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SURGERY FOR ESOPHAGEAL CANCER IN ELDERLY PATIENTS: THE VIEW FROM NOTTINGHAM

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Objective: **Our aim was to compare the outcome of esophageal resection for carcinoma in elderly patients (aged over 70 and over 80 years) with that of younger patients managed within a single specialist thoracic surgery unit.** ***Patients and methods:*** **Between January 1987 and November 1997, 523 patients underwent esophagectomy for carcinoma in the Nottingham City Hospital Thoracic Surgery Unit. The patients were divided into 3 groups by age: group I, under 70 years (*n* = 337); group II, 70 to 79 years (*n* = 150), and group III, 80 to 86 years (*n* = 36). These groups were compared with regard to preoperative medical status, operability and resectability, complications, operative mortality, and long-term survival.** ***Results:*** **Patients in groups II (6.0%) and III (2.8%) had fewer preexisting respiratory problems than patients in group I (12.5%), and the patients in group III had fewer preexisting cardiovascular problems (16.7%) than patients in groups I (25.2%) and II (32.7%). Although patients in group III were generally less likely to have operable lesions (64.3%), no significant differences in resectability rate were detected among the 3 groups (80.8%, 77.7%, and 80%). Elderly patients (groups II and III) had a higher incidence of overall (34% and 36.1%), respiratory (24.7% and 19.4%), and cardiovascular (7.3% and 11.1%) complications than those aged under 70 years (24.6%, 16.3%, and 2.1%, respectively). However, operative mortality (4.7%, 6.7%, and 5.6%) and 5-year survivals inclusive of operative mortality (25.1%, 21.2%, and 19.8%) were similar among the 3 groups.** ***Conclusions:*** **Accumulated experience in all aspects of perioperative management**

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may account for a low hospital mortality in elderly patients despite a greater operative risk. The survival benefit is similar to that in the younger age groups, enforcing the view that esophagectomy within specialist thoracic units can be safely offered (in appropriately selected patients) with acceptable long-term survival in all age groups. (J Thorac Cardiovasc Surg 1998;116:545-53)

society whose elderly population is growing, it is not surprising that the number of elderly patients referred to thoracic surgeons for esophagectomy is rising. The proportion of elderly patients (aged over 70 years) having an esophagectomy for carcinoma in our unit has steadily risen from 16.5% in 1987 to 43% in 1997 (χ^2 test for trend, $P = .01$) (Fig 1).

Esophageal resection has generally been associated with high morbidity and mortality rates. The increased risk of surgical treatment in elderly patients has to be balanced with the view that resectional surgery offers the only real hope of cure in most circumstances. Previous studies on the advisability of operation in elderly patients have resulted in conflicting views.[1-7] In this report we compare the results of surgery in patients in their eighth and ninth decades of life with those of patients aged less than 70 years to assess the role of esophageal resection in elderly patients.

Patients and methods

Between January 1987 and November 1997, 686 patients with carcinoma of the esophagus or gastroesophageal junction were evaluated with a view to performing esophagectomy. Thirty-one patients (4.5%) were believed to be unsuitable for surgery on medical grounds and the remaining 655 (95.5%) had a surgical exploration. In 523 patients (79.8%) esophageal resection was accomplished. These 523 patients were divided into 3 groups by age: group I, under 70 years; group II, 70 to 79 years; and group III, 80 to 86 years. (Demographic details and age distributions are shown in Table I and Fig 2). These groups were compared with regard to their preoperative fitness, operability and resectability rates, tumor characteristics and pathologic features, type of operation, length of hospital stay, prevalence of postoperative complications, operative mortality, and 5-year survival.

Preoperative evaluation was by means of physical examination, hematologic and biochemical investigations, chest x-ray radiography, barium meal, abdominal ultrasound, and esophagogastroscopy. Bone scan was performed if indicated. Major airways involvement by tumor was excluded where appropriate by bronchoscopy.

