Primary colon resection or Hartmann's procedure in malignant left-sided large bowel obstruction? The use of stents as a bridge to surgery

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Abstract
There is still significant debate regarding the best surgical treatment for malignant left-sided large bowel obstruction. Primary resection and anastomosis offers the advantages of a definite procedure without need for further surgery. Its main disadvantages are related to the increased technical challenge and to the potential higher risk of anastomotic leakage that occurs in the emergency setting. Primary resection with end colostomy (Hartmann's procedure) is considered the safer option. Tan et al compared in a systematic review and meta-analysis the use of self-expanding metallic stents (SEMS) as a bridge to surgery vs emergency surgery in the management of acute malignant left-sided large bowel obstruction. The authors concluded that the technical and clinical success rates for stenting were lower than expected. SEMS was associated with a high incidence of clinical and silent perforation. Stenting instead of loop colostomy can be recommended only if the appropriate expertise is available in the hospital. The goal of stenting, a decrease of the stoma rate, may be advocated only if the complication rates of stenting are lower than those of stoma creation in the emergency situation. Until now, this was not demonstrated in a prospective randomized trial.

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COMMENTARY ON HOT TOPICS
There is still significant debate regarding the best surgical treatment for malignant left-sided large bowel obstruction. In a multicenter German observation study, out of 15,911 patients with cancer of the left colon a total of 743 patients (4.7%) underwent emergency surgery, performed as a radical resection. In 57.9% (n = 430) a one-stage operation, in 11.7% (n = 87) a primary anastomosis with protective stoma, and in 30.4% (n = 226) Hartmann's procedure (HP) were performed. The morbidity and hospital mortality rates (overall hospital mortality, 7.7%, n = 57) did not differ significantly between the groups. With comparable mortality, HP was recommended for high risk patients in the emergency situation. On the basis of a literature search, Trompetas came to a similar conclusion: primary resection with end colostomy (HP) is considered the safest option in malignant left-sided colonic obstruction. The main advantages are that there is no risk of anastomotic dehiscence and the operation can be performed by less experienced and non-specialist surgeons. The main disadvantages of HP are the need for a second major operation to reverse the colostomy, and the fact that 40%-60% of patients do
not have their colostomy reversed, thereby significantly affecting their quality of life (QOL)[5]. The decision whether a one-stage procedure (resection and anastomosis) should be chosen or not, therefore mainly depends on the clinical assessment of the patient's condition. This is also demonstrated by a survey among members of the Society for Surgery of the Alimentary Tract, performed in the year 2001. With left-sided colonic emergencies in “high-risk” patients, most surgeons opted for a HP (88%) or a diverting colostomy (7%), but in “good-risk” patients 53% of the responders would have selected a one-stage procedure[5]. A Consensus Conference of the World Society of Emergency Surgery (WSES) and Peritoneum and Surgery (PnS) Society held in 2010, gave the following recommendations on management of obstructive left colon carcinoma: (1) HP should be preferred to loop colostomy (C) or loop ileostomy and subsequent resection (2 or 3 staged procedure), since C appears to be associated with longer overall hospital stay and need for multiple operations but not with a reduction in perioperative morbidity (Grade of recommendation 2B); and (2) HP offers no overall survival benefit compared to segmental colonic resection with primary anastomosis in obstructive left colon carcinoma (Grade of recommendation 2C+); HP should be considered in patients with high surgical risk (Grade of recommendation 2C)[4].

The choice of surgery also depends on the specialization of the surgeon. In a series of 336 emergency colorectal procedures performed in the United Kingdom for cancer and diverticular disease, a primary anastomosis was performed in 142 (64.3%) patients by colorectal surgeons and in 42 (36.5%) by non-colorectal surgeons. The overall morbidity and mortality rates were lower for colon and rectal surgeons (14.5% vs 24.3% and 10.4% vs 17.4%, respectively)[5].

Undisputed are the disadvantages of HP. Vermeulen et al[6] assessed the long-term QOL after emergency surgery for perforated diverticulitis in a cohort of 76 patients with HP and 53 patients with primary anastomosis. After 71 mo follow-up, 30 HP patients (39%) still had an end colostomy, but only two patients with primary anastomosis still had a loop ileostomy (4%). Survivors from acute perforated diverticulitis reported worse QOL compared to the Dutch population. QOL in patients who had undergone HP was lower compared to patients who underwent primary anastomosis, both from the patient’s and a social perspective. After reversal of HP, this difference disappeared, but HP reversal was performed in only 61% of the patients. QOL in patients after perforated diverticulitis was mainly influenced by the presence of a stoma postoperatively.

The restoration of bowel continuity usually should take place 3 mo after HP. In practice, however, the patients have to live longer with the stoma. van de Wall et al[7] provided a systematic overview of 35 studies on HP reversal in 6249 patients. Diverticular disease in 67% and colorectal malignancies in 17% were the main indications for HP. The mean reversal rate after HP was 44%, and the mean time interval between HP and reversal was 7.5 mo.

Even though HP was preferred so far in high-risk patients, the results, nevertheless, are not convincing. Rather than to query in an acute situation whether a single-stage procedure is still acceptable or whether better HP should be carried out for malignant left-sided bowel obstruction, it should be tried to avoid the emergency surgery (including the stoma) in order to attain a risk reduction for the patient[8]. Stoma complications after emergency surgery are underestimated. In a prospective audit of the United Kingdom, a total of 3970 stomas were recorded, of which 1329 (34%) were identified as problematic within 3 wk of surgery[9]. Patients undergoing an emergency procedure were more likely to have a problematic stoma. Another audit, too, revealed emergency surgery as a significant risk factor for stoma complications after colorectal cancer surgery[10].

