

# Oesophagogastrrectomy in patients over 70

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**ABSTRACT** Although the results of oesophageal resection for benign and malignant disease are well documented, the risk of operative death and long term survival in patients over the age of 70 is not well defined. The outcome has been reviewed for 46 patients (23 male, 23 female) aged 70 years or more (mean 74 years) undergoing oesophageal resection during a period of seven years; 16 patients were 75 years or over. All resections were performed with the EEA stapler, except for one cervical anastomosis that was stitched by hand. In 42 patients resection was for malignancy. Six patients died within 30 days of operation or during the initial hospital stay, giving an operative mortality of 13%. Only one of the 16 patients aged 75 years or more died. Cardiopulmonary complications accounted for most of the operative deaths. Patients were scored retrospectively by a multifactorial risk factor. Patients who left hospital had a mean preoperative score of 3.66, compared with 15.2 for those who died. Use of such a score may help to improve selection for surgery in this age group. It is concluded that oesophagogastrrectomy may be performed in selected patients over the age of 70 years with acceptable mortality, morbidity, and length of hospital stay.

## Introduction

Resection of the oesophagus provides the best hope of cure for patients with oesophageal cancer and is frequently the best form of palliation. It is also an acceptable method of dealing with some benign strictures of the oesophagus. Because the procedure carries a relatively high operative mortality<sup>1-3</sup> there has been a reluctance to operate on patients over the age of 70, who tolerate thoracotomy less well,<sup>4</sup> more frequently have complications such as pulmonary embolism and myocardial infarction,<sup>5</sup> and have a higher mortality after oesophagogastrrectomy than younger patients.<sup>1-7</sup> Newer operative techniques, combined with improved preoperative selection of patients, have led to improved clinical results in this age group according to recent reports.<sup>5-7</sup> We have reviewed our experience with 46 consecutive patients over the age of 70 years who underwent oesophagogastrrectomy for benign and malignant disease, and discuss the factors that have helped to improve the operative management of these patients.

## Methods

The case records of all patients undergoing oeso-

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phageal resection under the care of one surgeon (RJD) from January 1980 to June 1987 were retrospectively reviewed. During this period 267 patients were referred for treatment of oesophageal cancer, 160 undergoing resection and 107 being treated with palliative intubation. In all 176 patients underwent resection for benign and malignant disease, 46 of whom were over the age of 70 (range 70-84) years and are the basis of this report (fig 1). The mean age of the group was 74 (SD 38) years; 16 were over 75.

No patient was denied resection because of age alone. The criteria used to select patients with carcinoma of the oesophagus for resection were freedom from metastatic disease, no appreciable local spread,

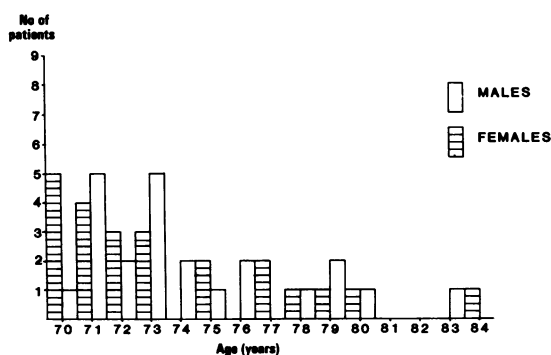


Fig 1 Age distribution of the patients.

and no concurrent medical disease that would seriously prejudice their prospects of surviving operation. In this context, the presence of vocal cord paresis, tracheo-oesophageal fistula, enlarged cervical lymph nodes, and the detection of hepatic metastases by ultrasound scanning were accepted as indicators of inoperability. Patients undergoing resection for benign disease had reflux induced strictures causing unacceptable dysphagia and the procedure was performed as a last resort for palliation. All anastomoses were performed with the EEA circular stapling device<sup>28</sup> except for one cervical anastomosis that was made by hand.

Preoperative assessment consisted of careful history and physical examination, pulmonary function tests, barium swallow, biochemical screen, oesophagoscopy, and in cases of a midthoracic tumour bronchoscopy. Isotope, ultrasound, and computed tomography scans were obtained when indicated for evaluation of local or metastatic spread. Since June 1983 we have used a left thoracotomy incision as our standard technique for resecting lesions of the gastric cardia and lower and mid oesophagus. Access to the abdominal viscera was obtained through an incision in the diaphragm. The oesophagus was routinely transected at least 5 cm above any palpable tumour and above the aortic arch for benign strictures. Neither pyloromyotomy nor pyloroplasty were performed routinely. Patients were normally extubated in the operating theatre and returned to the general ward.

