



Is previous abdominal surgery still a contraindication for laparoscopic surgery in colorectal cancer patients?

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Laparoscopy emerged as an alternative surgical approach after the introduction of laparoscopic cholecystectomy in 1987, although certain conditions such as previous abdominal surgery (PAS) were considered as absolute contraindications for this technique. Technical advances with development and improvement of instrumentation, growing surgical experience and increased laparoscopic skills over time made laparoscopic surgery the preferred method in certain centres for a range of complex and technically demanding procedures such as gastric, colorectal and even hepatic and pancreatic resections. In the same time, traditional absolute contraindications for laparoscopic surgery such as PAS have been reconsidered and largely resolved but still remain an issue of concern.

In a recent article by Dr. Lee and colleagues (1) published in the April 2016 online issue of *Surgical Endoscopy* the impact of PAS on short- and long-term outcomes of laparoscopic colorectal surgery was evaluated. The authors retrospectively reviewed a considerable number of patients (n=3,188) with primary colorectal cancer who underwent resectional laparoscopic colorectal surgery and compared patients with a history of PAS (n=593) to those without such history (n=2,595). They showed that overall PAS did not affect a range of intraoperative (conversion rate, operating time, number of harvested lymph nodes) or postoperative (time to flatus or defecation, length of hospital stay, and overall complication rate) parameters. However, when major PAS (defined as surgery involving more than one abdominal quadrant) was considered, it became evident that patients with major PAS (n=165) had significantly higher rates of conversion to open surgery when compared

to those without a history of previous intraabdominal surgery (4.2% vs. 1.7%) and a higher rate of overall postoperative complications (17.0% vs. 10.8%), mainly because of prolonged postoperative ileus and increased wound complications. Major PAS was also found by logistic regression analysis to be an independent risk factor for conversion to open surgery (adjusted odds ratio =2.74; 95% confidence interval: 1.197–6.269).

Overall, findings from this study are in general agreement with previously published series (2,3) showing that laparoscopic colorectal surgery can be successfully and safely completed in most patients with PAS and has similar short-term outcomes without oncologic clearance and radicality compromise compared to those without PAS. However, important details worth analyzing for better understanding of the true influence of previous intraabdominal surgery on laparoscopic surgery performance are missing, probably due to the retrospective nature of the study. The number of patients with PAS having adhesions significantly interfering with the procedure, the location, extent, severity and qualitative features of adhesions, the need for adhesiolysis, additional time necessary for adhesiolysis, inadvertent bowel injuries, other adhesion-related visceral injuries or intra- and post-operative complications and adhesion-related conversions to open surgery are all important parameters in this context. However, this can only be achieved in a prospective setting specifically designed to address these issues.

In a previous study using the same methodology, adhesion-related conversions were more common in patients with major or minor PAS when compared to no PAS

patients for both colon (50%, 20%, and 9.1%, respectively) and rectal (50%, 25%, and 8%, respectively) cancer patients undergoing laparoscopic colorectal resection, mainly due to specific types (gastrectomy and colectomy) of previous surgery (2). The rate of intraoperative enterotomies was also relatively higher in the same groups (major, minor, and no PAS) of patients; 8.3%, 3%, and 2.6%, respectively for colonic, and 6.3%, 3.8%, and 2.1%, respectively for rectal cancer patients. Nevertheless, mean operative time and other intraoperative and postoperative outcomes such as blood loss, mortality, severity of complications, time to soft diet, hospital stay, did not differ among the groups.

Another retrospective cohort study, evaluated the influence of specific types of previous surgery or different types of incision used during previous surgery on the outcomes of laparoscopic colorectal surgery (3). Adhesion-related conversion to open surgery was significantly more often among patients with PAS than among those without PAS (5.6% *vs.* 1.6%). Multivariate analysis identified previous median, upper median and lower median incisions as risk factors for conversion to open surgery. Inadvertent small-bowel enterotomies occurring either during initial access to the peritoneal cavity or during adhesiolysis were significantly more common in the PAS group than in the no PAS group (0.9% *vs.* 0.1%) with multiple PAS increasing the enterotomy risk. PAS was also associated with prolonged postoperative ileus and time to flatus, and delayed oral intake. When the authors looked at the type of procedure performed and the type of previous abdominal incision it became evident that laparoscopic transverse colectomy with previous median and upper median incision, laparoscopic left colectomy with previous upper median incision, and laparoscopic total colectomy with previous median incision were the combinations most likely associated with conversion to open surgery. These findings underline the impeding role of PAS on the operative field of future laparoscopic colorectal surgery when both correspond to the same anatomical area.

Both this study (1) and a previous report (3) included in their study population patients with previous laparoscopic surgery. This is an interesting issue as laparoscopic surgery has been widely spread and hundreds of thousands of different laparoscopic procedures have been performed around the world. Theoretically, laparoscopic surgery associates with less visceral injury and diminished inflammatory response than manual handling during open surgery and therefore results in less adhesion formation. Apparently, the small number of laparoscopic cases

prevented the authors from specifically examining the impact of previous laparoscopic surgery on the outcomes of laparoscopic colorectal surgery. It wouldn't be surprising to see in the future studies evaluating the influence of previous laparoscopic or even robotic surgery (4) on following laparoscopic colorectal surgery.

Important information provided by this study relates to the impact of laparoscopic surgery for colorectal cancer on disease prognosis (1). There has been some scepticism regarding the oncologic safety of laparoscopy in patients with PAS as technical difficulties with extensive bowel and tumor manipulation during adhesiolysis may breach the "no-touch" principle resulting in tumor cell shedding and intraoperative cancer cell dissemination. Survival curve and multivariable survival analysis showed that PAS either minor or major did not adversely affect overall or disease-free survival. Although details on duration and completeness of patient follow-up, adjuvant treatment used and cancer-specific causes of death are not given, inspection of survival curves reveals an authentic five-year overall and disease-free survival rate of over 80%. These are impressive figures given that almost two thirds of the study population had advanced (T3 and T4) tumors and almost one third of all patients had metastatic disease (as seen in the second table). In fact, patients with a history of minor PAS showed significantly better disease-free survival compared to those without PAS. As commented by the authors, this unexpected finding was mainly related to significantly better disease-free survival of patients with previous appendectomy. The relationship between appendectomy and tumor recurrence, if any, is unclear whereas the influence of unidentified confounding factors on this observation cannot be excluded.

Nowadays, when laparoscopy is establishing its pivotal role in the treatment of colorectal cancer patients, this report adds further information on the feasibility and safety of the laparoscopic approach when applied to patients with previous open abdominal surgery. Most importantly, laparoscopic surgery for colorectal cancer patients with PAS appears to be oncologically safe (1). It does not compromise the oncologic completeness of the surgery and has no detrimental effects on the long-term outcomes and disease prognosis. Furthermore, these effects appear to be valid even in cases of conversion to open surgery (5). Although some delay in postoperative intestinal function recovery may occur and despite the possibility of conversion to open surgery especially when specific operations or operations of certain location have been previously performed, patients with PAS have the right to benefit from the well-

known advantages of laparoscopic surgery. Previous open abdominal surgery itself should not be a contraindication for laparoscopic colorectal surgery and laparoscopy should be considered as the primary surgical approach even in these patients with open surgery being the alternative.

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