

Colonic Stent as Bridge to Surgery in Patients with Obstructive Left-Sided Colon Cancer

Mehmet Abdussamet Bozkurt, MD, Murat Gonenc, MD, Selin Kapan, MD, Ali Kocataş, MD, Baha Temizgönül, MD, Halil Alis, MD

ABSTRACT

Objective: We assessed the optimal time interval between endoscopic stenting and subsequent surgery in patients with obstructive left-sided colon cancer.

Methods: We reviewed the medical records of patients who underwent endoscopic colonic stenting for obstructive left-sided colon cancer between January 2009 and January 2012. Patients who had successful endoscopic intervention as a bridge to surgery were included in the study. Other variables studied were the duration between endoscopic stenting and surgery, the reobstruction rate, the stoma creation rate, the anastomotic leak rate, and the in-hospital mortality rate.

Results: The medical records of 53 patients who underwent endoscopic stenting for obstructive left-sided colon cancer were reviewed, and 43 were included in the study. The median duration between endoscopic stenting and surgery was 7 days (range, 5–33).

Conclusion: A median duration of 7 to 9 days after endoscopic stenting in patients with obstructive left-sided colon cancer is enough time to subsequently perform a safe surgical procedure. Extending this duration may expose the patient to the risk of reobstruction and emergency surgery.

Key Words: Large bowel obstruction, Endoscopic stenting, Bridge to surgery, Emergency colorectal surgery.

INTRODUCTION

As much as 20% of patients with left-sided colon cancer present with acute mechanical intestinal obstruction.^{1,2} In patients who have operable disease, emergency surgery and elective surgery after endoscopic stenting (ES) constitute the main treatment options. Although many studies and meta-analyses reported the potential advantages and drawbacks of each option, it is thus far not yet possible to decide which is superior.

ES is used to temporarily decompress the large bowel to allow an elective surgery option in patients with obstructive left-sided colon cancer.^{5–7} This not only provides an essential time for rebuilding the homeostasis but also enables further diagnostic workup for detecting synchronous colorectal cancers and distant metastases, which may ultimately alter the management of disease.^{8–10}

The duration between ES and subsequent surgery, which is related to the time necessary for the large bowel to restore its normal physiological status, in patients with obstructive left-sided colon cancer is unclear. Previous studies reported the duration between ES and surgery in patients with obstructive left-sided colon cancer as ranging between 3 and 95 days.^{10–15} In addition to this extreme variability, none of the authors clearly mentioned the criteria used for the assessment of timing of surgery in this setting. Therefore, it seems this timing depends somewhat on personal and institutional experience.

The main concern about the timing of surgery after ES in patients with obstructive left-sided colon cancer is the likelihood of reobstruction caused by migration or obliteration of the stent. This may again be handled with endoscopic intervention, which is associated with higher complication and lower success rates.^{16–18} Therefore, most patients who develop reobstruction after ES undergo emergency surgery.¹⁹ In addition, most patients with left-sided colon cancer who present with acute obstruction have advanced disease and thus require adjuvant chemotherapy. Therefore, prolonging the duration between ES and subsequent surgery in this setting may lead to a delay in adjuvant chemotherapy.²⁰

General Surgery Clinics, Dr. Sadi Konuk Training and Research Hospital, Istanbul, Turkey (Drs. Bozkurt, Gonenc, Kapan, Kocataş, Temizgönül, Alis).

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Address correspondence to: Mehmet Abdussamet Bozkurt, MD, Dr. Sadi Konuk Training and Research Hospital Istanbul, Turkey. Telephone: (+90) 532-579-1673, Fax: (+90) 212-544-4291, E-mail address: msametbozkurt@yahoo.com

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In this study, we aimed to analyze the outcomes of patients with obstructive left-sided colon cancer who underwent ES as a bridge to surgery.

METHODS

The study was designed as a retrospective analysis. The medical records of patients who underwent endoscopic colonic stenting for obstructive left-sided colon cancer between January 2009 and January 2012 were reviewed. Those who had successful endoscopic intervention as a bridge to surgery were included in the study. Successful endoscopic intervention was defined as stent deployment with full coverage of the stricture, observing the active passage of stool, and achieving colonic decompression after the procedure as judged by resolution of clinical symptoms and radiological evidence.

