

EMERGENT ENDOVASCULAR REPAIR FOR PRIMARY AORTOENTERIC FISTULA

Isabel Marques^{1*}, Mário Vieira², Ana Ferreira², Rodolfo Abreu², Roger Rodrigues², Luís Vilaça², João Oliveira²

¹ Serviço de Cirurgia Geral do Hospital de Braga, Portugal

² Serviço de Angiologia e Cirurgia Vascular do Hospital de Braga, Portugal

* Corresponding author: isabel.m.marques@hb.min-saude.pt

Abstract

We report the case of a 64-year-old male with significant cardiac comorbidities who reported three episodes of gastrointestinal bleeding. In the third episode, he presented massive hematemesis, anaemia and hypotension. Despite a standard upper endoscopy, a computed tomography (CT) showed an infrarenal abdominal aortic aneurysm and densification of the aortic fat cover. A primary aortoenteric fistula, with acute bleeding and haemodynamic instability, was assumed, and an emergent endovascular repair was performed. Subsequent CT scans and endoscopies demonstrated control of the enteric lesion. After five months, there was no evidence of infection or rebleeding.

Keywords: Aortic Aneurysm, Intestinal Fistula, Gastrointestinal Haemorrhage, Endovascular Procedures, Vascular Surgical Procedures

INTRODUCTION

Primary aortoenteric fistulas (PAEF) are uncommon (0,04-0,07%).¹⁻⁵ However, the incidence may be higher, as 1% of acute aneurysms had an associated PAEF.³ More than 75% of PAEF involve the duodenum, primarily resulting from an abdominal aortic aneurysm (AAA) compression in 83%. Mechanical erosion, contamination with intestinal flora, and subsequent low-grade infection accelerate the penetrating process.¹⁻³ The classic triad, haemorrhage, abdominal pain and pulsating abdominal mass, is present in 11-27,8%.¹⁻⁵ The most frequent signs are blood loss (hematemesis 8%, melena 46%), abdominal or back pain (48%) and shock 33%.³ A sentinel haemorrhage followed by massive bleeding is pathognomonic. The interval between the first bleed and

massive haemorrhage may range from hours to months.¹⁻⁵ Stable patients begin with upper endoscopy; although suggestive findings are present in 25 % of cases^{2,3} it may exclude other causes of bleeding.¹ Computed Tomography (CT) is the preferred initial diagnostic test, with a detection rate of 61%³ and a sensitivity of 85,7%.² The most critical finding is ectopic gas within or adjacent to the aortic lumen, the presence of contrast within the gastrointestinal tract, bowel wall thickening overlying an aneurysm or disruption of the aortic fat cover is indirect signs.³

A treatment option is an extra-anatomic bypass graft and aortic ligation with suture of the bowel lesion (mortality 25-90%); alternatively, in situ, aortic reconstruction can be performed (mortality 27- 40%).¹⁻⁵ Endovascular AEF repair (EV-AEFR) has emerged as a less invasive alternative, par-

ticularly for rapid bleeding control. For ruptured AAAs, an EVAR-first policy in a nonelective setting is recommended nowadays.⁹ For PAEF, it represents either a bridge therapy to control haemorrhage in unstable patients, followed or not by a more definite procedure, as is the case of frail patients. The likely-infected aorta remains in situ, and the gastrointestinal tract remains open.⁴ For septic patients with prohibitive comorbidities to immediate open repair, EV-AEFR could be coupled with percutaneous or open drainage to decrease the risk of persistent sepsis.² Also, endoscopic adjuvant therapies emerged, such as instillation of fibrin sealant into a fistula tract.^{2,10}

Prosthetic material in an infected field is a matter of concern. Therefore, antibiotic therapy should be provided for at least one week following negative cultures. Prolonged antibiotic treatment may be maintained according to the patient's history, physical examination, laboratory tests or imaging exams³.

Nearly all endovascular patients can be discharged home, whereas recovery in dedicated nursing facilities is typical after open repair.² The median overall survival after discharge is more prolonged in the open group, but this is most likely related to the older age and comorbidities in the endovascular group. EV-AEFR seems superior to early survival compared to open surgery, although this benefit is lost by the second year of follow-up.¹

CASE REPORT

A 64-year-old male patient, ECOG Performance Status grade 1, class 2 obesity, hypertensive and type 2 diabetes, was admitted to the Emergency Department with voluminous hematemesis, reporting a previous episode with no medical assistance. He remained hemodynamically normal, esophagogastroduodenoscopy (EGD) showed no lesions, and the patient was discharged home. Two days later, he presented again with massive hematemesis. The patient was septic, with tender epigastrium and no palpable masses. Resuscitative measures were ensured, EGD was normal, and a CT scan revealed an infrarenal AAA of 64 mm diameter, with no signs of rupture and discrete densification of the aortic fat cover (Fig.1). A PAEF with no signs of extensive peri-aortic infection was diagnosed, based on clinical presentation and CT findings. An EV-AEFR was performed (Endurant IIs bifurcated stent graft - Medtronic, Minneapolis, USA), with 124/16mm right limb and 93/13mm left limb), with the percutaneous approach under local anaesthesia, with final angiographic image showing exclusion of the aneurysm without endoleak (Fig.2).

