The right approach to carcinoma of the cardia and lower oesophagus

CHRISTOPHER WASTELL MS FRCS
Professor
JOSEPH CAHILL MCIR FRCS
Lecturer in Surgery
Professorial Surgical Unit, St Stephen’s Hospital, London

Key words: Surgery, Neoplasms, Oesophagus, Stomach Cardia; Surgical Staplers

Summary
Successful surgical palliation for carcinoma of the cardia and lower oesophagus is often compromised by anastomotic failure or local recurrence. These complications follow technical difficulty in achieving adequate resection and a safe anastomosis through inappropriate surgical exposure, often via the left chest.

A technique of oesophagogastrectomy is described employing a simultaneous right abdominothoracic approach without division of either costal margin or diaphragm. Synchronous laparotomy and thoracotomy facilitates both resection and anastomosis, and obviates the necessity to turn the patient over and redrape halfway through the operation.

Closure of the distal stomach and the gastro-oesophageal anastomosis are performed using staplers. No anastomotic leaks were detected in the 15 patients described.

Introduction
One of the major problems with resection of lower oesophagus and cardia of the stomach is to achieve adequate proximal clearance. So often these procedures are difficult because it becomes obvious during the operation that more oesophagus must be resected than had been anticipated. This leads to inadequate proximal resection, a difficult and therefore dangerous anastomosis, or both.

The technique described here employs a synchronous combined right sided abdominothoracic approach preserving the costal margin and diaphragm. Transection of the stomach and the gastro-oesophageal anastomosis are achieved using stapling devices which increase speed and safety.

Patients and results
Fifteen consecutive patients have been operated upon using this technique. There were 12 men and three women with a mean age of 64 years (range 46-78); details are shown in the Table.

There were no anastomotic leaks detected clinically or by a Gastrografin® (Schering) swallow on the fifth postoperative day. Three patients died: one from drug induced nephrotoxicity and renal failure; one, a longstanding chronic bronchitic, from cardiac failure, and the third from a pulmonary embolus two weeks after operation. Autopsy showed intact anastomoses in all these cases.

Technique
POSITION ON TABLE
The patient is placed supine on the table with the right shoulder raised by a vertical prop (Fig. 1), and the right arm across the chest in a trough available to the anaesthetist. This position allows the table to be rotated to the right for the abdominal part of the operation, carried out through an upper right paramedian incision and, on completion of this, by rotation back again, permits a right posterolateral thoracic incision through the bed of the 5th rib.

LAPAROTOMY
Following laparotomy and confirmation that resection is feasible, routine radical gastric mobilisation is per-
The right approach to carcinoma of the cardia and lower oesophagus

1. Position of patient on operating table

FIG. 1 Position of patient on operating table

2. Circular stapling gun being inserted via gastrostomy into tube of stomach. Note intact blood supply to greater curvature and pyloromyotomy. Insert shows line of section of stomach using linear stapler.

FIG. 2 Circular stapling gun being inserted via gastrostomy into tube of stomach. Note intact blood supply to greater curvature and pyloromyotomy. Insert shows line of section of stomach using linear stapler.

3. Spindle of gun being brought out between line of staples and greater curvature of stomach.

FIG. 3 Spindle of gun being brought out between line of staples and greater curvature of stomach.

4. Intrathoracic stapled anastomosis. Note purse string suture through oesophagus.

FIG. 4 Intrathoracic stapled anastomosis. Note purse string suture through oesophagus.

ach capcal of extending to the apex of the pleura is obtained (Fig. 2 insert). Pyloromyotomy is performed to prevent pyloric stenosis due to the inevitable vagotomy.

RIGHT THORACOTOMY
The chest is entered through the bed of the right fifth rib which is excised from its costal cartilage to a posterior position just above the tip of the scapula. The mediastinal pleura is incised, and the azygos vein is divided.
The thoracic oesophagus is now exposed in its entirety and can be mobilised by blunt dissection. The point of resection at least 10 cm above the uppermost border of palpable tumour is selected and a non-crushing oesophageal clamp is applied at a comfortable distance above this.

The right side of the oesophagus is now opened with scissors and a 3/0 Prolene® (Ethicon) purse string suture is placed along the cut edge. It is a policy of the ideal to confirm tumour clearance at the resection margin by frozen section. The oesophagus is then divided, the specimen removed, and the purse string is completed.

THE ANASTOMOSIS
Long handled Babcock forceps are applied to the oesophagus and the Auto Suture® sizers lubricated with KY jelly® (Johnson and Johnson) are gently inserted into the open end to establish the capacity of the oesophagus.

