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Case Report

Colonic stenting as a bridge to surgery in malignant colonic obstruction

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ABSTRACT

Upto 80% of patients with colorectal cancer that show up to the emergency room have an obstructive pathology. The use of colonic stenting as a bridge to surgery may resolve the occlusive disorder, allowing the surgeon to do a laparoscopic procedure and safer anastomosis avoiding therefore any stomas. A 65 years old male presented with obstructing sigmoid cancer. A colonic stent was placed, resolved his obstruction and five days later he had an oncological laparoscopic procedure followed by an uneventful recovery. Colonic stenting as a bridge to surgery compared to emergent surgery in obstructing colon cancer decreases definitive stomas, length of hospital stays, anastomotic leakage, early adverse events, and increases primary anastomotic rate. There is no difference in short-term mortality. Use of colonic stent as a bridge to surgery did not showed difference in terms of overall survival, disease free survival, and recurrence.

Keywords: Colonic stent, Colorectal cancer obstruction, Stenting as a bridge to surgery

INTRODUCTION

According to the National Institutes of Health, colorectal cancer is the 4th most common cancer in the United States of America with an estimated 51,020 deaths in 2019.[1] Fifteen percent of patients with colorectal cancer present with bowel obstruction and up to 80% of patients with colorectal cancer that show up to the emergency room have an obstructive pathology. The obstruction usually is seen at the sigmoid colon and up to 75% are distal to the splenic flexure.[2,3] Emergent surgery (ES) is associated with a higher mortality up to 20% compared to elective surgery 12.8%.[3]

In 1991, Dohmoto et al proposed the use of a colonic stent to resolve the obstruction due to neoplasm.[2] In 1994, Tejero et al published their experience using colonic stenting as a bridge to surgery (SBTS) to resolve the colonic obstruction and afterwards taking the patients to surgery.[5] Surgical alternatives for occlusive colorectal cancer are creating a loop colostomy, primary resection with end colostomy (Hartman's procedure) or resection and primary anastomosis. An obstructed and distended colon might be an impediment for laparoscopic surgery and many anastomoses will fail due to the difference in diameter of the proximal and distal bowel to anastomose.[2] The use of colonic SBTS may resolve the occlusive disorder, allowing the surgeon to do a laparoscopic procedure and safer anastomosis, decreasing stoma creation. This work has been reported in line with the SCARE criteria and with the PROCESS criteria.[6,7]

CASE REPORT

A 65 years old male with previous history of a conventional cholecystectomy and deep vein thrombosis diagnosed four years ago in treatment with rivaroxaban. Sigmoid wall thickening is noticed during a control

doppler ultrasound. He denies loss of weight, melena, hematochezia or any change in his bowel movements. A fecal immunochemical test is positive for hidden blood and he is referred to a gastroenterologist for a colonoscopy. The patient did not comply and did not came back for the colonoscopy. A month later he shows up to the emergency room with a 3 days history of abdominal distension, generalized abdominal pain, and no bowel movements. At physical exam the abdomen was distended, with diminished peristalsis and tender. Rectal exam had no fecal content and no masses were palpated. Relevant lab work was remarkable for hemoglobin at 18.4 g/dl, white blood cell count at 14.3 K/ul, platelets at 265 K/ul, and albumin at 3.5 gr/dl. Abdominal computed tomography (CT) scan (Figure 1) reveals sigmoid obstruction secondary to a neoplasm. Patient was consented for urgent colonoscopy that confirmed an obstructing lesion (Figure 2) at the proximal sigmoid. Under fluoroscopic guidance with a therapeutic gastroscope, a through-the-scope 22 mm x 90 mm duodenal self-expandable metallic stent (Wall-Flex Duodenal Stent, Boston Scientific®, Marlborough, MA, USA) was successfully deployed. A duodenal stent was used due to lack of availability of colonic stents. Obstruction was alleviated and the patient underwent a complete work-up revealing a carcinoembryonic antigen of 1.26 ng/ml and a thoraco-abdominal CT with no metastases. Five days later, with an adequate bowel preparation, we took the patient to the operating room. A laparoscopic total mesocolic excision and left hemicolectomy with colorectal anastomosis with a Johnson and Johnson® Echelon circular power stapler 29 mm was uneventfully achieved (Figure 3). The patient had a satisfactory post-operative period and was discharged home five days later. Pathology reported an intestinal colonic adenocarcinoma type 2, and was staged as pT3N0(0/26) M0, Stage IIA. The tumor was positive for perineural, vascular, and lymphoid invasion. Free margins and negativity for microsatellite instability was reported (Figure 4). At two years of follow-up the patient remains asymptomatic.

