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Improved results for left-sided malignant colorectal obstruction with a proper selection for self expandable metal stent placement, surgical resection or diverting stoma

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ABSTRACT

Aims: Endoscopic placement of Self Expandable Metal Stents to relieve malignant colorectal obstruction has become a common therapeutic advancement in clinical practice.
Methods: In a 16 year period 145 patients had endoscopic placement of a Self-Expandable Metal Stent for acute/subacute left sided malignant colorectal obstruction in a center where gastroenterologists and surgeons cooperate in a daily basis, discussing indications.
Results: There was no operative mortality and no major complication in placement of the stent. Technical and clinical success was respectively 94.5% and 91.8%. Consultation among specialists changed the preoperative indication in 60 patients.
Conclusions: Self-Expandable Metal Stents placement represents an important tool to treat patients with obstructing colorectal cancer. Surgical resection, diverting stoma or endoscopic stent placement should be chosen according to the clinical characteristics of each single patient. In this scenario, a close collaboration among specialists in selecting the most appropriate operative procedure is essential and brings to better results.

Introduction

Operative endoscopy has become a common therapeutic advancement in clinical practice [1–5], either as a temporary or definitive form of treatment. In selected patients, operative endoscopy has replaced traditional open or laparoscopic surgery. New techniques generate comparisons with established techniques. While medium- and log-term clinical outcomes are well known for traditional surgical techniques, often analysis of the results of new endoscopic operative techniques determine controversies. New technologies as well as deeper experience and expertise bring to continuous improved results, making any comparison source of debate. The positive aspects of the comparisons between endoscopic and surgical techniques can get lost in a field of mere competition when different medical specialties are involved. Several reports have shown the importance of a close collaboration among specialists in the diagnosis and in organizing treatment plans in patients with gastrointestinal diseases [5–7]. The establishment of a colorectal specialist team brings to improved overall results for the medical and surgical treatment of patients with colorectal cancer [8,9]. So far, most of the reports analyzing the results of Self-Expandable Metal Stent (SEMS) in patients with acute and/or subacute malignant left-sided colorectal obstruction have been based on a direct comparison between SEMS placement and different types of surgery [8–11].

In the last 15 years, we have developed a close collaboration between gastroenterologists and surgeons. The colorectal team discusses indications and the most appropriate procedure for each single patient. Not rarely the initial indication is changed after an open and cooperative team discussion. The aim of our study was to analyze the improvement in results determined by the colorectal team collaboration selecting endoscopic placement of colorectal SEMS, we started to use since 199.

Material and Methods

COLORECTAL ENDOSCOPIC STENTING: In a 16-year period (August 1999–December 2016), 145 patients with left-sided

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malignant colorectal obstruction had endoscopic placement of SEMS. They were prospectively recorded in a data base. The data base was retrospectively analyzed. The study was approved by the Ethical Committee.

SEMS PLACEMENT: Patients with complete obstruction as determined by preoperative sigmoidoscopy and CT scan, had only a low-pressure water enema few hours before the procedure. If there was no evidence of complete obstruction, a bowel preparation was done: those few patients (less than 10%) were followed carefully during the bowel preparation, which was immediately stopped in case of abdominal pain. The procedure was performed under light sedation with benzodiazepine, at a dosage depending on patient body weight. A guidewire was passed through the obstruction. In the initial experience, the guidewire was passed blindly through the obstruction, under fluoroscopic and endoscopic guidance. The guidewire was directed towards the obstruction with a colonoscope which remained distally to the tumour, to avoid the risk of perforation. Thanks to the suggestion of an endoscopist (AL), a modified technique has been introduced [5,6]. A pediatric naso-gastroscope (4,8 mm in diameter) has been used to pass the obstruction. This manoeuvre makes possible to have a direct vision of the anatomy and pathology, and to pass the guidewire above the obstruction, through the naso-gastroscope, under direct vision [3,9]. This has made the procedure much simpler, faster, and theoretically with reduced risk of perforation or bleeding. Time of exposure to radiation (fluoroscopy) has diminished from 15 to 4 min. The SEMS apparatus (Precision Stent System Microvasive, Boston Scientific Corporation, Boston, USA) is placed at the level of the obstruction, through the guidewire previously inserted, and deployed under fluoroscopic guidance, with a landing zone of 2 cm above and below the tumour. The length of the stent ranged from 9 to 12 cm. We used mainly uncovered stents: initially Ultraflex OTS stent, lately Wallflex TTS stents (Boston Scientific, Boston, USA). Most of the patients had one stent placed. In 10 patients two stents were required. The diameter of the stent was 24 mm at least.

