Original Investigation

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Laparoscopic resection for colorectal diseases: short-term outcomes of a single center

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ABSTRACT

Objective: Even though, laparoscopy is not accepted as the current gold standard in colorectal surgery, it can be performed as safely as open surgery. It is also widely accepted that the technique has many advantages. In this study, we evaluated the results of 33 patients with laparoscopic colorectal resection.

Material and Methods: Thirty-three patients who underwent laparoscopic colon surgery between January 2013 and September 2014 in the General Surgery Clinic at Marmara University Hospital were included in the study. Patients were evaluated in terms of their demographic and tumor histopathologic characteristics, type of surgery and early postoperative complications.

Results: Laparoscopic colorectal resection was performed for 33 patients who had malignant or benign lesions. The median age was 60 (35-70), and 18 (55%) were male patients. The majority of the patients (90%) were diagnosed with colorectal adenocarcinoma. Half of the patients were T3 and 67% had N0 stage. The median number of retrieved lymph nodes was 17 (4-28). Negative surgical margins were obtained in all patients. The postoperative hospital stay was 5 (4-16) days. Postoperative early complications were observed in only 5 patients. The majority of complications were treated without the need for surgery. No mortality was recorded in this series of patients.

Conclusion: This study showed that laparoscopic colorectal surgery could be performed safely based on its low complication rate, short length of hospital stay, providing sufficient surgical resection and lymph node dissection.

Keywords: Laparoscopy, colorectal surgery, colon resection

INTRODUCTION

Laparoscopic colorectal surgery provides less postoperative pain, better cosmesis, shorter hospital stay and earlier patient mobilization (1, 2). Jacobs et al. (3) performed the first laparoscopic colon resection in 1991 (3). However, it took time to be adopted due to its technical difficulties, lack of clinical evidence, the learning curve and fear of tumor seeding (4, 5). The recently published case series proved that there was no significant difference between open and laparoscopic colorectal surgery in terms of tumor recurrence, distant metastasis rates and disease free survival (6-8). Although laparoscopy is still not the gold standard in colorectal surgery, its advantages in experienced hands are acknowledged (9). In our study, we presented 33 cases who underwent laparoscopic colorectal resection for benign or malignant diseases.

MATERIAL AND METHODS

Thirty-three patients underwent laparoscopic colorectal surgery between January 2013-September 2014. An ethics committee approval was obtained from Marmara University. Our prospective database consisted of information on patient demographics, pathology reports (TNM stage, number of dissected lymph nodes), operation type, complications and length of hospital stay.

All the patients were evaluated for presence of locoregional disease and distant metastasis with colonoscopy, computed thoracic and abdominal tomography and/or pelvic magnetic resonance imaging. Patients were informed on laparoscopic surgery and their consents were obtained. Locally advanced rectal cancers were treated with neoadjuvant chemotherapy and radiation therapy. Preoperative bowel preparation was achieved by sodium phosphate containing purgatives, and the antibiotic prophylaxis consisted of 2 gr Cefazolin and 500 mg Metronidazole. A second antibiotic dose was administered in operations lasting longer than 4 hours. Low molecular weight heparins were applied for thrombo-emboli prophylaxis with a dose adjusted for body weight 12 hours before the operation.

Under general anesthesia, a 1 cm supra-umbilical skin incision was done followed by Veress needle insertion for carbon dioxide insufflation up to 10-12 millimeter mercury (mmHg). Mesocolic excision was performed for colon tumors and total mesorectal excision was performed for rectal cancers. To avoid seeding and surgical site infection, a wound protector was used in all operations (Alexis® O™ Retrac-

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tor. Applied Medical Resources Corporation, Rancho Santa Margarita, CA; USA). Negative pressure drains were placed to the operative field after completion of surgical procedure. Postoperatively, peroral feeding was started either when the bowel movements were observed or with patient declaration of flatus. Early and late complications were recorded by weekly patient visits or by using radiologic assessment tools up to 1 month.

The surgical specimens were evaluated for tumor type, grade, lymph node number and metastasis, presence of perineural invasion and surgical margins. Staging was done according to the American Joint Committee on Cancer (AJCC) 2010 system.

Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences for Windows version 17.0 (SPSS Inc; Chicago, IL, USA). Parametric data was given as mean±standard deviation, and nonparametric data as median with range (minimum-maximum).

RESULTS

Three hundred and sixty-six patients underwent colorectal surgery for either benign or malignant etiologies between January 2013-September 2013 36 (10%) of whom were operated laparoscopically. In the laparoscopy group, three surgeries were converted to open procedures; hence, 33 patients were included in the final analysis. The mean patient age was 60 (35-70) years, and 56% (n: 18) were male. Ninety percent of patients were diagnosed with colorectal adenocarcinoma. Anorectal cancer constituted 45% (n: 15), and 43% of them were treated with neoadjuvant chemotherapy and radiotherapy (Table 1). Patients with anorectal cancer were treated with abdominoperineal resection (n: 9) or low anterior resection (n: 6); loop ileostomy was performed in 5 patients in addition to coloanal anastomosis. All rectal cancers were operated by using the total mesorectal excision technique. Patients who were operated laparoscopically for benign diseases included one patient with Crohn's disease, one with familial adenomatous polyposis and one with villous adenoma (Table 2).

Co-morbid diseases consisted of diabetes mellitus (18%), hypertension (6%), chronic obstructive pulmonary disease (3%), and coronary artery disease (3%).

