One-stage left colon and rectal resection in emergency surgery

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Aim
The aim of the study was to evaluate one-stage left colectomy and rectal resection for patients admitted for emergency left colon obstruction or perforation.

Patients and methods
This prospective study included 20 consecutive patients with obstructed and/or perforated left-sided colon and rectum, who were admitted to the Department of General Surgery, Minia University Hospital during the period between February 2012 and September 2013. The resection and reanastomosis were performed as one stage without covering the stoma.

Results
Anastomotic leakage had occurred in one patient with rectal resection (5%) and mortality occurred in one patient (5%) due to postoperative pulmonary embolism. Morbidity was found in three patients (20%) with wound infection and in one patient with ileus (5%).

Conclusion
It is safe to perform this procedure. Low morbidity and mortality rate of resection without covering the stoma can be justified by further prospective studies on larger number of patients aiming to compare it with those operated upon by resection with covering the stoma.

Keywords:
colorectal, emergency surgery, resection

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Introduction

Emergency surgery in colonic obstruction is significantly associated with a risk for mortality, morbidity, and a high percentage of temporary or permanent stoma creation [1]. Right-sided colonic obstructions are treated by one-stage resection anastomosis in all patients, whereas controversy continues around emergency management of patients with obstructed left colon [2]. Majority of cases of colonic obstruction is due to colorectal cancer; 20% of patients with colonic cancer present with obstruction [3].

The absence of anastomosis makes the Hartmann procedure technically easier and eliminates the risk for dehiscence in such complex scenario, which occurs with this high-grade obstruction. The Hartmann procedure remains a suitable option for less experienced surgeons. The disadvantage of Hartmann is the need for a second operation to reverse the colostomy, which is a major one and which will be associated with the risk for dehiscence similar to primary rectal resection anastomosis [4,5]. Primary rectal resection anastomosis has the advantage of a definite procedure with no need for another surgery. Its main disadvantage is increased technical challenge and higher risk of leakage that occurs in emergency situations [4,5].

Lim *et al.* [6] compared intraoperative colonic irrigation (24 patients) with manual decompression (25 patients) in obstructed left colon cancer and concluded that manual decompression is a shorter simpler procedure than intraoperative colonic irrigation but has similar results with respect to mortality, morbidity, and anastomotic leaks.

Intraoperative colonic irrigation increases the duration of surgery by an hour, but this time can improve as the experience increases. The problems of intraoperative colonic irrigation can be overcome by segmental resection with primary anastomosis and manual decompression only [7,8]. This was supported by various studies comparing bowel preparation with those without preparation in elective colonic surgery. There is no evidence that mechanical preparation is associated with less rates of anastomotic leakage in elective colorectal surgery [9,10]. In 2009, Kam *et al.* [11] stated that no statistical significance was found between intraoperative colonic irrigation and manual decompression in the left-sided colorectal emergencies.

Patients and methods

This prospective study included 20 consecutive patients with obstructed and/or perforated left-sided colon and rectum, who were admitted to the Department of General Surgery, Minia University Hospital during the period between February 2012 and September 2013. Written informed consent was obtained from all included patients.

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Patients were subjected to complete clinical, laboratory, and radiological investigations. All patients were diagnosed by the use of abdominal plain radiograph erect and abdominal ultrasound. All included patients went for urgent exploration. The urgent decision was made for the presence of multiple air-fluid level and for ultrasonographic criteria of obstruction, air under diaphragm, and/or collection with raised leukocytic count.

Preoperative correction of the electrolyte imbalance and correction of any other general diseases were performed, and Ryle insertion was performed for nasogastric suction. Urinary catheter was used for measurement of urinary output, and blood or plasma substitute transfusion was carried out for selected patients; third-generation cephalosporin and metronidazole bottle was given to all, whereas antispasmodic and antipyretic was given to selected patients.

The operation was explained in detail to patients and written informed consent was obtained from all patients before each operation. Exploration was performed under general anesthesia and in some cases using combined spinal and epidural anesthesia; patient lying in the supine position was changed to the lithotomy position to introduce the circular stapler from the anus. Midline incision was our preferred incision and thorough exploration for the whole abdomen was performed to detect the lesion and staging in malignant cases. Suction and abdominal toilet were performed in perforated cases.

