EDITORIAL

Removable colonic stenting: time to expand the indications?

The potential benefit of placing self-expanding metal stents for the management of benign colonic strictures was initially pioneered by radiologists and, more recently, has been embraced by GI endoscopists. The experience with colonic stenting for benign strictures, leaks, and fistulae has been increasing.[1-3] Colonic stenting has been used most frequently for a variety of benign strictures, including those related to inflammatory bowel disease, diverticular disease, ischemic injury, radiation injury, or surgical anastomoses.[1,4-8] The early experience involved use of stents not designed for removal, such as the enteral Wallstent (Boston Scientific, Natick, Mass), Ultraflex Precision Colonic Stents (Boston Scientific, Natick, Mass), and Colonic Memotherm (Bard, Billerica, Mass). These stents were most often placed on the left side of the colon following serial dilatations.[1,9,10] Reports of initial case series suggested a high success rate, providing luminal patency for up to 7.5 months, but the rate of migration was up to one third in certain series when used for benign indications.[1,11,12] Perforation occurred in 10% of patients in one series, with an overall complication rate of 38%.

Most available self-expandable metal stents (SEMS) used by GI endoscopists are neither designed nor intended to be removed. Tumor ingrowth or proliferation of granulation tissue often results in fixation, which precludes removal. Recent advancements in stent technology have resulted in the availability of GI stents that can be considered removable. The feasibility of temporary placement of partially covered SEMS for the management of biliary leaks has been reported.[13] Covered biliary SEMS were designed to prevent tissue ingrowth, but even these stents have uncovered areas at either end to anchor the stent, which may preclude removal. Removable self-expandable stents for use in the biliary tree, including bioabsorbable self-expanding stents, have been evaluated in animal models with limited success due to concerns regarding the reliability and safety of removal.[14-16] The application of this removable technology for use in the esophagus has been well documented for benign strictures refractory to standard dilatation, in the management of esophago-tracheal fistulae, and for management of esophageal malignant strictures during neoadjuvant therapy.

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Although the Ultraflex stent (Boston Scientific, Natick, Mass) and the Alimaxx-E stent (Alveolus, Charlotte, NC) are not intended to be removed after deployment, they are designed with blunted ends and a proximal grasping suture for narrowing of the stent to enhance repositioning. The Polyflex stent (Boston Scientific, Natick, Mass), a self-expanding plastic stent, is a specially designed polyester silicone-coated stent. The silicone coating, especially at the end, resists tissue ingrowth and hyperplasia, and the proximal flare improves stent fixation. The thin wall of the stent also allows for both postdeployment repositioning or removal by lengthwise elongation when stretched. The utility of this device is constrained by the requirement of a relatively large (12-14 mm) rigid introducer and the necessity of fluoroscopic guidance using a wire for appropriate positioning. Several removable stents designed specifically for use in the colon are also available, including a polyurethane fully covered removable stent (Stentech, Seoul, Korea), and a polytetrafluoroethylene fully covered removable stent (S&G Biotech, Seongnam, Korea).[17] Migration of these covered removable stents may occur.

> The acceptance and desirability of any palliative procedure requires assessment of the safety and efficacy of the procedure as compared to the alternatives.

The availability of removable stent technology based on fully covered standard self-expandable stents has proved attractive in the treatment of benign colonic strictures.[18,19] Clinically significant colorectal anastomotic strictures most commonly occur in the extraperitoneal distal rectum. The reported rate of stricture for these low colorectal anastomoses averages 8% and has been attributed to poor blood supply, localized sepsis, anastomotic microleakage, proximal diversion with disuse, radiation fibrosis, residual inflammatory bowel disease, or recurrent malignancy. Symptomatic strictures are often approached by dilation with variable results.[20,21] Case series of balloon dilatation of postoperative surgical anastomotic strictures show a complete response rate of 71% to 88%, often after multiple procedures, with a complication rate of up to 18%.[22,23] The success of endoscopic dilatation is not significantly reduced despite the

presence of a stapled anastomosis, postoperative leakage, or a history of radiotherapy.[23] The use of local steroid injections has been reported to improve the results of treatment of colonic anastomotic strictures refractory to initial treatment with balloon dilatation.[24] Surgical resection and reanastomosis may be considered when endoscopic balloon dilatation fails, but many of these patients have anastomoses that are too low to consider reanastomosis. Stricturoplasty, transanal anastomotic revision using a circular stapling device, endoscopic transanal resection of strictures (ETARS), and repeat dilations have all been described. The experience with removable stent technology in this area is limited, in part, due to the rigid nature of the delivery devices, which have constrained deployment to the accessible regions of the distal sigmoid and rectum. The Polyflex stent has been used for the management of postoperative anastomotic strictures. The placement of these stents requires fluoroscopy and is confined to the rectosigmoid area, but they appear to be effective and can be easily removed if necessary. Spontaneous migration often occurs when the stricture improves, thereby obviating the need for removal.[25,26]

