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ORIGINAL ARTICLE – HEALTHCARE POLICY AND OUTCOMES

Mortality in Emergency Surgical Oncology

M. R. F. Bosscher, MD, B. L. van Leeuwen, MD, PhD, and H. J. Hoekstra, MD, PhD

Department of Surgical Oncology, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands

ABSTRACT

Purpose. Cancer patients can experience problems related to their disease or treatment. This study evaluated reasons for presentation at the emergency room (ER) and outcome of surgical oncology patients.

Methods. A retrospective chart review for all surgical oncology patients who presented at the ER of the UMCG for surgical consultation between October 1, 2012, and March 31, 2013.

Results. A total of 200 cancer patients visited the ER for surgical consultation: 53.5 % with complications of (previous) cancer treatment, 25.5 % with symptoms caused by malignant disease, and 21.0 % with symptoms not related to cancer or cancer treatment. The 30-day mortality rate for patients with progressive disease was 25.5 %, and overall mortality rate was 62.8 %. The most frequent reason for ER presentation was intestinal obstruction (26.5 %), of which 41.5 % was malignant. Most cancer patients (59.5 %) did not undergo surgery during follow-up. The 30-day mortality for these patients was 14.3 % and overall mortality was 37.8 %. Most patients who died within the first 30 days after ER presentation had not undergone any surgery after presentation (89.5 %).

Conclusions. There is great variation in mortality rates for cancer patients presenting at the ER for surgical consultation. The mortality in this study was greatest for patients with progressive disease (30-day mortality 25.5 % and overall mortality 62.8 %), and the majority of patients who died within 30 days (89.5 %) had not undergone surgery after ER presentation. Surgery should only be performed in the acute setting when essential and when the expected outcome is favorable for the patient.

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M. R. F. Bosscher, MD
e-mail: m.r.f.bosscher@umcg.nl

Cancer patients can experience problems related to their disease or cancer treatment at all stages of the disease, leading to presentation at the emergency room (ER).[1,2] An oncologic emergency is defined as an acute, potentially life-threatening condition in a cancer patient that has developed directly or indirectly as a result of cancer or cancer treatment.[2,3] Patients can present with symptoms caused by primary malignancy, disease progression, recurrence, or complications of surgery, radiation therapy, chemotherapy, and immune deficiency.[1,4–9] Cancer patients admitted through the ER generally have advanced disease and higher mortality compared with patients admitted or evaluated electively.[1,6,10–14] The number of visits to the ER increases near the end of life.[11] In a systematic review, Vandyk et al. explored range, prevalence, and outcome of treatment-related or disease-related symptoms for cancer patients presenting to the emergency department; they found variation and inconsistency in the reporting of symptoms and mortality, with the latter varying between 1 and 67 %.[8]

A certain proportion of oncologic emergencies may require surgical expertise and treatment. A few studies have evaluated surgical emergencies in oncology.[9,15–17] Surgical emergencies include bleeding, obstruction, gastrointestinal perforation, infectious complications due to immune deficiency, and postoperative complications, such as infection, anastomotic leak, wound healing disturbances, or intestinal obstruction.[1,3,9,17,18] Cancer patients requiring emergency surgery have a longer hospital stay and worse survival rates compared with those undergoing elective surgery.[1,15,19] Emergency surgery should be used to control emergency situations; however, for cancer patients, other nonoperative forms of treatment should also be considered.[15,16,18] These can be used as palliative treatment or bridge to surgery at a later stage if the patients' physical status does not allow surgical intervention.

The outcome of care in cancer patients with emergency presentation is worth exploring to provide evidence for (multidisciplinary) decision-making and improved quality of care in the acute setting.[8,10,20] In this study, we

evaluated the reasons for presentation at the ER for surgical consultation of cancer patients, surgical interventions after presentation, and the mortality rate.

METHODS

In accordance with institutional guidelines, a retrospective chart review was performed for patients who presented at the ER of the University Medical Center Groningen (UMCG), between October 1, 2012 and March 31, 2013. Initial triage at the ER of the UMCG is performed by a nurse, who triages the patients to be consulted by the different medical or surgical specialties. After triage, physicians can request consultation of other specialties. The charts of patients who were triaged for general surgery and surgical oncology were reviewed. When available, all patients with a history of cancer, as well as patients with a primary presentation of malignant disease at the ER were included.