Postoperative care consisted of ensuring optimal pulmonary function with chest physiotherapy, bronchodilators, and antibiotics when indicated. Subcutaneous heparin prophylaxis was begun before operation and continued until the patient was walking about freely. Parenteral nutrition was not used routinely before or after operation. Chest tubes were removed on the first or second postoperative day. Nasogastric tubes were left in place until the aspirate was minimal. Water by mouth was begun on the fourth day and foods were given as soon as they were tolerated. Gastrograffin swallows were not done routinely unless a leak was suspected or difficulty had been encountered in performing the anastomosis. Early ambulation was encouraged.

After discharge from hospital patients were seen every three months for the first year and then every six months. They were evaluated for evidence of tumour recurrence, anastomotic stricture, and metastatic spread. Patients complaining of dysphagia had endoscopy and dilatation as indicated. Radiotherapy was not used preoperatively but was used postoperatively when indicated for palliation of residual or recurrent disease.

All patients were assessed retrospectively on the basis of the multifactorial cardiac risk index of

Table 1 *Weighting of risk factors\**

Criteria	Points
<b>HISTORY</b>	
Age over 70 years	5
Myocardial infarction previous 6 months	10
<b>EXAMINATION</b>	
S <sub>3</sub> gallop or jugular venous distension	11
Appreciable aortic valve stenosis	3
<b>ELECTROCARDIOGRAM</b>	
Premature atrial contractions or rhythm other than sinus	7
More than five premature ventricular contractions/min	7
<b>GENERAL CONDITION</b>	
Abnormal blood gas tensions	
K <sup>+</sup> /HCO <sub>3</sub> abnormalities	
Abnormal renal function	
Liver disease	
Bedridden	3
<b>OPERATION</b>	
Emergency	4
Intraperitoneal, intrathoracic, or aortic	3
Total possible	53

\*Modified from Goldman *et al.*<sup>9</sup>

Goldman *et al.*<sup>9</sup> which has been shown to predict the risk of a fatal cardiac event reliably in patients undergoing non-cardiac surgery. This gave each patient a cumulative point score (which excluded points for age over 70 and for a thoracotomy incision as these were common to all patients) (table 1). Preoperative values for the forced expiratory volume in one second (FEV<sub>1</sub>) were retrospectively estimated in a similar manner.

Histologically, 20 patients had an adenocarcinoma, 20 a squamous cell carcinoma, one a lymphoma, and one an undifferentiated tumour. Four patients underwent resection for benign disease. Of the 42 patients with malignant tumours, the resection margins were clear in all but one, 33 had full thickness penetration of the oesophagus, and 15 had affected lymph nodes.

The 25 mm EEA stapler (Autosuture, United Kingdom) was used for the anastomosis in 12 patients, the 28 mm for 23 patients and the 31 mm for 10 patients. One anastomosis was hand sewn in the neck.

## Results

During the seven and a half years 46 patients (23 male, 23 female) aged 70 years or more underwent resection for benign or malignant disease. Forty two of the 46 patients had malignant disease. The resection rate for all patients aged 70 years or more presenting with oesophageal cancer during this period (60%, 42/70), was similar to the resection rate in patients below the age of 70 (59%, 118/197). Six patients died within 30 days of surgery or during the initial hospital stay, giving a hospital mortality of 13%; one of the patients

Table 2 Numbers of deaths and complications

DEATHS	
Myocardial infarction	3
Respiratory failure	1
Pulmonary embolus	1
Gastrotomy leak	1
COMPLICATIONS	
Wound infection	2
Deep venous thrombosis	1
Atrial fibrillation	1
Hypovolaemic shock	1
Stapler failure	1

was over 75 years (table 2). The mean length of hospital stay was 13.6 (SD 8) days. Three patients died of myocardial infarction, one from respiratory failure, one because of a leak at the gastrotomy staple line, and one (the patient over 75) from a massive pulmonary embolus after a long hospital course following a chylothorax.

