

Emergency laparoscopic colorectal surgery

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ABSTRACT

Introduction: The laparoscopic technique is increasingly used in colorectal surgery. However, in emergency cases, the use of the laparoscopic method is still limited. This was a study of the outcomes of laparoscopic surgery in emergency cases of colorectal disease at a single center.

Materials and Methods: The demographic data and perioperative findings of patients who underwent emergency laparoscopic colorectal surgery between July 2013 and January 2019 were retrospectively analyzed.

Results: An emergency laparoscopy was performed on a total of 14 of 658 (2.1%) patients who underwent colorectal surgery. Eight (57.1%) were male and the mean age was 55.2 ± 21.6 years. Conversion to open surgery was required in 5 cases (35.7%). The mean number of lymph nodes removed from the patients operated on for tumors was 22.5 ± 17.5 .

Conclusion: The results of this study suggest that the laparoscopic approach can be applied in emergency cases of colorectal disease in certain circumstances. However, the rate of conversion to open surgery was greater than for non-emergency laparoscopic surgery. Laparoscopy was most useful for colonoscopy perforations and some colonic obstructions.

Keywords: Colonoscopy; colorectal cancer; laparoscopy; perforation; tumor.

Introduction

Laparoscopy has been an important milestone in surgery with reduced postoperative pain, wound complications, hospital stay and return to early daily life. It was first used in colon surgery in 1991^[1] and has been used with increasing frequency so far. However, its use in emergency colorectal surgery did not follow the elective surgery trend. The main reasons are exploration restriction in the abdomen in case of intestinal obstruction and fear of inadequate tumor surgery. Presence of peritonitis and adhesions in emergency cases technically make the operations more challenging, additionally, requirement of experi-

enced team and equipment limit laparoscopic approach in emergency cases.

The aim of this study was to examine the patients who underwent emergency laparoscopic colorectal surgery in our clinic.

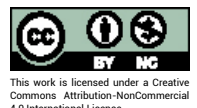
Materials and Methods

Data from patients who underwent emergency laparoscopic colorectal surgery between July 2013 and January 2019 were retrospectively collected. Patients who underwent conversion were also included in the study. The demographic data (age, gender, ASA), operation types, length



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of stay, pathology results, reoperation requirements, morbidity and mortalities were evaluated. Data were collected and analyzed in Microsoft Excel 2013. Fisher's exact test was used to compare the categorized data statistically.

Operation Technique

The patients were operated in supine position. The first trocar was inserted under the umbilicus with open technique. Then, according to the pathology, the other trocars were entered in the left or right quadrant on midclavicular line spaced 8 cm apart. Surgical procedure was performed according to the primary diagnosis. One drain was placed in the pelvis and the operation was terminated. Laparotomy was performed from the median line in conversion patients.

Results

A total of 658 colorectal operations were performed in our clinic between July 2013 and January 2019. Of these, 501 them were elective surgeries and 243 (48.5%) of these cases were done laparoscopically. 27 of these patients (11.1%) required conversion.

During the same period, 157 patients underwent emergency colorectal surgery and 14 (8.9%) of these patients underwent laparoscopic surgery. In 5 patients (35.7%) who underwent laparoscopic surgery, conversion to open surgery was required. In emergency laparoscopy, conversion rate to open was higher than the elective laparoscopic colorectal surgeries ($p=0.016$).

Of the 14 patients who underwent laparoscopic emergency colorectal surgery, 8 (57.1%) were male and the mean age was 55.2 ± 21.6 years. No patient had a previous history of abdominal surgery. Causes of emergency colorectal surgery were mechanical bowel obstruction (10, 71.4%) and acute ab-

Table 1. Demographic characteristics, preoperative diagnoses, pathology results, types of operations and postoperative findings

No	Age/Sex	ASA	Diagnosis	Pathology	Operation	Number of trocars	Hospitalization (days)	Mortality (11. day)	Lymph node / Metastasis
1	69 / F	3	Acute abdomen	Colonoscopy perforation	Side to side anastomosis	3	11	Yes	-
2	64 / M	2	Acute abdomen	Colonoscopy perforation	Primary repair	3	4	No	-
3	30 / M	2	Acute abdomen	Diverticulitis perforation	Right hemicolectomy	Conversion	7	No	64/0
4	26 / M	2	Acute abdomen	Diverticulitis perforation	Anterior resection	Conversion	7	No	7/0
5	59 / M	1	MBO	Rectum Ca	Low anterior resection-loop ileostomy	4	6	No	8/0
6	85 / M	3	MBO	Colon Ca	Right hemicolectomy	4	9	No	12/0
7	74 / M	2	MBO	Colon Ca	Right hemicolectomy	4	5	No	21/0
8	75 / F	3	MBO	Colon Ca	Right hemicolectomy	Conversion	17	Yes	16/0
9	61 / F	2	MBO	Crohn's disease	Right hemicolectomy	4	5	No	39/0
10	17 / F	1	MBO	Congestion - Edema	Right hemicolectomy	4	4	No	2/0
11	67 / F	3	MBO	Colon Ca	Left hemicolectomy	Conversion	13	No	17/2
12	58 / M	2	MBO	Colon Ca	Left hemicolectomy	4	9	No	10/1
13	69 / M	3	MBO	Colon Ca	Left hemicolectomy	5	11	No	34/0
14	17 / F	2	MBO	Megacolon	Left hemicolectomy	Conversion	5	No	41/0

