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Surgeons' follow-up practice after resection of colorectal cancer

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Consultant surgeons in two United Kingdom Health Regions were invited to complete a questionnaire on details of their personal management of patients with colon and rectal cancer, with particular emphasis on follow-up. Replies from 140 (94%) were analysed by the surgeon's subspecialty of colorectal and gastrointestinal surgery (group 1) and all others (group 2). There was a wide variation in the duration of follow-up, but no difference between the two groups. More group 1 surgeons carried out investigations as a routine after colonic ($P < 0.01$) and rectal ($P < 0.01$) resection. Colonoscopy was used more frequently by group 1 ($P < 0.0001$) and barium enema by group 2 surgeons ($P < 0.05$). Investigations to detect asymptomatic metastases were used as a routine by 33.3% of surgeons, in whom there was no concordance over the choice or combination of tests and no difference between the two groups of surgeons. There is no consensus among surgeons as to the ideal duration, intensity and method of follow-up after resection for colorectal cancer and little difference between the practice of colorectal and gastrointestinal surgeons and that of other specialists, except in the use of colonoscopy and barium enema. These results reflect the continuing lack of evidence on which to base the follow-up of patients after surgery for colorectal cancer.

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It has been suggested that intensive follow-up of patients after surgery for colorectal cancer will detect recurrent tumour at an early, asymptomatic stage, when further curative treatment might be possible *(1,2)*. Outpatient review also provides the opportunity to audit the results of treatment, provide psychological support for the cancer patient and detect metachronous cancers. This study investigates how surgeons in two United Kingdom (UK) Health Regions, Wales and Trent, follow up patients after apparent curative surgery for colorectal cancer. The methods of follow-up by colorectal and gastrointestinal surgeons is compared with that of all other surgeons, who also treat colorectal cancer in the two regions.

Methods

Consultant surgeons who had taken part in The Royal College of Surgeons of England Colorectal Cancer Audit were invited to complete a questionnaire on their management of colorectal cancer. The audit was held in two UK Health Regions, Wales and Trent. In all, 161 surgeons in the two regions treated patients with colorectal cancer during the 12-month audit. Questionnaires were sent to 149 of this group, the remainder had died, retired or emigrated during the study period.

The questionnaire asked for details on the length of outpatient follow-up after curative resection of colorectal cancer. Additional information was requested on outpatient investigations used to look for local recurrence, metachronous tumours and systemic metastasis. Data for colon and rectal cancer were collected separately. Details of the surgeon's usual practice were requested, accepting

Table 1. Duration and frequency of outpatient follow-up after surgery

	Rectum		*Colon*	
	Group 1	*Group 2*	*Group 1*	*Group 2*
No appointment	0	0	0	0
One appointment then discharge	1 (1.8)	2 (2.3)	1 (1.8)	2 (2.3)
One appointment then see as required	3 (5.5)	7 (8.2)	5 (9.2)	9 (10.6)
Regular outpatient appointments for				
< 1 year	2 (3.7)	5 (5.9)	2 (3.7)	4 (4.7)
1–2 years	4 (7.4)	11 (12.9)	5 (9.2)	13 (15.2)
2–5 years	30 (55.6)	33 (38.9)	24 (44)	28 (33)
5–10 years	9 (16.7)	13 (15.3)	10 (18.5)	12 (14.1)
> 10 years	5 (9.3)	14 (16.5)	7 (12.9)	17 (20)

Number of surgeons in each group, percentage in parentheses, group 1, colorectal and gastrointestinal surgeons, group 2 all other surgeons

that, for a few patients, follow-up might not be appropriate because of frailty, infirmity or other reasons. Data collection was anonymous but surgeons were asked if they had a subspecialty within general surgery. Answers were entered onto a computer database (Epi Info) for analysis. Statistical analysis was by the χ^2 test with Yates' correction.

