

Rare presentation of acute aortic dissection in a family doctor's office

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Nearly 1 in 5 Canadians have hypertension and are managed by family physicians.¹ Common complications of hypertension include myocardial infarction, stroke, peripheral vascular disease, or renovascular disease. However, a tiny percentage of patients develop serious complications like acute aortic dissection (AAD). While the exact prevalence of AAD is unknown, the peak age of incidence is known to be 60 to 70 years, while AAD due to Marfan syndrome or Ehlers-Danlos syndrome typically presents between 30 and 40 years of age.^{2,3}

In addition to hypertension, AAD is associated with other conditions such as giant cell arteritis, bicuspid aortic valve, cocaine use, trauma, polycystic kidney disease, and systemic lupus erythematosus.^{2,3} Iatrogenic aortic dissections might also develop after percutaneous or open cardiac interventions.

Aortic dissections are classified using the Stanford classification system, which differentiates aortic dissections into type A, involving the ascending aorta, and type B, not involving the ascending aorta. Type A aortic dissections tend to be managed surgically, whereas type B dissections are managed medically with blood pressure (BP) monitoring and hemodynamics.^{4,5}

Case

A 72-year-old woman presented to her family doctor's office for a routine BP assessment. Her past medical history included hypertension, asymptomatic left carotid stenosis, and hypothyroidism. She had had 2 previous hip arthroplasties and suffered a postoperative pulmonary embolus; she also underwent left neck dissection, oropharyngeal cancer excision, and adjuvant radiation therapy.

After the family doctor took her history, the findings of which were unremarkable, and performed a physical examination, including a BP in the right arm of 119/59 mm Hg and a precordial examination with normal findings, the patient stood up and felt a strange pain in the right side of her neck. Once sitting again the pain resolved, but she immediately developed a right-sided facial droop, dysarthria, and right leg weakness. In addition, she developed blurry vision, headache, and a sluggish dilated right pupil. Given her clinical symptoms there was serious concern that the patient had suffered an acute stroke, and both emergency medical services and the local stroke unit were contacted. The patient was given supplemental oxygen and, after developing considerable nausea, she experienced a single episode of hematemesis.

In the emergency department investigations revealed a hemoglobin level of 138 g/L (normal 115 to 160 g/L), platelet count of $192 \times 10^9/L$ (normal $150 \times 10^9/L$ to $400 \times 10^9/L$), an international normalized ratio of 0.9 (normal 0.9 to 1.1), and a troponin level of 9 ng/L (normal <14 ng/L). Findings from a standard electrocardiogram (ECG) demonstrated lateral cardiac ischemia (**Figure 1A**). As part of the acute stroke protocol, a computed tomography (CT) scan of the head and neck revealed an AAD of the ascending thoracic aorta (**Figure 1B**). A subsequent CT scan was performed to characterize the AAD and demonstrated a type A dissection extending from the aortic root, specifically the ostium of the right coronary artery, to the infrarenal abdominal aorta with complete occlusion of the right common carotid artery (**Figure 2**).

