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Tertiary stent-in-stent for obstructing colorectal cancer: A case report and literature review

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Abstract

BACKGROUND

Self-expandable metal stents (SEMSs) are frequently used in the setting of palliation for occluding, inoperable colorectal cancer (CRC). Among possible complications of SEMS positioning, re-obstruction is the most frequent. Its management is controversial, potentially involving secondary stent-in-stent placement, which has been poorly investigated. Moreover, the issue of secondary stent-in-stent re-obstruction and of more-than-two colonic stenting has never been assessed. We describe a case of tertiary SEMS-in-SEMS placement, and also discuss our practice based on available literature.

CASE SUMMARY

A 66-year-old male with occluding and metastatic CRC was initially treated by positioning of a SEMS, which had to be revised 6 mo later when a symptomatic intra-stent tumor ingrowth was treated by a SEMS-in-SEMS. We hereby describe an additional episode of intestinal occlusion due to recurrence of intra-stent tumor ingrowth. This patient, despite several negative prognostic factors (splenic flexure location of the tumor, carcinomatosis with ascites, subsequent chemotherapy that included bevacizumab and two previously positioned stents (1 SEMS and 1 SEMS-in-SEMS)) underwent successful management through the placement of a tertiary SEMS-in-SEMS, with immediate clinical benefit and no procedure-related adverse events after 150 d of post-procedural follow-up. This endoscopic management has permitted 27 mo of partial control of a metastatic disease without the need for chemotherapy discontinuation and, ultimately, a good quality of life until death.

CONCLUSION

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Tertiary SEMS-in-SEMS is technically feasible, and appears to be a safe and effective option in the case of recurrent SEMS obstruction.

Key words: Bevacizumab; Colorectal neoplasms; Intestinal obstruction; Palliative care; Self-expandable metallic stents; Case report

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Core tip: Endoscopic positioning of self-expandable metal stents (SEMSs) has an established role in the palliation of obstructing metastatic colorectal cancers (CRCs). More controversial is the management of re-obstruction due to intrastent tumor ingrowth. In our case, a patient with obstructing, metastatic, carcinomatous CRC, primary palliated with SEMS placement, experienced two different episodes of intrastent tumor in-growth. This occurred along with a long-lasting history of partial efficacy of chemotherapy, including bevacizumab. Both these episodes were successfully treated through subsequent stent-in-stent placement, with immediate symptom relief, no procedure-related complications (notwithstanding different negative prognostic factors), no need for chemotherapy discontinuation and, ultimately, a good quality of life.

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INTRODUCTION

Colorectal cancer (CRC) is one of the most commonly encountered neoplasms, especially in Western countries, with an increasing incidence over the last years^[1,2]. More than a quarter of CRC patients are diagnosed with stage IV disease, and about ten percent of CRC patients present with large bowel occlusion^[3-5], involving a management regimen (endoscopic *vs* surgical) that is still debated^[3,6-8]. The application of self-expandable metal stents (SEMSs) for CRC obstruction has been increasingly used over time in the setting of palliation of inoperable cases as an alternative to emergency surgery^[9]. Surgical procedures are burdened by a high mortality rate in this setting^[4,10,11], are not oncologically indicated in advanced disease, and require a time interval before undertaking chemotherapy^[12]. This represents the only possibility of disease control for these patients. On the contrary, endoscopic procedures, despite being less invasive^[13] and requiring shorter hospitalization times^[11,14-16], suffer from a suboptimal technical success rate (particularly for tortuous colorectal flexures^[17]) and from the possibility of these complications^[6,10,17-22]: colonic perforation (10%), stent migration (9%) and re-obstruction (18%)^[10]. The issue of complications is even more noteworthy when patients are candidates for chemotherapy with antiangiogenic agents (e.g., bevacizumab), a described risk factor for colonic perforation in the presence of a SEMS^[23,24]. While some complications need to be treated by surgery, re-obstruction can be treated by stent-in-stent deployment^[25]. Nevertheless, technical success and clinical efficacy are scarcely reported, yet are still lower than primary stenting^[3,25]. Moreover, the issue of the stent-in-stent patency and the possible management of an additional intra-stent neoplastic ingrowth has never been assessed.

We describe the case of a man with occluding splenic flexure CRC that was treated by SEMS positioning due to metastatic, carcinomatous disease, with chemotherapy starting immediately after the first stent positioning. However, in two different occasions (6 mo and 22 mo after primary stenting), the patients experienced symptoms of a radiologically confirmed bowel occlusion due to endoscopically-diagnosed intra-stent tumor ingrowth. Nevertheless, systemic disease was substantially under control with chemotherapy. Despite the presence of negative prognostic factors (splenic-flexure location, carcinomatosis, bevacizumab subsequently added to chemotherapy regimen, previously positioned SEMS and SEMS-in-SEMS), both of the two episodes were successfully treated with positioning of additional stent-in-stents, which allowed for substantial chemotherapeutic continuity and lasting partial disease control of carcinomatous disease.

