CASE REPORT

Atypical presentation of type B aortic dissection mimicking appendicitis managed medically

Muhammad Azharuddin,¹ Maria Amanda Delacruz,¹ Derek Baughman,² Patton Chandler³

¹Internal Medicine, Monmouth Medical Center, Long Branch, New Jersey, USA

²Department of Medicine, St. George School of Medicine, St. George, West Indies, Grenada

³Pulmonology and Critical Care Department, Monmouth Medical Center, Long Branch, New Jersey, USA

Correspondence to

Dr Muhammad Azharuddin, azhar_uddin203@yahoo.com

Accepted 20 June 2018

SUMMARY

This is a case of a 53-year-old male patient with a history of hypertension who developed sudden onset of right lower quadrant pain. On arrival, chest X-ray showed prominent aortic arch without cardiomegaly. CT of the abdomen/pelvis showed aortic dissection in descending aorta without rupture. CT of the chest displayed sparing of ascending and aortic arch. Ultrasound Doppler of the kidney displayed mild renal artery stenosis. Differential diagnosis was acute appendicitis, acute ureteric and severe gastroenteritis. The patient was started on oral blood pressure (BP) medicine to titrate off intravenous nicardipine and esmolol drip. After 10 days, he was switched to oral BP medicine. His leg pain was resolved with normal palpable pulse. One week later, his kidney function worsened. Thus, Lasix and minoxidil were stopped. The patient had no chest/abdominal pain and was tolerating the medicine well during his 2-week follow-up. Acute aortic dissection can be a fatal clinical emergency. Timing is critical during diagnosis and management of patients.

CASE PRESENTATION

A 53-year-old male patient with a history of hypertension who was taking no medications was in his usual state of health 3 days ago before developing a sudden onset of right lower quadrant pain. The pain was described as continuous, sharp, 8/10 in intensity, radiating down to the right leg, aggravating with any body movement and decreasing with rest. Pain was also once associated with non-bloody vomiting. The patient went to see his primary care physician who referred him to the hospital for evaluation of possible appendicitis. Initially, appendicitis was suspected since the patient had severe right lower quadrant pain, rebound tenderness, episodes of anorexia, nausea/vomiting and leucocytosis. Before admission to the hospital, the patient was taking Motrin with minimal relief for the last 3 days. On arrival, he denied any chest pain, shortness of breath or palpitations. He had a blood pressure (BP) of 241/151 mm Hg, heart rate 101/min, respiratory rate was 18/min, blood oxygen saturation level (SpO₂) of 97% on room air, temperature 37.4 °C.

BACKGROUND

Acute aortic dissection (AAD) is a potentially fatal emergency, with complications occurring early.^{1 2} This illness is reported to occur at older age (ages 60–80 years), with increased incidences in men than women.² Patients with AAD usually present with a clinical history of sudden-onset, excruciating, ripping or tearing anterior chest pain sometimes radiating to the back.² These classic symptoms of abrupt chest pain or back pain may not always be present.

An atypical presentation makes it difficult to diagnose quickly, especially if the patient has none of the characteristic pains. Painless dissection occurs in 5%–15% of patients with aortic dissection (AD).^{1 3} Other clinical manifestations include severe aortic regurgitation, myocardial ischaemia or infarction, congestive heart failure, neurological symptoms, pulmonary complications, mesenteric ischaemia and renal failure, depending on the location of the primary intimal tear and the extent of the dissection. With patients presenting atypically, a timely diagnosis can be difficult.² This is a case report of a patient with severe right lower quadrant pain mimicking appendicitis and diagnosed with AAD.

INVESTIGATIONS

On examination, abdomen was soft, with moderate right lower quadrant tenderness. Voluntary guarding, mild rebound and Rovsing's sign were positive. His right leg showed weakly palpable pulse in popliteal, anterior tibial, posterior tibial and dorsalis pedis artery.

Laboratory results displayed elevated white cell count (WCC) 21.2x10⁹/L with 79 neutrophils. Thus, he received 20mg intravenous labetalol which improved his BP to 178/100 mm Hg. His ECG was normal. A chest X-ray was done to rule out right lower lobe pneumonia, perforation and a search for free air below the diaphragm. The chest X-ray showed prominent aortic arch without cardiomegaly. A CT of the abdomen and pelvis with contrast was performed to rule out appendicitis which showed AD in descending aorta without rupture. When the AD was seen, thoracic CT scan was added with additional 25 cc of contrast which displayed sparing of ascending and arch of aorta (figure 1).

The patient's BP increased again to 184/101 mm Hg, and thus esmolol drip was initiated, and he was admitted to the intensive care unit for closer haemodynamic monitoring. His BP remained elevated, so nicardipine drip was

© BMJ Publishing Group Limited. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Azharuddin M, Delacruz MA, Baughman D, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2018-225378

Figure 1 CT chest, abdomen and pelvis with contrast: (A) displays CT of the chest with contrast. Descending aortic aneurysm originates just distal to the left subclavian artery. There is no evidence of involvement of the great vessels of the aortic arch. (B–D) show CT abdomen and pelvis with contrast. Aortic dissection is noted extending from the thoracic aorta, through the abdominal aorta into the bilateral external iliac arteries. Arrows pointing to dissection flap at the edge of the aorta.

also started. The therapeutic goal of BP was to remain below 120/80 mm Hg. Medical management was recommended for the patient.