Computed tomographic scan was not routinely performed because experience in this unit showed it to be a poor means of assessing both mediastinal tumor extent and lymph node status.[8] Our experience with endoscopic ultrasound, although brief, was soon abandoned as, apparently, providing no benefit. Its value is currently being reassessed in the light of experience of other units. Spirometry, capillary blood gas analysis, and electrocardiography were routine. Exercise tests were carried out in all patients above the age of 70 years, in those with lung volumes of less than 60% of predicted value for age and height, or in those with significant ischemic changes on the electrocardiogram.

Patients were considered eligible for a surgical exploration if they had no evidence of metastatic disease on screening tests and appeared to have adequate cardiorespiratory reserve. In general, patients more than 70 years old were very unlikely to qualify for an operation if they had a forced expiratory volume in 1 second of less than 50% of the predicted value for weight and height, vital capacity of less than 50% predicted, or if they were unable to complete stage I of the Bruce protocol (in the absence of musculoskeletal disorder) on exercise testing owing to symptoms or signs of myocardial ischemia or desaturation on exercise.

All operations were performed by the same team of three thoracic surgeons who used similar surgical techniques and uniform perioperative management.

Extensive mediastinal dissection was routinely carried out and included all periesophageal tissues with the subcarinal, paratracheal and parahiatal lymph nodes, both parietal pleurae overlying the esophagus, and the aortic adventitia. In the abdomen the lymph nodes from the left gastric artery pedicle were routinely excised, flush ligation of the left gastric pedicle being achieved by application of a vascular stapler (TLV-30 Auto Suture UK, Division of United States Surgical Corporation, Norwalk, Conn).

After the operation, all patients were transferred to the intensive care unit for a short period to allow elective removal of the endotracheal tube before their return to the ward. Postoperative analgesia was initially provided by means of continuous infusion of a local anesthetic (bupivacaine) and an opioid (fentanyl) mixture through an epidural catheter. Parenteral or enteral nutrition was not used. Barium swallow was carried out on the seventh postoperative day to check for anastomotic integrity before the commencement of oral feeding. Preoperative chemotherapy or radiotherapy was not given in view of the conflicting evidence of its benefit.[9]

Operative mortality includes all in-hospital deaths plus any death occurring after the patient was discharged from the hospital within 30 days of the operation.

Follow-up. The unit policy is for life-long follow up. Patients were seen in the outpatient clinics every 3 months for the first year, every 6 months for the next 2 years, and yearly thereafter.

Survival time was calculated from the time of the operation until death or until the end of the study period. Relevant

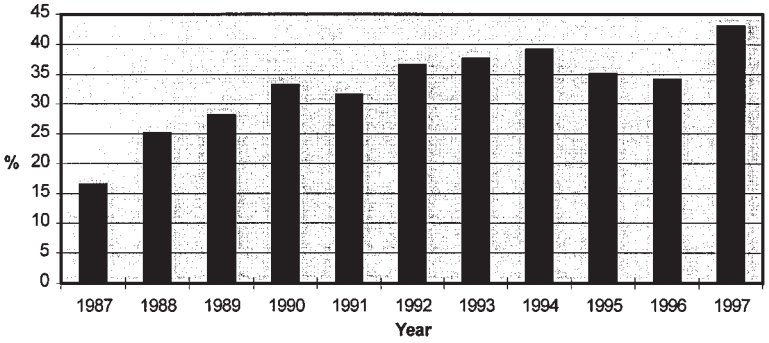

Fig 1. Percentage of patients older than 70 years having esophagectomy.

information was obtained from the patients' medical records, the patients' general practitioners, and the Thoracic Surgery Audit Database.

