The role of surgery in the palliative management of oesophageal cancer

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Summary

Cure of oesophageal cancer is unlikely in the majority of patients with this disease, so that the first aim of treatment is the effective palliation of dysphagia. Surgery is the most certain method of restoring normal swallowing, but should not be undertaken unless it is likely to be safe and effective. Appropriate therapy for the individual patient can only be selected after careful pre-operative assessment of the level, length and extent of the tumour and of the patient's general condition. The indications and techniques for oesophagectomy and oesophageal bypass are discussed.

Pre-operative assessment

This requires careful history-taking and physical examination to detect the symptoms and signs of extra-oesophageal spread and dissemination of tumour. For example, hoarseness due to left recurrent laryngeal involvement and constant pain indicate that the tumour has infiltrated the mediastinum; enlargement of the liver and scalene nodes are suspicious signs of distant spread that requires confirmation by liver function studies, a liver scan and node biopsy. Pre-operative investigations include a chest radiograph, to identify the occasional pulmonary metastases and concomitant lung disease. Barium swallow and meal examination is essential to locate the lesion, determine its length and detect extension of distal tumours into the stomach or the presence of malignant fistulas. Oesophagoscopy permits the final histological diagnosis to be made, and bronchoscopy is important to exclude airway infiltration and metastases to the tracheobronchial lymph nodes, evidenced by blunting of the carina. Computed tomography (CT) (Fig. 1) can reveal mediastinal...

Choice of method

The most distressing effect of oesophageal cancer is dysphagia, and the method chosen to palliate this symptom must aim to restore normal alimentation. Dilatation of a malignant stricture offers only temporary relief and oesophageal intubation will restrict the patient to a sloppy diet. Radiotherapy to the tumour can worsen dysphagia and up to 50% of patients still require dilatation after completion of therapy. It would therefore appear that surgery is the most certain method of restoring swallowing to normal.

The surgical procedure chosen can involve either resection or bypass of the tumour. The decision to operate and whether to perform oesophagectomy or oesophageal bypass can only be made after accurate assessment of the level, length and extent of the tumour and of the fitness of the patient for surgery.

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invasion, fixity to the aorta, or involvement of the vena azygos or mediastinal and coeliac lymph nodes.

These investigations allow accurate identification of the gross extent of the cancer. Of equal importance, however, is assessment of the patient’s fitness for major surgery and preparation for it. By the time of admission to hospital many patients are grossly malnourished. The catabolic effects of starvation and the presence of tumour must be reversed before it can be assumed that wounds and anastomoses will heal.

If after several weeks of refeeding, using enriched liquid diets, gastrostomy feeds or intravenous alimentation, the patient has not started to regain weight, major surgery is contraindicated. Chronic obstructive airways disease with superadded aspiration pneumonitis is a common finding in patients with oesophageal cancer. This necessitates cessation of smoking, intensive chest physiotherapy and administration of bronchodilators and antibiotics. Respiratory status must be improved to the stage where the lung fields are clear to auscultation and the patient can walk up two flights of stairs without obvious dyspnoea before thoracotomy can be safely undertaken. Otherwise, extrathoracic bypass rather than oesophagectomy would be the surgical procedure of choice.

Methods
Oesophagectomy
Indications

When careful pre-operative investigations have excluded gross extra-oesophageal extension of tumour and where the patient is fit for thoracotomy, the ideal method of palliation is oesophagectomy. Under these circumstances the mortality associated with this procedure should be less than 10%,12,14,15 Involvement of regional lymph nodes is not a contraindication to palliative resection; these can be excised with the tumour. When resection of the tumour is successful and there is no microscopic evidence of malignancy in the margins of the specimen, a prolonged remission of at least 1 year can be expected in 25% of survivors.16 When excisional surgery is combined with radiotherapy, cure will be an unexpected bonus for about 15% of patients.3-5

Although up to 20% of patients will require dilatation of anastomotic strictures after oesophagectomy, relief from dysphagia is immediate and complete in the majority.12,17 Total removal of the tumour will also prevent pain from cancerous mediastinal infiltration.

