

Surgical Approach and Results of Surgery in Adenocarcinoma of the Gastro-Oesophageal Junction

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ABSTRACT

Aim of Study: This paper attempts to determine the appropriate surgical procedure in relation to the pathological types of adenocarcinoma of the gastro-oesophageal junction in Singapore.

Methods: Data on population characteristics, clinical presentation, pathology, surgical procedures and results of treatment were gathered from the case records of a personal series of 32 patients resected for adenocarcinoma of the gastro-oesophageal junction.

Results: The 32 patients with adenocarcinoma of the gastro-oesophageal junction (Type I, 9; II, 20 and III, 3), presented at a late stage (Stage I – II, 5; III, 14; IV, 13). In 19 patients with Stages I – III disease, attempted curative surgery was performed – extended total gastrectomy for Types II and III disease (13 patients) and oesophagectomy for Type I (6 patients). There was one operative mortality following curative resection. Palliative resection was performed on 13 patients with Stage IV disease with one operative mortality. The main operative morbidity was anastomotic leakage, occurring in 5 patients; both operative deaths were associated with this complication. The actuarial 5-year survival was 20%.

Conclusion: Although gastro-oesophageal cancer presents late, it can be resected safely by extended total gastrectomy for Types II and III disease and oesophagectomy for Type I disease, taking precautions to minimise anastomotic leakage. Although usually palliative, Stages I and II and to a lesser extent Stage III, are curable by these surgical procedures which ensure a tumour free surgical margin and adequate lymphadenectomy.

Keywords: adenocarcinoma, oesophagus, oesophagectomy, oesophago-gastrectomy, Singapore

INTRODUCTION

Adenocarcinoma of the gastro-oesophageal junction is rapidly increasing in the West in relation to a high incidence of Barrett's oesophagus. As the disease presents late, prognosis is poor and the 5-year survival

being only 10% – 15% in most series⁽¹⁾. Controversies on its management remain unresolved. There is no agreement on the operative procedure with regard to the extent of resection and lymphadenectomy. Neoadjuvant chemoradiation has been encouraging but its role remains to be more clearly defined.

Despite widespread interest in adenocarcinoma of the gastro-oesophageal junction in the West, data on the disease in Singapore is sparse. In previous publications by the present author⁽²⁻⁴⁾, preliminary data on carcinoma involving the cardia of the stomach were presented. The present paper is based on a personal experience, and it analyses the pathological types of adenocarcinoma confined to the gastro-oesophageal junction in Singapore, the surgical approaches used and the survival results following surgery.

METHODS

During an 18-year period at the Singapore General Hospital (1980 – 86) and at the National University Hospital (1987 – 97), the present author personally performed resection on 43 patients for adenocarcinoma involving the cardia. In 32 of these patients, the tumour occurred in the area within 5 cm orad and 5 cm caudad to the lower oesophageal sphincter, and fulfilled the criterion of adenocarcinoma of the gastro-oesophageal junction as previously defined⁽⁵⁾. Eleven other patients had extensive gastric carcinoma with invasion of the cardia and are excluded from the present study. As an indication of relative frequency, the present author performed oesophagectomy on 54 patients with oesophageal squamous cell carcinoma during the same period.

Data on population characteristics, clinical presentation, pathology, surgical procedures and results of treatment were gathered by analysing the clinical records of these 32 patients resected for adenocarcinoma of the gastro-oesophageal region.

PATIENTS

There were 27 male Chinese, 4 female Chinese and one male Japanese patients. The age range was 28 to 85 years, with a mean of 65 years. The mean

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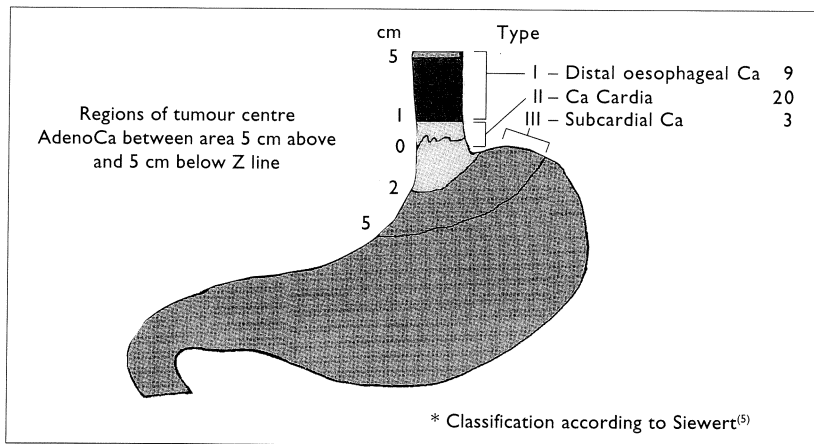