Results

Questionnaires were sent to 149 consultant surgeons and 140 replied, a response rate of 94%. The data for colorectal ($n=14$) and gastrointestinal ($n=40$) surgeons have been combined and are presented as group 1. Of the remaining 86 surgeons, 22 considered themselves general surgeons with no subspecialty interest. Others declared subspecialty interests in vascular ($n=28$), breast ($n=15$), endocrine ($n=5$), urology ($n=11$) and other ($n=5$). The combined data of these 86 surgeons is presented as group 2.

All 140 surgeons reviewed patients at least once after discharge from hospital, although the frequency of clinic appointments varied from once to lifelong surveillance. There was no difference in appointment practice between the two groups of surgeons and no difference in the outpatient follow-up of colon and rectal cancer (Table I). There were differences between the two groups of surgeons in the use of investigations for detecting recurrence or metachronous tumours after resection of colonic cancer (Table II). The majority, 87%, of group 1 carried out investigations compared with 65.1% of group 2 ($P<0.01$). Significant differences were in the more

Table II. Combinations of tests used for follow-up of colon cancer according to surgeon's declared subspecialty interest

	Group 1	*Group 2*
Routine tests*	47 (87)	56 (65.1)
Colonoscopy and CEA	7 (13)	1 (1.2)
Colonoscopy alone	22 (40.8)	12 (14)
Barium enema	1 (1.8)	10 (18.6)
Flexible sigmoidoscopy	1 (1.8)	2 (2.3)
Colonoscopy and barium enema	1 (1.8)	6 (7)
Colonoscopy and abdominal ultrasound	1 (1.8)	3 (3.5)
Other tests used by two or fewer surgeons	14 (26)	22 (25.6)

Group 1, colorectal and gastrointestinal surgeons, group 2 all others, numbers of surgeons with percentage in parentheses
*P <0.01
Barium enema ± other tests, $P<0.05$
Colonoscopy ± other tests, $P<0.0001$

Table III. Combinations of tests used for follow-up of rectal cancer

	Group 1	*Group 2*
Routine tests*	52 (96.3)	65 (75.6)
Colonoscopy alone	3 (5.6)	6 (7)
Rigid sigmoidoscopy alone	9 (16.7)	13 (15.1)
Rigid sigmoidoscopy and CEA	1 (1.9)	3 (3.5)
Rigid and flexible sigmoidoscopy	3 (5.6)	2 (2.3)
Rigid sigmoidoscopy and colonoscopy	6 (11.1)	3 (3.5)
Rigid sigmoidoscopy, colonoscopy and CEA	4 (7.4)	0
Rigid and flexible sigmoidoscopy and CEA	1 (1.9)	4 (4.7)
Rigid sigmoidoscopy and barium enema	0	6 (7)
Rigid sigmoidoscopy, barium enema and CEA	2 (3.7)	1 (1.2)
Other tests used by two or fewer surgeons	23 (42.6)	27 (31.4)

* $P<0.01$
Number of surgeons with percentage in parentheses

Table IV. Investigations carried out as a routine for asymptomatic metastatic disease

	Group 1	*Group 2*
Liver function tests	13 (24)	13 (15.1)
Ultrasound liver	15 (27.8)	17 (19.8)
CEA	12 (22.2)	15 (17.4)
Chest radiographs	4 (7.4)	4 (4.6)
Thoracic CT	3 (5.5)	1 (1.2)
Liver CT	3 (5.5)	2 (2.3)
Pelvic CT (rectal cancer only)	5 (9.2)	2 (2.3)

Group 1, colorectal and gastrointestinal surgeons, group 2 all others, numbers of surgeons with percentage in parentheses

frequent use of colonoscopy, with or without other investigations, by group 1 (57.4% *vs* 25.6%, $P<0.0001$) and the more frequent use of barium enema by group 2 (18.6% *vs* 3.7%, $P<0.05$). There was no apparent agreement between and within groups about which combination of tests might be the most effective (Table II). Follow-up practice for colon cancer by 26% of group 1 and 25.6% of group 2 surgeons was either unique or in common with one other surgeon.

