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Resection for colorectal cancer in the very old: are the risks too high?

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Abstract

Altogether 277 consecutive patients aged 70 or more who were admitted for resection of colorectal cancer between 1975 and 1985 were studied. The postoperative complications and mortality in the 175 patients aged 70-79 were compared with those in the 102 patients aged 80 or more. The overall mortality was 11%. Mortality was significantly higher after resection in the older age group even when deaths from widespread malignancy were excluded from the analysis. After curative resection mortality was 2% (2/120) in the younger group and 7% (4/60) in the older group, but after palliative resection of tumours with local or distant spread mortality was significantly higher, at 21% (9/44) and 38% (12/32), respectively. An equal but high proportion of patients in both age groups suffered major complications, but complications caused significantly more deaths in the older group. The length of stay in hospital was not significantly different between the age groups.

Patients should not be denied resection of a colorectal cancer because of age alone, especially if a curative operation is possible. The increased risk of death from major complications, particularly after palliative resection, should, however, be taken into account when an operation on patients over 80 is being considered.

Introduction

Attitudes to operating on the elderly have changed in recent years,^{1,2} and results have improved with better facilities for intensive care and the introduction of new technology. Vigilance in assessing risk preoperatively³ and advances in anaesthesia³ are important factors contributing to decreased mortality in the elderly.

A recent study by Wobbles of patients over 70 with colorectal malignancy showed a mortality of only 8%⁴ compared with

mortalities of 18% and 36% in earlier series.^{5,6} There have been few reports of the outcome of operating on patients over 80. Between 1975 and 1985 our policy in this colorectal unit was to resect the primary tumour whenever possible, without regard to age or spread of the tumour, to prevent distressing complications such as obstruction, perforation, severe pain, or incontinence. Such a policy may be suitable for patients under 80, in whom age does not normally influence the choice of surgical treatment, but is it justified in older patients? In an attempt to answer this we have compared the morbidity and mortality associated with resection of colorectal cancer according to this policy in patients aged 80 or over and in patients aged 70-79; we chose these age groups to minimise differences apart from age. The study was limited to short term results, and long term survival rates were not examined.

Patients and methods

We studied all patients aged 70 or more with colorectal carcinoma who were admitted under the care of one consultant surgeon (AAML) between 1975 and 1985. Data were obtained from the unit's clinical database and from hospital records when necessary. Our policy was that if the patient was fit for anaesthesia, irrespective of age, we tried to resect the primary tumour and preserve normal continence. A defunctioning stoma was raised after low anterior resection when the suture line was considered to be at risk of dehiscence, and continuity was re-established within the same hospital admission whenever possible. All anastomoses above the anus and below the splenic flexure were assessed radiologically between the seventh and 10th days after operation with a water soluble contrast medium. Anastomotic dehiscence was recorded if any leakage of contrast medium occurred, irrespective of clinical findings. In patients with acute or subacute obstruction the bowel was decompressed before elective surgery in nearly all cases, thus avoiding a staged procedure. Rarely, decompression was not possible and lavage was carried out in the operating theatre. Antibiotic prophylaxis was given preoperatively to all patients from 1978 onwards, and subcutaneous heparin was given to all patients except during 1985. Postoperative complications were treated vigorously without delay in all patients, but age was taken into account if admission to the intensive care unit was considered. An operative death was recorded if the patient died before leaving hospital. Deaths occurring more than 30 days after the primary operation, which often appeared coincidental and not directly related to complications, were also included as in no case could the operation be excluded as a contributory cause. Curative operations were defined as radical—that is, with a high arterial tie and wide resection margins—when local invasion or peritoneal or metastatic spread was absent. Palliative operations implied local or distant

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spread even when a radical operation was necessary to remove the primary tumour.

Statistical analysis was made with the Mann-Whitney test, the χ^2 test with Yates's correction, or Fisher's exact test (two tailed).

Results

Altogether 175 patients were aged 70-79 (median age 73) and 102 were aged 80 or more (median age 82, range 80-97). The two groups were similar with respect to sex, site of tumour, and type of operation (table I).

