Prevention & Rescue for Colorectal Stent Re-stenosis

Sung Pil Hong, M.D., Ph.D.
Department of Internal Medicine and Institute of Gastroenterology, Yonsei University College of Medicine, Seoul, Korea

Introduction

Self-expandable metal stents (SEMSs) have been regarded as an alternative treatment for palliation of malignant colorectal obstruction. Since the first colonic stent placement was introduced in 1991 by Dohmoto, a lot of studies have demonstrated that SEMSs is a safe and effective therapy for palliation with better clinical outcomes and lower mortality than emergency surgery. With the advance in stenting techniques and devices, recent studies reported the technical and clinical success rates of SEMSs up to 90%. In the practice, SEMS is performed as for the palliative aim or bridge to surgery. Previous our study showed 95.8% of early success rate and favorable long-term patency for the palliative purpose. Furthermore, SEMS placement had positive outcomes, including shorter hospital stay, earlier administration of chemotherapy, and a lower rate of stoma formation than emergent surgery. As for bridge to surgery, SEMS insertion provides a safe single-stage surgical resection with higher primary anastomosis rates than emergent surgery in patients with resectable colorectal cancers (CRCs). Therefore, placement of SEMSs has been generally accepted as an initial treatment of malignant colorectal obstruction.

However, SEMS develops complications. A meta-analysis showed that re-obstruction rates were 12% (range, 1%-92%), migration 11% (range, 0%-50%), and perforation 4.5% (range, 1%-92%). Because of the modern polychemotherapy combined with targeted agents, the survival of patients with unresectable CRCs has been lengthening from 11-13 months to 14.8-21.5 months. Therefore, there has an increasing chance to develop re-obstruction in patients with CRCs after successful stenting. This issue covers the preventive and rescue therapy for re-stenosis of SEMS in patients with CRCs.

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Covered stent

Colon stents are classified into uncovered stents and covered stents. Our previous study showed that the median duration of first stent patency was 137 days (range 14-1217 days) in patients with unresectable colorectal cancers. However, during the follow-up period, 29.6% of patients developed re-obstruction due to stent migration, tumor outgrowth, or ingrowth. In this point of view, covered stents have been developed to reduce
re-obstruction.

There have been a few studies to compare the clinical efficacies of uncovered stents with covered stents. Moon et al. compared the clinical outcomes of covered Comvi stents (Taewoong Medical Co) with uncovered Niti-S D-type stents (Taewoong Medical Co) in 68 patients with obstructive CRCs. Technical success and clinical success were not different between the 2 groups (technical success, 100% in D-type vs. 93.5% in Comvi type; clinical success, 97.3% in D-type vs. 90.3% in Comvi type). Although stent re-obstruction was occurred only in D-type, the incidence of stent migration was high in Comvi type. There was no difference of the stent patency between the 2 groups. Park et al. conducted a randomized prospective single center study to compare the clinical efficacies between uncovered WallFlex stents (Boston Scientific Co) and covered Comvi stents (Taewoong Medical Co) in 151 patients with malignant colorectal obstruction. Among 151 patients, 120 were primary colorectal cancer and 31 were extracolonic malignancies. Technical and clinical successes were not statistically different between the 2 groups (technical success, 98.7% in WallFlex stent vs. 98.7% in Comvi stent; clinical success, 92.0% in WallFlex stent vs. 95.9% in Comvi stent). Stent re-obstruction due to tumor infiltration tended to be high in WallFlex stents (14.5%) compared to Comvi stents (3.8%, \( p = 0.057 \)). However, stent migration was significantly high in Comvi stents (21.1%) than WallFlex stent (1.8%, \( p = 0.002 \)). Stent patency was not different between the 2 groups (6 months in WallFlex stent vs. 7.3 months in Comvi stent). In conclusion, although theoretically covered stents have been developed to reduce stent re-obstruction by blocking tumor infiltration and increase the stent patency, recent studies failed to show any clinical advantage of covered stents with high incidence of stent migration. Therefore, further technical advances of SEMS are mandatory to reduce stent re-obstruction.

**Primary colectomy**

As mentioned above, because patients with metastatic CRC are expected to have long-term survival of more than 2 years due to the recent advances in chemotherapy with targeted agents, there have been growing concerns about the long-term clinical efficacy and safety of SEMSs. Several studies reported that stent-related late complications are fairly high (up to 50%). Our previous study showed that the median duration of first stent patency was significantly shorter than emergent surgery in patients with unresectable CRCs (137 days vs. 268 days, \( P < 0.001 \)). Therefore, it could be a therapeutic option of primary colectomy in patients with unresectable CRCs after successful stenting. Our unpublished data showed that 14 of 130 patients with unresectable obstructive CRCs received further primary colectomy after successful stenting. Compared with stent only group, primary colectomy group showed higher patency (507.5 days vs. 113.5 days, \( p = 0.002 \)). Although overall long-term complications were not different between the 2 groups (47.4% vs. 21.4%, \( p = .065 \)), patients in the SEMS only group needed more interventions (\( p = .025 \)) and hospitalizations (\( p = .034 \)) to manage complications than those in the colectomy group. Moreover, primary colectomy after successful endoscopic stenting was a negative predictive factor for reobstruction (odds ratio, 0.12; 95% CI, 0.02-0.99; \( PP = .049 \)). Therefore, primary colectomy after successful endoscopic stenting could be an alternative therapeutic option in unresectable CRC patients especially who expect long-term survival.
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Stent in-stent

Although the patency of first stent was significantly shorter than emergent surgery, our previous study showed the median duration of stent patency including second stent was comparable to the patency of the surgery in patients with unresectable CRCs (229 days vs. 268 days, $P=0.239$). Therefore, second stent is a first option for palliation of re-obstruction. A previous study showed that early clinical success of second stent was 75% in 36 patients, and the median duration of stent patency was 170 days. A long duration between the previous stent and second stent was the only predictive factor for clinical success. It seems that clinical outcomes of second stent are worse than first stent in patients with CRCs. An unpublished study compared the clinical efficacies of second stents with palliative surgery in patients with malignant colorectal obstruction after successful first stenting. The technical and early clinical success rates were 97.5% and 86.1%, respectively. Early and late complications of second stents were 13.9% and 15.2%, respectively. The lumen patency was significantly longer in palliative surgery than second stent (7.9 months vs. 3.4 months, $P=0.003$). Although clinical outcomes were greater in palliative surgery than second stent, procedure-related mortality was occurred only in palliative surgery. Therefore, second stent is an alternative treatment to relieve malignant colorectal obstruction, and palliative surgery should be considered for patients who have good performance and expect long-term survival.

Conclusions

Recent studies have shown that SEMS is a safe and an effective alternative therapy for palliation in patients with obstructive CRCs.

References