Meanwhile, secondary causes of hypertension were also investigated, and the work-up for thyroid-stimulating hormone, plasma renin, aldosterone, metanephrine, cortisol, toxicology were normal. An ultrasound Doppler of the kidney displayed mild renal artery stenosis. Creatinine was normal, and echocardiogram showed normal ejection fraction, grade II diastolic dysfunction and moderate aortic regurgitation.

DIFFERENTIAL DIAGNOSIS

Based on patient's history and physicals including onset and location of pain and elevated WCC, differential diagnosis was broadened to include acute appendicitis, acute ureteric colic/urinary tract infection, severe gastroenteritis, small bowel obstruction, terminal ileitis, malignancy, incarcerated or strangulated femoral hernia, and psoas abscess. The diagnosis was made by a combination of clinical suspicion, vitals and CT scan.

TREATMENT

The patient was started on oral BP medicine to titrate off intravenous nicardipine and esmolol drip. It took 10 days to titrate off the intravenous drip, and he was completely switched to oral BP medicine including metoprolol 200 mg twice daily, clonidine 0.2 mg three times daily, amlodipine 10 mg daily, lisinopril 40 mg daily, hydralazine 100 mg twice daily, Lasix 20 mg orally daily and minoxidil 2.5 mg twice daily. His leg pain had resolved before discharge, and he had normal palpable pulse. The patient was discharged to home. During follow-up 1 week later, his kidney function worsened, increasing from 1.07 to 1.34 mg/dL. Thus, Lasix and minoxidil were stopped, and other medicines were continued. His BP was 128/58 mm Hg and heart rate was 64/min.

OUTCOME AND FOLLOW-UP

The patient had no chest pain or abdominal pain and was tolerating his medicine well during continuous follow-up for 2 weeks.

DISCUSSION

AAD is the most common fatal condition involving the aorta.¹ AAD has a mortality rate as high as 1% per hour during the first 48 hours after onset of symptoms if left untreated.¹ Elderly patients with type B dissection were commonly found to have a history of hypertension compared with younger cohort. While arteriosclerosis, diabetes and prior aortic aneurysm were more common in the elderly, Marfan syndrome and cocaine abuse were found common in younger patients.⁴

Classically, AD presents with severe, ripping/tearing chest, back or abdominal pain. According to International Registry of Acute Aortic Dissection, 95.5% of patients had pain. Recently, however, there have been several documented cases of atypical features being presented.¹ Many AD cases report various symptoms other than pain, especially neurological and cardiovascular manifestations, including upper or lower extremity weakness or numbness, hemiparesis, heart block, transient global amnesia and so on.³

Rapid diagnosis of AD is essential in improving prognosis.¹ Diagnostic biomarkers such as D-dimer, myosin heavy chain and calponin may have a role in initial clinical AAD diagnosis. Recent advanced imaging modalities—including spiral CT angiography, transoesophageal echocardiography and MRI angiography—should be promptly performed as they are effective non-invasive procedures and provide more accurate and useful data for assessing AD.^{1,5} Imaging plays an important role in diagnosis, risk stratification and selection of the appropriate treatment in patients with AD.⁽⁵⁾

Stanford type-B AD (TBAD) is defined as a dissection distal to the left subclavian artery. In TBAD, since it does not involve ascending aorta, brachiocephalic trunk and left carotid artery, conservative management is the best approach.⁶ TBAD generally is associated with better survival compared with ascending aorta involvement. Newer management strategies have shown the potential to improve outcomes and have reduced the need of surgery in more than 15% of cases.⁷ In acute type-B AD (ABAD), medical management (eg, antihypertensive, cardiac output suppressive)—which requires strict control of patient's BP to prevent progression of AD—is currently the preferred method of treatment for uncomplicated patients, including those with stable haemodynamic status, no branch vessel involvement and no periaortic haematoma.^{6,7} Our patient was managed medically.