The patient remained stable and was admitted to the Intensive Care Unit for three days. Vancomycin and ceftazolin were given preoperatively, and metronidazole plus ceftriaxone was initiated and prolonged for four weeks. A CT scan forty-eight hours after the procedure showed a reduction of periaortic densification, no signs of endoleak and two infra centimetric gas bubbles at the anterior aortic

wall (Fig.3 A). Endoscopic re-evaluation showed no lesions or bleeding, no evidence of infection, and the blood culture was negative. The control CTs showed: ten days after the procedure, stabilization of the same gas bubbles (Fig.3 B);



Figure 1

CT scan showing a fusiform infrarenal abdominal aortic aneurysm, with a maximum axial diameter of 64mm, with parietal calcifications, intramural thrombosis and an irregular patent lumen; with no signs suggestive of imminent rupture, with discrete densification of the aortic fat cover.



Figure 2

The final angiographic image.


Figure 3

CT scan performed 48 hours after procedure; B. CT scan 10 days after procedure; C. CT scan 3 weeks after procedure.

three weeks after the procedure, a reduction of the aortic diameter to 59mm and reduction of the bubbles previously described (Fig.3 C). The patient was discharged four weeks later, with an antibiotic regime of metronidazole and cefixime, for three months and another nine months of cefixime, enrolling a close follow-up. After five months, the patient remains asymptomatic without evidence of graft infection.

DISCUSSION

This case describes a PAEF diagnosed after a third of massive gastrointestinal bleeding with limited signs of infection, stretching the role of EV-AEFR as a less invasive procedure in a highly morbid condition. However, EV-AEFR may not be a definite treatment, with a high rebleeding rate of 80% after a free interval of two weeks or longer, a 75% of recurrence, leading to a burden of 60% of reintervention⁷. Nevertheless, open repair carries higher morbidity, longer recovery and may not preclude reintervention². Therefore, we chose to perform EV-AEFR to allow for rapid tensional control.

The decision to perform some intestinal procedures is still debated for septic patients. Antibiotics remain important allies of EV-AEFR. There is a higher sepsis-free rate at two years in patients receiving antibiotics for longer than six months, compared with those who received antibiotics for six months or less.⁶ Although no current guideline indicates the best antibiotic regimen, most case series is too small to draw conclusions.¹¹⁻¹⁵ *Staphylococcus aureus* is commonly present on the skin and has been reported to be the most frequently isolated microorganism in endograft infections¹², other Gram-positive cocci (*Enterococcus*, *Streptococcus*) are also commonly present.^{11,12} Bearing in mind the intestinal microbiota, the early administration of broad-spectrum

antibiotics should target gram-positive and gram-negative organisms and anaerobes. Regimens, including vancomycin plus third or fourth-generation cephalosporin, aminoglycoside, fluoroquinolone, or antipseudomonal penicillin with β -lactamase inhibitor, may be considered.^{11,15} Considering local bacterial resistance to fluoroquinolones and an orally available drug for a long course of antibiotics, a cephalosporin plus metronidazole was prescribed. Blood cultures, as in the present case, can sometimes be negative, and a CT scan is used with increasing frequency to raise the likelihood of detecting a graft infection.¹⁶ The time interval to perform an image is not well established, influenced by organizational constraints. However, performing a CT at discharge, at the first and sixth month, one year after the procedure and then yearly after that, has been described.^{12,13} Our patient missed the first month's CT scan once he chose to stay some months abroad, where his family was emigrant. During the hospital stay, a secondary open procedure was considered. However, CT scans did not show a progression of infection; endoscopy ruled out fistula, and blood cultures were negative. Both options were weighed, and a conservative approach was decided due to the patient's clinical stability.

EV- AEFR can shorten hospital stays, having less morbidity and mortality, potentially diminishing health costs and a better quality of life in the short term. Five months after the procedure, our patient remained on antibiotics with close follow-up, asymptomatic, without any evidence of rebleeding or infection. The patient was discharged four weeks later, with an antibiotic regime of metronidazole and cefixime, for three months and another nine months of cefixime, enrolling a close follow-up. After five months, the patient remains asymptomatic without evidence of graft infection. Further, follow-up would be advisable to follow the procedure's long-term result.

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