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Safety and Efficacy of Palliative Colorectal Stent Placement Using a Nasal Endoscope Technique

Taishi Hata, MD, PhD, Shiro Hayashi, MD,† Masakazu Miyake, MD, PhD,‡ Shunji Morita, MD, PhD,§ and Keizo Dono, MD, PhD§*

Abstract: The purpose of this study was to evaluate the safety and efficacy of palliative self-expanding metallic stent (SEMS) placement using a nasal endoscope technique in the context of colorectal malignant obstruction. Eighteen patients with malignant colorectal obstruction who underwent palliative SEMS insertion using a nasal endoscope technique at the Toyonaka Municipal Hospital from August 2005 to August 2011 were enrolled and retrospectively analyzed. In all cases, a guidewire could be inserted on the oral side of the tumor. The placement success rate was 94.4% (17/18), and the complication rate was 23.5% (4 cases). The stent migrated in 3 cases, and perforation occurred in 1 case following bevacizumab chemotherapy. These outcomes indicate that stenting is useful for terminal patients and that nasal endoscopy is useful in cases of difficult guidewire placement.

Key Words: advanced colorectal cancer, palliative care, self-expanding metallic stent, nasal endoscope

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About 30% of patients with colorectal cancer (CRC) present with obstructive symptoms, and 15% need emergency surgery.[1] However, emergency surgical treatment is generally avoided because surgical decompression (including colostomy or ileostomy and bypass surgery) is associated with high morbidity and mortality[2–5] and a negative impact on the patient's quality of life.[6]

Since the introduction of self-expanding metallic stent (SEMS) devices in the 1990s, some patients with bowel obstruction presenting as an emergency have been treated with a SEMS to restore luminal patency.[7–9] Following the first report in 1991 of the palliative use of metal stents by Dohmoto,[10] use of SEMS as an initial therapy for malignant bowel obstruction has increased.[11–13]

Palliative stenting seems to be a favorable therapeutic option in patients with unresectable CRC and a limited life expectancy. A systematic review by Watt et al[9] suggested that stent placement has positive outcomes compared with surgery, including shorter hospital stays and lower rates of adverse events.

When placing a stent, the most important step is inserting the guidewire at the oral side of the tumor. Usually, the endoscope is brought near the tumor, and the guidewire is inserted on the oral side. However, insertion of the guidewire is difficult for some locations, depending on the angle.

In recent years, a nasal endoscope has been used for upper gastrointestinal tract endoscopy. One feature of this scope is its slimness. With this endoscope, direct guidewire insertion into the oral side of the tumor is easily performed.

ELIGIBILITY CRITERIA

Patients with inoperable or recurrent malignancies were eligible for the study if they met the following criteria: life expectancy within 6 months; presence of colorectal stenosis symptoms; selection of stent placement instead of colostomy for the patient; stenosis region present from descending colon to rectum (because of the limited length and stiffness of the catheter delivery system); and provision of written informed consent.

Between August 2005 and September 2010, at Toyonaka Municipal Hospital, Osaka, Japan, 18 patients underwent palliative stent placement for inoperable malignant colonic obstruction, including 15 patients for primary CRC and 3 patients for extracolonic malignancies including gastric (n = 2) and cervical (n = 1) cancers.

FIGURE 1. Comparison of the tip diameter of the nasal endoscope GIF-N260 and CF-Q260A1, which is used for normal colonoscopy in our hospital. Tip diameter of the GIF-N260 is 4.9 mm and that of CF-Q260Ai is 12.2 mm.

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From the *Department of Gastroenterological Surgery, Graduate School of Medicine, Osaka University; ‡Department of Surgery, National Hospital Organization Osaka National Hospital, Osaka; Departments of †Gastroenterological Medicine; and §Gastroenterological Surgery, Toyonaka Municipal Hospital, Toyonaka, Japan.

The authors declare no conflicts of interest.

Reprints: Taishi Hata, MD, PhD, Department of Gastroenterological Surgery, Graduate School of Medicine, Osaka University, 2-2 E2 Yamadaoka, Suita, Osaka 565-0871, Japan (e-mail: thata@gesurg.med.osaka-u.ac.jp).

