 pandemic. The risks and benefits must be carefully weighed by the anesthesiologist and the psychiatrist before arriving at a decision to proceed with ECT course. They are at higher risk for both ECT-associated and COVID-19-related morbidity and mortality.[10] Each patient should be tested for COVID-19 infection close to the time of their procedure. It is also prudent to involve the patient's family and obtain a written and well-informed consent for the procedure.

Conclusion

The COVID-19 pandemic has created an atmosphere of fear and uncertainty among health care professionals due to their risk of infecting themselves as well as their families and colleagues. Since our patient presented to our tertiary care hospital at the beginning of the pandemic, we invested our time and resources towards ruling out COVID-19 infection, meanwhile missing the obvious diagnosis of DVT and PE in a catatonic patient. Many medical centers across the world may have to wait for 24 hours or longer to get a definitive negative COVID-19 report. It is easy to miss many diagnoses of significant importance in the crucial situation of COVID-19 pandemic. We may err on the side of caution, but at the same time we must not lose sight of the basic and common diagnoses first. We must have a high index of suspicion for the presence of DVT and PE in catatonic patients, so they can be managed and treated in an expeditious manner.

Conflicts of interest

The authors declare no conflicts of interest.

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