Patients were divided into three different categories according to their final diagnosis: (1) complication of (previous) cancer treatment, (2) caused by malignant disease, and (3) visit not related to cancer or cancer treatment. The patients' symptoms were documented, whether the patient was admitted, duration of emergency admission, and if the patient underwent any surgical intervention during follow-up.

Symptoms of intestinal obstruction with clinical evidence of tumor presence were regarded as malignant intestinal obstruction. All other cases of (transient) intestinal obstruction in the absence of signs of disease activity were regarded as benign. Adhesive bowel obstruction or strictures after previous abdominal surgery was regarded as related to cancer treatment. Symptoms interpreted as constipation in the absence of previous abdominal surgery were considered as intestinal obstruction neither related to cancer or cancer treatment. Other symptoms, which could not be related to (surgery performed as) cancer treatment, immune deficiency, or cancer, were classified as not related to cancer or cancer treatment.

Emergency surgery was defined as a surgical intervention which was performed nonelectively. Follow-up ended September 30, 2013. At final follow-up, charts of all patients were reviewed for correspondence regarding activity of malignant disease, mortality, and surgical procedures performed during the follow-up period after presentation at the ER. Data analysis was performed using IBM SPSS statistics 22.

RESULTS

Between October 1, 2012 and March 31, 2013, 200 cancer patients [median age 64 (range 18–89) years, 109 males (54.5 %) and 91 females (45.5 %)] visited the ER for surgical consultation. In total, 114 patients (57.0 %) were admitted through the ER; median duration of emergency admission was 7 (range 1–71) days. Median follow-up was 408 (range 0–547) days.

There were 107 patients (53.5 %) who presented with complications of cancer treatment. In this group, 97 patients (90.7 %) presented with complications after surgery and/or abdominal radiation therapy and 10 patients (9.4 %) with complications related to chemotherapy. Furthermore, 51 patients (25.5 %) presented with symptoms caused by malignant disease, of whom 6 patients (11.8 %) presented with symptoms leading to diagnosis of cancer. The remaining 45 patients were previously diagnosed with cancer. Finally, the visit of 42 patients (21.0 %) with a medical history of malignant disease was not related to their cancer or previous cancer treatment. Table 1 provides an overview of patient characteristics within the different categories.

The 30-day mortality rate for all patients was 9.5 %, and overall mortality at final follow-up was 32.5 %. The median survival was 128 (range 0–489) days. At final follow-up, 17.5 % of all patients were alive with disease (AWD) and 31.5 % died of progressive malignant disease (death of disease [DOD]). Furthermore, 45.0 % were alive and had no evidence of disease (NED), and 1 patient (0.5 %) died without signs of disease activity (death other causes [DOC]). For 5.5 % of all patients, there was no recent oncologic correspondence. Figure 1 visualizes the rates of disease activity at final follow-up within the different categories.

The 30-day mortality rate for the patients that presented with symptoms caused by malignant disease was 25.5 %, and the overall mortality rate at final follow-up was 62.8 %. Median survival was 69 (range 0–436) days. The most prominent types of cancer were small or large bowel adenocarcinoma (28.5 %), genitourinary tract (12.0 %), and gastric, esophageal, or laryngeal cancer (10.0 %).

The most frequent reason for presentation of cancer patients at the ER of the UMCG was intestinal obstruction (26.5 %); the majority was regarded as benign (58.5 %) and 41.5 % due to a malignant cause. Table 2 provides an overview of the symptoms of cancer patients presenting at the ER. For patients presenting with malignant intestinal obstruction, 30-day mortality was 9.1 %, and the overall mortality at final follow-up was 54.5 %. For patients presenting with benign intestinal obstruction, 30-day mortality was 3.2 %, and overall mortality at final follow-up was 12.9 %.

