CASE REPORT

Black necrotic oesophagus following the use of biodegradable stent for benign oesophageal stricture

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Abstract

Biodegradable stents are increasingly being used for benign oesophageal conditions that include refractory strictures and perforations. Acute oesophageal necrosis has been reported with various other conditions but none due to the insertion of biodegradable stents. A 58-year-old male presented as an acute emergency in severe haemodynamic shock. Investigations confirmed an oesophageal perforation. He underwent an emergency surgical intervention that identified extensive necrosis of the oesophagus requiring thoracic oesophagectomy, cervical oesophagostomy and a feeding jejunostomy as a damage control procedure. This was followed a month later, by successful reconstruction using a gastric conduit. This is the first reported case of a necrosis of the oesophagus following insertion of two biodegradable stents for a benign oesophageal stricture and highlights this rare but very serious life-threatening complication.

INTRODUCTION

Biodegradable stents are increasingly being used for benign oesophageal conditions that include refractory strictures and perforations. Acute oesophageal necrosis has been reported with various other conditions but none due to the insertion of biodegradable stents.

We report a case of a necrosis of the oesophagus following insertion of two biodegradable stents for a benign oesophageal stricture.

CASE REPORT

A 58-year-old man was admitted to a District General Hospital (DGH) in severe haemodynamic shock. His past medical history included alcohol abuse, epilepsy and gastro-oesophageal reflux disease leading to refractory gastro-oesophageal junctional stricture that required two biodegradable stent insertions within 20 months. Medications included sodium valproate, thiamine and vitamin B compound.

On admission, he had a Glasgow Coma Scale of 3 requiring aggressive resuscitation in the Intensive Care Unit (ICU). Contrast computed tomography (CT) chest showed mediastinitis, bilateral pleural effusions and free air around the distal posterior oesophagus (Fig. 1). A gastrograffin swallow confirmed an oesophageal perforation. He was transferred to the local specialist Upper Gastro-Intestinal Unit for further management.

The patient underwent emergency surgical intervention. A right postero-lateral thoracotomy was performed that showed extensive oesophageal necrosis (~10 cm of sub-carinal oesophagus). Damage control surgery was performed due to the progressive intraoperative haemodynamic instability. The necrotic segment of the oesophagus was resected, and proximal and distal ends of the oesophagus were stapled followed by a cervical oesophagostomy and a feeding jejunostomy. Histology showed microscopic features of acute severe transmural inflammation with necrosis of the mucosa and patchy full thickness necrosis of the muscle wall. Vessels exhibited acute inflammatory thrombus and vasculitis, features that were consistent with acute oesophageal necrosis.
He underwent six sessions of endoscopic balloon dilatations for his intractable dysphagias. Biodegradable self-expanding stents that are utilisable for such patients with refractory dysphagia. These stents are made of a biodegradable synthetic material (polydioxanone) and a semi-crystalline polymer monofilament that degrades by the random hydrolysis of its molecule ester bonds [3]. Following insertion, stent integrity and radial force are usually maintained for 6–8 weeks, and disintegration occurs between 11 and 12 weeks. Dual flared ends decrease the risk of migration, and radio-opaque markers in the middle and at both ends assist in their fluoroscopic deployment [4]. The length of the ELLA BD stent ranges between 60 and 135 mm, and the diameter of the flared ends and shaft are 30 and 25 mm, respectively [5]. Following their deployment, the stent progressively expands to its preformed diameter. Reported complications of biodegradable stents include retrosternal pain and stent migration. However, there are some recent reports of biodegradable oesophageal stents eroding into the tracheobronchial tree causing airway compromise [5], severe tissue reaction with hyperplastic in- and overgrowth causing stent obstruction [3] and even oesophageal obstruction due to their collapse [3, 6].

Acute oesophageal necrosis, a very rare condition of unknown aetiology, is defined as ‘a dark, pigmented state of the oesophagus’ (“black oesophagus”), with mucosal and submucosal necrosis at histology’ [7]. Rejchrt et al. have reported three cases of acute oesophageal necrosis found on endoscopy, of which two patients died due to their underlying disease. Other predisposing factors identified for this life-threatening condition include anticardiolipin antibody syndrome, herpes oesophagitis, severe diabetic ketoacidosis, gastric volvulus and ruptured thoracic aortic aneurysm.

To our knowledge, this is possibly the first reported case of a biodegradable stent as a predisposing factor for acute oesophageal necrosis. We feel that as these stents are becoming increasingly popular especially for these difficult cases of benign refractory dysphagias, it is important to be aware of this serious life-threatening complication. This case highlights need for further long-term follow-up studies and the reporting of complications for these biodegradable stents.

**CONFLICT OF INTEREST STATEMENT**

None declared.

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