A 21-year-old man presented with acute onset of severe, ripping chest pain. He reported mild dyspnea but denied other associated symptoms, including leg swelling, palpitations, or neurological symptoms. He had a long-standing personal history of hypertension and reported a family history of venous thromboembolism and diabetes mellitus.

On physical examination, the patient was tachycardic and hypertensive (systolic blood pressure in the range of 160–170 mm Hg). Computed tomographic angiography of the chest was performed. Computed tomographic angiography revealed an aneurysm of the ascending aorta measuring up to 6 cm in diameter with a focal outpouching posteriorly just superior to the takeoff of the left main coronary artery and a high-attenuation pericardial effusion, findings concerning for focal type A aortic dissection with contained rupture (Figure 1). Apparent filling defects in the right and left main pulmonary arteries were also seen with complete occlusion of blood flow into the right main pulmonary artery, suggestive of extensive pulmonary embolism (Figure 1).

The patient was taken to surgery emergently. Intraoperative echocardiography redemonstrated a focal dissection of the mid ascending aorta (Figure 2) with a posterior wall hematoma. No flow was seen in the right main pulmonary artery, and minimal flow was detected in the left main pulmonary artery. After transection of the aorta, the hematoma and pseudoaneurysm along the posterior wall were seen to erode into the transverse pericardial sinus with compression, but not erosion, of the adjacent pulmonary arteries (Figure 3). The ascending aorta was replaced with a Gelweave graft. The pulmonary arteries were also opened and explored and found to be completely free of clot. Intraoperative echocardiography and postoperative computed tomographic angiography after ascending aortic replacement demonstrated unobstructed main, right, and left pulmonary arteries, with normal flow (Figures 4 and 5). Therefore, the computed tomographic appearance of a saddle embolus of the pulmonary arteries was thought to be attributable to external compression by hematoma rather than intraluminal thrombus.

Surgical pathology demonstrated an acute dissection plane through an area of severe cystic medial degeneration.

Acquired pulmonary artery obstruction is commonly caused by chronic, nondissecting ascending aortic aneurysms but only infrequently by acute type A aortic dissection. In the latter case, extravasation of blood into the adventitia of the ascending aorta, which is shared by the pulmonary artery, results in hematoma surrounding the pulmonary arteries and subsequent compression and possibly occlusion. The dilated ascending aorta itself may also contribute to compression, particularly of the right pulmonary artery as it runs just posterior to the ascending aorta. Coexistence of pulmonary embolism and acute type A aortic dissection is exceedingly rare compared with external compression of the pulmonary arteries resulting from ascending aortic dissection, with only a few reported occurrences in the literature.

Disclosures

None.

References

Aortic Dissection With Apparent Pulmonary Embolus

Figure 1. Contrast-enhanced computed tomography. A, Axial image demonstrated aneurysmal dilation of the ascending aorta with a dissection flap (arrow). B, A more inferior axial image demonstrated apparent extensive filling defects involving the main, right, and left pulmonary arteries (arrow). C, The most inferior axial image demonstrated a high-attenuation pericardial effusion (arrows), likely representing hemorrhage. D, A coronal oblique image demonstrated the focal dissection/outrouching (arrow) to better advantage.

Figure 2. Intraoperative transesophageal echocardiogram demonstrated a short dissection flap in the ascending aorta.

Figure 3. Intraoperative photograph demonstrated a large amount of clot along the posterior wall of the ascending aorta, with subsequent compression of the main and right pulmonary arteries.
Figure 4. Intraoperative echocardiogram after graft replacement of the ascending aorta demonstrated unobstructed main (arrow), right, and left pulmonary arteries with normal color Doppler flow.

Figure 5. Postoperative computed tomographic angiography demonstrated contrast opacified main (black arrow), right, and left pulmonary arteries without filling defect. The replaced ascending aorta was also seen (white arrow).
Type A Aortic Dissection Mimicking a Saddle Pulmonary Embolus on Computed Tomographic Angiography
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