



Fluoroscopy-guided colorectal stent placement for distal malignant colorectal obstruction: a retrospective single-center study

Aycan Uysal
 Mert Göl
 Devrim Akıncı
 Türkmen Turan Çiftçi
 Emre Ünal

Hacettepe University Hospital, Department of
Radiology, Ankara, Türkiye

PURPOSE

Malignant distal colorectal obstruction is associated with substantial morbidity and mortality when managed with emergency surgery. This study aimed to evaluate the technical and early clinical outcomes, safety, procedural radiation exposure, and stent-related reintervention of fluoroscopy-guided self-expandable metal stent (SEMS) placement.

METHODS

This retrospective single-center study included patients treated between January 2018 and December 2025. Bridge-to-surgery or palliative intent was established before stent placement and retrospectively abstracted from contemporaneous records. Primary end points were technical success and early clinical success within 48 hours. Secondary end points included adverse events within 30 days, stent-related reintervention, time to oral intake, total procedure time, fluoroscopy time, and dose-area product.

RESULTS

The cohort comprised 19 patients. Technical success was achieved in all patients [100%; 95% confidence interval (CI), 82.4%–100%], and early clinical success in 18 (94.7%; 95% CI, 74.0%–99.9%). Median time to oral intake was 3 days (interquartile range, 2–5 days). Median total procedure time was 38 minutes (range, 25–55 minutes). Median fluoroscopy time was 4.5 minutes (range, 3.8–8.0 minutes), and median dose-area product was 6.4 Gy·cm² (range, 5.1–8.8 Gy·cm²). One severe adverse event occurred (5.3%; 95% CI, 0.1%–26.0%): delayed perforation requiring surgery. No stent migration or 30-day mortality occurred. Stenting was performed with bridge-to-surgery intent in 5 patients and palliative intent in 14. All bridge-to-surgery patients underwent surgery after a median of 12 days; 3 underwent primary anastomosis and 2 required stoma creation. Among patients treated with palliative intent, 13 achieved early clinical success and 1 experienced clinical failure. One endoscopic reintervention for delayed stent dysfunction was performed at 150 days.

CONCLUSION

Fluoroscopy-guided SEMS placement achieved high technical and early clinical success in selected patients with distal malignant colorectal obstruction and may provide an effective interventional radiology–led decompressive option in experienced centers.

CLINICAL SIGNIFICANCE

Fluoroscopy-guided SEMS placement can provide timely decompression in selected patients with distal malignant colorectal obstruction within an interventional radiology–led multidisciplinary pathway, with endoscopic support available when needed.

KEYWORDS

Malignant colorectal obstruction, self-expandable metal stent, fluoroscopy, interventional radiology, bridge to surgery

Handling editor: İlkey İdilman

Corresponding author: Aycan Uysal

E-mail: aycanuysal@hotmail.com

Received 08 June 2026; revision requested 12 July 2026;
last revision requested 29 August 2026; accepted 03
September 2026.



Epub: 05.10.2026

DOI: 10.4274/dir.2026.264164

Acute malignant colonic obstruction (MCO) is the initial presentation of colorectal cancer in approximately 8%–13% of cases and remains a time-sensitive condition in which prompt decompression is a major determinant of short-term outcomes.¹ Malignant distal colorectal obstruction may also arise from locally recurrent colorectal cancer or extracolonic malignancies through direct invasion, extrinsic compression, or peritoneal dissemination.^{2,3} Emergency surgery in this setting is associated with substantial morbidity and mortality, particularly in patients who are physiologically vulnerable, and carries higher stoma rates, lower rates of primary anastomosis, and less frequent use of minimally invasive approaches. Meta-analyses further suggest that self-expandable metal stents (SEMSs) may improve short-term perioperative outcomes compared with urgent surgery, particularly by reducing postoperative morbidity and length of hospital stay.^{4,5}

Since the first radiology-based reports in the late 1990s, colorectal SEMS placement has evolved from a predominantly palliative intervention into an established component of MCO management.^{6,7} By restoring luminal patency, SEMS placement may convert an emergency presentation into a more favorable elective setting, facilitating physiologic optimization, completion of staging, and operative planning while increasing the likelihood of single-stage resection with primary anastomosis. Contemporary guidelines support SEMS use for palliation and, in selected patients, as a bridge to surgery, although uncertainties remain regarding patient se-

lection, long-term oncologic outcomes, and optimal procedural strategy.^{1,2}

Most available evidence derives from endoscopic stent placement performed with fluoroscopic support, whereas fluoroscopy-guided placement without routine endoscopic assistance remains less well characterized. Endoscopic support may be particularly useful for proximal lesions or markedly tortuous anatomy, whereas a transanal fluoroscopic approach may provide a more direct route to selected distal strictures. Fluoroscopy-guided SEMS placement should therefore be viewed as a complementary option within multidisciplinary care rather than as a competing alternative to endoscopy.^{2,3}

Distal lesions nevertheless pose distinct technical challenges, including angulation, luminal distortion, patient discomfort, tenesmus, and concerns regarding stent anchoring. Radiology-based and contemporary fluoroscopy-guided series have reported high technical and clinical success in selected cases of malignant colorectal obstruction, including distal lesions.^{7–10} Fluoroscopic placement may also provide a rescue option after failed endoscopic traversal.¹¹ Appropriate case selection should incorporate computed tomography (CT)-defined anatomy, the absence of perforation, the likelihood that focal decompression will restore clinically meaningful bowel passage, local expertise, and the availability of endoscopic support when needed.

