EMERGENCY CASEBOOK

Atypical presentation of aortic dissection secondary to a gunshot wound

E Domingo, D Levy, S Iosovich

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We present a case of aortic dissection secondary to a gunshot wound. The traumatic aortic dissection in this patient occurred secondary to the cavitary forces produced by the bullet passing through the patient's chest. This is a rare phenomenon that could easily be missed if attention is placed only on the more obvious injuries.

This is a case presentation of an atypical presentation of aortic dissection secondary to a gunshot wound. A 21 year old man was brought into the emergency department (ED) by the emergency medical services following a gunshot wound to the back. The patient stated he was riding his bicycle when he heard a single gunshot, then he was struck in the back and fell to the ground. He denied any loss of consciousness. He arrived to the ED complaining of chest pain and shortness of breath.

Medical and surgical history was unremarkable. The patient was not taking any medications at the time, nor had allergies to any medications. He denied any tobacco, alcohol, or drug use. His family history was non-contributory to the case. He denied any headaches, dizziness, or blurred vision, and any abdominal pain, nausea, or vomiting. He had no pain in the extremities, and had no weakness or paraesthesia. He complained only of chest pain and shortness of breath.

Vital signs upon arrival to the ED were: temperature 99°F, pulse 102 beats/min, respiratory rate 22 breaths/min, blood pressure 140/78 mmHg, and pulse oximetry 98% on room air. In general, he appeared to be a young, well developed, thin, black man. He was diaphoretic and in mild respiratory distress. He had a Glasgow Coma Scale score of 15.

On physical examination, his heart sounds were tachycardic with a regular rhythm. He had no murmurs, rubs, or gallops. He was mildly tachypnoeic with normal chest expansions. Auscultation of his chest revealed decreased breath sounds on the left, but no rales, rhonchi, or wheeze. Abdominal examination was normal, with no bruits or tenderness. There were no palpable masses. Rectal examination was normal. Examination of the integument revealed two wounds; one to the left back at the 8 o'clock position and another to the left axillary area. His gross neurological appearance was intact.

In the ED, the patient was placed on cardiac and respiratory monitoring. He was given oxygen via a nasal cannula and two large bore intravenous catheters were placed. He was given normal saline at 150 ml/hour after a 500 ml bolus. Because of the results of the clinical examination, a thoracostomy tray was placed at the bedside. After the portable chest radiograph revealed a haemopneumothorax, a 32F chest tube was inserted into the left chest with an immediate blood return of 250 ml. A Foley catheter and

nasogastric tube were also placed. Serial re-evaluations of the patient's clinical status were performed.

Laboratory investigations revealed: white blood cell count of $11.5/\text{mm}^3$, haemoglobin 9.7 g/dL, haematocrit 27.9, and platelets $247/\text{mm}^3$. Basic metabolic panel, liver function panel, and coagulation studies were all relatively normal. Urinalysis showed moderate presence of blood. A chest computed tomography scan with intravenous contrast was then performed (fig 1). This study revealed a haemopneumothorax, fracture of the left sixth and seventh ribs, and an aortic dissection (arrow). The patient was found to be clinically stable and was then sent for thoracic aortography, which found a 30 mm aortic dissection of the descending aorta (fig 2, arrow).

The final diagnosis of the patient was a traumatic aortic dissection, haemopneumothorax, and fractured sixth and seventh ribs. He was transferred to another facility with cardiothoracic surgical support. At follow up, it was possible to manage the medically without surgical intervention.

Figure 1 Atypical presentation of aortic dissection secondary to a gunshot wound.

Abbreviation: ED, emergency department

Figure 2 Atypical presentation of aortic dissection secondary to a gunshot wound.

DISCUSSION

The aortic dissection in this patient occurred secondary to the cavitory forces produced by the bullet passing through the patient's chest. This is a rare phenomenon that could easily be missed if attention is placed on the more obvious injuries.

Aortic dissection is a common catastrophe of the aorta. When left untreated, about 33% of patients die within the first 24 hours and 50% die within 48 hours. The 2 week mortality rate approaches 75% in patients with undiagnosed ascending aortic dissection.¹

The essential feature of an aortic dissection is a tear in the intimal layer followed by the formation of a subintimal haematoma. This produces a false lumen, which can reduce blood flow to the major arteries arising from the aorta.² In the emergency department, aggressive management of heart rate and blood pressure should be initiated. Beta-blockers

Table 1 Classifications of aortic dissection⁵

Stanford classification	
Type A	Involves ascending aorta
Type B	Involves descending aorta only
DeBakey classification	
I	Involves the ascending aorta, aortic arch, and descending aorta
II	Confined to the ascending aorta
III	Confined to the descending aorta distal to the left subclavian artery

should be administered to reduce the rate of change of blood pressure and the shear forces on the aortic wall.³

There are two classifications for dissections (table 1). Urgent surgical intervention is required in type A dissections. Uncomplicated type B dissections may be treated medically to control blood pressure. Distal dissections treated medically have the same or a lower mortality rate as those treated surgically. Surgery is reserved for dissections that are leaking, ruptured, or compromising blood flow to a vital organ. Long term therapy involves a beta-blocker combined with other hypertensive medications.[45]

This was an interesting case not only because of the presentation of the traumatic aortic dissection, but also because this case teaches a vital lesson. As emergency physicians, it is important to not just focus on the more obvious problems, but to always remember to rule out all other potential life threatening injuries.

Authors' affiliations

E Domingo, D Levy, S Iosovich, Good Samaritan Medical Center Emergency Medicine Residency Program, West Islip, New York College of Osteopathic Medicine Educational Consortium, NY, USA

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Correspondence to: Dr E Domingo, 30 Eighth Avenue, Farmingdale, NY 11735, USA; emdomingo@aol.com

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