

## ORIGINAL ARTICLE

# PALLIATIVE STENTING VERSUS SURGERY FOR OBSTRUCTING LEFT-SIDED COLORECTAL CANCER

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**Aim:** This study aimed to compare the results of palliative stenting with the results of emergency surgery for patients with obstructing left-sided colorectal cancer.

**Methods:** Patients with inoperable obstructing left-sided colorectal cancer with self-expanding metallic stent (SEMS) placement (group A) or emergency surgery (group B) from June 2003 to June 2005 were included. Data on the mortality, morbidity, necessity of intensive care and hospital stay for the two groups were compared.

**Results:** Insertion of metallic stent was successful in 14 of 16 patients (87.5%). Hospital death occurred in two patients in group A and in 6 patients in group B. The mean hospital stay was significantly shorter in (Group A) {3.3±2.3days versus (Group B) {15.7±10.7,  $p=0.0001$  Table 1. The incidence of colostomy was significantly lower in (Group A) (4 patients) versus (13 patients) in (Group B),  $p=0.003$ . Twelve patients (70%) required intensive care admission after surgery, compared with only two patients (12.5%) following SEMS insertion ( $p=0.0001$ ).

**Conclusion:** SEMS are effective in the palliation of obstructing left-sided colorectal cancer. SEMS is associated with a shorter hospital stay, less likelihood of intensive care admission and lower incidence of stoma creation, when compared with emergency surgery.

**Keywords:** colostomy, stenosis, malignancy.

## INTRODUCTION

The surgical management of malignant left-sided colonic obstruction has changed considerably in recent years, with many authors advocating a single stage procedure.<sup>(1,2)</sup> However, emergency operations involving the unprepared and obstructed left colon in poor risk patients usually result in high operative mortality and morbidity rates.<sup>(3)</sup> Moreover, obstructing cancers are more advanced and are associated with a high incidence of distant metastasis. Thus, in many cases, operations are merely palliative in nature, with the main objective to relieve the bowel obstruction.<sup>(4)</sup> Thus, the creation of a colostomy is inevitable in many patients, and the colostomy is likely to be permanent in those who have had a palliative operation.<sup>(5)</sup> These colostomies may be a cause of considerable distress in patients with short life expectancy. Colostomy operation itself may also have an associated

morbidity and mortality.<sup>(6)</sup> The use of a self-expanding metal stent (SEMS) to relieve malignant left colon obstruction has been described, both for palliative purposes and to allow delayed elective surgery after mechanical bowel preparation.<sup>(7)</sup> This prospective study was done to compare the outcome of patients with obstruction due to primary left-sided colorectal cancer treated by palliative stenting with outcome in patients who treated by emergency palliative surgery.

## PATIENTS AND METHODS

From June 2003 to June 2005, 16 patients underwent the insertion of a SEMS (Group A) in the General Surgery Department of El-Minia University Hospitals, for palliative treatment of obstructing lesion in the left-sided colon or rectum. Premorbid conditions such as cardiorespiratory disease, renal insufficiency, cirrhosis and diabetes mellitus

were documented, and physicians were consulted for optimal perioperative management. Preoperative resuscitation included aggressive fluid replacement with monitoring of central venous pressure and urine output, correction of electrolyte imbalance and nasogastric decompression. Flexible sigmoidoscopy was performed to confirm the site and nature of the obstruction. Investigations were done to detect metastasis in form of plain x-ray chest, abdominal ultrasonography, and CT abdomen in some cases when general condition of patient allowed. Intravenous prophylactic antibiotics (Cefuroxime and metronidazole) were given. After the procedure, patients were monitored carefully and those with severe pre-morbid risk factors or requiring inotropic or ventilatory support were admitted to the intensive care unit (ICU).

