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Case Report

"Stent in Stent" Procedure for Treatment of Extreme Strictures of Colorectal Cancer – Case Series in a Single Center: How to Do it

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ABSTRACT

Background: Since 1990's the use of self-expanding metal stent has been known. Initially, this kind of technique has been debated in literature. Actually, is a widely used technique for treatment of bowel neoplastic obstruction. This procedure is important to restore bowel canalization but is feasible performed by expert endoscopists and a dedicated anesthesiologist team. More difficult seems to be the treatment of strictures longer than 9 cm of large bowel or synchronous very close stenosis of rectal-sigmoid junction and rectum. This technical note demonstrated how SEMS positioning can be performed for treatment of long and extreme large bowel obstruction.

Methods: In this case series we have treated all patients admitted in our department with diagnosis of extreme bowel neoplastic obstruction, with "stent in stent" technique, in deep sedation.

Results: From January to August 2019 we admitted in our Surgical and Endoscopic Unit two patients, a 90-year-old for bowel obstruction by synchronous colorectal cancer and a 80-year-old female for 15 cm large bowel neoplastic obstruction. Patients were submitted to "Stent-in-Stent" technique. No complications and perforation were observed with restore of bowel canalization after few hours from SEMS positioning. Both patients had no signs of bowel obstruction at abdomen X-Ray control, after 48 hours. 80-year-old female patient was submitted to left colectomy after 6 days without complications, while 90-year-old was discharge after 3 days.

Conclusion: This study demonstrated how is possible to perform endoscopic SEMS positioning to treat longer than 15 cm neoplastic large bowel obstruction and synchronous colorectal cancer with "Stent-in-Stent" technique. Our technical note describes, point by point, all passages of this procedure and suggests as is possible to treat synchronous sigmoid-rectal neoplastic obstruction using two different kind of metal stent.

Introduction

Colorectal cancer represents one of the most frequent causes of bowel obstruction and it also represents about 47% of gastrointestinal emergencies and 80% of large bowel obstruction [1]. Self-expandible metal stent (SEMS) positioning is an endoscopic procedure widely used in recent years for treatment of obstructive colon cancer. This procedure is important to restore bowel canalization but is feasible performed by expert endoscopists. In literature this technique is well-described, but there are possibilities in few cases that stricture is longer than metal stent. This case series shows how it's possible the treatment of long bowel neoplastic obstruction and treatment of very close synchronous colorectal cancer.

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Materials and Methods

This case series has been performed at Department of General and Emergency Surgery Castellaneta "San Pio" Hospital, Taranto, Italy from January to August 2019. All patients admitted in our department with diagnosis of bowel obstruction, were submitted to CT-Scan. After CT-scan demonstrating colorectal obstruction, they underwent to pre-operative endoscopy for planning the possibility SEMS positioning as "bridge to surgery" or for palliative therapy. After SEMS positioning patients submitted to fast fluid diet after 24 h and food intake after X-Ray abdomen 48 h control to visualize possible dislocation of SEMS.

If SEMS has been positioned for bridge to surgery, patients submitted to surgical procedure after 7 days, if not, SEMS was used as palliative procedure for old age patients with Stage IV colorectal cancer disease at CT-Scan. Sedation has always been a critical component of performing GIE procedures. All procedures were performed in deep sedation and the aim of this procedure is to increase patient's comfort, to improve endoscopic performance and to increase patient and endoscopist satisfaction. The need for sedation is decided by the type of endoscopy, duration of procedure, degree of endoscopic difficulty, patient physical status and physicians' preferences [2].

The sedation regimen for GIE procedures is still varied. We have followed the American Society of Anesthesiologists (ASA) and the American Academy of Pediatrics guidelines, that represent the standard for institutional policy development in the area of procedural sedation [3, 4]. All patients received fentanyl (25-50 μg) and iv midazolam (2-3 mg) routinely before Propofol TCI. The initial effect site concentration (EC) of Propofol TCI system was set at 2-3 μg/ml for colonoscopy. EC of propofol TCI was further titrated using 0.5 μg/ml steps. During procedures, a bolus of fentanyl (25-50 μg) could be added as rescue therapy. All patients received oxygen 2 l/min via nasal cannula.

