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ORIGINAL ARTICLE

Comparison between open and laparoscopic gastrectomy for gastric cancer: A monocentric retrospective study from a western country

X. Rod^a, D. Fuks^{b,*}, R. Macovei^a, H. Levard^a,
J.-M. Ferraz^a, C. Denet^a, C. Tubbax^a, B. Gayet^b,
T. Perniceni^a

^a Department of digestive disease, institut mutualiste Montsouris, université Paris-Descartes, 42, boulevard Jourdan, 75014 Paris, France

^b Université Paris Descartes, 15, rue de l'École-de-Médecine, 75005 Paris, France

KEYWORDS

Laparoscopy;
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Postoperative
outcomes

Summary

Background: The majority of laparoscopic gastrectomy (LG) reports arise from Asia and the benefit of this approach in western countries remains unclear. The objective of this study was to compare the postoperative outcomes between LG and open gastrectomy (OG) for gastric cancer in a western center.

Methods: Between 2005 and 2015, all consecutive patients with gastric cancer who underwent either LG or OG were enrolled. Postoperative morbimortality was evaluated according to Dindo-Clavien classification.

Results: Over 164 patients, 60 had LG and 104 OG with a mean age of 62 and 65 years, respectively. Total gastrectomy represented 58% of LG and 54% of OG ($P=0.749$). Operative time was not different in the two groups (160.8 vs. 174.2 min, $P=0.780$) so as intraoperative blood loss (111 vs. 173 mL, $P=0.057$). The rate of severe complications (including postoperative bleeding) was significantly higher in the LG group (40% vs. 23%, $P=0.012$) so as reoperation rate (27% vs. 6%, $P<0.001$). There was no statistical difference in terms of postoperative mortality (0 vs. 3%, $P=0.252$) or length of hospital stay (20 vs. 16 days, $P=0.116$).

Conclusion: Laparoscopic gastrectomy for the treatment of gastric cancer in western countries appears to be feasible but with a higher rate of severe complications compared to open gastrectomy.

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* Corresponding author. Fax: +33 1 56 61 63 23.
E-mail address: david.fuks@imm.fr (D. Fuks).

Introduction

Gastric cancer represents the second cancer mortality rate worldwide [1]. Gastrectomy with perigastric lymphadenectomy is the best treatment and had proven to improve survival of patients affected with gastric cancer (GC) [2,3]. The laparoscopic techniques incrementally diffused since the first laparoscopic distal gastrectomy for early gastric cancer has been reported by Kitano et al. in 1994 [4]. Technological advances, increased surgical experience, and improved techniques have promoted the use of laparoscopic gastrectomy (LG), which has been shown to be safe for patients with early gastric cancer [5,6]. Indeed, LG has multiple advantages, like less blood loss, less postoperative pain, faster recovery, and better short-term quality of life than open gastrectomy (OG) [7,8]. But, LG is challenging due to technical difficulties. Although many reports have indicated the feasibility of LG with respect to short-term surgical outcomes, most of the literature on this subject came from Asia where the incidence of gastric cancer is very high and where there is a nationwide screening program. Different gastric cancer epidemiology between the West and East lead to different philosophies and issues [9].

In western countries, gastric cancer is less frequent and is most often diagnosed at advanced stage. There were only few reports on the procedure of laparoscopic gastrectomy for GC [10–14]. Hence, it seems important to establish if this approach has the same advantage in Western countries. Indeed, the objective of this study was to compare the postoperative outcomes after either laparoscopic or open gastrectomy in patients with gastric cancer in a Western tertiary referral center.

Material and methods

Patient' selection

From 2005 to 2015, all consecutive patients who underwent either open or laparoscopic gastrectomy for confirmed primary gastric cancer were retrospectively selected. A retrospective analysis was performed using a prospectively maintained comprehensive database. The non-inclusion criteria included total gastrectomy for remnant gastric cancer, patients treated for gastric GIST and patients who underwent an emergency gastrectomy with bleeding or perforation. Patients were divided in 2 groups: laparoscopy vs. open gastrectomy. This study was approved by the local institutional review board.

Surgical procedures

Procedures were performed in supine position. For laparoscopic procedure, we used five ports. For total gastrectomy with D2 lymphadenectomy, we started by a complete colo-epiploic detachment. Then, the hepatic pedicle is dissected from top to bottom and from right to left, descending on the gastroduodenal artery to finish sub-pyloric dissection from below. The duodenum was sectioned using a stapler. The dissection was continued from right to left by making a complete resection of the small and the large omentum, until the gastro-splenic ligament which is severed on the spleen with haemostasis of the short vessels. The dissection was continued from the spleen hilum to the celiac trunk

with clip and section of the left gastric vein on the splenic vein. We then proceed to the mechanical section of the first jejunal cove and realization of a loop in Y of 60 cm of length with anastomosis at the foot of the loop. By an incision under the xyphoid and after section of the esophagus, the operative piece was removed in "monobloc". We performed a manual or stapled end-to-side oeso jejunostomy.

For distal gastrectomy, the postpyloric duodenum was cut using a stapler as well as the stomach. The side-to-side gastrojejunostomy using a stapler or manual was done by an upper abdominal incision.

Lymph node stations were resected according to D1 for perigastric resection or D1.5 lymphadenectomy when associated with resection of the lymph nodes of coeliac branches and D2 when associated with resection of the lymph nodes of splenic hilum [3].

All procedures were performed by expert surgeons in upper gastrointestinal surgery.

Neo- and adjuvant chemotherapy with 5-fluorouracil (5-FU) (mostly 5-FU with cisplatin) was done when recommended.

Postoperative outcomes and studied criteria

Until hospital discharge, patients were routinely monitored with clinical examination and blood tests. Any complication that affected the normal postoperative period defined morbidity and was stratified according to the Dindo-Clavien classification [15]. A major complication corresponds to a Dindo-Clavien score equal or greater than 3. Infectious comorbidity was defined as any complication with evidence of associated localized or systemic infection indicated by fever, leukocytosis and positive culture. Post-operative morbidity and mortality were taking into account at any time during the postoperative hospital stay or until 90 days after surgery.

Staging was determined according to the seventh edition of the International Union against Cancer (UICC) TNM classification [16]. R0 was defined as negative margin if no cancerous cell was seen on the edges and R1 if some were detected microscopically.

In line with the National Guidelines about follow-up after surgery in gastric cancer, all patients were followed up regularly in the outpatient clinic, starting 1 month after surgery, and then every 4 months. Follow-up consisted of a general review history, physical examination, serum tumor marker levels, liver function tests and CT of the thorax, abdomen and pelvis.

Statistical analysis

Patient baseline characteristics are expressed as median (range) for continuous data or mean \pm standard error of the mean when appropriate, and as numbers with percentages for categorical data. Preoperative, operative and postoperative characteristics, were compared between laparoscopic versus open technique. Fisher's exact test or Chi² test was used to evaluate associations between categorical variables. A Student's *t*-test was applied to assess the differences in continuous variables between groups. *P*-values were two-sided with *P* < 0.05 considered statistically significant. Statistical analyses were performed using SPSS[®] (IBM, Armonk, New York, USA) version 20.

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