Propensity Score Matching: Results were compared for patients who were admitted with left-sided malignant colorectal obstruction in the period in which endoscopic stenting was available (1999–2016) and for patients who were admitted in the previous period (1994–1999) in which endoscopic stenting was not available. The clinical outcomes of eighty patients with left sided malignant obstruction treated from 1994 to 1999 were compared to eighty patients treated in the more recent period. Patients were selected by random sampling within strata: all observations were ranked on their propensity score, and the data were then divided into quantiles of the propensity score. Within each stratum, equal sample sizes in the treatment and control groups were selected. Matching within calipers was proposed to protect against a treated and control observation not similar to each other in their propensity score.

Results

Mortality and Morbidity after SEMS placement: There was no case of postoperative mortality or major morbidity after SEMS placement. There were no case of bowel perforation or major bleeding**.** Technical success was obtained in 94.5% of the 145 patients. In 8 patients it was not possible to pass the guidewire through the obstruction, due to sharp angulation of the obstruction. The procedure was not continued. Surgical colorectal resection or diverting stoma appeared a more appropriate procedure. Clinical success was obtained in 91.8% of the patients. In 4 patients with ascites and peritoneal implants, despite technical success of stent placement, symptoms of obstruction persisted. In another 10 patients, with ascites and stage IV colorectal cancer, placement of a stent was not considered appropriate.

Table 1
Propensity score matching left-sided malignant colorectal obstrcution

Period	1994–1999	1999–2017
N Patients	80	80
Primary Resection	40	30
Diverting Stoma	40	10
SEMS Placement	0	40
Mortality	6/80 (7.5%)	2/80 (2.5%)
Permanent Stoma	7/80 (10%)	4/80 (5%)
MajorComplications	10/80 (10%)	4/80 (5%)
Anastomotic Leak	5	1
Wound Infection	1	1
Cardiovascular/Pulmonary	4	2

P < 0.0001 Combined Mortality-Morbidity.

Surgical Resection: During the same time period, 60 patients with acute/subacute left-sided malignant colorectal obstruction underwent surgical resection. After consultation between surgeons and gastroenterologists, the option of surgery was considered the safest and best option. Sharp angulation of the rectosigmoid junction, associated to complete bowel obstruction in a patient in good general conditions was considered an indication to surgery. A diverting stoma was preferred in patient with significant proximal colon dilatation. Patients with severe dehydration, electrolyte unbalance, severe co-morbidities were considered for SEMS.

Improved results after the availability of endoscopic stenting

After the introduction into clinical practice of endoscopic stenting, there was a significant improvement in results. The two matched groups had similar clinical and pathological characteristics.Even if a comparison between two historical periods implies inevitable possibilities of errors, there were no major changes, in term of pre, intra- and post-operative techniques and approaches, other than the possibility to use selectively endoscopic stenting (Table 1).

Follow-up: Patients were followed by the same team who was involved in stent placement. As concern as patients with stage IV colorectal cancer who had definitive stenting, endoscopic re intervention was needed in 28% of the patients during a mean follow up of 22 months. Most of the complications were related to fecal impaction and they were treated successfully endoscopically.