CASE PRESENTATION

A 66-year-old man was diagnosed in March 2016 with occluding colonic cancer, immediately proximal to and partially involving the splenic flexure. Due to the presence of liver metastasis and peritoneal carcinomatosis with ascites, a 22 mm/6 cm through-the-scope (TTS) SEMS (Wallflex™, Boston Scientific) was placed through the stenosis, and chemotherapy with fluorouracil/folinic acid/irinotecan was immediately started. Six months later, an occluding intra-stent tumor ingrowth (with responsive systemic disease) was treated by the placement of a colonic stent-in-stent (22 mm/9 cm TTS SEMS; Wallflex™, Boston Scientific), and chemotherapy resumed 2 d after.

After more than 1 year of substantial disease stability (although bevacizumab was added to the chemotherapy regimen 18 mo after diagnosis), the patient experienced symptoms of intestinal occlusion in January 2018 (+16 mo from the second stent). Physical examination revealed abdominal distension, hyper-tympanism on percussion, and tinkling bowel sounds. An abdominal X-ray showed ileocolic dilation proximal to the correctly located previous stents (Figure 1A), and colonoscopy showed new intrastent tumor ingrowths (Figure 2A).

FINAL DIAGNOSIS

The conclusive diagnosis was bowel occlusion due to intrastent tumor ingrowth in a patient with previously positioned multiple SEMS for the palliation of an obstructing, metastatic, carcinomatous CRC with partial disease control under chemotherapy, including bevacizumab.

TREATMENT

Considering the presence of carcinosis and ascites, as well as the patient's willingness to avoid a stoma, an additional TTS 22 mm/8 cm SEMS (Hanarostent®, M.I.Tech) was successfully positioned within the two previous stents (Figure 3) using fluoroscopic guidance and deep sedation. This procedure was performed after multidisciplinary discussion and informed consent.

OUTCOME AND FOLLOW-UP

Despite that the stent opening appeared endoscopically not brilliant (Figure 2B), the patient experienced immediate relief of occlusive symptoms, the following X-ray showed no residual bowel dilation (Figure 1B) and chemotherapy was resumed 8 d after.

No SEMS-related adverse events occurred until June 2018 (+150 d from the last procedure and +27 mo from diagnosis), when the patient died due to systemic complications related to disease progression.

DISCUSSION

This 66-year-old patient with metastatic, carcinomatous, occluding CRC was successfully treated with multiple endoscopic procedures (1 SEMS and 2 SEMS-in-SEMS placements), without procedure-related complications and with clinical benefit, good quality of life and partial systemic disease control for more than 2 years.

Some aspects made us consider this case of interest for endoscopy, gastroenterology and oncology practitioners. Firstly, to our knowledge, the possibility of positioning a third stent-in-stent for recurrent intrastent tumor ingrowth has never been considered and described. Moreover, some presumptive technical difficulties and negative prognostic factors^[26] did not interfere with the success and efficacy of the endoscopic palliation. For example, a significantly lower technical success of SEMS placement^[27] and patency after SEMS placement^[25] has been demonstrated in patients with carcinomatosis (83% *vs* 93% for technical success^[27] and 118 d *vs* 361 d for SEMS patency^[25]). Carcinomatosis and the proximal location of the obstruction were found to be independent predictors of technical failure^[27]. Moreover, concomitant chemotherapy with bevacizumab has been preliminary associated with increased perforation risk when compared to either chemotherapy without bevacizumab or no chemotherapy^[23,24,28-30]. However, in our case, neither the presence of peritoneal

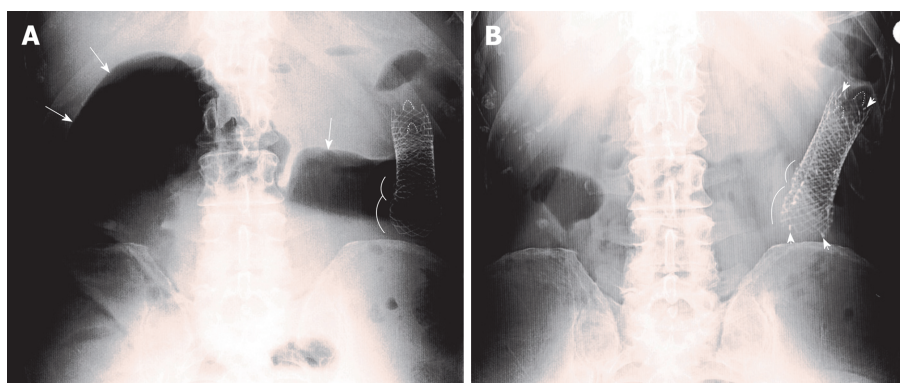


Figure 1 Abdominal X-ray before and after the positioning of the third stent. A: Large bowel massive distention (long arrows) without apparent stent migration; curves highlight the profiles of the proximal edges of the first and second previously placed stents; B: The third stent placed within the two previously placed stents (short arrows indicating some of the radiopaque markers), with detention of proximal loops.

carcinomatosis with ascites, the splenic flexure location, nor subsequent chemotherapy that included bevacizumab affected the technical success or lasting clinical benefits of the procedures. In fact, the patient has remained asymptomatic, on a varied fiber-free diet and with an acceptable quality of life until death, which was due to disease progression.