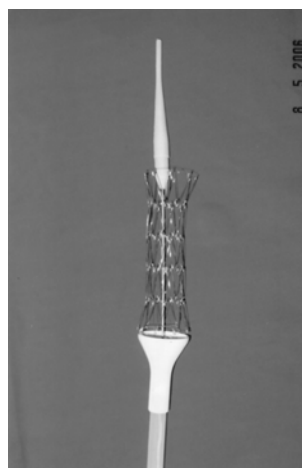
The outcomes of these patients were included in this study, while patients with stents as a 'bridge' to elective operation were excluded from the study. Data regarding patient demographics, details of procedures, complications and the survival of patients were collected prospectively. During the same period, 17 Patients underwent emergency palliative surgery for obstructing left-sided colorectal cancer (Group B). Data concerning these patients were collected prospectively. The options for surgery include proximal colostomy, Hartmann's operation (primary resection without anastomosis), primary resection with primary anastomosis and bypass. The general condition of the patient, the stage of the disease and distant metastasis are important determinants of the surgical option. However the preferred option is the primary resection. But in patients who had locally advanced disease with adjacent vital structures, in patients with hemodynamic instability and in these debilitated by concomitant medical disease, single stage resection and anastomosis may not be possible and creation of colostomy was usually required. The outcomes in terms of post-procedure mortality, complications and survival rates for the two groups were compared Table 1.

**Table 1. Comparison of patients having insertion of SEMS or emergency surgery.**

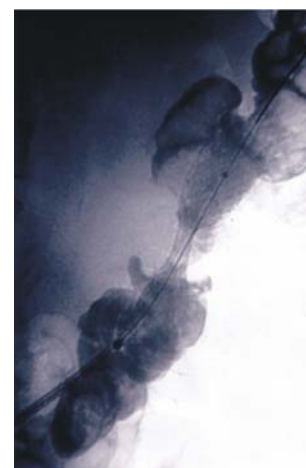
	SEMS N=16	Surgery N=17	P
Sex ratio (M: F)	10:6	11:6	0.89
Age (mean±SD); years	58.5±7.7	58.7±7.2	0.93
<b>Site of tumor:</b>			0.09
Descending colon	2	8	
Sigmoid colon	8	5	
Rectum	6	4	
Presence of medical disease	8	9	0.86
Presence of distant metastasis	13	14	0.93
Hospital stay (mean±SD);days	3.3±2.3	15.7±10.7	0.0001*
Hospital death	2	6	0.12
Complications	6	13	0.02*
Colostomy	4	13	0.003*
Mean±SD survival (days)	114±44	117±48	0.84

P\*:significant.

After informed consent has been obtained from the patients, the technique was carried out following the steps described by Tejero et al.<sup>(8)</sup> Wall stent esophageal endoprosthesis (Schneider, Switzerland), 22 mm in diameter and 70-100 mm in length, were used in all cases (Fig. 1). A pre-shaped, straight and blunt tip 7-Fr angiographic catheter (Cordis, Miami, Florida, USA) and a 0.038-inch angled stiff-type guide wire (Terumo, Tokyo, Japan) were jointly advanced through the anus to the tumor under fluoroscopic guidance. The stenosis was then negotiated with the guide wire and angiographic catheter. Once the lesion had been traversed, the guide wire was replaced by 0.038-inch Amplatz Superstiff guide wire (Medi-Tech, Boston Scientific, Watertown, Massachusetts, USA). The angiographic catheter was then withdrawn and the delivery system of the endoprosthesis was advanced over the Amplatz guide wire through the tumor (Fig. 2). After complete deployment of the stent, contrast material was injected to assess the patency and correct location of the stent. The time required for the procedure varied between 30 minutes and 1 hour, and no anesthesia or sedation was necessary. In case of failure of the technique, the procedure was abandoned and the patient underwent emergency laparotomy. After 48 hours of successful SEMS placement, a further Gastrografin enema was performed to assess the patency of the stent and to rule out complications. Patients had an early discharge from the hospital and follow up was scheduled every 4 weeks for one year.



