Original Article

A demographic study of colorectal cancer in a state hospital with 149 consecutive patient

Nuri Emrah Goret

Health Sciences University, Kartal Dr Lutfi Kirdar Research and Education Hospita, Department of General Surgery, Istanbul, Turkey

Abstract

Aim: Colorectal carcinoma (CRC) is the third most common cancer in both men and women in the United States and the second leading cause of cancer-related mortalities overall. This study aimed to determine and present the risk factors contributing to mortality and morbidity in 149 retrospectively-evaluated patients with CRC who had been urgently and electively operated on in a secondary healthcare facility.

Material/Methods: Overall, 149 patients with CRC who underwent emergency and elective surgery in Çanakkale State Hospital between January 2014 and March 2018, were retrospectively evaluated.

Results: Of the 149 patients, 79 (53.1%) were male and 70 (46.9%) were female. The mean age was 68.49 ± 10.79 years. Rectum was the most common anatomic tumor location (31.5%) and the least common location was the transvers colon (2.1%). Histopathologically, the most common tumor type was adenocarcinoma (88.6%), followed by mucinous adenocarcinoma (8.6%). 67.7% of the patients underwent elective surgery and 32.2% underwent emergency surgery. The most common complication was wound site infection (14.7%). Although the mortality rate was 4.7% in all cases (emergency/elective), it was 12.5% in emergency cases. The mortality rate for patients over 80 years of age were 27.3%.

Discussion: CRCs have a high mortality rate if they are widespread, especially in patients of 80 and if they require emergency intervention. When morbidity, mortality, and costs, such as postoperative patient care and stoma, are considered; it can be concluded that screening programs for low mortality and early diagnosis of CRC in patients before the age of 80 should be developed further, risk factors should be identified, and protective measures should be implemented.

Conclusion: A demographic study of colorectal cancer with 149 patients

Keywords: Colon carcinoma; rectum carcinoma; emergency colorectal surgery; elective colorectal surgery.

INTRODUCTION

Colorectal carcinoma (CRC) is the third most commonly diagnosed cancer in both males and females, and considering both the sexes, it accounts for the second leading cause of cancer-related deaths in the United States (1-3). In a study conducted in 2014, approximately 10,000 new colon cancer cases and 40,000 new rectal carcinoma cases were reported in the United States (4). Reportedly, CRC deaths account for approximately 9% of all cancer-related deaths (5,6).

Patients with CRCs presenting to the emergency department with acute abdomen are generally considered to have advanced cancer and poor prognoses (7). Simultaneously, a high rate of complications and mortality is expected in such emergency cases (8). Screening and early intervention should practically be performed to prevent emergency surgeries in these patients. Although such screening programs are performed, patients with CRC continue to present with emergency cases of acute abdomen (2).

This study aimed to determine and present the risk factors contributing to the mortality and morbidity in 149 patients with CRC, who were evaluated retrospectively and underwent emergency or elective operations at a secondary health-care service provider.

MATERIAL and METHODS

Patients who underwent colorectal surgery during the 4-year period of January 2014–March 2018 were evaluated retrospectively. Parameters used in this study were obtained from the patients' medical records. A form was created and used to record the data of each patient.

Patients with incomplete data were excluded from the study. The study was conducted in accordance with the Declaration of Helsinki and the received the permissions from the management of the Çanakkale State Hospital (No: 25.01.2019/93874972).

A total of 149 patients with CRC who were operated on between January 2014 and March 2018 at the Çanakkale State Hospital were included in the study and were evaluated in terms of age, sex, emergency-elective status, anatomic tumor location, tumor stage, operation procedure, the length of stay, the presence/absence of complications, morbidity, and short-long term mortality. The data were analyzed using Windows, Microsoft Excel 2016 and SPSS 24.0 package program was used for the statistical analysis of the data. Chi Fisher test statistics were used for the comparison of categorical data. Statistical significance level was taken as 0.05 for all tests.

RESULTS

Of the 149 patients operated on due to a tumor, 79 (53.1%) were male and 70 (46.9%) were female. The mean age was 68.49±10.79 (31−91) years. The mean age of females was 69.3±10.74 (47−91) years and 67.78±10.86 (31−90) years for males.

Anatomic tumor location was noted in the rectum (low anterior resection) in 47 (31.5%), the ascending colon (hemicolectomy) in 35 (23.5%), the rectosigmoid (anterior resection) in 34 (22.8%), the sigmoid colon (anterior resection) in 19 (12.8%), the descending colon (hemicolectomy) in 11 (7.3%), and the transverse colon (hemicolectomy) in 3 (2.1%) patients (Table 1).