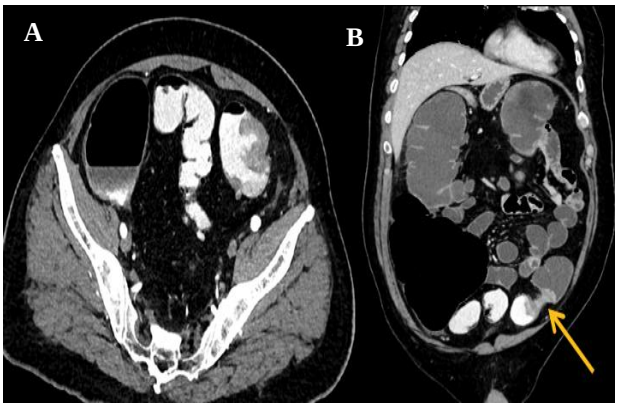

Figure 1: (A) CT scan showing colonic obstruction secondary to neoplasm and (B) yellow arrow demonstrates the stenotic sigmoid causing the obstruction.

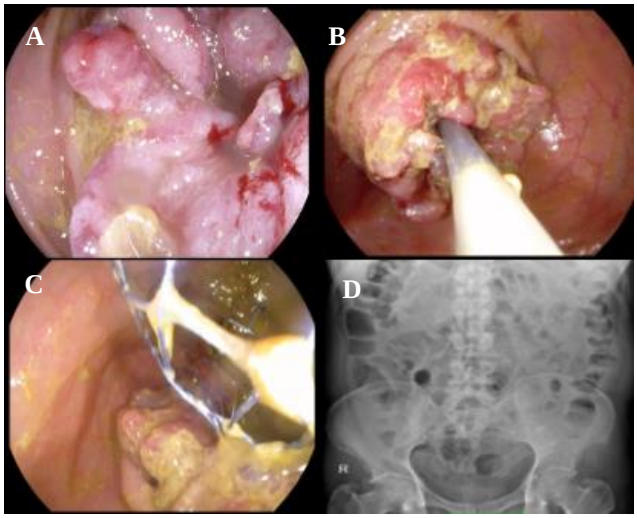

Figure 2: Colonoscopy (A) stenotic sigmoid tumor, (B) wire passed through colonic lumen, (C) stent placement and (D) abdomen X-ray showing resolved obstruction.

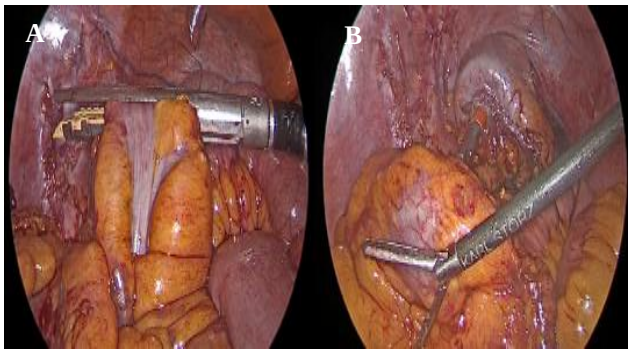

Figure 3: (A) Distal colonic resection and (B) colorectal anastomosis.

Figure 4 (A-C): Pathology examination showing the stent in the sigmoid colon.

DISCUSSION

The use of a colonic stent to alleviate colonic obstruction was first used as a palliative therapy. It was then described as a bridge therapy, resolving the obstruction and taking the patient to the operating room a couple of days later.

Table 1: Literature review of meta-analysis comparing SBTS and ES.