MBO: Mechanical bowel obstruction; ASA: American Society of Anesthesiologists Classification; F: Female; M: Male.

domen (4, 28.5%). Two patients with mechanical bowel obstruction had hypertension as additional disease, one patient had ITP, and one patient had a cardiac pacemaker. Coronary artery disease and prostate cancer were also present in a patient with hypertension. One of the patients who presented with acute abdominal pain had hypertension as an additional disease and another patient had lung adenocarcinoma. The median ASA score of the patients were 2 (1–3). The median trocar number was 4 (3–5). Patients' demographics, preoperative and postoperative data were given in Table 1. The mean duration of hospitalization was 8.0 ± 3.6 days. In all malignant patients, the surgical margin was negative and the median retrieved lymph nodes were 16 (2–64). No postoperative morbidity was observed in any patient but one patient

died in the early postoperative period. This patient was operated because of perforation in the sigmoid colon during colonoscopy and peritoneal carcinomatosis was diagnosed during laparoscopy. This patient's biopsy revealed metastasis of lung adenocarcinoma. Since the perforation area occupied almost all of the lumen, side-by-side anastomosis was performed and the patient died due to cardiopulmonary insufficiency unrelated to abdominal problem on the 11th postoperative day. The median follow-up period was 8 (2–65) months and none of the cancer patients had recurrence or metastasis.

Discussion

Despite the reported benefits of laparoscopy in the elective treatment of benign and malignant colorectal diseases,

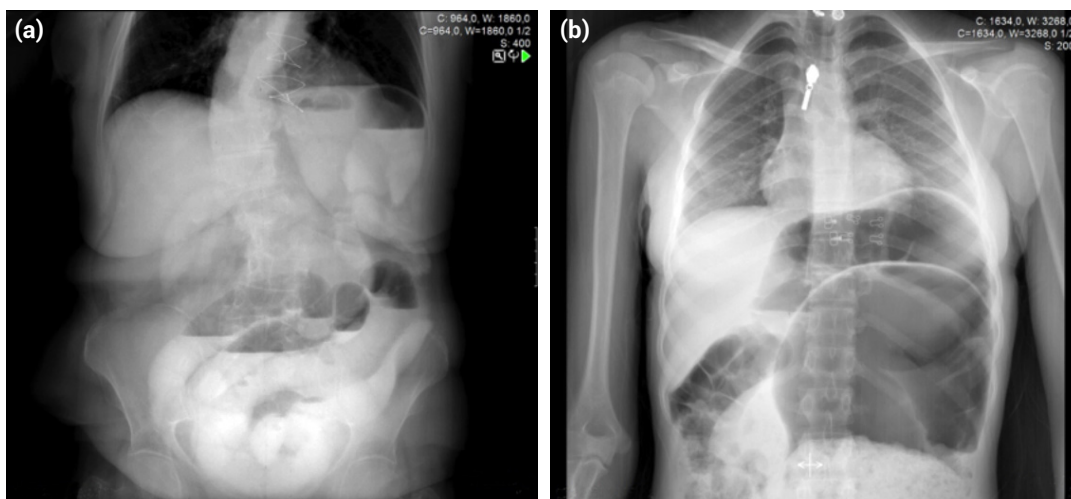


Figure 1. (a) Preoperative image, ileal perforation due to a mass in the cecum (Patient # 8). (b) Preoperative image of toxic megacolon (Patient # 14).