After emergency presentation, 81 patients (40.5 %) underwent surgery during follow-up; 46 patients (23.0 %) underwent emergency surgery during the same emergency admission, and 17 (8.5 %) underwent elective surgery related to the reason for presentation at the ER. Furthermore, 18 (9.0 %) patients underwent surgery during follow-up, not related to the initial presentation at the ER. Table 3 gives an overview of surgical procedures for the

TABLE 1 Characteristics of cancer patients presenting at the ER for surgical consultation

	Total	Complication of cancer treatment	Caused by malignant disease	Visit not related to cancer or treatment
Total (%)	200 (100)	107 (53.5)	51 (25.5)	42 (21.0)
Median age (years)	64 (18–89)	63 (18–89)	65 (26–84)	64 (19–88)
Gender				
Male (%)	109 (54.5)	58 (54.2)	27 (52.9)	24 (57.1)
Female (%)	91 (45.5)	49 (45.8)	24 (47.1)	18 (42.9)
Type of malignancy				
Small bowel, colorectal (%)	57 (28.5)	36 (33.6)	15 (29.4)	6 (14.3)
Genitourinary (%)	24 (12.0)	11 (10.3)	6 (11.8)	7 (16.7)
Esophageal, gastric, laryngeal (%)	20 (10.0)	13 (12.1)	4 (7.8)	3 (7.1)
Melanoma (%)	18 (9.0)	11 (10.3)	7 (13.7)	–
Breast (%)	17 (8.5)	12 (11.2)	1 (2.0)	4 (9.5)
Hematologic (%)	15 (7.5)	7 (6.5)	2 (3.9)	6 (14.3)
Liver, pancreatic, cholangio (%)	8 (4.0)	2 (1.9)	6 (11.8)	–
Non melanoma skin cancer (%)	9 (4.5)	4 (3.7)	1 (2.0)	4 (9.5)
Soft-tissue sarcoma (%)	8 (4.0)	3 (2.8)	3 (5.9)	2 (4.8)
Other (%)	24 (12.0)	8 (7.5)	6 (11.8)	10 (23.8)
Stage of treatment before presentation				
No cancer (%)	6 (3.0)	–	6 (11.8)	–
Active disease				
Diagnostic/staging phase	8 (4.0)	2 (1.9)	4 (7.8)	2 (4.8)
Receiving treatment with curative intent	60 (30.0)	43 (40.2)	10 (19.6)	7 (16.7)
Palliative stage	37 (18.5)	10 (9.4)	20 (39.2)	7 (16.7)
NED after being treated for cancer in the past (%)	89 (44.5)	52 (48.6)	11 (21.6)	26 (61.9)
Previous cancer treatment				
Yes (%)	183 (91.5)	107 (100)	39 (76.5)	37 (88.1)
No (%)	17 (8.5)	–	12 (23.5)	5 (11.9)
Emergency admission (%)	114 (57.0)	51 (47.7)	38 (74.5)	25 (59.5)
Median duration of emergency admission (days)	7 (1–71)	8 (1–51)	10 (1–71)	4 (1–26)
Surgery (%)	81 (40.5)	44 (41.1)	22 (43.1)	15 (35.7)
Emergency surgery same admission (%)	46 (23.0)	24 (22.4)	10 (19.6)	12 (28.6)
Elective surgery related to presentation (%)	17 (8.5)	5 (4.7)	10 (19.6)	2 (4.8)
Emergency surgery other reason (%)	6 (3.0)	4 (3.7)	2 (3.9)	–
Elective surgery other reason (%)	12 (6.0)	11 (10.3)	–	1 (2.4)
No surgery during follow-up (%)	119 (59.5)	63 (58.9)	29 (56.9)	27 (64.3)
Deceased during follow-up (%)	65 (32.5)	22 (20.6)	32 (62.8)	11 (26.2)
Within 30 days (%)	19 (9.5)	3 (2.8)	13 (25.5)	3 (7.1)
30 days–6 months (%)	21 (10.5)	6 (5.6)	12 (23.5)	3 (7.1)
6 months–1 year (%)	15 (7.5)	7 (6.5)	4 (7.8)	4 (9.5)
1–1.5 years (%)	10 (5.0)	6 (5.6)	3 (5.9)	1 (2.4)
Median survival of deceased (days)	128 (0–489)	246 (2–474)	69 (0–436)	159 (1–489)
Median follow-up (days)	408 (0–547)	417 (2–547)	196 (0–546)	428 (1–541)
Disease activity at follow-up				
Yes (%)	98 (49.0)	37 (34.6)	44 (86.3)	17 (40.5)
AWD (%)	35 (17.5)	17 (15.9)	12 (23.5)	6 (14.3)
DOD (%)	63 (31.5)	20 (18.7)	32 (62.8)	11 (26.2)
No (%)	91 (45.5)	60 (56.1)	6 (11.8)	25 (59.5)
NED (%)	90 (45.0)	59 (55.1)	6 (11.8)	25 (59.5)
DOC (%)	1 (0.5)	1 (0.9)	–	–
Unknown (%)	11 (5.5)	10 (9.3)	1 (2.0)	–
Alive (%)	10 (5.0)	9 (8.4)	1 (2.0)	–
Deceased (%)	1 (0.5)	1 (0.9)	–	–

