Editorial

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Laparoscopic surgery for cure of colorectal cancer

One good reason for considering a change of access to radical surgery for colorectal cancer should be the proven superiority of the new approach to the treatment of benign diseases of the same viscera. For the time being this does not seem to be the case for laparoscopic colorectal surgery [8]. In fact, there is so far no convincing evidence showing that minimal invasive colorectal surgery is advantageous over its traditional counterpart with regard to the immediately recognizable outcome [22]. On the other hand, the immediately recognizable drawbacks of laparoscopic colorectal surgery (learning curve, prolonged operating time, high morbidity rates following conversion to open surgery, and the ''new'' complications) are well documented [24, 25]. In spite of this, an increasing number of surgeons are today attempting to perform laparoscopic surgery for cure of colorectal cancer outside randomized controlled trials. It is therefore appropriate to review the cancer issues that may make laparoscopic colorectal surgery for cure of malignancy an unsafe procedure.

Disease localization and demarcation

View magnification and the loss of the palpating hand have considerable consequences for disease localization and demarcation. Colon cancer can be intraluminal and/or intramural and preoperative tatooing or metal-clip application is mandatory for intraoperative lesion identification (with fluoroscopy in the case of clips). In case of failure, laparoscopic ultrasound can facilitate the localization of early disease and the evaluation of adequate resection margins. Perioperative colonoscopy may, however, be necessary in case of extremely mobile large villous adenomas for exact tumor location. All intraoperative diagnostic methods share the disadvantage of a further prolonged operating time.

Failure to identify the lesion before resection leads to increased manipulation of the tumor-bearing bowel segment (prior to proximal vessel division) or resection of a sound colon segment. Disease demarcation is a critical issue, too, as T4 cancers require open en bloc surgery, as do transverse colon tumors. A restricted ability to pack away the small bowel can interfere with this requirement.

Laparoscopy-induced disease progression?

The laparoscopic approach is suspected of being responsible for previously unknown tumor spreading. Anecdotal reports support an increased rate of abdominal wound metastases. The overall incidence cannot be determined given that the total number of patients undergoing such procedures is, regrettably, unknown. The American Society of Colon and Rectal Surgeons Laparoscopic Registry has reported a 1.1% wound recurrence rate at 1-year follow-up for 480 patients [26]. As many operations have been performed during the last 2 years, there is reason to fear that the true incidence might be over 4%. Most recurrences (80%) have been reported to occur within 1 year (range 1–26 months) at port sites which had not been used for specimen retrieval even when the specimen was removed in a plastic bag [27]. Only 63% of these patients had advanced disease at the time of laparoscopy. Four patients (9%) were reported as Dukes A adenocarcinomas, which is hardly comprehensible unless understaging or perforation occurred. More than 50% of abdominal wound metastases were associated with peritoneal carcinomatosis. Over 80% of these patients with peritoneal tumor dissemination had Dukes C cancers at the time of laparoscopy and died within 1 year of the date of recurrence diagnosis. Two patients (17%) with Dukes B colon tumors developed abdominal wound metastases with peritoneal carcinomatosis (9 and 10 months after laparoscopy), which were treated by cytoreductive surgery and intraperitoneal chemotherapy [15].

Experimental data [19] support a significant increase in abdominal wound metastasis rates after laparoscopic resection compared with open excision. It is still unclear whether metastatic mechanisms such as viable cancer cells directly implanted by increased contact with tumor-laden instruments, cannulas, stability threads [2], specimen and/or vehiculated by carbon dioxide within vapor particles that condense [10] and/or transported by cell-laden fluid at the time desufflation [28] account for all wound metastases. Other experimental data [4, 13, 14] are controversial as to whether pneumoperitoneum enhances spread, implantation, and growth of free, viable cancer cells on ischemic and traumatized sites of visceral and/or parietal peritoneum. Interestingly, some of these data [4] have pointed out that the topography of carcinomatosis depends on port placement.

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Patient selection

If the risk of pneumoperitoneum-enhanced tumor shedding, implantation, and take cannot be ruled out, laparoscopy-induced disease progression could occur in all adenocarcinomas extending to the serosal layer of the bowel wall. Endoscopic ultrasonography (EUS) allows fairly accurate assessment of the depth of colonic wall invasion, whereas CT-scan findings poorly correlate with pathology [11]. Preoperative knowledge of the T-factor adds to selection of colon cancer patients unsuitable for celioscopic resection. In fact, laparoscopy-induced peritoneal tumor dissemination could occur not only in patients with T3 resectable cancers but also in patients with unresectable disease undergoing laparoscopy for palliation.

Although the view in the low pelvis may be even better than in open surgery [20], laparoscopy should not be attempted in patients with cancer of the middle third of the rectum. This is particularly true for lesions 5–6 cm from the anal margin where there is doubt that a sphincter-saving procedure can be performed. Not doing so may in turn increase the relative number of abdominoperineal resections [23]. Moreover, it has been easier to prove the feasibility of a truly laparoscopic abdominoperineal excision [6] since there is no need for distal suture line or for laparotomy. (The bulky specimen with its attendant mesentery is delivered perineally.)

The technical limit of the distal suture line may in part be overcome using bilaterally articulated laparoscopic stapling devices (ETS FLEX 35, Ethicon Endosurgery, Cincinnati, OH) (Reflex AEC 35, Richard-Allan, Richland, MI). However, the achieval of an adequate distal margin (even in tumors of the proximal third of the rectum) still depends on the index-thumb palpation of the distal edge of the lesion. Furthermore, colorectal anastomosis after laparoscopic high anterior resection of the rectum should not be carried out completely laparoscopically whenever operating on cancer since the totally intracorporeal approach [3] may not permit washout of the proximal colon end [21].

Long-term cure rates

True recurrence, survival, and death rates after laparoscopic surgery for colorectal cancer remain unknown, although some retrospective papers [5, 12, 18] reported early outcomes comparable with conventional surgery. This view is supported by the short-term outcome analysis of a small randomized trial [16]. Five-year results of a nonrandomized prospective study showed no significant differences in 191 patients undergoing a totally intracorporeal technique [9].

Conclusion

Although laparoscopic resection of colorectal cancer may be technically possible, it must be kept in mind that adenocarcinoma of the large bowel is curable by open surgery in about 50% of the cases. This includes the considerable achievements in terms of long-term survival rates reported by the Registry of Repeat Resection of Colorectal Hepatic Metastases [7]. Moreover, since the diagnosis of synchronous colorectal neoplasms is established intraoperatively in 76% of the patients [1], the loss of manual palpation is not reassuring.

The future of laparoscopic surgery for cure of colorectal cancer will not become more certain as a result of recommendations to excise trocar sites [13], use the cytotoxic agent povidone-iodine [10], salvage intraperitoneal chemotherapy [16], or perform with a gasless technique. Until we know more about the long-term results, laparoscopic radical surgery for colon cancer should not be performed based on surgeon or patient preference, but, preferable, inside randomized studies, or possibly within prospective series designed for strict follow-up and audit.

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