Statistics. Survival distribution was calculated by means of the product-limit method of Kaplan and Meier and includes operative mortality and all causes of death. In univariate analysis, survival curves were compared with log-rank test and proportions with the χ^2 test or Fisher's exact test as appropriate. Further comparisons between each pair of groups were made only if the overall *P* value was less than .05. A *P* value of less than .05 was used as guide to statistical significance. Multivariate adjustment for preoperative medical problems (risk factors) involved Cox proportional hazards and logistic regression analysis. Nonparametric tests were used to make between-group comparisons for the continuous variables length of tumor and length of hospital stay because of the non-normality of their distributions. All statistical analyses were done with the use of the statistical package SPSS PC (version 7.5) (SPSS Inc, Chicago, Ill).

Results

Fitness for operation, operability, and resectability. Among those patients who were initially evaluated (n = 686), a significantly higher proportion of octogenarians (19.6%) were considered to be medically unfit for an operation than was the case in patients aged from 70 to 79 (4.9%) and under 70 years (2.3%), as shown in Table II. As a result, the operability rate (defined as the proportion of the patients who underwent a resection among those who were initially evaluated with a view to esophagectomy) was significantly lower in group III (64.3%) than in groups I (78.9%) and II (73.9%) (P = .03, χ^2). The resectability rate, however (defined as the proportion of the patients who underwent a resection among those who underwent surgical exploration) was similar (77.7%-80.8%) among all 3 groups.

Clinical features, tumor characteristics, operative approach, and histologic type. Among those who had a resection (n = 523), both septuagenarians and octogenarians had fewer preexisting respiratory problems (eg, chronic obstructive airways disease, asthma, tuberculosis) than the patients aged less than 70 years.

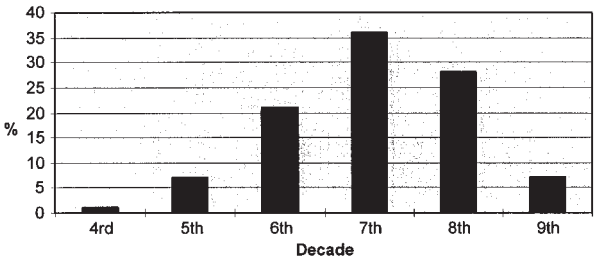

Fig 2. Age distribution per decade of life.

Preexisting cardiovascular problems (eg, ischemic heart disease, hypertension, myocardial infarction, peripheral vascular disease, deep venous thrombosis) were more prevalent in group II than in the other 2 groups (Table III).

Tumor site and characteristics are shown in Table IV. The surgical approaches and anastomotic techniques used are shown in Table V. Twenty-eight transhiatal resections were carried out during the first 5 years of the study period. The procedure was later abandoned, however, because it showed no advantage in terms of morbidity and mortality and was thought to provide inadequate mediastinal clearance.

Histologic examination of the resected specimens showed that adenocarcinoma was about twice as common as squamous cell carcinoma in all 3 groups. Barrett's esophagus was present in 113 specimens with adenocarcinoma and in 2 with histologically undifferentiated tumors. A large proportion of the patients had advanced tumors, that is, stage III (56.2%) (Table VI).

Morbidity, operative mortality, and hospital stay. Overall postoperative complications were significantly more prevalent in the elderly groups of patients (34% and 36.1%) than in the patients aged less than 70 years (24.6%), as shown in Table VII. Postoperative complications also tended to occur more often in those with preexisting respiratory or cardiovascular problems (χ^2 test, P = .04 and P = 0.06, respectively). After adjustment for

Table I. *Patient demographic details*

	Group			
	I	*II*	*III*	*Total*
No. of patients	337	150	36	523
Age (y)				
Mean	59.4 (SD 8.1)	73.6 (SD 2.6)	81.5 (SD 1.7)	65.0 (SD 10.2)
Range	28-69	70-79	80-86	28-86
Sex				
Female	105 (31.2%)	47 (31.3%)	17 (47.2%)	169 (32.3%)
Male	232 (68.8%)	103 (68.7%)	19 (52.8%)	354 (67.7%)

SD, Standard deviation.