There were six complications, excluding operative deaths, and no anastomotic leaks. The complications included two wound infections, a deep vein thrombosis, an episode of atrial fibrillation, and one episode of hypovolaemic shock. In one patient with a benign stricture the stapler failed. Although the staples fired satisfactorily, the knife failed to cut the central core of tissue adequately. Some excess residual tissue was removed through the gastrotomy, and more endoscopically when the patient developed dysphagia after the operation. Repeat resection of the oesophagus was eventually required and this patient is now symptom free.

Follow up information was available until July 1987 for all patients. Survival, calculated by the actuarial method<sup>10</sup> and with operative deaths taken into account, was 50% at one year and 15.3% at five years (fig 2).

On the basis of the modified cardiac risk index of Goldman *et al*<sup>9</sup> described above, the mean cumulative preoperative point score was 3.66 (1.83) for the patients who left hospital and 15.2 (9.8) for those who died within 30 days of surgery or while in hospital ( $p < 0.0005$ , Student's *t* test). No patient with a cumulative point score greater than 10 survived. There was no statistical difference in preoperative FEV<sub>1</sub> values between the survivors (2.1 (0.9) litres) and those who died (1.9 (0.8) l).

## Discussion

Oesophagogastrectomy has been associated historically with a high operative mortality and poor long term survival when carried out for malignant disease. In a review of 122 papers published world wide from 1953 to 1978 the average operative mortality was 29% (range 1–83%).<sup>11</sup> Recent papers from Britain report an

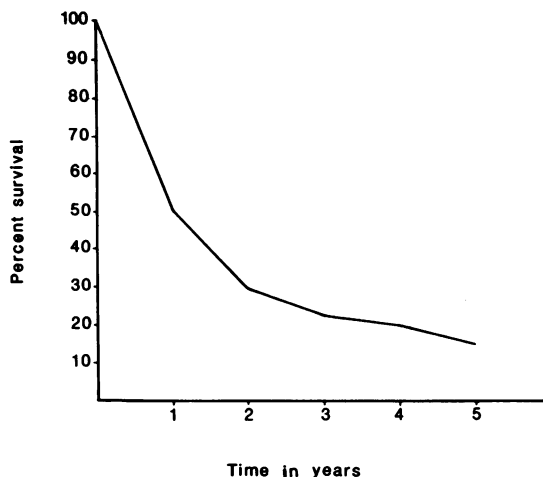


Fig 2 Actuarial survival of patients with malignant disease (operative deaths included). One year—50.6%; two years—29.6%; three years—23%; four years—20.3%; five years—15.3%.

operative mortality of around 10%,<sup>3,8,12</sup> and lower figures have been reported from the United States and Japan.<sup>13,14</sup> Although mortality has decreased with improvements in operative techniques and supportive care, oesophagogastrectomy still carries one of the highest operative mortality rates for a routine surgical procedure.<sup>15</sup> These figures have led some to believe that oesophagogastrectomy is not justified in the elderly, where mortality rates have been much higher.<sup>1-3</sup> Reviewing over 1700 patients, Wong<sup>1</sup> reported an operative mortality of 61% in the 128 patients over the age of 70. Behl *et al*, using the circular stapling device, in 1983 reported a 33% mortality in 23 patients over the age of 60,<sup>2</sup> and attributed the high mortality to the advanced age of the patients. Wong, however, found that in addition to advanced age concurrent "medical" conditions, particularly previous cardiac or respiratory illness, were the most important causes of mortality after oesophagogastrectomy.

Postoperative pulmonary infection and cardiac arrhythmias were found more frequently in the elderly by Keeling *et al*,<sup>7</sup> though postoperative hospital stay was not related to age. Cardiac and respiratory complications were the major cause of death in our patients also. We would disagree, however, with Wong and Behl that age alone is a major cause of mortality and should exclude a patient from the possibility of resection. The hospital mortality in our series of 46 patients was 13% overall, with only one death in the 13 patients aged over 75 years. Sixty per cent of the patients with malignant disease underwent resection.