**Fig 1. Stent before deployment (expanded outside)**



**Fig 2. Radiograph obtained after stent insertion in the sigmoid colon.**

**Statistical analysis:** Categorical variables were compared with the X<sup>2</sup> or Fisher's exact test when appropriate. Continuous variables were presented as mean±standard deviation (SD) and were compared with t-student test. P<0.05 was considered statistically significant.

## RESULTS

During the study period, 16 patients underwent insertion of a SEMS as palliative treatment for obstructing primary colorectal cancer distal to the splenic flexure (Group A), emergency surgery for palliation was performed in 17 patients (Group B). There were no differences in age, sex, presence of concomitant medical illness and presence of distant metastasis between the two groups Table 1.

The technique of SEMS succeeded in relieving the obstruction in 14 of 16 patients (87.5%). Symptoms and signs of intestinal obstruction resolved within 24 hours of SEMS placement in 10 patients; in the remaining 4 patients, and although some improvement was evident from start, complete clinical and radiological resolution did not occur until the fourth day. The technique of SEMS was unsuccessful in 2 of 16 patients (12.5). The causes of failure were inability to place a guide wire across the lesion in one patient, and perforation in the other. Both of them underwent an emergency colostomy, with a poor outcome; one died from acute postoperative renal failure, and another had severe abdominal necrotizing fasciitis originating in the colostomy.

The mean hospital stay was significantly shorter in (Group A) {3.3±2.3 days} versus (Group B) {15.7±10.7}, p=0.0001 (Table 1). The incidence of colostomy was significantly lower in (Group A) (4 patients) versus (13 patients) in (Group B), p=0.003. The mean survival time was 114±44 and 117±48 days in (Group A) and (Group B) respectively. This difference was not statistically significant (p=0.84), Table 1. Early complications (within 30 days) occurred in 5 patients (31.2%). These included perforation of colon in one patient, stent migration in one patient, stent occlusion in one patient, rectovesical fistula in one patient following chemoradiation and severe tenesmus due to stent placement for a distal rectal cancer in one patient. Two patients died after insertion of SEMS; one from myocardial infarction and the other from renal failure. In (Group B), the types of operations employed are shown in Table 2. Six patients (35%) died in the postoperative period. The causes of death and postoperative morbidity are shown in Table 3, 4. respectively. The morbidity rates were significantly less in (Group A) versus (Group B), p=0.02. However, 12 patients (70%) require intensive care admission after surgery, compared with only two patients (12.5%) following SEMS insertion (p=0.0001).

**Table 2. Types of operations in patients having palliative surgery (group B).**

	No. Of patients (%)
Hartmann's operation	8 (47%)
Colostomy	5 (29.4%)
Primary resection and anastomosis	2 (11.7%)
Bypass	2 (11.7%)

**Table 3. Causes of death in patients having emergency surgery (group B).**

	No. Of patients (%)
Multi-organ failure	2 (11.7%)
Adult respiratory distress syndrome	1 (5.8%)
Pulmonary embolism	2 (11.7%)
Anastomotic leak (fecal peritonitis)	1 (5.8%)

**Table 4. Post-operative morbidity in both groups.**

Group A		Group B	
Complications	No.(%)	Complications	No.(%)
Colon perforation	1(6.2%)	Myocardial infarction	1(5.8%)
Stent migration	1(6.2%)	Pneumonia	1(5.8%)
Stent occlusion	2(12.4%)	Pulmonary embolism	1(5.8%)
Rectovesical fistula	1(6.2%)	Renal failure	2(11.7%)
Tenesmus	1(6.2%)	Wound infection	5(29.4%)
-	-	Colostomy complications	3(17.5%)

During follow-up, one patient in group A reported stent occlusion by fecal matter after 4 months which was treated with cleansing enemas. While the following complications were reported in group B. Colostomy obstruction was reported in one patient after three months and was treated conservatively. Minor bleeding was reported from colostomy site in one patient. Colostomy prolapse was reported in one patient and surgical treatment was done.