Procedures began when patients did not respond to eyelid stimulation. Monitoring included electrocardiography (II lead), heart rate, peripheral oxygen saturation, noninvasive blood pressure (every 5 min), capnography, according to recent guidelines [3, 5]. All procedures were performed by the same endoscopist and anesthesiology team. No severe complications, such as persistent hypoxia needing tracheal intubation or severe hypotension (systolic pressure <90 mmHg) occurred. One patient presented bradycardia episodes (HR<50 beats/min) and she was treated with iv atropine bolus infusion. No procedures was interrupted.

Results

From January to August 2019 we admitted in our Surgical and Endoscopic Unit two patients in which performed two different endoscopic technique never described in literature.

Case 1

A 90-year-old patient admitted in our department for large bowel obstruction for double neoplastic stenosis, at sigmoid-rectal junction and middle rectum 6 cm apart. This patient refused any surgical treatment, but endoscopic treatment accepted, and informed consent was subscribed by patient. Pre-operative CT-Scan and endoscopy showed synchronous cancer at 6 cm from anal verge and a second tumor at sigmoid rectal junction. No metastasis showed by CT-scan, but the patient refused any surgical treatment, but he accepted endoscopic palliative procedure.

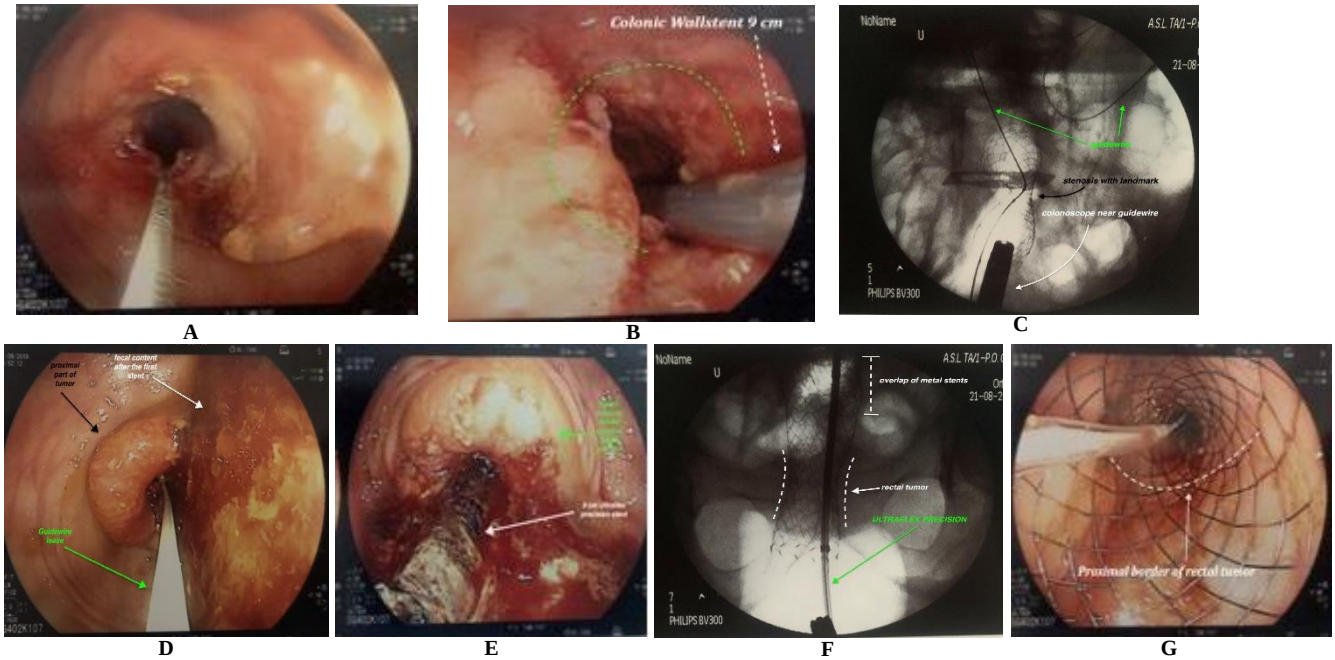


Figure 1: A) Colonoscopy with visualization of proximal part of the first tumor. **B)** First Self-expandible metal stent WallFlex 9 cm under vision positioning. **C)** First metal stent radioscopy positioning control. Guidewire is released inside transverse colon, very far away from the tumor to guarantee the persistence of the guidewire during the procedure. **D)** Colonoscope vision near the guidewire. Fecal content is present inside rectum