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Management outcomes of diverticulitis and colitis in patients with active cancer☆

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ABSTRACT

Background: Little is reported in the literature on management strategies and outcomes in patients with an active cancer diagnosis who undergo emergent general surgery. The purpose of this study is to evaluate preoperative risk factors in both operative and non-operative management, as well as to describe the outcomes of colonic emergencies within a cancer patient population.

Methods: A single institution cancer database was reviewed retrospectively to identify patients with an active cancer diagnosis who had an emergency general surgery consult placed for an acute colonic pathology.

Results: A total of 87 patients were included. Among these, 38 patients underwent operative and 49 underwent nonoperative management. There was a 71% rate of postoperative complications in the operative group; these patients were also more likely to require intensive care unit admission ($P < .001$), die during their hospitalization ($P = .003$), have a greater 30-day mortality ($P = .001$) and were less likely to be discharged to home ($P < .001$). No patients in the nonoperative group required admission to the intensive care unit, 3 of the 49 (6%) died during their hospitalization, and 75% of nonoperative patients were discharged to home.

Conclusion: When clinically appropriate, patients with active cancer who present with an acute colonic emergency can undergo nonoperative management safely. In contrast, patients undergoing operative management have a substantial risk of morbidity and mortality.

Introduction

An estimated 1.68 million new cases of cancer are diagnosed in the United States each year, with an average age at diagnosis between 65 and 74 years.[1] Overall, the rates of cancer survival continue to improve, and many more patients are living with cancer.[2] Inherent in this improved survival is the development of diagnoses requiring emergency surgical consultation in patients living with cancer,[3] which leads to an increasing number of patients seeking emergency treatment from general surgeons. Few studies have attempted to assess the identification of preoperative risk and the outcomes of treatment in patients with disseminated cancer who present with concomitant acute surgical emergencies.[4–6] The existing studies have focused on patients presenting with gastrointestinal emergencies secondary to their underlying cancer diagnoses that were associated with very poor outcomes and high mortality. At this time, there are little data to help guide discussions of appropriate treatment and to provide realistic expectations for patients when they develop surgical conditions. Even for common surgical emergencies, little data exist regarding outcomes for operative or nonoperative management.

Surgeons are tasked with providing optimal outcomes in increasingly complex patients, with more attention focused on the best way to deliver care that is both appropriate and improves quality of life (QOL). Given the high morbidity and mortality expected with surgical management of gastrointestinal emergencies in the cancer patient population,[2,3] we sought to evaluate a single institutional experience and subsequent outcomes with surgical emergencies in patients with active cancer. The scope of this initial investigation focuses on common surgical diseases involving the colon: colitis and diverticulitis. The purpose of this study is to evaluate preoperative risk factors in both the operative management and nonoperative management, as well as to describe the

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subsequent outcomes of colonic emergencies within a patient population with cancer.

Methods

A single institution cancer database at The Ohio State University Wexner Medical Center (OSUWMC) was queried to identify patients with an active cancer diagnosis who received consultation for an acute surgical diagnosis between 2011 and 2016. OSUWMC is both a tertiary care and National Cancer Institute-Designated Cancer Center. The acute surgical diagnoses were further narrowed to include diagnoses for peritonitis, diverticulitis, and colitis. Diagnoses were obtained via the primary International Classification of Diseases, 9th and 10th editions (ICD-9 and ICD-10) code query. Disease diagnosis was confirmed at either the time of consultation or based on intraoperative findings. Final diagnosis was determined by the operative report as well as by the pathology report. Patients who had colonic conditions because of malignancy were excluded. Patients younger than 18 years of age, prisoners, patients diagnosed with malignant bowel obstructions, or patients who received surgical consults for unrelated diagnoses were also excluded. Institutional review board approval (2016E0567) was obtained and informed consent waived for this retrospective study.

Electronic health records were reviewed retrospectively to identify basic demographic data as well as baseline clinical characteristics, including the pre-existing cancer diagnosis and current treatment status. Additional variables recorded included time to surgical consult, initial lab values at time of surgical consultation, concurrent medical comorbidities, acute surgical diagnosis, operative versus nonoperative treatment plans, hospital course after the surgical consult, mortality, complications, readmission rate, disposition at discharge, return to prior oncologic treatment, and the use of palliative care services.

