



Case report

Enterocolic fistula due to a rectal stent: Case report and literature review



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HIGHLIGHTS

- SEMS are highly effective in relieving malignant bowel obstruction.
- They may be used as a bridge to resection or as a final palliative option.
- The most common complications of SEMS include perforations and occlusions.
- SEMS may also be complicated by fistula formation; a finding rarely reported.
- This work is the most extensive review of this complication to date.

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ABSTRACT

Introduction: Self-expanding metal stents (SEMS) are successfully being used to acutely relieve obstructing colorectal cancers; yet, their use does not come without complications.

Presentation of case: We present a case in which a patient with a recurrent obstructing sigmoid carcinoma underwent colonic stenting for acute decompression. Two months after stent placement, an enterocolic fistula formed from erosion of the upper end of the stent.

Discussion: An extensive literature review revealed that fistula formation, as a complication of stent placement, is rarely reported. Presentation of the case is followed by a review of complications that may arise following SEMS placement, with a focus on enterocolic fistulae. To our knowledge, this work provides the most extensive review of the subject to date.

Conclusion: SEMS provide an effective, safe, and less invasive option for patients when used in the appropriate clinical context. Further reports of enterocolic fistulae as a complication of SEMS placement are necessary in order to better understand this potential adverse event.

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1. Introduction

Self-expandable metal stent (SEMS) placement is a minimally invasive option for achieving acute colonic decompression in patients with obstructing colorectal cancer. Such patients may then undergo elective oncologic resection and anastomosis at a later date. In patients who are not candidates for invasive surgical procedures, SEMS may be used for palliation.

Studies have demonstrated that the technical success rate for SEMS is high with a low procedural complication rate [1]. The use of

SEMS has been shown to effectively avoid emergent surgery in more than 90% of patients; yet, no procedure is devoid of complications. Perforation, occlusion, stent migration, bleeding, erosion, and ulcer formation have all been reported [2]. Enterocolic fistula formation, while observed, is a rarely reported complication of SEMS placement. We herein report a case of an enterocolic fistula that developed after the placement of a SEMS for a recurrent obstructing sigmoid carcinoma.

2. Case report

A 73 year old male presented at another institution in 2006 with a near obstructing sigmoid carcinoma. He underwent a laparoscopic low anterior resection and was found to have a T3, N0, M0 – Stage 2 colorectal cancer. The specimen also revealed previously undiagnosed chronic ulcerative colitis. He elected not to have adjuvant therapy. He underwent follow up care and surveillance

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colonoscopies through 2008. However, thereafter he failed to follow-up.

The patient presented to our clinic in 2010 with narrowed, watery, urgent stools, loss of appetite, and weight loss. On exam, he was a cachectic male who clearly had lost a significant amount of weight. His abdomen was soft, nontender, and scaphoid. His digital rectal exam was normal; however, rigid proctoscopy showed an obstructing tumor at 10 cm from the anal verge. Additional imaging confirmed the presence of an obstruction and showed no evidence of a fistulous tract. At that time, he was offered placement of a self-expanding metal stent for decompression prior to staging his colorectal cancer. A 25 mm, 9 cm long WallFlex (Boston Scientific) colonic stent was deployed endoscopically with fluoroscopic control. Imaging showed excellent placement of the stent (Fig. 1). He was discharged the following morning on a low residue diet. Follow up one week later revealed improved appetite and decreased abdominal symptoms.

Subsequent staging including a PET/CT scan showed a large pelvic tumor mass surrounding and infiltrating the colorectal anastomosis, a left para-renal mass, and multiple enlarged retro-peritoneal lymph nodes. Biopsies of the left para-renal mass showed metastatic colorectal adenocarcinoma. Since his obstructive symptoms had resolved, initial systemic chemotherapy was recommended by the multidisciplinary tumor board.

Two months into systemic treatment the patient presented with diarrhea, nausea, and abdominal distention that warranted admission. Abdominal X-ray and CT revealed a high grade obstruction with distention of both the small bowel and colon. Endoscopy showed tumor growing into and around the upper end of the stent. A catheter was used to try to pass the obstruction but

this seemed to pass outside of the colonic lumen. The patient was offered several short and long term treatment options and he elected to proceed with exploration and diversion.

Laparotomy revealed a large pelvic mass bulging upward out of the pelvis. Two loops of small bowel were seen adherent to the pelvic wall. The first was easily mobilized. The second was densely adherent to the distal colon just above the pelvic mass between the iliac bifurcation. Upon further exploration, the second loop of bowel was found to be adherent to the upper end of the metallic stent. The stent had eroded through the medial wall of the descending colon just superior to the pelvic mass and into the distal ileum, creating an enterocolic fistula. The stent was mobilized from the colon wall for 2 cm and was divided circumferentially with a large metal cutter. Multiple sharp protruding ends were trimmed and the remaining ends were curled back into the lumen with a needle driver. The colon defect was now well above the remaining stent which was solidly incorporated into the colorectal wall and tumor. The defect was repaired with Lembert sutures and covered with omentum. A loop ileostomy was created. The patient recovered well. He continued palliative treatment with chemotherapy. He died in hospice 22 months after diagnosis of his recurrence.

3. Discussion

Enterocolic fistula is a rare complication of self-expandable metal stenting. We report a case in a patient with obstruction due to a recurrent distal sigmoid carcinoma at the prior colorectal anastomosis. Review of the English language medical literature revealed only 5 other cases complicated by fistulae: 3 in patients with obstructing cancers, one at a stenotic anastomosis, and one in a patient with Crohn's disease.