Table II. *Fitness for operation, operability, and resectability*

	Group				
	I	*II*	*III*	*Total*	χ^2 *Test (for trend)*
Patients assessed for operation	427	203	56	686	
Patients unfit for operation	10 (2.3%)	10 (4.9%)†	11 (19.6%)*	31 (4.5%)	$P < .0001$ ($P < .0001$)
Patients explored surgically	417 (97.7%)	193 (95.1%)	45 (80.4%)	655 (95.5%)	
Patients having a resection	337	150	36	523	
Resectability rate	80.8%	77.7%	80.0%	79.8%	$P = .67$ ($P = .53$)
Operability rate	78.9%	73.9%	64.3%‡	76.2%	$P = .03$ ($P = .01$)

*Group I versus III, $P < .0001$.
†Group II versus III, $P = .001$.
‡Group I versus III, $P = .01$.

Table III. *Preoperative medical problems*

	Group				
	I	*II*	*III*	*Total*	χ^2 *Test (for trend)*
Respiratory	42 (12.5%)	9 (6.0%)*	1 (2.8%)	52 (9.9%)	$P = .03$ ($P = .01$)
Cardiovascular	85 (25.2%)	49 (32.7%)	6 (16.7%)	140 (26.8%)	$P = .08$ ($P = .80$)
Diabetes mellitus	15 (4.5%)	7 (4.7%)	4 (11.1%)	26 (5.0%)	$P = .21$ ($P = .20$)

*Group I versus II, $P = .03$.

preexisting disease, the odds ratios (95% confidence interval) for postoperative complications were 1.6 (1.06, 2.49) and 1.9 (0.93, 4.02) for the over-70 and over-80 groups, respectively ($P_{trend} = .01$).

Remarkably, the higher prevalence of postoperative complications in the patients aged more than 70 or 80 years was not accompanied by a higher operative mortality (Table VIII). Sixteen deaths occurred in group I (4.7%), 10 in group II (6.7%), and 2 (5.6%) in group III.

Operative mortality was marginally increased in relation to preexisting respiratory problems ($P = .15$), but not cardiovascular problems ($P = .5$), and remained unrelated to age group even after adjustment for preexisting disease ($P_{trend} = .4$).

Respiratory complications (pulmonary infection, respiratory failure, and adult respiratory distress syndrome) were the major causes of death in groups I and II, with anastomotic leaks being an important cause of death in the first 2 groups and the only apparent cause of death in the patients aged over 80 years. Cardiovascular events (myocardial infarction, ventricular tachyarrhythmias, pulmonary embolism, and stroke) accounted for 5 deaths in groups I and II (Table VIII).

Median hospital stay was increased marginally with

Table IV. *Tumor characteristics*

	Group			
	I	*II*	*III*	*Total*
Upper third	8 (2.4%)	5 (3.3%)	1 (2.8%)	14 (2.7%)
Middle third	69 (20.5%)	33 (22.0%)	7 (19.4%)	109 (20.8%)
Lower third	170 (50.4%)	64 (42.7%)	23 (63.9%)	257 (49.1%)
GE junction	90 (26.7%)	48 (32.0%)	5 (13.9%)	143 (27.3%)
Length				
Median	5 cm	5 cm	4.5 cm	5 cm
Range	0.5-14 cm	1-13 cm	2.5-11 cm	0.5-14 cm

GE, Gastroesophageal. χ^2 Test for tumor site: $P = .31$. Kruskal-Wallis test for tumor length, $P = .11$. Jonckheere-Terpstra test (ordering), $P = .04$.