AWD alive with disease, *DOD* death of disease, *NED* no evidence of disease, *DOC* death other causes

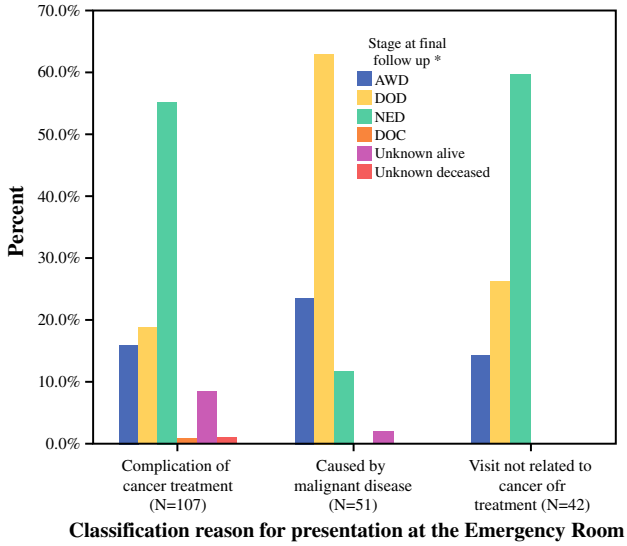

FIG. 1 Disease activity at final follow-up within subgroups of cancer patients presenting at the ER for surgical consultation. **AWD* alive with disease, *DOD* death of disease, *NED* no evidence of disease, *DOC* death other causes

most frequent reasons for presentation. Most patients did not undergo surgery during follow-up (59.9 %). When patients underwent surgery, the procedures that were most frequently performed were drainage of abscesses, excision of fistula, or wound debridement (10.5 %). Of the patients presenting with benign intestinal obstruction, 29.0 % underwent a laparotomy for benign resection, adhesiolysis, or anastomotic leak. Of the patients with malignant intestinal obstruction, 31.8 % underwent a palliative bypass of ileo-/colostomy with of without tumor or bowel resection.

For the patients who did not undergo surgery during follow-up after presentation, 15.1 % was already in a palliative phase before presentation at the ER, the 30-day mortality was 14.3 %, and overall mortality at final follow-up was 37.8 % (Table 4; Fig. 2). Of the patients who underwent emergency surgery, 26.1 % was in a palliative phase before inclusion, 30-day mortality was 2.2 %, and overall mortality at final follow-up was 26.1 %. Of the patients undergoing elective surgery, 5.9 % was in a palliative phase before inclusion, 30-day mortality was 5.9 %, and overall mortality was 35.3 %. Most patients who died within the first 30 days after presentation (89.5 %) had not undergone any surgical procedure after presentation at the ER. One patient underwent a laparotomy for intestinal perforation and died of sepsis postoperatively. The other patient died due to cardiac arrest during elective surgery.