The largest series to date was reported by Small et al. from the Mayo Clinic [2]. A retrospective review of SEMS placed for malignant colorectal obstruction from 1999 to 2008 was performed. They identified 168 patients who underwent SEMS placement for palliation and 65 patients who underwent SEMS placement as a "bridge to surgery." The main outcome measurements included stricture location, stent-induced complications, time to adverse events, and need for additional intervention. They found success rates of 96% and 99% in the palliative and preoperative groups respectively. Overall, complications were seen in 24.4% of patients. Perforation and occlusion were the most common complications seen (36.9%). Migration and erosion/ulcer were less common. Gender, degree of obstruction, stent diameter, stricture dilation prior to stent insertion, and operator experience were found to be significant risk factors for adverse events. No enteric fistulae were reported. Gukovsky-Reicher et al., performed a 5-year literature review of 59 stent placements, and also reported no occurrences of fistulae [3].

Two retrospective studies documented the occurrence of a single enterocolic fistula in each series. Both patients received a SEMS for malignant obstruction. Suh et al., reviewed 55 patients treated with uncovered SEMS [4]. They found that stent occlusion caused by tumor ingrowth or overgrowth to be the most frequently encountered complication closely followed by perforation, stent migration, and bleeding. One patient developed an enterocolic fistula. Suzuki et al., reported 7 stent migrations and one fistula in 36 patients [5].

Three isolated case reports of fistula formation following SEMS placement were found in our literature review. Wada et al., reported a patient with Crohn's disease who suffered a stent perforation in a stenosed segment of sigmoid colon [6]. This developed into an ileosigmoid fistula. A deep ulcer was found in the resected specimen suggesting that the underlying disease process might be the reason for fistula formation rather than the metallic stent. Modarai et al., reported a case in which a 66 year old man



Fig. 1. 25 mm, 9 cm long WallFlex (Boston Scientific) colonic stent placed through a recurrent rectal cancer at a colorectal anastomosis. The patient later developed an enterocolic fistula from the upper end of the stent.

developed a tight anastomotic stricture after resection of a rectosigmoid junction carcinoma [7]. This was treated with a SEMS. Several months later, the stent had fractured, and a fistula developed to the distal ileum. Finally, Alvi and Pitt published a case report in which a patient developed an enterocolic fistula after receiving a stent for an obstructing left colonic tumor [8].

Fistula formation can lead to serious or debilitating complications, ranging from disturbance of fluid and electrolyte balance to sepsis and even mortality [9]. Symptoms caused by enterocolic fistulae vary depending on the location of the fistula and the amount of bowel bypassed. For this reason, enteroenteric fistulae in which only a short segment of bowel is bypassed may be asymptomatic and only diagnosed incidentally by imaging or during surgery. Symptomatic patients will typically experience severe discomfort and pain. Other presenting symptoms may include diarrhea, weight loss, distention, among other symptoms seen with bowel obstruction. The patient we report presented with diarrhea, nausea, and abdominal distention. Although this constellation of symptoms is nonspecific, they should raise suspicion for fistula formation in any patient known to have a self-expanding metallic stent.

An explanation that could explain why some patients experience enterocolic fistulae and others do not has not yet been proposed. This is likely related to the small sample size of the population under study. Perhaps inflammation may play a role. We hypothesize that patients with a preexisting inflammatory bowel are at higher risk of fistula formation due to the fact that their inflamed bowel places them at higher risk for complications that precede the development of an enterocolic fistula. The occurrence of fistula formation in patients with Crohn's disease is well documented [10–12]. Patients with ulcerative colitis do not experience this complication as their disease process does not involve the colon transmurally; therefore, epithelium from the inflamed colon does not come into contact with epithelium from the small bowel. Stent erosion would make this possible. Additionally, patients with preexisting ulcerative colitis are likely at increased risk for erosion as they are, in a sense, already partially eroded from ulcers extending through their mucosal and submucosal layers. As such, stent erosion may be “facilitated” in these patients. Documented contraindications for the use of SEMS in the treatment of malignant colorectal obstruction have previously been defined as tumor stenosis within 5 cm above the anocutaneous line or manifest incontinency [13]. Preexisting inflammatory bowel, while not a contraindication to SEMS placement, is likely a risk factor for our observed findings and may offer an explanation as to why our patient developed a fistula. More studies of enterocolic fistula formation in this context are required in order to properly evaluate the validity of our hypothesis.

4. Conclusion

In conclusion, self-expanding metal stents (SEMS) are increasingly being used as a treatment option for patients with malignant bowel obstructions who require immediate decompression. They may be used to avoid urgent surgery, as a bridge to resection

without diversion, or as a final palliative option, depending on the clinical scenario. Published studies have shown that SEMS offer a highly effective, safe, and less invasive option for patients when used for these purposes [1–4]. When complications do occur, they are most often perforations or occlusions [2–5]. Few large-scale studies have found enterocolic fistula formation to occur as a complication following SEMS placement, and only a few case reports have emerged demonstrating its existence. Although this complication is rare, clinicians should be aware of the common presenting signs and consider fistula formation in the appropriate clinical context. Here, we report an additional case and review the published literature to better understand the complications that can arise through the use of SEMS, remind clinicians of this potential adverse event, and encourage further studies to reduce SEMS complications.

Conflicts of interest statement, Funding statement, Consent section

All authors guarantee the accuracy and integrity of this article. We have no financial or other conflicts of interest to report. Our institutional IRB states that as no identifying information was used, consent for use of this material in print is unnecessary.

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