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Malignant Bowel Obstruction in Patients With Recurrent Ovarian Cancer

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Abstract

We sought to report incidence, risk factors, and survival related to bowel obstruction in 311 ovarian cancer patients with recurrent disease. A total of 68 (22%) had a documented bowel obstruction during their cancer course, and 49 (16%) developed it after cancer recurrence. Surprisingly, 142 (45%) fit into an “unknown” category (3+ months of data lacking from last contact/death). No risk factors were identified; management included surgery (n = 21), conservative measures (n = 21), and other (n = 7). Documented bowel obstruction was not associated with a statistically significant reduction in survival after cancer recurrence. In conclusion, although bowel obstruction occurs in only a subgroup of patients with ovarian cancer and does not appear to detract from survival after cancer recurrence, limited end-of-life information may be resulting in an underestimation of incidence.

Keywords

ovarian cancer; bowel obstruction; morbidity; end of life

Malignant bowel obstruction is a devastating event. It appears to occur at the end of life in patients with few surgical options, heralding a survival of only a few months.¹ Patients with ovarian cancer, in particular, have high rates of malignant bowel obstruction compared to patients with other cancer types. Indeed, in a recent review, Jayson and others described bowel obstruction as “the most frequent single cause of death” in patients with ovarian cancer.²

Despite the consequences of this cancer complication, only a handful of studies have reported incidence rates and risk factors. One such study evaluated 8607 ovarian cancer patients within a merged data set from the Surveillance, Epidemiology, and End Results (SEER) and Medicare databases.³ Approximately 20% of these patients developed a bowel

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obstruction, and risk factors included mucinous tumor histology. Of note, these investigators focused exclusively on a Medicare patient population, leaving unaddressed the concern of whether an age-unspecified population suffers similar rates of bowel obstruction. In a smaller, single-institution study from Italy, Sartori and others examined 270 patients with ovarian cancer and found that 28% developed an obstruction. The purpose of that study was to define risk scores to predict patient outcomes to identify the most appropriate palliative intervention for an obstructed patient.⁴ These 2 studies have contributed substantially to the published literature on this topic of bowel obstruction in patients with ovarian cancer, providing a rate of 20% to 28% and appearing to mitigate the concern voiced by Jayson and others that bowel obstruction is “the most frequent single cause of death” in patients with ovarian cancer.²

Nonetheless, several unanswered questions remain. Can these rates of bowel obstruction be confirmed within a United States’ cohort of age-unspecified patients? What clinical factors predict the development of bowel obstruction in an age-unspecified United States population of patients with recurrent ovarian cancer? Do recurrent ovarian cancer patients who develop a malignant bowel obstruction have a shorter survival compared to those without a bowel obstruction? This descriptive study was undertaken to help answer these questions with the goal of enabling health care providers to accurately counsel patients and their families in the setting of recurrent ovarian cancer.

Methods

Overview

This single-institution study focused on recurrent ovarian cancer patients who were seen at the Mayo Clinic with recurrent cancer between January 2001 and September 2011. This earlier date was chosen because it marks when routine second-look operations were no longer performed and, thereby, eliminated an element of lead-time bias to time-to-obstruction data.^{5,6}

After the study team had obtained approval from the Mayo Clinic Institutional Review Board, the Mayo Clinic Tumor Registry provided a list of all patients with ovarian cancer. An extensive medical record review identified patients with recurrent ovarian cancer; these patients are the focus of this report.

Acquisition of Clinical Data

The medical records of eligible patients were then reviewed in depth. Abstracted information included patient date of birth, vital status at the time of record review, cancer stage, cancer histology, presence/absence of ascites at cancer diagnosis, Ca-125 level at cancer diagnosis, date of cancer recurrence, and date of last follow-up or death. In addition, medical records were reviewed to determine whether a bowel obstruction had been diagnosed and, if so, the date and method of diagnosis and the primary type of intervention used to manage the obstruction. When exact dates were unavailable, a mid-interval date (eg, a mid-month date) was imputed.

With respect to identifying patients with a bowel obstruction, a separate category was devised for patients who clearly manifested progressive or persistent ovarian cancer but who had 3 or more months of lacking clinical information. This 3-month interval was chosen because it is reflective of the recommended surveillance interval for patients with ovarian cancer per published guidelines.⁷ Bowel obstruction in such patients was considered “unknown.”

Statistical Analyses

The current study is descriptive. Limited analyses were performed with JMP, Cary, North Carolina. Kaplan Meier curves were constructed, and a log rank test was used to examine survival differences based on patient groups. Survival was assessed from the time of recurrent cancer unless otherwise stated, and data were censored as appropriate. Cox proportional hazards models were constructed to assess each variable’s impact on survival within univariate models with the intention of subsequently assessing statistically significant variables within a multivariate model. Descriptive demographic categories were collapsed in the event of small patient numbers, as was the case, for example, for cancer histology. Continuous data were log-transformed for analyses if not normally distributed. A *P* value of <.05 was considered statistically significant.

Results

Demographics and Rates of Bowel Obstruction

A total of 311 eligible patients with recurrent cancer were identified. The median age at the time of cancer recurrence for the cohort as a whole was 60 years (range: 16–90 years). A total of 68 (22%) patients had documented evidence of a bowel obstruction at some point during their cancer course; 49 (16%) patients had documented evidence of an obstruction after a diagnosis of recurrent cancer. In 142 (45%) patients, 3 or more months of information was lacking in the medical record prior to death or last follow-up on bowel obstruction, making their documented bowel obstruction status “unknown.” Patient demographics based on bowel obstruction status appear in Table 1.

