

Malignant bowel obstruction: A retrospective clinical analysis

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Abstract. Malignant bowel obstruction (MBO) is a disease with a poor prognosis, particularly in patients with advanced bowel or gynecological cancers. Multimodality treatments may be used to relieve the symptoms in patients with MBO; however, there is currently no consensus regarding the optimal treatment and no strong evidence supporting the efficacy of any treatment in improving the quality of life (QOL) and prolonging survival. We conducted a search through our medical center database of cancer registries for MBO cases between January, 1995 and December, 2008 and analyzed the clinicopathological characteristics and association between treatments and prognosis or QOL. The primary type of cancer causing MBO was found to be adenocarcinoma of colon. The overall survival time was found to be significantly higher among patients presenting with MBO as the initial symptom and improved QOL was achieved in patients who received surgical treatment. The mean survival time and the functional status of colorectal cancer patients receiving targeted therapy and chemotherapy were more satisfactory compared with those receiving surgery alone or conservative treatment. Furthermore, for end-stage cancer patients with MBO, hospice care was effective in reducing pain scores and relieving the symptoms of the disease.

Introduction

Malignant bowel obstruction (MBO) is a disease with a poor prognosis, particularly in patients with advanced bowel or gynecological cancers. Although it may occur at any stage, it is most commonly associated with end-stage cancer (1). Retrospective reviews demonstrated that 10-50% of patients with advanced cancer stage will develop MBO during the course of their disease and suffer from intractable abdominal pain, nausea and vomiting, which result in a poor quality of

life (QOL), mental and emotional problems (2). Multimodality treatments, including surgery, palliative radiotherapy, chemotherapy and total parenteral nutrition formulas, may be used to relieve the symptoms in patients with MBO; however, there is currently no consensus regarding the optimal treatment strategy and no strong evidence supporting the efficacy of any treatment in improving QOL and prolonging survival.

Materials and methods

Patient records. In order to evaluate the clinical presentation, treatment options and survival of MBO patients, we searched the TSGH database of cancer registries for MBO cases between January, 1995 and December, 2008 and analyzed the clinicopathological characteristics and the association between treatments and prognosis or QOL. The clinical information and diagnostic results were extracted from the medical records, including demographic data, clinical manifestations, physical examination, radiological findings, laboratory results and pathology reports. Non-malignant causes of obstruction, such as adhesions from previous surgery, hernia, volvulus, inflammatory bowel disease, fecal impaction and bowel ischemia were excluded from this study.

Functional status. The change in patients' functional status following treatment was evaluated according to the Eastern Cooperative Oncology Group (ECOG) performance status, with a decrease in the ECOG score reflecting the improvement of the symptoms following treatment. Clinicopathological data from 27 MBO patients (16 males and 11 females) treated in our hospital, with a median age of 69.3 years (range, 36-92 years) were retrospectively analyzed. Survival was calculated with the Kaplan-Meier method and the groups were compared using the log-rank test (3,4).

Results

Cases. Among the 27 MBO patients, the primary malignant tumors included 15 colorectal cancers, 5 gastric, 2 duodenal, 2 bladder, 1 ovarian, 1 pancreatic and 1 pseudomyxoma peritonei. The MBO patients were classified as the initial symptom (IS) and post-treatment of primary cancer (PT) groups, according to the time of onset of the MBO symptoms. The clinical characteristics of the IS (n=10) and PT groups (n=17) are summarized in Table I. According to the statistical analysis,

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Table I. Malignant bowel obstruction (MBO): Initial symptom vs. post-treatment of primary cancer groups.

Characteristics	MBO patient groups	
	Initial symptom (n=10)	Post-treatment (n=17)
Age (years)		
Range	45-92	36-85
Median	74.1	66.5
Gender		
Male	5	11
Female	5	6
Stage		
III	3	6
IV	5	8
ECOG score		
0-2	5	2
3-4	5	15
Primary cancer		
Colorectal	8	7
Other	2	10
Treatment		
Surgery	7	3
Chemotherapy	3	10
Outcome		
Overall RR (%)	50	17.6
Survival time (months)	15.92	4.15

ECOG, Eastern Cooperative Oncology Group; RR, response rate.

the overall survival time was significantly higher in the IS group compared with that in the PT group (P=0.003, Fig. 1).

