

CASE REPORT

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Type A Aortic Dissection Presenting with Acute Lower Extremity Vascular Insufficiency in the Absence of Chest Pain

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Abstract: We report a case of a 53 year-old man with a history of hypertension presenting with acute left lower extremity paresthesias and pulselessness initially presumed to be secondary to arterial thrombosis or embolism. Work-up included a transthoracic echocardiogram which revealed an aortic dissection at the level of the aortic root extending to the visualized portions of the descending aorta. Type A aortic dissections are relatively rare, with the vast majority of patients presenting with chest pain. Timely diagnosis of Type A aortic dissections are critical as to facilitate rapid surgical repair. To our knowledge, this is the first report of a painless Type A aortic dissection presenting with isolated lower extremity vascular insufficiency and demonstrates the potential role of transthoracic echocardiography as a rapid, non-invasive bedside modality in visualizing Type A aortic dissections.

Keywords: painless aortic dissection

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Case Report

A 53 year-old man with a history of longstanding, untreated hypertension presented with acute onset distal left-lower extremity pain, paresthesias, pallor, and difficulty ambulating for approximately six hours. He denied chest pain, back pain, abdominal pain, palpitations, syncope, or focal neurologic symptoms. His physical examination was notable for a blood pressure of 151/51 mmHg and a heart rate of 75 beats per minute. Carotid pulsations were brisk with single upstrokes. There were no carotid bruits and jugular venous pressure was within normal limits. Heart was regular with a III/IV diastolic murmur appreciated at the right upper sternal border. Lungs were clear and abdomen was nontender without palpable masses or bruits. Examination of the extremities demonstrated a diminished left-sided femoral pulse and absent dorsalis pedis and posterior tibialis pulses on the left.

Initial laboratory values were notable for acute kidney injury with a serum creatinine of 2.1 mg/dL and an elevated troponin I of 3.1 ng/mL (later peaking at 14.6 ng/mL). Electrocardiogram showed a sinus rhythm with left ventricular hypertrophy without acute ischemic changes. The patient was initially admitted to the vascular surgery service with a diagnosis of acute ischemia of the left lower extremity of unclear etiology and treated with intravenous heparin. Definitive imaging with computed tomography (CT) or magnetic resonance imaging (MRI) was deferred due to renal failure and concern regarding administration of contrast agents. Plans for angiography with possible thrombectomy were made for the following day.

Transthoracic echocardiogram (TTE) was done to assess left ventricular systolic function in light of the asymptomatic non-ST segment elevation myocardial infarction (NSTEMI). The study demonstrated normal biventricular size and systolic function, moderate dilatation of the ascending aorta (4.7 cm), an extensive segment of aortic dissection extending from the aortic annulus to the visualized portion of the thoracic descending aorta (Fig. 1) with visualized dissection flap prolapsing across the aortic valve, and moderate aortic insufficiency (Fig. 2).

Discussion

Though aortic dissections are relatively rare, they carry a high risk of morbidity and mortality in the

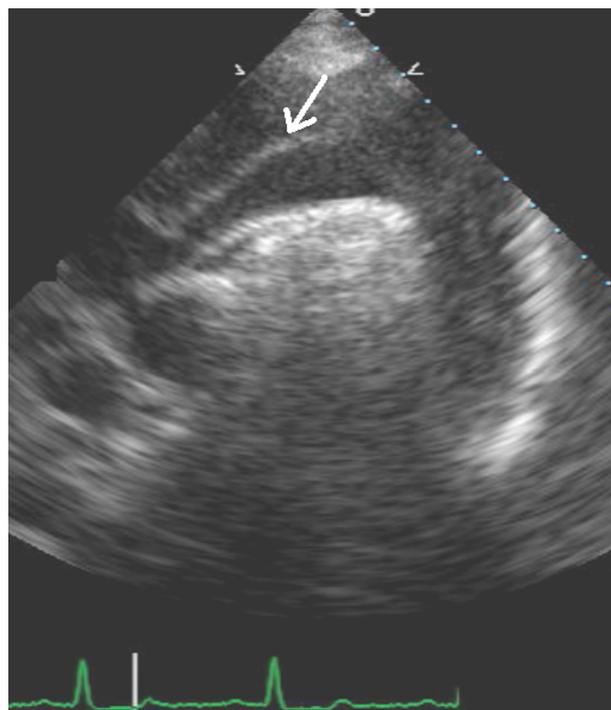


Figure 1. Transthoracic echocardiogram in the suprasternal view demonstrating a dissection flap in the ascending aorta, aortic arch, and thoracic descending aorta.

short term. Typically, Type A aortic dissections present with pain, which is usually severe and of sudden onset. Painless aortic dissections are rare. In the International Registry of Acute Aortic Dissection (IRAD), approximately 96% of patients presenting with aortic dissection reported any pain; more specifically, 79% of patients with Type A dissections reported chest pain.¹ The pain experienced with aortic dissection has classically been described as “tearing” or “ripping” and may suggest the location of the aortic dissection. While pain is the most common presenting symptom in acute aortic dissection, painless presentations have been reported. In a review of 977 patients from IRAD, 6.4% of patients had a painless aortic dissection. Patients presenting with painless aortic dissections were older, more likely to be diabetic, have a history of aortic aneurysm, or had prior cardiovascular surgery, and were more likely to present with syncope, congestive heart failure, or stroke. As would be expected, patients presenting with a painless aortic dissection had a significantly higher in-hospital mortality (33.3% vs 23.2%; $P = 0.05$).² An independent, single center Japanese cohort reported the incidence of painless acute aortic dissection at 17% and

