Endovascular treatment of a secondary aortoenteric fistula: a temporary solution?

Introduction

Secondary aortoenteric fistulas complicate around 0.5% of all aorto-iliac operations and present a median of 90 months after the initial operation (Bergqvist et al, 1996). Untreated, they are 100% fatal. They can occur after open or endovascular repair of abdominal aortic aneurysms. The majority are aorto-duodenal fistulae but fistulae to the oesophagus, stomach, jejunum, colon, rectum and even appendix are described. They are thought to arise from a combination of friction between the bowel and proximal anastomotic sutures, persistent bowel wall trauma caused by pulsation of the graft and intraoperative bowel wall injury.

Common presentations include sepsis, haematemesis or melaena or rarely as acute small bowel obstruction secondary to intraluminal thrombi (Bergqvist and Björck, 2009). Gastrointestinal bleeding in a patient with a known aortic graft should be assumed to be a secondary aortoenteric fistula unless otherwise proven. Fortunately, these often present with a 'herald' bleed a few weeks or months before the inevitable fatal haemorrhage (Bergqvist and Björck, 2009). Nonetheless, these cases should be considered a surgical emergency.

Discussion

Secondary aortoenteric fistula after abdominal aortic aneurysm repair remains a serious complication which requires urgent treatment. Existing case series are limited by the long timescale over which cases are acquired and better outcomes have been attributed to surgical care improving with time rather than the benefits of a certain procedure (Kuestner et al, 1995).

Traditional approaches to repair consisted of graft excision and extra-anatomic bypass (the axillary-bifemoral bypass), graft replacement or a more conservative repair by direct suture. Irrespective of the approach, a meta-analysis quoted procedure-associated mortality at 50% (Kieffer et al, 2004). In the past 10–15 years, developments in endovascular techniques have opened up the possibilities for endovascular repair of such fistulae.

Literature review suggests that the gold standard is removal of the original graft and securing the proximal stump of the aorta, followed by construction of an extra-anatomic axillary-bifemoral bypass. The bowel wall must also be repaired, either by direct suture or through a more

Figure 1. Axial abdominal computed tomography image at presentation, showing gas in the aneurysm wall and an aortoenteric fistula.

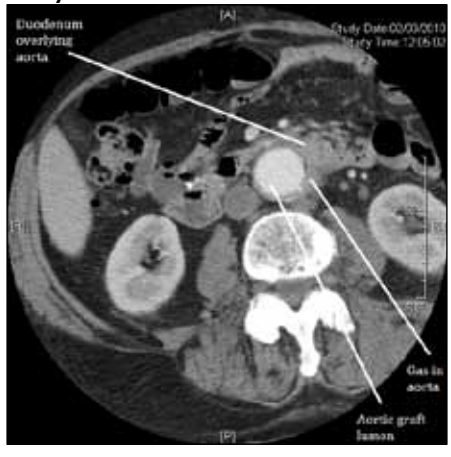

Figure 2. Coronal reformat computed tomography image post-treatment, showing a bifurcated Zenith stentgraft (Cook, Inc) in the abdominal aorta.

Case Report

An 86-year-old ex-smoker (45 pack years) with a background of type 2 diabetes, prostate cancer and intermittent claudication had undergone elective open repair of a 5.7 cm abdominal aortic aneurysm in November 2001, from which he made an uneventful recovery and remained well at 1-year follow up.

In September 2009, he presented with haematemesis, fever and rigors. Blood cultures were negative and an oesophagogastroduodenoscopy was reported as normal. He was discharged.

He re-presented to accident and emergency in February 2010 with a 4-day history of fevers, lethargy, melaena and rigors. On admission, he was pyrexial (39.2°C) and was having rigors. Routine blood tests showed anaemia, neutrophilia and a raised C-reactive protein level. Blood cultures grew *Escherichia coli* without evidence of urinary or respiratory tract infection. An oesophagogastroduodenoscopy indicated an abnormality in the second part of the duodenum that was not consistent with a duodenal ulcer. Computed tomography scans showed a gas bubble around his abdominal aortic graft (*Figure 1*) and he was diagnosed with aortitis and an aorto-duodenal fistula. He was treated with emergency placement of a bifurcated Zenith endovascular stent-graft (Cook, inc) inside the existing graft (*Figure 2*) and was started on long-term oral co-amoxiclav and metronidazole as prophylaxis.

He remains well at 9-month follow up, despite having had three admissions to hospital as a result of peri-aortic infection and sepsis.

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formal resection and anastomosis. However, acute surgery can be challenging in these unstable patients. It is therefore wise to use endovascular stent-grafts to arrest the bleeding on presentation and, after adequate resuscitation, assess the patient's suitability to undergo the axillary-bifemoral bypass. As evidenced by a case report, endovascular stent-graft placement is sufficient in patients who are high risk and unsuitable for surgery but the patient needs to take oral antibiotics for life (Roche-Nagle et al, 2009). That case report did not include a timeframe for follow up and the long-term outcomes of endovascular repair in secondary aortoenteric fistulas need to be studied in further detail. The complications of such a procedure include peri-aortic infection, rebleeding and stent-graft failure and the incidence of these requires further evaluation.

Techniques also need to be developed to reduce the incidence of secondary aorto-enteric fistulas. Overlaying the anastomotic sutures with a portion of graft (Demaria et al, 2002) or omentum have been suggested in the literature and should be adopted as regular practice both as primary prevention during open abdominal aortic aneurysm repair and as secondary prevention after open repair of secondary aorto-enteric fistulas.

It will be interesting to observe the changes in incidence of secondary aorto-enteric fistulas that will occur as endovascular aneurysm repair gains popularity as the first-line treatment for infrarenal abdominal aortic aneurysms. It is probable that the lack of direct contact between bowel wall and suture or graft will see a reduction in the incidence of secondary aortoenteric fistulas, although a review showcases 16 case reports of secondary aortoenteric fistulas developing after endovascular aneurysm repair over a 10-year period (Chenu et al, 2009). BJHM

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LEARNING POINTS

- In patients with aortic grafts presenting with gastrointestinal bleeding, a secondary aortoenteric fistula should be assumed until otherwise proven.
- The gold standard for treatment is removal of the original graft and securing the proximal stump of the aorta, followed by construction of an extra-anatomic axillary-bifemoral bypass. The bowel wall must also be repaired, either by direct suture or through a more formal resection and anastomosis.
- Acute surgery can be challenging in these unstable patients. In patients who are unsuitable for surgery, endovascular stent-graft placement is sufficient but requires the patient to be on a lifelong course of oral antibiotics.
- As endovascular techniques gain popularity as the first-line treatment for abdominal aortic aneurysms it is probable that the lack of direct contact between bowel wall and suture or graft will see a reduction in the incidence of secondary aortoenteric fistulae.