TECHNICAL REPORT

Aberrant Right Subclavian Arterioesophageal Fistula: Endovascular Occlusion via a Transbrachial Approach

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Introduction

Arterio-oesophageal fistulae are a rare cause of haematemesis and are frequently fatal. Such fistulae have been reported to involve the thoracic aorta or aberrant right subclavian artery. They may be associated with aneurysmal degeneration of the artery, an aortic graft and prolonged nasogastric intubation. In the latter situation the severity of the situation is complicated by the uncertain diagnosis and the difficulties stopping the haemorrhage sufficiently quickly. We present the first documented case of a patient with an aberrant right subclavian arterioesophageal fistula successfully treated by an endovascular repair via a brachial approach.

Case Report

A 24-year-old man required prolonged intensive care after polytrauma, with extensive burns and fractures of the lower thoracic vertebrae and pelvis. After 31 days of tracheotomy and nasogastric intubation, he suddenly developed massive bright red haematemesis, with hypovolaemic shock, necessitating urgent resuscitation and massive transfusion. At this time the patient was haemodynamically stable. Upper gastrointestinal endoscopy was not feasible due to continued massive blood loss. An urgent cervico-thoracic CT scan demonstrated a previously unsuspected aberrant right subclavian artery in contact with the nasogastric tube (Fig. 1). The patient was transferred immediately to the operating room.

A 7-French standard introducer was inserted into the exposed right brachial artery. Arteriography confirmed the diagnosis, with a typical contrast leak. After passing of fistula with a 0.035 hydrophilic J guide wire and determining the arterial diameter, the bleeding was controlled by inflating a balloon (7 mm by 20 mm) in the subclavian artery. Thereafter the patient was stabilised haemodynamically. The subclavian origin was then ligated via a left antero-lateral thoracotomy. His right arm was revascularised by carotido-subclavian transposition. After a protracted course the
patient was successfully weaned from haemodialysis and endotracheal intubation. There was no complication of the combined endoluminal and surgical treatment. The patient was eventually discharged after 4 months.

**Discussion**

Although an aberrant right subclavian artery is the most frequent anatomical anomaly of the aortic arch, only 11 cases of iatrogenic fistula related to prolonged esophageal intubation have been reported. Only three patients have survived. This high mortality is explained by injury to an unsuspected major vessel and the simultaneous need for urgent resuscitation and rapid control of bleeding. Surgical repair can be difficult and may take considerable time to achieve.

Miller et al. have reported successful intraoesophageal balloon tamponade to control haemorrhage. Arteriography is the investigation of choice to confirm the diagnosis of arterioenteric fistula, hence Hirakata has described temporary endovascular occlusion from a femoral approach. In our case subsequent management was directed by CT scan. The right transbrachial approach enabled straightforward retrograde catheterisation of the aberrant subclavian artery to both confirm the diagnosis and control the haemorrhage. Before conventional surgical treatment, a balloon may be inflated above the lesion to stop the arterial flow and thus decrease bleeding. The placement of a 1 mm oversized balloon enabled us to rapidly and efficiently control the arterioesophageal fistula. In addition angiography was carried out via brachial introducer left in place. A covered stent was not used, because of the risk of the infection. The transbrachial artery approach has few indications in vascular emergency although it has been used for subclavian arterial injuries instead of the transfemoral route.

This case illustrates the advantage of endovascular occlusion in the management of major arterial injuries in the operating room prior to definitive treatment. This technique can be used in selected cases of angiographically identified arterial injuries in which operative exposure is likely to be difficult or cause significant blood loss.

**References**


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