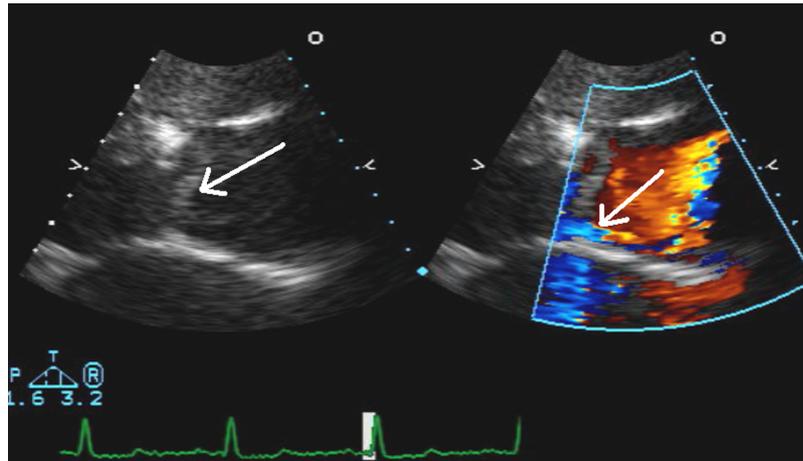


Figure 2. Transthoracic echocardiogram in the parasternal long axis view demonstrating a dissection flap at the level of the aortic valve with eccentric aortic insufficiency.

similarly identified disturbance of consciousness, syncope, and focal neurologic deficits as more common manifestations of painless aortic dissections. Of note, the definitive diagnosis of aortic dissection took greater than one day in 33% of patients presenting without pain in this cohort.³

The diagnosis of aortic dissection can be made by a variety of modalities, with MRI, CT, or transesophageal echocardiography (TEE) being the preferred methods. The initial imaging modality chosen is often dictated by availability, patient stability, and patient specific contraindications to a particular modality. In the IRAD, most patients with aortic dissection had more than one imaging modality performed, with the initial imaging modality being echocardiography (TTE and/or TEE) in 42% of patients with a Type A dissection. The diagnostic yield of TTE has been extensively studied, with a reported sensitivity of 59%–85% and specificity of 63%–96%; as such, TTE should not be considered a definitive study for ruling out aortic dissection and that additional studies should be performed if TTE is negative or inconclusive.⁴ That being said, TTE can be helpful in identifying complications of Type A aortic dissections, such as aortic insufficiency or cardiac tamponade. Current practice guidelines for acute aortic diseases do not recommend a specific diagnostic modality of aortic dissection, but rather suggest selection of the imaging modality based on individual patient factors and resource availability.⁵

In this particular case, the TTE was done primarily to evaluate left ventricular systolic function with the diagnosis of aortic dissection being made somewhat surreptitiously. While a high index of suspicion is clearly necessary in making the diagnosis of aortic dissection in the absence of pain, certain historical or physical clues, such as the presence of unequal blood pressures in the upper extremities, a personal or family history of aortic disease, or a new murmur suggestive of aortic insufficiency (as seen in this patient) may prompt the clinician to further investigate for aortic dissection.

To our knowledge, this is the first reported case of painless Type A aortic dissection presenting as isolated lower extremity ischemia and demonstrates the potential utility of TTE for demonstrating Type A aortic dissections. As demonstrated in this case, TTE can provide a readily available, rapid, and non-invasive imaging modality that can be performed at the bedside in critically ill patients, although it should be emphasized that the reported sensitivity of TTE is variable, making more definitive studies necessary if TTE is negative or inconclusive. It is particularly important to emphasize the use of the suprasternal view in demonstrating aortic arch pathology as seen in this case.

He was immediately taken to the operating room where he underwent successful repair of the ascending aorta with a 28 mm Dacron interposition graft along with resuspension of the aortic valve. Subsequent CT angiography showed extension of the dissection



caudally to the level of the iliac artery bifurcation involving both common iliac arteries including extension of the dissection flap into the left renal artery with normal perfusion of the left kidney. His post-operative course was relatively uneventful with improved perfusion of the left lower extremity along with normalization of his renal function. He was discharged home on post-operative day number eight in good condition with plans to follow-up in vascular surgery clinic for re-evaluation of his left lower extremity.

Disclosures

Author(s) have provided signed confirmations to the publisher of their compliance with all applicable legal and ethical obligations in respect to declaration of conflicts of interest, funding, authorship and contributorship, and compliance with ethical requirements in respect to treatment of human and animal test subjects. If this article contains identifiable human subject(s) author(s) were required to supply signed patient consent prior to publication. Author(s) have confirmed that the published article is unique

and not under consideration nor published by any other publication and that they have consent to reproduce any copyrighted material. The peer reviewers declared no conflicts of interest.

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