CASE REPORT

Benign oesophageal disease: 4 cases managed at a teaching hospital in Ndola, Zambia

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Abstract

Benign oesophageal stricture disease presents with slowly progressive dysphagia and minimal weight loss. Progression of the disease results in total dysphagia, malnutrition, and psychosocial complications that compel patients suffering from this condition to seek an oesophagectomy as their last definitive treatment option. Upper gastrointestinal (GI) endoscopy with tissue biopsy and barium swallow are important for evaluating the sequelae of oesophageal stricture disease, with endoscopy being the gold-standard evaluation procedure. Transhiatal oesophagectomy, as opposed to the Ivor Lewis procedure, is the preferred corrective procedure because it avoids a thoracotomy and intrathoracic anastomosis. Gastric conduits are the conduits of choice, followed by colonic conduits. Jejunal conduit placement is technically challenging as it requires microvascular anastomosis techniques. Colonic conduits are preferred for patients with lesions above the T1 vertebra or more proximal strictures, and those with expected long-life survival because the colon undergoes differential growth. Reconstructive procedures for patients with benign oesophageal strictures are not common in poorly resourced settings. In Zambia, such patients have historically been managed with feeding gastrostomies and/or referred abroad for reconstructive surgery. In this article, we present our maiden experience of reconstructive surgical management of benign oesophageal strictures by using both Ivor Lewis and transhiatal oesophagectomy procedures, performed at Ndola Teaching Hospital, Zambia.

Keywords: benign oesophageal stricture, dysphagia, caustic stricture, oesophageal reconstruction, gastric conduit, colonic conduit, transhiatal, Ivor Lewis oesophagectomy, Zambia

Introduction

The causes of oesophageal stricture disease can be classified into 3 types: intrinsic (pertaining to inflammation or neoplasm of the oesophageal wall), extrinsic (pertaining to invasion or compression of the oesophagus), and neuromuscular disturbance of oesophageal peristalsis (pertaining to failure of the muscle to relax).[1] They can also be classified as benign or malignant. Benign oesophageal strictures result in slow progression of dysphagia with minimal weight loss, whereas the malignant type results in a rapid progression of dysphagia with significant weight loss.[1]

Caustic ingestion and infectious oesophagitis (candida, herpes simplex virus, cytomegalovirus, and HIV) are among the common causes of strictures in developing countries.[1]-[3] Caustic injuries are caused mainly by accidental (in children) or suicidal (in adults) ingestion of alkalis or acids.[4]-[6] Caustic substances cause mucosal injury with no selective preference of mucosal subsites, in contrast to the old belief that alkalis preferentially affect the oesophagus and acids the stomach.[7]-[10] The mechanisms of injury of alkalis and acids are by liquefactive necrosis and coagulative necrosis, respectively.[11] Scar retraction in caustic injuries results in benign strictures.[12]

The purpose of this article is to report our experience in managing 4 patients with dysphagia due to benign oesophageal strictures at Ndola Teaching Hospital, a tertiary referral centre in Ndola, Zambia.

Case descriptions and management

Our patient cohort consisted of 3 men and 1 woman (Table), the youngest being 21 years of age and the oldest 43 years. All 4 patients were electively and definitively managed with open surgical procedures. The patients were referred with established dysphagia to Ndola Teaching Hospital from their base hospitals. The acute phase of the illness had been treated at their respective base hospitals. To optimize outcomes, all 4 patients were medically and surgically managed for chronic oesophageal stricture disease. Medical management involved fluid resuscitation, pain management, serum electrolyte balance, glycaemic control, thromboprophylaxis, and