Table 1. Distribution of patients according to anatomic tumor location and operation procedures

Anatomic tumor location	Operation procedure	Number of cases (n = 149, 100%)
Rectum	Low Anterior Resection	n= 47 (31.5%)
Ascending colon	Hemicolectomy	n= 35 (23.5%)
Rectosigmoid	Anterior Resection	n= 34 (22.8%)
Sigmoid colon and upper rectum	Anterior Resection	n= 19 (12.8%)
Descending colon	Hemicolectomy	n= 11 (7.3%)
Transverse colon	Hemicolectomy	n= 3 (2.1%)

In terms of histopathological diagnoses, 132 (88.6%) patients had adenocarcinoma, 13 (8.6%) had mucinous adenocarcinoma, 1 (0.7%) had gastrointestinal stromal tumor, 1 (0.7%) had neuroendocrine carcinoma, 1 (0.7%) had grade I neuroendocrine tumor, and 1 (0.7%) had non-Hodgkin lymphoma. For these patients, the pathological stage was T1 in 6 (4.1%), T2 in 27 (18.1%), T3 in 71 (47.6%), and T4 in 45 (30.2%).

In total, 101 (67.7%) patients underwent elective operations and 48 (32.2%) patients underwent emergency operations. Of the patients who underwent an emergency operation

with a tumor diagnosis, 35 (23.5%) were operated on due to acute mechanical intestinal obstruction (AMIO), 12 (8.1%) due to tumor perforation, and 1 (0.7%) because of bleeding (Table 2).

Table 2. Distribution of patients who underwent emergency operation

Emergency Operation for tumor diagnosing	Number of cases, n=48 (32.3%)
Emergency (for acute mechanical intestinal obstruction)	n=35 (23.5 %)
Emergency (for tumor perforation)	n=12 (8.1 %)
Emergency (for bleeding)	n=1 (0.7 %)

In the postoperative period, no complications occurred in 115 (77.2%) patients. Of the 34(22.8%) patients who developed complications, 22(14.7%) developed a wound site infection, 2(1.3%) developed a fistula, 2(1.3%) developed an evisceration with fistula, 2(1.3%) developed pulmonary embolism, 1 (0.7%) developed an early ileus, 1(0.7%) developed a wound site evisceration and cerebrovascular event, 1(0.7%) developed pulmonary embolism and myocardial infarction, 1 (0.7%) developed paralytic ileus, 1(0.7%) developed SVO, and 1(0.7%) developed stoma retraction with wound site infection.

When complications were examined based on age, emergency operation and sex distribution; it was seen that emergency operation and sex of the patient did not have a statistically significant relationship with complication rates. Based on age group, the patients in the 66-79 year group was statistically significant compared to the patients in the under 65 years and over 80 years of age groups (p=0.009, p<0.05) (Table 3).

Table 3. Distribution of complications according to age, emergency operation and sex

		No complications (n: 115)	Complication (n: 34)	p*
Age Group	65 years and under	52 (45.2 %)	6 (17.6 %)	0.009
	Between 66 – 79 years	46 (66.7 %)	23 (67.6 %)	
	80 years and over	17 (14.8 %)	5 (14.7 %)	
Emergency operation	Emergency	33 (28.7 %)	15 (44.1 %)	0.071
	Elective	82 (71.3 %)	19 (55.9 %)	
Sex	Male	59 (51.3 %)	20 (58.8 %)	0.283
	Female	56 (48.7 %)	14 (41.2 %)	

In terms of mortality, only seven patients (4.7%) died. Six (4%) of them died in the early postoperative period (within 30 days), and one (0.7%) died on the postoperative 39th day due to pulmonary embolism that developed in the intensive care unit. Of these seven (4.7%) patients, one patient (0.7%) underwent elective operation. Of the remaining six (4%) patients, four (2.7%) underwent emergency operations due to AMIO and two (1.3%) for tumor perforation (Table 4).

