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ONLINE CASE REPORT

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Late life revision surgery for dilated colonic conduit in long gap oesophageal atresia

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ABSTRACT

Long gap oesophageal atresia presents a surgical challenge as there is insufficient length of the oesophagus to restore continuity. Oesophageal replacement is generally achieved using a conduit, taken from the stomach, jejunum or colon. Preferences of approach vary between and within surgical centres. Specific to colonic interposition, the continued growth and dilation of the interposed segment may lead to redundancy. Revision surgery in these cases is challenging and has been sparsely described in adult patients. We present two patients who had colonic interposition for long gap oesophageal atresia in infancy and who then underwent successful revision surgery in their fifth decade.

KEYWORDS

Oesophageal atresia – Revision surgery – Oesophagoscopic surgery – Adult – Infant

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Oesophageal atresia is a congenital abnormality with a documented incidence of 1 in 4,000 live births.[1] Historically, many infants born with oesophageal atresia would succumb before their first birthday. Advances in surgical care mean that current survival rates are over 90%.[2] Long gap oesophageal atresia (LGOA) refers to the extended distance between the two oesophageal ends that prohibits primary anastomosis. Management of LGOA involves ligating any associated fistula, establishing enteral feeding by gastrostomy and forming a cervical oesophagostomy to manage oral secretions. Definitive oesophageal replacement surgery can then be planned. Both early and late complications of these operations are well recognised.[3]

Case 1

A 52-year-old woman underwent colonic interposition as an infant, with the conduit brought through the posterior mediastinum. She presented with attacks of severe abdominal and chest pain, worsening dysphagia and episodes of food bolus obstruction. Dilation of both the proximal and distal anastomosis gave little symptomatic relief. Subsequent imaging and endoscopy revealed a dilated and kinked colonic interposition (Fig 1).

Surgery

The colonic conduit occupied the left posterior chest and the surgical approach was therefore via a left neck incision, left seventh space lateral thoracotomy and upper midline laparotomy. Intraoperative findings were of an elongated colonic interposition with a short remnant distal oesophagus. The oesophagus was mobilised in the neck, followed by mobilisation of the stomach, with the greater curve tube stapled. The colonic interposition was resected along with the remnant oesophagus in the chest. A pyloroplasty was performed on the gastric tube, and it was pulled up and anastomosed with the oesophageal stump in the neck.

In the postoperative period, a small anastomotic leak was revealed on water soluble swallow on day 5, which resolved with conservative measures. The patient was stepped down from the high dependency unit on day 9 and treated with intravenous antibiotics for aspiration pneumonia. She was provided with parental nutrition while an inpatient, tolerating a soft diet at the time of discharge.

Follow-up

Postoperatively, the patient required dilation of the oesophagogastric anastomosis in the neck at four weeks. At six months, she had recovered well with no complaints of pain and no restrictions to alimentary intake. Her dysphagia had resolved. However, she now had symptoms of reflux and intermittent regurgitation, as is common after a gastric pull-up procedure. Oral proton pump inhibitor therapy was commenced.

Case 2

A 49-year-old woman had a retrosternal colonic interposition as an infant, after an initial cervical oesophagostomy

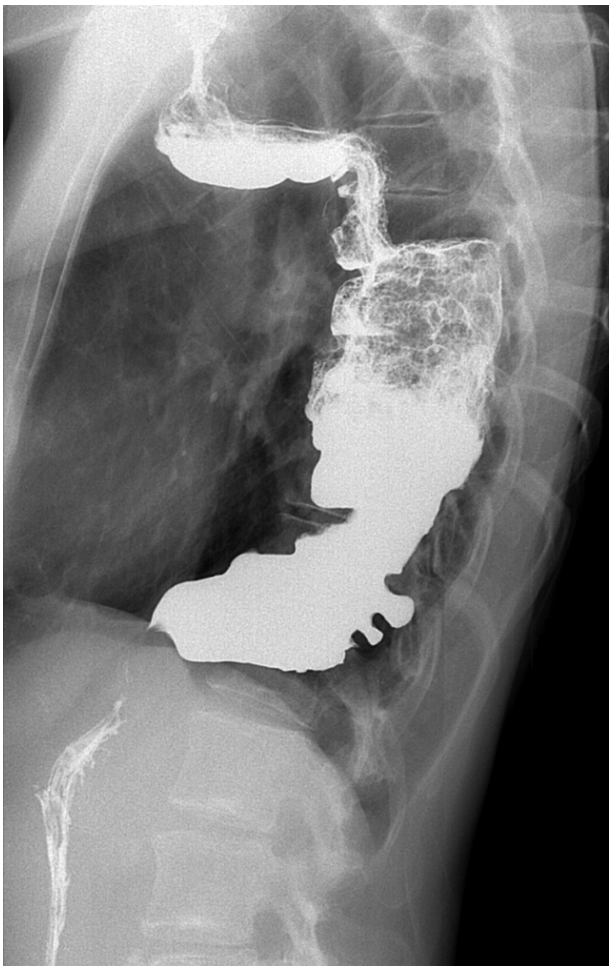

Figure 1 Preoperative fluoroscopy of patient 1 demonstrating a dilated and kinked colonic conduit in the left chest

