Successful Endovascular Management of a Case of Aorto-oesophageal Fistula Presenting as Life Threatening Upper Gastrointestinal Bleed

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Introduction: Aorto-oesophageal fistula is a rare but life threatening cause of upper gastrointestinal haemorrhage. Severity of the presentation and complexity of subsequent management depends on the size of the defect on both the aortic side and oesophagus.

Report: The patient was a 67 year old Chinese man, who presented initially with a Stanford type A dissection with caudal extension to the right common iliac artery. The patient underwent replacement of the ascending aorta and proximal arch with debranching of the right innominate artery and aortic valve replacement. A follow up computed tomography (CT) aortogram done in the post-operative period showed a stable appearance of the caudal extension of the aortic dissection. The patient was discharged with a plan for future stenting of the thoracic aorta. Three weeks later the patient re-presented with an upper gastrointestinal bleed from an aorto-oesophageal fistula. The patient underwent endovascular stenting of the descending aorta for management of the fistula. Repeat oesophagogastroduodenoscopy showed a small erosion 35 cm from the incisors where the previous bleeding site had been. No further bleeding was seen.

Discussion: The patient recovered uneventfully after the procedure. Follow up CT aortogram done at 6 weeks demonstrated thrombosis of the false lumen of the descending thoracic aorta. Aorto-oesophageal fistula related to chronic type B aortic dissection is an extremely rare clinical entity and presents a challenge to the treating surgeon. This case demonstrates that selected cases can be judiciously managed by thoracic endovascular aneurysm repair alone.

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INTRODUCTION

Aorto-oesophageal fistula is a rare but life threatening cause of upper gastrointestinal (GI) haemorrhage. The severity of the presentation and complexity of subsequent management depends on the size of the defect on both the aortic side and in the oesophagus. If left untreated it is likely to cause recurrent bleeds and may cause exsanguination. Herein, a case of aorto-oesophageal fistula related to type B aortic dissection which was managed by endovascular stenting, is presented.

CASE REPORT

The patient was a 67 year old Chinese man with no major past medical history who presented initially with severe left sided jaw pain radiating to the back. An initial computed tomography (CT) aortogram showed a Stanford type A dissection with caudal extension to the right common iliac artery. All the visceral branches were arising from the true lumen. The patient underwent replacement of the ascending aorta and proximal arch with debranching of the right innominate artery and aortic valve replacement, by the cardiothoracic surgery team. Post-operatively, the patient recovered well, without any complications. Follow up CT aortogram done on post-operative day 7 revealed stable appearance of the caudal extension (type B component) of the aortic dissection. All the visceral branches except the right renal artery, were arising from the true lumen. The patient was discharged home with a plan for future endovascular stenting of the thoracic aorta (for the type B component).

Three weeks later the patient re-presented complaining of several episodes of melaena followed by one episode of massive haematemesis. On arrival at hospital, the patient’s haemoglobin was 6.8 g/dL. He was appropriately resuscitated and an urgent oesophagogastroduodenoscopy (OGD) was carried out, which showed active spurting at the midoesophagus arising from a visible vessel (nipple sign)
(Fig.1) with an underlying pulsating mass without any visible ulcer, suggestive of an aorto-oesophageal fistula. The patient was hypotensive at the time of the procedure and was subsequently resuscitated in the high dependency unit. An urgent CT aortogram was done, which showed a stable appearance of the dissection flap and did not demonstrate any contrast extravasation or any aorto-oesophageal fistula. The oesophagus was seen to be extremely compressed by the aorta at the level corresponding to the bleeding point in the oesophagus (Fig.2). All the supra-ortic branches were patent (Fig.3) and there was no suggestion of visceral malperfusion. After extensive discussion with the patient and his family regarding possible operative options for the aortic dissection the patient underwent endovascular stenting of the descending aorta. A stent graft was deployed at the origin of left subclavian artery in the true lumen. Even after balloon moulding with a CODA balloon, the false lumen was still being perfused. Hence, an proximal extension was introduced and deployed distal to the left common carotid artery origin. Following this there was only a trickle of flow seen into the false lumen in a much delayed phase. A third stent was deployed to just above the coeliac artery, overlapping proximally with the stent grafts (Fig.4). Completion aortogram showed preserved perfusion of the visceral branches. A repeat OGD was carried out at the same time and showed a small erosion 35 cm from the incisors where the previous bleeding site had been. No further bleeding was seen. The patient recovered uneventfully after the procedure. He was slowly weaned to a normal diet. The patient was not on anticoagulants in the post-operative period. Haemoglobin was monitored serially and there was no further drop. The patient was discharged on post-operative day 6. Follow up CT aortogram done six
weeks post-operatively demonstrated thrombosis of the false lumen of the descending thoracic aorta (Fig.5). The patient was started on lifelong oral antibiotics and to date has been followed up for 3 years with CT scans which have shown the thrombosed false lumen to be decreasing in size with no evidence of infection or repeat haemorrhage (Fig.6).

**DISCUSSION**

Cases of primary aorto-oesophageal fistula associated with aortic dissection are extremely rare. Most of the cases reported in the literature have been associated with thoracic aortic aneurysm or penetrating aortic ulcer. The fistula appeared to arise from the false lumen hence it was thought that reduction of the false lumen by covering the entry point would stop the bleed. Endovascular stenting of the true lumen may have covered the entry point to the false lumen at the descending thoracic aorta, but the false lumen would still have been perfused through communication with the true lumen at a lower level. However, the perfusion pressure in the false lumen would have reduced significantly, owing to coverage of entry tear. There was uncertainty as to whether the thoracic endovascular stenting would have achieved complete thrombosis of the false lumen. An alternative treatment modality would have been an open repair. This would have been a major procedure, which is known to be associated with high morbidity. Different series have reported a morbidity rate in the range of 20–30% for open repair of type B aortic dissection. All these factors had to be taken into account prior to making the decision to proceed with endovascular stenting of the thoracic aorta.

Various surgical techniques have been described in the literature for repair of aorto-oesophageal fistulas. The mainstay of surgical management is quick control of the aortic defect (either by means of endovascular stenting, extra-anatomic bypass, or by antibiotic soaked graft repair) followed by immediate repair of the oesophageal defect. Another option would be immediate defunctioning followed by definitive repair at a later date. However, these are more common in the context of chronic infection leading to development of the fistula. In this case, thoracic endovascular aneurysm repair (TEVAR) allowed rapid control of the aortic defect. The oesophageal lesion, as demonstrated by both OGDs, was small and therefore it was appropriate to treat it conservatively at this point. Subsequently, the patient did not show any signs of mediastinitis or any other complication from what appeared to be a pinpoint lesion in the oesophagus. Had this defect been larger then it would have required repair of the oesophagus with an intercostal muscle flap.

**CONCLUSION**

Aorto-oesophageal fistula related to type B aortic dissection is an extremely rare clinical entity and presents a challenge to the treating surgeon. The present case demonstrates that selected cases can be judiciously managed by TEVAR alone.

**CONFLICT OF INTEREST**

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