

COLORECTAL CANCER SCREENING

Guidelines for follow up after resection of colorectal cancer

J H Scholefield, R J Steele

Gut 2002;51(Suppl V):v3-v5

Follow up after colorectal resection is a surgical tradition, which has become a routine part of clinical practice consuming considerable amounts of scarce resources and for which there is precious little evidence of benefit to the patient.

Colorectal cancer is a common condition and is the third most common cancer in the UK. The main treatment for this disease is surgical excision. Each consultant colorectal surgeon sees an average of 50 new patients with colorectal cancer each year and probably sees them in an outpatient clinic between one and four times per year. The cost of this type of follow up is uncertain but a recent survey in the United States showed the cost of five years' follow up varied from \$900 to \$27 000 per patient.¹ As there are over 30 000 new cases of colorectal cancer per annum in England and Wales the use of NHS resources for this group of patients alone is likely to run into tens of millions of pounds per annum.

EXECUTIVE SUMMARY

1 Although there is no evidence that *intensive* follow up for the detection of recurrent disease improves survival, it is reasonable to offer liver imaging to asymptomatic patients under the age of 70 in order to detect operable liver metastases once during the first two years after resection. (**Recommendation Grade:A**)

2 Although there is no evidence that colonoscopic follow up improves survival, it does produce a yield of treatable tumours. It is recommended that a "clean" colon is examined by colonoscopy five years after surgery and thereafter at five yearly intervals up to the age of 70 years. (**Recommendation Grade:B**)

3 In the absence of randomised trials, the only realistic argument for routine follow up is patient support and audit. Audit should be focused on outcome measures.

PREVALENCE AND INCIDENCE

There are approximately 30 000 new cases of colorectal cancer per annum in England and Wales. On average therefore each consultant surgeon probably sees 50 new cases per year. As overall five year survival is around 40%, assuming that patients are discharged five years after resection or at age 70, each surgeon probably has around between 100 and 200 patients attending follow up appointments each year. Some surgeons see patients at three monthly intervals during the first year but most revert to annual appointments thereafter.

Colorectal cancer is the third commonest malignancy in the developed world. It accounts for about 20 000 deaths per year in the England and Wales. Although the incidence and mortality of colorectal cancer have generally been static for the past 40 years there is some recent evidence to suggest that the incidence of the disease is falling in both the UK and USA.²⁻³ The reasons for this slight decline are uncertain but may be related to earlier diagnosis and increased public awareness of the condition. For colon cancer there are almost equal proportions of men and women affected, most commonly between the ages of 60 and 80. Rectal cancer is more common in men.²

INTERVENTION

(1) Reasons for follow up

The management of colorectal cancer patients after treatment has been completed is controversial. Some of the reasons for follow up after apparently curative operation for colorectal cancer are identified below and the difficulties highlighted:

(a) Detection of problems related to recent surgical procedure—wound healing, stoma problems, urinary and sexual difficulties after rectal surgery.

(b) Detection of recurrent disease at an early or pre-symptomatic stage when further attempts at cure might be possible. Up to 50% of colorectal cancer patients will develop a recurrence of their tumour and most of these will die from their disease. But can the process of follow up prevent this?

(c) Surveillance for metachronous tumours. Between 5% and 10% of patients will develop metachronous tumours.

(d) Provision of psychological support for the cancer patient. The need for such support varies widely from patient to patient and may not be best provided in a surgical outpatient clinic (stoma care support being a prime example).

(e) Facilitation of audit. As a relatively recent indication for surgical follow up, few surgeons have used the opportunities to obtain their own outcome data from their follow up regimen.