At our institution, selected patients with distal malignant colorectal obstruction are managed using an interventional radiology–led fluoroscopic workflow, with endoscopic support available as needed. We evaluated this workflow in a contemporary single-center cohort that included primary colorectal tumors, malignant anastomotic recurrence, and extracolonic malignancies, focusing on technical and early clinical outcomes, adverse events, procedural radiation exposure, stent-related reintervention, and subsequent management after decompression.

Methods

Study design and patient selection

This retrospective single-center study was approved by the Hacettepe University Health Sciences Research Ethics Committee (decision number: SBA 26/067; date: January 20, 2026), and the requirement for individual informed consent was waived. All consecutive patients referred to the interventional radiology unit for fluoroscopy-guided stent-

ing of distal malignant colorectal obstruction between January 2018 and December 2025 were screened for inclusion.

Distal obstruction was defined anatomically as a malignant stenosis involving the distal sigmoid colon, rectosigmoid junction, or rectum; no fixed distance from the anal verge was used as an eligibility threshold. Eligible patients had clinical symptoms of large-bowel obstruction and contrast-enhanced CT evidence of a dominant malignant stenosis with upstream colonic dilatation, without evidence of perforation. Stenting was considered when focal decompression of the index lesion was expected to restore clinically meaningful bowel passage.

Peritoneal carcinomatosis alone was not considered an exclusion criterion. Patients were not offered stenting when CT demonstrated peritoneal disease causing multi-level obstruction, including small-bowel involvement, because isolated treatment of the distal colorectal lesion was unlikely to provide adequate decompression. Patients with proximal colonic obstruction were outside the study's prespecified scope. Treated patients were excluded from the analytic cohort when the indication was non-malignant or was not an obstructing colorectal lesion, including anastomotic leak, benign anastomotic stricture, tumor fistulization, and stenting after magnetic compression anastomosis in a patient with a colostomy and an obstructed anastomotic segment. The cohort derivation pathway is shown in Figure 1.

Multidisciplinary assessment and treatment intent

Most patients were referred by the general surgery service after clinical and contrast-enhanced CT evaluation; gastroenterology input was obtained when clinically feasible (Figure 2). Eligibility for fluoroscopy-guided stenting was determined jointly by interventional radiology, surgery, and oncology, considering lesion anatomy, disease extent, absence of perforation, the anticipated effectiveness of focal decompression, operability, and the planned oncologic pathway. Both endoscopic and fluoroscopic gastrointestinal stenting were available at our institution. For this distal cohort, fluoroscopy-guided placement was selected based on lesion location, CT-defined anatomy, procedural urgency, and local expertise. Endoscopic support was available if needed, but no combined procedure or same-session endoscopic assistance was required.

Main points

- Fluoroscopy-guided self-expandable metal stent placement achieved 100% technical success [95% confidence interval (CI), 82.4%–100%] and 94.7% early clinical success (95% CI, 74.0%–99.9%) in 19 patients with distal malignant colorectal obstruction.
- Safety was favorable, with one severe adverse event (5.3%) and no stent migration or 30-day mortality.
- Procedural radiation exposure was low, with a median fluoroscopy time of 4.5 minutes and a median dose-area product of 6.4 Gy·cm².
- All 5 patients treated with bridge-to-surgery intent underwent surgery after a median of 12 days, and 13 of 14 patients treated with palliative intent achieved early clinical success, with one delayed endoscopic reintervention.

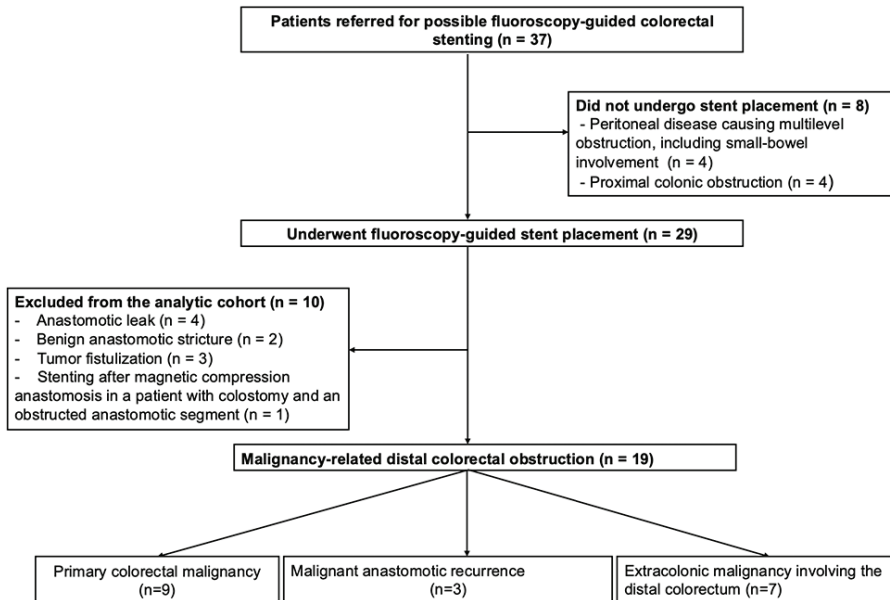


Figure 1. Flowchart of patient selection and analytic cohort derivation.

