Stenting for large bowel obstruction – evolution of a service in a district general hospital

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ABSTRACT

INTRODUCTION Stenting for obstructing large bowel malignancy is a technique that is gradually increasing in popularity. The two main indications are for palliation and as a 'bridge to surgery'. Some of the proposed advantages of colonic stenting are safety, reduced morbidity and mortality, avoidance of a stoma and shorter hospital stay.

PATIENTS AND METHODS This was a retrospective study of consecutive patients who had self-expanding metal stents deployed between February 2001 and June 2006. Data were collected from the MEDITECH electronic integrated healthcare information support system and case note review. Data concerning demographics, primary diagnosis, and location of malignant stricture, indication for stenting, method of stenting, outcome, complications and mortality rates were obtained and analysed on Microsoft Excel.

RESULTS Colonic stenting was first performed in the Countess of Chester Hospital in 2001. Thirty-two procedures have been performed since then. The median age was 80 years and the majority of cases were palliative (28 of 32), with three of the remaining cases successfully stented as a 'bridge to surgery'. Initially, this was performed as a radiological procedure; however, the success rate was noted to be better if a surgical endoscopist was also involved. We recorded a 57% clinical success rate in the group of patients that had the colonic stent inserted radiologically; however, the group where this was inserted as a combined radiological and endoscopic procedure yielded a clinical success rate of 78%. We experienced stent-migration in four patients (13%) and rectal perforation in one patient (3%). There was no tumour re-obstruction or stent-related mortality.

CONCLUSIONS A colonic stenting service can be introduced into a district general hospital with low morbidity and mortality. A well-motivated team is required and combined endoscopic and radiological approach in our hands appears to offer the best results.

KEYWORDS

Self-expanding metal stent – Large bowel obstruction – Stent

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Emergency surgery for acute malignant large bowel obstruction is associated with poor clinical outcome in view of a background of fluid and electrolyte depletion, faecal loading of the unprepared colon, nutritional deficiencies, and impending colonic perforation if the obstruction is not relieved. Morbidity and mortality for emergency surgery is widely quoted as 45–50% and 15–20%, respectively, as opposed to a mortality of 0.9–6% following elective surgery.^{1,2} This figure is higher in elderly patients with co-existing medical conditions. Traditionally, patients with acute large bowel obstruction either undergo emergency resection that might require creation of a stoma or they are managed conservatively if the risks of surgery are deemed too high. Nugent *et al.*³ reported that stomas adversely affect the quality of life of these patients and should be avoided whenever possible.

Since its introduction in 1991 by Dohmoto,⁴ the self-expanding metallic stent is gaining popularity among coloproctologists. It has proved to be effective in relieving obstruction in patients who are either unfit for major resection or have advanced malignancy. More recently, it is being used as a 'bridge to surgery' whereby colonic obstruction is relieved in the acute setting and a single-stage resection can be scheduled for a later date avoiding stoma formation. Although only about 600 cases of its use have been reported world-wide, clinical outcomes are encouraging.^{5,6}

This study evaluates the outcome of the self-expanding metallic stent service at The Countess of Chester Hospital over a 5-year period following its introduction in 2001.

Patients and Methods

This is a retrospective study of consecutive patients who had self-expanding metallic stents deployed between February 2001 and June 2006. Data were collected from the MEDITECH electronic integrated healthcare information support system and case note review. Data concerning demographics, primary diagnosis, and location of malignant stricture, indication for stenting, method of stenting, outcome, complications and mortality rates were obtained. Data were analysed on Microsoft Excel. Fisher's exact test (SPSS v.13.0 statistical software, USA) was applied to measure the statistical difference between the radiological and combined radiological+endoscopic groups. *P*-values less than 0.05 were considered statistically significant.

Results

A total of 32 patients had a self-expanding metallic stent deployed over this 5-year period. Twenty (63%) were males and 12 (37%) females, age range 49–94 years with a median age of 80 years. Twenty-five (78%) patients had colon cancer as the primary diagnosis, four (13%) had rectal cancer, one (3%) ovarian cancer, one (3%) breast cancer, and one (3%) malignant melanoma as the primary tumour (Fig. 1).