Diagnosis and Predictors of Bowel Obstruction

Among the 49 patients who had documented evidence of a bowel obstruction after cancer recurrence, the primary method of diagnosis was computerized tomography in 27 (55%), surgery in 14 (29%), and another diagnostic modality in 8 (16%).

None of the candidate risk factors for obstruction—patient age at time of recurrent cancer, cancer stage, tumor histology (serous vs endometrial vs other), baseline Ca-125 level, and ascites at diagnosis—showed a statistically significant association with the development of bowel obstruction postrecurrence (data not shown).

Outcomes Related to Bowel Obstruction

Management of patients with recurrent cancer with bowel obstruction consisted of surgery (*n* = 21), conservative measures such as bowel rest (*n* = 21), and other interventions, such as

stent placement ($n = 7$). No statistically significant differences in survival were observed based on intervention (data not shown).

At the time of this report, 165 patients within the entire cohort, 45 of all patients with obstruction, and 30 developed an obstruction after cancer recurrence had died.

Most patients with documented evidence of a bowel obstruction after cancer recurrence lived only a few months (29 lived less than 6 months after the obstruction). However, in patients with and without bowel obstruction, median survival from the time of recurrent cancer was 2.1 years and 3 years, respectively ($P = .12$; Figure 1).

Discussion

In this study of 311 patients with recurrent ovarian cancer, 68 (22%) had documented evidence of a bowel obstruction at some point during their cancer course; and 49 (16%) had documented evidence after a diagnosis of recurrent cancer. These rates of bowel obstruction appear somewhat comparable to those reported by others.^{3,4} However, the fact that 142 (45%) patients were lacking information on morbidity prior to death or after last follow-up raises concern that the rate of documented bowel obstruction reported here and in previous reports may, in fact, represent an underestimate.

Indeed, this last point is perhaps the most salient finding of this study. This 45% rate of absent data may be higher in a tertiary care center, such as ours, where patients travel long distances for specialized oncology treatment, return home after completion of such therapy, and undergo surveillance at a local health care facility. Nonetheless, for many reasons—patient and family wishes, poor patient mobility, and financial issues—it becomes difficult to diagnose end-of-life morbidity with accuracy in dying patients. Diagnostic tests become too intrusive, and health care providers appropriately shift their attention from understanding the etiology of symptoms to palliating them. In effect, this study underscores the need to report an “unknown” category when reporting rates of end-of-life morbidity, such as bowel obstruction. Reporting this “unknown” category enables health care providers to become more aware of the potential to underestimate the rate of bowel obstruction and perhaps also the rates of other end-of-life complications.

In addition, although some patients who had developed a bowel obstruction lived only a few months, median survival was not statistically different based on whether or not patients developed a bowel obstruction after cancer recurrence. We analyzed survival based on whether or not patients had a documented bowel obstruction and based on the inclusion of the third “unknown” category, as alluded to above (data not shown), we observed no statistically significant differences between any of these groups in either of these analyses. Presumably, multiple other end-of-life causes of morbidity—in addition to bowel obstruction—can occur in patients with ovarian cancer and yield a somewhat similar, detrimental effect on survival.

One limitation of the current study is the small sample size, which is a potential explanation of why we were unable to identify clinical risk factors for obstruction. A much larger sample size would be expected to provide valuable information in this regard, as evidenced by the

large SEER/Medicare study that showed that tumor histology is associated with the development of bowel obstruction.³ This limitation of our study is perhaps compensated by our more detailed data set. The latter enabled us to lend insight into this end-of-life issue in patients with ovarian cancer, particularly from the standpoint of demonstrating the need to introduce an “unknown” category when assessing the documented incidence of end-of-life morbidity.

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Figure 1.

In patients who did (lower line) and did not (upper line) develop a documented bowel obstruction after cancer recurrence, the median survival from the time of recurrent cancer was 2.1 and 3 years, respectively ($P = .12$).

Table 1Demographics.^a

	With bowel obstruction, N = 68 (%)	No bowel obstruction, N = 101 (%)	“Unknown” bowel obstruction, N = 142 (%) ^b
Age, median (range) ^c	60 (39, 86)	60 (16, 90)	60 (24, 89)
Tumor histology			
Serous	45 (66)	51 (50)	94 (66)
Endometrioid	3 (4)	2 (2)	16 (11)
Other	18 (26)	41 (41)	32 (23)
Cancer stage			
1	5 (7)	14 (14)	15 (11)
2	12 (18)	9 (9)	14 (10)
3	39 (57)	55 (54)	83 (58)
4	7 (10)	11 (11)	11 (8)
Ca-125, median (range) ^d	264 (13–8775)	350 (5–33 400)	381 (7–381)
Ascites at diagnosis			
Yes	25 (37)	35 (35)	46 (32)
No	37 (54)	66 (65)	66 (46)

^a Numbers do not always round to 100% because of missing data or rounding, and numbers in parentheses refer to percentages unless otherwise specified.

^b This category is comprised of patients who manifested progressive or persistent ovarian cancer but had 3 or more months of lacking detailed clinical information in the medical record.

^c Age refers to patient age at time of cancer recurrence.

^d Missing Ca-125 data occurred in 22 patients with documented bowel obstruction, 32 with no obstruction, and 53 with unknown status.