Controlling BP and AD requires target values of <120 mm Hg for systolic BP and <60 bpm for typical heart rate. According to European Society of Cardiology 2001 guidelines on medical management of AD, immediate treatment involves lowering of systolic BP using beta-blockers (eg, esmolol or labetalol), additional vasodilator for severe hypertension (eg, nicardipine or sodium nitroprusside to titrate BP to 100–120 mm Hg) and lowering BP with calcium channel blockers (eg, verapamil) for obstructive pulmonary disease.⁸

According to American Heart Association and American College of Cardiology 2010 guidelines, intravenous beta-blockers should be started and titrated to target a heart rate of <60 bpm, and non-dihydropyridine calcium channel blocking agents (eg, verapamil or diltiazem) as an alternative for rate control.⁸ If systolic BP stays >120 mm Hg after proper heart rate control, ACE inhibitors (eg, enalaprilat) and/or other vasodilators should be given to continue lowering BP to maintain proper end-organ perfusion. In addition, vasodilator therapy should not be started before rate control to avoid reflex tachycardia.⁸

Surgery for ABAD is generally indicated for patients with persistent symptoms despite medical treatment, a rapidly

expanding false lumen, impending or frank rupture, or major-organ malperfusion that cannot be resolved by percutaneous therapy. The results of surgery remain suboptimal. Despite improved surgical techniques and perioperative care, in-hospital mortality rates are reported to be 25%–50%.⁷ For patients with ABAD requiring surgery, using open procedure and reduced circulatory arrest time provide better surgical outcomes. Aortic stent-graft implantation represents a promising alternative to conventional surgical repair, but long-term outcome is still being evaluated.⁷

Patients perspective

I am thankful for the doctors at Monmouth Medical for the proper diagnosis. I had no idea what was going on. Now I am taking proper medication and feeling better. They really go above and beyond to educate me and make sure I understand all my options.

Learning points

- ▶ In patients with severe abdominal pain localised to the right lower quadrant, one must always broaden the differential to rule out other rare causes. Diagnosis of aortic dissection requires a high index of suspicion especially if the patient presents with hypertension urgency.
- ▶ Aortic dissection is an acute emergency. Timing is critical during diagnosis and management of patient. Delayed management can lead to lethal complications.
- ▶ Aortic dissection can be managed medically or surgically depending on the location of lesion or extent of disease. Each case and patient should be examined on an individual basis.
- ▶ In medical management, it is crucial to control BP with multiple antihypertensive medicines. If possible, try to avoid surgical intervention because of high perioperative mortality rate.
- ▶ Since diagnosis of appendicitis was based on right lower quadrant pain, there was anchoring bias. The pulse deficit combined with a neurological symptom (numbness) is highly concerning for an aortic dissection or arterial embolism. Thus, obtaining an initial CT angiogram would have been reasonable.

Patients who undergo surgery are more likely to be younger, male, have hypertension, diabetes, a neurological deficit on presentation, periaortic haematoma, wider aortic diameter (greater than 6 cm) and any branch vessel involvement with evidence of malperfusion, preoperative coma or altered consciousness, partial thrombosis of the false lumen and shorter time from the onset of symptoms to surgery.^(4,5) Higher mortality in elderly is usually due to factors linked with generalised arteriosclerosis, including hypertension and diabetes.⁷

In conclusion, this is a unique case of AD that demonstrates several valuable lessons in both clinical diagnosis and clinical management. Complicated ABAD remains a challenging problem.⁷ Similar to type A dissections, preoperative evaluation of patients with ABAD allows for assessing surgical risk.⁷

Acknowledgements The authors would like to thank the Department of Internal Medicine at Monmouth Medical Center for their continued support in pursuing medical research and publication activities.

Contributors All authors contributed equally in the making of this case report. MA and PC designed the case report concept. MAD retrieved patient consent form. MA, MAD and DB worked on case presentation. MA and MAD composed first draft of the case report. MA and DB worked on the second and final draft of full case report. PC, MAD, DB and MA checked for accuracy and finally agreed on the end result.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Imamura H, Sekiguchi Y, Iwashita T, *et al.* Painless acute aortic dissection. - Diagnostic, prognostic and clinical implications. *Circ J* 2011;75:59–66.
- 2 Sonaglioni A, Baravelli M, Lombardo M, *et al.* Atypical presentation of ascending aortic dissection in an ultracentenarian woman. *Aging Clin Exp Res* 2017;29:807–8.
- 3 Liu JF, Ge QM, Chen M, *et al.* Painless type B aortic dissection presenting as acute congestive heart failure. *Am J Emerg Med* 2010;28:646.e5–646.e7.
- 4 Mehta RH, Bossone E, Evangelista A, *et al.* Acute type B aortic dissection in elderly patients: clinical features, outcomes, and simple risk stratification rule. *Ann Thorac Surg* 2004;77:1622–8.
- 5 Donati T, Wilson J, Köbel T, *et al.* Modern diagnostics for type B aortic dissection. *Gefasschirurgie* 2015;20:420–7.
- 6 Ha leD, Imray C. Aortic dissection: a case of atypical clinical manifestation and valuable lessons in management. *BMJ Case Rep* 2011;2011:1–3.
- 7 Trimarchi S, *et al.* Role and Results of Surgery in Acute Type B Aortic Dissection: Insights From the International Registry of Acute Aortic Dissection (IRAD). *Circulation* 2006;114:357.
- 8 Suzuki T, Eagle KA, Bossone E, *et al.* Medical management in type B aortic dissection. *Ann Cardiothorac Surg* 2014;3:413–7.

Copyright 2018 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow