Annals of the Royal College of Surgeons of England (1985) *vol.* 67

Abdominocervical oesophagectomy in the elderly

R C N WILLIAMSON MD MChir FRCS
Professor of Surgery
University of Bristol

Key words: OESAPHAGECTOMY, ABDOMINOCERVICAL

Summary

Abdominocervical (transhiatal) oesophagectomy was carried out in 8 patients. Five of 6 with oesophageal cancer were elderly (aged 75–88 years), and one was 59 years old. Two patients (aged 54 and 74 years) had recurrent achalasia and megaoesophagus 30 years after cardiomyotomy. Chest complications were common, but there were no anastomotic leaks and no deaths. In 2 patients with large para-oesophageal hiatal hernias oesophagectomy had not been planned; the procedure was undertaken for an unexpected carcinoma of the cardia and an oesophageal tear. Three patients have died of recurrent cancer at 12, 17 and 21 months. The 5 survivors are swallowing satisfactorily, although one has required two dilatations of an anastomotic stricture.

Introduction

Carcinomas of the oesophagus and pancreas share several features that militate against satisfactory treatment: they predominantly affect the elderly, early local and lymphatic spread are common, five-year survival is exceptional and resection, which offers the only realistic chance of cure, has a substantial mortality rate. In specialist centres in Britain the operative mortality rate is now around 10% *(1–3)*. Even lower figures have recently been reported from the USA and Japan *(4–6)*. Nevertheless, in a worldwide review of some 84,000 patients with squamous carcinoma of the oesophagus, nearly 1 in 3 (29%) failed to survive the operation *(7)*. Thus in extreme old age palliative treatment is probably all that should be offered. Dysphagia can be easier to relieve than the pain and jaundice of pancreatic cancer, yet radiotherapy, chemotherapy, intubation, endoscopic dilatation and laser recanalisation of the oesophagus all have their own limitations and complications *(3)*.

Not surpisingly the mortality rate of oesophagectomy is greater in patients over the age of 70 years than it is in younger patients *(6)*. Thoracotomy combined with laparotomy is poorly tolerated by the elderly who often have cardiorespiratory disease and may be malnourished as a result of their obstruction. Although ostensibly a further escalation of the procedure, near-total resection of the oesophagus is an attractive option. A cervical oesophagogastrostomy is well away from the primary tumour and therefore less susceptible to suture-line recurrence than an intrathoracic anastomosis *(8)*. Moreover reflux is less troublesome at this level and mediastinitis is not an inevitable sequel to postoperative dehiscence.

The operation of abdominocervical (or 'blunt', 'blind' or transhiatal) oesophagectomy allows complete removal of the gullet without the need for formal thoracotomy. The operative technique is based on that described by LeQuesne and Ranger in 1966 *(9)* and modified for carcinoma of the thoracic oesophagus by Kirk *(10)* and Orringer *(11)*. It has been successfully undertaken without operative loss in 5 patients with oesophageal cancer over the age of 75 years, in 1 younger patient with cancer and in 2 patients with megaoesophagus from recurrent achalasia.

Correspondence to: University Department of Surgery, Bristol Royal Infirmary, Bristol BS2 8HW

Patients and Results

Between September 1981 and January 1985 8 patients underwent abdominocervical oesophagectomy in this Department without operative loss. During the same period 15 patients with squamous or adenocarcinoma underwent oesophagectomy via a conventional thoracotomy. Access was by left thoracolaparotomy in 7 and by laparotomy and right thoracotomy in 8, 2 of whom had a further incision in the neck to complete a subtotal oesophagectomy. There was one postoperative death, which arose from complications associated with detachment and embolisation of an intravenous feeding line. The conventional thoracotomy patients will not be further considered.

INDICATIONS FOR OPERATION

Six patients had carcinoma of the oesophagus (Table 1). Their ages ranged from 59–88 years, 5 of the 6 being over the age of 75 years; all but one were female. Abdominocervical oesophagectomy was only planned in 4 of the 6 cases. In a frail 88-year-old (case No 3) the oesophagus was torn during reduction of a large, mixed hiatus hernia, which was anchored in the mediastinum partly by adhesions but mainly by the proximal carcinoma. Although malignant nodes were observed beside the left gastric vessels, intubation was abandoned in favour of resection. The other unplanned oesophagectomy is described below.

Five patients had squamous carcinomas of the middle third of the oesophagus (Fig. 1), the diagnosis in each case being confirmed by endoscopic biopsy. The sixth (case No 2) had an unsuspected adenocarcinoma of the cardia. At the age of 72 years anaemia and mild dysphagia had drawn attention to her large, fixed, paraoesophageal hiatus hernia which was managed conservatively. Five years later she was reinvestigated for increasing dysphagia. Barium swallow examination (Fig. 2) and an incomplete oesophagoscopy merely confirmed the enormous rolling hernia, which compressed the lower oesophagus. She was found to have malignant thrombocythaemia, with a platelet count of 2282×10^9/l, and received busulphan therapy. Complete

TABLE I. *Abdominocervical oesophagectomy: indications and outcome in 8 patients*

Case No.	*Sex*	*Age*	*Lesion*	*Histological differentiation*	*Metastases*	*Other conditions*	*Outcome*
1	M	80	SCC at 30 cm	Poor	Nil	—	Died at 21 mo
2	F	77	Adenoca. cardia Mixed HH	Good	Nil	Thrombo-cythaemia	Died at 17 mo
3	F	88	SCC at 25 cm Mixed HH	Poor	Nodes	Pernicious anaemia	Died at 12 mo
4	F	75	SCC at 30 cm	Poor	Nodes	Ischaemic heart disease	a/w at 15 mo
5	F	76	SCC at 26 cm	Moderate	Nodes	Chronic bronchitis	a/w at 11 mo
6	F	59	SCC at 30 cm	Moderate	Nodes	—	a/w at 6 mo
7	M	54	Rec achalasia	—	—	—	a/w at 3.5 yr
8	F	74	Rec achalasia	—	—	—	a/w at 3.0 yr

Note: SCC = squamous cell carcinoma; HH = hiatus hernia; Rec = recurrent; a/w = alive and well

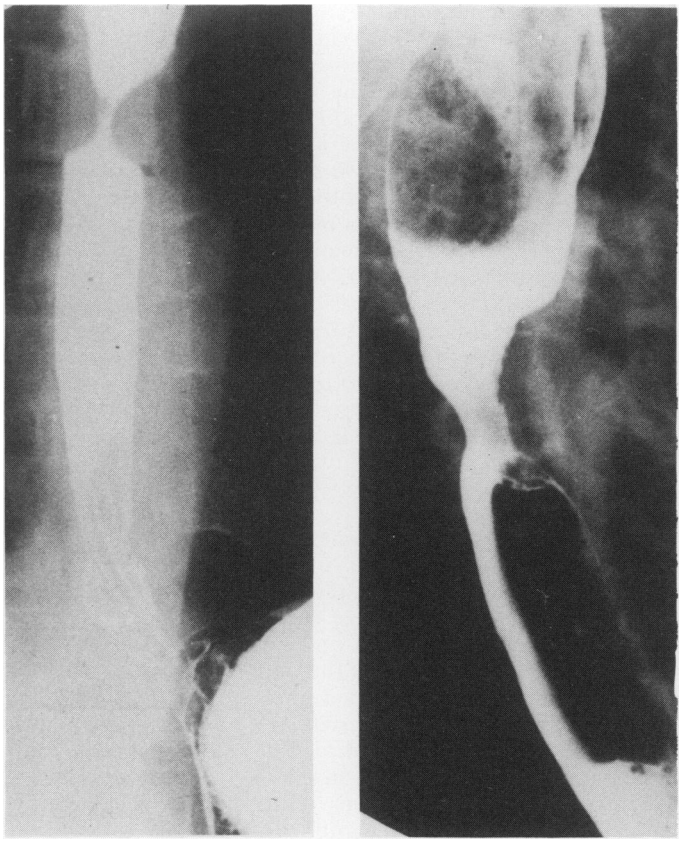

FIG. 1 A suitable lesion for abdominocervical oesophagectomy: localised squamous carcinoma of the middle third of the oesophagus in a woman of 75 years (case No 5) shown on barium swallow examination.

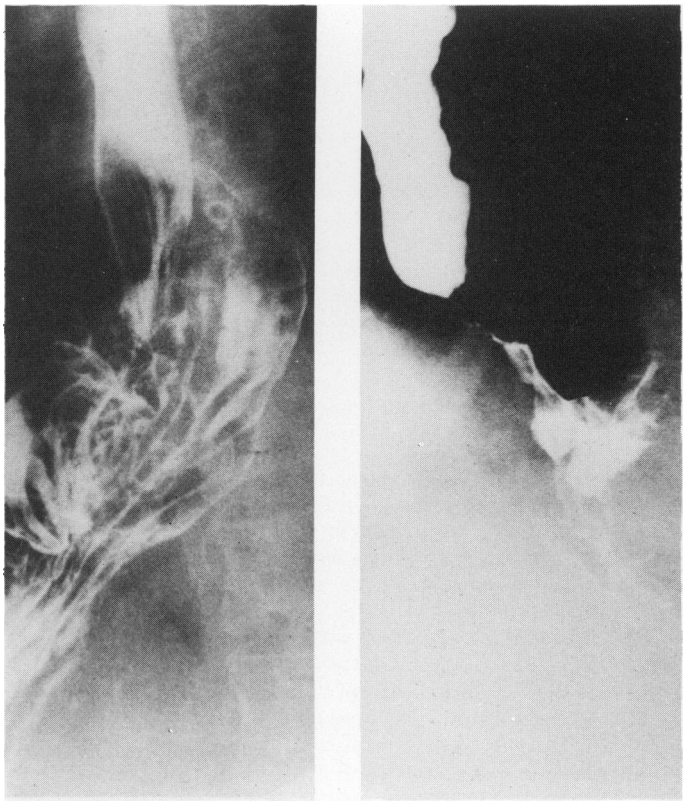

FIG. 2 Two pictures from a barium swallow examination which showed compression of the lower oesophagus by a large paraoesophageal hernia containing stomach (case No 2). A small carcinoma of the cardia was missed.

aphagia now demanded surgical relief, and she came to operation despite a profound neutropenia (white cell count 1.0×10^9/l). After reduction of the herniated stomach into the abdomen a small scirrhous cancer was encountered at the cardia, and this was resected; special care was taken not to damage the spleen. Subsequent platelet counts remained normal, suggesting that the preoperative values may simply have reflected a reactive thrombocytosis. However, 8 months after removal of the tumour the platelets rose to 691×10^9/l, and she received a further course of busulphan.

Two patients developed recurrent achalasia 30 and 31 years after a transabdominal cardiomyotomy for achalasia of the cardia (Table I). Each had had an excellent symptomatic response to Heller's operation but had gradually developed renewed dysphagia. Barium studies together with endoscopy had shown that the oesophagus was grossly dilated and contained large quantities of food residue but no tumour (Fig. 3).

OPERATIVE DETAILS

The abdominal oesophagus was exposed through an upper midline laparotomy. Thorough mobilisation of the stomach involved division of the lesser and greater omentum (outside the gastro-epiploic arcade), together with the short gastric, left gastric and left gastro-epiploic vessels. The spleen was preserved in 7 of 8 cases; splenectomy improved access to the hiatus in one patient (case No 8) with multiple adhesions around a previous cardiomyotomy. In 6 patients a short Heineke-Mikulicz pyloroplasty was performed. To achieve a tension-free anastomosis in the neck it was necessary to

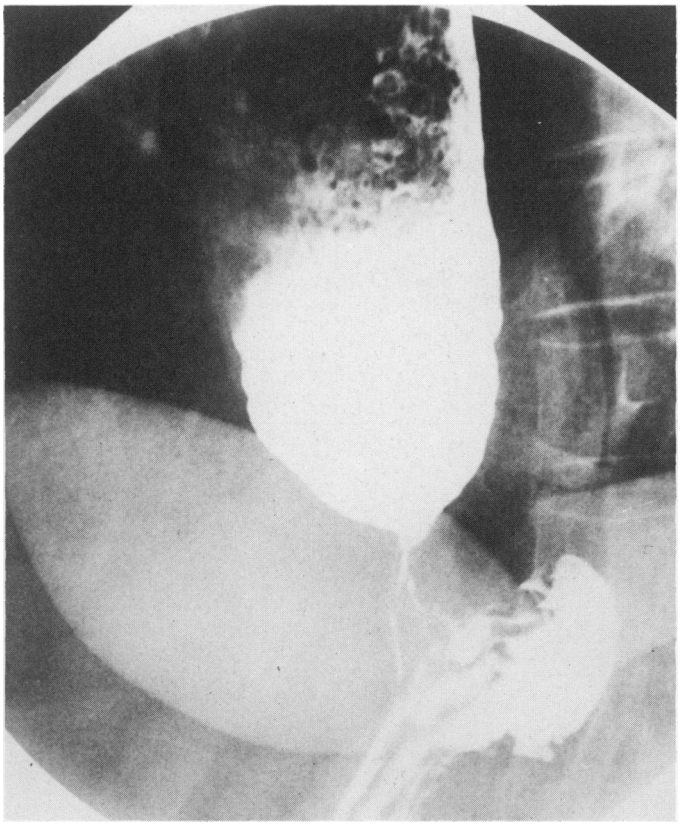

FIG. 3 Recurrent achalasia 31 years after cardiomyotomy (case No 8): barium swallow examination. There was some element of peptic stricture, although an endoscope could be passed onwards and into the stomach. Histological examination of the resected oesophagus showed aganglionosis, large and abnormal nerve trunks in the intermuscular plane and marked submucosal inflamation.

advance the pylorus almost to the hiatus. This manoeuvre required full mobilisation of the duodenal loop but usually not ligation of the right gastric vessels. Particular care was taken not to injure the right gastro-epiploic artery and vein, which were the main vessels supplying the transplanted stomach.

The thoracic oesophagus was freed by blind dissection from below. First, the hiatus was stretched or divided anteriorly for a short distance to allow insertion of the surgeon's right hand. A capacious posterior mediastinum made the dissection easier in the 4 patients with hiatal herna or megaoesophagus. Three of the tumours were partially adherent in the region of the tracheal bifurcation. The endotracheal tube was routinely deflated at this stage to lessen the risk of tracheal injury. Nearly all the mediastinal dissection was carried out from below.

The cervical oesophagus was exposed through a transverse incision above the medial half of the right clavicle, with division of the sternal head of sternomastoid. The gullet was mobilised from behind the trachea, taking care not to damage the right recurrent laryngeal nerve (which was not always seen). Once the oesophagus was completely free within the chest, the stomach was divided obliquely immediately below the cardia. A TA-55 or TA-90 stapler was used, and the staple line was oversewn with a running 2/0 catgut suture. The lower oesophagus was reattached to the gastric fundus with three stout silk sutures, and the stomach was gently drawn up into the neck. The cervical oesophagus was then transected and the specimen was removed. Continuity was restored by anastomosing the oesophageal stump to a short fundal gastrotomy, using one layer of interrupted 3/0 polypropylene sutures.

A nasogastric tube sited with its tip just above the pyloroplasty was stitched to the nostril to prevent accidental postoperative displacement. A water-seal drain was placed in the posterior mediastinum via a stab incision in the neck. Generally no other chest drains were inserted, but a chest X-ray was obtained once the patient was settled in the recovery room. A suction drain was left in the abdominal cavity. In the most recent operation (case No 6) the hiatus was incised anteriorly and a lighted retractor was inserted into the posterior mediastinum to assist the dissection. Later a breach in the left pleura was observed, and an intercostal drain was placed in the left hemi-thorax.

Most patients had both a thoracic epidural catheter and an arterial line. They all experienced a sharp but transient fall in systolic blood pressure during the mediastinal dissection, owing to caval obstruction and/or cardiac displacement. It was necessary to withdraw one's hand from time to time, whereupon cardiac output rapidly improved. The epidural catheter was left in situ for postoperative analgesia.

COMPLICATIONS AND OUTCOME

Serious bleeding was not encountered. The total transfusion requirement during hospital stay varied from 0–4 units of blood (Table II). Chest complications were common in this group of elderly patients. Five of them developed a pneumothorax or pleural effusion on one or other side, usually with collapse/consolidation of the underlying lung, but most of these were small and subsided spontaneously. One patient had an intercostal drain inserted at 12 hours and another two had an effusion aspirated at 2 days and 7 days; one of these two required oxygen by mask for 8 days. Four patients had transient postoperative arrhythmias requiring digitalisation. The most serious complication was a sudden respiratory arrest 10 days postoperatively in a patient who had

TABLE II *Abdominocervical oesophagectomy: perioperative course in 8 patients*

Case No.	*Units of blood transfused*	*Operative difficulty*	*Postoperative complications*			*Days from op until discharge*
			Pneumothorax	*Pleural effusion*	*Other*	
1	3	Tumour stuck to R bronchus	L	L	Urinary retention	24
2	0	Nil	—	—	—	13
3	4	Oesophageal tear	—	—	Pneumonia	21
4	0	Tumour slightly stuck	R	R+L	SVT Resp. arrest	16
5	4	Tumour stuck to carina	R	R+L	AF	18
6	0	Nil	—	—*	—	13
7	4	Adhesions at cardia	R+L	R+L	AF	16
8	4	Adhesions, splenectomy	—	L	AF Hypoxia	24

Note: *Left intercostal drain inserted prophylactically. op = operation; SVT = supraventricular tachycardia; Resp = respiratory; AF = atrial fibrillation

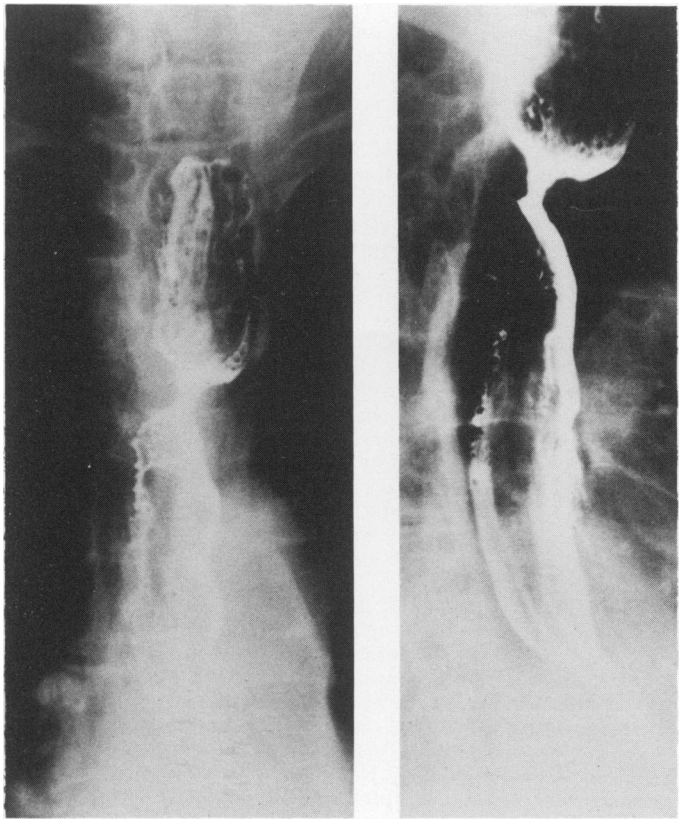

FIG. 4 Barium swallow examination showing an anastomotic stricture two months after an uneventful abdominocervical oesophagectomy (case No 5). The anastomosis has retracted down the superior mediastinum. Multiple biopsies showed no evidence of carcinoma and the stricture responded to bougienage.

been making satisfactory progress (case No 4). She was promptly resuscitated and made a good recovery after overnight ventilation.

Anastomotic integrity was tested radiologically at 5–7 days. There were no leaks. Three patients received parenteral nutrition for a short period. All patients were swallowing satisfactorily on discharge from hospital 13–24 days postoperatively, but one man still had an indwelling catheter for urinary retention.

The 2 patients with achalasia are alive and well 3 years later. They have regained weight and have no trouble swallowing. One describes steatorrhoea, which could reflect bacterial contamination of her thoracic stomach. She has declined investigation, but her bowel actions have normalised on a low fat diet. Three of the 6 patients with cancer have died from recurrent disease at 12, 17 and 21 months postoperatively (Table 1). Two could swallow satisfactorily until the end, but the third developed mild dysphagia when her stomach became narrowed at the level of the aortic arch by massive mediastinal recurrence. One of the three survivors developed an anastomotic stricture 2 months postoperatively (Fig. 4). The stricture was benign, perhaps ischaemic in origin, and responded to bougienage on two occasions.

Discussion

The results show that patients over the age of 75 years can tolerate subtotal oesophagectomy by the abdominocervical route and gain a worthwhile lease of life with satisfactory swallowing. None of the 5 elderly patients with oesophageal carcinoma was particularly robust and it is doubtful if they would all have survived a conventional transthoracic resection. The 88-year-old lady must be one of the oldest patients ever to have survived near-total oesophagectomy. Orringer's unique series of 100 transhiatal oesophagectomies for cancer (with 6 deaths) included 7 patients over the age of 75 years and one of 92 years *(12)*. He has also reported a lady of 85 years who had the same procedure carried out for recurrent achalasia *(13)*. Sugimachi and colleagues have recently recorded a 14% postoperative mortality rate in 51 patients undergoing subtotal oesophagectomy over the age of 70 years *(6)*. They stress the frequency of chest complications in this age group and the importance of preventing atelectasis by early, vigorous and repeated physiotherapy.