Histopathologic results are shown in Table 3. Two patients had in situ carcinoma, 1 T1, 3 T2, and 14 had T3 cancers. The median number of dissected lymph nodes was 17 (range: 4-28). The patient with 4 dissected lymph nodes in the final specimen was diagnosed as carcinoma in situ. 67% of the patients were lymphatic metastasis free, 23% (n: 7) had N1, and 10% (n: 3) had N2 disease. Surgical margins were negative in all patients. The median length of hospital stay was 5 (4-16) days.

15.2% of the patients had early postoperative complications. Superficial surgical site infection was observed in 1 patient who had right hemicolectomy and in 1 patient who had anterior resection. They both were treated with drainage and antibiotics. One patient with abdominoperineal resection had bowel obstruction, and he was treated by nasogastric decompression alone without requiring an additional operation. One patient who had laparoscopic right hemicolectomy was re-operated for long lasting bowel obstruction. An intraabdominal abscess was detected around the anastomosis, the abscess was drained. At the 3rd postoperative day, drains were withdrawn and the patient was discharged. Another patient who had a history of chronic obstructive pulmonary disease underwent laparoscopic right hemicolectomy. He had respiratory distress on the 2nd postoperative day and was followed up in the intensive care unit with noninvasive mechanical ventilation for 3 days. No further complications occurred. We did not have any fatal events in our series.

Table 1. Demographics and preoperative characteristics of patients (n=33)

Age [Median (Min-Max)]	60 (30-75)
Gender	
Male	18 (55%)
Female	15 (45%)
Preoperative diagnosis	
Adenocarcinoma	30 (91%)
Attenuated FAP	1 (3%)
Villous adenoma	1 (3%)
Crohn's disease	1 (3%)
Localization of the lesion	
Cecum	5 (15%)
Ascending colon	5 (15%)
Descending colon	2 (6%)
Sigmoid colon	6 (18%)
Rectum	12 (36%)
Anal canal	3 (9%)
Liver metastasis	2 (6%)
Neoadjuvant radiotherapy	13 (43%)

FAP: familial adenomatous polyposis

Table 2. Types of laparoscopic procedures performed

Laparoscopic procedure	Number of patients (%)
Abdominoperineal resection	8 (24.2)
Abdominoperineal resection +liver metastasectomy	1 (3)
Ileocecal resection	1 (3)
Sigmoid colon + small bowel resection	1 (3)
Low anterior resection	4 (12,1)
Low anterior resection + loop ileostomy	5 (16,2)
Right hemicolectomy	9 (27.3)
Sigmoid resection	3 (9,1)
Left hemicolectomy	1 (3)
Total	33 (100)

DISCUSSION

In this study, we presented our case series of 33 patients who underwent laparoscopic colorectal surgery. Laparoscopic sur-

Table 3. Histopathologic characteristics of patients with colorectal cancer (n=30)

Grade	Number (%)
1	3 (10)
2	8 (60)
3	1 (3)
Undetermined	8 (27)
T stage	
In situ carcinoma	2 (6)
1	1 (3)
2	3 (10)
3	14 (47)
4	6 (20)
No tumor	4 (13)
N stage	
0	20 (66.6)
1	7 (23.3)
2	3 (10)
Number of retrieved lymph nodes (median)	17 (4-28)
Lymphovascular invasion	10 (33)
Perineural invasion	8 (275)
Positive surgical margin	0 (0)

gery constitutes 10% of our colorectal operations. Therefore, the number of patients is low as compared to open surgery. Major limitations of this study are the small sample size, short follow-up period and the retrospective design of the study. In addition, the outcomes of this study group were not compared with that of patients with open surgery.

Nowadays, laparoscopic surgery is being widely used for the treatment of both malignant and benign colorectal diseases. It has advantages such as better cosmesis, shorter hospital stay, lower incisional hernia incidence and early mobilization as compared to open surgery. Grupta et al. found that systemic immunity appears to be preserved better in laparoscopic surgery as compared to open surgery (10). In our series, laparoscopic colorectal surgery constituted 10% of all colorectal cases and our rate of conversion to open surgery was 8%. The literature states the conversion rate to open surgery between 17-20% (11-13). Our low conversion rate may be due to patient selection.

The complication rate in laparoscopic colorectal surgery is not higher than in open surgery (14-16). In previous studies, the complication rates were found to be between 1.5–36% (17-19). Our complication rate was determined as 15%. The most common complication in our series was superficial surgical site infection (6%).

There are relative contraindications for laparoscopic colorectal surgery such as major cardiac or pulmonary disease, portal hypertension, coagulopathy, pregnancy, tumor obstruction and/or perforation, as well as T4 tumors (20). In our study, 6 (18%) patients had T4 disease and underwent laparoscopic resection.

In laparoscopic colorectal surgery, using a video processor with a magnification function aids the surgeon to visualize the hypogastric plexus, ureters and gonadal arteries. Direct visualization helps decreasing the risk of major injuries to these vital structures. Our follow-up period and study size are low to interpret its oncologic outcomes. The minimum number of dissected lymph nodes is reported as 12 for proper staging (21). Our mean number of lymph nodes in the final pathology specimens was 17, and all the resection specimens had tumor-free surgical margins.

CONCLUSION

Laparoscopy is currently not the gold standard in colorectal surgery. Nevertheless, it can be performed safely by colorectal surgeons and has advantages such as low complication rate, short hospital stay, sufficient extent of surgical resection and lymph node dissection.

Ethics Committee Approval: Ethics committee approval was obtained for this study from the ethics committee of Marmara University.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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