Table V. *Operative approach and anastomotic technique*

	Group			
	I	*II*	*III*	*Total*
Left thoracotomy	172 (51%)	83 (55.3%)	21 (58.3%)	276 (52.8%)
Left thoracolaparotomy	49 (14.5%)	16 (10.7%)	6 (16.7%)	71 (13.6%)
Ivor Lewis	92 (27.3%)	45 (30%)	9 (25%)	146 (27.9%)
Transhiatal	23 (6.8%)	5 (3.3%)	0	28 (5.4%)
McKeown	1 (0.3%)	1 (0.7%)	0	2 (0.4%)
Stapled anastomosis	253 (75.1%)	106 (70.7%)	28 (77.8%)	387 (74.0%)
Hand anastomosis	84 (24.9%)	44 (29.3%)	8 (22.2%)	136 (26%)

χ^2 Test for operative approach, $P = .50$. χ^2 Test for anastomotic technique, $P = .51$.

Table VI. *Tumor pathology and stage (AJCC criteria)*

	Group			
	I	*II*	*III*	*Total*
Adenocarcinoma	213 (63.2%)	101 (67.3%)	25 (69.4%)	339 (64.8%)
Squamous cell carcinoma	111 (32.9%)	45 (30.0%)	10 (27.8%)	166 (31.7%)
Undifferentiated and small cell carcinomas	13 (3.9%)	4 (2.7%)	1 (2.8%)	18 (3.4%)
Barrett's esophagus	70 (20.8%)	38 (25.3%)	7 (19.4%)	115 (22.0%)
Involved lymph nodes	217 (64.4%)	86 (57.3%)	19 (52.8%)	322 (61.6%)
Uninvolved lymph nodes	120 (35.6%)	64 (42.7%)	17 (47.2%)	201 (38.4%)
Stage I	18 (5.3%)	10 (6.7%)	2 (5.6%)	30 (5.7%)
Stage IIa	88 (26.1%)	43 (28.7%)	14 (38.9%)	145 (27.7%)
Stage IIb	35 (10.4%)	15 (10.0%)	4 (11.1%)	54 (10.3%)
Stage III	196 (58.2%)	82 (54.7%)	16 (44.4%)	294 (56.2%)

AJCC, American Joint Committee on Cancer.[24] χ^2 Test for histologic cell type, $P = .85$. χ^2 Test for Barrett's esophagus, $P = .50$. χ^2 Test for lymph node status, $P = .18$ (χ^2 test for trend, $P = .07$). χ^2 Test for pTNM stage, $P = .74$.

age group (12, 13, and 13.5 days, respectively; Table VIII).

Palliation of the dysphagia. Besides an attempt at cure, palliation of dysphagia is also important. Good palliation of dysphagia was achieved in 413 patients (79.0%). In all, 112 patients had symptoms of dysphagia after they were discharged from the hospital and required 1 to 4 dilatations: 76 patients (22.6%) in group I, 30 patients (20.0%) in group II, and 6 patients (16.7%) in group III. In 37 of these patients, anastomotic tumor recurrence was documented 3 to 50 months after the operation.

The exact incidence of malignant anastomotic recurrence is rather difficult to assess, because often patients die of distant metastases and generalized disease away from the hospital. The same seems to be true for the very important issue of postesophagectomy quality of life, the evaluation of which requires specifically designed and executed studies, which are clearly beyond the scope of this report.

Table VII. *Postoperative complications*

	Group				
	I	*II*	*III*	*Total*	χ^2 *Test*
Overall	83 (24.6%)	51 (34.0%)	13 (36.1%)	147 (28.1%)	*P* = .057
Respiratory	55 (16.3%)	37 (24.7%)	7 (19.4%)	99 (18.9%)	*P* = .094
Cardiovascular	7 (2.1%)	11 (7.3%)*	4 (11.1%)†	22 (4.2%)	*P* = .003
Supraventricular tachycardias	56 (16.6%)	26 (17.3%)	6 (16.7%)	88 (16.8%)	*P* = .98
Anastomotic leaks	19 (5.6%)	8 (5.3%)	2 (5.6%)	29 (5.5%)	*P* = .99
Chylothorax	15 (4.4%)	5 (3.3%)	1 (2.8%)	21 (4.0%)	*P* = .78

*Group I versus II, *P* = .005 (χ^2 test).
†Group I versus III, *P* = 0.03 (Fisher's exact test).