Resection of the colon or rectum was performed according to the lesion with the appropriate safety margin in malignant cases; the distal resection margin was more than 2 cm in all our patients and the proximal resection margin was far more than 5 cm. The inferior mesenteric artery was ligated at the aortic level and the inferior mesenteric vein was ligated with the left colic artery. All the mesenteric fat of the resected mesentery was excised with contained lymphatics and lymph nodes, and postoperative pathology reports showed free resection margins; we removed more than 15 lymph nodes in our patients as we know that it is unaccepted to resect less than 10–15 lymph nodes. We performed high anterior resection for our rectal cancer patients with total mesorectal excision and more than 2 cm distal resection margin and sphincter preservation. This was performed by well-experienced surgeons.

Manual decompression of the loaded bowel and primary anastomosis using circular stapler without covering the stoma was performed for all patients, and the abdomen was closed with drains. Postoperative fluids with central venous pressure monitoring, parenteral triple antibiotic, cimetidine, hyperalimentation, and prophylactic anticoagulant were given for all patients, with correction of any concurrent general diseases, postoperative monitoring, fever, fluid chart, and daily electrolyte analysis. Oral fluids were allowed after 5 days.

Postoperative ileus was managed by nasogastric suction and intravenous fluids until return of intestinal motility; wound infection was managed by opening some stitches for wound drainage and by antibiotic according to culture sensitivity. Gastrografin enema was performed in our patients after 10 days to evaluate the integrity of the anastomosis and to detect radiological leakage. Clinical leakage was considered when fecal matter came from the drains with colocutaneous fistula, which occurred on the fifth day and was low output fistula, and was managed by stopping oral intake and continuing intravenous fluids and hyperalimentation until it was considerably reduced to only 5–10 cc per day after 2 weeks. Then, we allowed semisolid food and constipating measures (two vial streptomycin on pectin bottle) three times per day for another 2 weeks when the leak stopped completely.

Follow-up was performed after 6 months with colonoscopy for recurrence of tumor in malignant patients and for anastomotic strictures in all patients. Neither recurrence nor stricture had occurred.

Results

Data were described by simple descriptive statistics such as range, mean, and percentage. Twenty patients were included in the study, 12 men (60%) and eight women (40%), with a mean age of 58.1 years for men and 40 years for women. Five patients were with colonic causes (two traumatic patients, two volvulus patients, and one diverticulosis coli patient), 13 patients were with rectosigmoid causes (rectosigmoid cancer), and two patients were with rectal causes (rectal cancer). The demographic data of patients undergoing colorectal resections are shown in Table 1.

Clinically, all patients presented with acute abdominal disease: five patients with peritonitis (one patient

Table 1 Descriptive statistics of the study group

Variables	Male	Female
Sex [*n* (%)]	12 (60)	8 (40)
Age (mean) (years)	58.1	40
Cause [*n* (%)]		
Trauma	2 (10)	
Volvulus	2 (10)	
Diverticulosis	1 (5)	
Rectosigmoid cancer	13 (65)	
Rectal cancer	2 (10)	

with perforated volvulus, one patient with perforated diverticulosis coli, one patient with perforated obstructed rectosigmoid cancer, one patient with traumatic devitalized injury to the left colic flexure, and one patient with traumatic avulsion of the sigmoid mesocolon) and 15 patients with acute obstruction (one patient with sigmoid volvulus-failed endoscopic management, 12 patients with obstructed rectosigmoid cancer, and two patients with obstructed upper third rectal cancer).

Diagnosis was settled by finding multiple air-fluid levels in plain radiograph in the erect position in all patients (20 patients) and abdominal collection in abdominal ultrasound with air under diaphragm in plain radiograph in the erect position in perforated obstructed patients (five patients). Frozen section biopsy was positive in malignant patients (15 patients).

Left hemicolectomy was performed in two patients (traumatic patient and perforated diverticulosis coli patient), sigmoidectomy in three patients (two patients with volvulus and one traumatic patient), rectosigmoidectomy in 13 patients (rectosigmoid cancer), and high anterior resection in two patients. Manual decompression without intraoperative colonic lavage and primary stapled anastomosis without covering stoma were performed in all patients. The mean operative time was 90 min (Table 2).