SI group. The clinical characteristics of the IS group are summarized in Table II. Of the 10 patients in this group, 7 underwent surgery, whereas 3 did not receive surgical treatment. The overall survival time of the patients who received surgical treatment was significantly higher compared with that in the no surgical treatment group (P=0.022, Fig. 2). Of the 7 patients who received surgical treatment, 6 exhibited an improvement in the ECOG performance status, although the difference was not statistically significant (P=0.206). There may be a trend indicating that the survival time of colorectal cancer patients receiving surgery and concurrent treatment is higher compared with those receiving surgery alone (P=0.538); however, the results require further analysis, taking into consideration the severity of the disease, age and number of cases.

PT group. The clinical characteristics of the PT group are summarized in Table III. The mean survival time of the patients in this group was shorter compared with the IS group. The mean survival time of colorectal cancer patients receiving targeted therapy and chemotherapy was longer

Overall Comparisons			
	Chi-square	df	Sig.
Log-rank (Mantel-Cox)	9.097	1	0.003

Test of equality of survival distributions for the different levels of group.

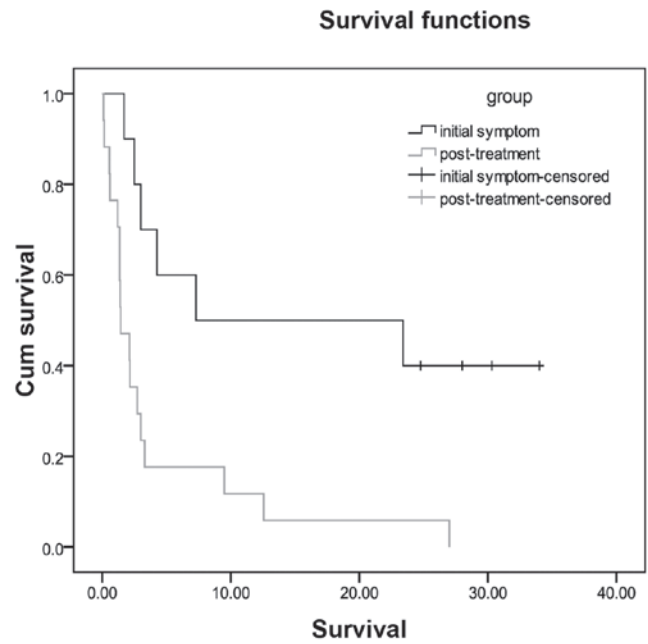


Figure 1. The overall survival time was significantly higher in the initial symptom compared with that of the post-treatment of primary cancer group (P=0.003). Sig., significance; cum, cumulative; df, degree of freedom.

Overall Comparisons			
	Chi-square	df	Sig.
Log-rank (Mantel-Cox)	5.249	1	0.022

Test of equality of survival distributions for the different levels of group.

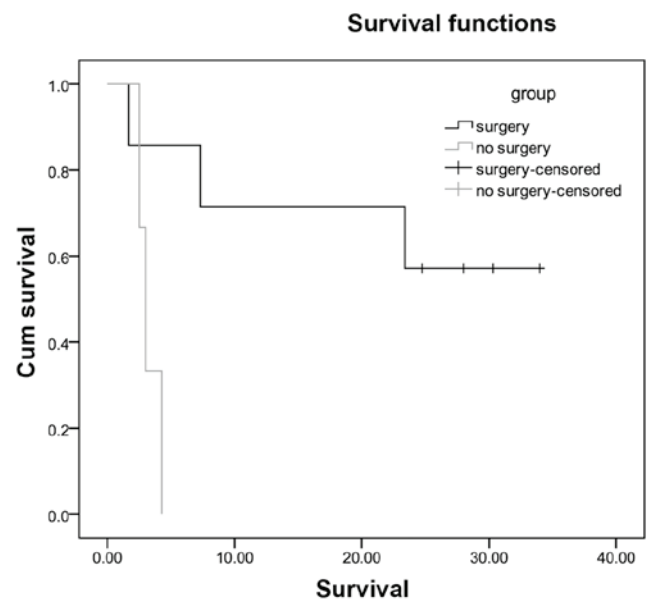


Figure 2. The overall survival time of patients who underwent surgery was significantly higher compared with the patients who did not receive surgical treatment (P=0.022). Sig., significance; cum, cumulative; df, degree of freedom.

Table II. Malignant bowel obstruction as the initial symptom.

