

Colon Resection

Is Standard Technique Adequate?

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KEYWORDS

• Colon cancer • Surgery • Lymph node • Complete mesocolic excision

KEY POINTS

- The principles behind colon cancer resections have changed little over the past few decades.
- Recent data suggest improved outcomes in colon cancer surgery with wider resections of lymphovascular pedicles along defined anatomic planes compared with traditional approaches.
- There are no definitive data demonstrating biologically why larger lymph node yields or identification equates to improved oncological outcomes.
- Intratumoral and intertumoral clonal heterogeneity likely confounds many surgical studies.

INTRODUCTION

Colorectal cancer is the third most common cancer worldwide, accounting for approximately 600,000 deaths per annum (CRUK Cancer Stats: <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/bowel/mortality/>). The potentially curative primary treatment for patients with both colon and rectal cancer remains surgery. Adjuvant treatment with chemotherapy provides additional benefit for those patients with more advanced colonic tumors.

Over the past few decades, there have been significant improvements in the treatment of patients with colonic and rectal cancers. In rectal cancer, the role of earlier diagnosis, improved preoperative staging, neoadjuvant therapy, total mesorectal excision, and laparoscopic surgery have improved outcomes from oncological and patient recovery perspectives. Of these, arguably the most important for the surgeon was the advent of total mesorectal excision (TME) by Heald and Ryall.¹

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Current thinking is that colonic tumors spread via hematogenous, lymphatic, and possibly perineural routes, with the lymphatics anatomically following the arterial supply. Current practice is to excise a proportion of the draining lymphatic bed to accurately stage the cancer and also clear possible lymphatic metastases.² Recently, significant debate has centered on the degree of lymphatic clearance required; several reports have demonstrated improved oncologic outcomes with wider lymphovascular resections compared with current standard practice. Whether these improved outcomes are secondary to improved lymph node yield or an alternative technical effect has not yet been ascertained.

CURRENT SURGICAL PRACTICE FOR COLONIC RESECTION

The traditional approach to surgical colon cancer resection involves removal of the primary tumor with adequate proximal and distal resection margins, and a clear circumferential resection margin (which may require en bloc resection of the abdominal wall or other viscera) together with an anatomically defined mesenteric lymphovascular pedicle. These operations may be performed via either a traditional open approach or laparoscopically. It has now been shown by a wide number of studies, including large randomized controlled trials (RCT), such as COST,³ CLASICC,⁴ and COLOR,⁵ that oncological outcomes from laparoscopic colonic surgery are equivalent to open surgery. The necessity to include resection of the lymphovascular mesentery is based on the tenet that in addition to hematogeneous spread, colonic tumors most commonly spread initially via the lymphatic system, which anatomically follows the colonic arterial supply. Historically it is held that en bloc lymph node resection is necessary not only for staging (Cady-Fisher) but also to reduce tumor burden (Halsted). The Cady-Fisher model of cancer progression proposes that systemic spread occurs as an early event in cancer development, whereas the Halsted theory suggests a more stepwise progression in the development of metastases. More contemporary views on the role of lymphadenectomy have seen it purely for staging purposes, the results of which effect management by defining adjuvant treatment options. Generally speaking, adjuvant chemotherapy is reserved for those patients with lymph node involvement (stage III/IV) or poor prognosis stage II cancers. Inadequate assessment of lymph nodes for malignancy will theoretically lead to understaging, resulting in increased mortality through undertreatment. Understaging may be consequent on either the surgeon not removing enough lymph nodes or the pathologist not identifying and examining all lymph nodes present in the specimen. In relation to the latter, various options have been evaluated to increase the identification and assessment of lymph nodes, including fat dissolution chemicals⁶ and ex vivo sentinel lymph node (SLN) identification.⁷ With respect to the operative harvesting of nodes, it is recommended to perform a “high tie” of the vascular pedicle to maximize the number of lymph nodes within the colonic mesentery.

WHAT IS THE EVIDENCE TO SUPPORT CURRENT COLONIC CANCER SURGICAL PRACTICE?

It is important to identify the evidence for current practice in colonic cancer surgery. As with most other solid organ malignancies, primary treatment is surgical. In the past, there has been a reluctance to use neoadjuvant therapy in colonic cancer surgery because of concerns over accurate radiological staging and the risk of bowel obstruction during treatment. However, recently published results from the FOxTROT trial show that this option is feasible and safe, and may potentially induce

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