The first successful 'blind' oesophagectomy was probably carried out by Grey Turner in Newcastle-upon-Tyne in 1933 *(14)*. The patient was a 58-year-old miner with carcinoma of the mid-oesophagus, and staged reconstruction was achieved by means of a presternal skin tube. Subsequently Ong and Lee showed that a primary pharyngogastric anastomosis was feasible after pharyngo-oesophagectomy for cancer *(15)*, and LeQuesne and Ranger simplified this operation by removing the (normal) oesophagus without a formal thoracotomy *(9)*. Once McKeown had popularised subtotal oesophagectomy and the cervical anastomosis for carcinoma of the middle third *(16)*, transhiatal excision of the malignant oesophagus with primary anastomosis was an inevitable development. Kirk performed 5 such procedures in 1974, but only in the presence of extensive spread that precluded a more radical dissection *(5)*. He has subsequently advocated the operation, together with total gastrectomy, for cancers adjacent to the cardia *(17)*.

If it is accepted that the abdominocervical operation is safe and avoids exsanguination, the only clear advantage of the transthoracic route lies in its potential for *en bloc* clearance of mediastinal lymph nodes. Unfortunately squamous cancers can spread to supraclavicular and coeliac nodes even without overt metastases within the chest *(8,18)*, which may explain why the 3-year actuarial survival for transthoracic and transhiatal resection (i.e. with and without formal lymph node dissection) is almost identical at 14 per cent and 17 per cent *(12,19)*. These considerations assume less importance in very elderly patients, in whom the prime objective must be to restore normal swallowing. Nevertheless, in those who survive subtotal oesphagectomy 5-year survival is independent of age *(6)*.

The operative technique employed differs slightly from those described elsewhere *(9–11,20)*. A transverse incision in the lower right neck provides adequate access, though nearly all the dissection is done from below. Orringer has a 31% incidence of recurrent laryngeal nerve paresis, which he attributes to retraction in the tracheo-oesophageal groove *(12)*. This complication was not observed in the present small series. Others have stated the importance of avoiding injury to the right gastro-epiploic vessels, gastric fundus and spleen. In the present series it was particularly important to preserve the spleen in the patient with associated thrombocythaemia, possibly of malignant origin. Chest drains were not inserted routinely, though others have recommended this step *(17)*, and a minor breach of the pleura on one or both sides is clearly common, up to 63% incidence *(12)*. By dividing the right crus we have found that it may be possible to visualise a pleural tear and to ensure that in the posterior mediastinum at least the dissection is not 'blind' but is carried out under direct vision.

Preoperative bronchoscopy and computed tomography (CT) are sensible precautions, since invasive carcinomas cannot safely be tackled by the transhiatal approach. Each investigation is fallible, however, CT being inaccurate both in the presence of cachexia and after previous operation or radiotherapy *(21)*. Skilled anaesthetic management is vital, particularly during manual dissection of the mediastinum. The surgeon must complete this part of the operation in easy stages to avoid prolonged hypotension. An epidural catheter and an arterial line are strongly recommended. Orringer stresses that the surgeon must be prepared to proceed directly to thoracotomy if complications such as bleeding or tracheal injury are encountered *(11)*.

Abdominocervical oesophagectomy proved a successful treatment in two patients who had had a transabdominal cardiomyotomy (circa 1950) for achalasia. Although good long-term results can be anticipated in over 80% of patients with transthoracic oesophagomyotomy *(22,23)*, renewed dysphagia has been reported in 19% of patients on 10 year follow-up *(24)*. If reoperation is required, an extended myotomy may still be successful *(25)* but subtotal oesophagectomy would seem a more secure method for relieving symptoms and preventing the risk of carcinoma *(13)*. As in large hiatal hernias, megaoesophagus can facilitate the mediastinal dissection. Caustic stricture provides another indication for abdominocervical oesophagectomy *(20)*, and two of our patients illustrate the value of the procedure if unexpected findings are encountered during oesophageal surgery.

I wish to thank Professor C Prys Roberts and his colleagues in the Sir Humphry Davy Department of Anaesthesia for their invaluable help in managing these patients.

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