TABLE I—Details of operations performed on patients. Figures in parentheses are percentages

	Patients aged 70-79 (n=175)	Patients aged 80 and over (n=102)
Men	79 (45)	49 (48)
Resection	164 (94)	92 (90)
Curative	120 (69)	60 (59)
Palliative	44 (25)	32 (31)
Site of carcinoma:		
Ascending and caecum	29 (17)	24 (24)
Transverse	9 (5)	4 (4)
Splenic flexure	8 (5)	4 (4)
Sigmoid and descending	44 (25)	21 (21)
Rectum	85 (49)	49 (48)
Rectal resections*:		
Anterior	57 (67)	32 (65)
Abdominoperineal	18 (21)	7 (14)
Other	9 (11)	7 (14)

*Four patients with rectal carcinoma (one aged 70-79, three aged 80 and over) did not undergo resection.

TABLE II—Occurrence and type of complications. Figures in parentheses are percentages

	Patients aged 70-79 (n=175)	Patients aged 80 and over (n=102)
Patients having operations	173 (99)	98 (96)
Patients with complications	65 (38)	31 (31)*
Major complications	39 (23)	25 (25)†
Minor complications	26 (15)	6 (6)
No of major complications	44	30
Myocardial infarct or failure	2 (5)	3 (10)
Urinary retention, prostatectomy	4 (9)	
Deep venous thrombosis	6 (14)	5 (17)
Pulmonary embolus	4 (9)	2 (7)
Cerebrovascular accident		1 (3)
Pseudomembranous colitis	1 (2)	
Mechanical obstruction	4 (9)	1 (3)
Pneumonia	3 (7)	6 (20)
Renal failure		2 (7)
Haemorrhage	3 (7)	2 (7)
Wound dehiscence		2 (7)
Anastomotic leak	12 (27)	4 (13)
Anastomotic leak from stoma	2 (5)	1 (3)
Fracture after fall	3 (7)	1 (3)
No of minor complications	39	10
Urinary tract infection	9 (23)	1 (10)
Urinary retention	5 (13)	
Urethral stricture		1 (10)
Minor chest infection	11 (28)	4 (40)
Wound infection	11 (28)	4 (40)
Wound haematoma	3 (8)	

* $p=0.36$, † $p=0.72$ (χ^2 test with Yates's correction).

TABLE III—Deaths according to management of patients

	Patients aged 70-79		Patients aged 80 and over	
	No of patients	No (%) of deaths	No of patients	No (%) of deaths
Resection	164	11 (7)	92	16 (17)*
Curative	120	2 (2)	60	4 (7)†
Palliative	44	9 (21)	32	12 (38)†
Bypass procedure	1		1	1
Local excision	8		5	
No operation	2		4	3
Total	175	11 (6)	102	20 (20)**

* $p=0.014$, ** $p=0.0014$ (χ^2 test with Yates's correction). †Not significant at 5% level by Fisher's exact probability test.

COMBINED RESULTS

The combined mortality in both age groups was 11% (31/277), but mortality associated with curative operations being only 3% (6/180) compared with 28% (21/76) for palliative operations ($p<0.001$). Mortality after anterior resection (15%; 13/89) was higher than after abdominoperineal excision (4%; 1/25), but the difference was not significant ($p=0.3$). Of all patients having operations, 64 developed major complications; the commonest (which accounted for 22% of major complications) was anastomotic dehiscence after anterior resection, which occurred in 16 of the 89 patients who had this operation (table II). Faecal fistulas did not occur. Deep venous thrombosis and pneumonia were also common complications. Two patients with fractures after a fall subsequently died.

