Intra-operative Pulmonary Embolism after Coronary Artery Bypass Grafting and Aortic Valve Replacement

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Introduction:
The incidence of pulmonary embolism (PE) after cardiac surgery ranges from 0.4-3.2%1,2. PE is most common after coronary artery bypass grafting (CABG)1,3. Most of these cases manifest one to two weeks after surgery2,4,5. This case, however, reports a clinically significant intra-operative PE shortly after weaning from cardiopulmonary bypass.

Case Presentation:
A 65 year old male with renal cell carcinoma and atrial fibrillation presented with dyspnea and fatigue. An electrocardiogram revealed atrial fibrillation with septal Q waves. He underwent an aortic valve replacement and three vessel CABG. The initial intra-operative transesophageal echocardiogram (TEE) was notable for a depressed ejection fraction of 25-35% with severe inferior and inferoseptal hypokinesis, aortic valve area of 1.07cm², and preserved right heart function. After revascularization and valve replacement, TEE showed improvement of the septal and inferior wall motion abnormalities, an ejection fraction of 35-45%, a functioning bioprosthetic aortic valve, and preserved right heart function. Within an hour of discontinuation from cardiopulmonary bypass, PaO₂ declined to 68mmHg on 100% oxygen. The patient was transported to the intensive care unit (ICU) on milrinone, vasopressin, and norepinephrine. In the ICU the patient's hypoxemia persisted, and was accompanied by hemodynamic instability. A repeat TEE showed moderately reduced right ventricular function without visible clot in the pulmonary artery. The patient was started on inhaled nitric oxide and epinephrine. Lower extremity dopplers revealed a right femoral vein thrombus. The saphenous venous graft was harvested endoscopically from the left leg. Given the patient's chronic kidney disease, he was unable to receive a contrast angiography. A vena cava filter was placed and removed two months later after ultrasound confirmation of patent vessels.

Discussion:
Few, if any, cases of PE after cardiac surgery occur intra-operatively. Known risk factors for PE include atrial fibrillation and perioperative MI4. Recurrent renal cell carcinoma may have also played a role in this case. Deep venous thrombosis (DVT) occurs with equal incidence on the side of saphenous venous graft harvest and the contralateral extremity2-4. This unusual case illustrates that migration of a DVT to the pulmonary artery should be considered in the differential diagnosis of intra-operative hypoxemia despite recent heparinization.

References: