

Surgery for the palliation of intestinal obstruction in advanced abdominal malignancy

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ABSTRACT

Introduction: Intestinal obstruction commonly occurs in advanced abdominal and pelvic malignancy. Management of these patients is difficult, as it is uncertain which patients benefit from palliative surgery and which benefit from medical management.

Methods: Clinical records for patients who underwent surgery for palliation of bowel obstruction were reviewed retrospectively. All had metastatic malignant disease and were seen by the general surgical department for intestinal obstruction. The following factors were examined: preoperative albumin, APACHE II score, age, site of metastases, presence of ascites, operative findings and type of operative procedure performed, length of postoperative stay and mortality.

Results: 27 palliative operations for intestinal obstruction for metastatic malignancy were performed during this period. This included two patients who were re-operated on for recurrence of intestinal obstruction after recovering from the first operation. All patients had radiological evidence of intestinal obstruction preoperatively. All patients who survived were discharged from hospital without requiring parenteral nutrition or hydration, and were able to tolerate oral medication and feeds. In this small series, site of metastases, presence of ascites, APACHE II score and gender were not predictive of mortality. An albumin level of 21 g/L or less was predictive of mortality. Almost 50 percent of these patients would require a stoma. Our series had a 30-day mortality rate of 20 percent.

Conclusion: Surgery does have a role in palliation of symptoms of intestinal obstruction in carefully-selected patients with advanced abdominal and pelvic malignancy. Patients should be counselled

on the likelihood of a stoma and the 30-day mortality risk.

Keywords: abdominal malignancy, intestinal obstruction, surgical palliation

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INTRODUCTION

Intestinal obstruction is a common problem in patients with advanced malignancy, with an estimated 3%–15% of all terminally-ill cancer patients suffering from intestinal obstruction.^(1,2) In advanced abdominal and pelvic malignancy, 5%–51% of patients with ovarian malignancies⁽³⁻⁸⁾ and 10%–28% of patients with gastrointestinal cancer^(4,5) will suffer from intestinal obstruction. In such patients, surgery is for palliation of obstructive symptoms, not for oncological resection. Common presenting symptoms are abdominal pain, abdominal distension, nausea, vomiting and failure to pass flatus.^(1,2,9,10) In 1985, Baines et al demonstrated an improvement in abdominal pain, colic, nausea and vomiting by using analgesia, anti-spasmodics and anti-emetics,⁽¹⁾ and since then, the range of pharmacological interventions available to palliate intestinal obstruction has increased.^(2,5,10,11) More recently, endoscopic stenting has also been shown to be an option in selected patients.^(12,13) The evolution of chemotherapeutic agents in the treatment of some tumours has also increased the range of options for patients.⁽¹⁴⁾

Nevertheless, for patients whose symptoms do not respond to pharmacological intervention and who are not candidates for endoscopic stenting, management of these patients presents the following difficulties: first, intestinal obstruction may be due to more than one physiopathological process, viz. intraluminal obstruction from polypoid lesions occluding the bowel lumen; intramural obstruction from infiltration of tumour within the muscular coat of the bowel wall; extramural obstruction from mesenteric, omental masses and malignant adhesions causing extrinsic compression of the bowel; motility disorders due to tumour infiltration of the mesentery, bowel muscle, coeliac or enteric plexuses;

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chemotherapy, opioids, paraneoplastic neuropathy, interleukin-1 type factors and anticholinergics may also contribute; and constipation and faecal impaction, exacerbated by opioid use, declining motor activity and low oral intake.^(4,9,10,15)

Second, in view of the progressive nature of disease, it is uncertain which patients would benefit from palliative surgery and which would have an outcome no different from medical management, since many have both diffuse peritoneal metastatic disease and/or adhesions from previous surgery. It is difficult to predict whether the quality and/or quantity of life will be improved by surgery in this group of patients, who already have a poor prognosis at the time of presentation. A Cochrane review in 2006 found that no firm conclusions affecting clinical practice could be drawn from the existing data.⁽⁴⁾ Third, surgical morbidity and mortality in this group of patients are high,^(4,16,17) given that these patients already have poor performance status (mobility and function). Fourth, symptoms of bowel obstruction may occur acutely or intermittently,^(1,9,10) making it even more difficult to distinguish which patients might benefit from surgery and which would not.

While several case series have shown that some patients will benefit from palliative surgery, it is not clear what criteria should be used for the selection of patients for palliative surgery.^(4,11,18-21) We examined retrospectively a series of patients who underwent surgery for palliation of intestinal obstruction, drawn from our weekly audit records at our department over a two-year period from September 2004 to August 2006. The objectives of this study were twofold: to review patient and disease factors that predict survival after palliative surgery for bowel obstruction in advanced intra-abdominal malignancy in our local patient population, and compare it with other published data; and to understand the morbidity and mortality risk in our local patient population, so as to better counsel patients and their families to make an informed decision prior to surgery.

METHODS

Clinical records for patients admitted over a two-year period to our department for surgical palliation of bowel obstruction in advanced abdominal malignancy were reviewed retrospectively. These patient details were retrieved from morbidity and mortality presentations in the department weekly audit meetings. Patients undergoing bypass procedures for gastric outlet obstruction alone were excluded from this analysis. Patients presenting with emergency obstruction as the first presentation of cancer were also excluded.

Table I. Patient demographics.

Demographic	No.*
Age (years)	
Mean	64.5
Median (range)	69 (28–85)
Gender	
Male	12
Female	13
Site of primary malignancy	
Stomach	9
Colon	7
Ovary	2
Lung	2
Gallbladder	1
Small bowel	1
Breast	1
Bladder	1
Thigh sarcoma	1
APACHE II score	
Mean	5.6
Median (range)	6 (2–11)
Preoperative albumin (g/L)	
Mean	30.8
Median (range)	32 (16–43)
Operative findings of obstruction from	
Tumour deposits	25
Adhesions only	2
Nature of palliative operation	
Resection	6
Bypass	14
Adhesiolysis only	2
Stoma only	5
Stoma with resection/bypass	5
Perioperative mortality	4

* unless otherwise stated

Inclusion criteria for intestinal obstruction were based on the preoperative clinical diagnosis by the primary team managing the patient, and the radiologists' preoperative reporting of the abdominal radiographs showing multiple air-fluid levels and/or dilatation of the bowel. Criteria for surgical palliation were a histologically-proven diagnosis of malignancy, and a histologically- or radiologically-proven metastases at the time of surgery. The following factors were examined: preoperative albumin, APACHE II score, age, site of metastases, presence of ascites, preoperative chemotherapy, preoperative radiotherapy, operative findings, type of operative procedure performed (bypass, resection, adhesiolysis or stoma only), length of postoperative stay and mortality.

The data was analysed using the Statistical Package for Social Sciences version 10.1 (SPSS Inc, Chicago, IL, USA). Independent *t*-test was used to analyse the effect of continuous variables (age, APACHE II score, length of stay in hospital, length of stay in hospital postoperation) on the 30-day mortality; Fisher's exact test was used to analyse categorical variables (gender,

Table II. Comparison of patient characteristics at the time of operation.

Characteristic	All (n = 27)	Survival (n = 23)	Mortality (n = 4)	p-value
Age (years)				NS
Mean	64.5	63.6	69.0	
Median (range)	69 (28–85)	69 (28–85)	67 (62–80)	
Gender				NS
Male	12	11	1	
Female	15	12	3	
Site of primary malignancy				NS
Stomach	9	8	1	
Colon	7	5	2	
Ovary	3	3	0	
Lung	2	2	0	
Gallbladder	1	1	0	
Small bowel	1	1	0	
Breast	2	1	1	
Bladder	1	1	0	
Thigh sarcoma	1	1	0	
Primary malignancy colon	7	5	2	NS
Presence of liver metastases	10	7	3	0.16
Presence of lung metastases	11	9	2	NS
Presence of distant peritoneal metastases	25	19	4	NS
Presence of ascites	16	13	3	NS
APACHE II score				NS
Mean	5.6	5.4	6.5	
Median (range)	6 (2–11)	6 (2–11)	5.5 (5–10)	
Preoperative albumin > 21 g/L	24	22	2	< 0.05
Previous chemotherapy	18	15	3	NS
Previous radiotherapy	4	4	0	NS
Benign vs. malignant cause of obstruction from				NS
Tumour deposits	25	21	4	
Adhesions only	2	2	0	
Level of obstruction				NS
Small bowel only	18	16	2	
Large bowel	9	7	2	
Nature of palliative operation				NS
Resection	6	4	2	
Bypass	14	12	2 [†]	
Adhesiolysis only	2	2	0	
Stoma only	5	5	0	
Stoma with resection/bypass	5	4	1	
Length of hospital stay (days)				–
Mean	18	18.2	13.8	
Median (range)	13 (12–41)	15 (8–41)	14 (2–25)	
Length of postoperative hospital stay (days)				–
Mean	12	12.6	7*	
Median (range)	12 (1–30)	12 (1–30)	5 (1–17)*	

* Mortality occurred

[†] includes one patient who had ileostomy in addition to bypass

NS: not significant

albumin > 21 g/L, primary malignancy of colon, liver metastases, lung metastases, peritoneal metastases, ascites, previous chemotherapy, previous radiotherapy, benign vs. malignant cause of obstruction, level of obstruction); and analysis of variance was used for multiple categorical variables (site of primary malignancy, nature of palliative operation).

RESULTS

The patient characteristics are summarised in Table I. 27 palliative operations for intestinal obstruction for metastatic malignancy were performed during this period. This included two patients who were re-operated on for recurrence of intestinal obstruction. One of these patients died within 30 days of the second operation

which was performed eight months after the first operation. The patient had a much lower albumin at the time of the second operation. One other patient in this series had a recurrence of intestinal obstruction 46 days later that was successfully managed conservatively. 18 patients had obstruction at the level of the small bowel and nine had colonic obstruction. Patients who had both small and large bowel involvement in peritoneal carcinomatosis were classified by their most proximal transition zone found intraoperatively. One patient who had two separate loops of bowel involved (one small bowel loop as well as part of the sigmoid loop adherent to the pelvic tumour), was classified as small bowel obstruction for the purpose of analysis.