Table 4. Characteristics of patients with mortality

Mortality	Emergency/elective	Age/sex	Anatomic tumor location	Complication	Tumor stage
Early postoperative period	Emergency, AMIO	84 / K	Transverse colon	None	T3
Early postoperative period	Emergency, AMIO	82 / E	Descending colon	Pulmonary embolus + MI	T4
Early postoperative period	Emergency, Tumor perforation	86 / K	Rectosigmoid	None	T4
Late postoperative period	Emergency, AMIO	91 / K	Ascending colon	Pulmonary embolus	T3
Early postoperative period	Emergency, Tumor perforation	76 / E	Rectosigmoid	None	T4
Early postoperative period	Emergency, AMIO	83 / K	Rectosigmoid	None	T4
Early postoperative period	Elective	82 / E	Ascending colon	Cerebrovascular event	T4

*AMIO: acute mesenteric ischemia, MI: myocardial infarction

When early period (postoperative 30 days) mortality rates were examined, it was seen that the mortality rates of patients over the age of 80 were statistically significantly different than the mortality rates of patients under the age of 65, and patients between the ages of 65 and 79 (p=0.001, p<0.05). When mortality rates of the patients operated on under emergency conditions were observed, it was seen that the mortality rates of patients over the age of 80 were statistically significantly different than the mortality rates of patients under the age of 65, and patients between the ages of 65 and 79 (p=0.022, p<0.05) (Table 5).

When mortality was examined based on emergency and elective cases, it was seen that for the patients operated on under elective conditions compared to the patients operated on under emergency conditions, the mortality above the age of 65 was statistically significantly different (p=0.005, p<0.05) (Table 6).

DISCUSSION

The recent increase in the number of patients with CRC, with increasing age is noteworthy (9). Colon carcinoma has been reported to occur at very young ages in the literature. Particularly, in a case report published in 2007, a 9-year-old boy with a history of familial colon carcinoma was reported (10). Another study involving 241 patients with colon carcinoma reported four patients under 20 years of age (11). In the present study, the youngest patient was 31 years old, and the mean age of the patients was approximately 68 years, which is consistent with the literature.

CRCs have been reported to dominantly occur in males (12). Similarly, in our study, males were dominant. Although there is no obvious reason for the male dominance in CRC cases as reported in the literature, the frequency of abdominal obesity and alcohol consumption in men can be held responsible for it (11).

Table 5. Early (postoperative 30 days) mortality rates for our patients under 65, between 65 and 79, and over 80 years of age

		65 years and under (n: 58)	Between 66 and 79 years (n: 69)	80 years and over (n: 22)	p*
Mortality	Ex	0 (0.0%)	1 (1.4%)	6 (27.3%)	0.001
	Live	58 (100.0%)	68 (98.6%)	16 (72.7%)	
Operation state	Emergency	13 (22.4%)	23 (33.3%)	12 (54.5%)	0.022
	Elective	45 (77.6%)	46 (66.7%)	10 (45.5%)	

Table 6: Mortality rates based on emergency and elective cases

		Emergency (n: 48)	Elective (n: 101)	p*
Mortality	Ex	6 (12.5%)	1 (1.0%)	0.005
	Live	42 (87.5%)	100 (99.0%)	

A study reported that for CRCs, the anatomic location of the tumor is most commonly in the rectum (approximately 60%) and least commonly in the descending colon (13,14). In other studies, anatomic tumor location was most commonly observed in the left colon (12,15, 16).

While it was reported by a study conducted in Turkey in 2013 that right colon cancer was more common than left colon cancer; in our study, anatomic tumor location was most commonly observed in the rectum, ascending colon, rectosigmoid, and sigmoid colon, and this observation is similar to those reported in previous studies (17).

One reason why rectal, rectosigmoid, and left colon carcinomas are more common may be the fact that proctosigmoidoscopy can be more easily performed than rectal examination and colonoscopy (11). Additionally, as the other segments of the colon have a slightly wider lumen than the rectum and rectosigmoid region, carcinomas that develop in the further regions may lead to intestinal mechanical obstruction, and such patients are more likely to be admitted to the hospital with ileus, which can be considered a possible reason for CRC.

In terms of histological tumor subtypes, approximately 90% of patients with CRC were reported to have adenocarcinoma (2,15). For the rest, the World Health Organization reported a wide range of subtypes (18). Among the other subtypes, mucinous adenocarcinoma has an incidence of approximately 4−19%; in addition, when such tumors are microscopically evaluated, extracellular mucin lakes should be present in more than half the tumors. If there is <50% mucin, the mucinous component should be interpreted as concomitant adenocarcinoma (18). Compared with classical adenocarcinomas, mucinous adenocarcinomas have a poorer prognosis (2). Although many histological tumor subtypes are present, in terms of the subtypes in our study, 88.6% of patients had adenocarcinoma and 8.6% had mucinous adenocarcinoma; these incidences were consistent with those reported in the literature.