Techniques

The level of the lesion determines the operative approach to resection, and since of all parts of the gastro-intestinal tract the stomach is most easily mobilized and has the best blood supply, gastric replacement of the excised oesophagus is the safest method of reconstruction.13,15 The length resected above and below the tumour is very important if anastomotic recurrence and return of malignant dysphagia are to be prevented. When the cancer is situated in the distal oesophagus, the proximal stomach must be resected to provide good clearance below the tumour. At least 5 cm of macroscopically uninvolved oesophagus above the growth must be excised; if the adequacy of clearance is doubtful the margins of the resected specimen should be checked by frozen section before the anastomosis is performed. To meet these criteria, laparotomy and right thoracotomy with the anastomosis at or above the aortic arch level will be necessary (Fig. 2, A). The left thoraco-abdominal and lower left thoracic approaches, which can lead to difficulty in performing high anastomoses, are not advised for squamous cancers of the distal oesophagus.

For cancers of the upper and middle thirds of the thoracic oesophagus, where the upper level of the lesion is seen at oesophagoscopy to be at least 6 cm below the cricopharyngeus, ‘total’ oesophagectomy15 is the appropriate procedure (Fig. 2, B). In this operation a neck dissection is added to laparotomy and right thoracotomy. The stomach is drawn up into the neck, where the anastomosis can be performed with ease between the oesophageal remnant and the gastric fundus.12,13,15 Oesophageal cancers arising within 5 cm of the pharyngo-oesophageal junction necessitate excision of part of the pharynx and attached larynx for complete clearance of tumour (Fig. 2, C). The thoracic oesophagus below the tumour can be mobilized partly under vision and partly by blind digital dissection through the neck and abdominal incisions. The mobilized stomach is drawn through the posterior mediastinum for immediate anastomosis to the pharynx.19-21 This operation, pharyngolaryngo-oesophagectomy with gastric replacement, is only suitable for the minority of cancers of the cervicothoracic oesophagus where there is no evidence of invasion into the back wall of the trachea.19 Otherwise tearing of the trachea at operation, or later tracheostome recurrence leading to haemorrhage, asphyxia and inhalation bronchopneumonia can be expected.20 However, in patients with localized tumours this operation gives prompt relief from dysphagia, can be safely performed with a mortality rate of less than 10%22-24 and ensures comfortable survival for at least 1 year in 50% of patients.24 Although it involves laryngectomy, well-motivated patients can compensate for the loss of the larynx by the development of ‘gastric’ speech.20-24

Almost all long lesions of the oesophagus prove on pre-operative investigation to have extended into the mediastinum.
Even when a lesion of 10 cm or more appears localized to the oesophagus, however, oesophagectomy is contraindicated. Adequate longitudinal resection of such a lesion results in difficulty in opposing the oesophageal remnant to the remaining stomach. The use of long-segment colonic or jejunal interposition in this situation results in operative mortality rates of 20% - 30% as well as an increased incidence of anastomotic leakage. Use of these procedures in the patient with oesophageal cancer achieves very little if a major part of the patient's limited survival will be spent in hospital recovering from the complications of surgery.

**Oesophagectomy without thoracotomy**

While digital mobilization of the normal oesophagus is a standard manoeuvre in the operation of pharyngolaryngoesophagectomy, as described above, blind enucleation of thoracic oesophageal cancers is seldom indicated. Almost all oesophageal cancer has extended through the oesophageal wall by the time of diagnosis and so-called 'blunt oesophagectomy' almost certainly leaves residual tumour in situ. Local control of the lesion is unlikely to be achieved. Although the procedure would appear attractively simple in debilitated patients with severe lung disease, it is nevertheless associated with an appreciable mortality rate of between 20% and 30%.

One application of extrathoracic oesophagectomy however, is in the frail patient with a small distal third cancer which can be dissected under vision through the abdominal incision using a transthoracic approach. The uninvolved oesophagus above the tumour can then be mobilized digitally and the stomach drawn through the posterior mediastinum to the neck (Fig. 2, D). This enables a cervical oesophagofundic anastomosis to be performed without entering the chest.

