Is a Dissection in the Middle of the Aortic Arch Complicating This Large Ascending Thoracic Aortic Aneurysm?

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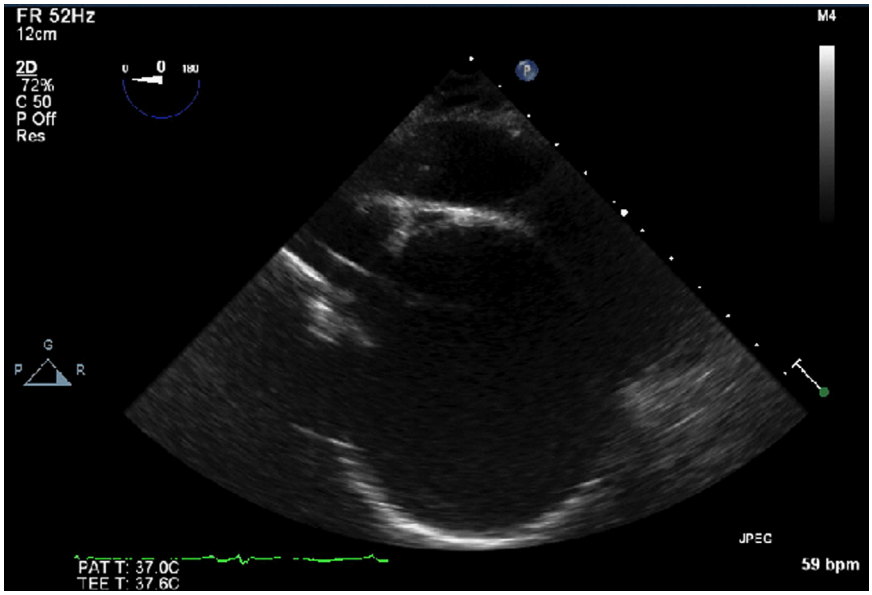

Fig 1. Midesophageal ascending aortic short-axis image showing large ascending thoracic aortic aneurysm.

A 78-YEAR-OLD, 98-kg, 188-cm man with a past medical history of essential hypertension and hyperlipidemia was evaluated in the preoperative clinic of the authors' institution in preparation for an elective right inguinal herniorrhaphy. The patient denied cardiovascular complaints. The physical examination revealed a grade II of VI diastolic murmur that was heard along the right sternal border; the patient was referred for transthoracic echocardiography as a result. This study revealed a large ascending thoracic aortic aneurysm, moderately severe aortic insufficiency, mild left ventricular (LV) enlargement, and an estimated LV ejection fraction of 45%. The inguinal herniorrhaphy was postponed. A computed tomography scan with angiographic contrast and a left-heart catheterization confirmed the presence of the large ascending thoracic aortic aneurysm. Coronary angiography indicated that the coronary arteries were normal. The patient was transported to the operating room for repair of the aortic aneurysm. After anesthetic induction and endotracheal intubation, a comprehensive transesophageal echocardiography (TEE) examination was conducted. The ascending thoracic aorta was aneurysmal with a maximum diameter of 7.8 cm (Fig 1 and Video 1). The sinotubular junction was profoundly effaced and moderate-to-severe aortic insufficiency was present (Fig 2 and Video 2). The distal aortic arch (Fig 3 and Video 3) was normal. Subtle flexion of the TEE probe in the upper esophageal aortic arch long-axis view revealed the following images (Figs 4 and 5 and Videos 4 and 5). What is the diagnosis?

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1053-0770/2605-0038$36.00/0

http://dx.doi.org/10.1053/j.jvca.2013.02.014

Key words: aortic aneurysm, aortic arch branches, aortic dissection, brachiocephalic trunk, carotid artery, congenital heart disease

