

Role of endoscopic colonic stent insertion in patients with colonic obstructing malignancy: a single-center study

Mohammad S. Marie^a, Gad M. Behairy^b

^aDepartment of Endemic Medicine and Hepatogastroenterology, Faculty of Medicine, Cairo University, ^bDepartment of General Surgery, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Correspondence to Mohammad S. Marie, MD, Jeddah 23523, Saudi Arabia. Tel: +966 560 352 933; e-mail: mohammadsaeedmarie@gmail.com

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Background

Left-sided colonic malignant lesions have the potential of acute bowel obstruction. Emergency surgery with stoma construction is considered the standard of management. Insertion of colonic stent to allow bowel decompression, primary resection, and re-anastomosis, avoiding the need of colostomy formation, can be an alternative. We describe our experience with the use of colonic stent in left-sided malignant obstruction as a step to relieve the obstruction before definitive surgical intervention.

Patients and methods

A total of 30 patients with left-sided colonic malignant obstruction were included; 15 patients were offered colonic self-expandable metal stent insertion, and the other fifteen patients were offered emergent surgery.

Results

Of the 15 patients, 10 (66.6%) had successful stent insertion (technical and clinical). We failed to insert stent in four (26%) patients, and one (6.6%) patient had colonic perforation. All patients with successful colonic stent insertion underwent one-step resection and primary anastomosis.

Conclusion

Colonic stent for left-sided colonic malignant obstruction represents a valuable procedure for one-step resection and primary anastomosis without the need for colostomy.

Keywords:

colostomy, obstruction, stent

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Introduction

Cancer colon incidence is increasing in both males and females. Patients with left-sided colonic lesions may present with acute obstruction in 8–26% of cases, which carries a risk of colonic perforation and high morbidity and mortality [1].

Resection and primary anastomosis of nonobstructing left-sided or right-sided colonic tumors is the main stay of management. However, for obstructing left-sided lesions, most patient are not amenable for primary anastomosis and most of them are offered stoma construction [2], which has negative effects on patients' physical and psychological well-being [3].

Preoperative insertion of colonic self-expandable metal stent (SEMS) was evaluated in several studies and offered a bridge to surgery. Subsequently, patients can be offered primary anastomosis without the need for stoma construction; thus, it offers less morbidity and mortality compared with emergency surgical resection [4].

On the contrary, some studies showed that SEMS insertion in such group of patients with acute

obstructing colonic lesions carries a risk of perforation and tumor spread, with no significant effect on overall survival; based on that, the European society of gastrointestinal endoscopy did not recommend stent insertion in patients with malignant acute colonic obstruction [5].

In our study, we evaluated the role of endoscopic insertion of colonic stents in patients with acute obstructing colonic malignancy and its effect on postoperative outcomes.

Patients and methods

We conducted our study during the period from November 2018 to October 2019, in Saudi German Hospital, Jeddah.

We recruited patients presenting to the hospital with features of acute bowel obstruction secondary to malignant-looking left-sided colonic lesions.

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Diagnosis was based on clinical features of bowel obstruction (abdominal pain, vomiting, and failure to pass stool), evidence of fluid level by abdomen radiography, and computed tomography abdomen showing malignant-looking left-sided colonic mass, which is confirmed by histopathology.

Patients were divided into two groups: group 1 underwent endoscopic colonic decompression by inserting SEMS followed by surgical resection. The other group (group 2) patients were offered emergent surgical exploration, which is considered the standard of care.

We excluded patients with perforation, patients with peritonitis, patients with distant metastasis, and patients with non-malignant or malignant right-sided colonic lesions.

All patients were put on initial management by bowel decompression, intravenous fluids, and antibiotic therapy.

Colonic metal stent insertion

After informed consent, 15 patients were offered stent insertion. Of them, 10 patients underwent successful colonic stenting using Wallflex colonic SEMS (Boston Scientific). Type and length of stents were selected according to the size of the lesions and availability of stents either fully covered, which is used in most of the cases (10 cases), or partially covered, which is used in rest of the patients. Success is either technical, which means in-place stent insertion, or clinical, when there is evidence of colonic decompression.