An at least theoretical approach to circumvent the emergency operation and its complications is the bridging of the obstruction with a stent. It allows after decompression of the left colon and mechanical bowel preparation scheduled surgery of the patient with a high rate of primary anastomoses[11-13].

In this context, I read the recent systematic review and meta-analysis published by Tan et al[14] with great interest and I strongly recommend it to readers.

It was the aim of this article to compare the use of self-expanding metallic stents (SEMS) as a bridge to surgery vs emergency surgery in the management of acute malignant left-sided large bowel obstruction. Four randomized clinical trials with 234 patients were identified. In terms of efficacy of SEMS placement, the technical and clinical success rates were 70.7% and 69% respectively. SEMS intervention resulted in significantly higher successful primary anastomosis [risk ratio (RR), 1.58] and lower overall stoma (RR, 0.71) rates. The clinical perforation rate was 6.9 (8 of 116) and the silent perforation rate 14% (11 of 77). There was no significant difference in anastomotic leak, 30-d reoperation, in-hospital mortality and surgical-site infections rates between stenting and emergency surgery. The authors concluded that the technical and clinical success rates for stenting were lower than expected. SEMS was associated with a high incidence of clinical and silent perforation. However, as a bridge to surgery, SEMS had higher successful primary anastomosis and lower overall stoma rates, with no significant difference in complications or mortality.

A Cochrane review published a few months earlier was more cautious with the recommendation of SEMS[15]. According to this evaluation the use of colonic stent in malignant colorectal obstruction seems to have no advantage over emergency surgery. The clinical success rate was statistically higher in emergency surgery group. The advantages of colorectal stent included shorter hospital stay and procedure time and less blood loss. However, due to the variability in the sample size and trial designs in the included studies, further randomised trials with bigger
sample size and well defined trial design are needed to achieve the robust evidence\[9\].

In the meantime a further small randomised trial has been published which cannot change this conclusion\[10\]. In this study 20 patients were randomized to stenting as a bridge to elective surgery and 19 patients to emergency surgery for left-sided malignant colonic obstruction. Technical stent failure occurred in five patients (25%). Two of 20 patients in the stenting group required defunctioning stomas compared to 6 of 19 in emergency surgery group. There was a trend towards lower morbidity and mortality in the stenting group, but the differences were not statistically significant.

The results of the Dutch Stent-in study illustrate the difficulties in interpreting the available data\[17\]. In this multicentre randomised trial 98 patients with acute left-sided malignant colonic obstruction were assigned to receive colonic stenting (n = 47) as a bridge to elective surgery or emergency surgery (n = 51). No difference was recorded between treatment groups in 30-d mortality, overall mortality, morbidity, and stoma rates during a 6-mo follow-up, and mean global health status did not differ between both interventions. However, the emergency surgery group had an increased stoma rate directly after initial intervention. These authors concluded that colonic stenting has no decisive clinical advantages to emergency surgery. It could be used as an alternative treatment in as yet undefined subsets of patients, although with caution because of concerns about tumour spread caused by perforations\[17\].

Finally, a meta-analysis should be mentioned which compared the outcomes of stent use as a bridge to surgery and emergency surgery in the management of obstructive colorectal cancer in 8 studies and included also the Chinese Biomedical Literature Database\[18\]. About 232 patients (38.6%) underwent stent insertion and 369 (61.4%) underwent emergency surgery. The primary anastomosis rate in the stent group was higher (RR, 1.62), and overall complications (RR, 0.42), including anastomotic leakage (RR, 0.31) were reduced by stent insertion. Nevertheless, also in this study, stent insertion before subsequent surgery had no effect on perioperative mortality and long-term survival.

Some authors\[19\] guessed that SEMS intervention in patients with acute colonic obstruction should be cost-effective since it allows single-stage surgery, a shorter stay in the intensive care unit, and shorter hospitalization in comparison to emergency surgery. A Canadian study based on a decision analytical model even suggested that the use of colonic stenting for patients with acute malignant colonic obstruction is less expensive than emergency resective surgery\[24\]. Whether this is so, in fact, cannot be confirmed and should be prospectively proven by true comparative studies.

Critically, it should be noted that in the few trials and small case series reported so far the patient should be transferred by means of stenting from an emergency situation to elective surgery. For this purpose, a loop colostomy is a simple alternative which can be performed in any hospital and by non-specialized surgeons. This procedure avoids the hazards that arise when inexperienced apply a SEMS. Stenting instead of loop colostomy can be recommended only if the appropriate expertise is available in the hospital. The Consensus Conference of the WSES and PnS Society, gave the recommendation that HP should be preferred to loop colostomy\[24\]. But in fact the basis of this recommendation is weak. So far, the sole randomized trial which compared emergency colostomy with acute resection could not demonstrate major disadvantages with colostomy, besides a longer hospital stay\[25\]. A Cochrane review which was worked out to answer the same question (primary or staged resection for obstruction from primary left colorectal carcinoma) found that the limited number of identified trials together with their methodological weaknesses did not allow a reliable assessment of the role of either therapeutic strategy in the treatment of patients with bowel obstruction from colorectal carcinoma\[26\]. Therefore, the second goal of stenting, a decrease of the stoma rate, may be advocated only if the complication rates of stenting are lower than those of stoma creation in the emergency situation. Until now, this was not demonstrated in a prospective randomized trial.

**REFERENCES**

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