The results for rectal cancer are given in Table III. More surgeons in group 1 carried out routine investigations compared with those in group 2 (96.3% *vs* 75.6%, $P<0.01$). However, unlike colonic cancer, there was no difference between the two groups in the methods of investigation. The follow-up practice for rectal cancer by 42.6% of group 1 and 31.4% of group 2 surgeons was either unique or in common with one other surgeon.

Routine investigation for asymptomatic metastases was carried out by 47 (33.5%) of surgeons. These employed various combinations of the following: liver function tests (26 surgeons), liver ultrasound (32 surgeons), carcinoma embryonic antigen (CEA) levels (27 surgeons), chest radiographs (eight surgeons), thoracic computed tomography (CT) (four surgeons), liver CT (five surgeons) and pelvic CT (five surgeons). There was no difference between group 1 and group 2 surgeons in the use of any of these tests.

Discussion

The results of this study emphasise the lack of a consensus among surgeons in two UK Health Regions over surveillance strategy after surgery for colorectal cancer. The lack of conformity is equally true for colorectal and gastrointestinal surgeons (group 1), when compared with all other 'non-abdominal' surgeons (group 2). There are some differences between the two groups. More patients with rectal or colonic cancer, treated by group 1 surgeons, were found to undergo investigation for local recurrence and metachronous tumour. This may be because of a greater commitment to audit in their field of interest by colorectal and gastrointestinal surgeons. There was also a difference between specialist and non-specialist surgeons in the use of colonoscopy and barium enema. This may reflect the involvement and easier access of colorectal and gastrointestinal surgeons to endoscopy. Whether these differences in practice result in better outcome for the individual patient is not known.

A more uniform follow-up practice is reported by specialist surgeons in the United States of America *(3)*. In a survey of the American Society of Colon and Rectal Surgeons, more than 75% of respondents follow-up their patients every 3–6 months for the first 2 years, with 80% doing CEA assays every 3 months for 3 years. However, there was considerable variation in the use of investigations such as colonoscopy, chest radiographs, CT scanning and liver function tests. Evidence to support individual practice was not discussed in this survey.

These variations reflect a lack of published evidence on which to base clinical practice. No prospective, randomised, controlled trial of follow-up *versus* minimal surveillance has been carried out, although the protocol for such a study has been drawn up *(4)*. Meta-analysis has been used in an attempt to define any benefit from postoperative surveillance. The results from seven studies, each comparing the outcome of two follow-up programmes, of varying intensity, after surgery for colorectal cancer, have been analysed *(5)*. However, none of these studies were randomised. In three, patients undergoing intensive follow-up were compared with contemporary controls who elected to opt out of postoperative surveillance. In the remaining four studies, patients were compared with historic controls. The meta-analysis showed no increase in 5-year survival of patients undergoing intensive follow-up unless CEA levels were measured. However, the authors highlighted the poor quality of the data available and were unable to give an unequivocal answer about the value of intensive follow-up.

Although published studies neither support nor disprove routine follow-up as a means to improve survival, a special case may be made for the detection of metastatic liver disease. There is good evidence that 1–3% of all patients with colorectal cancer may benefit from resection of liver metastases *(6)*. For a common disease, this small percentage translates into a significant number of cases and supports a follow-up strategy that includes liver imaging for metachronous metastases. In the present survey, only 26.4% of surgeons use ultrasound or computed tomography to screen for asymptomatic liver disease.

It was disappointing to find that there has been no real change in surgeons' follow-up practice since a report from Wales and the South-West of England almost 10 years ago *(7)*. The continued lack of evidence on which to base clinical practice is one reason for the persistent wide variation in follow-up. Until such evidence is available, there will be continuing diversity in surgeons' follow-up activity. Studies are needed on audit of cancer care, as highlighted by the Calman–Hine Report *(8)*, psychological support for the patient, screening for metachronous tumours and survival, before standards for follow-up can be defined.

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