Table VIII. *Mortality, causes of death, and hospital stay*

	Group				
	I	*II*	*III*	*Total*	*Probability*
Respiratory	8	4		12	
Anastomotic leaks	4	2	2	8	
Cardiovascular	2	3		5	
Other	2 (sepsis)	1 (aortic rupture)		3	
Overall mortality	16 (4.7%)	10 (6.7%)	2 (5.6.%)	28 (5.4%)	*P* = .51 (χ^2 test for trend)
Hospital stay (days)					
Median	12	13	13.5	12	*P* = .04* (Kruskal-Wallis)
Range	8-90	8-120	10-57	8-120	

*Jonckheere-Terpstra test for trend, *P* = .02.

Survival. The overall 5-year survival including postoperative mortality and all causes of death was 23.8% (median 19 months, 95% CI 16.4-21.6 months). Five-year survival was higher in group I (25.1%, median 19 months, CI 15.8-22.2) and group II (21.2%, median 20 months, CI 15.1-24.9) than in group III (19.8%, median 20 months, CI 11-29 months), but not significantly so (Fig 3). Neither preexisting respiratory disease nor preexisting cardiovascular disease was a significant predictor of survival (log-rank test, *P* = .4 for both), and differences in survival between age groups remained nonsignificant after adjusting in multivariate analysis for preexisting disease (P_{trend} = .35).

The overall 5-year survival among the 457 patients (87.4%) who were considered to have a curative (no microscopic or macroscopic evidence of residual disease) R_0 resection was 26.7% (median survival 21 months, 95% CI 16.6-25.5 months). There were no significant differences among the 3 groups (group I: 28.3%, median 21 months, CI 15.3-26.7 months; group II: 23.9%, median 23 months, CI 13.1-32.9; group III: 21.6%, median 21 months, CI 11.0-31.0 months) (Figs 4 and 5).

However, none of the remaining 66 patients who had a noncurative (evident microscopic-macroscopic residual disease) R_{1-2} resection survived longer than 31 months (median 13 months, 95% CI 10.2-15.8 months), with all 3 groups having similarly poor survivals (group I: median 14 months, CI 10.8-17.2; group II: median 12 months, CI 4.4-19.6; and group III: 8 months, CI 0.2-15.8 months) (Figs 4 and 5).

Discussion

There are no scientifically established criteria to define the term *elderly,* which is being used arbitrarily in assessing the outcome after operations in patients more than 70 years old.[1-5] The proportion of septuagenarians in our series (35.6%) (Fig 2) is higher than the 29.8%,[1] 22%,[4] and 16.5%[5] previously reported by other authors.

Inasmuch as the number of patients with carcinoma of the esophagus or cardia being referred at advanced age is rising, both the referring physician and the thoracic surgeon need to meet the challenge. A conservative approach, often adopted by many physicians and surgeons in the treatment of elderly patients with esophageal carcinoma, is based, first, on the fear of increased operative mortality and, second, on the perception that these patients have a potentially short life span. However, as shown here and reported elsewhere,[5]

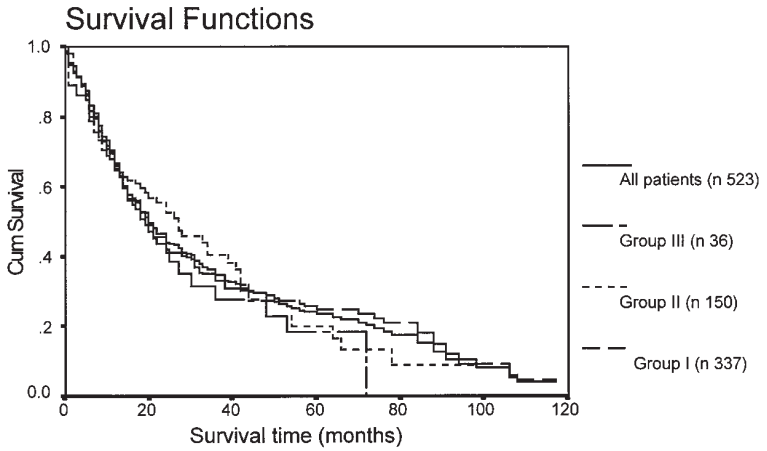

Fig 3. Actuarial survival for all patients and for patients in groups I, II, and III (P = .88).