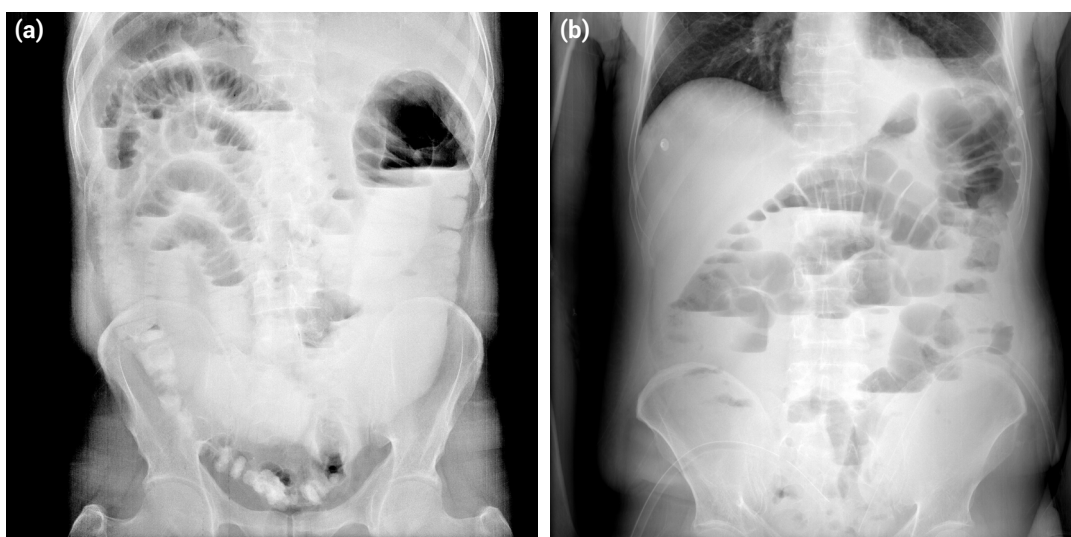


Figure 2. (a) Preoperative image, obstruction, due to a mass in the left colon (Patient # 12). (b) Preoperative image, obstruction, due to a mass in the left colon (Patient # 13).

laparoscopic colectomy has not become widespread in emergency settings. The laparoscopic approach in acute colonic obstruction is still considered by many surgeons as an absolute contraindication.^[2,3] Some reasons to say; difficulty in creating a pneumoperitoneum, limited working area in the abdominal cavity, instability of the patient, difficulty of handling of the dilated intestines and experienced surgeon requirements.^[4,5] The reasons of our conversion were dilatation of the intestine, technical difficulties due to narrowing in the abdominal cavity, inability to form enough pneumoperitoneum, difficulty in proper surgical resection because of the tumor's adherence to surrounding tissues.

While the mortality rate associated with elective colonic resection is less than 5%, this rate can increase to 23% following emergency colorectal resections.^[6] We did not do a comparative study of emergency and elective laparoscopic colorectal surgeries. One of the limitations of our study was the variety of surgical indications and etiologies. There were also a limited number of patients in each group. Literature data on emergency laparoscopic right hemicolectomy in the right colon obstruction is lacking. There are controversial aspects in the left colon obstruction, such as endoscopic colonic stents before surgery. Previous reports demonstrated that laparoscopic left hemicolectomy can be performed in only one-fourth of these patients.^[7,8] Previous studies on the role of laparoscopic colectomy in inflammatory bowel disease have demonstrated the safety, feasibility, and benefits of laparoscopic approach.^[9] Colon perforation is one of the complications of colonoscopy and treatment depends on the condition of the patient. Treatment can be either open or laparoscopic emergency surgery or conservative approach. The role of laparoscopy in patients with iatrogenic colonic perforation after the colonoscopy is important in terms of fewer complications, shorter hospital stay, and smaller incisions.

Our conversion rates in laparoscopic emergency colorectal surgery (30%) were higher than in the literature. In the study performed by Masoomi et al.,^[10] Laparoscopic surgery was found to be low in emergency patients, but conversion rate was 25%. The wide variance of conversion rate is related to the patient selection, surgeon's experience, and procedure-related factors that affect the need for conversion in different studies.^[11] In our study, the reason for this increase was thought to be due to the flexibility of the patient selection criteria. Open surgery

was required in 3 of 10 patients with mechanical bowel obstruction with air-fluid levels on plain abdominal X-ray. Plain abdominal radiographs of those patients who were converted to open surgery (Fig. 1a, b) and completed laparoscopically (Fig. 2a, b) were shared with figures.

Our study was able to demonstrate that it could be safely performed in an emergency setting with acceptable perioperative results by experienced laparoscopists. Adequate lymph node collection, low mortality and morbidity, shorter hospital stay, and adequate surgical margins are possible when emergency laparoscopic colectomy is required for colon cancer.

Conclusion

Emergency laparoscopic colectomy in a well-selected patient group is feasible and safe when performed by experienced surgeons. The postoperative results are comparable with the open technique. Conversion rates are higher than elective surgery. Colonoscopy perforations and some colonic obstructions are suitable for the emergency laparoscopic approach.

Disclosures

Ethics Committee Approval: The study was approved by the Local Ethics Committee.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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