Complications occurred in five patients (25%): one patient with anastomotic leakage (5%), one patient with paralytic ileus (5%), and wound infection occurred in three patients (15%). Mortality occurred in one patient (5%) (Table 3).

Table 2 Frequency distribution of the study group with respect to clinical presentation and operative procedure

Variables	*n* (%)
Clinical presentation	
Acute obstruction	15 (75)
Peritonitis	5 (25)
Operative procedure	
Left hemicolectomy	2 (10)
Sigmoidectomy	3 (15)
Rectosigmoidectomy	13 (65)
High anterior resection	2 (10)

Table 3 Frequency distribution of the study group with respect to complications

Complication	*n* (%)
Anastomotic leakage	1 (5)
Paralytic ileus	1 (5)
Wound infection	3 (15)
Mortality	1 (5)

Discussion

Resection with primary anastomosis and without on-table lavage is found to be an easy, practical, and safe management option for the left-sided colonic obstruction with few complications [12]. Resection of the acute sigmoid volvulus with primary anastomosis following decompression is found to be a safe procedure [13].

Colorectal cancer is considered the third commonest malignancy worldwide [14]. In all, 70% of the lesions are distal to the splenic flexure of colon, 25% are found in the sigmoid colon, 10% at rectosigmoid, and 4–6% are located in the descending colon [15]. In our study, in all malignant patients, lesions were found in the rectosigmoid junction and rectum, as they are more liable for obstruction.

The left side of the colon has smaller diameter than the right side; hence, the left-sided tumors can cause intraluminal occlusion presenting with obstruction, which represents a challenging clinical problem for physicians in the diagnosis and operative management. Patients with more advanced lesions presenting with partial and high-grade obstruction commonly gave a long history or were not of colonic surveillance previously. This is of clinical significance as the diagnosis of primary malignancy may be accompanied by the incidence of synchronous cancers in the colorectal region-2–10% incidence of synchronous adenomatous polyp from 15–50% [16]. We did not find synchronous lesions in our study.

In acute complete or near-complete colonic obstruction, patients require an emergency operation, where preoperative evaluation of the condition could not be possible. Intraoperative palpation of the colon with intraoperative lavage and on-table colonoscopy is the only diagnostic and therapeutic option during the immediate time period perioperatively. Preoperative computed tomography may identify proximal synchronous lesion along with complete distal obstruction; therapeutic colonoscopic techniques may be delayed months unless intraoperative techniques are used [17]. In our study, we depended on intraoperative palpation and frozen section biopsy for suspected lesions.

Curable surgical resection is the treatment of choice for regional colorectal cancer. Surgical resection of the obstructing carcinoma of the colon has a significant morbidity and mortality rate [18].

Sasaki *et al.* [19] reported that intraoperative colonic irrigation with on-table colonoscopy is a useful, more accurate diagnosis for colorectal cancer before colectomy in patients presenting with complete obstruction of the

left colonic cancer and found that this protocol is a safe one without mortality, low morbidity, and without a significant difference in the complication rate.

A study was conducted on 24 patients in which 17 female patients with a median age of 76 years presented with left-sided colonic obstructive carcinoma or colonic diverticulitis. The median operation time was 85 min. Colonic ileus was resolved on day 2 (29%) and on day 3 (58%). The median time of hospital stay was 7 days. There were no deaths and no readmissions. A reactionary hemorrhage in one patient needed return to the theater and this patient's anastomosis developed anastomotic leak on the day 4 and was converted to an end stoma. Urinary infection and wound infection were seen in two patients. Two patients developed anastomotic strictures and both of them responded to the balloon dilatation at 5 months [12].

In our study, we had comparable results with longer median operative time (90 min), low ileus rate in 5%, increased length of hospital stay (15 days), more deaths (one), less return to operative theater (none), less anastomotic leak (5%), which was managed conservatively, more wound infections (15%), which may be due to more patients with peritonitis under septic conditions, and less anastomotic strictures (none).

In the future, we will evaluate relieving the obstruction first using an expandable metal stent then will perform elective laparoscopic colectomy after the acute condition has resolved in addition to extending our study to include more patients and making it a comparative study with patients with covering stoma.

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Conflicts of interest

None declared.

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