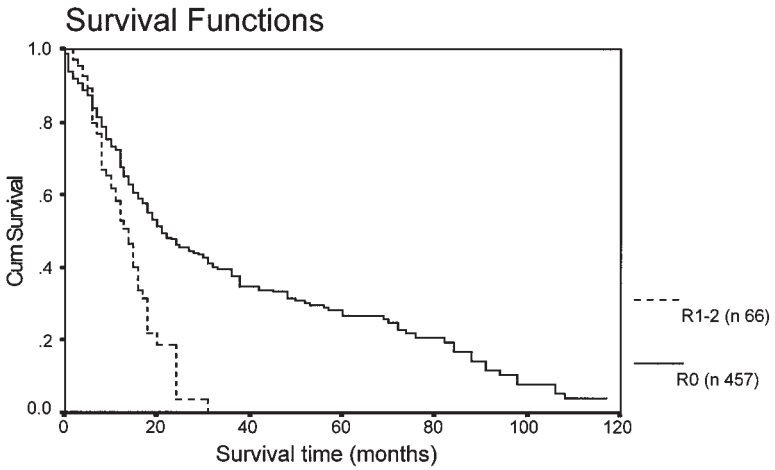

Fig 4. Actuarial survival for patients having a curative (R_0) or noncurative (R_{1-2}) resection (P < .0001).

high operative mortality is not necessarily the case. Furthermore, the average life expectancy in the United Kingdom is 74 years for men and 79 years for women,[10] with the average life expectancy for octogenarians for men and women being 5.9 and 7.5 years, respectively.[11] Although forms of treatment other than surgery, such as chemotherapy, radiotherapy, intubation, and laser therapy, can be considered, they are essentially palliative. We would agree with others[12] that the feasibility of esophageal resection in elderly patients depends partly on the anticipated benefits. In this respect, surgery seems to offer the only real hope for cure and the best form of palliation with acceptable long-term quality of life.[13] We therefore favor early surgical exploration of all eligible patients, being prepared to attempt complete resection in patients with locally advanced but resectable disease.

An improvement in the preoperative staging with reduction of the nonresectability rate (20% in this series) is of course highly desirable, and in this respect refinements in endoscopic ultrasonography and the development of thoracoscopic-laparoscopic staging methods appear to be promising.[14]

The resection rate in our series was similar in all 3 groups, but the percentage of those who were refused an operation on medical grounds rose with age. In octogenarians this was 19.6% (Table II). Despite this precaution, the elderly patients had more postoperative complications than their younger counterparts (Table VII). The 34.0% postoperative complication rate in group II is higher than the 24.7% reported by Jougon and associates[5] but compares favorably with postoperative complication rates of over 50% reported for septuagenarians by other authors.[2,4] The 36.1% complica-

