Investigation of clinicopathological parameters in emergency colorectal cancer surgery: a study of 67 patients

Amir Talebreza[1], Emad Yahaghi[2], Ehsan Bolvardi[3], Babak Masoumi[4], Mehran Bahramian[5], Ebrahim Khodaverdi Darian[6], Koorosh Ahmadi[7]

[1]Department of Surgery, AJA University of Medical Sciences, Tehran, Iran
[2]Department of Molecular Biology, Baqiyatallah University of Medical Sciences, Tehran, Iran
[3]Department of Emergency Medicine, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran
[4]Department of Emergency Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
[5]Department of Emergency Medicine, Madani Hospital, Alborz University of Medical Sciences, Karaj, Iran
[6]Young Researchers and Elite Club, North Tehran Branch, Islamic Azad University, Tehran, Iran
[7]Department of Emergency Medicine, Alborz University of Medical Sciences, Karaj, Iran

Corresponding author:
Koorosh Ahmadi
Department
of Emergency Medicine
Alborz University
of Medical Sciences
Karaj, Iran
Phone: 00989124806577
E-mail: kooroshem@gmail.com

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Abstract

Introduction: The aim of the present study was to establish, having adjusted for case mix, the size of the differences in postoperative mortality and 5-year survival between patients presenting as an emergency with evidence of obstruction and perforation and the association of clinicopathological factors with mortality (bivariate analyses).

Material and methods: The study included 67 patients who presented with colorectal cancer (CRC) between 2009 and 2013 in Iran. The mean age of the patients was 59.7 years. Of the 67 patients, 37 (55.22%) were male and 30 (44.77%) were female. Certain parameters that correlated with CRC and surgical treatment were investigated

Results: Our results showed that 46 (68.65%) patients had obstruction, while perforation was observed in 21 (31.34%) cases. Among the patients with obstruction, obstruction of the right colon was observed in 29 (43.28%) cases. There was no significant difference in mortality rate between right and left colonic obstruction. Based on the bivariate analyses, our findings showed that death of patients was significantly related to tumor grade (p = 0.02) and TNM staging (p = 0.026), but no association was found between other parameters and death, including age, sex, and tumor site.

Conclusions: Compared with patients who undergo elective surgery for colon cancer, those who present as an emergency with evidence of obstruction or perforation have higher postoperative mortality rates and poorer cancer-specific survival. Also, colorectal cancer patients with emergency surgery showed aggressive histopathology and an advanced stage.

Key words: colorectal cancers, emergency, surgery, histopathological factors, survival.

Introduction

Colorectal cancer (CRC) is known as one of the commonest cancers worldwide, with 850,000 new cases and 500,000 deaths annually [1, 2]. Elective surgical resection is the first option of cancer treatment, but many colorectal cancer cases present as an emergency [1–7].

Moreover, it has been estimated that 6% to 30% of patients have symptoms or late complications associated with the disease. It has been reported that most patients have an advanced stage at the time of diagnosis and are referred for surgery with curative intent. Previous investigations have reported that a high rate of mortality and shorter survival may be related to emergency treatment [8–10]. Emergency procedures have been shown to have worse outcomes when compared with elective resections in patients suffering from colorectal cancer. The prognosis is poorer when patients present for emergency compared to elective treatment. High rates of morbidity and mortality are associated with colorectal cancer in complicated forms including intestinal necrosis, obstruction, perforation, localized peritonitis, diffuse and aggravated by others diseases [11–13].

The aim of this study was to evaluate the significance of clinicopathological characteristics of colorectal cancer patients presenting as an emergency.

Material and methods

Sixty-seven patients who underwent resection for colorectal cancer between 2009 and 2013 in the Emergency Room Service of Tehran hospitals were included in the study. The tissues were confirmed by pathological evaluation. The mean age of the patients was 59.7 years. Of the 67 patients, 37 (55.22%) were male and 30 (44.77%) were female. Signs and symptoms of patients are summarized in Table I.

The following parameters correlated with CRC: complications of the cancer in the clinical presentation including obstruction or perforation, site of tumor in the large intestine. Clinical features, length of stay, outcomes, and pathological results were obtained in this study. The tumor stage and grade were also determined in this study. The clinicopathological factors of the patients are shown in Table II.

Statistical analysis

SPSS software version 16.0 for Windows (SPSS Inc, IL, USA) was used to evaluate all the data. The χ^2 test was used to evaluate the association of variables. Differences were considered statistically significant when p was less than 0.05. The bivariate analysis was used to compare parameters including age, sex, tumor site, staging and tumor grade with death.

Results

The surgical treatment was as follows: tumor resection with primary anastomosis (44.77%); 38.80% of patients were treated with colostomy. The signs and symptoms of patients with CRC are summarized in Table I. Bleeding was never seen among the patients. The tumor location, tumor grade and tumor staging are shown in Table II. In addition, 9 (13.43%) cases had distant metastases, most of them in the liver.

