Reminder of important clinical lesson

Aortic dissection: a case of atypical clinical manifestation and valuable lessons in management

Le Dung Ha,¹ Christopher Imray²¹Warwick Medical School, Coventry, UK;²University Hospitals Coventry and Warwickshire, Coventry, UK

Correspondence to Le Dung Ha, L-D.Ha@warwick.ac.uk

Summary

A 55-year-old gentleman with a medical history of hypertension presented to emergency department with sudden onset of central abdominal pain and left flank pain. A CT KUB (kidney, ureter and bladder) was performed to assess the patient for a possible renal calculus and other potential gastrointestinal causes. However, an extensive aortic dissection from the arch of the aorta to the iliac arteries was detected. Hypotensive blood pressure control was started in an attempt to reduce the shear stress on the aortic wall. Unfortunately, the drop in blood pressure reduced splanchnic perfusion, resulting both duodenal perforation (secondary to duodenal ischaemia of the watershed area) and the development of acute renal failure. The patient underwent an emergency laparotomy for the perforated duodenum and biliary peritonitis. He was transferred to the intensive care unit for 18 days postsurgery for renal, respiratory, nutritional and cardiovascular support and was finally discharged home.

BACKGROUND

This is an unique case of aortic dissection that demonstrates a number of valuable lessons in both clinical diagnosis and clinical management of aortic dissection and integrated team management of a complex clinical scenario.

Despite the origin of the dissection flap at the arch of aorta between the left carotid artery and the left subclavian artery, the patient did not present with the classic 'tearing,' 'ripping,' 'excruciating' chest pain or pain between the shoulder blades. Instead, the hospital presentation was the central abdominal and flank pain due to the advancing involvement of the coeliac axis, the mesenteric arteries and the renal arteries. This underscores the significance of a high index of suspicion while diagnosing aortic dissection.

Aggressive blood pressure control resulted in poor organ perfusion and, subsequently, duodenal perforation secondary to foregut ischaemia and acute renal failure. Hence, while hypertension is undesirable in aortic dissection cases, hypotension, leading to hypo-perfusion, also has devastating consequences.

With significant biliary contamination of the peritoneal cavity following the perforated duodenal ulcer, two abdominal drains were inserted in order to control any secondary biliary leakage should the surgical repair of the ischaemic duodenum fail. The repair did partially fail and as a result of the drains a controlled fistula allowed the patient to avoid high-risk redo surgery. With adequate nutrition and no distal intestinal obstruction the fistula healed without intervention.

CASE PRESENTATION

A 55-year-old gentleman presented to emergency department with a sudden onset of dull constant central abdominal pain which radiated to the back and was aggravated by lying down. There were no relieving factors and no other

associated symptoms, in particular chest pain, nausea and vomiting, changes in bowel habit, urinary symptoms and neurological deficits.

Two to three hours after his presentation to the hospital, the central abdominal pain gradually became more focal and localised to the left flank.

His medical history included hypertension, psoriasis, a previous renal calculus and a previous duodenal ulcer. He was a heavy smoker with a 15-pack-year history and was an occasional drinker.

On presentation, his blood pressure in the left arm was 174/85 mm Hg. The blood pressure in the right arm was unfortunately not documented. All other observation readings were within normal range. Urine dipstick revealed microscopic haematuria +++ but there were no signs of infection.

Examination did not elicit any positive findings apart from mild generalised abdominal tenderness without rebound and guarding. Genital examination was unremarkable. His chest was clear with normal heart sounds and all upper and lower peripheral pulses were present.

INVESTIGATIONS

With a working diagnosis of renal calculus a CT KUB (kidney, ureter and bladder) was arranged. No calculus was detected but an abdominal aortic dissection was noted, which involved the descending thoracic, abdominal and iliac vessels.

Since only the lower thoracic aorta was included in CT KUB, a contrast enhanced CT angiogram of the aorta was performed. This scan revealed an extensive aortic dissection which commenced at the aortic arch, between the origin of the left carotid and left subclavian artery, and extended beyond the aortic bifurcation through both common iliac arteries to the level of the distal external and internal iliac arteries (figure 1).

Figure 1 Pictures demonstrating the extent of the aortic dissection. CT scan transverse section – (A) thorax level, (B) thorax/abdominal level, (C) abdominal level – the celiac trunk is supplied by both the false and the true lumen, (D) aortic bifurcation level, (E) common iliac level, (F) external/internal iliac level. Red arrows identify the dissection flap. The true lumen is the smaller concave one, being compressed by the false lumen..

The dissection flap also extended along the left subclavian artery but did not involve the left carotid artery.

The coeliac axis, superior mesenteric artery and renal arteries were all involved with perfusion of the splanchnic circulation being through both the true and the false lumen.

There was no evidence from the CT scan that the aortic dissection commenced intra-abdominally.

DIFFERENTIAL DIAGNOSIS

The patient presented with atypical symptoms of sudden onset of central abdominal pain which later became left-sided flank pain.

With a medical history of renal calculus and a urine dipstick result of microscopic haematuria, a working diagnosis of renal calculus was made while also considering other gastrointestinal causes.