Year	Author	No. studies	N	Mortality	OS	DFS	DR	Morbidity	WI	Definitive stoma	Primary anastomosis rate	Anastomotic leakage	ICU (days)	LOS
2012	Yi Zhang	8	601	ND	ND	NM	NM	Supports SBTS	NM	ND	Supports SBTS	Supports SBTS	Supports SBTS	NM
2014	Akihisa Matsuda	11	1136	NM	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM
2014	Xuan Huang	7	382	ND	NM	NM	NM	Supports SBTS	Supports SBTS	Supports SBTS	Supports SBTS	Supports SBTS	NM	NM
2017	Alberto Arezzo	8	497	ND	NM	NM	ND	ND	NM	Supports SBTS	Supports SBTS	NM	NM	NM
2017	Marco Ceresoli	17	1333	NM	ND	NM	ND	NM	NM	NM	NM	NM	NM	NM
2017	Niccolo Allievi	7	448	ND	NM	NM	NM	Supports SBTS	Supports SBTS	Supports SBTS	ND	ND	NM	NM
2018	Igor Braga Ribeiro	4	125	ND	ND	NM	NM	ND	NM	Supports SBTS	NM	NM	ND	Supports SBTS
2018	Femke J. Amelung	21	1919	NM	ND	ND	ND	NM	NM	Supports SBTS	NM	NM	NM	NM
2018	Chi Chung Foo	7	448	ND	ND	ND	Supports ES*	ND	NM	NM	NM	NM	NM	NM

OS: overall survival, DFS: disease free survival, DR: disease recurrence, WI: wound infection, ICU: intensive care unit, LOS: length of stay, ND: no significant difference, NM: not measured, SBTS: stenting as a bridge to surgery, ES: emergent surgery, and *systemic recurrence.

Placement of a colonic stent as a bridge to surgery has many short-term advantages. Mir et al compared patients with malignant colonic obstruction who had a colonic SBTS and ES. The SBTS group had more laparoscopic resections (64.9% vs 5%), more primary anastomosis (91.2% vs 55%), less definitive stomas (10.5% vs 50%), less length of stay (7 days vs 12 days), and less short-term mortality (1.8% vs 20%).[8] Recent meta-analysis supports SBTS compared to ES with less definitive stomas, increased primary anastomosis rate, and less anastomotic leakages (Table 1).[9-14]

One of the main points to discuss when using a new therapy or device is its safety. Clinical failure of a colonic stent placement may be caused by inability to resolve occlusion 16%, migration (uncovered stent 3-12%, covered stent 30-50%), and perforation (3.8-6.9%).[15] Patients with perforation have a mortality of 16.3%.[15] Halsema et al found associated risk factors to perforation due to stent placement: stent design, benign etiology, and bevacizumab increased risk of perforation. Concomitant chemotherapy and intraprocedural stricture dilation were not associated with increased risk of perforation.[15] Hooft et al did a prospective study using colonic SBTS in patients with malignant obstruction. They found an increase 30 days morbidity in the first 60 patients so decided to end the study. They concluded that colonic stents might have an advantage in very selected patients and were concerned about long term results too.[16] After this study, many others have reported colonic stent placement as a safe technique and it seems that there is a learning curve directly associated with the number of patients treated. Park et al did a retrospective study of 353 patients with colonic stent placement. They divided their group of patients in three terms and showed that less complications were seen in the last group (learning curve). They studied the patients through 10 years and no mortality difference was seen between the groups.[17]

Literature review shows that in most recent meta-analysis there is less early adverse events in the SBTS group compared to ES.[9,11,14] There are also less wound infections in SBTS groups when compared to ES.[9,11] Most meta-analysis show no difference in mortality when comparing SBTS with ES (Table 1).[9-12,14,18]

The most feared complication after stent placement for colorectal malignancy is perforation since it is associated with an increased immediate mortality and there are concerns on cancer seeding and worse long-term prognosis. These speculations are taken from the standard statement that perforated rectal cancer has increased risk of local recurrence. Avlund et al did a 10 years period study in two centers. They measured overall survival and recurrence. They report a 12% rate of stent related perforations. Median follow-up was 4.8 years and they found decreased survival and increased recurrence in patients with stent related perforations.[19]

Long term oncological outcomes have been the main controversy of using colonic stents in obstructing tumors. Sung Il Kang et al. compared ES and SBTS. They followed patients for 45 months and showed there was no difference in disease free survival and overall survival.[20] Most literature (meta-analysis) show that when comparing SBTS and ES there is no difference in overall survival, disease free survival, and recurrence.[10,12-14,18,21,22] There is only one meta-analysis that showed increased systemic recurrence in SBTS compared to ES but most studies have showed no difference (Table 1).[18]

CONCLUSION

Many studies are being done to accurately determine if colonic SBTS is a safe procedure in the short and long term. Currently, when compared to ES, colonic SBTS reduces definitive stomas, length of hospital stays, anastomotic leakage, and early adverse events including wound infection. It also increases primary anastomotic rate. There is no difference in mortality. In long term studies, there is no difference in overall survival, disease free survival and recurrence.

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