Table. Demographic and clinical details

Variable	Patient 1	Patient 2	Patient 3	Patient 4
Age, years	21	43	31	23
Sex	Male	Female	Male	Male
Cause of stricture	Suicidal caustic ingestion	Candida oesophagitis (with underlying HIV infection)	Suicidal caustic ingestion	Suicidal caustic ingestion
Previous operation	Feeding gastrostomy	Feeding gastrostomy	Feeding gastrostomy	Feeding gastrostomy
Indications for oesophagectomy	Socioeconomic, nutritional	Socioeconomic, psychological	Socioeconomic, nutritional, psychological	Socioeconomic nutritional
Type of oesophagectomy	Ivor Lewis	Transhiatal	Transhiatal with feeding jejunostomy	Transhiatal
Estimated blood loss, mL	<500	1500	<500	<500
Prophylactic antibiotics	2 doses	2 doses	2 doses	2 doses
Conduit used	Right colon	Stomach	Stomach	Stomach
Intensive care unit admission, days	6	6	6	6
Mode of feeding	Total parenteral nutrition	Total parenteral nutrition	Feeding jejunostomy	Total parenteral nutrition
Oral feeding	Nil	Day 7	Nil	Day 8
Anticoagulants	Nil	Enoxaparin 40 mg once daily after 3 postoperative days	Enoxaparin 40 mg once daily after 3 postoperative days	Enoxaparin 40 mg once daily after 3 postoperative days
Transient hoarseness of voice	Nil	Yes	Nil	Nil
Anastomotic leak	Nil	Nil	Yes (cervical anastomosis)	Nil
Morbidity	Nil	Splenectomy due to uncontrollable bleeding	Severe sepsis due to surgical site infection	Nil
Mortality	Sudden death on postoperative day 6	Nil	Died on postoperative day 28	Nil

nutritional support. Surgical management comprised feeding gastrostomy for nutrition, followed by oesophagectomy (Ivor Lewis or transhiatal oesophagectomy) with a conduit to maintain continuity of the gastrointestinal tract.

The indications for oesophagectomy included inability to afford feeds (socioeconomic), malnutrition and fluid/electrolyte imbalance (nutritional), and clinical depression or negative emotions (psychological).

Figure 1 shows a preoperative radiographic image (barium swallow) of Patient 2, with proximal oesophageal dilatation and no passage of barium into the distal oesophagus and stomach.

Figures 2, 3, 4, and 5 show operative steps taken to mobilize oesophageal replacement conduits and their anastomoses. Figure 2 shows mobilization of a gastric conduit and Figure 3 shows a cervical oesophagogastric anastomosis. Figure 4 shows mobilization of a right colonic conduit in preparation for oesophagocolonic anastomosis in (Figure 5).

Discussion

Three patients had oesophageal strictures due to caustic injuries and were young (aged 21, 31, and 23 years), consistent with the findings of other authors.[1] The 43-year-old woman had an inflammatory proximal oesophageal stricture in advanced HIV due to candidiasis, a well-recognized cause of proximal and mid-oesophageal stricture in HIV.[1]

All 4 patients had total dysphagia due to benign proximal, long oesophageal stricture formation. They had significant malnutrition and were referred for surgical management of the dysphagia. For all 4 patients, the oesophageal stricture diagnoses were confirmed by barium swallow and endos-

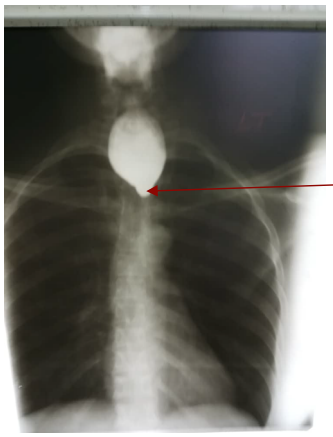

Figure 1. Patient 2's preoperative barium swallow

She was a 43-year-old woman with HIV and oesophageal stricture formation secondary to candida oesophagitis. She had this stricture for 3 years before surgery. She was depressed and had difficulty taking her daily antiretroviral therapy.

copy with biopsy.[1],[10] The causes of benign oesophageal stricture formation in our patients included caustic injuries and oesophageal candidiasis in advanced HIV disease (with a CD4 count of 208), which are established causes of oesophageal strictures.[1]

The main problems our patients developed due to total dysphagia were malnutrition, spitting of saliva and eating via a feeding tube in public, which often caused embarrassment. The patients felt rejected by society and became emotionally distressed, leading to depression. As a result, all 4 patients requested corrective surgery, the final intervention for reestablishing gastrointestinal continuity.