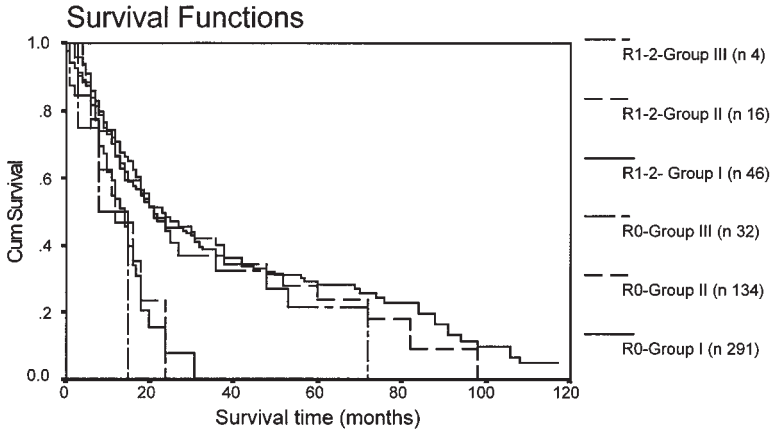

Fig 5. Actuarial survival for each group of patients having a curative (R_0) or noncurative (R_{1-2}) resection (P = .0003).

tion rate in our octogenarians is similar to that reported by Adam and colleagues.[6]

The operative mortality was, however, kept low in all 3 age groups. The 6.7% operative mortality in group II is lower than the recently reported 7.8%[5] and compares favorably with operative mortality rates of 13% to 21% reported earlier, also for septuagenarians.[1-4,15] The 5.6% operative mortality in patients in group III compares favorably with operative mortality rates of 10% to 13% reported for octogenarians from other centers.[6,7]

The similar survival in the 3 groups (Fig 3) stresses the point that the disease itself and not the patient age is the limiting factor for long-term survival after esophageal resection for carcinoma.

The 21.2% 5-year survival in group II compares favorably with 5-year survivals of 19% and 13.5% reported in septuagenarians by other authors,[1,5] and the 19.8% 5-year survival in group III also compares favorably with a 17% survival reported by Adam and associates[6] in their series of 31 octogenarians. Although the survival figures quoted here leave much to be desired, sadly the bulk of the evidence currently available suggests that use of neoadjuvant treatment confers no overall survival benefit beyond that achieved so far by surgery alone.[16-18] Thus it seems that routine use of such treatment with its associated toxicity is currently not justified.[9,19] The practice is unusual in the United Kingdom.

It has been suggested that the transhiatal approach for esophagectomy is less invasive[20] and its use would have been associated with reduced postoperative morbidity and mortality, but this has not been proven.[21,22] Regarding elderly patients, Naunheim and associates[2] have reported similar mortality and morbidity figures in patients treated with a transhiatal or transthoracic approach in their series of 38 septuagenarians.

Our experience also suggests that thoracotomy is as safe in the septuagenarians and octogenarians as in the younger age patients. Only 5 of 186 patients in this series over 70 years old had a transhiatal resection and none over 80 years (Table V). In addition, the low operative mortality observed in all 3 age groups (Table VIII) shows that selected elderly patients can tolerate with somewhat increased morbidity an extensive mediastinal dissection as well as the younger patients.

Although the competent performance of the operation itself is very important,[23] we do not believe that the type of surgical approach used is an important factor affecting the immediate postoperative outcome. We would emphasize instead the need for effective analgesia, the provision of vigorous physiotherapy, and the prompt treatment of pulmonary infection, arrhythmias, and other complications as soon as they occur.

It would appear that the immediate postoperative outcome after esophagectomy depends heavily on the adoption of a coordinated multidisciplinary approach and teamwork in all aspects of perioperative management of the often debilitated elderly patients with esophageal cancer. This is perhaps more efficiently achieved within specialist units with experience in the management of thoracic problems.

Conclusions

Despite careful patient selection, postoperative complications tend to occur more frequently in elderly patients. Early recognition and effective treatment of such complications in a unit managing large numbers of patients with esophageal cancer, with more than one third of them being over 70 years of age, seems to account for a low operative mortality and short hospital stay in both septuagenarians and octogenarians. By

applying a thoracotomy-based operative approach with extensive mediastinal dissection, regardless of age, we were able to observe 5-year survivals of 20% or more in all age groups. These data support the view that esophageal resection for carcinoma within specialist thoracic units is feasible and wholly appropriate for all reasonably fit patients, regardless of age.

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