

Case report

Aorto-oesophageal fistula presenting as a submucosal oesophageal haematoma

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Abstract. The CT findings in a fatal case of aorto-oesophageal fistula secondary to an atheromatous plaque in the thoracic aorta are described. These features are correlated with findings on endoscopy and barium studies.

Aorto-oesophageal fistula (AOF) is a rare cause of upper gastrointestinal haemorrhage, occurring most commonly in association with thoracic aortic aneurysms, foreign bodies, oesophageal malignancy, the presence of an aortic prosthetic graft or following trauma [1]. Only three cases of aorto-oesophageal fistula secondary to a ruptured atherosclerotic ulcer in the thoracic aorta, without aneurysmal dilatation, have been described in the literature [1].

The radiological findings of a patient with primary aorto-oesophageal fistula secondary to a ruptured atheromatous ulcer of the thoracic aorta are presented. The diagnosis of AOF is rarely made pre-mortem, but should be suspected when there is a combination of suggestive clinical and radiological features [1]. This report illustrates the value of computed tomography in the appropriate clinical setting.

Case report

An 80-year-old Caucasian female presented with a 3 h history of frank haematemesis. There was no preceding vomiting or abdominal pain. There were no risk factors for upper gastrointestinal haemorrhage such as previous peptic ulcer disease, chronic liver disease or ingestion of non-steroidal anti-inflammatory drugs.

The patient was haemodynamically stable on admission but was anaemic. Upper gastrointestinal endoscopy showed a submucosal mass in the distal oesophagus. Contrast enhanced dynamic CT of the thorax was then performed following an intravenous bolus of 100 ml of non-ionic contrast medium at a rate of 2.5 ml s^{-1} with a scan delay time of 20 s. A $4 \times 4 \text{ cm}$ mass of low attenuation

in the mid-oesophagus contained extravasated contrast medium from the adjacent thoracic aorta (Figure 1). These findings suggested an aorto-oesophageal fistula. The aorta, although slightly dilated, showed no evidence of focal aneurysm and measured 3 cm at the site of AOF. The oesophagus above and below this mass appeared normal apart from some mild mucosal thickening. A barium swallow showed almost complete obliteration of the lumen of the mid-oesophagus by a submucosal mass (Figure 2). A differential diagnosis of a submucosal mass such as a leiomyoma, spontaneous intramural oesophageal haematoma or oesophageal tumour was considered. The presence of contrast medium within the oesophageal mass on CT made these differential diagnoses less likely, and raised the possibility of AOF. However, AOF was thought to be unlikely in the absence of a typical causative pathology. A massive



Figure 1. A large contrast filled peri-aortic mass is outlined contiguous with the atherosclerotic descending aorta.

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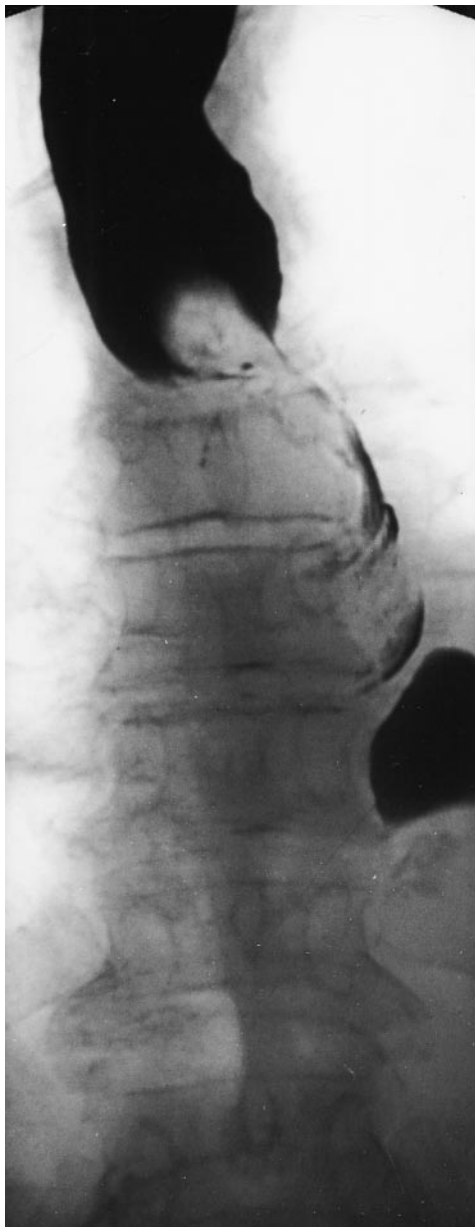


Figure 2. Barium swallow showing an obstructing intramural mass in the lower oesophagus.

haematemesis immediately following the barium swallow led to the patient's death.