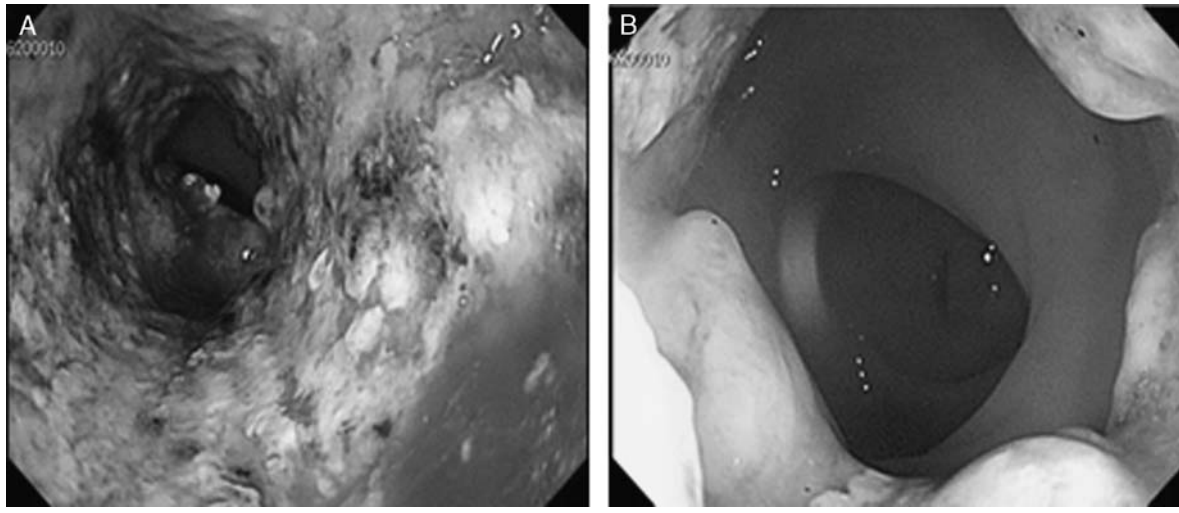

FIGURE 2. A nasal endoscope (B) could pass a stenosis site that was too narrow (A) for a normal endoscope.

STENT PLACEMENT

In patients undergoing palliative stenting, 2 expert endoscopists placed SEMS under fluoroscopy, using endoscopic methods. To avoid perforation, balloon dilation was not perfomed.[14,15] Because there was no insurance allowance for a through-the-scope colonic stent in Japan until May 2012, we used the proximal release type of Ultraflex Esophageal Stent System (23 mm diameter, 7 to 15 cm length, noncover type; Boston Scientific, Natick, MA). Stent length selection was based on the location and length of the stricture.

In some cases, placement of the guidewire was difficult, and for these cases, we used a nasal endoscope. Because the diameter tip of this endoscope is only 4.9 mm (Fig. 1), we were able to easily insert the scope on the oral side of the tumor. With a successful insert, guidewire placement was straightforward. Furthermore, by observing the mucosal state of the oral side with a monitor, we were able to collect detailed tumor information (length of the stenosis, position and presence or absence of obstructive colitis, etc.) (Fig. 2).

After the guidewire was sufficiently inserted on the oral side of the tumor, the nasal endoscope was withdrawn, and the stent was delivered along the guidewire using nasal endoscopy and fluoroscopic guidance (Fig. 3). After stent placement, we confirmed the location as well as the absence of complications such as perforation and bleeding. The procedure was completed. Water consumption was started immediately after the procedure. At 5 to 7 days after implantation, stent status was assessed through endoscopy and solid food was begun.

RESULTS

Of our 18 included patients (Table 1), 5 cases were rectal cancer, 8 were sigmoid colon cancer, 1 was local recurrence of rectal cancer, 2 cases were Douglas pouch metastasis of gastric cancer, and 1 case was local recurrence

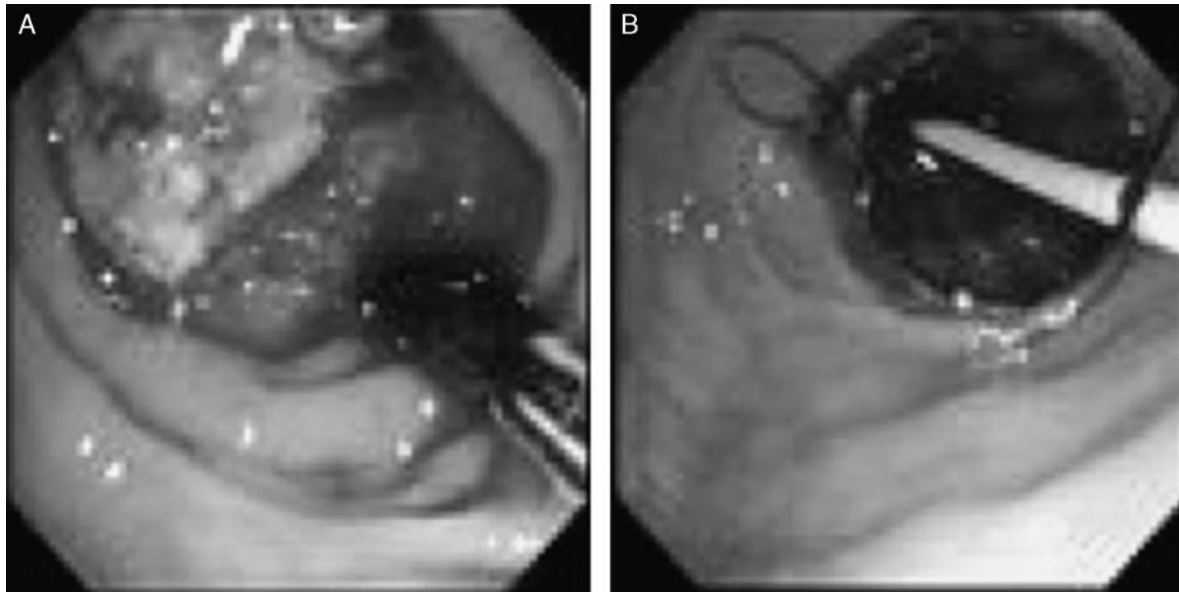

FIGURE 3. A, The stent was delivered along the guidewire. B, Opening the stent from proximal side.

