

CHAPTER 11 ELECTIVE SURGERY FOR COLON CANCER

11.1 Operative technique

The objective of surgical treatment of colon cancer is to remove the primary tumour and any regional spread that may have already occurred, without causing further dissemination of tumour, while at the same time preserving a reasonable quality of life for the patient. The prime question to be answered needs to be directed at the surgical pathology and technical aspects of management. The appropriate surgeon to undertake the surgery is addressed in Section 12.1.

11.2 High ligation

The technique of colonic cancer resection has been debated widely throughout the 20th and now the 21st century. Features emphasised include high ligation of the lymphovascular pedicle before manipulating the tumour,¹ wide excision,^{2,3} and early isolation of the lymphovascular pedicle with minimal manipulation.^{1,2} In a review of the literature, Sugarbaker and Corless⁴ concluded that high ligation of the mesenteric pedicle did not produce substantial improvement in survival. (See also Section 12.6.)

Does high ligation provide any benefit?

Guideline — High ligation	Level of evidence	Practice recommendation	Refs
High ligation of the lymphovascular pedicle does not confer any oncological benefit. Resection where feasible should extend to the origin of segmental vessels.	III-3	Equivocal	4

11.3 No-touch isolation technique

Wiggers et al⁵ have reported a prospective randomised trial comparing the no-touch isolation technique with standard methods of colon cancer resection. No significant difference was noted in postoperative morbidity or mortality. Garcia-Olmo et al⁶ reported a study using reverse transcriptase polymerase chain reaction assessment of blood from the main drainage vein of the tumour and peripheral blood. This research failed to demonstrate that tumour cells were shed into the circulation during standard tumour mobilisation and could not support the use of the no-touch isolation technique.

Does no-touch isolation technique have any benefit?

Guideline — No-touch isolation technique	Level of evidence	Practice recommendation	Refs
The no-touch isolation technique has no oncological benefit.	II	Recommend	5

11.4 Segmental versus extended resection

There are very few prospective randomised trials comparing limited segmental resection versus more extensive resection. The French Association for Surgical Research⁷ published a prospective randomised controlled trial comparing median and actuarial survival in 270 consecutive patients after left hemicolectomy or left segmental colectomy for cancers located between the distal third of the transverse colon and (but not including) the rectal sigmoid junction. Complications and operative

mortality were not significantly different. Patients were followed up for approximately ten years. Actuarial survival curves for all patients and for Dukes C patients were similar.

Is segmental and extended resection equivalent in outcome?

Guideline — Segmental and extended resection	Level of evidence	Practice recommendation	Refs
Segmental resection is equivalent to extended resection in outcome.	II	Equivocal	7

11.5 Sutured and stapled anastomosis

Ileocolic, colocolic or colorectal reanastomosis after resection can be achieved by a hand-sewn suture technique or with metal staples. In a meta-analysis, MacRae and McLeod⁸ reported a higher rate of anastomotic stricture with a stapled anastomosis, but mortality rate, anastomotic leak rates and locoregional cancer recurrence rates are equivalent between the two techniques. They conclude that both techniques are effective and the choice may be based on surgeon preference.

A recent Cochrane review of stapled versus hand-sewn anastomosis revealed that in a pooled analysis of the results of the 1233 patients studied (9 trials, 622 stapled anastomoses and 611 hand sewn), there was no evidence of superiority of stapled over hand-sewn colorectal anastomoses, regardless of anastomotic level.⁹

Do sutured and stapled anastomosis have equivalent outcomes?

Guideline — Sutured and stapled anastomosis	Level of evidence	Practice recommendation	Refs
Sutured and stapled anastomosis have equivalent outcomes.	I	Strongly recommend	8, 9

11.6 Omental wrapping of anastomosis

Wrapping the anastomosis with omentum has long been reported as lowering the leak rate from colorectal anastomoses.^{10,11} In a review of the literature, O’Leary¹² found no evidence to support this theory. This technique cannot be supported by available evidence.