Post-mortem examination demonstrated a large submucosal haematoma in the mid-oesophagus which communicated directly with the adjacent aortic lumen (Figures 3a and b). The remainder of the oesophagus was normal with no evidence of neoplastic disease. The aorta showed no aneurysmal dilatation although there were atheromatous changes. The pathological findings were diagnostic of an AOF secondary to a ruptured atheromatous ulcer of the aorta.

Discussion

Aortoenteric fistula is a rare cause of upper gastrointestinal haemorrhage and accounts for

3.5% of deaths from upper gastrointestinal haemorrhage [2]. Most aortoenteric fistulas are located in the third part of the duodenum and are associated with aneurysm or prosthetic replacement of the abdominal aorta. However, aortoenteric fistulae have been reported along the length of the gastrointestinal tract from the oesophagus to the rectum [3].

Approximately 500 cases of aorto-oesophageal fistula have been reported in the literature. 87% of AOFs are due to thoracic aortic aneurysms, oesophageal malignancies, foreign body ingestion, following thoracic aorta reconstructive surgery, following trauma and secondary to corrosive oesophagitis [1]. Rupture of an atheromatous thoracic aortic ulcer is a rare cause of AOF. Hollander and Quick reviewed 500 cases of AOF in the literature, of which only three cases were due to ruptured atheromatous plaque [1].

The pre-operative diagnosis of AOF was established in only 33% of reported cases [4]. The diagnosis was made at surgery or at post-mortem in the remaining cases. AOF is usually suspected more readily in patients with thoracic aortic aneurysms and prosthetic aortic grafts. In the presence of a prosthetic graft, the development of upper gastrointestinal haemorrhage and/or sepsis should suggest the possibility of AOF [4]. The mean time for development of AOF in patients with prosthetic grafts is 15 months [5].

In the absence of clinical suspicion of AOF, no single examination reliably makes the diagnosis [1]. Many authors feel that upper gastrointestinal endoscopy is the most useful first investigation in patients with AOF [6]. Endoscopy will usually exclude the more common causes of gastrointestinal haemorrhage and may demonstrate a pulsatile submucosal oesophageal mass. There have been previous reports of the value of contrast enhanced CT in AOF although demonstrations of true aorto-oesophageal communication are rare [7]. In the CT evaluation of a patient with suspected AOF, close attention to technique is essential. Helical CT facilitates accurate examination of the aortic wall and lumen and makes three-dimensional reconstruction possible. Comparison of pre- and post-contrast CT scans is essential for differentiating AOF from the main differential diagnoses which are submucosal masses such as a leiomyoma, spontaneous intramural oesophageal haematoma or oesophageal tumour.

In this case, CT was the most useful investigation as it demonstrated a peri-oesophageal mass and also suggested a communication between the oesophagus and aorta. Upper gastrointestinal endoscopy, however, was valuable as it ruled out other more common causes of upper gastrointestinal bleeding and indicated the presence of a submucosal haematoma. In contrast to the widely held view



(a)



(b)

Figure 3. (a) Note the probe outlining the aorta-oesophageal fistula. (b) View of the opened oesophagus showing the submucosal haematoma (arrow) and the ruptured haematoma.

that conventional barium studies do not have a significant role in the diagnosis of AOF [4], the barium swallow confirmed the presence of a significant submucosal mass which had almost completely obliterated the oesophageal lumen. Furthermore, the barium swallow suggested that a significant increase in size had taken place since the endoscopy. Barium swallow has the major disadvantage that it will interfere with later angiography and therefore oral contrast should be withheld until angiography is complete.

References

1. Hollander JE, Quick G. Aorto-oesophageal fistula: A comprehensive review of the literature. *Am J Med* 1991;91:279-87.
2. Kane JM, Meyer KA, Kozoll DD. An anatomical approach to the problem of massive gastrointestinal haemorrhage. *Arch Surg* 1955;70:570-82.
3. Champion MC, Sullivan SN, Coles JC, Golbach M, Watson WC. Aortoenteric fistula: incidence, presentation, recognition, and management. *Ann Surg* 1982;195:314-7.
4. Goldstone J, Cunningham CC. Diagnosis, treatment and prevention of aorto-enteric fistulas. *Acta Chir Scand Suppl* 1990;555:165-72.
5. Seymour EQ. Aorto-oesophageal fistula as a complication of aortic prosthetic graft. *AJR* 1978;131:160-1.
6. Sosnowik D, Greenberg R, Bank S, Graver LM. Aorto-oesophageal fistula: early and late endoscopic features. *Am J Gastroenterol* 1988;83:1401-4.
7. Mark A, Moss AA, Lusby R, Kaiser JA. CT evaluation of complications of abdominal aortic surgery. *Radiology* 1983;145:409.
8. Carter R, Mulder GA, Snyder EN, Brewer LA. Aorto-oesophageal fistula. *Am J Surg* 1978;136:26-30.