Our surgical management of the patients aimed at reestablishing gastrointestinal continuity, a critical determinant of quality of life after oesophagectomy. Morbidity[11] and complication rates (with highest mortality among gastrointestinal procedures) are estimated at 3% to 23%.[12]-[15] An ideal replacement of the oesophagus would allow for sufficient length and intrinsic motility to facilitate movement of food boluses and would minimize reflux.[11] Such a conduit does not exist, but some autologous oesophageal replacement tissue achieves acceptable function.[11] In our case, oesophageal replacement (conduit) options were determined intraoperatively and included the stomach and colon, in that order of preference.[11] We used gastric conduits for 3 of our patients (patients 2, 3, and 4) due to its sufficient length, its predictable vascular supply, and its requiring only 1 anastomosis, unlike for the 21-year-old man (Patient 1), for whom we used an isoperistaltic right colonic conduit. This patient had scarring in the antral and pyloric stomach regions, contraindicating the use of a gastric conduit.[11]

Proponents of the colonic conduit recommend it for its substantial length (ideal for oesophageal strictures above T1), its ability to undergo differential growth (ideal in patients with long life expectancies), its resistance to damage by acid, and the presence of an ileocecal valve that can prevent reflux.[11]-[16] Disadvantages of the colonic conduit include the development of native colon disease, loss of absorptive capacity that results in diarrhoea, increased risk of an anastomotic leakage, and it requires a longer and more technically demanding procedure.[17]-[20] Some surgeons prefer to use the left colon because of its smaller diameter, resistance to chronic dilatation, more reliable blood supply, adequate length, and ability to propel solid food,[11],[13],[21],[22] but we used the right colon for our 21-year-old male patient.

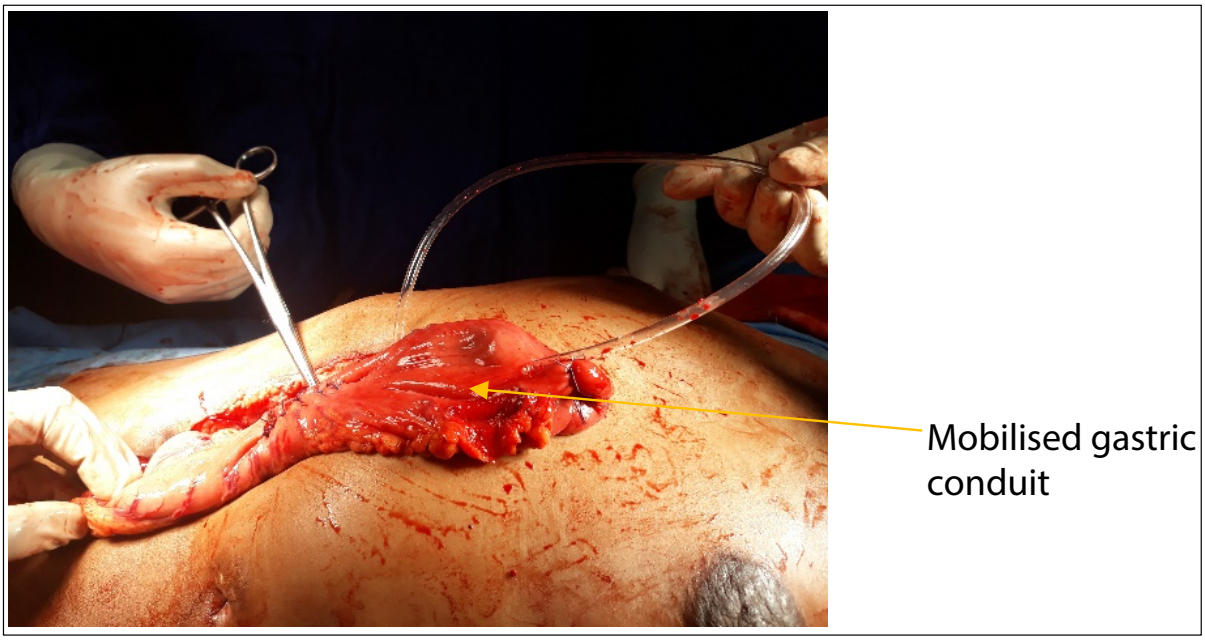

Figure 2. Intraoperative picture of the Patient 2's (43-year-old female) mobilized gastric conduit

The right colon equally gives good results, and our centre has preferential experience with it.