CT scan demonstrated an extensive dissection of the thoracic and abdominal aorta which was extending into the visceral and iliac branches. The partial involvement of the coeliac axis, the superior mesenteric artery and the renal arteries probably reduced visceral perfusion and caused central abdominal and flank pain.

It is unclear, nevertheless, why, despite the origin of the dissection being at the level of the arch, between the left carotid and left subclavian artery, there was an absence of the typical excruciating/tearing/ripping pain across the chest or at the back between the shoulder blades.

TREATMENT

The patient's pain was initially controlled with morphine. However, while undergoing the CT arteriogram, his blood pressure in the left arm was elevated from 174/85 mm Hg to 210/130 mm Hg. Aggressive blood pressure control to reduce shear stress on the aortic wall was indicated¹ and the combination of labetalol and glyceryl trinitrate infusions were started on the third day of his hospitalisation.

Meanwhile, the patient was reviewed for the potential of endovascular repair. However, this was felt to be

challenging due to the close proximity of the left common carotid artery and the origin of the dissection flap. Occlusion of the common carotid artery by the endovascular stent would result in a likely stroke. As a type B aortic dissection, that is, it did not involve the ascending aorta, the brachiocephalic trunk and the left carotid artery, conservative management was felt to be the best approach.

On the next day, his blood pressure in the left arm dropped considerably to 128/72 mm Hg. Unfortunately, he started to have an ongoing generalised abdominal pain which could not be controlled even with the strongest combination of intravenous paracetamol, codeine and morphine. Generalised tenderness was elicited on examination consistent with peritonitis.

There was a decrease in his urine output to 15 ml/h and his urea and creatinine rose from 5.3 mmol/l to 15.6 mmol/l and 68 µmol/l to 225 µmol/l, respectively.

The new pain and reduced urine output were thought to be the direct result of reduced mesenteric and renal perfusion following aggressive antihypertensive medication. An urgent CT scan was obtained, confirming a significant amount of free fluid and air in the peritoneal cavity, which was not present on the previous two CT scans.

With a working diagnosis of bowel perforation secondary to ischaemia, emergency operation was carried out on the same day. An almost total transection of duodenum at the watershed area, with a posterior ulcer was found. There was widespread biliary contamination of the peritoneal cavity. A Paul Miculicz pyloroplasty with omental patch was performed and two drains were inserted adjacent to the surgical site.

Endovascular repair of aortic dissection was not considered appropriate at the time because of the associated sepsis.

Postsurgery, the patient was admitted to the intensive care unit for continuous veno-venous haemofiltration, cardiovascular support, ventilatory support, careful blood pressure monitoring, prophylactic antibiotics and total parenteral nutrition.

Initially there was no drainage from the abdominal drains. However, on day 10 there was a sudden high volume of bilious output, this gradually reduced over the next 14 days. The patient remained in intensive care for 18 days. He was then transferred to a general surgical ward where the drains were removed when output was minimal and diet and fluids were slowly reintroduced.

He was discharged after 2 months of hospital stay. He still had low volume drainage into a stoma bag from his controlled duodenal fistula. Three weeks after discharge his fistula had fully healed. He requires strict control of his blood pressure to prevent progression of his aortic dissection. Endovascular repair will be considered.

OUTCOME AND FOLLOW-UP

The patient was monitored in the intensive treatment unit for 18 days postoperation. He was then monitored in the ward and was discharged home after 2 months of hospitalisation.

He requires extremely tight blood pressure control with an aim for a systolic blood pressure of no greater than 120 mm Hg. If his blood pressure levels seem variable, home blood pressure monitoring or 24-h ambulatory blood pressure monitoring may be useful.

His medication on discharge includes nifedipine 40 mg once daily, bendroflumethiazide 2.5 mg once daily, folic acid 125 g twice daily, atenolol 50 mg twice daily, omeprazole 40 mg once daily, olmesartan 20 mg once daily and methyldopa 250 mg three times daily.

The patient is alive and well 2 months after discharge. He is reviewed regularly by both his general practitioner and the vascular consultant in charge. He requires strict control of his blood pressure to prevent progression of his

aortic dissection. At the moment, his blood pressure is well controlled and his renal function is normal. Endovascular repair will be considered.

DISCUSSION

The wide variety of different clinical presentations of aortic dissection and the management options of this condition are reviewed and discussed in the article cited in the reference.

Learning points

- ▶ Diagnosis of aortic dissection requires a high index of suspicion.
- ▶ Although reducing blood pressure is desirable in managing aortic dissection, too much decrease will result in inadequate organ perfusion and multi-organ failure.
- ▶ The severe abdominal pain which characterises visceral ischaemia might have been detected earlier had it not been masked by morphine infusion.
- ▶ Inserting an intra-abdominal drain following omental patch closure of perforated duodenal ulcer played a crucial role.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. Khan IA, Nair CK. Clinical, diagnostic, and management perspectives of aortic dissection. *Chest* 2002;**122**:311–28.

This pdf has been created automatically from the final edited text and images.

Copyright 2011 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.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Ha LD, Imray C. Aortic dissection: a case of atypical clinical manifestation and valuable lessons in management. *BMJ Case Reports* 2011; 10.1136/bcr.02.2011.3801, date of publication

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