



Laparoscopic surgery for colorectal cancer: towards a lower cost surgery?

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Populations are aging worldwide and the prevalence and economic burden of patients with colorectal cancer (CRC) is supposed to increase in the future (1). Frequently older people show comorbidities, for example cardiac and lung diseases, which rise operative risk, and the risk of postoperative morbidities, thus leading to an increase in hospital length of stay and costs (2). Many studies highlighted the importance of laparoscopic surgery for the treatment of CRC, with a growing interest in the analysis of cost-effectiveness for this procedure in comparison with open surgery. Vara-Thorbeck *et al* carried out the first study on laparoscopic surgery in the elderly with CRC more than 20 years ago (3). The authors demonstrated that no mortality and very low morbidity occurred despite the patients' older age, debilitated conditions, and comorbidities. These results were supported by more recent studies that did not show any difference compared with open surgery as regards morbidity or length of hospitalization (4-7). Moreover, a meta-analysis carried out on elderly patients showed that laparoscopic procedures reduced the number of surgical site infections, and postoperative cardiac and respiratory complications (8). Kennedy *et al.* reviewed the database of the American College of Surgeons' National Surgical Quality Improvement Program (ACS NSQIP) and demonstrated that laparoscopy decreased length of hospitalization and risk of postoperative complications in a cohort of 8,660 elderly patients after surgery for CRC (9). There is growing evidence that laparoscopic colorectal surgery could be effective and safe also for very old patients (10). A recent systematic review and meta-analysis

by Li *et al.* underlined the efficacy of laparoscopic surgery performed on octogenarians in reducing the length of hospital stay, intraoperative bleeding, time to return to normal bowel function, and incidence of postoperative morbidities such as pneumonia, wound infection, and postoperative ileus (11). As regards the cost-effectiveness of laparoscopic procedures, an interesting study conducted in Sweden on 1,044 rectal cancer patients showed that laparoscopy had higher costs compared to open surgery, at 28 days (\$1,910) and 3 years (\$3,854) after surgery. However, there were no significant differences between the laparoscopic and open approach in long-term costs to society (\$684) (12). Similar results were showed in a systematic review carried out by Murray *et al.* (13). The authors reported a quicker recovery and no significant difference in mortality or disease-free survival up to 3 years for laparoscopic surgery. Anyway, operative times are longer for laparoscopic approach and a significant rate of conversions from laparoscopic to open surgery was observed. The costs for laparoscopic surgery seemed to be higher to the health service compared to open surgery, with an expected additional cost of around pound 300 per patient. However, these costs are balanced by short term benefits and long-term outcomes as regards survival and cure rates up to 3 years. Another systematic review by Jensen *et al.* confirmed that even if laparoscopic resection for CRC is associated with higher equipment costs, it is cost-effective and provides equivalent quality of life compared to open surgery. The only condition that influence the cost-effectiveness of laparoscopy is postoperative hernia rates (14). In their article, Hayashi *et al.* used a propensity score matching analysis to assess the

surgical outcomes and economic benefits of laparoscopic versus open surgery for CRC (15). The results of this study are consistent with previous reports and pointed out that patients with CRC after laparoscopic resection showed lower morbidity and a reduced postoperative length of stay compared to open surgery. The use of laparoscopic procedures generated a higher mean surgical expense but at the same time reduced the non-surgical costs. Noteworthy, the authors observed a decrease in average cost of laparoscopic procedures of around 130,000 yen in comparison with open surgery, even if this difference was statistically not significant. In conclusion, the majority of studies support the advantages of laparoscopic resection for CRC as a minimally invasive technique with low rate of complications and clear economic benefits. Further studies are still needed to confirm these findings, but it seems reasonable to think that in the future the laparoscopic approach should confirm its role as a routine and cost-effective procedure for the treatment of CRC.

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