Exclusion criteria were: (1) iatrogenic colonic perforation during endoscopic intervention, (2) failure to place the colonic stent endoscopically, (3) failure to achieve colonic decompression immediately after a successful session of colonic stenting, and (4) extraluminal obstruction caused by other intraabdominal malignancies.

All of the procedures were carried out with the patient under conscious anesthesia with propofol (2 mg/kg, intravenous) and fentanyl (2 mg/kg, intravenous) with a Fujinon EVE 200 colonoscope (Fujinon, Tokyo, Japan). All procedures were performed under fluoroscopic guidance by surgeons. During the procedure, patients were placed in the left lateral decubitus position on the fluoroscopic table and were moved to the supine position only when necessary. The stricture was crossed with the endoscope. However, when the stricture could not be traversed, a stiff guidewire with a soft tip was used to cannulate the stricture, and contrast was then injected through a catheter that had been threaded over the guidewire to estimate the length of the stricture. An uncovered self-expandable metallic stent (Niti-S, Taewoong Medical, Seoul, Korea) was preferred in all procedures. The size of the endoscopic stent to be used was determined according to the diameter of the stricture and varied between 8 and 12 Fr. The stent delivery system was advanced under fluoroscopic guidance over the guidewire. The stents were readily introduced through the therapeutic channel of the endoscope. All stents were deployed starting with the distal end of the delivery catheter first, resulting in stent deployment at the proximal end of the stricture first. The procedure was terminated after the passage of fecal material through the stent had been observed. Stents were placed in the initial colonoscopy.

The criteria used to determine the timing of surgery after ES were: (1) normalization of biochemical parameters including renal and liver function tests, (2) optimal modification of surgical risks associated with comorbidities, (3) clinical and radiological evidence of colonic decompression, and (4) completion of a diagnostic workup for local and systemic disease. The patients in which reobstruction developed, defined as recurrent bowel obstruction after successful ES caused by stent failure, underwent emergency surgery.

The following data were collected: age, sex, location of obstruction, duration between endoscopic stenting and surgery, reobstruction rate, stoma creation rate, anastomotic leak rate, and in-hospital mortality rate.

Statistical analysis was done using Microsoft Office Excel 2007 (Microsoft, Redmond, Washington). Descriptive analyses were expressed as either percentages or mean value and standard deviations.

RESULTS

The medical records of 53 patients who underwent endoscopic colonic stenting for obstructive left-sided colon cancer were reviewed. Among those, 10 were excluded and 43 were included in the study. The reasons for exclusion in the 10 patients were iatrogenic colonic perforation during endoscopic intervention (2), failure to place the colonic stent endoscopically (1), failure to achieve colonic decompression immediately after a successful session of colonic stenting (1), extraluminal obstruction due to other intraabdominal malignancies (1), the use of colonic stenting as a palliative measure (1), and extension of the tumor beyond peritoneal reflection, whereby a diverting loop ileostomy was considered in addition to low anterior resection (4).

The mean age was 63.2 ± 9.5 years (range, 42–81) and the female-to-male ratio was 18:25. The locations of the obstructions were the left colon in 14 (32.5%) and the sigmoid colon in 29 (67.5%). The patients had an initial diagnostic laparoscopy to rule out disseminated disease. All patients except those who had reobstruction underwent either regular or extended left colectomy or anterior resection and primary anastomosis. The decision to use the open or laparoscopic approach, as well as whether to use stapled or hand-sewn anastomosis, was made by the attending surgeon.

The median duration between colonic stenting and surgery was 8 days (range, 5–33) (**Table 1**). Because of the difficulties in the anesthesia preparation for surgery, the

Table 1.

The Duration Between Colonic Stenting and Surgery

Duration Time (days)	Number of Patients, n (%)
5	1 (2.3%)
6	5 (11.6%)
7	8 (18.6%)
8	13 (30.3%)
9	7 (16.3%)
10	5 (11.6%)
11	2 (4.7%)
16	1 (2.3%)
33	1 (2.3%)
Total	43 (100%)

Table 2.