We did not perform any preoperative investigations to assess the suitability of using a colonic conduit for any of our 4 patients. However, they all received mechanical colon preparation before surgery. Some centres have reported the use of colonoscopy and computed tomography arteriography to investigate the patency of the superior and inferior mesenteric arteries and their branches that contribute to the anastomoses that make up the artery of Drummond.[11]

We did not use a jejunal conduit for any of our patients because many studies report that the jejunal mesentery inhibits a surgeon's pull-up and risks mesenteric injury.[23] Additionally, reduced arterial blood supply[11] and venous drainage[24] of the distal conduit result in inadequate length to reach the neck without microvascular anastomoses.[11] Competence to perform microvascular anastomosis, although available in Zambia, is yet to be employed in gastrointestinal grafts.

Three patients (patients 2, 3, and 4) underwent transhiatal oesophagectomies with gastric conduits, and 1 (Patient 1) underwent the Ivor Lewis procedure with a right colonic conduit. Barreto et al.[25] note the advantage in the transhiatal procedure of diminished respiratory complications by avoiding a thoracotomy and intrathoracic anastomosis, which can lead to mediastinitis.[25]

Intraoperative complications were recorded in 2 of the 4 patients: the 43-year-old woman (Patient 2) and 31-year-old man (Patient 3). The former had uncontrollable bleeding from the spleen due to iatrogenic injury, which resulted in a splenectomy for haemorrhage control; the latter, despite normal preoperative electrocardiograph findings, had 2 cardiac arrests and, therefore, high morbidity. Resuscitation was successful on both occasions and adrenalin infusion to support cardiac function was administered until the sixth postoperative day. The 31-year-old man was intubated for 6 days while the other 3 were extubated 24 hours postoperatively.

The patients' recovery courses included 6 days in the intensive care unit, followed by 3 days in the surgical high-dependency unit and 5 days in the general ward. The 23-year-old man and the 43-year-old woman were discharged on postoperative day 14. We had 2 deaths: the 21-year-old man suddenly died on postoperative day 6, and the 31-year-old man succumbed to severe sepsis due to a cervical oesophagogastric anastomotic leak on postoperative day 21. Nasogastric tubes (NGTs) were removed on postoperative day 6 for the 43-year-old woman and the 23-year-old man. NGTs were not removed for the 21-year-old man and the 31-year-old man, both of whom eventually died. All 4 patients received total parenteral nutrition for the first 6 days following surgery, except for the 31-year-old man, who had a feeding jejunostomy inserted intraoperatively; oral feeding was introduced on postoperative day 7 for patients 2 and 4. Jejunostomy feeding was started on day 2 because of hypoglycaemic spells due to delayed dumping syndrome.

During recovery, the 31-year-old man developed a neck abscess on postoperative day 6, which was treated with drainage, debridement, reinforcement of gastroesophageal anastomosis, and exposure of the wound site by releasing wound sutures. Blood and pus cultures for this patient had no growth. Paul et al.[26] note that anastomotic leakage is common in cervical gastro-oesophageal anastomosis due to the possibility of high tension and ischaemia at the anasto-