Does omental wrapping of intestinal anastomoses have any benefit?

Guideline — Omental wrapping	Level of evidence	Practice recommendation	Refs
Omental wrapping of anastomosis has no benefit.	III-2	Strongly not recommend	12

11.7 Synchronous colonic cancer

The reported incidence of synchronous carcinoma of the colon varies from 2% to 9%.^{13,14} The most appropriate surgical approach for synchronous tumours depends principally on the location of the tumours. The options available are extended segmental colectomy, separate segmental resections, and subtotal or total colectomy with ileorectal anastomosis. The choice for individual patients must be based on both the anatomical position of the synchronous tumours and the age of the patient.

Total or subtotal colectomy may be appropriate for younger patients with synchronous carcinoma. In fact, Demeter and Freeark¹⁵ have recommended this option because of concern over the relatively high risk for metachronous carcinomas in younger patients. However, there is no evidence to support the superiority of subtotal or total colectomy under such circumstances as compared with extended or separate segmental resections with careful lifelong surveillance of the large intestine.

11.8 Fixed tumours with contiguous organ attachment

Adherence of tumours to nearby structures occurs in about 10% of patients with Colorectal Cancer.¹⁶ Up to 43% of such attachments are inflammatory, and 40% of patients who have tumours adherent to other organs are subsequently proven to have a Dukes B lesion, which underlines the potential for cure. If the patient is to be offered the best chance of cure, an *en bloc* resection of the primary tumour and the attached organ should be performed.

McGlone et al¹⁷ and Gall et al¹⁸ have reported markedly reduced survival prospects for patients who have had division of dense adhesions between Colorectal Cancer and a contiguous organ compared with patients who underwent *en bloc* resection. Tumour attachment to the abdominal wall mandates wide discontinuity excision of both tumour and abdominal wall.

11.9 Synchronous resection of liver metastases

Between 10% and 20% of patients having resection of primary Colorectal Cancer will have liver metastases evident (see also Section 21.1.1). Hepatic resection remains the only potential for cure for such metastases. Most liver resections will necessitate an anatomical resection of liver tissue, which would most appropriately be performed several months postoperatively.¹⁹ A small proportion of patients have hepatic metastases that are potentially curable by wedge resection at the time of the primary operation.²⁰ Synchronous resection of liver metastases could be considered at time of primary bowel operation.

Basic requirements²¹ for safe simultaneous resection of a hepatic metastasis at the time of large bowel resection are as follows:

- a solitary liver metastases lesion that can be removed by a limited resection
- minimal blood loss or contamination in an uncomplicated bowel resection
- the presence of an appropriate incision for hepatic resection
- medical status that would permit both procedures
- availability of surgical expertise for hepatic resection.

Lyass et al²² reported a prospective study showing that combined colonic and hepatic resection is comparable to staged resection in terms of postoperative morbidity and mortality, length of stay and survival. It is likely that suitable cases will, however, remain the exception rather than the rule.

11.10 Ovarian metastases

The incidence of synchronous metastatic ovarian disease is between 2% and 8%. Blamey et al²³ have reported that 1.4% of female patients required re-operation for ovarian recurrence after colonic cancer resection. Morrow and Enker²⁴ have recommended bilateral oophorectomy if only one ovary is involved, because of the risk of bilateral ovarian metastatic disease.

Sielezneff et al,²⁵ in a nonrandomised study, were not able to demonstrate an improvement in local recurrence or liver metastasis rates of survival with bilateral prophylactic oophorectomy, although

microscopic metastases were found in one patient. In a prospective randomised trial²⁶ examining the influence of prophylactic oophorectomy on recurrence and survival in patients with Dukes B and C Colorectal Cancer, no case of ovarian metastasis has been observed in control subjects on short-term follow up.