Statistical analysis

Standard descriptive statistical techniques were employed to evaluate subjects who were managed medically as well as those who underwent operative management. Parametric and nonparametric test results were reported, as appropriate. Counts and proportions were reported and between-group differences were examined using χ^2 testing. Differences in the proportion of patients undergoing operative versus nonoperative management by diagnosis was examined using a Fisher exact test.

Results

A total of 87 patients were included in this study. Baseline characteristics of the overall patient population at time of surgery consultation are listed in Table 1. Most patients were Caucasian (87%), had a blood cancer (47% had a leukemia or lymphoma), had stage IV cancer (24%), and/or were receiving chemotherapy at time of consultation (75%). A total of 38 patients underwent operative management, and 49 underwent nonoperative management.

Table 2 summarizes characteristics based on management strategy between operative and nonoperative management. The operative group was somewhat older, 62.5 years of age versus 57.1 years of age in the nonoperative group ($P = .038$). The median WBC was 8.1 in the operative group and 4.6 in the nonoperative group ($P = .010$), median lactate was 2.3 in the operative group and 1.0 in the nonoperative group ($P < .001$) and median creatinine was 0.9 in the operative group and 0.8 in the nonoperative group. Not surprisingly, all patients who presented with peritonitis ($n = 12$) underwent operative management ($P < .001$). Of the patients who underwent operative management, the majority were ASA class IV or V ($n = 25/38$, 66%). Indications for operative management included progressive multisystem organ failure ($n = 12$), peritonitis ($n = 12$), pneumoperitoneum attributable to underlying colitis/diverticulitis ($n = 8$), and diverticular abscess not amenable to percutaneous drainage or responsive to antibiotic therapy ($n = 6$).

Table 1
Overall cohort baseline characteristics at the time of surgical consult ($n = 87$).

Age	59.5 ± 12.2
Male	42 (48)
Female	45 (52)
Race	
White	76 (87)
African American	8 (9)
Asian	1
Unknown/ not reported	2
Cancer diagnosis on admission	
Leukemia	26 (30)
Lymphoma	15 (17.
Lung	12 (14)
Breast	6 (70)
Other	4 (5)
Renal, head and neck, multiple myeloma, sarcoma	3 each
Colon, biliary, melanoma	2 each
Prostate, hepatocellular, pancreatic, esophageal, cervical, MDS	1 each
Cancer stage of solid tumors	
Stage I	4 (45)
Stage II	9 (10)
Stage III	7 (8)
Stage IV	21 (24)
Unable to obtain	46 (53)
Chemotherapy status at time of consult	
Receiving chemotherapy	65 (74.71)
Not receiving chemotherapy	22 (25.29)
XRT status at time of consult	
Receiving XRT	3 (3.45)
Not receiving XRT	84 (96.55)

Values are *n* (%) or mean (SD) unless otherwise indicated.
MDS, myelodysplastic syndrome; *XRT*, radiation therapy.

Table 3 summarizes outcomes based on management strategy. No patients required intensive care unit (ICU) admission in the nonoperative group compared with 68% ($n = 26$) of patients who underwent operative management ($P < .001$). In-hospital mortality was greater for patients who underwent operative compared to non-operative management, 32% vs 6%, respectively ($P = .003$). The 30-day mortality was also greater in the operative group, 34% vs 6% ($P = .001$). Patients who underwent operative management were also less likely to be discharged to home, with only 24% being discharged to home versus 76% in the nonoperative group ($P < .001$). Of the patients who survived and were subsequently discharged from the hospital, there was no difference in 30-day readmission ($P = .541$) or in the proportions of patients who returned to cancer treatment ($P = .886$). For patients who underwent an operation, 21% had an intraoperative complication including one intraoperative death after pulseless electrical activity (PEA) arrest on transferring the patient to the operating table. Most of the operative cohort also had at least one postoperative complication (71%) (Table 4). Within this subset of patients, 21% required an additional invasive procedure, including one of the following: exploratory laparotomy, abdominal wall closure, interventional angiographic embolization of the gastroduodenal artery, operative removal of a drain, cardiac catheterization, chest tube placement, and nephrostomy tube placement.

Discussion

The present investigation assessed outcomes after emergency diagnoses involving the colon in patients with underlying malignancies. This patient population presents a unique set of risks

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