Fig 1 – Distribution of adenocarcinoma in gastro-oesophageal region in 32 patients.

duration of symptoms was 8 months. Fig 1 shows the distribution of tumour according to Siewert's classification⁽⁵⁾. Type I, 9, Type II, 20, Type III, 3. The pTNM⁶ stages were: Stage I, 2; IIA, 1; IIB, 2; III, 14; IV, 13. The main clinical features were: dysphagia (30); weight loss, 22; anaemia (Hb < 12gm), 8. ASA risk status⁷ were 1, (healthy patient), 10; 2 (patient with mild to moderate systemic disease), 12; and 3 (patients with severe systemic disease), 10.

OPERATIVE PROCEDURES

Attempted curative surgery was performed on 19 patients (20 operations) with pTNM stages I – III disease.

1. Extended total gastrectomy for Types II and III tumour (13 patients)

Laparotomy was performed through an oblique upper abdominal incision. The lower oesophagus with 2 – 5 cm margin proximal to the tumour was resected with a ring of diaphragmatic hiatal tissue,

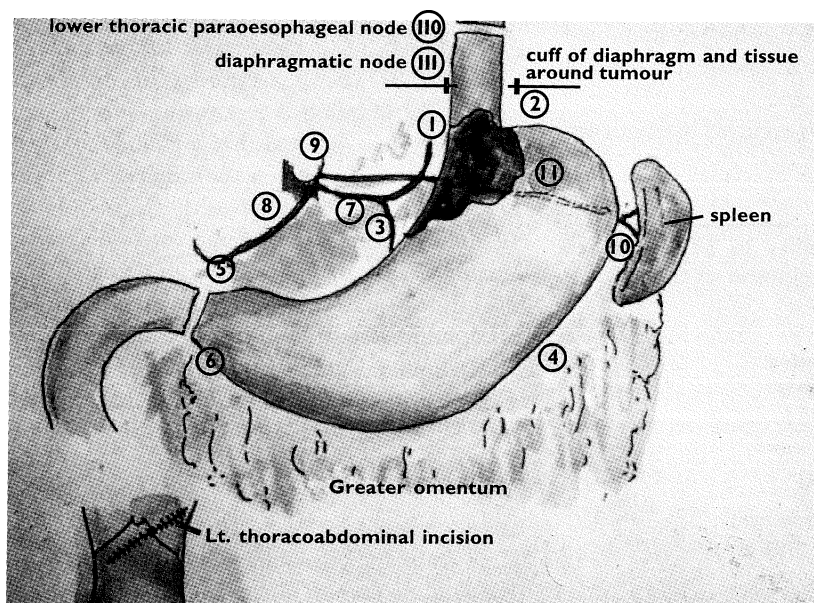


Fig 2 – Total gastrectomy with resection of lower oesophagus for Types II and III tumour. NB lymph nodes numbered according to recommendations of the Japanese Research Society for gastric cancer; 1, right cardiac node; 2 left cardiac node; 3, lesser curvature node; 4, nodes along short gastric, and left and right gastro epiploic arteries; 5, suprapyloric node; 6, subpyloric node; 7, left gastric artery node; 8, common hepatic artery node; 9, coeliac artery node; 10, splenic hilar node; 11, splenic artery node.

paraoesophageal nodes, whole stomach, spleen, omentum and regional nodes 1 – 11⁸ (D₂ resection), as shown in Fig 2. Reconstruction was performed with a stapled oesophago-jejunostomy. In 7 patients, dissection of the lower oesophagus and mediastinum and anastomosis was facilitated by extending the abdominal incision into the left chest. In 6 other patients, lower oesophageal exposure was performed through the divided hiatus without thoracotomy.