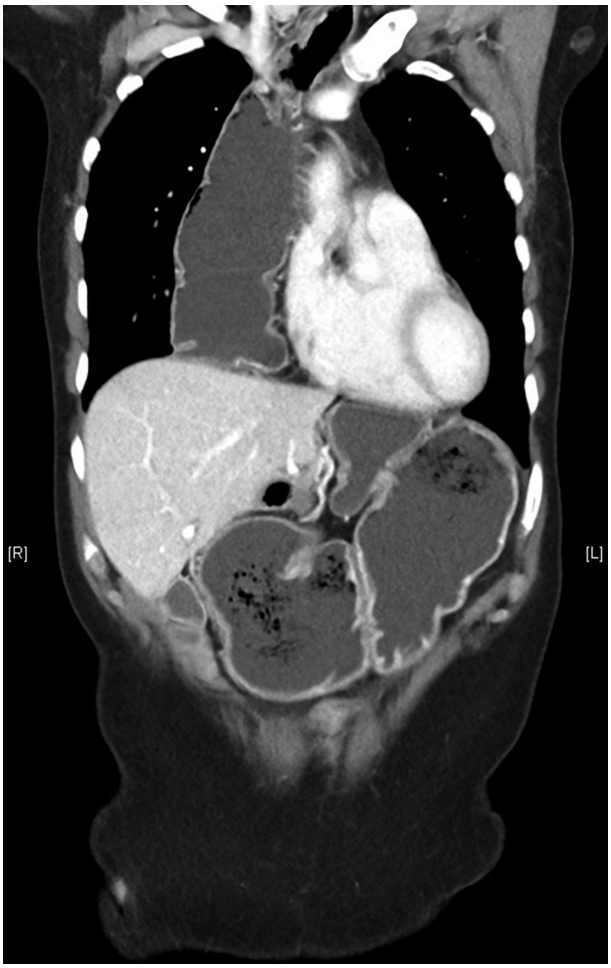

Figure 2 Coronal computed tomography of patient 2 demonstrating the grossly dilated colonic conduit in the retrosternal position

and feeding gastrostomy. Owing to anastomotic stricture, she underwent revision of this interposition as a teenager, with the distal anastomosis being refashioned. At presentation, she was only tolerating a liquid diet and was suffering with severe reflux despite maximum medical management. Cross-sectional imaging and contrast swallows showed a grossly dilated and tortuous conduit with poor outlet function (Fig 2). Oesophagogastroduodenoscopy revealed patent oesophagocolic and cologastric junctions but a capacious and non-motile colonic interposition.

Surgery

Given the retrosternal nature of the conduit and the adolescent revision, the surgical approach necessitated a median sternotomy extending to the left neck and an upper midline laparotomy. Intraoperative findings were of a dilated retrosternal interposition. A gastric tube was fashioned with a distal pyloroplasty and the oesophagus was transected in the neck. In order to achieve the proximal anastomosis, the left side of the manubrium and clavicle head were removed. The patient was cared for in the high dependency unit for nine days after the operation and was treated with antibiotics for a pseudomonas urinary tract infection. Computed tomography on day 6 revealed no leak (Fig 3). Parental nutrition was commenced immediately following surgery and she was discharged on a puree diet with supplemental energy drinks.

Follow-up

Outpatient review at six months demonstrated a good recovery for the patient, who was able to eat small meals of solid food and maintain her weight with minimal nutritional supplements. Eating subsequently deteriorated, necessitating a short hospital admission for temporary placement of a nasojejunal feeding tube for nutritional support.