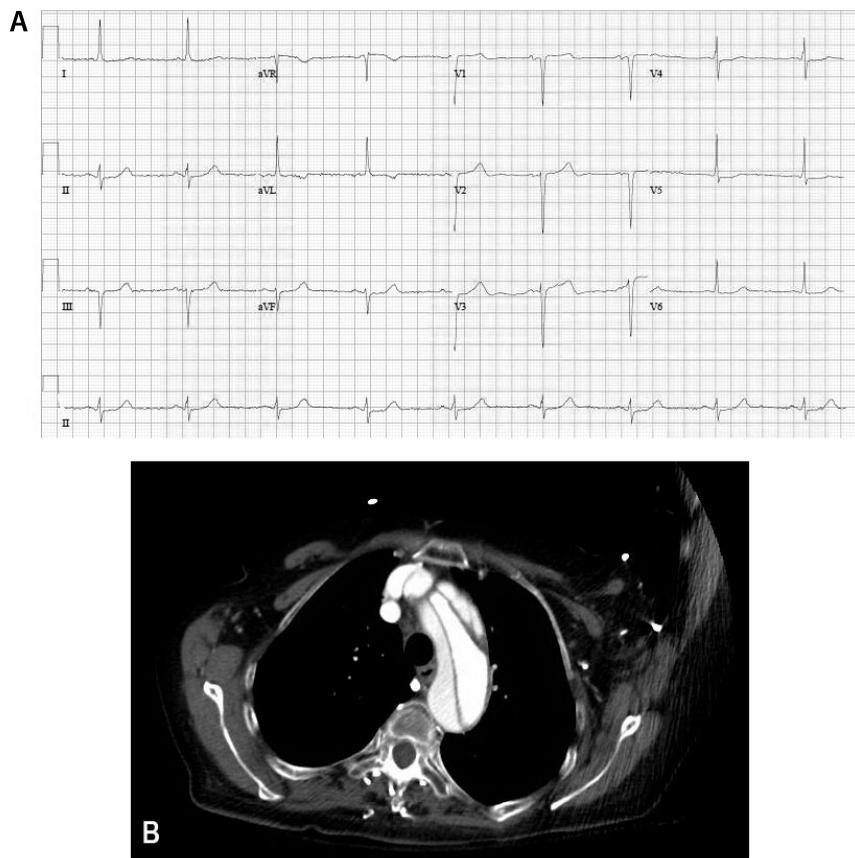
Editor's key points

- ▶ Hypertension is a known risk factor for acute aortic dissection (AAD).
- ▶ Consider AAD in patients with new-onset chest pain. New-onset focal neurologic signs and sudden onset of tearing or ripping pain are associated with the highest likelihood ratios for diagnosis of AAD. Patients might also experience syncope, hemoptysis, or hematemesis.
- ▶ Although AAD is rare, family physicians can play a key role in the urgent diagnosis and transfer of patients to hospital for definitive care that, for many, will represent the difference between survival and morbidity or mortality. Clinics should refer buprenorphine-naloxone patients back to primary care when they are stable for methadone.

Points de repère du rédacteur

- ▶ L'hypertension est un facteur de risque connu de dissection aortique aiguë (DAA).
- ▶ Il faut envisager une DAA chez les patients qui présentent de soudaines douleurs thoraciques. L'apparition nouvelle de signes neurologiques focaux et la douleur soudaine apparentée à une déchirure ou à un décollement sont associées aux taux les plus élevés de probabilité d'un diagnostic de DAA. Les patients peuvent aussi présenter une syncope, de l'hémoptysie ou de l'hématémèse.
- ▶ Quoique les DAA soient rares, les médecins de famille peuvent jouer un rôle vital dans le diagnostic rapide et le transfert urgent des patients à l'hôpital vers les soins complets qui, pour plusieurs, feront la différence entre la survie et la morbidité ou la mortalité.

Figure 1. Investigation findings: A) Standard electrocardiogram showing lateral cardiac ischemia. B) Computed tomography scan of the head and neck showing an acute aortic dissection of the ascending thoracic aorta.



The cardiovascular surgery team assessed the patient but given her age and comorbidities they suggested that her perioperative mortality would be approximately 50%. This risk, as well as a postoperative risk of stroke, resulted in the patient deciding to pursue medical management. She was treated with propranolol and metoprolol; however, 2 days after presenting with the AAD, the patient passed away.

Discussion

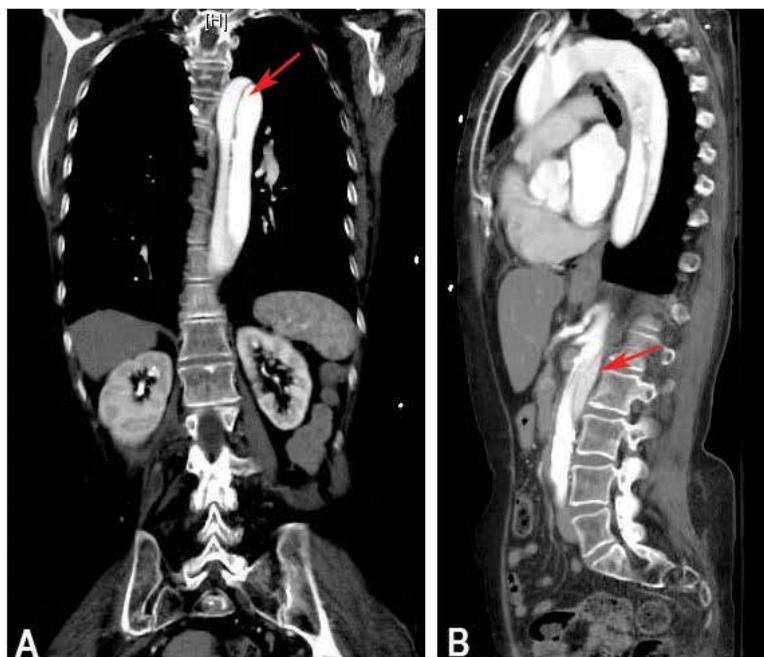
The literature was reviewed from MEDLINE and EMBASE using the terms *aortic dissection*, *family medicine*, and *Canada* to assess the prevalence of AAD presentations in primary care. Analysis of the results demonstrated a paucity of reports aside from a case report published in *Canadian Family Physician* describing a missed presentation of AAD in primary care.⁶