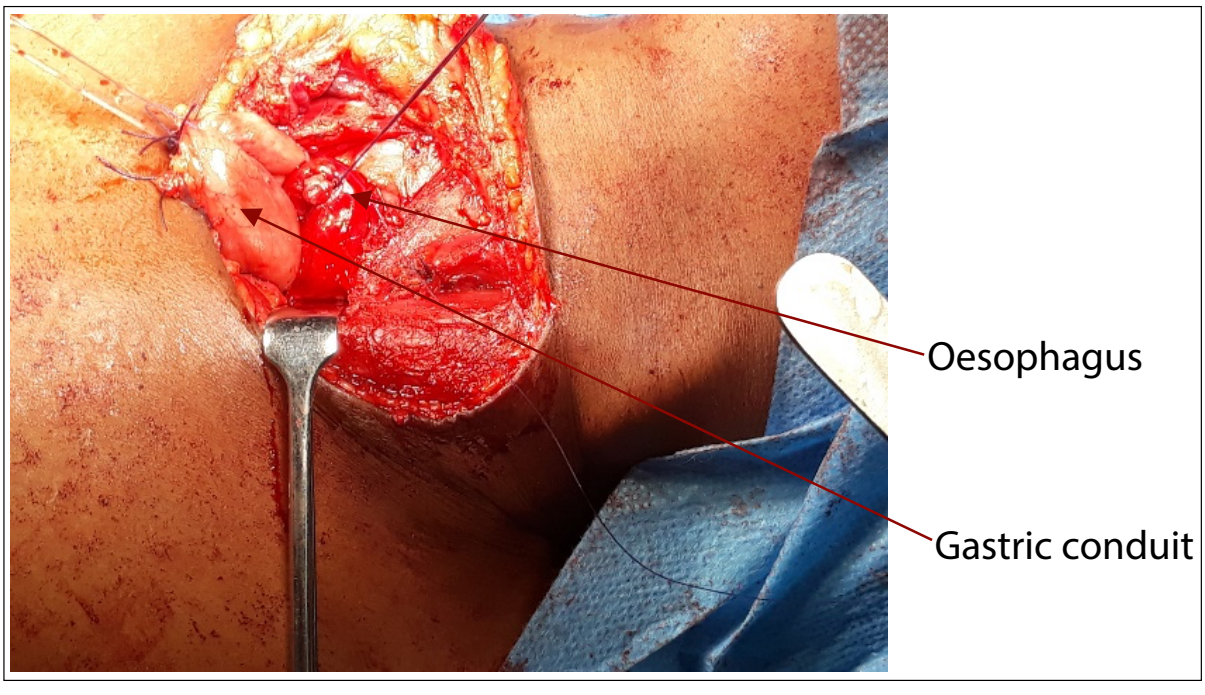

Figure 3. Cervical gastro-oesophageal anastomosis in a 43-year-old woman (Patient 2)

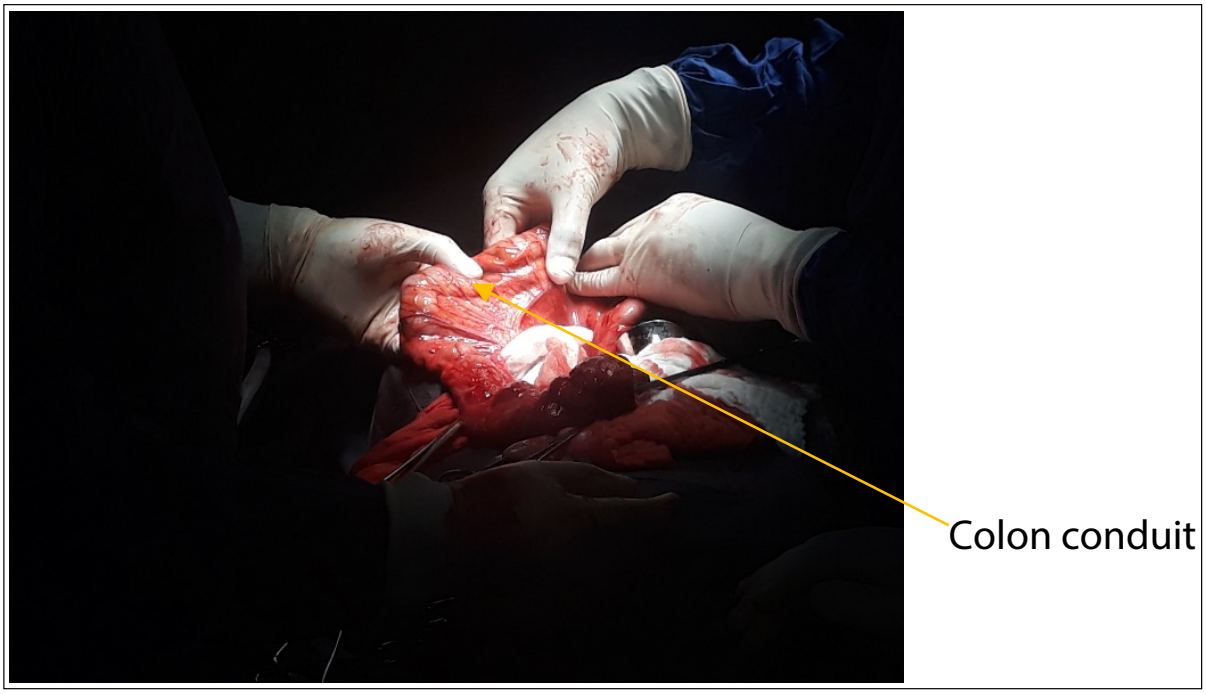

Figure 4. Patient 1 (21-year-old man) undergoing the laparotomy stage of the Ivor Lewis procedure along with colon conduit mobilization