DISCUSSION

Cancer patients can experience problems requiring emergency evaluation, and some of these problems may require surgical treatment.[1,18,21] In this study, of all cancer patients who presented at the ER for surgical consultation, 53.5 % presented with complications of (previous) cancer treatment, and 25.5 % presented with symptoms caused by malignant disease. This means that the majority of cancer patients at the ER presents with oncologic emergencies,

TABLE 2 Symptoms of cancer patients presenting at the ER for surgical consultation

	Total *N* (%)	Complication of cancer treatment *N* (%)	Caused by malignant disease *N* (%)	Visit not related to cancer or treatment *N* (%)
Total	200 (100)	107 (100)	51 (100)	42 (100)
Intestinal obstruction	53 (26.5)	21 (19.6)	22 (43.1)	10 (23.8)
Benign	31 (58.5)	21 (100)	–	10 (100)
Malignant	22 (41.5)		22 (100)	–
Wound infection, abscess, fistula	52 (26.0)	45 (42.1)	–	7 (16.7)
Other infections, thrombosis	17 (8.5)	10 (9.4)	–	7 (16.7)
Clinical deterioration, pain, renal failure, neurological symptoms	17 (8.5)	–	17 (33.3)	–
Gastrointestinal infection, pancreatitis	15 (7.5)	1 (0.9)	2 (3.9)	12 (28.6)
Problems with feeding tube, drain, indwelling catheter	14 (7.0)	13 (12.1)	–	1 (2.4)
Abdominal sepsis, intestinal perforation, neutropenic enterocolitis	11 (5.5)	6 (5.6)	1 (2.0)	4 (9.5)
Pain from wound, scar, ileo-/colostoma without infection	8 (4.0)	7 (6.5)	–	1 (2.4)
Biliary obstruction	8 (4.0)	1 (0.9)	7 (13.7)	–
Bleeding	5 (2.5)	3 (2.8)	2 (3.9)	–

TABLE 3 Surgical procedures following emergency presentation of cancer patients at the ER for the most frequent symptoms of presentation

	Total *N* (%)	Intestinal obstruction, benign *N* (%)	Intestinal obstruction, malignant *N* (%)	Wound infection, abscess, fistula *N* (%)	Other symptoms *N* (%)
Total	200 (100)	31 (100)	22 (100)	52 (100)	95 (100)
No surgery during follow-up	119 (59.5)	19 (61.3)	9 (40.9)	26 (50.0)	65 (68.4)
Drainage of abscess, excision of fistula, wound debridement	21 (10.5)	–	–	13 (25.0)	8 (8.4)
Laparotomy for benign resection, adhesiolysis or anastomotic leak	19 (9.5)	9 (29.0)	1 (4.6)	2 (3.9)	7 (7.4)
Tumor resection or excision	14 (7.0)	1 (3.2)	2 (9.1)	6 (11.5)	5 (5.3)
Laparotomy for palliative bypass, ileo-/colostomy with or without resection	12 (6.0)	2 (6.5)	7 (31.8)	1 (1.9)	2 (2.1)
Cholecystectomy, appendectomy	7 (3.5)	–	–	2 (3.9)	5 (5.3)
HIPEC	4 (2.0)	–	3 (13.6)	–	1 (1.1)
Lymph node dissection	2 (1.0)	–	–	2 (3.9)	–
Splenectomy	1 (0.5)	–	–	–	1 (1.1)
Vascular surgery	1 (0.5)	–	–	–	1 (1.1)

TABLE 4 Outcome of surgical procedures performed during follow-up after presentation at the ER for surgical evaluation