Often, AAD is not included in the differential diagnosis of chest, abdominal, or back pain seen in family practice. For patients with AAD, sudden onset of tearing or ripping pain is the symptom associated with the highest likelihood

ratio for diagnosis (**Table 1**).⁷ Often, the pain radiates to patients' back, neck, jaw, or arm depending on the location of the dissection.⁸ Further, patients might experience syncope, hemoptysis due to rupture into the tracheobronchial tree, or hematemesis due to rupture into the esophagus.⁹ Other signs include hypotension or a BP discrepancy between the left and right arm. Auscultation of the precordium might reveal a new murmur of aortic insufficiency. Examination of the lungs might demonstrate a new pleural effusion suggestive of a free aortic rupture into the hemithorax, which is more common on the left side than the right. Neurologic findings seen in this case such as facial droop, dysphagia, or new-onset weakness might suggest a carotid dissection or acute stroke due to AAD.⁴

When AAD is suspected a chest x-ray scan and ECG are the first investigations ordered. A widened mediastinum, displaced aortic arch, or new pleural effusion could all be suggestive of the diagnosis. An ECG often demonstrates some myocardial ischemia secondary to intimal flap occlusion of the coronary ostia or from substantial systemic and coronary hypoperfusion.

Figure 2. Computed tomography scan showing a type A dissection: A) Dissection extending from the aortic root, specifically the ostium of the right coronary artery, to B) the infrarenal abdominal aorta



Bloodwork performed includes measuring troponin levels to rule out cardiac ischemia.^{2,3}

Other imaging that can provide a rapid and accurate diagnosis includes echocardiography and a CT scan, the

latter of which demonstrates the dissection flap and perfusion of organs including the intestines, spleen, and kidneys.^{2,4}

Upon diagnosis of AAD, an immediate transfer to the emergency department is crucial for referral to cardiothoracic or vascular surgery and simultaneous initiation of resuscitation. Important considerations during resuscitation include establishing adequate venous access and close BP monitoring.⁴

For patients who are operative candidates, AAD might be repaired through endovascular or open surgery depending on the anatomy of the dissection.^{7,10,11} The International Registry of Acute Aortic Dissection database provides insight into AAD mortality and survival. In particular, these data demonstrate that age older than 70 years is an independent predictor of mortality (38.2% vs 26.0%, $P < .0001$).¹² A study performed by Stamou et al of 90 patients with type A AAD younger than 70 years and 29 patients 70 years or older who underwent surgery did not demonstrate a significant difference in operative mortality. They also did not show a significant difference in rebleeding rates, stroke, kidney failure, prolonged ventilation, or 5-year survival.¹¹ More important, patients presenting with hemodynamic instability, regardless of age, experienced a 71.4% mortality, compared with 23.9% in patients with hemodynamic stability ($P < .001$).¹¹

For those who are not candidates for surgical repair or do not desire surgery AAD can be medically

Table 1. Likelihood ratios for possible symptoms, signs, and investigation findings for acute aortic dissection

FINDINGS	POSITIVE LIKELIHOOD RATIO (95% CI)
Symptom	
• Tearing or ripping pain	10.8 (5.2-22.0)
• Migrating pain	7.6 (3.6-16.0)
• Sudden chest pain	2.6 (2.0-3.5)
• History of hypertension	1.5 (0.8-3.0)
Sign	
• Focal neurologic deficit	33.0 (2.0-549.0)
• Diastolic heart murmur	4.9 (0.6-40.0)
• Pulse deficit	2.7 (0.7-9.8)
Investigation findings	
• Widened mediastinum on x-ray scan	3.4 (2.4-4.8)
• Left ventricular hypertrophy on ECG	3.2 (1.5-6.8)

ECG—electrocardiogram.
Data from Klompas.⁷

managed. Oral or intravenous antihypertensive medications are the mainstay of therapy and include nitroprusside, metoprolol, labetalol, or calcium channel blockers such as verapamil or diltiazem.^{7,10,11}

Conclusion

Although AAD is rare, family physicians can play a key role in the urgent diagnosis and transfer of patients to hospital for definitive care that for many will represent the difference between survival and morbidity or mortality. 

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Competing interests

None declared

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