Although no patient in our series was denied resection because of age alone, selection of patients is obviously important. Resectability rates for oeso-

Table 3 Published morbidity and mortality rates for palliative intubation in the management of oesophageal cancer

Authors	Hospital mortality (%)	Complication rate (%)	Average survival
Girardet <i>et al</i> <sup>23</sup>	13.9	25.4	4.2 months
Duvoisin <i>et al</i> <sup>25</sup>	14	45	4.5 months
Proctor <sup>27</sup>	36	18	11 weeks
Sanfelippo and Bernatz <sup>19</sup>	10	27	—
Angorn and Hegarty <sup>20</sup>	16	9	—
Unruh and Pagliero <sup>26</sup>			
Pulsion	14.3	42.9	2 months
Traction	23.1	38.5	4 months
Mean	18.2	40.9	

phageal cancer in published reports varied from 21.7% to 76.2% in one review,<sup>12</sup> though Keeling *et al* recently reported a resection rate of 89% in patients aged 70 years or more.<sup>7</sup> Our rate of 60% of patients of a similar age compares favourably with these figures.

As pulmonary and cardiac complications are recognised as important in elderly patients undergoing oesophageal surgery<sup>5,6</sup> Sugimachi *et al*<sup>6</sup> looked at preoperative pulmonary function in an attempt to improve preoperative selection in patients over the age of 70 undergoing oesophageal resection, but were unable to predict postoperative pulmonary complications or death. We too were unable to find any relation between preoperative FEV<sub>1</sub> and outcome. We did, however, show a significant correlation between retrospectively calculated cardiac risk and postoperative death. The analysis of cardiac risk was based on the risk index of Goldman *et al*,<sup>9</sup> based on physical examination, medical history, and laboratory investigations. This assesses the operative risk of death from a cardiac cause and thereby helps to select patients at high risk from non-cardiac surgical procedures. The cumulative point system allows patients to be placed in one of four categories of increased risk. We applied this analysis retrospectively so conclusions must be guarded, but our data suggest that Goldman's cardiac risk index may be a logical way of improving selection of elderly patients for oesophagogastrctomy.

We attribute our favourable mortality to several technical changes that we have adopted over the years.<sup>8</sup> We had no anastomotic leaks, traditionally a major source of mortality in elderly patients undergoing oesophageal resection.<sup>5,6</sup> All our intrathoracic anastomoses since 1980 have been performed with the EEA stapler and the consequent reduction in anastomotic leaks helped to decrease operative mortality.<sup>8</sup> Disruption of an intrathoracic oesophageal anastomosis is the most serious complication of this type of surgery, carrying a mortality of 50%.<sup>16</sup>

Since 1983 we have preferred a left thoracotomy through the bed of the unresected 7th rib with a

transthoracic incision of the left hemidiaphragm in patients requiring oesophagogastrctomy. Dark *et al*, using a similar approach through the bed of the 8th rib, report an operative mortality of 7.6%.<sup>12</sup> We have now attempted resection by this route in 22 patients aged 70 or more. Three required extension to a thoracoabdominal incision when exposure proved to be inadequate. Looking at patients of all ages, we found that the operative mortality improved from 10.9% in 73 patients having resections via a left thoracoabdominal approach to 5.9% in 75 patients with a left thoracotomy incision.<sup>17</sup> We agree with Dark *et al* that the smaller incision reduces operative time and, as it does not cross the costal margin, allows for less painful coughing and breathing and better cooperation with chest physiotherapy after operation.

Oesophagogastrctomy therefore may be successfully performed in elderly patients with an acceptable mortality and a short hospital stay. Long term survival continues to be elusive, however, owing to the advanced stage at which patients with oesophageal cancer characteristically present. Mediastinal invasion was present in 33 (78%) of our patients and local lymphatic spread in 15 (35%), and this is reflected in our five year survival figures.

At present the alternatives to surgical resection of oesophageal carcinoma consist of dilatation, radiotherapy, intubation, and laser therapy. Chemotherapy has no role at present in relieving dysphagia. These alternative forms of palliation offer inferior relief of dysphagia and pain as well as a shorter long term survival (see table 3 for intubation).<sup>16 18 19-26</sup>

Methods of intubating oesophageal tumours described by Proctor<sup>27</sup> and Celestin<sup>24</sup> are ingenious and can be performed relatively easily. These are not without serious risk, however, and carry little chance of five year survival.

Our data suggest that selected patients aged 70 and over requiring oesophageal resection for cancer and benign strictures can have oesophagogastrctomy with an acceptably low hospital mortality rate, a low incidence of serious morbidity, and a short hospital stay. The procedure also achieves excellent relief of pain and dysphagia. The use of the circular stapling device through a left thoracotomy approach and today's improved surgical techniques makes oesophageal resection a reasonable procedure in the elderly.

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