The EEA® circular stapling gun with the appropriate cartridge (usually 31 mm) but without the anvil is inserted into the tube of the stomach from the abdomen through a gastrotomy, placed in the most distal part of the remaining antrum but not conflicting with the pyloromyotomy (Fig. 2). The gastrotomy has to be closed following the anastomosis and should lie as far below the level of the diaphragm, as possible. The spindle of the gun is brought through the apex of the transected stomach at the junction between the staple line and the greater curve (Fig. 3). The spindle is extended from the barrel of the gun and the anvil is applied.

The gun together with the stomach tube is then passed up through the hiatus behind the liver into the mediastinum. The anvil is introduced into the oesophagus (Fig. 4), and the purse string tied snugly around the spindle. Ensuring that the stomach has not rotated, the cartridge and anvil are approximated, and the anastomosis is completed by firing the gun. The gun is then opened by 3 turns and removed via the gastrotomy. The ‘doughnuts’ are examined in the usual way. It is essential that the proximal (oesophageal) doughnut be complete, but the distal doughnut will be interrupted where the knife has crossed the linear staple line. The doughnuts are sent for histological examination as they represent the resection margins.

CLOSURE AND POSTOPERATIVE CARE
The gastrotomy is closed in two layers with 2/0 chronic catgut. The chest is closed in layers and a 32 French gauge tube drain is placed close to the anastomosis. This remains until a Gastrografin® swallow on the fifth or sixth postoperative day has confirmed the integrity of the anastomosis. The abdomen is closed routinely, and a corrugated drain placed to the gastric bed.

A chest radiograph is taken in the recovery area to confirm full expansion of the right lung, and the integrity of the left pleura. Most patients have been ventilated electively for 12-24 hours before being extubated.

Access to the lower oesophagus through a left abdominothoracic incision is attended by significant respiratory morbidity, and has led surgeons to seek alternative approaches. Left thoracotomy alone (1), or separate left sided abdominal and thoracic incisions (2) seek to reduce the incidence of respiratory complications by maintaining the integrity of the costal margin and diaphragm, as advocated on the right side by Lewis and Tanner (3,4). Modifications to the left sided approach do not address the difficulty of obtaining an adequate resection margin with subsequent anastomosis under the arch of the aorta.

Molina et al. (3) have shown significant overestimation of the tumour free distance above the palpable margin of gross malignancy: when the surgeon estimated this distance to be 5-6 cm it was usually not greater than 0.2-1 cm. Since the incidence of local recurrence is the same in patients with less than 3 cm clear as those with involved resection margins, the palpable margin above overt malignancy must be 10 cm (5). The same authors showed a 19.5% operative mortality, with microsurgical involvement of the resection margin in 56% of procedures performed through either a left abdominothoracic, or a thoracic approach. Corresponding figures for an abdominal and separate right thoracic approach were an 8.3% mortality, and 8% proximal involvement with tumour. Similarly Sefton et al. (6) found that the resection margin was involved in four out of seven patients with carcinoma of the cardia when an estimated 6 cm clearance had been obtained. Thirty seven out of 50 cases in that series had involved resection margins after surgery for carcinoma of the cardia. We would suggest that an adequate resection and safe anastomosis can seldom be performed through a left sided approach. Our mortality figures are disappointing, but they relate partly to the perioperative management of old and unfit patients undergoing palliative resection. No anastomotic leak occurred, and this was the principal cause of death in Molina’s series (3).

A right sided approach to the oesophagus offers much better access, and a technically satisfactory reconstruction after oesophagogastrectomy. However two separate stages to the operation, with repositioning of the patient between them is unsatisfactory and cumbersome. The abdominothoracic approach described, with the patient ‘up side down’ on the operating table, permits synchronous laparotomy and thoracotomy. This not only facilitates dissection and adequate resection, but permits periaphral stapling of the anastomosis high in the right chest, which may be very difficult through a thoracotomy (7). Furthermore, preservation of the diaphragm and costal margin minimises the respiratory complications attendant on their division (2).

The use of stapling devices has greatly improved the safety of oesophageal anastomosis, and in common with others authors our anastomotic leak rate was zero (8,9). Although we were initially uncertain of the wisdom of transecting the linear T190® staple line closing the gastric tube with the EEA® end to end circular stapler, it has been shown in dogs that this is entirely safe (10).

References
This little passage during our own through surgeons, three trated. Literature and wide spectrum of this book deals with the basic science of the subject, with chapters on embryology, surgical anatomy, changes in the intraluminal contents in obstruction, changes in blood flow and peristalsis, central and local haemodynamic changes and the systemic effects of obstruction. In the section on embryology, it was disappointing that the outdated views of hernias and obstruction, changes of large bowel can occur into the various duodenal recesses is still postulated. As long ago as 1923, Andrews demonstrated the impossibility of this classical concept and showed that the duodenal types of hernias and probably also the paraaecal hernias are, in fact, anomalies of intestinal rotation.

