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Laparoscopy in colon cancer: The new standard?

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There are few topics in surgery as challenging and controversial as the role of laparoscopy in malignant colonic disease. Whilst laparoscopic cholecystectomy has been rapidly become the gold standard in the treatment of gallbladder lithiasis, laparoscopic surgery for colon cancer has remained controversial for a long time and it is still a matter of discussion.^{1–6}

Since first performed in 1991, this technique was not widely accepted by the surgical community. Criticism towards this new approach initially regarded the increased risk of port site metastasis and the diffusion of neoplastic cells inside the peritoneum due to the insufflation. The impossibility of a manual evaluation of neoplasm and its dissemination was considered a reduction of the role of the surgeon. Moreover, there was not a general consensus on the effectiveness of this technique, the oncologic radicality, the short and long-term outcome, wide-ranging costs and ease of learning. Open surgery still seemed to be the most effective treatment of colon cancer.

In the mid and late 1990s, several multi-centre clinical trials started, randomising patients with colon cancer to laparoscopic or open surgery in order to assess definitive results on effectiveness in terms of oncological outcomes. These studies progressively modified initial diffidence and confirmed what short-term benefits had widely demonstrated.^{7–9,11}

Laparoscopic colectomy determines a significative reduction in the hospital stay length, a faster return to oral diet, bowel function and earlier resumption of a normal diet. Cosmetic advantage and the shorter scar are obviously well appreciated. The use of analgesic requirement is reduced due to a less post-operative pain. As regard long-term oncologic outcome, no significative differences were noted between open and laparoscopic surgery: local recurrence rate, cancer-specific survival rate.^{12–15,17,20,21}

Adequacy of oncologic resection has also been demonstrated equivalent to open surgery.²²

Another point of discussion was the economic aspect. Laparoscopic colectomy usually requires more operating theatre time and the use of more expensive disposable equipment.

But higher operation costs are compensated by lower costs of hospitalisation. As a matter of fact total hospital charges are directly related to the learning period. As soon as surgeons get more skilled, laparoscopy-correlated costs get lower and are similar to conventional open surgery.^{16–18} Shortening of leaning period becomes fundamental for achieving cost-effective laparoscopic surgery. On the other hand, the process of technical assimilation of laparoscopic colectomy is very long and must be conducted cautiously, keeping in mind that even referral colorectal centres use laparoscopy in a percentage of 25% total colonic surgery.^{10,19} Out-of-hospital costs have not yet been evaluated.^{23,24}

A comparison of stress response after laparoscopic and open surgery was also investigated. Laparoscopic surgery induces less trauma than open surgery on peritoneal and systemic immune system and this reflects on a better short-term outcome.

In conclusion, there are still many matters of discussion amongst the surgical community about the secure viability of this technique for all the segments of colon and rectum.

The results of many studies undoubtedly highlight that laparoscopic and mini-invasive colon surgery are as oncological safe and efficacious as the conventional open technique, it being understood that the principles of surgery are not neglected.⁴

Laparoscopic approach is definitively an option to be offered to patients.¹

Conflict of interest statement

Authors disclose no financial and personal relationship with other people or organisations that could inappropriately influence their work.

REFERENCES

1. Moloo H, Sabri E, Wassif E, et al. Laparoscopic resection for colon cancer: would all patients benefit? *Dis Colon Rectum* 2008;51(2):173–80.