Case no.	Gender	Age (years)	Primary cancer	Stage	Treatment	Survival time ^a (months)	ECOG score (peri-treatment)	Hospice (days)
4	M	73	Colon	IV	Exp. lap. with Hartmann's, end S-colostomy and wedge of seg 2	30.3	2 to 1	-
5	M	76	S-colon	IV	Colostomy + CPT-11, Erbitux, UFUR, Oxalip, 5-FU	23.4	3 to 2	-
9	F	92	R-S colon	II	Exp. lap. with T-loop colostomy	1.7	4 to 4	-
11	F	81	R-colon	IIIc	Exp. lap. with Hartmann's	28	2 to 1	-
12	M	81	S-colon	IIIb	AR and protective T-loop colostomy	7.3	2 to 1	8
15	M	45	Stomach	IV	Oxalip + HDFL (8) ^b	4.26	4 to 4	-
17	F	83	D-colon	Iib	T-loop colostomy and left hemicolectomy + UFUR, Xeloda	24.76	2 to 1	-
19	M	81	S-colon	IIIB	Exp. lap. with AR + 5-FU (4) ^b , Oxalip + 5-FU (2) ^b	34	2 to 1	-
20	F	74	Duodenum	IV	5-FU (10) ^b	3	4 to 4	-
22	F	55	Colon	IV	HDFL (2) ^b , Oxalip + HDFL (2) ^b , Erbitux, Xeloda and CPT-11	2.5	3 to 4	-

^aTime from initial diagnosis of primary cancer with malignant bowel disease to death. ^bCourses of chemotherapy. ECOG, Eastern Cooperative Oncology Group; M, male; F, female; S, sigmoid; R, rectum; D, descending; exp. lap., exploratory laparotomy; UFUR, tegafur-uracil; 5-FU, 5-fluorouracil; HDFL, high-dose 5-FU and leucovorin; AR, anterior resection.

compared with that of the patients who received surgery alone or conservative treatment (2.72 vs. 0.69 months, respectively; $P=0.018$, Fig. 3) and the patients' functional status exhibited a more significant improvement in the former group (ECOG score from 4 to 3). The mean survival time of gastric cancer patients receiving targeted therapy + chemotherapy was longer compared with those receiving chemotherapy alone, although the difference was not statistically significant ($P=0.182$), which may be due to the smaller number of cases. We also observed that cancers which responded well to chemotherapy, such as ovarian and colorectal cancers, were associated with longer survival.

Hospice patients. The clinical characteristics of MBO patients under hospice care are summarized in Table IV. A total of 7 patients received hospice care. The MBO symptoms in the terminal stage of cancer were intractable abdominal pain, abdominal fullness, nausea, vomiting and constipation. Under hospice care, the pain scores of all 7 patients decreased and the symptoms causing discomfort were improved.

Discussion

MBO is a common palliative care problem, encountered in 5-51% of patients with ovarian cancer, 10-28% of patients with colorectal cancer and 3-15% of patients with other types of cancer (1,2,5-8). In our study, the type of cancer most commonly responsible for MBO was found to be colorectal adenocarcinoma (55%). The differences in incidence may be attributed to the differences in clinical environment, admission criteria, diagnostic standards and clinical assessment.

Overall Comparisons			
	Chi-square	df	Sig.
Log-rank (Mantel-Cox)	5.629	1	0.018

Test of equality of survival distributions for the different levels of group.

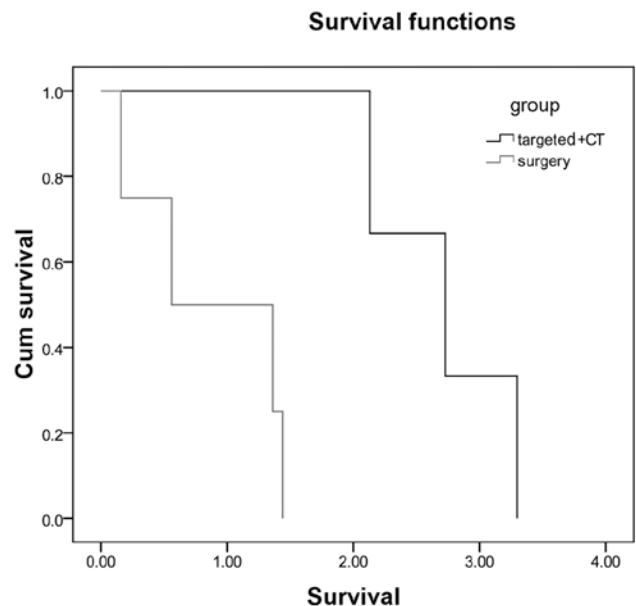


Figure 3. The mean survival time of colorectal cancer patients who received targeted therapy and chemotherapy (CT) was longer compared with those receiving surgery alone or conservative treatment (2.72 vs. 0.69 months, $P=0.018$) and their functional status exhibited a more significant improvement (ECOG score from 4 to 3). Sig., significance; cum, cumulative; df, degree of freedom.

Table III. Post-treatment malignant bowel obstruction (MBO).

Case no.	Gender	Age (years)	Primary cancer	Stage	Treatment	MBO treatment	Survival time (months)	ECOG score (Tx)	Hospice (days)
1	F	81	R-colon	III	APR + colostomy + CCRT	Exp. lap. with loop jejunostomy	1.44	4 to 4	-
2	M	85	Colon	IV	Nil	Nil	0.56	4 to 4	17
3	F	69	TCC	III	Nephroureterectomy + removal of bladder cuff, R't+CCRT (Toxol weekly)	Gemzar +vinblastin; MTX + vinblastin	1.2	4 to 4	-
6	F	64	Ovary	IIIc	Debulking+Phyxol+ carboplatin+Doxil, Caelyx+Hycamptin	Carboplatin (11) ^a + Hycamptin (2) ^a	12.56	2 to 1	60
7	F	46	Stomach	IV	Cisplatin+5-FU	5-FU (3) ^a	3	4 to 3	9
8	M	36	D-S colon	III	Exp. lap. with bisegmentectomy, left hemicolectomy	5-FU(5) ^a ; Oxalip+ 5-FU (2) ^a ; Erbitux (8) ^a	3.3	4 to 3	-
10	M	72	Duodenum	II	Whipple resection+5-FU (11) ^a	conservative	0.1	4 to 4	-
13	M	66	Stomach	IV	HDFU (4) ^a	Taxotere (1) ^a	1.4	4 to 4	18
14	M	67	R-S colon	IIa	Neoadjuvant CCRT, s/p oral UFUR+exp. lap. with LAR	Nil	0.16	4 to 4	-
16	M	77	Pseudomyxoma peritonei		Exp. lap. with removal of tumor	Nil	0.6	4 to 4	-
18	M	84	Colon	IIB	Op+LDLFL and liver metastasis s/p weekly HDLFL, Campto with HDLFL, Oxalip with HDLFL, Erbitux with HDLFL	Xeloda, Erbitux	2.73	4 to 3	16
21	M	70	T-colon	IIIc	Right hemicolectomy+5-FU +Eloxatin (6 months)	FOLFORI (4) ^a	2.13	4 to 3	-
23	M	71	S-colon	IV	Hartmann's procedure and lobectomy of liver	Nil	1.36	4 to 4	23
24	F	46	Stomach	IV	Exp. lap.+TAH+BSO,	5-FU	2.16	4 to 3	-
25	M	57	Pancreas	IV	Major surgery	5-FU	9.5	2 to 1	-
26	M	63	TCC	IV	Nephroureterectomy and removal of bladder cuff, R't	Exp. lap. with lysis of adhesions +jejunojejunostomy +end ileostomy +decompression of small intestine	1.36	4 to 4	-
27	F	78	Stomach	IV	Subtotal gastrectomy + FOLFOX	AR+colostomy, HDLFL; Phyxol+ Avastin; Irino+ HDLFL+Avastin, with daily oral UFUR	27	4 to 2	-

^aCourses of chemotherapy. ECOG, Eastern Cooperative Oncology Group; Tx, the ECOG status of the patient; M, male; F, female; S, sigmoid; R, rectum; D, descending; T, transverse; APR, abdominoperineal resection; CCRT, concurrent chemoradiation; exp. lap., exploratory laparotomy; Nil, conservative treatment; TCC, transitional cell carcinoma; MTX, methotrexate; R't, radiotherapy; s/p, status post; UFUR, tegafur-uracil; Op, operation; 5-FU, 5-fluorouracil; HDFU, high-dose 5-FU; LDLFL, low-dose 5-FU and leucovorin; HDLFL, high-dose 5-FU and leucovorin; TAH, total abdominal hysterectomy; BSO, bilateral salpingo-oophorectomy; AR, anterior resection; LAR, low anterior resection; FOLFOX, leucovorin, 5-FU and oxaliplatin; FOLFORI, irinotecan, infusional 5-FU and high-dose leucovorin.