After limited preparation by colonic enemas, the procedure was done under fluoroscopic and colonoscopic guidance. We identify the lesion (Fig. 1) and then pass a guide wire (Fig. 2) under fluoroscopic guidance after injection of contrast media, and then the stent is deployed (Fig. 3) over the guide wire. We did not try any dilatation before colonic stent insertion. All lesions were biopsied for histopathological confirmation. This group of patients was scheduled for elective surgery at variable time after decompression.

Stent insertion failed in four patients. Failure was related to difficulty in passing guide wire through the obstructing lesions, especially at the sites of colonic angulation. Colonic perforation occurred in one patient. These patients were shifted to the other group and underwent immediate surgery.

Figure 1



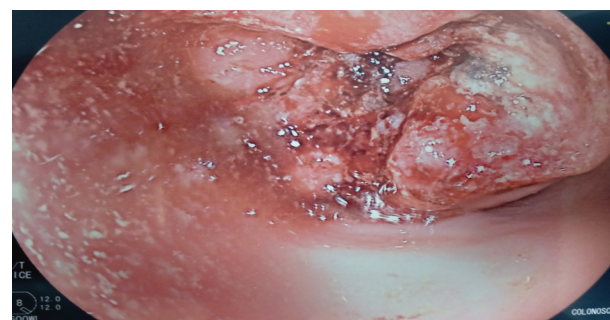
Obstructing sigmoid malignant-looking mass.

Figure 2



Passing colonic stent over guide wire.

Figure 3



Colonic stent deployed.

Patients underwent emergency surgical intervention

This group of patients underwent emergency exploratory surgery without preoperative endoscopy. Intraoperative staging and evaluation for resectability were done. For cases that underwent left hemicolectomy, inferior mesenteric vessels were ligated close to aorta and inferior border of pancreas, and for cases that underwent sigmoidectomy, ligation of sigmoid branches with lymphadenectomy was done for all procedures. All patients afterward were subjected to colostomy with Hartmann pouch. All

resected lesions were subjected to histopathological examination.

Results

We recruited 30 patients with acute obstructing left-sided colon malignant mass and divided into group 1, where patients were offered SEMS insertion, and group 2, where patients were offered emergency surgery.

Demographic features and laboratory and histopathological findings

Demographic features and laboratory findings of both groups are illustrated in Table 1. Age and sex were comparable in both groups, with more predominance of male sex, but with no significant statistical difference. All histopathological results proved adenocarcinoma.

Patients underwent self-expandable metal stent insertion

Of the 15 patients in group 1 who were offered SEMS insertion, 10 (66%) had technically and clinically successful procedure.

Stent insertion failed in four (26%) patients; two of them had splenic flexure lesions and the other two had descending colon lesions. One (6.6%) patient had been complicated by perforation. Bleeding occurred in six (40%) patients, but it was mild bleeding, which stopped spontaneously. We did not encounter any case of stent migration despite most of the cases had fully covered metal stent insertion.

Patients with successful stent insertion ($n=10$ patients) underwent primary resection anastomosis; three patients had left hemicolectomy, and seven patients had sigmoidectomy (no patients needed stoma construction). The remaining five patients were subjected to colostomy with Hartmann pouch.

Average interval time (time between stent insertion and elective surgery) was 4 ± 2 days. However, average hospital stay was 11 ± 3 days.

Patients underwent emergent surgical exploration

Stoma construction was needed in all patients in group 2 who underwent emergency surgery. Six patients had sigmoidectomy and nine patients had left hemicolectomy. Surgical procedure was technically more difficult with higher risk of complications in this group of patients including higher risk of peritoneal soiling. Average hospital stay was 7 ± 2 days.

Patient outcomes and statistical analysis

All values are presented as mean, median, (range), or percentage. The primary outcomes of this study were to evaluate the success and complication rates between cases that had colon stent and those who had emergent surgery with colostomy. Continuous data were compared using the unpaired t test or Mann-Whitney tests. Categorical variable were evaluated using χ^2 test. Statistical significance was determined a priori at less than or equal to 0.05.