The second half of this monograph deals with clinical management. Chapters include clinical presentation and preoperative management, radiology, surgical treatment of small bowel obstruction with and without vascular occlusion, the management of large bowel obstruction, pseudo-obstruction and postoperative bowel obstruction. These chapters contain interesting discussions on the use of postoperative long tube intubation of the small bowel for recurrent adhesive obstruction, the value and limitation of tests for viability in strangulated gut and the pros and cons of resection with Anastomosis in large bowel obstruction—all subjects of absorbing interest to the general surgeon.

The text is nicely produced, clearly written and supplied with plentiful line diagrams and X-rays. There is an up to date bibliography. This is a volume that can certainly be recommended to all those who have to deal with these important and testing abdominal emergencies.

**Book reviews**


The acute abdomen remains one of the last important bastions of clinical medicine. There is perhaps no other common situation where the bedside features of the case, supplemented perhaps with a few simple laboratory tests, are all important and where the clinical decision made by the man on the spot has such important consequences for the patient. In all the wide spectrum of this subject, intestinal obstruction, in its numerous manifestations, seems to hold pride of place in its literature and a number of classical monographs have been published on this subject from both sides of the Atlantic. To these we welcome this latest addition to the Clinical Surgery International series.

The two editors have chosen 20 other contributors from the USA and the United Kingdom who include, as well as surgeons, three radiologists, a physician and an anatomist.

The first part of the book deals with the basic science of the subject, with chapters on embryology, surgical anatomy, changes in the intraluminal contents in obstruction, changes in blood flow and peristalsis, central and local haemodynamic changes and the systemic effects of obstruction. In the section on embryology, it was disappointing that the outdated views of hernias and obstruction, changes of large bowel can occur into the various duodenal recesses is still postulated. As long ago as 1923, Andrews demonstrated the impossibility of this classical concept and showed that the duodenal types of hernias and probably also the paraaecal hernias are, in fact, anomalies of intestinal rotation.

The second half of this monograph deals with clinical management. Chapters include clinical presentation and preoperative management, radiology, surgical treatment of small bowel obstruction with and without vascular occlusion, the management of large bowel obstruction, pseudo-obstruction and postoperative bowel obstruction. These chapters contain interesting discussions on the use of postoperative long tube intubation of the small bowel for recurrent adhesive obstruction, the value and limitation of tests for viability in strangulated gut and the pros and cons of resection with Anastomosis in large bowel obstruction—all subjects of absorbing interest to the general surgeon.

The text is nicely produced, clearly written and supplied with plentiful line diagrams and X-rays. There is an up to date bibliography. This is a volume that can certainly be recommended to all those who have to deal with these important and testing abdominal emergencies.

**Palae-oncology** edited by S Retsas. 64 pages, illustrated. Farrand Press, London. £9.50.

This little book is a masterpiece. It comprises four essays based on presentations at a symposium on the antiquity of cancer, held in relation to the 19th Mediterranean Congress of Chemotherapy in 1984. Appropriately it was held on board ship during passage from Kos to Rhodes.

Dr George Stathopoulos, Associate Professor in Medical Oncology in Athens, contributes a comprehensive review of bone tumours in antiquity, ranging from pre-Columbian Peru, through our own Neolithic period to a mandible from Lower/Middle Pleistocene East Africa, likely to be the oldest known malignant tumour in man. This chapter is extensively illustrated by the Library of the Wellcome Institute and the cognoscenti can make their own diagnoses.

The second chapter is by Emeritus Professor Paul Ghaliaouni, whose death has so tragically curtailed his superb contributions to our knowledge of Pharaonic medicine. He has given a precise and well referenced account of the few known examples of malignancy found in ancient Egyptian mummies and skeletons. Dr Fawzi Boulos, Director of the Museum of the History of Medicine and Pharmacy in Cairo, then cites the possible references to malignancy in the Ebers, Edwin Smith and Kahun papyri of ancient Egypt. An appendix reproduces hieroglyphic transliterations of the relevant hieratic passages making this a most useful source document.

Finally, the Editor himself, from the Medical Oncology Unit of the Westminster Hospital, discusses the references to malignancy in the writings of the Hippocratic School and Galen. Here we break into the modern era with unmistakable clinical descriptions of tumours, particularly of breast, nasopharynx and uterus. Of special interest is the early use of the word karkinos (crab) to describe tumours. Surprisingly, onkos does not seem to have been used in relation to cancer.

My only disappointment in this book is its brevity. The scholarly and informed authors have done a splendid job in providing a concise and highly readable review of a difficult subject, much confused in the past by authors seeking sensation but with little understanding of ancient languages. The present work is strongly recommended not only because it is fascinating reading but also because it is a reliable source of hard data which, in this field, can be very difficult to find.

J F NUNN

Head of Division of Anaesthesia

Clinical Research Centre, Harrow