	Total	Palliative stage before inclusion	Emergency surgery	30-day mortality	Deceased during FU	NED at final FU
Total (%)	200 (100)	34 (17.0)	46 (23.0)	19 (9.5)	64 (32.0)	91 (45.5)
No surgery during follow-up (%)	119 (100)	18 (15.1)	–	17 (14.3)	45 (37.8)	57 (47.9)
Drainage of abscess, excision of fistula, wound debridement (%)	21 (100)	4 (19.0)	14 (66.7)	–	6 (28.6)	10 (47.6)
Laparotomy for benign resection, adhesiolysis or anastomotic leak (%)	19 (100)	3 (15.8)	18 (94.7)	1 (5.3)	4 (21.1)	10 (52.6)
Tumor resection or excision (%)	14 (100)	1 (7.1)	1 (7.1)	–	1 (7.1)	5 (35.7)
Laparotomy for palliative bypass, ileo-/colostomy with or without resection (%)	12 (100)	5 (41.7)	8 (66.7)	1 (8.3)	6 (50.0)	3 (25.0)
Cholecystectomy, appendectomy (%)	7 (100)	2 (28.6)	5 (71.4)	–	–	4 (57.1)
HIPEC (%)	4 (100	–	–	–	2 (50.0)	–
Lymph node dissection (%)	2 (100)	1 (50.0)	–	–	–	–
Splenectomy (%)	1 (100)	–	–	–	–	1 (100)
Vascular surgery (%)	1 (100)	–	–	–	–	1 (100)

because only 21.0 % of all cancer patients presented with symptoms that could not be related to malignant disease or cancer treatment.

The overall mortality rate after presentation at the ER for surgical consultation was 32.5 % after a median follow-up of 408 days. The varying mortality rates between the different subgroups is in accordance with the literature.[8] Nevertheless, in this study, the overall mortality of 62.8 % for patients presenting with symptoms caused by malignant disease is in the upper range of reported mortality for cancer patients after emergency presentation in the literature (1–67 %), even after a relatively short follow-up. The 30-day mortality for the category of cancer patients who presented with symptoms caused by malignant disease was 25.5 %. Considering the overall mortality of 62.8 % within this category, this means that more than one-third of all patients who were deceased during the follow-up period (i.e. 40.6 %) died within the first 30 days. These results underscore the importance of awareness regarding the occurrence of oncologic emergencies. The mortality rates found in this study confirm the fact that all cancer patients require special attention at the ER, regardless of the reason for presentation.

At final follow-up, 45.5 % of all patients were NED. Nevertheless, this was only for 11.8 % of patients who presented with symptoms caused by malignant disease. The remaining 86.3 % were AWD or had died of progressive

FIG. 2 Surgery during follow-up and mortality of cancer patients following presentation at the ER for surgical evaluation

disease (DOD). Patients who presented with symptoms caused by malignant disease clearly had a worse outcome than patients presenting for complications of cancer treatment or other reasons. Regarding the rate of disease activity within this group when the study ended, the overall mortality is expected to increase when the follow-up period will be extended.

In some emergency oncology situations, determining whether symptoms are caused by disease progression, the effects of cancer treatment, or nononcologic causes is difficult.[16] Time for diagnostic methods for definite diagnosis is not always available.[3,16] However, medical decisions have to be made within a certain time frame to guarantee optimal patient care. It is important to have the right knowledge and judgment for institution of proper treatment. The main reasons for emergency surgery in oncology are bowel obstruction, gastrointestinal perforation, and hemorrhage.[3,17,18,22,23] Furthermore, patients with acute or chronic leukemia and patients who receive chemotherapy can suffer from complications due to cytopenia or immunosuppression, requiring emergency surgical treatment.[9,18,24,25]

In this study, intestinal obstruction was the most frequent symptom for surgical consultation at the ER. More than one-third of cases of intestinal obstruction were proven to have a malignant cause (41.5 %). In 40.9 % of cases with malignant causes, patients were treated conservatively, and 59.1 % underwent surgery in either an emergent or elective setting. For benign causes, 61.3 % of patients were treated conservatively and 38.7 % underwent surgery during the follow-up period. In the literature, benign causes have been reported to account for 18 % up to 55 % of cases of small-bowel obstruction, in contrast to colorectal obstruction, with a reported 80 % for malignant origin.[23,26–29] For both conditions, the combination of malignant origin and emergency presentation is associated with advanced disease and worse outcome.[3,30–33] Mortality in this study was high for patients with malignant intestinal obstruction (30-day mortality 9.1 %, and overall mortality at final follow-up 54.5 %) compared with patients with benign origin (3.2 and 12.9 % respectively).