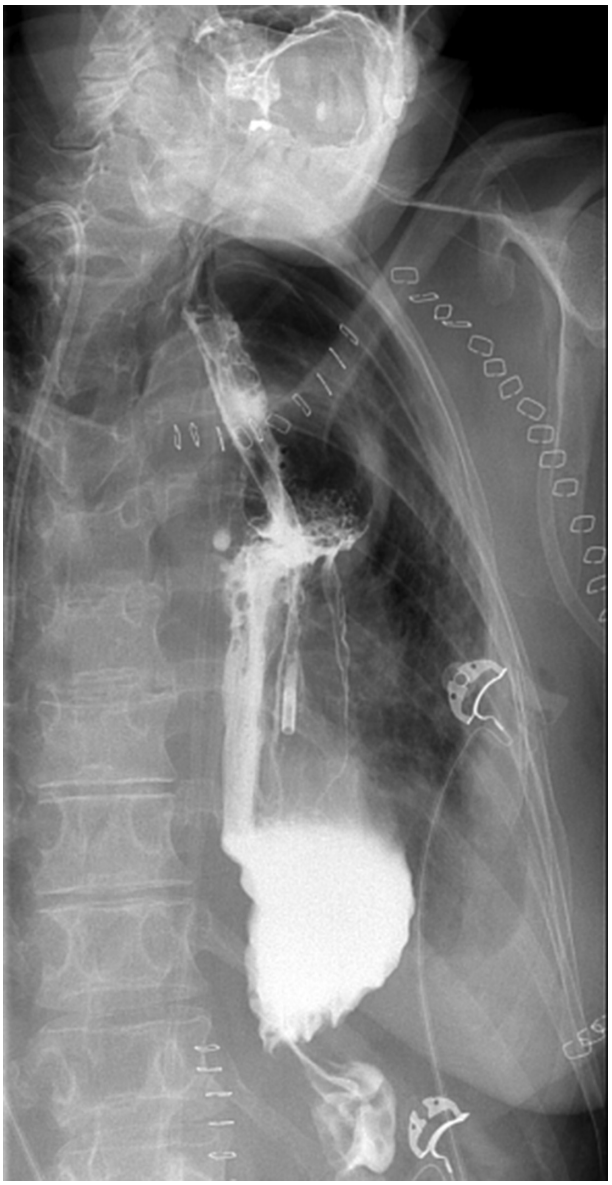

Figure 3 Radiological findings of patient 2 on postoperative day 6 demonstrating the straighter route of the gastric pull up, with surgical clips in situ

Discussion

Adult outcome data from congenital conditions are not well reported and transitional care of these individuals is generally poorly managed.[4] As more of these children survive to adulthood, we face a developing need for adult specialists to manage the medical and surgical morbidity of a new patient population in whom complications are common. Whereas paediatric surgeons at the reporting centre now prefer gastric transposition as management for LGOA, there are a significant number of patients surviving to adulthood with colonic conduit formed in infancy. This emphasises the need for adult specialists to recognise both historic and modern practice in order to best serve the patient group.

Complete resection and revision of the oesophageal replacement in patients of this age has not been described previously. As highlighted by these cases, complications may not arise for decades and patients involved are heterogeneous. Alternative surgical methods to correct redundancy include segmental resection,[5] anastomotic revision and replacement with a supercharged jejunal tube. The latter option is technically challenging but can be utilised when other revisions have failed. Segmental resection requires a further anastomosis and does not address the ongoing risk of redundancy. Long-term complications of gastric transposition include dumping syndrome, gastro-oesophageal reflux and Barrett's oesophagus. It is important to tailor the surgical approach to the patient and involvement of the multidisciplinary team (especially dietetics) is essential for successful recovery.

Conclusions

We suggest that resection and replacement with gastric transposition presents a surgical treatment option in patients with debilitating complications that are refractory to conservative management.

References

1. Nassar N, Leoncini E, Amar E *et al*. Prevalence of esophageal atresia among 18 international birth defects surveillance programs. *Birth Defects Res A Clin Mol Teratol* 2012; **94**: 893–899.
2. Koivusalo AI, Sistonen SJ, Lindahl HG *et al*. Long-term outcomes of oesophageal atresia without or with proximal tracheooesophageal fistula – gross types A and B. *J Pediatr Surg* 2017; **52**: 1,571–1,575.
3. Coopman S, Michaud L, Halna-Tamine M *et al*. Long-term outcome of colon interposition after esophagectomy in children. *J Pediatr Gastroenterol Nutr* 2008; **47**: 458–462.
4. Svoboda E, Fruithof J, Widenmann-Grolig A *et al*. A patient led, international study of long term outcomes of esophageal atresia: EAT 1. *J Pediatr Surg* 2018; **53**: 610–615.
5. Dhir R, Sutcliffe R, Rohatgi A *et al*. Surgical management of late complications after colonic interposition for esophageal atresia. *Ann Thorac Surg* 2008; **86**: 1,965–1,967.