## DISCUSSION

Colorectal cancer may present by intestinal obstruction in 20 percent of patients.<sup>(9)</sup> Those patients were usually older in age and more likely to have advanced or disseminated disease.<sup>(10)</sup> The operative mortality rate following palliative surgery is usually high.<sup>(11)</sup> Malignant left-sided colonic obstruction is a difficult clinical problem. The options for surgery are variable and non-is satisfactory.<sup>(12)</sup> This has led to the increasing use of interventional techniques in the palliation of disease in these patients, in an attempt to avoid colostomy and to improve the quality of life.<sup>(13)</sup> This has been made possible by the SEMS, which is capable of relieving colonic obstruction rapidly and effectively. In the present study, metallic stents have been shown to be effective in relieving colonic obstruction in 14 patients (87.5%). This success rate was similar to the success rate of

Khot et al.<sup>(12)</sup> This successful decompression by SEMS placement has many advantages and could improve the quality of life, provided it is durable, well tolerated and with a low complication rate. SEMS placement can obviate the need for colostomy, which is usually done under general anesthesia, and can also considerably shorten the hospital stay with a significant reduction in intensive care admission.<sup>(14)</sup> In the present study, failure was attributed to an inability to pass the guide wire or colonic perforation, which necessitated an emergency colostomy. This agrees with Dauphine et al who reported failure due to inability to pass the guide wire through the lesion. An emergency colostomy was necessitated in every such case.<sup>(15)</sup> Insertion of a stent is usually performed without anesthesia, and was associated with a less dramatic course after the procedure, a more rapid recovery and a shorter hospital stay.<sup>(16)</sup> The length of hospital stay, intensive care and surgery may therefore be less in patients treated with a stent. Binkert et al<sup>(17)</sup> reported shorter hospital stay, shorter intensive care stay and fewer complications in patients treated by SEMS. In addition, the more rapid and less complicated recovery is certainly of benefit to patients with a limited life expectancy. Palliative chemotherapy and/or radiation can also be administered at an earlier stage. Avoidance of stoma is an important benefit of palliation by SEMS, particularly in patients with incurable disease. The complication rate associated with colostomy is high, especially when performed as an emergency.<sup>(18,19)</sup> The quality of life is usually adversely affected by the presence of colostomy. Nugent et al<sup>(20)</sup> reported that up to 80 percent of patients with colostomy experience alteration in life style. In the present study, the mortality and morbidity rates are significantly less in the stented group in comparison with the surgery group. The deaths following SEMS placement were unrelated to the procedure. In the previously published series,<sup>(15,16)</sup> the complication rate has been reported to range from 14% to 42%, while the complication rate in the present study was 31%. Perforation occurred in 6.2% of stented patients in our study. Balloon pre-dilatation is associated with higher incidence of perforation.<sup>(12)</sup> Balloon dilatation cannot therefore be recommended. Fortunately, it is possible to achieve stent placement even in patients with tight strictures without employing dilatation when modern stents are used. In addition, as perforation is more likely to occur during guide wire manipulation, the introduction of a wide range of soft-tipped guide wires may contribute further to prevention of perforation.<sup>(12)</sup> Stent migration is a possibility that needs to be in mind at all times during follow up. In the present study, stent migration was recorded in one patient (6.2%); which was attributed to the shrinkage of the size of the tumor due to chemotherapy. This was similar to other studies.<sup>(20,21)</sup> It is of interest that most patients with stent migration remained asymptomatic and needed no further intervention, as the luminal compromise is no longer existed. Furthermore, some of stents used were not

designed specially for colorectal anatomy, and this might also have favored migration. In the future, specially designed colorectal stents should contribute to reducing migration. Stent occlusion was due to fecal impaction in one patient (6.2%) and was treated by cleansing enema. One patient with SEMS placed low in the rectum complained of some tenesmus. At this level both the tumor and the stent can produce this disabling symptom and Laser re-canalization offered better palliation.

In conclusion, SEMS are effective in the palliation of obstructing left-sided colorectal cancer. SEMS is associated with a shorter hospital stay, less likelihood of intensive care admission and lower incidence of stoma creation, when compared with emergency surgery.

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