The role of permanent SEMS in the management of malignant colonic obstruction is well documented. Data have shown the benefit of the placement of permanent colonic stents as a bridge to surgery and for palliation in nonoperative candidates.[1,27] The placement of stents to relieve obstruction as a prelude to definitive surgery is advantageous by allowing bowel cleansing and one-stage operation without diversion.[1] Even as a temporizing measure before the initiation of palliative chemoradiation therapy in patients not amenable to curative resection, placement of rectal stents can obviate the need for temporary diverting colostomy. In patients with incurable obstructing lesions who choose not to undergo palliative diversion, stenting offers a reasonable option, since obstruction as a terminal event is extremely undesirable. Patients with comorbid conditions who are poor operative candidates due to increased risk of anesthesia and surgery may be well served by placement of colonic stents; however, stenting of lower rectal lesions can be associated with significant discomfort.

The article by Song et al[28] in this month's *Gastrointestinal Endoscopy* expands the indications for rectal stent placement by establishing the feasibility of placing removable SEMS for obstructing lesions within 5 cm of the anal verge. The authors used 3 types of removable stents available in the authors' country and describe a technique for the delineation of the anal verge with an inflated Foley urinary catheter, which helps guide the distal fluoroscopic placement of these stents. One of the major advantages of this approach is the ability to simply remove the stent, should the discomfort be significant.

There is still a great deal of controversy and uncertainty regarding the appropriate palliative management of lower rectal obstructing lesions within 5 cm of the anal verge.[29,30] There are several available endoscopic options for the management of obstructing low rectal cancers. The use of laser recannulation typically requires multiple procedures and carries a significant risk of perforation. Surgical palliation may be preferable to nonoperative management in patients who are suitable operative candidates. Palliative resection may prevent future complications such as bleeding, re-obstruction, sacral nerve root invasion, pain, perforation (especially after chemoradiation therapy), invasion of contiguous structures, and fistula formation. Colostomy may also be preferable in bedridden or incontinent patients.

The acceptance and desirability of any palliative procedure requires assessment of the safety and efficacy of the procedure as compared to the alternatives. The article does not quantify the functional status of the patients or whether they were able to leave the hospital—critical elements in assessing the effectiveness of palliative therapy. The patient's quality of life (QOL), as measured by standardized instruments, is another issue not addressed, and ideally, the QOL should be measured against surgical palliation with colostomy. The problem of pain from distally placed rectal stents limits their usefulness, even if the pain can be controlled with narcotic analgesics. In the current study, there appears to be significant pain associated with the placement of these stents close to the anal verge, with 10 of the 16 patients in the lower stenting group experiencing pain. In patients who require stenting for obstruction following palliative chemoradiation, the anticipated survival is 30 to 180 days, as documented in this article.[28] The use of narcotics for pain control is a reasonable and acceptable short-term option in this group of desperately ill patients with advanced incurable disease who really are not suitable candidates for surgical palliation. Migration of low rectal stents into the sensate areas of the anal canal is the principle problem limiting stent placement in these circumstances. Lodging the distal flange in the mass above the dentate line is necessary to prevent anal canal pain. The presence of a large proximal flange may prevent migration, but may increase the rate of perforation.

Placement of SEMS for low lesions of the distal rectum may not be better palliation than colostomy in patients who accept surgery if the palliative procedure risks inducing a more serious condition. Perforation from stent placement that results in the need for more serious emergency surgery in a patient who is less well able to tolerate such an intervention is not good palliation.

In conclusion, the use of removable colonic stents may improve the accuracy of placement and decrease the degree of discomfort in the palliative management of lower rectal neoplasms. Despite the many promising applications for removable colonic stent technology, the paucity of technically suitable stents, especially for placement proximal to the rectosigmoid, remains a daunting problem. Further research into the development and use of endoscopically delivered removable colonic stents would be worthwhile.

DISCLOSURE

The authors report that there are no disclosures relevant to this publication.

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Abbreviations: ETARS, endoscopic transanal resection of strictures; QOL, quality of life; SEMS, self-expandable metal stents.

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