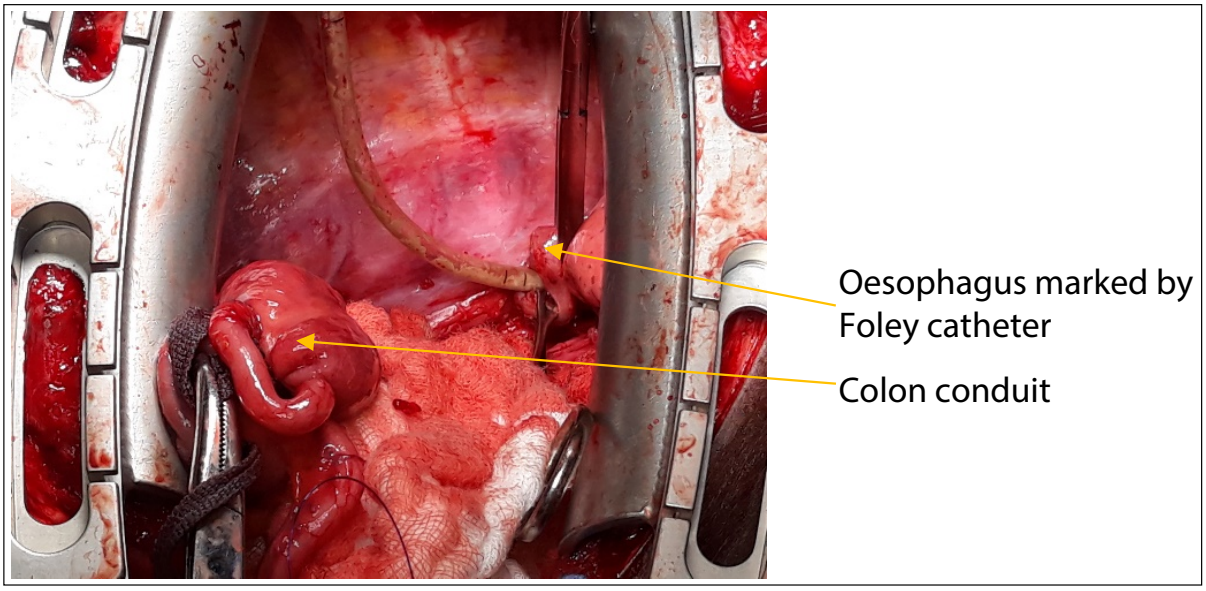

Figure 5. Patient 1 (21-year-old man) undergoing the right thoracotomy stage of the Ivor Lewis procedure

The oesophagus is marked with a Foley catheter and the colon by the appendix. The colon conduit has been mobilized into the right thoracic cavity in readiness for oesophagocolic anastomosis. Before this procedure, this patient had total dysphagia for 3 years.

motic site.[26] In our patient, the cervical leak required that we reopen the neck incision, drain the collection, and debride the wound.

Davis and Heitmiller[27] report that all their patients nursed in ICU were sedated, intubated, and mechanically ventilated overnight following surgery.[27] In their study, extubation was done as tolerated; the NGT was removed on day 5, and video oesophagography to assess conduit patency was performed before the commencement of oral feeds on day 6. Additionally, all of their patients had feeding jejunostomies. Feeding via jejunostomy was stopped after day 6 if oral feeding yielded no complications.

All of our patients, except the 21-year-old man, developed both early and late dumping syndrome, which we successfully managed. Donington[28] reports that dumping syndrome with vasomotor and gastrointestinal features occurs after up to 50% of oesophagectomies due to the discharge of hyperosmolar gastric contents into the small intestine.[28]

The long-term benefit of oesophagectomy for benign oesophageal strictures due to caustic injury is that it obviates the 8% risk of developing oesophageal carcinoma after 25 to 50 years; it is, therefore, preferably performed on young patients and better avoided in elderly patients.[29],[30]

Reconstructive procedures for patients with benign oesophageal strictures are not common in our setting. For a long time, such patients have been managed with feeding gastrostomies, with or without referral abroad for reconstructive surgical management. The patients we have reported on are the first 4 to be managed by surgical intervention at our institution.

Conclusions

Benign oesophageal strictures and can be treated with oesophagectomy and restoration of gastrointestinal continuity with conduits associated with acceptable morbidity and mortality. The oesophagus has no ideal replacement conduit, and the stomach is a preferred conduit associated with better outcomes than the colon.

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