2. Oesophagectomy for Type I tumour (6 patients)

a) Allison type oesophago-partial gastrectomy (4 patients). Through a left thoraco abdominal incision, oesophago partial gastrectomy was performed, resecting the lower oesophagus and upper stomach, spleen and omentum, paraoesophageal, paragastric nodes, and nodes along the splenic hilum, left gastric and coeliac artery and the remnant stomach was anastomosed to lower oesophagus after pyloroplasty.

b) Transhiatal total oesophagectomy with cervical oesophago-gastrostomy in a patient with poor respiratory function.

c) Ivor Lewis oesophagectomy (1 patient)

A 69-year-old patient with Stage II tumour was treated by Ivor Lewis oesophagectomy and 9 years later developed carcinoma of the gastric remnant on the gastric side of the oesophagogastric anastomosis. The recurrent cancer (T3N1) was resected by total oesophago gastrectomy and reconstruction was performed by a substernal right colon graft (Fig 3).

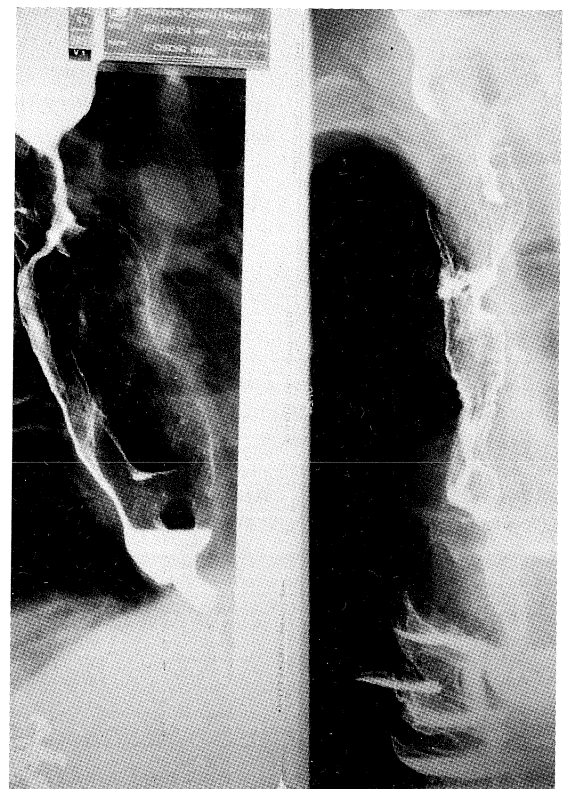


Fig 3 – Barium swallow shows on left malignant stricture in a thoracic stomach 9 years after Ivor Lewis oesophagectomy; on right, substernal right colonic graft after re-resection of thoracic stomach and upper oesophagus.

Palliative surgery

In 13 patients with Stage IV disease, (with paraortic or cervical metastatic lymph nodes or metastasis to liver), palliative resection was performed – extended total gastrectomy, 10 (with pancreatectomy as well in 2 patients); Allison oesophago-partial gastrectomy 2, and Ivor Lewis oesophagectomy 1.

RESULTS

Morbidity and Mortality (Table I)

The main complication was anastomotic leakage, occurring in 5 patients, two of whom died. Anastomotic leakage occurred in 2 of 6 patients following Allison oesophago-partial gastrectomy, and in 3 of 23 patients following total gastrectomy with distal oesophageal resection and oesophago-jejunal anastomosis. There was no leakage following Ivor Lewis oesophagectomy in 2 patients, transhiatal oesophagectomy in one patient and colon interposition in another patient.

In 3 patients, anastomotic leakage healed following parenteral nutrition and surgical drainage; successful repair of anastomotic leak was undertaken in one patient. Two patients with anastomotic leak died. A 59-year-old patient with Stage IV disease died one month following Allison oesophago-partial gastrectomy complicated by leakage. An 84-year-old man with a past history of hypertension, epilepsy, chronic obstructive airway disease, and pulmonary tuberculosis had Stage I carcinoma and symptomatic gallstones. Following resection of stomach and distal oesophagus and cholecystectomy, he developed fits and sepsis and died. Contrast study showed a small anastomosis leak.

Residual tumour at the resection margin was identified on histopathological examination in 3 patients following palliative resection of large tumours. None of the 19 patients who had attempted curative surgery for Stage I – III disease had residual tumour at the resection margins.

Respiratory complications occurred in 6 patients; however none was fatal.

Survival following surgery

Table II summarizes the 5-year survival rate according to the stage of disease. There were 23 patients operated on between 1980 and 1992 with a potential follow-up of 5 or more years, and 3 of these survived 5 or more years. Two of the survivors were patients with Stages I – II tumours and includes the patient who had re-resection for recurrent cancer of the gastric remnant 9 years later (Fig 3). One of the 11 patients operated for Stage III tumour between 1980 and 1992 survived 5 years.

