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Case Report

Cardiovascular collapse and hypoxemia in a man with a right-sided mediastinal mass, undiagnosed atrial septal defect, and right-to-left shunt☆,☆☆

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A 65 year old man presented with fever, pancytopenia, hypoxemia, and cardiovascular collapse requiring intensive care unit admission. Computed tomographic pulmonary angiogram showed a right-sided mediastinal mass adjacent to the right atrium. The patient had a video-assisted thoracoscopic surgical biopsy of the mass, with selective bronchial blockade to maximize oxygenation during lung isolation. Intraoperative transesophageal echocardiography showed an unexpected large atrial secundum defect with a right-to-left shunt and intracardiac mass. This shunt could be reversed with a norepinephrine infusion, resulting in improved oxygenation. Histopathology showed potentially curative diffuse large B cell lymphoma (DLBCL).

1. Introduction

A 65 year old man presented with febrile pancytopenia, hypoxemia, and cardiovascular collapse requiring intensive care unit (ICU) admission. He also had one month of anorexia, weight loss, night sweats, and intermittent rigors. High-flow oxygen was commenced with fluid resuscitation, a norepinephrine infusion, and piperacillin/tazobactam and vancomycin after blood cultures.

Chest radiography was essentially normal. Computed tomographic (CT) pulmonary angiogram showed no evidence of pulmonary emboli, with normal pulmonary parenchyma but also with a right-sided mediastinal mass abutting the diaphragm and right atrium (RA) 5 × 4 × 4 cm. Prominent paraaortic nodes were noted with low attenuation lesions in the liver and spleen, suspicious for a lymphoproliferative disorder. The mass was not adjacent to major airway structures and there was no evidence of tracheobronchial compression or compromise (Fig. 1).

Transthoracic echocardiogram was normal, with no significant right heart compression, normal valves, and no cardiac explanation for the hypoxemia. A bone marrow aspirate showed hypocellular marrow with occasional lymphoid aggregates suggestive of a lymphoproliferative disorder. Multiple sets of blood cultures grew no organisms.

A multidisciplinary meeting between consulting units felt that the diagnosis was still uncertain and a definitive tissue diagnosis was still required before chemotherapy.

Given the hypoxemia, it was felt that a CT-guided biopsy and its associated pneumothorax would not be tolerated in this man. The patient was scheduled for a video-assisted

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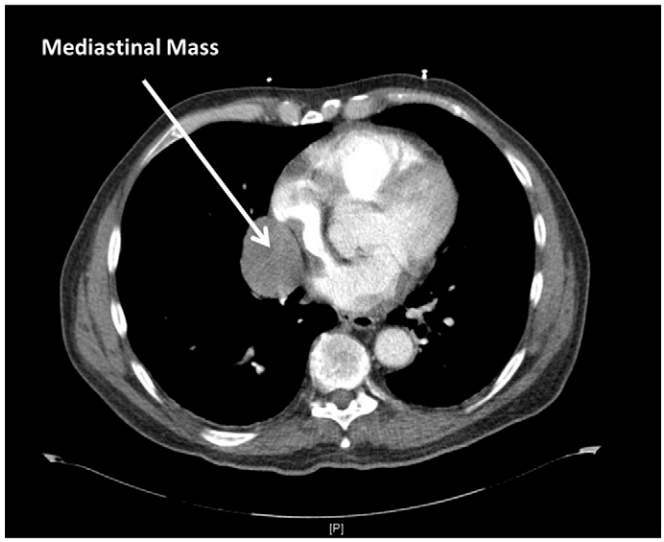

Fig. 1 Computed tomographic (CT) scan of the chest with the arrow identifying a mediastinal mass (arrow) adjacent to the right atrium.

thoracoscopic surgical (VATS) biopsy or removal of the right thoracic mass.

The thoracic surgeons requested lung isolation during the case.

Detailed discussion occurred with consulting units and the patient regarding the extremely high-risk nature of the case.

Upon patient arrival in the operating room, hemodynamics prior to induction were a blood pressure of 80/40 mmHg and oxygen saturations (SpO_2) of 88% on high-flow oxygen.

A right internal jugular central catheter was in situ from the patient's previous ICU stay. A 16-gauge (G) cannula was sited in the left forearm, as was a 20-G left radial arterial catheter. The plan was to perform general anesthesia with a single-lumen endotracheal tube (ETT) and to isolate the right lung with selective bronchial blockade of the right middle and lower lobes.

In addition, transesophageal echocardiogram (TEE) was planned during the case to evaluate cardiac function. After three minutes of preoxygenation, intravenous induction proceeded, with an infusion of norepinephrine prepared in the event of cardiovascular collapse. The patient was slowly induced with midazolam 0.04 mg/kg, fentanyl 4 μg/kg, propofol 0.7 mg/kg, and rocuronium 0.6 mg/kg. He was very hypotensive immediately after induction, requiring multiple boluses of metaraminol. His anesthesia was maintained with

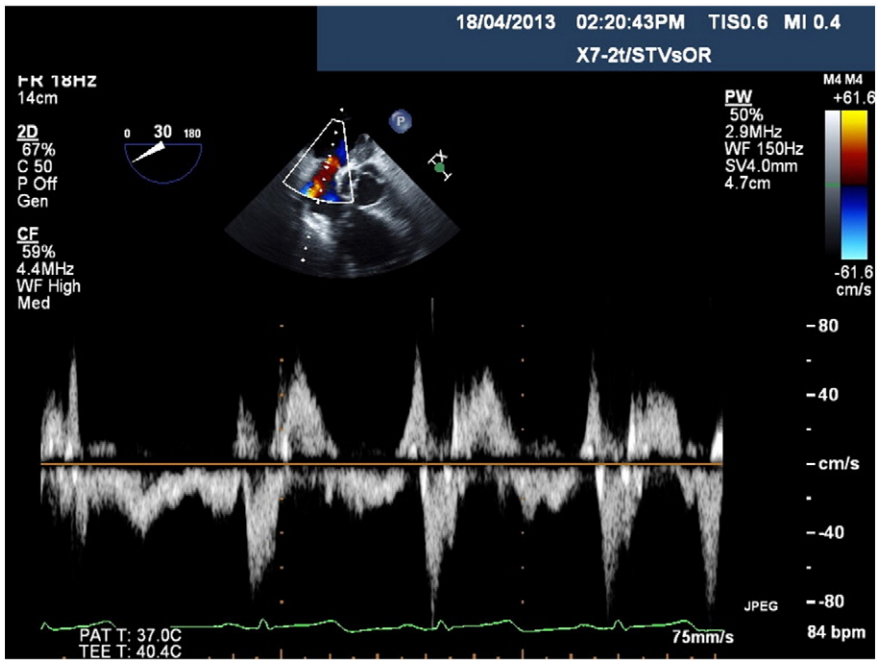

Fig. 2 Pulsed wave Doppler through the secundum atrial septal defect (ASD) showing left-to-right shunt with flow below the baseline and then right-to-left shunt with flow above the baseline.