THE PROCESS OF FOLLOW UP

A follow up programme for colorectal cancer patients usually includes outpatient visits, clinical evaluation, haematological, radiological, and colonoscopic evaluation. There are potentially thousands of possible combinations of frequency and intensity of these components.⁴ This is reflected in the wide variations in practice.¹

(a) Detection of recurrent disease

As 80% of recurrences after resection of colorectal cancer occur within the first two years after surgery it has been traditional to undertake more intensive follow up during this period.⁵ Despite this policy, the majority of patients become symptomatic from recurrence between hospital appointments.⁶⁻⁷ The Wessex audit found that 78% of local recurrences and 62% of distant recurrences were symptomatic at the time of presentation, and some patients wait for their next appointment before reporting their symptoms. Even when an intensive investigation programme has been implemented it fails to detect approximately 50% of asymptomatic recurrences,⁸⁻⁹ but the diagnosis of asymptomatic recurrence is more likely to result in attempts at curative re-operation.¹⁰⁻¹¹ The outcomes for re-operation in this situation tend to come from large specialist centres that quote mean survivals of around 30% at three years.¹² As only 30% of patients with recurrent disease are suitable for further surgery the global results after diagnosis of recurrent disease are very poor. The proportion of patients in whom potentially curable recurrences are discovered is probably less than 1% overall.¹³⁻¹⁵ Nevertheless several studies have demonstrated that patients

with asymptomatic recurrences are more likely to undergo attempts at potentially curative operations, but with little evidence of survival advantage for most patients.^{10 11}

By contrast one study has demonstrated that patients with advanced but asymptomatic colorectal cancer show an improvement in survival if given chemotherapy while still asymptomatic rather than waiting for symptoms to develop.^{11 16} Further studies in this area are awaited.

A meta-analysis¹⁷ of published studies to determine whether intensive follow up is of benefit was unable to identify a single randomised trial with patients allocated to follow up or no follow up groups. Among the seven non-randomised studies in which controls were either historical or self selected (defaulted from follow up) the authors were unable to draw definite conclusions.

The role of carcinoembryonic antigen (CEA) monitoring is uncertain. There is still no evidence that the lead time provided by CEA monitoring confers any survival benefit.^{18 19} The results of a major prospective randomised study on CEA monitoring, set up in 1983 are awaited but initial results indicate that second look surgery prompted by a rise in CEA has no effect on survival (J Northover, personal communication, evidence category: Ia).

A Scottish randomised controlled trial showed that patients discharged to general practitioner based follow up did not suffer greater morbidity or mortality than those followed up in a surgical outpatient clinic in hospital. The increased GP workload was only two extra surgery attendances per doctor per year and the majority of GPs were willing to undertake this work.²⁰

(b) Surveillance for metachronous cancers

There is no evidence that colonoscopic follow up has a significant impact on survival after surgery for colorectal cancer. Nevertheless patients with colorectal cancer have a predisposition to further adenomas and a second primary (metachronous) cancer in the remaining large bowel.^{21 22} Surveillance colonoscopy after the initial resection results in a substantial yield of such tumours.²³ On this basis patients should probably undergo colonoscopic follow up, and if the colon is free of tumours then further colonoscopy should be repeated at three to five yearly intervals.²⁴⁻²⁷ The frequency of such examinations and the age at which surveillance should cease cannot be determined from published data. A minimum standard would be five yearly surveillance once a "clean" colon is established and to cease surveillance at the age of 70 years. Availability of resources currently dictates follow up policy in many institutions.

Local recurrence of rectal cancer should be palpable by digital rectal examination, or seen at rigid sigmoidoscopy. There is no evidence that such examinations improve survival.²⁸ The results of re-operation in this group are generally disappointing.²³

(c) Provision of psychological support

Limited evidence suggests that non-intensive surveillance (colonoscopy and computed tomography every three to five years) is beneficial, but that more intensive annual or biannual follow up confers no additional benefit.²⁹ Whether the interval between follow up visits should be three or five years is currently uncertain. There is limited evidence to suggest that follow up is reassuring to most patients.^{30 31}

(d) Facilitation of audit

Surgeons in the UK are required to audit their practice as a part of clinical governance. Without this information the stimulus to investigate and perhaps change personal practice is lost.

To monitor performance surgeons must audit results of their surgery and for this some form of follow up is essential.

However, audit cannot be carried out properly without the allocation of adequate resources.

COSTS AND BENEFITS OF FOLLOW UP

A rough estimate in calculating the cost of follow up for colorectal cancer is £50 for an outpatient attendance, £150 for a CT scan of the abdomen and pelvis, and £150 for a colonoscopy. Assuming six monthly follow up, one CT scan and one colonoscopy in five years this would cost £800 per patient over five years. Given that only 50% of patients might be expected to survive five years and some would be deemed too frail for follow up this cost may be halved. In a community of 300 000 there may be 250 patients being followed up after bowel cancer resection including about 175 patients/annum requiring colonoscopy. The cost of this follow up would be £250 000 per year for this group of patients (with wide confidence intervals!).