All patients had radiological evidence of intestinal obstruction preoperatively (data from radiologists' reports). A radiological transition point was seen in all but one of the preoperative radiographs. For this patient, a small bowel contrast series showed a transition point. All radiographs were done within a time frame of three days prior to the operation. Preoperative computed tomography was available for 20 cases. Four scans did not show intestinal obstruction at the time they were performed, which was more than 20 days prior to surgery. This was in keeping with the natural history of intestinal obstruction in advanced malignancy; there may have been scans ordered for non-specific abdominal symptoms and/or functional symptoms before intestinal obstruction occurred.

All patients who survived were discharged from hospital without requiring parenteral nutrition or hydration, and were able to tolerate oral medication and feeds, according to discharge summaries, although the volume of feeds tolerated was variable and not always recorded. In this small series, presence of metastases, presence of ascites, APACHE II score and gender were not predictive of mortality (Table II). Only the preoperative albumin levels ≤ 21 g/L was predictive of mortality ($p < 0.05$). In this series, a total of ten patients required a stoma (alone or in addition to resection or bypass). Five patients had a stoma only (three ileostomies, two caecostomies and one colostomy). Five patients had a stoma in addition to resection or bypass (two had bypass and ileostomy, one had bypass and sigmoid mucocutaneous fistula and two had resection and ileostomy).

DISCUSSION

Surgery does have a role in the palliation of symptoms of intestinal obstruction in carefully-selected patients with advanced abdominal and pelvic malignancy. Our series had

a perioperative mortality rate (defined as 30-day mortality inhospital) of 20%, comparable to reported perioperative mortality rates in other publications, ranging from 0% (for a series with colorectal primaries only) to 50%, although most reported mortality rates are in the range of 20%–30%.^(17, 22-25) In this small series, where only four patients died within 30 days, there was no increased mortality found for the factors that have been associated with poor outcome in other publications, including APACHE II score, ascites, colon primary site, small bowel obstruction, nutritional status and age.^(19,20,24-29) Although this could be due to the relatively low numbers in this series, it could also be due to careful patient selection based on the abovementioned factors, and the multifactorial patient outcome. Preoperative radiotherapy to the abdominal or pelvic cavity in this small series of cases with primary malignancy in the stomach did not worsen outcome, and none of the three patients who had received radiotherapy died within 30 days of surgery.

Indications and contraindications to palliative surgery for intestinal obstruction remain controversial,^(1,4,11,15,18,19,30-32) although many authors have rightly emphasised that patient choice is paramount. Low preoperative albumin was significant in this analysis. Albumin is known to be an independent predictor of survival for surgical patients in general.⁽³³⁾ Albumin could be both an indicator of disease progression as well as a predictive factor for mortality, and would certainly affect wound-healing and perioperative fluid management. This is in keeping with the Krebs and Goplerud criteria of poor nutritional status as a contraindication to surgery.⁽¹⁹⁾ In this series, age was not a predictive factor of mortality. Contrary to a previous series,⁽¹⁷⁾ resection was not superior to bypass when it came to assessing the 30-day mortality (even when analysis was performed after excluding the two cases of adhesiolysis only), suggesting that careful overall patient selection might be more important than any one factor. In addition to perioperative mortality, many of these patients will require a stoma, and patients undergoing surgical palliation for intestinal obstruction should be counselled preoperatively, where possible. Morbidity from enterocutaneous fistulae is a known surgical complication.^(3,8) In our series, one of the patients who died within 30 days of surgery suffered a burst abdomen shortly before death.

As mentioned in the Cochrane review of other publications,⁽⁴⁾ this study had several limitations. As this was a case series of surgically-managed cases only, there was no comparator group for those who were successfully treated by parenteral hydration and pharmacological

means,⁽³⁴⁻³⁷⁾ so as to predict which patients would benefit from surgery. All patients in this series had an obvious transition point at surgery, and almost all had a radiological transition point of obstruction. Secondly, as this was a retrospective series, definitions of intestinal obstruction, as well as the decision to proceed to surgery had been at the discretion of the primary team, so there were no uniform criteria or definitions of intestinal obstruction. Lastly, none of the outcome measures included quality-of-life measures, an important aspect in decision-making at the end of life.

Unfortunately, the Eastern Co-operative Oncology Group score was only available for ten patients. This would have been useful in stratifying patients, and should definitely be collected in a prospective study. A prospective study comparing both medically-managed and surgically-managed intestinal obstructions in advanced abdominal malignancy, and examining the disease and patient factors that predict positive outcome and failure of palliation, would be useful in clinical decision-making for patients with advanced malignancy and intestinal obstruction. We would also attempt to quantify peritoneal disease in a future study and assess how this affects decision-making with regard to surgical palliation.⁽³⁸⁾ This small retrospective series would assist us in designing a prospective trial that would answer some of the unanswered questions. However, as discussed in some recent review articles, ethical issues in end-of-life decisions make study design challenging in the case of malignant bowel obstruction, although these obstacles are not insurmountable.^(39,40)

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