**Oesophageal bypass**

**Indications**

When there is pre-operative evidence that a cancer has spread beyond the oesophagus and is infiltrating adjacent structures, exploration of such a tumour is contraindicated. Not only will thoracotomy prove a pointless exercise in one-third of patients, but in the remainder, who are subjected to oesophagectomy, the operative mortality rate is alarmingly high. In patients with extra-oesophageal extension of tumour and also those whose poor respiratory function makes thoracotomy for resection hazardous, the surgical alternative to oesophagectomy is oesophageal bypass. Right colon, jejunum, gastric tubes and the whole stomach have all been used for bypass procedures. However, before any bypass operation can be recommended it must fulfil certain requirements: an acceptably low mortality rate for the operation in debilitated patients and the achievement of immediate and complete relief from dysphagia.

**Techniques**

The mortality rate associated with colon bypass in patients with unresectable oesophageal cancer varies between 30% and 50%, and figures reported for long jejunal bypass are even higher. Fashioning an isoperistaltic or retroperistaltic tube from the greater curve of the stomach to bypass the oesophagus is safer than using colon; the mortality rate in oesophageal cancer patients is less than 20%. There is, however, a high incidence of anastomotic leakage and strictures, so that prolonged hospitalization is necessary in 30% - 40% of survivors.

The stomach has a better blood supply than the jejunum, colon and gastric tubes; the fundus of the stomach will reach easily into the neck by any route. Gastric bypass in the patient with oesophageal cancer has been associated with a mortality rate of less than 10% and a low rate of anastomotic complications in most recent series. Gastric bypass, which restores normal swallowing and is less dangerous than intubation, is therefore the procedure of choice in the patient with unresectable thoracic oesophageal cancer who is fit for major surgery.

The level of the lesion determines the route of the bypass. For lower third cancers, the stomach may be taken retrosrernally to the neck (Fig. 3). For upper and middle third cancers, where continued growth of the primary tumour or enlargement of scalene nodes can compress a bypass brought through the narrow thoracic inlet, the presternal route is preferred (Fig. 4).

When the cancer is invading the airway it is probably wise to add to gastric bypass the additional step of Roux-en-Y jejunal anastomosis to the intra-abdominal oesophagus, to drain oeso-
phageal secretions away from the site of an incipient or frank oesophageal-airway fistula. After gastric bypass, the cancer should be irradiated to control its growth and relieve pain. Even patients with tracheobronchial involvement can be safely irradiated; when the oesophagus has been effectively bypassed, precipitation or enlargement of a malignant fistula by radionecrosis will be of little consequence. The combination of gastric bypass and radiotherapy results in an average survival of 7 months, with 25% of patients surviving comfortably for a year or more. This compares favourably with the combination of intubation and radiotherapy where the average survival is 3 months, less than 5% of patients surviving for a year.

Oesophageal bypass is contraindicated for high cervicothoracic cancers; here there is not enough normal oesophagus above the tumour to safely anastomose to the stomach, and bypass of these lesions with intestinal segments anastomosed to the pharynx leads to death from aspiration. Oesophageal bypass is seldom indicated for cancers of the distal oesophagus which are invading the stomach; when the stomach cannot be used for bypass, the only alternatives are the more hazardous colon or jejunal bypasses. Oesophageal bypass is also contraindicated in patients who are poor operative risks and in those with gross disseminated disease who will survive, on average, only 2 months after the operation. In these patients a non-operative method of palliation is advised.

Conclusions

1. The appropriate method of palliation for oesophageal cancer can only be selected after careful assessment of the level, length and extent of the tumour and the general condition of the patient.

2. When the tumour is localized to the oesophagus and the patient is fit for thoracotomy, the best method of palliation is by oesophagectomy. Under these circumstances the operation is associated with a low mortality rate, alleviates dysphagia promptly and provides the longest disease-free interval.

3. In the patient with an unrespectable tumour who can be made fit for major surgery, the procedure of choice to restore normal swallowing is an oesophageal bypass using the whole stomach. Bypass must be combined with radiotherapy to control tumour growth and relieve pain.

4. Oesophageal bypass is contraindicated in patients unfit for major surgery, in those with advanced proximal or distal lesions not suited to gastric bypass, and in those with disseminated disease. In these cases some relief from dysphagia can be provided by non-operative methods which include dilatation of the stricture, use of various types of oesophageal tubes, and radiotherapy.

REFERENCES