because the first stent has been inserted in the first stenosis. **E)** Ultraflex precision 9 cm colonic stent is inserted inside the distal tumor. The position of colonscope is near the guidewire. **F)** Radioscopic control of correct proximal release of Ultraflex precision. **G)** Endoscopic control of the continuity between two stents.

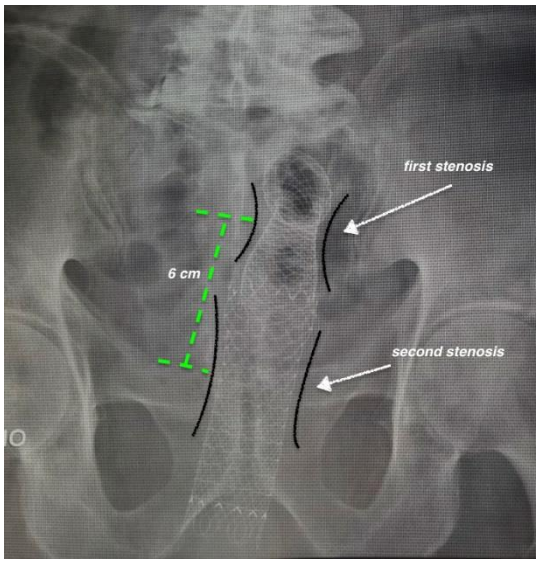


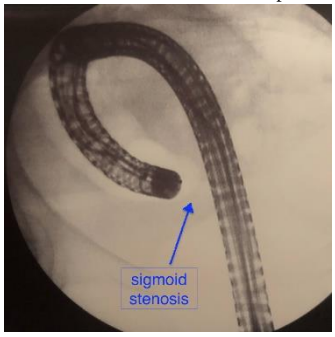
Figure 2: X-Ray control of Abdomen after 48 h. No dislocation of the stents. First stenosis is at sigmoid-rectal junction, while the second one is at 5 cm from the anal verge.

To treat the proximal stricture was used WallflexTM 9 cm Boston scientific colonic stent. After first stent positioning, the guidewire is released across the tumor (Figures 1A-1D). To treat the rectal tumor was used Ultraflex precision 9 cm Boston Scientific because the main characteristic of this stent is the proximal release that, in the rectum, it is important because allows to control the exact position of the stent without including dental line. Subsequently, the colonscope is positioned near to guidewire to prepare and to look the access of Ultraflex precision Boston Scientific 9 cm stent (Figures 1E-1G). Under the way of guidewire and under endoscopic vision, Ultraflex precision is released (proximal release).

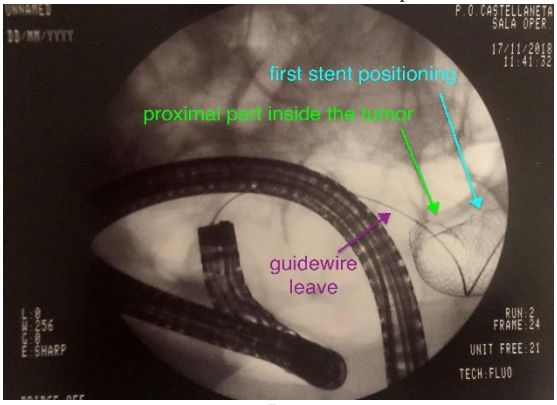
Our technical note is shown in (Figure 1E) in which is evidenced as the instrument is positioned near the stent for seeing the exact position of proximal part of the stent. After 48 h from SEMS positioning, patient was submitted to X-Ray Abdomen control (Figure 2) that demonstrated the correct two SEMS positioning. Patient had not post-operative pain and tenesmus and not obstructive symptoms presented at X-Ray abdomen. After 1 year the patient is alive and stents were not dislocated.