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2. Lelong B, Bege T, Guiramand J, et al. Colon cancer and laparoscopy: state of the art 2007. *Bull Cancer* 2007;**94**(12):1053–8.
3. Young-Fadok TM. Colon cancer: trials, results, techniques (LAP and HALS), future. *J Surg Oncol* 2007;**96**(8):651–9.
4. Rovera F, Dionigi G, Boni L, et al. Colorectal cancer: the role of laparoscopy. *Surg Oncol* 2007;**16**(Suppl 1):S65–7.
5. Bianchi PP, Ceriani C, Montorsi M. Laparoscopic surgery of colon cancer state of art and literature review. *Ann Ital Chir* 2006;**77**(4):289–94.
6. Martel G, Bushey RP. Laparoscopic colon surgery: past, present and future. *Surg Clin North Am* 2006;**86**(4):867–97.
7. Patankar SK, Larach SW, Ferrara A, et al. Prospective comparison of laparoscopic vs. open resections for colorectal adenocarcinoma over a ten-year period. *Dis Colon Rectum* 2003;**46**(5):601–11.
8. Law WL, Lee YM, Choi HK, et al. Impact of laparoscopic resection for colorectal cancer on operative outcomes and survival. *Ann Surg* 2007;**245**(1):1–7.
9. Tong DK, Law WL. Laparoscopic versus open right hemicolectomy for carcinoma of the colon. *JSLs* 2007;**11**(1):76–80.
10. Choi DH, Jeong WK, Lim SW, et al. Learning curves for laparoscopic sigmoidectomy used to manage curable sigmoid colon cancer: single-institute, three-surgeon experience. *Surg Endosc* 2008 [Feb 13; Epub ahead of print].
11. Jayne DG, Guillou PJ, Thorpe H, et al. UK MRC CLASICC Trial Group. Randomized trial of laparoscopic-assisted resection of colorectal carcinoma: 3-year results of the UK MRC CLASICC Trial Group. *J Clin Oncol* 2007;**25**(21):3061–8.
12. Chung CC, Ng DC, Tsang WW, et al. Hand-assisted laparoscopic versus open right colectomy: a randomized controlled trial. *Ann Surg* 2007;**246**(5):728–33.
13. Fleshman J, Sargent DJ, Green E, et al. For the Clinical Outcomes of Surgical Therapy Study Group. Laparoscopic colectomy for cancer is not inferior to open surgery based on 5-year data from the COST Study Group trial. *Ann Surg* 2007;**246**(4):655–62.
14. Steele SR, Brown TA, Rush RM, Martin MJ. Laparoscopic vs. open colectomy for colon cancer: results from a large nationwide population-based analysis. *J Gastrointest Surg* 2008;**12**(3):583–91.
15. Hinojosa MW, Murrell ZA, Konyalian VR, et al. Comparison of laparoscopic vs. open sigmoid colectomy for benign and malignant disease at academic medical centers. *J Gastrointest Surg* 2007;**11**(11):1423–9.
16. Hayes JL, Hansen P. Is laparoscopic colectomy for cancer cost-effective relative to open colectomy? *ANZ J Surg* 2007;**77**(9):782–6.
17. Nakamura T, Kokuba Y, Mitomi H, et al. Comparison between the oncologic outcome of laparoscopic surgery and open surgery for T1 and T2 rectosigmoidal and rectal carcinoma: matched case-control study. *Hepatogastroenterology* 2007;**54**(76):1094–7.
18. Park JS, Kang SB, Kim SW, Cheon GN. Economics and the laparoscopic surgery learning curve: comparison with open surgery for rectosigmoid cancer. *World J Surg* 2007;**31**(9):1827–34.
19. Klausner JM. Laparoscopic colectomy – recommended routinely? *Harefuah* 2007;**146**(3):193–246.
20. Kahn moui K, Cadeddu M, Farrokhyar F, Anvari M. Laparoscopic surgery for colon cancer: a systematic review. *Can J Surg* 2007;**50**(1):48–57.
21. Fingerhut A, Ata T, Chouillard E, et al. Laparoscopic approach to colonic cancer: critical appraisal of the literature. *Dig Dis* 2007;**25**(1):33–43.
22. Bonjer HJ, Hop WC, Nelson H, et al. Transatlantic laparoscopically assisted vs. Open Colectomy Trials Study Group. Laparoscopically assisted vs. open colectomy for colon cancer: a meta-analysis. *Arch Surg* 2007;**142**(3):298–303.
23. Lee YS, Lee IK, Kang WK, et al. Surgical and pathological outcomes of laparoscopic surgery for transverse colon cancer. *Int J Colorectal Dis* 2008;**23**(7):669–73.
24. Schlachta CM, Mamazza J, Poulin EC. Are transverse colon cancers suitable for laparoscopic resection? *Surg Endosc* 2007;**21**(3):396–9.