TABLE IV—Cause of death in patients with postoperative complications

Cause of death	Patients aged 70-79		Patients aged 80 and over	
	Death before 30 days	Death after 30 days	Death before 30 days	Death after 30 days
Pneumonia	3		4	2
Pulmonary embolism	1	1	1	
Anastomotic leak, pneumonia		2	1	
Renal failure			2	
Postoperative haemorrhage				1
Widespread malignancy	2	2	2	3
Cerebrovascular accident			1	
Total	6	5	11	6

TABLE V—Median (range) length of stay in hospital (in days) by presence of complications and stoma

	Patients aged 70-79	Patients aged 80 and over	Significance*
Patients without complications	20 (5-54)	24 (6-94)	$p=0.31$
Patients with complications	40 (13-122)	38 (6-138)	$p=0.16$
Patients with defunctioning stoma	50 (21-122)	46 (7-54)	$p=0.18$
Patients without defunctioning stoma	33 (13-90)	29 (6-138)	$p=0.35$

*Mann-Whitney test.

PATIENTS AGED 70-79

Resections were considered to be curative in 120 patients and palliative in 44 (table I). Complete local excision of a rectal carcinoma was carried out in eight patients. Two patients in whom the operative risks were thought to be unacceptable were treated by radiotherapy alone, and one patient in whom a resection was impossible underwent a bypass procedure. The rate of resection was therefore 94%. Forty four major complications occurred, more than half of which were associated with anterior resection of rectal carcinoma. Complications occurred in 65 patients (37%) and were considered to be major in 39 (23%) and minor in 26 (15%). Thirty two patients (56%) had complications after anterior resection compared with seven (39%) after abdominoperineal resection ($p=0.31$). Radiological evidence of dehiscence of the suture line was seen in 12 out of 57 patients (21%) after anterior resection for rectosigmoidal carcinoma, and anastomotic leakage contributed to death in two patients (4%).

Mortality in patients undergoing palliative resection was 21% compared with only 2% in those undergoing curative resection ($p<0.001$) (table III). In all, 11 patients died, six within 30 days of operation and five later. Widespread malignancy was the cause of death in four of these patients. Table IV shows other causes of death; five deaths (9%) occurred after anterior restorative resection compared with one (6%) after abdominoperineal resection.

Table V shows that patients with complications stayed in hospital considerably longer if they had a stoma and continuity was restored during the same admission.

PATIENTS AGED 80 AND OVER

Resection was performed in 92 patients aged 80 and over, giving a rate of 90%. The operation was curative in 60 and palliative in 32. In four cases an

operation was contraindicated by the extent of disease or by the patient's poor medical condition, and in one case only a bypass procedure was possible. Local excision through the anus was considered to be complete in five patients with small tumours. Thirty major complications occurred, more than half of them after anterior resection. Complications occurred in 31 patients (32%) and were major in 25 (25%) and minor in six (6%) (table II). Twelve patients (38%) had complications after anterior resection compared with one (14%) after abdominoperineal resection ($p=0.48$). Radiological evidence of anastomotic leakage was seen in four patients after 32 restorative procedures (13%); three subsequently died.

In all, 20 patients died, three of whom had not undergone surgery. Of the 17 postoperative deaths, 12 (76%) occurred after palliative resections and four (24%) after curative resections ($p<0.001$) (table III). The main causes of postoperative deaths were widespread malignancy (five deaths) and pneumonia (six); all patients in this age group who developed pneumonia postoperatively subsequently died. Eight deaths (25%) occurred after anterior resection and none after abdominoperineal resections ($p=0.34$). The median stay in hospital of the patients without complications was 24 days, and of the patients with complications 38 days (table V). Patients with complications remained in hospital considerably longer if they had a stoma than if they did not.

STATISTICAL ANALYSIS BETWEEN AGE GROUPS

Significantly more patients aged 80 and over than aged 70-79 died (table III) after resection of their tumour ($p=0.014$), and this difference remained significant after deaths from widespread malignancy were excluded from the analysis ($p=0.036$). When patients were stratified according to whether they had curative or palliative operations the difference between the age groups was not significant owing to the smaller numbers within each group. There was no significant difference between the groups in the number of patients with complications, but patients in the older age group nearly always had major complications (81%). Significantly more patients with major complications died in the older age group (68% v 28%, $p=0.01$); the difference remained significant when those dying from widespread malignancy were excluded from the analysis ($p=0.018$). The occurrence of anastomotic leak was not significantly different between the two age groups; the length of stay in hospital was similar in the two groups, even when the presence or absence of a defunctioning stoma was considered (table V).