Actuarial survival was also calculated according to the Kaplan Meier method and shown in Fig 4. The actuarial 5-year survival was 20% for all 30 patients with Stage I – IV disease (excluding 2 operative deaths). It was 31.8% for 18 patients with Stage I – III disease (excluding 1 operative death).

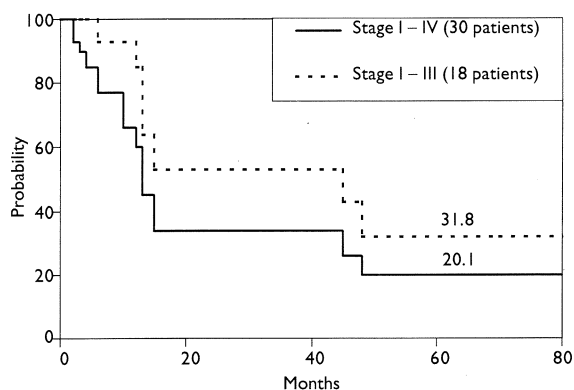


Fig 4 – Actuarial survival in 30 patients (excluding 2 operative deaths) resected for adenocarcinoma of gastro-oesophageal junction.

DISCUSSION

In the West, adenocarcinoma of the gastro-oesophageal junction has increased dramatically over the past 2 decades and some series suggest that adenocarcinoma now exceeds oesophageal squamous cell carcinoma in incidence^(10,11). In Singapore, the incidence of adenocarcinoma of the gastro-oesophageal junction is unknown. The Singapore Cancer Registry reported that for the years 1968 – 1992, adenocarcinoma comprised 2.1% of “oesophageal cancer”. However, the Registry does not classify adenocarcinoma of the gastro-oesophageal junction as a separate disease entity so that Types II & III cancer could well have been entered as gastric cancer in the Registry.

The present study suggests that adenocarcinoma of the gastro-oesophageal junction is not infrequent in our population – 32 cases of adenocarcinoma versus 54 cases of squamous cell oesophageal cancer operated by the present author over the same period of time. Barrett’s oesophagus⁽¹³⁾, obesity and low consumption of raw fruits and vegetables⁽¹⁴⁾ have been identified as risk factors for adenocarcinoma of the gastro-oesophageal junction in the West. Although these risk factors are less evident in Singapore, nevertheless it appears that there is significant presence of adenocarcinoma of the gastro-oesophageal junction in our population.

Table I – Operative complications and mortality in 33 operative procedures on 32 patients resected for adenocarcinoma of the gastro-oesophageal junction

| Operative complication | Attempted curative surgery n = 20 | Palliative surgery n = 13 | Total n = 33 |
|------------------------------------|--------------------------------------|--|-----------------|
| Anastomotic leakage | 3 (1)* | 2 (1)* | 5 (2)* |
| Residual tumour at surgical margin | 0 | 3 (2 upper margin) (1 lower margin) | 3 |
| Respiratory complications | 4 | 2 | 6 |
| Post op psychosis | 2 | 0 | 2 |
| Post op haemorrhage | 1 | 0 | 1 |
| Mini stroke | 1 | 0 | 1 |

* figures in parenthesis indicate operative mortality

Table II – Observed 5-year survivors following surgical resection in 32 patients with adenocarcinoma of the gastro-oesophageal junction.

| pTNM stage | No. of patients | No. surviving surgery | No. surviving more than 5 years | Comments |
|------------|-----------------|-----------------------|---------------------------------|---|
| I | 2 | 1 (1)* | 0 | An overseas patient defaulted FU after 7 months |
| IIA | 1 | 1 (1)* | 1 | Re-resected for recurrent cancer of gastric remnant 9 years after Ivor Lewis oesophagectomy (Fig 3) |
| IIB | 2 | 2 (2)* | 1 | One patient died after 6 months from COLD |
| III | 14 | 14 (11)* | 1 | |
| IV | 13 | 12 (8)* | 0 | |
| Total | 32 | 30 (23) | 3 | |

Figure in parenthesis indicates no. of patients who were operated on between 1980 – 92 with a potential 5 or more years of follow-up.