The distribution of the stricture site was: 21 (65%) in the sigmoid colon, four (13%) in the rectum, four (13%) in the distal transverse colon, two (6%) in splenic flexure and one (3%) in descending colon (Fig. 2). Twenty-two (68%) patients had this procedure for palliation due to advanced malignancy, six (19%) were medically unfit for major resection and four (13%) had the self-expanding metallic stent inserted as a 'bridge to surgery' (Fig. 3).

Fourteen (44%) patients had the self-expanding metallic stent inserted radiologically whilst in eighteen (56%) a combined radiological and endoscopic procedure was performed involving an interventional radiologist and a surgical endoscopist.

We measured outcome by recording the technical success (defined as successful deployment of the stent at the site of obstruction) and clinical success (defined as the subsequent relief of obstruction following stenting) following self-expanding metallic stent insertion.

We achieved 83% technical success in the combined group and 71% in the radiological group. Values of 78% clinical success in the combined group and 57% in the radiological group were recorded (Fig. 4). The difference between the radiological and combined radiological+endoscopic group in terms of technical ($P = 0.67$) or clinical success ($P = 0.27$) is not statistically significant.

One patient (3%) developed a rectal perforation following an attempt to stent an obstructing rectal tumour and was managed conservatively with success. Four patients (13%) experienced stent migrations (3 proximal and 1 distal migrations). There was no stent-related mortality or tumour re-obstruction in our series.

Discussion

The demographics of our study reflect an elderly population who presented with malignant large bowel obstruction. Out of a total of 32 patients, 29 (91%) had the primary tumour located in the large bowel while the remaining patients had obstructing metastatic lesions from the ovary, breast and skin. We know that 70% of all malignant large bowel obstructions occur in the left-sided colon and that acute obstruction is the initial presentation in 10–30% of patients who suffer from colorectal cancer.^{7–12}

In our series, the indication for self-expanding metallic stent placement was largely palliative (87%); however, four patients (13%) had self-expanding metallic stent inserted as a ‘bridge to surgery’. This is a relatively new concept among coloproctologists whereby the metallic stent helps to decompress the colon and avoids the need for emergency resection. This creates an opportunity to resuscitate the patient adequately while planning for definitive elective resection at a later date, if judged appropriate. It can also avoid the formation of a stoma.

Best evidence for this practice is limited to a number of small case series and two large systematic reviews^{14,15} as no randomised controlled trials have been carried out to date. Ng *et al.*,⁵ in a case-matched study, reported that insertion of a self-expanding metallic stent as a bridge to surgery for obstructing left-sided colorectal cancer gives a higher rate of primary anastomosis and a better outcome in terms of a shorter postoperative hospital stay and reduction in need for intensive care unit stay.

Self-expanding metallic stents can be inserted radiologically, endoscopically or as a combined procedure. The combined approach provides an opportunity for the guide wire to be inserted under direct vision and biopsies could be obtained during the procedure. It also combines the experience and expertise of the interventional radiologist in guide-wire manipulation and interpretation of image

intensification with those of the endoscopist for accurate stent deployment. In our study, a combined radiological and endoscopic approach for self-expanding metallic stent deployment improved clinical outcome (Fig. 4).

Colonic stenting, like any clinical intervention, is not devoid of complications. It requires a dedicated team with expertise to produce good outcomes. Colonic perforation (3–4%) is the most feared complication because the resultant faecal peritonitis can be fatal. Stent migration (proximal or distal) is reported to occur in 4–23% of cases.^{16,17} Stent-related mortality and tumour re-obstruction are quoted as 0.5–0.6% and 7–10%, respectively. Tumour re-obstruction occurs either due to tumour growing through the stent into the bowel lumen or as a result of faecal loading of the colon.

In our series, we experienced one rectal perforation that was managed conservatively and four stent migrations (13%). There was no tumour re-obstruction or stent-related mortality.

We believe that recent advances in production of sophisticated stents and stent-delivery systems coupled with increasing technical experience can improve results further.

Conclusions

Our study in a district general hospital shows that insertion of self-expanding metallic stents in cases of malignant large bowel obstruction is a safe and effective technique, is associated with low morbidity and mortality and can avoid emergency resection and stoma formation. We recommend a dedicated multidisciplinary team and a combined radiological and endoscopic approach for good results. Enrolment in multicentre, randomised trials is required for best level of evidence.

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