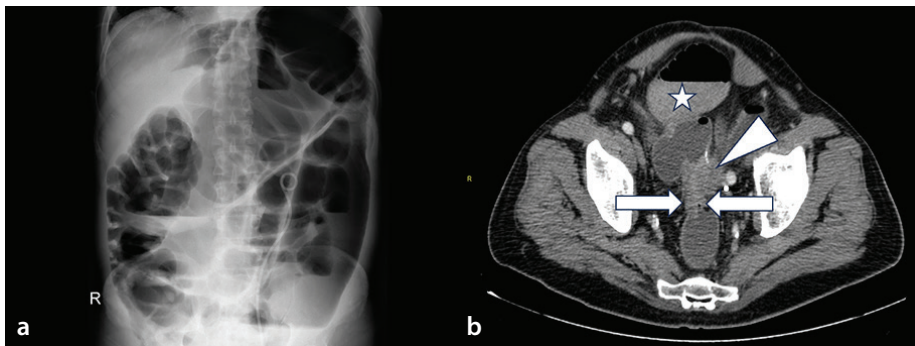


Figure 2. Preprocedural imaging of malignant anastomotic recurrence causing distal colorectal obstruction. (a) Upright abdominal radiograph demonstrates dilatation of colonic and small-bowel loops with multiple air-fluid levels, consistent with bowel obstruction. A left-sided double-J ureteral stent is also present. (b) Axial contrast-enhanced computed tomography image demonstrates recurrent tumor at the colorectal anastomosis (arrowhead), causing severe luminal narrowing (arrows) and upstream bowel dilatation (asterisk).

Bridge-to-surgery intent was established before stent placement in operable patients for whom elective resection after decompression was planned. Stenting was considered palliative when definitive resection was not planned because of unresectable or disseminated disease or the patient's overall clinical condition. Treatment intent was retrospectively abstracted from contemporaneous medical records. Because urgent decompression was often required, preprocedural tumor board review was not mandatory; subsequent management was reassessed after decompression and discussed in a multidisciplinary setting when indicated.

Preprocedural assessment

All patients underwent clinical evaluation and contrast-enhanced CT before intervention to confirm the level and extent of ob-

struction, estimate stricture length, assess proximal bowel dilatation, and exclude overt perforation or diffuse multilevel disease. Baseline laboratory evaluation included hemoglobin, white blood cell count, and serum albumin. American Society of Anesthesiologists (ASA) class and Eastern Cooperative Oncology Group (ECOG) performance status were recorded as baseline clinical variables. Procedures were performed in the angiography suite under anesthesiology monitoring, generally with conscious sedation and escalation to moderate sedation when required by patient cooperation or procedural tolerance; prophylactic antibiotics were administered.

Fluoroscopy-guided stent placement

All procedures were performed by an interventional radiologist with at least 10

years of experience in non-vascular interventional radiology. Patients were positioned in the left lateral decubitus position for fluoroscopy-guided stent placement. After anal cannulation, the stenotic segment was approached with a hydrophilic guidewire (Radifocus; Terumo, Tokyo, Japan) and a 5-Fr Bern or vertebral catheter (Boston Scientific, Marlborough, MA, USA). Once the obstructing segment had been traversed, water-soluble iodinated contrast material was injected to confirm intraluminal positioning proximal to the lesion and to delineate stricture length and morphology. An Amplatz stiff guidewire (Boston Scientific, Marlborough, MA, USA) was then advanced across the lesion, and a 9- or 10-Fr sheath was advanced over it for stent deployment. All patients were treated with uncovered nitinol SEMSs (Niti-S D-type colonic stent; TaeWoong Medical, Gimpo, South Korea). Stent diameter was standardized to 22 or 24 mm, and stent length was selected according to fluoroscopic stricture measurements to ensure coverage beyond both lesion margins. Overlapping stents were used at the operator's discretion for selected long-segment or multifocal strictures.

At the end of the procedure, fluoroscopy was used to confirm stent position, expansion, and restoration of luminal passage (Figure 3). No balloon dilation was performed before or after stent deployment. Low-pulse-rate fluoroscopy was used at 7.5 pulses/s, with collimation whenever feasible and without routine angiographic or digital subtraction acquisitions. Total procedure time was defined as the interval from initial transanal cannulation to final fluoroscopic confirmation of stent position and luminal passage and was retrospectively abstracted from the procedural records. Fluoroscopy time and dose-area product were recorded by the fluoroscopy system.

Postprocedural follow-up

Following stent placement, patients were monitored for abdominal distension, pain, passage of flatus and stool, and tolerance of oral intake. Abdominal radiographs were obtained during the initial hospitalization, and CT was performed selectively in patients with persistent or recurrent symptoms or suspected perforation, stent migration, or recurrent obstruction (Figure 4). Subsequent follow-up was not protocolized and was reconstructed from available inpatient records, outpatient surgical and oncologic assessments, and follow-up imaging. Follow-up ended at definitive surgery, death, stent-re-