Discussion

Acute bowel obstruction secondary to malignant colonic lesions carries a surgical emergency with a significant risk of complication. Most of patients require colostomy construction because of the insufficient bowel preparation. Insertion of stent to bypass the obstructing colonic malignant lesion is considered a bridge to surgery that was evaluated in many studies with doubtful results [6]. Colonic stenting before definite surgical resection can result in shorter hospital stay and lower post-procedural complication rates [7].

In our study, patients who underwent colon stent insertion had lower rate of stoma construction and subsequently higher rate of primary colonic anastomosis compared with patients who underwent immediate surgical intervention. As per a meta-analysis published by Tian-Zhi and Ker-Kan [8], it was suggested that evaluation of the stoma rate is essential when comparing the two different interventions, because creation of a definitive stoma

Table 1 Demographic features and laboratory findings

	Group 1	Group 2	P value
Age	55 \pm 12.68	52.47 \pm 6.89	
Sex (male sex)	10 (66.66)	9 (60)	
Hemoglobin (g/dl)	10.38 \pm 1.49	10.65 \pm 0.89	NS
CEA	210.77 \pm 190.66	191.57 \pm 260.09	NS
Site of colonic lesion by colonoscopy	Sigmoid: 7 (46.6) Descending colon: 4 (26.6) Splenic flexure lesion: 4 (26.6)		

Data are presented as mean \pm SD and n (%).

can have profound effects on the psychosocial well-being of the patients.

Although there was a trend to a longer hospital stay in the SEMS group, which may be owing time needed for decompression after colonic stenting, if we consider that the patients who underwent immediate surgical intervention will need rehospitalization for stoma closure, the overall hospital stay will be in favor for colonic stent insertion.

In our study, the technical and clinical success rate of colonic stent insertion was 66%, which is comparable to other studies. The technical and clinical success of SEMS varies in accordance to the published studies. Sebastian *et al.* [9] reported a technical success rate of 91.9% and a clinical success rate of 71.7% for SEMS placement as a bridge to elective surgery. Pirlet *et al.* [10] had a 53% technical failure for stent insertion.

Colonic perforation is the main drawback and a serious complication for endoscopic colonic stent insertion. One out of 15 (6.6%) patients had perforation. Other complications like bleeding had a rate of 40%. Migration rate was low; this may be related to the nature of tight colonic lesions minimizing the risk of stent migration and also being applied for temporary short preoperative period. A series of studies [11] showed complications rates, such as perforation (4%), stent migration (10–12%) and re-obstruction (7–0%), causing a cumulative mortality of 1%.

All stents were placed by a gastroenterologist with experience in SEMS placement for the treatment of colonic obstruction. Operator experience and technical expertise in stent placement has been shown to reduce significantly the number of stent-related complications.

The surgeon reported that preoperative colonic decompression by endoscopic stenting allows better operative field in this group of patients compared with patients who underwent emergency surgery. Sebastian *et al.* [9] demonstrated that preoperative insertion of colonic stents improves the operative field by relieving the colonic obstruction, which facilitates primary anastomosis. Increasing intra-abdominal pressure carries a risk of respiratory complications and wound dehiscence. Fecal contamination of the peritoneum, surgical site infections, and abscess formation were significantly higher in patients operated by emergency exploration with higher morbidity.

This study is limited by the small number of patients, we did not try such procedures in more proximal lesions because of technical difficulties, and also some missing data, as we did not study the potential oncological complications like possibility of tumor spread and risk of vascular invasion by the compressing malignant tumor, especially in procedures complicated with perforation, and this is considered one of the drawbacks of our study. A retrospective study found that the 3-year overall survival (85.2 vs. 82.8%; $P=0.65$) and recurrence-free survival (80.7 vs. 78.6%; $P=0.916$) were not significantly different between the stent and surgery groups; however, in the stent group, perforation was identified as an independent risk factor for cancer recurrence (odds ratio 22.0; 95% $P=0.030$) and seeded metastasis (odds ratio 46.0; 95%; $P=0.016$) [12].

In conclusion, colonic stent insertion was found to be a safe and effective temporary method of relieving acute left-sided colonic obstruction to allow one-step surgical resection. The complication rate found in our study was low, and success rates were comparable to other studies. The positive results may have good effect on the physical and psychological status of the studied patients.

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Conflicts of interest

There are no conflicts of interest.

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