For patients who did not undergo surgery after presentation, 30-day mortality was 14.3 % and the overall mortality at final follow-up was 37.8 %. The 30-day mortality rates for patients undergoing elective surgery or emergency surgery related to the presentation at the ER were 5.9 and 2.2 % respectively, and overall mortality rates at final follow-up were 35.3 and 26.1 %. Surprisingly, the 30-day mortality and overall mortality rates were less after emergency surgery compared with elective surgery related to the reason for presentation at the ER, despite the fact that about five times as many patients who underwent emergency surgery (26.1 %) were in a palliative phase compared with the patients who underwent elective surgery (5.9 %).

In the literature, mortality and survival have been reported to be worse after emergency surgery compared with elective surgery because of the more advanced disease in the former group.[1,15,19,34] Barnett et al. described a 30-day mortality of 11 % after emergency surgery compared with 5 % after elective surgery for colorectal cancer and a 2-year survival of 42 and 65 % respectively.[1] These studies mainly highlight the difference in mortality between emergency and elective procedures. More importantly, mortality in this study was greatest for patients who did not undergo any surgical intervention after presentation. The majority (89.5 %) of all patients who died within 30 days had not undergone surgery after emergency presentation.

The difference in mortality rates in this study between patients who did not undergo any surgery after emergency presentation, and patients undergoing emergency or elective surgery, is possibly due to a proper assessment of the patients' physical status in an emergency setting; i.e., performing emergency surgery on the patients who benefit from this procedure, even if they are already in a palliative stage, bridging patients to elective surgery when possible, and refraining patients with more advanced disease and worse condition from any surgery.[18,35–37] On the other hand, it could be possible that the difference in mortality rates is due to a withholding policy in regards to performing surgery, although it could have been favorable for survival of the patient.

In many situations, multiple medical disciplines are involved during emergency admission, due to concurrent issues of attention. Multidisciplinary evaluation of the cancer patient and defining the patient's performance score on admission would be beneficial for better risk assessment and determination of further treatment to prevent unnecessary invasive procedures at the end of life.[18]

Limitations of this retrospective study were that it is impossible to detect all cancer patients that experienced surgical emergency symptoms and presented at the ER, especially those with a primary presentation. We did not include patients admitted through the outpatient clinic or patients with neurological symptoms and/or (pathological) fractures requiring admission for neurosurgery, or orthopedic surgery. Last, categorizing a very heterogeneous group of patients with different types of malignancies and different types of symptoms into only a few categories was difficult. However, it will provide more overview of the reasons for presentation in surgical oncology and predictors of final surgical oncology outcome.[38–40]

Even with the ample selection of possible treatment, the patients' prognosis, performance, and quality of life should be taken into account when determining policy and treatment.[15,18,39,40] Surgery should only be performed when essential and when the expected outcome is favorable for the patient.[1,15,16,35,39] A multidisciplinary approach is required, and other forms of treatment should be considered for cancer patients with poor prognosis.[1,15,16,41] Patients' preferences should be taken into account when determining the intensity of care at the end of life.[42] When no intervention will be meaningful, palliative care should be provided in hospital or home situations. General practitioners can provide many elements of care.[43–46] Further prospective research is needed to gain a more detailed insight in prognostic factors and optimal treatment for cancer patients in emergency situations.

CONCLUSIONS

Of all cancer patients who presented at the ER for surgical consultation, 53.5 % presented with complications of cancer treatment, 25.5 % with symptoms caused by malignant disease, and only 21.0 % with symptoms that could not be related to malignant disease or cancer treatment. Mortality was highest for patients who presented with symptoms caused by malignant disease, and more than one-third of the deceased patients died within the first 30 days after emergency presentation. Intestinal obstruction was the most frequent symptom, and more than one-third were proven to be malignant. The mortality in this study was higher for patients who did not undergo any surgery after presentation compared with patients who did undergo emergency or elective surgery. The majority of patients who died within 30 days (89.5 %) had not undergone surgery. The patients' prognosis and quality of life should be taken into account when determining policy and treatment options at the end of life, and surgery should only be performed when essential and when the expected outcome is favorable for the patient.

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