The average time of hospitalization in the intensive care unit (ICU) was 10.3 days and perioperative mortality was 22.38% (15 patients, 1 month after surgery). Our results showed that 46 (68.65%) cases had obstruction, while perforation was observed in 21 (31.34%) cases. Among the patients with obstruction, obstruction of the right colon was observed in 29 (43.28%) cases. Our findings showed that mortality rate was not associated with tumor site and right or left colonic obstruction.

Based on the bivariate analyses, our results showed that death of patients was significantly related to tumor grade (p = 0.02) and TNM staging (p = 0.026), but no association was found between other parameters and death, including age, sex, and tumor site (Table II).

Discussion

It has been reported that a high proportion of colorectal cancer cases may be treated as an emergency [1–7]. Emergency presentation has been shown to have worse outcomes when compared with elective resections in patients with colorectal cancer. High rates of morbidity and mortality are associated with colorectal cancer in complicated forms including intestinal necrosis, obstruction, perforation, localized peritonitis or diffuse and aggravated by other diseases [14–16].

Operative mortality due to obstruction or CRC perforation was estimated to be from 16% to 38% [17]. In our study, the average time of hospitalization in the ICU was 10.3 days and perioperative

Table I. Signs and symptoms of patients

Signs and symptoms	Number of patients	Percent
Abdominal pain	65	97.01
Anorexia	55	82.08
Vomiting	38	56.71
Tenesmus	10	14.92
Loss of weight	40	59.70

Table II. Association of clinicopathological factors with death (bivariate analyses)

Parameters	%, number	Death (%)	Risk ratio	*P*-value
Age group [years]:				
< 64	53.73; 36 cases	9 (25)	0.65	0.526
> 64	46.26; 31 cases	6 (19.35)		
Gender:				0.623
Female	44.77; 30 cases	7 (23.33)	0.83	
Male	55.22; 37 cases	8 (21.62)		
Site of tumor:				0.724
Right colon	49.23; 33 cases	7 (21.21)	0.91	
Sigmoid	16.41; 11 cases	1 (9.09)	0.42	
Transverse colon	11.94; 8 cases	2 (25)	0.68	
Left colon	19.40; 13 cases	4 (26.66)	0.71	
Upper rectum	2.98; 2 cases	1 (30.76)	0.42	
TNM staging:				0.026
I	5.97; 4 cases	0 (0)	0	
II	44.77; 30 cases	2 (6.66)	0.55	
III	31.34; 21 cases	6 (28.57)	2.27	
IV	19.40; 13 cases	7 (53.84)	2.61	
Histological grade:				0.02
I	10.44; 7 cases	1 (14.28)	0.77	
II	58.20; 39 cases	6 (15.38)	2.41	
III	31.34; 21 cases	8 (38.09)	2.68	

mortality was 22.38% (15 patients, 1 month after surgery). It has been postulated that patient's poor clinical condition including dehydration, malnutrition, and advanced age may be involved in this matter.

Smothers *et al*. [18] reported that an emergency colectomy can be an independent negative prognostic factor in the context of morbidity and mortality in CRC patients.

A previous study showed a morbidity and mortality rate of 41% and 15% in patients operated on for obstruction or perforation respectively [19]. Ascanelli *et al*. [20] reported 27% morbidity and 12% mortality in patients with colorectal cancer who were referred for emergency surgery. Moreover, it was reported that overall survival and percentage of survival are lower in CRC patients who undergo an emergency operation [21].

Our results showed that obstruction was observed in 46 (68.65%) cases and 21 (31.34%) cases had perforation. Among the patients with obstruction, obstruction of the right colon was observed in 24 (35.82%) cases. The majority of tumors were located in the right colon (49.23%; 33 cases), and others were located in other parts (Table II). Our findings showed that mortality rate was not associated with tumor site and right or left colonic obstruction. It has been previously reported that lesions are most common on the right side in elderly patients presenting acutely [22].

It has been reported that the incidence of right colon obstruction may range between 15% and 44% worldwide. High numbers of patients are needed to interpret this matter. In a series by Smithers *et al*. [23], emergency procedures of right hemicolectomies for colon carcinoma were reported. On the other hand, a previous study did not find any significant differences in the mortality rate between right-sided and left-sided lesions in CRC patients [24]. However, it has been suggested that patients with one-stage surgery will have shorter survival than patients with non-obstructing lesions [25].

In the present study, 9 (13.43%) cases had distant metastases, most of which were in the liver. It has been previously reported that up to 30% of patients undergoing a curative operation had hepatic metastases at the time of presentation, and the presence of such occult metastases can be

associated with death from disseminated disease within 5 years [26].

In the present study, our findings showed that death of patients was significantly related to tumor grade ($p = 0.02$) and TNM staging ($p = 0.026$). Based on the bivariate analyses, no association was found between other parameters and death, including age, gender, and tumor site. These clinicopathological parameters were previously reported by different authors for various cancers [27–34]. It has been reported that advanced CRC is related to higher incidence of complications and mortality [35]. The limitation of this study is the number of patients, and a larger sample size is needed to evaluate the significance of clinicopathological characteristics in patients with colorectal cancer.

In conclusion, our results indicated that patients with emergency surgery showed aggressive histopathology and an advanced stage.

Conflict of interest

The authors declare no conflict of interest.

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