In gynaecological oncology women with a past history of Colorectal Cancer who present with an ovarian mass are most infrequently encountered. The pathology in these patients can be problematic and the opinion of a pathologist who is expert in this area should be sought. Morphologic changes such as garlanding, dirty necrosis etc can be augmented by the use of immunohistochemical stains from cytokeratin 7 and 20.²⁷

When should oophorectomy be performed in association with colectomy for colon cancer?

Guideline — Oophorectomy in surgery for colon cancer	Level of evidence	Practice recommendation	Refs
Bilateral oophorectomy should be performed if there is obvious malignant disease of one or both ovaries.	III-3	Recommend	23, 24
Prophylactic bilateral oophorectomy for colon cancer cannot be supported by the available evidence.	II	Strongly not recommend	26

11.11 Laparoscopic surgery for colonic cancer

Laparoscopic colectomy, in experienced hands, is a safe and feasible alternative to open resection for benign disease. In all studies,²⁸⁻³⁰ laparoscopic techniques might not be possible in some patients, requiring conversion to open surgery. In a recent randomised trial³¹ assessing short-term quality of life (QoL) outcomes, laparoscopic colorectal surgery did not seem to confer any advantage.

Concerns regarding the oncological safety of laparoscopic colectomy for cancer can only be answered by large, well-designed randomised trials. Multicentre trials from the United States^{32,33} reported equivalent analytic outcome between laparoscopic and conventional colonic resection. A random controlled trial (RCT) from Hong Kong assessed laparoscopic resection of rectosigmoid carcinoma in 403 patients.³⁴ Several multicentre trials are now in progress in Europe,³⁵ and Australasia (Australasian multicentre prospective clinical study, comparing laparoscopic and conventional open surgical treatment of colon cancer in adults [ALCCaS]).

A search for relevant articles published to the end of 2002 found a recent meta-analysis assessing short-term outcomes after laparoscopic resection for Colorectal Cancer. The analysis involved the outcomes of 2512 patients in twelve trials. Colorectal Cancer was found to be ‘associated with lesser morbidity, less pain, a faster recovery and shorter hospital stay, without compromising oncological clearance’.³⁶

Is laparoscopic colonic surgery as effective as the conventional approach?


Guideline — Laparoscopic surgery	Level of evidence	Practice recommendation	Refs
In experienced hands, laparoscopic surgery for colon cancer has equivalent outcome to conventional surgery.	I	Recommend	36

11.12 Self-expanding metal stents for obstructing cancer

Patients presenting with malignant large bowel obstruction require emergency management that usually involves resection without anastomosis or resection, on-table colonic lavage and primary anastomosis. There have been several reports³⁷⁻⁴⁰ of the use of self-expanding metal stents to relieve the colonic obstruction, thereby allowing bowel preparation and subsequent elective resection. A major indication is the palliative treatment of malignant large bowel obstruction in the presence of widespread tumour dissemination or in a patient with significant co-morbidity.⁴¹ The stents can be deployed under fluoroscopic control,^{39,40} colonoscopic control,³⁷ or a combination of the two techniques.³⁸ A success rate of 80–100% has been reported. The colonic perforation rate of 0–16% is expected to lessen with greater experience and more flexible stents. Stent migration (10%) and occlusion (10%) are other complications. Pain, and less commonly, haemorrhage, might also occur. The technical failure of stent deployment was reported in 8–10%,⁴² mainly from access failure, and less commonly from malposition and perforation.

The risk of tumour dissemination caused by stent deployment in an otherwise potentially curative situation has not been adequately assessed and long-term recurrence and survival analysis is required. At present, the use of self-expanding metal stents in curative cases cannot be supported except in prospective trials with ongoing evaluation. (See also Section 13.4.4.)

11.13 Extended colonic resection

Currently, the extent of colonoscopic surgery is based on  hovascular drainage. Extended resections may be appropriate for proven HPNCC and may be appropriate for cases strongly suspicious of HPNCC where a mutation is yet to be identified.⁴³ Research will continue into mutational abnormalities in sporadic cancer and may affect standard resection in the future.

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