A recent survey in the United States showed a wide range of costs of follow up per patient. The cheapest regimen cost \$900 (approximately £500), while the most expensive was almost \$27 000 (approximately £15 000) per patient over five years.¹ Although follow up practices in the UK are likely to be closer to the cheaper end of this survey, the number of patients undergoing follow up for colorectal cancer indicates that we are spending millions of pounds on an activity of uncertain benefit.

RECOMMENDATIONS FOR AUDIT

(1) The National Health Service Health Technology Assessment Group is commissioning trials of different follow up regimens after "curative" resection of colorectal cancer and this should provide much needed information but it will be some years before these data are available.

(2) In the meantime, it behoves us all to rationalise our follow up programmes. The data available suggest that in general current regimens for follow up are wasting resources.

The above guidelines should facilitate decisions to trim excessive regimens and provide opportunities to re-allocate NHS resources for cost effective services.

Authors' affiliations

J H Scholefield, Department of Surgery, University Hospital, Nottingham, UK

R J Steele, Department of Surgery, Ninewells Hospital, Dundee, UK

Correspondence to: Professor J H Scholefield, Department of Surgery, University Hospital, Nottingham NG7 2UH, UK; john.scholefield@nottingham.ac.uk

REFERENCES

- 1 Virgo K, Vernava A, McKirgan L, et al. Cost of patient follow up after potentially curative colorectal cancer treatment. *JAMA* 1995;**273**:1837-41. (Category: IIb)
- 2 OPCS. *Mortality statistics, cause, England and Wales 1993*. Office of Population, Censuses and Surveys Department of Health. London: HMSO, 1995. (Category: IIa)
- 3 Miller BA, Ries LA, Hankey BF, et al. *Cancer statistics review 1973-89*. NCI, NIH Publ No 92-2789. Rockville, MD, NIH, 1992. (Category: IIa)
- 4 Kieveit J, Bruinvels D. Detection of recurrence after surgery for colorectal cancer. *Eur J Cancer* 1995;**31A**:1222-5. (Category: III)
- 5 Umpleby HC, Fermor B, Symes MO, et al. Viability of exfoliated colorectal carcinoma cells. *Br J Surg* 1984;**71**:659-63. (Category: III)
- 6 Cochrane JPS, Williams JT, Faber RG, et al. Value of outpatient follow-up after curative surgery for carcinoma of the large bowel. *BMJ* 1980;**1**:593-5. (Category: III)
- 7 Hulton NR, Hargreaves AW. Is long-term follow-up of all colorectal cancer necessary? *J R Coll Surg Edinb* 1989;**34**:21-4. (Category: III)
- 8 Tornqvist A, Eklund G, Leandroer L. The value of intensive follow-up after curative resection for colorectal carcinoma. *Br J Surg* 1982;**69**:725-8. (Category: IIb)
- 9 Bohm B, Schwenk W, Jucke HP, et al. Does methodic long-term follow-up affect survival after curative resection of colorectal carcinoma? *Dis Colon Rectum* 1993;**36**:280-6. (Category: IIb)