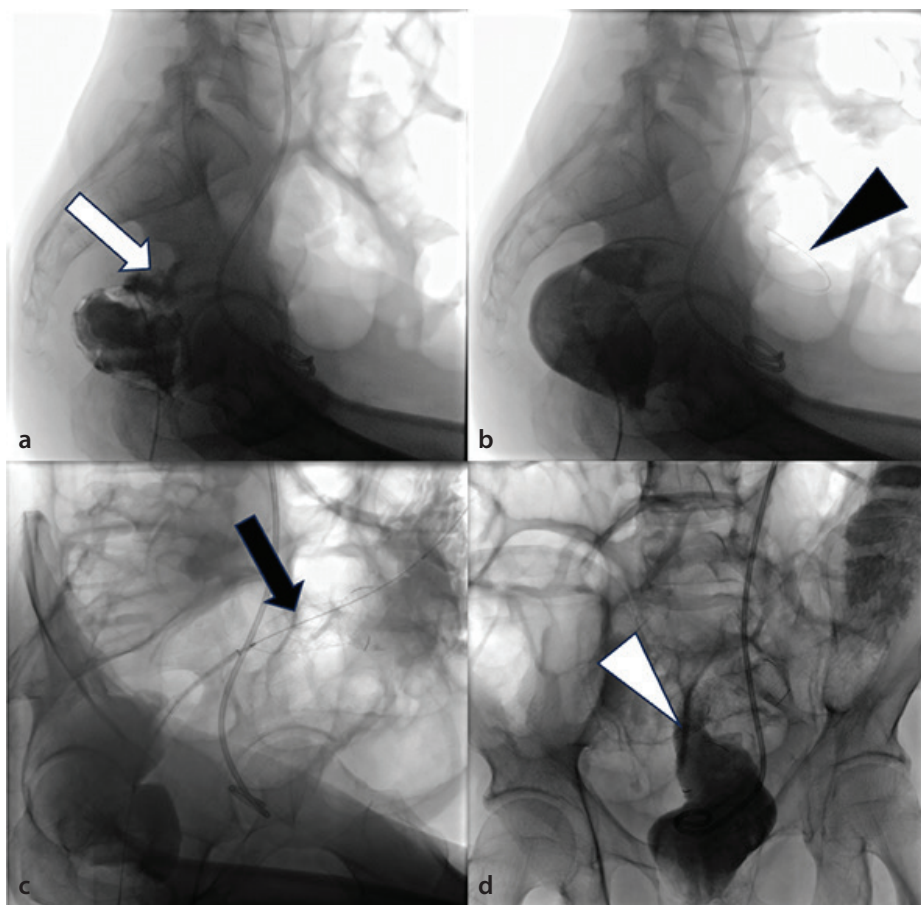


Figure 3. Fluoroscopy-guided colorectal stent placement for malignant obstruction. (a) Transanal catheterization and injection of water-soluble contrast material delineate the focal malignant stenosis and transition point (white arrow). (b) The stenotic segment is traversed with a hydrophilic guidewire (black arrowhead). (c) An uncovered self-expandable metal stent is deployed across the stenosis (black arrow). (d) Contrast passage through the expanded stent confirms restoration of luminal patency (white arrowhead).

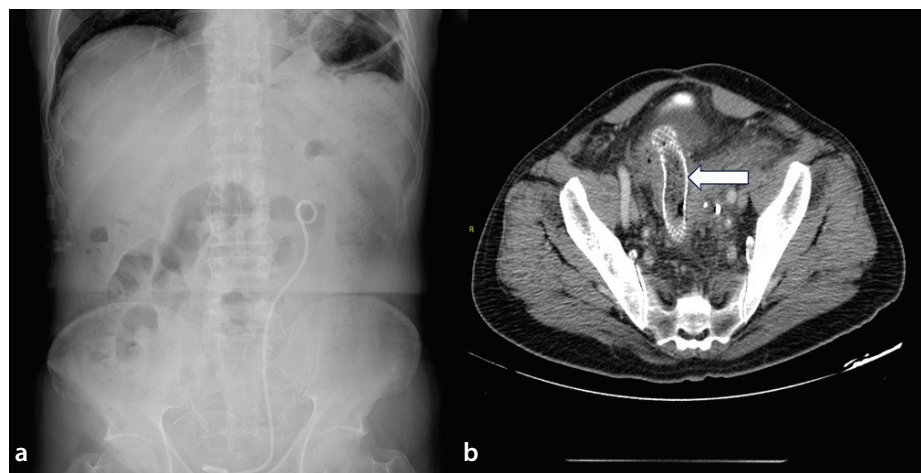


Figure 4. Early postprocedural imaging following colorectal stent placement. The patient showed clinical improvement, with reduced abdominal distension and passage of flatus and stool within 24 hours. (a) Upright abdominal radiograph obtained on postprocedural day 8 demonstrates marked reduction in bowel dilatation and air-fluid levels. (b) Axial contrast-enhanced computed tomography image demonstrates the expanded rectosigmoid stent (arrow) with restored luminal patency.

lated reintervention, or the last documented clinical encounter.

Definitions and study end points

The primary end points were technical success and early clinical success. Technical success was defined as successful fluoroscopic deployment of the stent across the target lesion, with satisfactory coverage of the stenotic segment and restoration of luminal passage on contrast assessment. Early clinical success was defined as improvement in obstructive symptoms with passage of flatus and/or stool within 48 hours, without the need for urgent alternative decompression. Time to oral intake was evaluated separately as a secondary outcome.

Secondary end points included total procedure time, fluoroscopy time, dose-area product, time to oral intake, stent migration, adverse events within 30 days, 30-day mortality, and stent-related reintervention. Stent dysfunction was defined as recurrent obstructive symptoms attributable to the treated segment that prompted endoscopic, radiologic, or surgical reintervention. The stent-related reintervention-free interval was defined as the time from stent placement to the first intervention for documented stent dysfunction. In patients without stent-related reintervention, follow-up ended at the time of definitive surgery, death, or the last documented clinical assessment.

Migration was defined as radiographic displacement of the stent from its original position, regardless of clinical consequence. Adverse events were retrospectively classified according to the Society of Interventional Radiology adverse-event severity scale.¹² Routine endoscopic reassessment was not performed.

Statistical analysis

Continuous variables were summarized as median [interquartile range (IQR)] or range, as appropriate, and categorical variables as counts and percentages. Exact two-sided 95% confidence intervals (CIs) for proportional outcomes were calculated using the Clopper-Pearson method. Because of the small sample size and descriptive study design, no formal between-group hypothesis testing was performed. Stent-related reintervention and the corresponding interval were reported descriptively. Formal time-to-event analysis of stent patency was not performed because follow-up was non-protocolized and definitive surgery and death represented frequent competing events. Statistical analyses

were performed using IBM SPSS Statistics, version 26.0 (IBM Corp., Armonk, NY, USA).