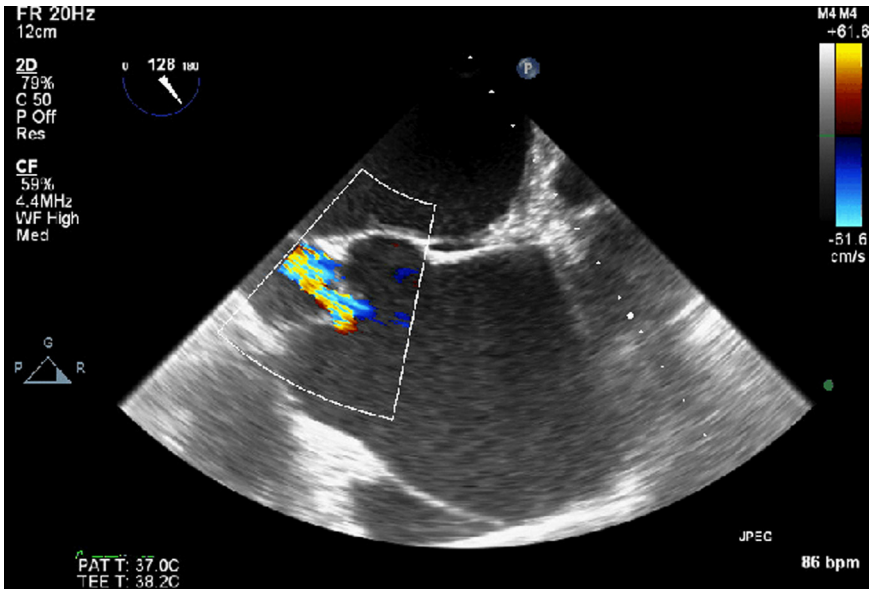

Fig 2. Midesophageal aortic valve long-axis image with color Doppler blood flow mapping showing large ascending thoracic aortic aneurysm, profoundly effaced sinotubular junction, and moderate aortic insufficiency. (Color version of figure is available online.)

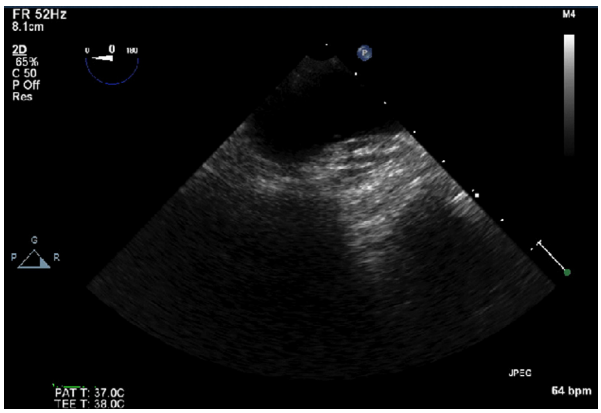

Fig 3. Upper esophageal aortic arch long-axis image showing normal distal aortic arch.

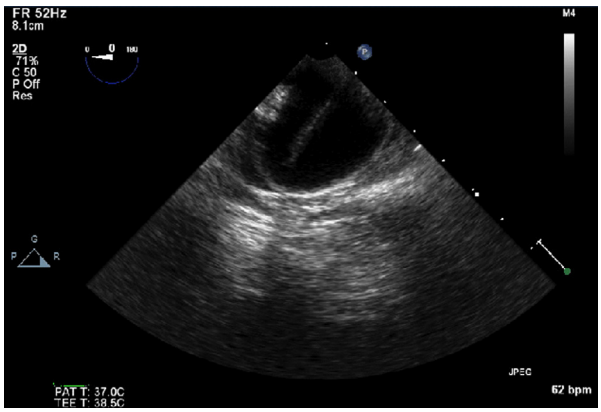

Fig 4. Modified upper esophageal aortic arch long-axis image showing apparent "dissection" in the proximal aortic arch.

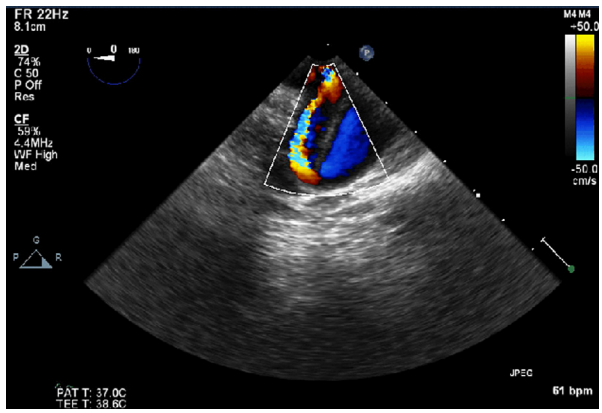

Fig 5. Modified upper esophageal aortic arch long-axis image with color Doppler mapping showing blood flow in both "lumens" of the apparent "dissection" in the proximal aortic arch. (Color version of figure is available online.)

DIAGNOSIS: LONG-AXIS VIEW OF A COMMON ORIGIN OF THE BRACHIOCEPHALIC TRUNK AND LEFT CAROTID ARTERY MIMICKING TYPE-A DISSECTION

A modified upper esophageal aortic arch long-axis TEE image depicted what initially appeared to be a dissection flap located within the middle of the aortic arch (Fig 4 and Video 4). Color Doppler mapping in the same imaging plane demonstrated blood flow in both "lumens" moving in opposite directions (Fig 5 and Video 5). However, the short-axis view showed that the suspected "dissection" was, in fact, two distinct arterial vessels (Figs 6 and 7 and Videos 6 and 7). A three-dimensional computed tomography (CT) reconstruction demonstrated that these blood vessels were the brachiocephalic trunk (innominate artery) and the left carotid artery, which shared a common origin (Fig 8). The TEE and CT findings