Controversies in Laparoscopy for Colon and Rectal Cancer

Kellie L. Mathis, MD*, Heidi Nelson, MD

KEYWORDS

• Colon cancer • Rectal cancer • Surgical morbidity • Oncologic outcomes
• Laparoscopic surgery

KEY POINTS

- Laparoscopic surgery should be offered to appropriate patients undergoing colectomy for colon cancer, as oncologic outcomes are equivalent to those following open surgery.
- Laparoscopy for colon cancer offers faster gastrointestinal recovery and shorter duration of hospital stay compared with open surgery.
- Laparoscopic proctectomy for rectal cancer is being studied. Oncologic data are not yet available, but short-term outcomes are at least equivalent to open proctectomy.

INTRODUCTION

Colorectal cancer is the third most common malignancy and the third most common cause of cancer-related death in the United States.[1] Surgical resection remains the primary treatment modality for resectable disease, and the surgical management of colon and rectal cancer has evolved over the past 2 decades. Laparoscopy for colon surgery was originally reported in 1991 by Fowler and White.[2] Since that time, considerable controversy has surrounded the application of laparoscopic techniques for colon and rectal cancer. Despite an abundance of randomized trial evidence that laparoscopy is oncologically equivalent to and offers short-term benefits over open colectomy for colon cancer, laparoscopy remains underused. Early data suggest that short-term benefits are also realized for rectal cancer, but robust long-term oncologic data are not yet available. Laparoscopy in the pelvis is technically challenging and whether laparoscopic proctectomy for rectal cancer is ready for prime time remains to be determined. Robotic rectal dissection may overcome many of the challenges of laparoscopy.

The authors have nothing to disclose.
Division of Colon and Rectal Surgery, Mayo Clinic, 200 First Street Southwest, Rochester, MN 55905, USA
* Corresponding author.
E-mail address: mathis.kellie@mayo.edu

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It has been suggested that only approximately 9% of colectomies for colon cancer were being performed laparoscopically in the United States between 2005 and 2007.[3] An administrative review of 48 hospitals in the northwest United States showed that there was no increase in the percentage of colon cancer operations performed laparoscopically between 2005 and 2010.[4] Similar findings were reported recently using data from the National Inpatient Sample in which only 6.7% of colon cancer cases were being done laparoscopically.[5] The reasons for this perceived lack of acceptance are not known. Lack of training and/or experience with the technique, as well as persistent concerns about the oncologic adequacy of the technique are likely the 2 major contributing factors. There is also evidence that database reviews underestimate the percentage of patients undergoing laparoscopy for colon cancer. With improved coding, Fox and colleagues[6] reviewed data from the National Inpatient Sample and determined that more than 40% of colon cancer operations are now done laparoscopically. We review the available evidence for the laparoscopic technique for colon and rectal cancer.

COLON CANCER

Operative and Short-Term Outcomes

Level I evidence from 4 large multicenter (often multinational) randomized trials consistently suggest that patients undergoing laparoscopic and open colon cancer surgery have equivalent rates of perioperative morbidity and mortality.[7–10] The operative outcomes and short-term results of these 4 trials are reported in **Tables 1** and **2**.

Multiple meta-analyses and systematic reviews have been performed to combine the short-term outcomes of available randomized controlled trials (RCTs) for laparoscopic versus open colon cancer resection. Tjandra and Chan[11] evaluated 17 randomized trials with a combined 4013 patients. They found no significant differences in overall and surgery-specific morbidity, anastomotic leak rates, reoperation rates, and quality of oncologic resection. Operative times were prolonged in the laparoscopic group. Additionally, laparoscopy was associated with lower 30-day mortality, fewer wound complications, lower surgical blood loss, and decreased pain scores, with an associated lower requirement for narcotic analgesia. Bowel function and

Table 1
Operative outcomes for laparoscopic versus open resection of colon cancer in major randomized trials

Trial	Assigned Group	No. of Patients	Conversion Rate (%)	Operative Time (min)	Estimated Blood Loss (mL)	Lymph Node Count
COST[7]	Laparoscopy	437	21	150	—	12
	Open	435		95	—	12
CLASICC[8]	Laparoscopy	273	29	180	—	12
	Open	140		135	—	14
COLOR I[10]	Laparoscopy	621	17	145	100	10
	Open	627		115	175	10
ALCCaS[9]	Laparoscopy	298	15	158	100	13
	Open	294		107	100	13

Abbreviations: ALCCaS, Australasian Randomized Clinic Study Comparing Laparoscopic and Conventional Open Surgical Treatments for Colon Cancer; CLASICC, Conventional versus Laparoscopic-Assisted Surgery in Colorectal Cancer; COLOR I, Colon Cancer Laparoscopic or Open Resection I; COST, Clinical Outcomes of Surgical Therapy.