

Laparoscopic resection for rectal cancer: the new standard of care?

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The highly anticipated long-term oncologic outcomes of the landmark “Colorectal Cancer Laparoscopic or Open Resection (COLOR) II trial” were finally released in the April 2015 edition of the *New England Journal of Medicine* (1). The authors are to be congratulated for their success in designing and conducting a rigorous, large-scale trial, requiring a substantial investment in time and effort to answer a pertinent clinical question regarding the care of colorectal cancer patients worldwide.

Laparoscopic colorectal resection was first introduced in the early 1990s (2). Since then, there has been widespread enthusiasm towards utilizing laparoscopic approaches to treat patients that require a colorectal resection. The advantages of laparoscopy such as decreased postoperative pain, faster return of bowel function, shorter hospital stay and improved cosmesis were attractive to surgeons and patients alike. Laparoscopic colorectal resection however, requires advanced laparoscopic skills, which has hampered its adoption. The considerable learning curve raised skepticism with regards to whether laparoscopic colorectal resection would compromise the quality and completeness of colorectal oncologic resection. This meant that initial adoption of the laparoscopic technique was largely limited to patients with benign disease only. In the early 2000s, mounting evidence started to suggest that laparoscopic colon resection was oncologically equivalent to open resection for patients with colon cancer. The COST and COLOR I trial results confirmed these findings (3,4).

Despite over a decade of additional experience since those studies were published, the question remained as to whether these same techniques were appropriate for the treatment of rectal cancer. It has been widely established that total mesorectal excision (TME) is the

golden standard technique of curative rectal cancer resection (5). This technique is predicated on resection of a complete mesorectal envelope, clear circumferential resection margins, with en-bloc resection of regional lymph node basins. The COLOR II trial by Bonjer *et al.* was designed to establish the equivalency of laparoscopic colorectal resection compared to open resection for patients with rectal malignancy. The COLOR II trial is a non-inferiority, open label and multicenter trial that was conducted at 30 centers in eight countries. The study was sponsored by Ethicon Endo-Surgery Europe but the sponsor had no role in study design, data gathering or analysis. The study enrolled a total of 1,044 patients that were randomized in a 2:1 fashion resulting in 699 laparoscopic resections and 345 open resections for rectal cancer. The two groups were found to be similar in terms of patient characteristics, comorbidities and tumor location.

The short term outcomes of this trial were reported 2 years ago, showing that patients treated with laparoscopic resection had improved short-term surgical outcomes. These included, specifically, faster return of bowel function and shorter hospital stay. There was also no difference in the incidence of perioperative complications (6). The highly awaited long term oncologic outcomes were finally reported in April 2015. Minimal required follow-up included annual clinical examinations for 5 years after resection. Three years after the index surgery, CT or MRI of the pelvis combined with imaging of the liver and the chest were performed. Recurrent disease was defined as the presence of locoregional recurrence, the presence of distant metastases, or death from rectal cancer. The trial found no statically significant differences in locoregional recurrence, disease free survival

and overall survival between the two treatment groups.

The trial did elicit some thought-provoking findings between the two groups. Interestingly, when used for distal lesions, laparoscopic resection was found to have a lower rate of circumferential resection margin involvement (9% *vs.* 22% respectively) and lower rate of locoregional recurrence (4.4% *vs.* 11.7%) compared to open. Furthermore, although the trial did not find any differences in overall survival or disease free survival amongst stage I and stage II disease, there was a trend towards improvement in disease free survival (64.9% in laparoscopic group *vs.* 52% in open group) in patients with more advanced disease (stage III). Whether this survival advantage is due to the less taxing and invasive nature of laparoscopy remains to be seen (7,8).

The COLOR II trial by Bonjer *et al.* clearly demonstrates that laparoscopic colorectal resection for rectal cancer is a non-inferior modality of performing proctectomy with curative intent. Laparoscopic resection does not compromise oncologic outcomes and has some palpable advantages in terms of postoperative recovery, and may even provide some oncologic benefit in patients with more advanced disease. This trial establishes laparoscopic rectal resection as the new standard of care in rectal cancer surgical treatment. The frontier now shifts towards ensuring that this advantageous technique is available to patients that need it. Laparoscopic colorectal resection remains technically challenging. The estimated learning curve has been estimated to be anywhere between 50 to 150 cases and remains the biggest hurdle for patients and care providers to overcome (9,10). Colorectal surgery training practices must evolve to ensure that the surgeons performing these procedures are technically proficient to ensure that patients receive the true benefit of laparoscopy, as the expert surgeons in the COLOR II trial were able to demonstrate.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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