Results

Cohort derivation

During the study period, 37 patients were referred for possible fluoroscopy-guided colorectal stenting. Eight did not undergo stenting: 4 had peritoneal disease causing multilevel obstruction, including small-bowel involvement, and 4 had proximal colonic obstruction outside the prespecified scope of the study. Among the remaining 29 treated patients, 10 were excluded because the indication was not distal malignant colorectal obstruction, including anastomotic leak ($n = 4$), benign anastomotic stricture ($n = 2$), tumor fistulization ($n = 3$), and stenting after magnetic compression anastomosis in a patient with a colostomy and an obstructed anastomotic segment ($n = 1$). The final analytic cohort comprised 19 patients: 9 with primary colorectal malignancy, 3 with malignant anastomotic recurrence after rectal cancer surgery, and 7 with extracolonic malignancy involving the distal colorectum (Figure 1).

Baseline and lesion characteristics

The cohort included 19 patients (10 men and 9 women) with a median age of 67 years (IQR, 54–76.5 years); ASA class was II in 11 patients and III in 8 patients, and ECOG performance status was 0 in 6 patients, 1 in 9 patients, and 2 in 4 patients. Median hemoglobin was 11.4 g/dL (IQR, 10.0–12.3 g/dL), median white blood cell count was $8.8 \times 10^9/L$ (IQR, $4.9\text{--}13.6 \times 10^9/L$), and median serum albumin was 3.2 g/dL (IQR, 2.7–3.7 g/dL); hypoalbuminemia was present in 13 of 18 patients with available values. Peritoneal metastases or carcinomatosis were present in 12 patients (63%). The etiology of obstruction was primary colorectal malignancy in 9 patients, malignant anastomotic recurrence in 3, and extracolonic malignancy in 7. The treated obstruction was located in the rectum ($n = 10$), rectosigmoid junction ($n = 5$), or sigmoid colon ($n = 4$). Median fluoroscopic stricture length was 6.5 cm (IQR, 5.0–7.5 cm), median distance from the anal verge was 12.5 cm (IQR, 7.0–16.5 cm), and median stent length was 10 cm (IQR, 9–12 cm) (Table 1).

Procedural and early clinical outcomes

Technical success was achieved in all 19 patients (100%; 95% CI, 82.4%–100%), and early clinical success was achieved in 18 patients (94.7%; 95% CI, 74.0%–99.9%). Me-

dian total procedure time was 38 minutes (range, 25–55 minutes). Median fluoroscopy time was 4.5 minutes (range, 3.8–8.0 minutes), and median dose-area product was 6.4 Gy·cm² (range, 5.1–8.8 Gy·cm²). Median time to oral intake was 3 days (IQR, 2–5 days). One severe adverse event occurred (1/19, 5.3%; 95% CI, 0.1%–26.0%): delayed perforation on postprocedural day 6 requiring surgery. No stent migration or 30-day mortality was observed (0/19 for each; 95% CI, 0%–17.6%) (Table 2).

Technical success was achieved in all etiologic subgroups. Early clinical success was achieved in 9 of 9 patients with primary colorectal malignancy, 2 of 3 with malignant anastomotic recurrence, and 7 of 7 with extracolonic malignancy. The only clinical failure and severe adverse event occurred in the malignant anastomotic recurrence group. In a patient with clinical failure, a retrospective review suggested that traction and fixed angulation due to desmoplastic peritoneal dis-

ease limited effective bowel passage despite restoration of luminal patency in the treated segment. Because of the small subgroup sizes, no formal between-group comparisons were performed (Table 3).

Treatment intent, subsequent management, and stent-related reintervention

Stenting was performed with bridge-to-surgery intent in 5 patients and palliative intent in 14. All 5 bridge-to-surgery patients subsequently underwent surgery at 4, 7, 12, 12, and 15 days after stent placement, corresponding to a median interval of 12 days (IQR, 7–12 days). Three underwent resection with primary anastomosis, and 2 required stoma creation. In both patients who required stoma creation, the operative course reflected additional intra-abdominal disease burden or multilevel obstruction rather than a technical failure at the index stent site. In 1 bridge-to-surgery patient, only partial symptomatic relief was documented due to

Table 1. Baseline clinical and lesion characteristics of the analytic cohort ($n = 19$)

Variable	Value
Age, years	67 (IQR, 54–76.5)
Male sex	10/19 (52.6%)
Female sex	9/19 (47.4%)
ASA class II	11/19 (57.9%)
ASA class III	8/19 (42.1%)
ECOG performance status 0	6/19 (31.6%)
ECOG performance status 1	9/19 (47.4%)
ECOG performance status 2	4/19 (21.1%)
Hemoglobin, g/dL	11.4 (IQR, 10.0–12.3)
White blood cell count, $\times 10^9/L$	8.8 (IQR, 4.9–13.6)
Serum albumin, g/dL	3.2 (IQR, 2.7–3.7)
Hypoalbuminemia (< 3.5 g/dL)	13/18 (72.2%)
Peritoneal metastases/carcinomatosis	12/19 (63.2%)
Etiology of obstruction	
Primary colorectal malignancy	9/19 (47.4%)
Malignant anastomotic recurrence after rectal cancer surgery	3/19 (15.8%)
Extracolonic malignancy involving the distal colorectum	7/19 (36.8%)
Treated lesion location	
Rectum	10/19 (52.6%)
Rectosigmoid junction	5/19 (26.3%)
Sigmoid colon	4/19 (21.1%)
Fluoroscopic stricture length, cm	6.5 (IQR, 5.0–7.5)
Distance from the anal verge, cm	12.5 (IQR, 7.0–16.5)
Stent length, cm	10.0 (IQR, 9.0–12.0)
Overlapping stents used	1/19 (5.3%)

Data are presented as median (IQR) or n/N (%). Etiologic categories are mutually exclusive. Stricture length was measured fluoroscopically after delineating the stenotic segment with contrast. Extracolonic malignancies included breast cancer ($n = 2$) and pancreatic, bladder, ovarian, cervical, and gallbladder cancer ($n = 1$ each). ASA, American Society of Anesthesiologists; ECOG, Eastern Cooperative Oncology Group; IQR, interquartile range.

a second obstructive process involving the transverse mesocolon rather than stent-site failure.