TABLE 1. Patient Clinical Characteristics

Total number of patients	18
Male/female	12/6
Age [median (range)]	71 (50-84)
Site of obstruction	
Descending colon	0
Sigmoid colon	8
Rectum	10
Etiology	
Colorectal cancer	15
Extracolonic malignancies	3

of cervical cancer. The male:female ratio was 12:6, and the median age was 71 years (range, 50 to 84 y). Median placement time was 81 days (range, 8 to 768 d).

Outcomes are shown in Table 2. In all cases, the guidewire could be inserted on the oral side of the tumor. The placement success rate was 94.4% (17/18), and the rate of complications was 23.5% (4 cases; Table 3). In 3 of these 4 cases, stent migration occurred, and in 1 gastric cancer case, the migrated stent was removed under spinal anesthesia 1 week after the stent procedure. In the other 2 cases, the migration occurred because of a decreased tumor volume resulting from chemotherapy. In 1 patient started on chemotherapy (mFOLFOX6 + bevacizumab) at 13 days following the stent procedure, colon perforation occurred 23 days after the start of chemotherapy.

DISCUSSION

Previous studies have described SEMS as a favorable palliative treatment for patients with colorectal stenosis. One reason for stenting therapy for colorectal stenosis is to avoid creating a colostomy because colostomy care is a physical and mental burden to terminally ill patients.

Khot et al[7] reported a stent replacement technical failure rate of 8%, mainly for an inability to place a guidewire across the lesion. Unlike the upper gastrointestinal tract, gaining an anterior view of the colorectal stenosis lumen can be difficult, as can placement of a guidewire in such cases. Thus, we used nasal endoscopy for inserting the guidewire in these difficult cases. Because the nasal endoscope is slim (4.9 mm diameter), it can generally pass through a stenosis, unlike an ordinary colonoscopy scope. With successful insertion of the nasal endoscope on the oral side of the tumor, guidewire placement is easy. Furthermore, we were able to monitor tumor diameter and oral side mucosal status and could confirm the existence of stenosis colitis, an advantage over normal colonic endoscopy.

Our series included 3 cases of stent migration, all with external CRC stenosis. Usually, we used an uncovered stent. In these 3 cases, however, the site of the stenosis limited the ability of a noncovered stent to embed sufficiently in the mucosa. One case had perforation of the colon near the end of the stent following initiation of chemotherapy (FOLFOX + bevacizumab).[16] Bevacizumab is a monoclonal immunoglobulin G1 antibody directed against vascular endothelial growth factor (VEGF) that inhibits new blood vessel formation and growth.[17] Inhibition of VEGF by bevacizumab could cause thrombosis of smaller splanchnic or mesenteric vessels, leading to bowel ischemia and ultimately bowel perforation,[18] one of the reasons for gastrointestinal tract perforation with chemotherapy using bevacizumab. Bowel obstruction, chemotherapy-induced colitis, and tumor necrosis also are risk factors for gastrointestinal tract perforation. Thus, chemotherapy with bevacizumab after colonic stent insertion is considered a risk factor for perforation. Chau et al[19] reported 2 cases of perforation with bevacizumab after stent placement and recommended caution in these situations. Cennamo et al[20] reported on 2 colon cancer patients who received SEMS and developed bowel perforation with chemotherapy with 2.5 mg/kg bevacizumab. These authors concluded that stent placement is a risk factor for bowel perforation with bevacizumab, regardless of dose.

TABLE 2. Study Outcome

Stent length [median (range)] (cm)	10 (7-15)
No. stents: 1/2	17/1
Guidewire successes [n (%)]	18 (100)
Clinical successes [n (%)]	17 (98.4)
Complication [n (%)]	4 (22.2)
Survival [median (range)] (d)	81 (8-768)
Meal start time [median (range)] (d)	5 (5-7)

TABLE 3. Complications

Primary Disease	Complication
Douglas pouch metastasis (gastric cancer)	Migration (7 d)
Local recurrence (cervical cancer)	Migration after chemotherapy (458 d)
Sigmoid colon cancer	Migration after chemotherapy (768 d)
Rectal cancer	Perforation after chemotherapy (23 d)

CONCLUSIONS

Compared with palliative colostomy, stenting is useful for terminal CRC patients for both physical and mental outcomes. A nasal endoscope is useful for cases in which guidewire placement is difficult.

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