In this study, as in other series, adenocarcinoma of the gastro-oesophageal junction presents late; 27 of 32 patients were in advanced Stage III and IV disease.

Our operative approach has been determined by the site of carcinoma in relation to the oesophageal junction. It has similarities with the scheme proposed by Siewert in that Types II and III tumours be treated by D₂ type total gastrectomy with distal oesophageal resection and Type I tumour resected as for squamous cell oesophageal cancer⁽⁵⁾. Using this approach, tumour margin involvement has been low and operative mortality (2 in 33 operations) appears acceptable compared with 15% – 19% in most series⁽¹⁵⁾. Our actuarial 5-year survival of 20% also appears acceptable in comparison with 10% – 15% in most series⁽¹⁾.

In most series, a major cause of operative mortality has been cardio-respiratory complications. We were fortunate in not having any operative death due to this complication and this is possibly related to our selective operative approach. For patients who have poor respiratory function and Types II and III tumour, extended total gastrectomy was performed without thoracotomy; with adequate experience, the lower oesophagus can be adequately exposed through the divided oesophageal hiatus. Thoracotomy can also be avoided in patients with poor respiratory function in Type I tumour by performing transhiatal oesophagectomy with cervical oesophago-gastrostomy, as was done in one of our patients.

Most series also report that anastomotic leakage is another important source of morbidity. In the present series, it occurred in 5 patients and was fatal in 2 patients. Anastomotic leakage appeared to be related to difficulties in exposure of the lower oesophagus and tension at the anastomosis and the following precautions should be taken to minimise its occurrence. Thus, while oesophago-partial

gastrectomy for Type I tumour can be performed by the Allison left thoraco-abdominal approach, exposure is considerably better with the Ivor Lewis laparotomy – right thoracotomy approach and this should preferably be routine. Tension in the oesophago-jejunostomy following extended total gastrectomy needs to be avoided by mobilising an adequate length of well vascularised jejunal loop. When remnant stomach is used, we have on occasions, made multiple serosal incisions to increase the length. However following wide excision of a large tumour extending widely into both the oesophagus and stomach, colonic interposition would be more appropriate.

Although surgery for adenocarcinoma of the gastro-oesophageal junction is usually palliative, Stages I and II and to a lesser extent, Stage III are potentially curable. Thus attempted surgical resection should ensure tumour-free margins and adequate lymphadenopathy. The absence of tumour involvement of the surgical margins in all 19 cases of curative resection in the present series suggest that the extent of resection of the oesophagus and stomach with our approach is adequate.

However, the extent of lymphadenectomy for cure remains controversial. Based on the excellent results in Japan with D₂ resection for gastric cancer, it appears appropriate for us to perform D₂ type resection for adenocarcinoma of the gastro-oesophageal junction as well. As for more radical resections, a few small series have reported the survival advantage of extended bloc oesophago-gastrectomy for early lesions⁽¹⁶⁾ but these results have not been verified by controlled trials. In Japan, there is an ongoing trial on D₂ versus D₄ lymphadenectomy for carcinoma cardia, and we await the results with interest.

The successful re-resection on the patient who developed cancer of the thoracic gastric remnant following Ivor Lewis oesophagectomy 9 years previously is also of anecdotal interest as no such case appears to have been reported in the literature. The prolonged time interval between the previous surgery and the reappearance of cancer in the gastric remnant suggest that the cancer is a second tumour rather than a true recurrence. As the patient has survived 4 years after re-resection and apparently free from recurrence, this anecdote suggests that re-resection for adenocarcinoma of the gastro-oesophageal junction can on occasions, be rewarding.

In the search for better medium and long-term survival for adenocarcinoma of the gastro-oesophageal junction, encouraging results have been reported with neoadjuvant chemoradiation in phase II trials⁽¹⁷⁾, as well as with a single phase III randomised study⁽¹⁸⁾. This latter study compared preoperative chemoradiation using cisplatin, 5FU and 40Gy units of radiation with surgery alone. Twenty-five percent of patients had complete pathological response and there was also survival advantage of 32% at 3 years compared to 6% for surgery alone. There is however concern over the

study as protocol violations were not clearly described, staging appeared incomplete and surgical techniques were not standardised. Thus, although results are encouraging, there is a need for further validation, such as the current CACGB-9781 trial in the US, before neoadjuvant chemoradiation is accepted as the standard treatment for adenocarcinoma of the gastro-esophageal junction⁽¹⁹⁾.

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