Discussion

Linn *et al* collected data from 108 series of operations on the elderly published over 40 years and attempted to establish the operative risk relative to age.⁷ The information was incomplete, and comparison of results between institutions was therefore impossible. They concluded that the risk in old patients could not be determined, largely because mortality associated with operations on the elderly was not compared with that of younger patients having comparable operations in the same institutions. We examined the morbidity and mortality associated with major operations for a condition that is common in the elderly. Patients were drawn from one catchment area over 10 years and treated by one surgeon in the same hospital. Despite the difficulties inherent in a retrospective study of this nature statistical analysis between age groups was possible because of the similar characteristics of the groups.

The overall mortality of 11% in our patients is similar to that reported by Wobbes⁴ and compares well with another recent study in which a mortality of 18% was reported after elective surgery in patients aged 70 or over.⁸ In our series the postoperative mortality in patients aged 80 and over was significantly higher than that in those aged 70-79, and this difference remained when deaths due to advanced malignancy, as opposed to deaths due to complications, were excluded from the statistical analysis. The increased mortality in older patients therefore seems to be directly related to the operations and the subsequent complications, which were nearly always serious in this age group. The elderly may seem fit on routine preoperative assessment, but studies of pulmonary wedge pressure and arteriovenous oxygen tension have shown impaired cardio-respiratory function in over 60% of patients aged 65 or more.² The ability of patients to tolerate major operations or subsequent complications seems to some extent to depend on age.

Mortality after curative resections was low and not dependent on age, but many deaths in both age groups occurred in patients with

extensive malignancy in whom only palliative surgery was possible. This finding agrees with that of Reiss *et al*.¹ Such high mortality may reflect technical difficulties in operating on some patients with extensive local disease, as well as the poor healing⁹ and response to sepsis in patients with advanced malignancy. An aggressive approach to managing major complications is clearly inappropriate in such patients, and this must also contribute to the high mortality.

In both age groups mortality and morbidity were higher after restorative resection for rectal carcinoma than after abdominoperineal resection, though the numbers were small and the difference not significant. There seems little justification in opting for the technically simpler abdominoperineal resection,¹⁰ which results in a distressing stoma, on account of age alone.

The incidence of major complications was high but similar in both age groups, and, contrary to expectation, radiological evidence of anastomotic dehiscence occurred less commonly in the older age group despite a similar proportion of anterior resections of rectal cancer (tables I and III). The reason for this is unclear, but anxiety about the blood supply certainly led to anastomoses being fashioned most carefully in very old patients.

These patients stayed in hospital for a long time after operation; the length of stay was similar in the two age groups and was roughly doubled if complications occurred. The patients were drawn from a catchment area with an above average number of people over 75, and a particularly high proportion of whom lived alone.¹¹ Difficulties in rehabilitation and in providing social services caused many patients in both age groups to remain in hospital long after recovery from their operation. The stay in hospital was also prolonged for patients with temporary stomas, who had continuity restored during the same admission. The alternative would have been readmission for closure of the stoma three months later. Elderly patients may be unable to lead an independent life with a stoma and certainly require a period of inpatient training in the care of a stoma before discharge. Delayed closure, including the necessary pre-operative preparation, is likely to increase the total stay in hospital even more. In terms of length of stay and treatment of complications patients over 80 made no greater demand on resources than those in their 70s, though both age groups compared poorly with younger patients in this unit. Reducing the incidence of complications and avoiding temporary stomas would allow earlier discharge of our elderly patients, but only if adequate rehabilitation and social services were also available.

The terminal stages of untreated primary colorectal cancer may be distressing, and as the operative risk in old patients with potentially curable cancer is small such patients should not be denied resection because of age alone. This study suggests, however, that age is relevant to the overall outcome of colorectal resection and should be considered when very old patients and their relatives are being advised about the operation. Resection carries a significantly higher risk when malignant disease is widespread, and a more conservative approach may be indicated in such circumstances.

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