Among the 14 patients treated with palliative intent, 13 achieved early clinical suc-

cess and continued palliative management; 1 experienced clinical failure and underwent surgery for delayed perforation. Among the 13 patients who achieved early clinical success and continued palliative management, median available follow-up was 35 days (IQR,

17–90 days). Among all 14 patients treated with palliative intent, 1 (7.1%) underwent endoscopic reintervention for delayed stent dysfunction at 150 days; this event occurred in a patient who had achieved early clinical success. No additional stent-related reintervention was documented before death or the last available clinical follow-up. Fluoroscopy-guided stent placement was successful in 1 patient after failed colonoscopic traversal (Table 4).

Discussion

This retrospective single-center study demonstrated high technical and early clinical success for fluoroscopy-guided SEMS placement in selected patients with distal malignant colorectal obstruction. This study adds contemporary outcome data on an interventional radiology–led fluoroscopic workflow in a distal cohort that included primary colorectal malignancy, malignant anastomotic recurrence, and extracolonic malignancy. The findings should be interpreted

Table 2. Procedural and early clinical outcomes of fluoroscopy-guided SEMS placement (n = 19)

Outcome	Value	95% CI
Technical success	19/19 (100%)	82.4%–100%
Early clinical success within 48 hours	18/19 (94.7%)	74.0%–99.9%
Time to first oral intake, days	3 (IQR, 2–5)	—
Total procedure time, minutes	38 (range, 25–55)	—
Fluoroscopy time, minutes	4.5 (range, 3.8–8.0)	—
Dose-area product, Gy·cm ²	6.4 (range, 5.1–8.8)	—
Severe adverse events within 30 days	1/19 (5.3%)	0.1%–26.0%
Delayed perforation requiring surgery	1/19 (5.3%)	0.1%–26.0%
Stent migration	0/19 (0%)	0%–17.6%
Thirty-day mortality	0/19 (0%)	0%–17.6%

Data are presented as median (interquartile range), median (range), range, or n/N (%), as appropriate. Confidence intervals for proportions are exact two-sided 95% CIs calculated using the Clopper–Pearson method. The severe adverse event was a delayed perforation on postprocedural day six requiring surgery. CI, confidence interval; IQR, interquartile range; SEMS, self-expandable metal stent.

Table 3. Descriptive outcomes according to the etiology of distal malignant colorectal obstruction

Etiology	n	Technical success	Early clinical success within 48 hours	Severe adverse events within 30 days
Primary colorectal malignancy	9	9/9 (100%; 95% CI, 66.4%–100%)	9/9 (100%; 95% CI, 66.4%–100%)	0/9 (0%; 95% CI, 0%–33.6%)
Malignant anastomotic recurrence	3	3/3 (100%; 95% CI, 29.2%–100%)	2/3 (66.7%; 95% CI, 9.4%–99.2%)	1/3 (33.3%; 95% CI, 0.8%–90.6%)
Extracolonic malignancy involving the distal colorectum	7	7/7 (100%; 95% CI, 59.0%–100%)	7/7 (100%; 95% CI, 59.0%–100%)	0/7 (0%; 95% CI, 0%–41.0%)

Data are presented as n/N (%), with exact two-sided 95% CIs calculated using the Clopper–Pearson method. Etiologic categories are mutually exclusive. The only clinical failure and severe adverse event occurred in the malignant anastomotic recurrence group. No formal comparisons were performed because of the small subgroup sizes. CI, confidence interval.

Table 4. Treatment intent, subsequent management, and stent-related reintervention

Treatment intent/clinical course	n (%)	Additional details
Bridge-to-surgery intent	5/19 (26.3%)	Intent established before stent placement in operable patients with planned elective resection after decompression
Subsequent surgery after bridge-to-surgery stenting	5/5 (100%)	Surgery at 4, 7, 12, 12, and 15 days; median interval, 12 days (IQR, 7–12)
Primary anastomosis	3/5 (60.0%)	—
Stoma creation	2/5 (40.0%)	Associated with additional intra-abdominal disease burden or multilevel obstruction rather than technical failure at the index stent site
Palliative intent	14/19 (73.7%)	Definitive resection was not planned because of unresectable or disseminated disease or overall clinical condition
Early clinical success in patients treated with palliative intent	13/14 (92.9%)	—
Clinical failure in patients treated with palliative intent	1/14 (7.1%)	Delayed perforation on postprocedural day 6 requiring surgery
Continued palliative management after successful decompression	13/14 (92.9%)	Median available follow-up, 35 days (IQR, 17–90)
Stent-related endoscopic reintervention in patients treated with palliative intent	1/14 (7.1%)	Endoscopic revision for delayed stent dysfunction at 150 days

Data are presented as n/N (%) or median (IQR), as appropriate. Bridge-to-surgery and palliative intent were established before stent placement and retrospectively abstracted from contemporaneous medical records. Follow-up was not protocolized and ended at definitive surgery, death, stent-related reintervention, or the last documented clinical encounter. IQR, interquartile range.

in the context of careful case selection and substantial operator experience.