Case 2

A 80-year-old women, admitted in our surgical department with diagnosis of bowel obstruction from sigmoid cancer. CT-Scan demonstrated 15 cm of sigmoid cancer in dolicosigma. The patient was submitted to self-expanding metal stent positioning (Wallflex 9 cm Colonic stent). To ensure 2 cm of overlap of healthy tissue from both side with SEMS, was used "stent in stent" technique, positioning 3 Wallflex inside this extended tumor. The first stent is positioned through the scope after guidewire release in the left colon. Subsequently, the second stent is positioned under radioscopy control, while the third stent is positioned under vision, with over-scope technique (Figures 3A-3F).



A



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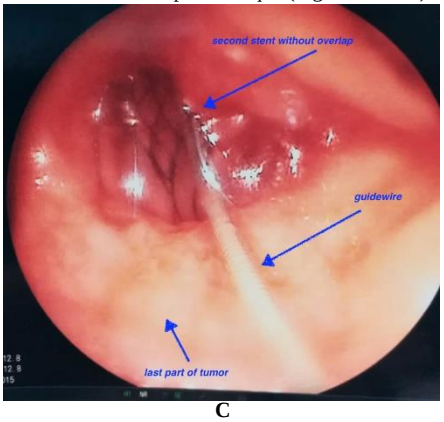

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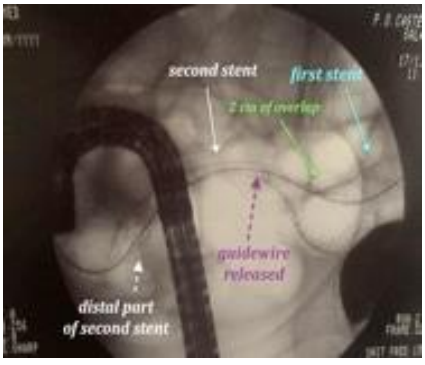

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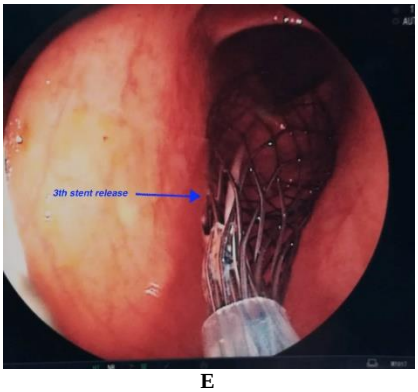

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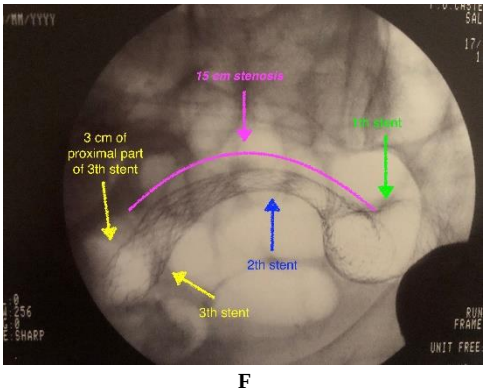
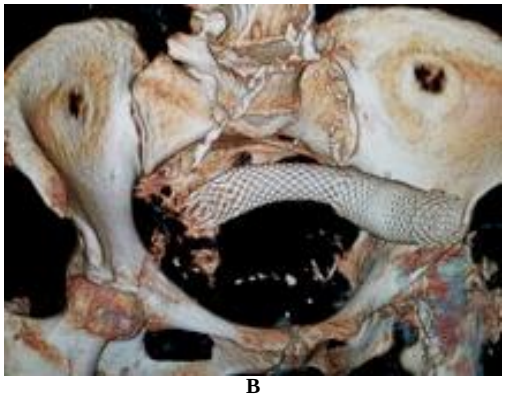