Patients with CRC presenting as emergency cases are considered to be locally advanced and are associated with poor survival. In previous studies, emergency CRC surgeries have been associated with high complication and mortality rates, independent of the tumor stage (2,8). Although colonoscopy screening programs are clinically performed, the emergency presentation of patients with CRC, who do not undergo screening, can lead to a high rate of complications (19-21).

The most common postoperative complications in patients with CRC include wound site infections, intra-abdominal collections, early anastomosis leakages, and wound eviscerations (2). Consistent with the literature, the most common complication in our study was wound site infection.

A study conducted in 2005 with 266 patients with CRC who underwent emergency/elective laparotomies demonstrated that patients with advanced-stage tumor who presented to ER with obstruction and peritonitis findings had a poorer prognosis than patients who underwent elective operations (22).

In a study conducted in Italy in 2018, patients who underwent an emergency operation due to left colon obstruction had a higher mortality (approximately 20%) than those who underwent an elective operation (approximately 5%). Moreover, the study reported the morbidity and mortality rates as 44% and 12%, respectively, in patients who underwent an emergency operation (9).

In a study conducted in 2018 with 113 patients with CRC who underwent emergency operation, 28 patients were aged 75 or older. The 30-day mortality rate of this age group was approximately 90% (2).

In a study conducted in 2015 with colorectal carcinoma cases; cases were divided into three main groups as 65 years of age and below, 66-79 years of age, and over 80 years of age. The objective of the division into 3 age groups was reported as the maximum retirement age being 65 in European countries, thus expressing the potential factors of lifestyle changes, and access to screening and treatment. Most of the colorectal carcinoma patients were diagnosed between 65-79 years of age and patients over 80 years of age were reported to need specific treatment modalities and also may experience more negativity compared to the young population (23).

In the study of Gülcü et al. (2018) conducted in Turkey, 63 octogenarians with colorectal carcinoma (80-89 years) were studied; 17.5% of the cases were operated for emergency surgery, the most common procedure in elective cases was low anterior resection (approximately 22%), most common procedure in emergency cases was Hartmann's procedure (approximately 9%), the most common histopathological diagnosis was adenocarcinoma (approximately 90%) and approximately one third of the cases were stage IIIB. 10 of their patients (approximately 16%) developed medical mortality. Their overall mortality rates were 1.6% (23). While the rates were similar to our rates, our mortality rate over the age of 80 was 27.3%. Gülcü et al. reported that cases over 80 years of age can be performed safely in specialist centers (24).

In our study, 48 (32.2%) patients underwent emergency operation. Of the 149 patients, who underwent both emergency and elective laparotomies, only seven patients died postoperatively. Of these seven patients, six had undergone emergency laparotomy and one had undergone elective laparotomy. Moreover, similar to those in the study by Biondo et al. (22), peritonitis findings secondary to tumor perforation and AMIO were among the causes of laparotomy.

When the cases in our study with mortality were examined, only one of our patients was 76-years-old, while all of the other 6 patients were over the age of 80. We did not have any cases of mortality with patients under the age of 65.

The mortality rates over the age of 75-80, especially in cases of emergency operation, is expected to be very high, as reported by Gendler et al. and Ait Ouakrim et al.

In the present study, the overall mortality rate was 4.7% (7/149) and the mortality rate of patients who underwent an emergency operation was 12.5% (6/48). Our mortality rate for patients over 80 was 27.3%.

The mortality rate reported in this study is lower than those reported in previous studies. This can be due to the smaller number of patients in our study compared with other studies.

CONCLUSION

The primary limitations of this study include its retrospective nature and the fact that the patients included in the study were those who presented to a medium-sized hospital in a small city. CRCs are common and have a high mortality rate, particularly if the patient is over 80 and they require emergency intervention.

Considering the morbidity, mortality, and treatment costs, such as postoperative patient care and stoma, screening programs for the early diagnosis of CRC before the age of 80 should be developed, risk factors should be determined, and protective measures should be applied.

Nuri Emrah Goret: ORCID:0000-0002-4792-0109

REFERENCES

1- Nwafor CC, Nwafor NN. The pattern and distribution of cancers in Akwa Ibom State, Nigeria. Niger J Clin Pract 2018;21:603-8.