Our overall outcomes compare favorably with those reported in previously fluoroscopy-guided series. Zeng et al.⁹ reported technical and clinical success rates of 97.5% and 96.6%, respectively, whereas Wan et al. reported corresponding rates of 98.5% and 95.5% in malignant rectal obstruction.¹⁰ In the present cohort, technical success was achieved in all three etiologic subgroups. Early clinical success was achieved in all patients with primary colorectal and extracolonic malignancy and in 2 of 3 patients with malignant anastomotic recurrence. The only clinical failure and severe adverse event occurred in the anastomotic recurrence group, although the small subgroup sizes preclude meaningful comparisons among etiologies.

Our cohort largely comprised patients with advanced metastatic disease, many of whom had peritoneal metastases or carcinomatosis and were not candidates for definitive surgery. In most patients, SEMS placement provided clinically meaningful decompression without the need for immediate emergency surgery, as reflected by early symptom relief and resumption of oral intake. By relieving obstruction and often preserving intestinal continuity, stenting may also facilitate subsequent oncologic and supportive care. In this context, SEMS may serve not only as a local decompressive measure but also as a practical component of palliative oncologic management.

Our institutional workflow consisted of prompt surgical referral; contrast-enhanced CT review; multidisciplinary assessment of whether focal distal decompression was likely to restore bowel passage; fluoroscopy-guided transanal stent placement by an interventional radiologist with at least 10 years of non-vascular interventional radiology experience under anesthesiology monitoring; and postprocedural reassessment by surgery and oncology. Endoscopic colorectal stenting at our institution is performed by the gastroenterology service through a separate clinical workflow. In contrast, the patients in the present cohort were referred to interventional radiology predominantly by general surgery, with gastroenterology consultation obtained when clinically appropriate. Endoscopic support was available if needed, but no combined procedure or same-session endoscopic assistance was required. Because a complete cross-service, procedure-specific registry was unavailable and referral pathways and case selection

differed between services, a reliable contemporaneous comparison could not be performed. Accordingly, the present study was intended to describe our interventional radiology-led fluoroscopic workflow rather than to establish superiority over endoscopic techniques.

The distinction between technical and clinical success is particularly relevant in advanced or anatomically complex diseases. The only clinical failure occurred despite technically successful stent deployment in a patient with malignant anastomotic recurrence and peritoneal carcinomatosis. Retrospective review suggested that traction and angulation related to desmoplastic peritoneal disease limited effective passage despite restoration of luminal patency. This case illustrates that correct stent deployment does not invariably provide adequate decompression when fixed angulation or multifocal disease persists. Similarly, in a patient who subsequently underwent surgery, the index stent provided only partial symptomatic relief because of a second obstructive process involving the transverse mesocolon rather than failure at the treated segment. These observations underscore the importance of distinguishing focal technical success from the overall clinical effect of decompression in patients with extensive intra-abdominal disease.

SEMS placement may convert an emergency presentation into a more controlled operative pathway in appropriately selected patients. Pooled analyses have reported high technical and clinical success, favorable primary anastomosis rates, and low perioperative mortality in the bridge-to-surgery setting.⁵ More recent evidence suggests lower morbidity and stoma rates than emergency resection without a clear adverse effect on disease-free or overall survival in selected patients with left-sided MCO.¹³ The interval from stent placement to surgery may also be individualized after successful decompression.¹⁴ In our cohort, bridge-to-surgery intent was established before stent placement in five operable patients, all of whom subsequently underwent surgery after a median of 12 days. Three underwent primary anastomosis, whereas two required stoma creation due to additional intra-abdominal disease burden or multilevel obstruction.

Palliative stenting may relieve obstruction while avoiding emergency surgery and reducing stoma burden in patients without a planned definitive resection. Meta-analytic data suggest shorter hospitalization and

lower early morbidity than surgery, although later reintervention is more frequent.¹⁵⁻¹⁷ In the present cohort, 13 of 14 patients treated with palliative intent achieved early clinical success. Among the 13 patients who continued palliative management, 1 underwent endoscopic reintervention for delayed stent dysfunction at 150 days, and no additional stent-related reintervention was documented before death or the last available follow-up. These findings indicate effective short-term decompression in most patients but should not be interpreted as evidence of durable stent patency, given the median follow-up of 35 days, the non-protocolized assessment, and the frequent occurrence of death as a competing event. Although patient-reported quality of life was not assessed, symptom relief and resumption of oral intake provided pragmatic indicators of early clinical recovery.

Procedural radiation exposure was also evaluated. Median fluoroscopy time was 4.5 minutes (range, 3.8–8.0 minutes), and median dose-area product was 6.4 Gy-cm² (range, 5.1–8.8 Gy-cm²), within a fluoroscopy-only workflow using 7.5 pulses/s and no routine angiographic or digital subtraction acquisitions. Median total procedure time was 38 minutes (range, 25–55 minutes). These measurements are provided as procedural reference data rather than comparative benchmarks, because radiation exposure and procedure duration are influenced by equipment, patient habitus, lesion complexity, collimation, and institutional technique.