- 10 **Kjeldsen B**, Kronborg O, Fenger C, *et al.* A prospective randomised study of follow up after radical surgery for colorectal cancer. *Br J Surg* 1997;**84**:666–9. **(Category: Ib)**
- 11 **Ovaska J**, Jarvinen H, Kujari H, *et al.* Follow-up of patients operated on for colorectal cancer. *Am J Surg* 1990;**159**:593–6. **(Category: IV)**
- 12 **Suzuki K**, Dozois RR, Devine RM, *et al.* Curative reoperations for locally recurrent rectal cancer. *Dis Colon Rectum* 1996;**39**:730–6. **(Category: IIb)**
- 13 **Camunas J**, Enriquez JM, Devesa JM, *et al.* Value of follow-up in the management of recurrent colorectal cancer. *Eur J Surg Oncol* 1991;**17**:530–5. **(Category: III)**
- 14 **Safi F**, Link KH, Beger HG. Is follow-up of colorectal cancer patients worthwhile? *Dis Colon Rectum* 1993;**36**:636–44. **(Category: III)**
- 15 **Wyatt JP**, Aitkin RJ. Evaluation of hospital and general practice follow-up after surgery for colorectal cancer. *Br J Surg* 1984;**81**:145. **(Category: III)**
- 16 **Glimelius B (for the Nordic Gastrointestinal Tumour Adjuvant Therapy Group)**. Expectancy or primary chemotherapy in patients with advanced asymptomatic colorectal cancer: a randomised trial. *Eur J Cancer* 1991;**27** (suppl 2):S82. **(Category: Ib)**
- 17 **Bruinvels DJ**, Stiggelbout AM, Kievit J, *et al.* Follow-up of patients with colorectal cancer. A meta-analysis. *Ann Surg* 1994;**219**:174–82. **(Category: III)**
- 18 **Minton JP**, Hoehn JL, Gerber DM, *et al.* Results of a 400-patient carcinoembryonic antigen second-look colorectal cancer study. *Cancer* 1985;**55**:1284–90. **(Category: IIa)**
- 19 **Moertel CG**, Fleming TR, Macdonald JS, *et al.* An evaluation for the carcinoembryonic antigen (CEA) test for monitoring patients with resected colon cancer. *JAMA* 1993;**270**:943–7. **(Category: IIa)**
- 20 **Florey CdV**, Yule B, Fogg A, *et al.* A randomised trial of immediate discharge of surgical patients to general practice. *J Public Health Med* 1994;**16**:455–64. **(Category: Ib)**
- 21 **Heald RJ**, Lockhart-Mummery HE. The lesion of the second cancer of the large bowel. *Br J Surg* 1972;**59**:16–19. **(Category: IIb)**
- 22 **Tornqvist A**, Ekelund G, Leandoer L. Early diagnosis of metachronous colorectal carcinoma. *Aust N Z J Surg* 1981;**69**:725–8. **(Category: IIb)**
- 23 **Juhl G**, Larson GM, Mullins R, *et al.* Six-year results of annual colonoscopy after resection of colorectal cancer. *World J Surg* 1990;**14**:255–61. **(Category: III)**
- 24 **Brady PG**, Straker RJ, Goldschmid S. Surveillance colonoscopy after resection for colon carcinoma. *South Med J* 1990;**83**:765–8. **(Category: III)**
- 25 **Winawar SJ**, Zauber AG, O'Brien MJ, *et al.* Randomised comparison of surveillance intervals after colonoscopic removal of newly diagnosed adenomatous polyps. *N Engl J Med* 1993;**328**:901–6. **(Category: Ib)**
- 26 **Kronborg O**, Hage E, Deichgraeber E. The remaining colon after radical surgery for colorectal cancer. The first three years of a prospective study. *Dis Colon Rectum* 1983;**26**:172–6. **(Category: IV)**
- 27 **Barlow AP**, Thompson MH. Colonoscopic follow-up after resection for colorectal cancer: a selective policy. *Br J Surg* 1993;**80**:781–4. **(Category: IV)**
- 28 **Rosen L**, Abel ME, Gordon PH, *et al.* Practice parameters for the detection of colorectal neoplasms – supporting documentation. *Dis Col Rectum* 1992;**35**:391–4. **(Category: IV)**
- 29 **Shoemaker D**, Black R, Giles L, *et al.* Yearly colonoscopy, liver CT and chest radiography do not influence 5 year survival of colorectal cancer patients. *Gastroenterology* 1998;**114**:7–14. **(Category: Ib)**
- 30 **Keibert GM**, Welvaart K, Kievit J. Psychological effects of routine follow-up on cancer patients after surgery. *Eur J Surg* 1993;**159**:601–7. **(Category: IIb)**
- 31 **Stiggelbout AM**, de Haes JCJM, Vree R, *et al.* Follow up of colorectal cancer patients: quality of life and attitudes towards follow up. *Br J Cancer* 1997;**75**:914–20. **(Category: IIb)**