2- Gendler S, Shmilovich H, Aranovich D, et al. Urgent laparotomy in patients with metastatic colorectal cancer presenting as an acute abdomen: A Retrospective Analysis. Isr Med Assoc J 2018;20:619-622.

3- Ozkan OF, Goret NE, Goret CC. The histopathological changes after neoadjuvant theraphy for rectal carcinoma. LOJ Med Sci 2018;1:LOJMS.MS.ID.000102.

4- Siegel R, Ma J, Zou Z, et al. Cancer statistics, 2014. Cancer J Clin, 2014;64:9-29.

5- Canbey Goret C, Goret NE. Histopathological Analysis of 173 Consecutive Patients with Colorectal Carcinoma: A Pathologist's View.Med Sci Monit 2018;24:6809-15.

6- EuroSurg Collaborative. Body mass index and complications following major gastrointestinal surgery: a prospective, international cohort study and meta-analysis. Colorectal Dis 2018;20:O215-O225.

7- Amri R, Bordeianou LG, Sylla P, et al. Colon cancer surgery following emergency presentation: effects on admission and stage-adjusted outcomes. Am J Surg 2015;209:246-53.

8- Askari A, Malietzis G, Nachiappan S, et al. Defining characteristics of patients with colorectal cancer requiring emergency surgery. Int J Colorectal Dis 2015;30: 329-36.

9- Danzi M, Grimaldi L, De Capua M, et al. Obstructing left sided colorectal cancer. A retrospective single center study. Ann Ital Chir 20187;7.

10- Musa AA, Agboola AO, Banjo A A, et al. Rectal carcinoma in a nine-year- old Nigerian male child: Case report. East Afr Med J 2007;82:93-6.

11- Ibrahim KO, Anjorin AS, Afolayan AE, Badmos KB. Morphology of colorectal carcinoma among Nigerians: a 30-year review. Niger J Clin Pract 2011;14:432-5.

12- Abdulkareem FB, Abudu EK, Awolola NA, et al. Colorectal carcinoma in Lagos and Sagamu, Southwest Nigeria: A histopathological review. World J Gastroenterol 2008;14:6531-5.

13- Elesha SO, Owonikoko TK. Colorectal neoplasms: A retrospective study. East Afr Med J 1998;75:718-23.

14- Aykan NF, Yalçın S, Turhal NS, et al. Epidemiology of colorectal cancer in Turkey: A cross-sectional disease registry study (A Turkish Oncology Group trial). Turk J Gastroenterol 2015;26:145-53.

15- Sule AZ, Mandong BM, Iya D. Malignant colorectal tumors: A ten year review in Jos, Nigeria. West Afr J Med 2001;20:251-5.

16- Hasbahceci M, Idiz O, Cengiz MB, et al. Risk factors for readmission following colorectal cancer surgery. Acta Oncologica Turcica 2017;1:36-42.

17- Seydaoğlu G, Özer B, Arpacı N, et al. Trends in colorectal cancer by subsite, age, and gender over a 15-year period in Adana, Turkey: 1993-2008.Turk J Gastroenterol 2013;24:521-31.

18- Hamilton SR, Bosman FT, Boffetta P, et al. Carcinoma of the colon and rectum. In: Bosman FT, Carneiro F, Hruban RH, Theise ND, eds. WHO classification of tumours of the digestive system. 4th edition. Lyon France: IARC Press; 2010:134−46.

18- Langner C, Harbaum L, Pollheimer MJ, et al. Mucinous differentiation in colorectal cancer indicator of poor prognosis? Histopathology 2012;60:1060-72.

19- Mayir B, Ensari CO, Durhan A, et al. Colonoscopy Findings in Patients Who Have Positive Fecal Occult Blood Test for Colorectal Cancer Screening. Turk J Colorectal Dis 2018;28:27-30.

20- Kalcan S, Sisik A, Basak F, et al. Evaluating factors affecting survival in colon and rectum cancer: A prospective cohort study with 161 patients. J Can Res Ther 2018;14:416-20.

21- Biondo S, Martí-Ragué J, Kreisler E, et al. A prospective study of outcomes of emergency and elective surgeries for complicated colonic cancer. Am J Surg 2005;189:377-83.

22- Ait Ouakrim D, Pizot C, Boniol M, et al. Trends in colorectal cancer mortality in Europe: retrospective analysis of the WHO mortality database. BMJ 20156;351:h4970.

23- Gülcü B, Yılmazlar T, Işık Ö, Öztürk E. Colorectal cancer surgery in octogenarians. Turk J Surg 201818;34:271-5.