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Oncology

Laparoscopy could be the best approach to treat colorectal cancer in selected patients aged over 80 years: Outcomes from a multicenter study

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SUMMARY

Background: The efficacy and safety of treating elderly patients with colorectal cancer (CRC) is of concern. This study aimed to compare the short- and long-term outcomes of elective laparoscopic vs. open surgery to treat CRC in very elderly patients.
Methods: All patients aged >80 years and who had undergone a colectomy for CRC without metastasis between July 2005 and April 2012 were considered for inclusion. Demographic, clinical, operative, and postoperative data, plus overall and disease-free survival rates, were retrospectively collected and compared between two groups of patients that underwent an open procedure (OP group) or laparoscopy (LG).
Results: 123 patients were enrolled (55 OPG, 68 LG). Median age was similar between the groups (84 vs. 83 years, respectively; NS). Duration of surgery was significantly lower in OPG (170 vs. 200 min; $p = 0.030$). Overall mortality at 3 months was 8.3%: it tended to be greater in the OPG (16.5% vs. 1.5%, NS). Morbidity was significantly greater in the OPG compared to the LG (52.7% vs. 27.5%; $p = 0.021$), resulting in significantly longer hospital stay (12 vs. 8 days, respectively; $p < 0.001$). Pathological findings were similar between the two groups. Cumulative overall survival rates at 3 and 5 years were significantly greater after laparoscopy (85% and 72%) compared to open surgery (58.2% and 48%, respectively; $p < 0.001$).
Conclusions: Our study suggests that laparoscopy is safe and could increase overall survival compared to open surgery in elderly patients suffering from CRC.
Summary: This retrospective study compared the short- and longer-term outcomes of patients aged >80 years and undergoing elective laparoscopic or open surgery for CRC between 2005 and 2012.

1. Introduction

More than 1.2 million cases of colorectal cancer (CRC) are newly diagnosed annually, with more than 600,000 related deaths [1]. CRC is the third most common site of cancer worldwide [1] and remains a disease of the elderly: median age at diagnosis is ~70 years and patients aged >85 years are three times more likely to develop colon tumors than those aged between 60 and 69 years [2]. It is now well-established from several randomized studies that laparoscopic colectomy is the gold-standard approach for CRC surgery [3]. The steadily increasing age of the general population and the high prevalence of CRC in the elderly requires that we question the potential outcomes after this minimally invasive surgical technique compared to open surgery in this population [4]. Furthermore, some studies report that being aged >70 years is associated with more postoperative complications [5]. Usually, patients aged >80 years and with cardiorespiratory or other comorbidities are

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particularly exposed to greater postoperative morbidity and mortality risks.

Laparoscopic colorectal surgery is associated with longer operating times but with shorter lengths of hospitalization. It has similar rates of postoperative complications, the need for readmissions, re-operations, and mortality rates compared to a laparotomy approach [6–8]. However, elderly and frail patients are generally excluded from clinical trials, and are therefore underrepresented in studies that focus on cancer treatments [9]. Patients enrolled in published studies are usually younger than those generally treated in current clinical practice. In most clinical trials, median age does not exceed 70 years [10]. Thus, this retrospective study aimed to compare the short- and long-term outcomes after elective laparoscopic vs. open surgery in patients aged >80 years and suffering from CRC without metastasis.

2. Methods

2.1. Selection of patients

All elderly patients (>80 years old) with CRC and consecutively treated by surgery between July 1st 2005 and April 30th 2012 were considered for inclusion in this study. Patients were recruited from three referral surgical departments: University Hospital of Saint-Etienne, Montsouris Hospital at Paris, and Timone Hospital at Marseille; France. We included only patients treated with a curative intent and who had no metastases and/or carcinosis. We excluded patients with low or middle rectal cancer, and those undergoing emergency treatment.

Characteristics of the population (age, comorbidities, American Society of Anesthesiology [ASA] score), tumor distance from the anal verge at colonoscopy, pathologic findings, laparoscopy vs. open surgery, duration of surgery, number of blood units transfused were assessed, as were short-term postoperative morbidity and mortality rates and long-term postoperative outcomes (recurrence and survival times).