In one study focusing on secondary stent-in-stent placement^[25], the rate of technical success was not reported (patients with attempted but failed secondary SEMS placement were excluded). In this study, overall clinical success after secondary positioning was achieved in 75% of patients (which is lower than reported in the setting of primary stenting), and long-term clinical failure was reported in 52% of patients with initially successful secondary positioning. In addition, the presence of carcinomatosis was associated with reduced long-term clinical success. However, in our case, the presence of the two previously positioned SEMS did not hamper the successful positioning and clinical efficacy of the third stent-in-stent.

The same authors also compared, for the first time, the clinical outcomes of an endoscopic re-stenting *vs* palliative surgery after a first stent failure in 115 patients, which was due to malignant re-obstruction. They demonstrated that among patients undergoing secondary SEMS placement, the overall mortality rate and median duration of hospital stay were significantly lower than in the surgery group, where the median lumen patency was higher (7.9 mo *vs* 3.4 mo for the stent patency). Notably, no significant differences were registered in overall and progression-free survival between the two groups^[31]. In this scenario, we report one case with an extraordinary stent patency of 480 d after secondary stenting and of 150 d after tertiary stenting.

All these data highlight the need for a cautious evaluation of the solution best suited for one specific patient with stent re-obstruction.

CONCLUSION

In this case, despite the presence of negative prognostic factors and technical difficulties, tertiary stenting was technically successful. The patient experienced immediate relief of symptoms, has not encountered any SEMS-related adverse events, and has maintained a good quality of life during the 150 d following the last stent positioning, without the need for chemotherapy discontinuation. Despite the fact that the evidence on multiple stenting is controversial, and that data on tertiary stent-in-stenting are lacking, this report suggests that the positioning of a third stent-in-stent in patients with recurrent intra-stent tumor in-growth should be considered and might be a reasonable and effective option. Further research is needed to confirm the safety and reproducibility of this approach compared with surgical options, not only in terms of technical feasibility, but also regarding quality of life and long-term outcomes.

EXPERIENCES AND LESSONS

SEMS positioning is an established treatment for the palliation of occluding

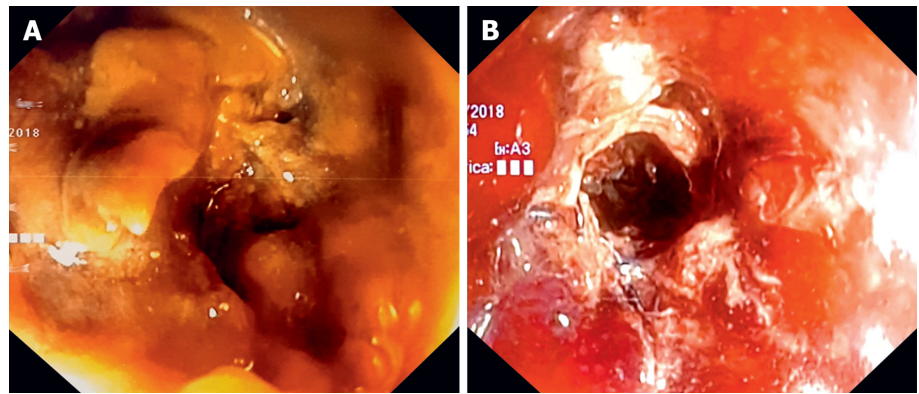


Figure 2 Endoscopic appearance of neoplastic stenosis before and after the third stent. A: Tumor ingrowth inside the two completely hidden previously placed stents; B: A small diameter hole inside the stenotic tract immediately after deployment of the third stent.

unresectable CRCs. Even in the presence of negative prognostic factors, the feasibility of endoscopic palliation may be discussed in multidisciplinary tumor boards in facilities with high endoscopic expertise and prompt surgical back-up.

SEMS re-obstruction is the most frequent complication of the endoscopic palliation of occluding CRCs, and SEMS-in-SEMS placement has proven to be a valid option in this setting.

Even after secondary failure of SEMS-in-SEMS due to recurrent tumor ingrowth, a tertiary SEMS-in-SEMS placement is technically feasible and might be an option in referral centers.

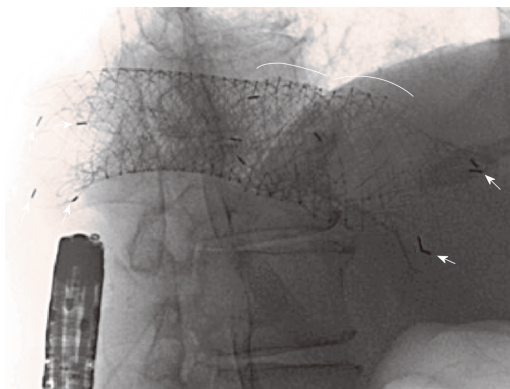


Figure 3 Intraoperative radiological appearance of the three stents bypassing the lesion above the splenic flexure. Curves highlight the proximal edges of the first and second previously placed stents; arrows indicate some of the radiopaque markers of the third recently positioned and gradually expanding stent.

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