F

Figure 3: A) First stent WallFlex 9 cm colonic stent positioning. Intraoperative radioscopy control that demonstrated the presence of the stent inside the tumor, without the overlap. **B)** The second Wallflex 9 cm stent positioning under intraoperative radioscopy control. **C)** Endoscopic second stent positioning control. **D)** Radioscopy control of correct positioning without overlap. **E)** Third stent under vision positioning. **F)** Radioscopic control of all stents positioned with correct overlap.

After 48 h from SEMS positioning, patient was submitted to CT-Abdomen control (Figures 4A & 4B) that demonstrated the correct SEMS positioning. Patient, after 8 days from SEMS positioning was submitted to left colectomy with colorectal T-T anastomosis, according to Knight-Griffen technique (Figures 5A & 5B). No post-operative complications presented, and she was discharged after 8 days.

A



B

Figure 4: A) CT-Abdomen triple stent reconstruction. **B)** CT-3D image reconstruction.

A

B

Figure 5: A) & **B)** Post-operative pictures that demonstrated the correct positioning of all SEMS in 15 cm of sigmoid cancer.

Discussion

In the last years, has been developed a new technique for treatment of neoplastic obstruction of large bowel through self-expanding metal stent positioning. This endoscopic technique is used for palliative treatment of neoplastic strictures or for "bridge to surgery". As described by Abelson *et al*. comparing patients submitted to palliative stent vs stoma formation, demonstrated 6.4% vs 12.7% about died in the hospital and post-operative complications (p=0.05). Moreover, he shows no body procedural complications compared to stoma group with 8.1% [6].

Oistamo *et al*. in a retrospective single-center cohort study, includes all patients submitted to colon surgery and he compared 23 patients submitted to proximal stoma (stoma group) and 20 patients treated to surgery after self-expanding metal stent positioning, and he demonstrated a higher number for removed lymph nodes in the stent group than in the stoma group (8.7 vs 21; p=0.001) [7]. As suggest by Lazzaro, Saini, Elton *et al*. secondary colonic stent positioning is feasible in acute large bowel obstruction when primary positioning fails [8].

Many studies demonstrated the efficacy of this technique and even our recent perspective randomized controlled clinical study demonstrates the effectiveness of this technique but no study, in literature, describes the way of treatment of long neoplastic stenosis using SEMS positioning [9-11]. This study demonstrated how is possible to perform endoscopic SEMS positioning to treat neoplastic large bowel obstruction for palliative treatment or as bridge to surgery and describes point by point all passages of this technique. Furthermore, this study suggests that for treatment of synchronous sigmoid-rectal neoplastic obstruction is possible to use two different kind of metal stent. It's clear that this kind of procedure is possible only for expert endoscopist.

Conclusion

"Stent in stent" technique for extreme neoplastic stricture of large bowel is feasible and efficacy. Inside rectum can be use Ultraflex precision stent with this technical note that it allows viewing the exact position of the proximal side of the stent. Our experience in these cases has been very positive and we recommend following this kind of SEMS positioning for long and extreme neoplastic strictures.

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Conflicts of Interest

None.

Author Contributions

All authors have contributed to the design this study. Furthermore, De Luca GM and De Luca A, contributed to literature research; Fazzolari L contributed in the choice and elaboration of the figures; Putignano C, Rahaza L and, Dimito C contributed as anesthesiology team; Giordano

G, MD have contributed as Radiologist for pre-operative CT-scan and follow-up X-Ray abdomen after stent positioning and in the reconstruction of the figures; Pepe AS, MD (head of division) contributed as surgery team; Giungato S, MD, corresponding author, has contributed as endoscopist and surgeon, has elaborated the manuscript and has performed endoscopic procedures.

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