2.2. Preoperative work up

All patients underwent the following: a preoperative colonoscopy, a tumor biopsy, CT scans of the thorax, abdomen, and pelvis, plus assessment of serum levels of carcinoembryonic antigens. Magnetic-resonance imaging and positron-emission tomography were selectively used.

2.3. Preoperative care

Bowel preparation was not conducted before surgery. A single dose of antibiotics as prophylaxis was routinely given (750 mg of cefuroxime) at induction of general anesthesia and was repeated intraoperatively if surgery lasted for >2 h. Prophylaxis for deep-vein thrombosis was given: i.e., low molecular-weight heparin (50 UI/kg per day) was given to all patients after surgery and was continued for 30 days post-surgery.

2.4. Surgery

The surgeons were experts in both laparoscopic and open colorectal surgery (about 400 colorectal surgeries were performed per year in each of the three departments). The decision to perform a colectomy by laparotomy or laparoscopy was decided upon by the surgeon. Resection of tumors using laparoscopy was performed using a Pfannenstiel incision or a right para-rectal incision. For a right or transverse colectomy, a right para-rectal incision was performed.

Conversion to open surgery was defined as the need to perform an abdominal incision longer than 7 cm. Oncology was graded according to the R-classification of the International Union against Cancer: i.e., R0: no residual tumor, R1: microscopic residual tumor, R2: in situ macroscopic residual tumor [11]. The R margin was graded R1 if a residual microscopic tumor was identified within 1 mm of the serosal margin.

2.5. Postoperative outcomes

All postoperative outcomes were recorded including the type of complication(s) if it occurred within the first postoperative month (anastomotic leakage, ischemia, abscess, collection, hematoma, bleeding, peritonitis, anastomosis stenosis, infection, cardiorespiratory complication, or death), management methodologies (medical, radiological, surgical), and their severities according to the international Clavien Classification [12]. Recovery after surgery was defined as restoration of bowel sounds, passage of flatus, and formation of stools. Patients were systematically clinically examined at 4–6 weeks after discharge from hospital. The length of hospitalization was measured from the time of surgery to the date of discharge from hospital. Discharge was recorded as discharge to home with or without assistance, or discharge to a nursing facility.

Postoperative follow-up visits included clinical, biochemical, and radiological assessment every 3 months during the first postoperative year, then, every 6 months up to a postoperative time of 5 years, and afterwards every year until 10 years. Surviving patients were assessed for disease recurrence and site of recurrence. Follow-up information was obtained from medical records, direct consultation with the patient, and/or a telephone interview. At the end of the follow-up, the statuses of all patients were assessed: i.e., alive, mortality, cancer recurrence. The endpoint of data collection was 31st July 2013. Patients were followed-up from the time of surgery to this endpoint, or until death if this occurred before, or until the date of last contact.

2.6. Statistical analyses

Statistical analyses were performed using IBM SPSS Statistics version 20 (IBM SPSS Inc., Chicago, IL, USA). Continuous variables are expressed as their means ± standard deviations (SD), or as their medians and ranges (min, max). Categorical variables are reported as numbers and percentages. Mean values between the two groups were compared using Student's *t*-test or the Mann–Whitney *U* test. Comparisons between percentages were made using the Chi-squared test or Fisher's exact test, as appropriate, for the qualitative variables.

Time-to-event endpoints were estimated using the Kaplan–Meier method within each group. From the univariate analyses, we identified predictors of overall survival. Factors included in the multivariate analyses were significant in the univariate analyses at a p-value of <0.10. Univariate and multivariate Cox's proportional hazard regression models were used to estimate the hazard ratio (HR). The HRs were expressed with their 95% confidence intervals. All tests were two-sided. Statistical significance was defined as a p-value of <0.05.

3. Results

3.1. General characteristics of the population and comorbidities (Table 1)

Of the 123 patients (41 from each of the three referral surgery departments), 68 patients (55.3%) underwent laparoscopy (the laparoscopy group [LG]) and 55 (44.7%) underwent open surgery (the OPG). Overall median age was 83 years (range: 80–91) with