Morbidity and Mortality Rates

Anastomotic leak	3 patients (6.7%)
Mortality of cardiopulmonary failure	2 patients (4.6%)
Mortality of severe sepsis caused by anastomotic leak	1 patient (2.3%)

operation was delayed 16 days for one patient and 33 days for another. Overall primary anastomosis and stoma creation rate was 95% (n = 41) and 5% (n = 2), respectively. Anastomotic leak, which was confirmed by combined clinical and radiological evaluation, occurred in three patients (7%). The in-hospital mortality rate was 7% (n = 3). The causes of mortality were cardiopulmonary failure exacerbated by preexisting comorbidities in two patients and severe sepsis caused by anastomotic leak in one patient (**Table 2**).

Reobstruction occurred because of either stent migration or stool impaction in six patients (14%). The duration between colonic stenting and reobstruction in these patients was 4, 9, 10, 12, 15, and 21 days, respectively. A second endoscopic intervention was not performed because it may have increased the risk of perforation and caused a delay in surgery; instead, emergency surgery was performed in these patients. Three of those six patients underwent total colectomy and ileorectal anastomosis, two underwent left colectomy and colorectal anastomosis, and one underwent the Hartmann procedure.

DISCUSSION

The preference between ES and emergency surgery in patients with obstructive left-sided colon cancer is the subject of an ongoing debate and directly affects the hypothesis of the present study. The proponents of ES who already believe in the superiority of ES over emergency surgery in terms of surgical outcomes should reasonably do the subsequent surgery at the earliest convenience, because such patients are always at risk for reobstruction, which usually necessitates emergency surgery.

Currently available data in terms of morbidity and mortality are contradictory regarding the comparison of elective surgery after ES and emergency surgery in patients with obstructive left-sided colon cancer. Although some authors reported similar morbidity and mortality rates, some found these parameters to be significantly lower in patients who underwent ES. In these studies, however, the constant finding was that ES is associated with a significantly lower stoma creation rate and a higher successful primary anastomosis rate. It should be emphasized that the reduction in morbidity and mortality in the short term is a natural result of an increased stoma creation rate, because the major determinant of morbidity and mortality in this setting is anastomotic complications. Therefore, one may appreciate that ES and subsequent surgery is superior to emergency surgery in patients with obstructive left-sided colon cancer. This means the concern for reobstruction after ES in such patients is not unfounded.

The expectation from ES in patients with obstructive left-sided colon cancer is to achieve similar outcomes as those who undergo elective surgery for nonobstructive left-sided colon cancer. The anastomotic leak and in-hospital mortality rate in this series is within the reported ranges found in the literature for patients who undergo elective surgery for nonobstructive left-sided colon cancer. Therefore, it seems that a median duration of 8 days between ES and subsequent surgery is enough time to perform a safe surgery.

The present study showed that the primary anastomosis rate was significantly higher and the stoma creation rate was significantly lower in patients who underwent elective surgery after ES when compared with those who underwent emergency surgery to repair reobstruction after ES, which is also the constant finding in most similar studies.^{8,13,14,21} In addition, we believe this is important for quality of life, and the other important advantage is to start medical therapy earlier to avoid emergency surgery.

We also found that the mortality rate was significantly lower in patients who underwent ES and elective surgery when compared with those who underwent emergency surgery to repair reobstruction after ES. Conversely, we failed to show any significant difference in the anastomotic leak rate between both sets of patients. Although this is not a surprising finding, it should be noted that most patients who underwent emergency surgery to repair reobstruction had extended bowel resection and ileorectal anastomosis, which carries a lower risk than a colorectal disease.

There are several important limitations of the present study. First, it was retrospective in nature. Second, it had a limited number of patients included, which reduces the power of the study results. Finally, the criteria used to determine the timing of surgery in this series are somewhat subjective, as was mentioned before for previous studies.^{22–25}

In conclusion, a median duration of 7 to 9 days between ES and subsequent surgery in patients with obstructive left-sided colon cancer is enough to perform a safe surgical procedure. In our study, reobstruction occurred in only one patient before 8 days. As a result, one week (range, 7–9 days) is enough time for decompression to prepare for subsequent surgery. Moreover, extending this duration exposes the patient to the risk of reobstruction and emergency surgery, which is associated with a decreased primary anastomosis rate, and increased stoma creation and in-hospital mortality rates.

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