This study has several limitations. First, its retrospective, single-center design and small sample size limit precision and preclude meaningful statistical comparisons among etiologic subgroups. Second, the cohort was clinically heterogeneous and restricted to distal obstruction, which limits generalizability to proximal lesions. Third, procedures were performed by a single interventional radiologist with at least 10 years of non-vascular interventional radiology experience; therefore, the high technical success may not be directly reproducible in centers with less experience. Moreover, a complete cross-service, procedure-specific registry of endoscopy-assisted colorectal SEMS procedures was unavailable, precluding a reliable contemporaneous comparison; differences in referral pathways and case selection also introduced potential selection bias. A prospective study based on a shared procedure-specific registry would provide a more appropriate framework for comparing fluoroscopic and endoscopic workflows. Fol-

low-up was not protocolized and was reconstructed from clinical records and available imaging, creating a risk of incomplete event ascertainment. The short follow-up in the palliative group and the frequent competing events of death and definitive surgery precluded formal time-to-event analysis of stent patency. Finally, quality of life was not formally assessed, and the clinical benefit of decompression was inferred from symptom improvement, passage of flatus or stool, and resumption of oral intake.

Fluoroscopy-guided SEMS placement achieved high technical and early clinical success in selected patients with distal malignant colorectal obstruction. Within an experienced, multidisciplinary setting, it may provide an effective interventional radiology-led option for bridge-to-surgery decompression and palliation. The small cohort, absence of a comparative group, and non-protocolized follow-up warrant cautious interpretation and further evaluation in larger studies.

Footnotes

Conflict of interest disclosure

The authors declared no conflicts of interest.

References

1. Mauro A, Scalvini D, Borgetto S, et al. Malignant acute colonic obstruction: multidisciplinary approach for endoscopic management. *Cancers (Basel)*. 2024;16(4):821. [\[Crossref\]](#)
2. van Hooft JE, Veld JV, Arnold D, et al. Self-expandable metal stents for obstructing colonic and extracolonic cancer: European Society of Gastrointestinal Endoscopy (ESGE) Guideline - update 2020. *Endoscopy*. 2020;52(5):389-407. [\[Crossref\]](#)
3. Cardoso PM, Rodrigues-Pinto E. Self-expandable metal stents for obstructing colon cancer and extracolonic cancer: a review of latest evidence. *Cancers (Basel)*. 2024;17(1):87. [\[Crossref\]](#)
4. Zhao XD, Cai BB, Cao RS, Shi RH. Palliative treatment for incurable malignant colorectal obstructions: a meta-analysis. *World J Gastroenterol*. 2013;19(33):5565-5574. [\[Crossref\]](#)
5. Tomita M, Saito S, Makimoto S, et al. Self-expandable metallic stenting as a bridge to surgery for malignant colorectal obstruction: pooled analysis of 426 patients from two prospective multicenter series. *Surg Endosc*. 2019;33(2):499-509. [\[Crossref\]](#)
6. Choo IW, Do YS, Suh SW, et al. Malignant colorectal obstruction: treatment with a flexible covered stent. *Radiology*. 1998;206(2):415-421. [\[Crossref\]](#)
7. de Gregorio MA, Mainar A, Tejero E, et al. Acute colorectal obstruction: stent placement for palliative treatment--results of a multicenter study. *Radiology*. 1998;209(1):117-120. [\[Crossref\]](#)
8. Kim H, Kim SH, Choi SY, et al. Fluoroscopically guided placement of self-expandable metallic stents and stent-grafts in the treatment of acute malignant colorectal obstruction. *J Vasc Interv Radiol*. 2008;19(12):1709-1716. [\[Crossref\]](#)
9. Zeng Z, Liu Y, Wu K, Li D, Lai H, Zhang B. Efficacy and safety of fluoroscopy-guided self-expandable metal stent placement for treatment of malignant colorectal obstruction. *Dig Dis Sci*. 2023;68(3):939-947. [\[Crossref\]](#)
10. Wan Y, Zou MS, Li D, Wu HH, Zhang B. Determinants of clinical success and complications in fluoroscopy-guided self-expandable metal stent for treatment of malignant rectal obstruction. *Clin Radiol*. 2025;84:106869. [\[Crossref\]](#)
11. Kim DR, Yoon CJ, Lee JH, Choi WS. Fluoroscopic rescue of failed endoscopic stent placement for obstructing colorectal malignancy. *AJR Am J Roentgenol*. 2020;214(1):213-217. [\[Crossref\]](#)
12. Baerlocher MO, Nikolic B, Sze DY. Adverse event classification: clarification and validation of the Society of Interventional Radiology Specialty-Specific System. *J Vasc Interv Radiol*. 2023;34(1):1-3. [\[Crossref\]](#)
13. McHugh FT, Ryan EJ, Ryan OK, et al. Management strategies for malignant left-sided colonic obstruction: a systematic review and network meta-analysis of randomized controlled trials and propensity score matching studies. *Dis Colon Rectum*. 2024;67(7):878-894. [\[Crossref\]](#)
14. Suh JW, Oh HK, Lee J, et al. Safety of early surgery after self-expandable metallic stenting for obstructive left-sided colorectal cancer. *Surg Endosc*. 2023;37(5):3873-3883. [\[Crossref\]](#)
15. Veld J, Umans D, van Halsema E, et al. Self-expandable metal stent (SEMS) placement or emergency surgery as palliative treatment for obstructive colorectal cancer: a systematic review and meta-analysis. *Crit Rev Oncol Hematol*. 2020;155:103110. [\[Crossref\]](#)
16. Ma B, Ren T, Cai C, Chen B, Zhang J. Palliative procedures for advanced obstructive colorectal cancer: a systematic review and meta-analysis. *Int J Colorectal Dis*. 2024;39(1):148. [\[Crossref\]](#)
17. Rotaru V, Chitoran E, Gullo G, Mosoiu DV, Simion L. Self-expanding metal stents as an alternative to palliative surgery in advanced obstructive colorectal cancer-a systematic review and meta-analysis. *J Clin Med*. 2025;14(12):4339. [\[Crossref\]](#)