Discussion

SEMS placement has been accepted in daily clinical practice [5,9–14]. SEMS offers many theoretical advantages. SEMS placement as a bridge to surgery has the potential to transform an emergency clinical condition into an elective situation. The patient can be treated after correction of electrolyte and fluid unbalance, common in elderly patient with bowel obstruction. A proper bowel preparation and a complete colonoscopy can be performed before surgery [15].

The role of SEMS in this setting has been source of controversies [16,17] Two randomized prospective studies comparing SEMS placement as a bridge to surgery with emergency resection have shown a relatively high technical and clinical failure for stenting [18,19]. Four other prospective randomized studies, have shown more favorable results for resection after stenting than for emergency resection [1,10,20,21]. Meta analyses have concluded that SEMS stenting in this clinical setting reduces the rate of complications and of permanent stoma formation [22–25]. Five studies analyzed the five-year oncological outcome of patients who had

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resection after SEMS placement and after emergency surgery, and no difference was found in terms of local or distant recurrence between the two groups of patients in four reports [26–30].

In patients with Stage IV colorectal cancer, and symptoms of acute and sub acute obstruction, stenting can represent a valid choice, especially when colorectal resection carries a significant operative risks. Short hospital stay and almost immediate resume of oral feeding can be expected after stenting. Prospective randomized studies and reviews of regional data bases [31,32] comparing stenting versus diverting colostomy have shown lower complication rate and shorter hospital stay in patients who had a stent. In patients with Stage IV obstructing colorectal cancer and good general conditions, surgical resection offers many theoretical advantages in comparison to stenting: conceptually more effective action of chemotherapy [33–35] and prevention of recurrent cancer obstruction, with the possibility of a better quality of life [36].

Several studies [23,37–39] have analyzed the results in patients with Stage IV colorectal cancer who had stenting versus those who had tumor resection. The studies included 837 patients (404 stenting; 433 surgery). Hospital stay and complication rates were significantly lower in the stenting group. Clinical success in relieving the obstruction was higher in the surgery group (99.8% versus 93.1%). Permanent stoma rate was higher in the surgery group (54% versus 13%). The overall number of complications was similar in the two groups, but complications in the stent group occurred later. The most common complications in the stent group were re obstruction (18%), migration (9%) and perforation (10%). Median survival in the two groups of patients was similar (7.6 versus 7.8 months). Recent meta analyses have shown that the risk of perforation is not increased in patients with stenting receiving chemotherapy without bevacizumab (7%) in comparison to patients who had no chemotherapy at all (9%). Patients who had stenting and chemotherapy with bevacizumab had increased perforation rate (12.5%) [40–44].

Retrospective studies have shown that technical success for SEMS placement is higher when the operator has performed more than 20 procedures [16,45–48].

Very few papers have focused the attention to a proper collaboration between specialists before and during the SEMS placement.

A close collaboration between surgeons and gastroenterologists allows to determine the most appropriate therapeutic option, avoiding the risk of a difficult SEMS insertion when surgery is a much easier option and vice-versa. Risk factors for technical success of SEMS include complete obstruction, with sharp angulation of the large bowel above the recto sigmoid junction. The blind passage of the guidewire, can lead to the perforation of the large bowel wall which, above the obstruction, is thin, dilated, and partially ischemic. Colorectal stenting, as suggested by the European Society for Gastrointestinal Endoscopy is more difficult, with a higher possibility for stent dislodgment, in the right and transverse colon. It is very difficult to place the stent in the right position in these anatomic locations, and the risk for complications is high.

Conclusions

The therapeutic options in patients with acute or subacute malignant colorectal obstruction, including endoscopic placement of a stent, should be based on a careful analysis of the different risk factors. In this scenario, a close collaboration among specialists in selecting the most appropriate operative procedure, is essential and brings to better results. SEMS placement, surgical resection or simple diverting stoma should be considered complementary techniques to be used according to the specific clinical situation and experience of the involved colorectal team.

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Declaration of competing interest

None of the authors has conflicts of interest to declare.

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