Although MBO is a common problem in clinical practice, achieving a consensus on its management is difficult, as the treatment selection maybe be affected by the location

and degree of obstruction, cancer stage, patient's functional status, survival time and co-morbidity (2,5-8). Furthermore, it may also be affected by the lack of a definitive diagnosis,

Table IV. Palliative care of malignant bowel obstruction.

Case no.	Gender	Age	Primary cancer	Stage	Symptoms	ECOG (hospice)	Pain	TPN	NG	Hospice (days)
12	M	81	S-colon	IIIb	Abdominal fullness, nausea and vomiting	4	9 to 4	N	Y	8
2	M	85	Colon	IV	Abdominal fullness	4	6 to 2	N	N	17
6	F	64	Ovary	IIIc	Abdominal fullness, nausea and vomiting	3	5 to 3	N	N	60
7	F	46	Stomach	IV	Constipation and shortness of breath	4	6 to 2	N	Y	9
13	M	66	Stomach	IV	Abdominal fullness and constipation	4	7 to 4	N	Y	18
18	M	84	Colon	IIB	Abdominal fullness	4	5 to 3	N	Y	16
23	M	71	S-colon	IV	Abdominal pain and fullness	3	3 to 2	N	Y	23

ECOG, Eastern Cooperative Oncology Group; S, sigmoid; TPN, total parenteral nutrition; NG, nasogastric tube; M, male; F, female; N, no; Y, yes.

therapeutic goals and large clinical studies assessing the effects of different treatment plans on symptom relief and QOL improvement.

MBO patients may be classified into IS and PT groups according to the time of onset of the MBO symptoms and the patients of the IS group were considered more suitable for surgery, exhibited better ECOG scores and longer mean survival time compared with those in the PT group.

Woolfson *et al* demonstrated in a non-randomized study in 1997 that surgery did not significantly affect survival time and QOL (9). However, in our study, the overall survival time of the patients in the IS group who received surgical treatment was significantly longer compared with that of the no surgical treatment group. Thus, our results suggested that surgical treatment is suitable for IS group patients.

In the PT group, the mean survival time of colorectal cancer patients who received targeted therapy and chemotherapy was longer compared with that of patients who received surgery alone or conservative treatment and the patients' functional status exhibited a more significant improvement in the former group. Thus, palliative chemotherapy may be of value for this group of patients and may be considered a viable option when discussing the therapeutic plan with the patient and the family members.

The most common symptoms of MBO in the terminal stages of cancer are intractable abdominal pain, abdominal fullness, nausea, vomiting and constipation. Previous studies have predominantly focused on approaches to the management and resolution of intestinal obstruction, with little consideration for QOL (10). Under palliative care, the pain scores exhibit a marked decrease and the symptoms are improved. Thus, medical care personnel are always questioned regarding hospice care interventions in terminal cancer patients.

Multimodality treatment strategies, which currently include surgical treatment, palliative radiotherapy, chemotherapy and total parenteral nutrition formulas, may be used to relieve the symptoms in patients with MBO; however, there is no consensus regarding the optimal treatment strategy and no strong evidence supporting the efficacy of any treatment in improving QOL and prolonging survival. Thus, it is crucial for physicians in palliative care to accurately assess the patient's clinical condition, anticipated survival time, risk of mortality and morbidity. The physicians should also communicate

with the patient and the family members prior to making therapeutic plan decisions. Furthermore, educational interventions for patients and their family members should focus on the primary goals of MBO management in the palliative care setting. Patients with MBO from metastatic intra-abdominal disease may bear a significant physical and psychological burden, with a highly compromised QOL at the time of diagnosis; however, with adequate treatment, an improvement may be quickly achieved.

Targeted therapy for prolonging survival requires further investigations. Our previous studies have had certain limitations, such as limited number of cases, lack of QOL evaluation, heterogeneity, different types of cancer and different forms of treatment (11).

There were also important limitations to the present study. Although this was not a randomized trial, the patient characteristics in the two groups were significantly different. Furthermore, the number of patients and duration of follow-up were limited. A longer follow-up period may help stabilize the trends and enable more reliable conclusions.

In conclusion, the primary cause of MBO in our study was adenocarcinoma of the colon. The overall survival time was significantly higher in the IS group and improved QOL was achieved in patients receiving surgical treatment. The mean survival time of colorectal cancer patients receiving targeted therapy and chemotherapy was longer compared with those receiving surgery alone or conservative treatment and their functional status exhibited a more significant improvement. In addition, for end-stage cancer patients with MBO, hospice care was effective in reducing pain scores and relieving the symptoms of the disease.

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