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COLORECTAL CANCERS OCCURRING WITH ILEUS

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Abstract

Introduction: To establish the clinical profiles of the newly diagnosed colorectal cancers in patients presenting to the emergency service with ileus symptoms.

Materials and Method: The study was carried out with the retrospective examination of the patients who presented to a tertiary emergency service with non-specific ileus symptoms and were diagnosed with colorectal cancer for the first time. The clinical, laboratory and radiologic data of the patients were recorded in the study form compiled from the Hospital Information Management System and the emergency service presentation files.

Results: 102 patients who presented to the emergency service due to ileus and were diagnosed with a mass were included in the study. Of these patients mean age was 66.50±12.30 (mean±standard deviation). During the presentation, the Charlson Comorbidity Index was considered as 1.00 [Interquartile Range 0.00 – 2.00] while the median value of the modified Glasgow Prognostic Score was 1.00 [Interquartile Range 0.00 - 2.00]. The modified Glasgow Prognostic Score was statistically significant ($p<0.001$), especially in the patients in whom perforation developing as a late complication was observed.

Conclusion: The frequency of being diagnosed with colorectal cancers by presenting to the emergency service with non-specific symptoms is increasing despite the routine cancer screening in the healthcare systems. In this process, the difficulties in making appointments during the hospital presentations under elective conditions and the long time interval until the diagnosis gave rise to the necessity for patients to consider faster diagnosis and treatment options through the emergency service.

Keywords: Colorectal Neoplasms; Ileus; Emergency; Prognosis.

INTRODUCTION

Although emergency services are intended to be the entry point for patients into the healthcare system if acute conditions emerge, they have become areas in which chronic diseases are diagnosed over time. In particular, diseases such as cancer, which should be detected in primary or polyclinical areas, have also begun to be diagnosed in emergency services. As patients often present with indefinite symptoms of their diseases, limited resources and time make the detection of this circumstance difficult (1). While most of the colorectal cancers in this group are diagnosed electively, some of them occur as emergency cases (2). During presentations due to the need for acute medical care, a high suspicion level is important in making diagnoses.

Colorectal cancers are the most encountered type of malignancy throughout the world. Colorectal cancer is correlated with an increase in risk factors such as smoking and obesity, as well as the changes in the dietary and living habits of an increasingly aging population (3). While approximately 20% of patients present with obstructive symptoms, such as abdominal pain, nausea, vomiting, bloating, or an inability to excrete gas/stool prior to diagnosis, some of them are diagnosed in emergency services with a complication, such as perforation, which may lead to unstable physiologic parameters (4,5). These complications are correlated with poor survival due to the preoperative mortality and postoperative morbidity rates, which are highly related to comorbidities such as sepsis and acute kidney damage (6,7). Furthermore, adverse outcomes may also occur due to an advanced disease stage at presentation to emergency services, as well as high American Society of Anesthesiologists (ASA), mGPS (modified Glasgow Prognostic Score), and CCI (Charlson Comorbidity Index) scores (8-11). Our study was intended to evaluate the characteristics of patients who presented to the emergency service with non-specific ileus-dependent symptoms and were diagnosed with colorectal cancer for the first time, as well as the factors affecting emergency service management.

MATERIALS AND METHOD

Study Design

The study was carried out via the retrospective examination of the patients who presented to the tertiary hospital emergency service with non-specific ileus symptoms and were diagnosed with colorectal cancer for the first time between January 2020 and June 2023. Approval was obtained from the local ethics committee prior to the study (Decision number: 2024/115). Informed consent was obtained from the participants whose images were used in the publication.

For the collection of clinical and radiological data for the patients included in the study, the local computer-based hospital information management system (HIMS) program was used. Patients who were under the age of 18 and those whose clinical and laboratory data were incomplete were excluded from the study. Masses were detected in 124 of 622 patients who presented to the emergency service with non-specific bowel obstruction symptoms and were diagnosed with ileus, and 22 patients were excluded from the study because their data could not be obtained. Ultimately, 102 patients were included in the study (Figure 1).

Clinical Parameters

The complaints at presentation to the emergency service, the duration of the complaints, the demographic data regarding the patients, the treatment administered in the emergency service, mGPS scores, CCI scores, the hospitalization area, and the treatment method used after hospitalization were recorded. The data on the patients regarding tumor stage were derived from the contrast-

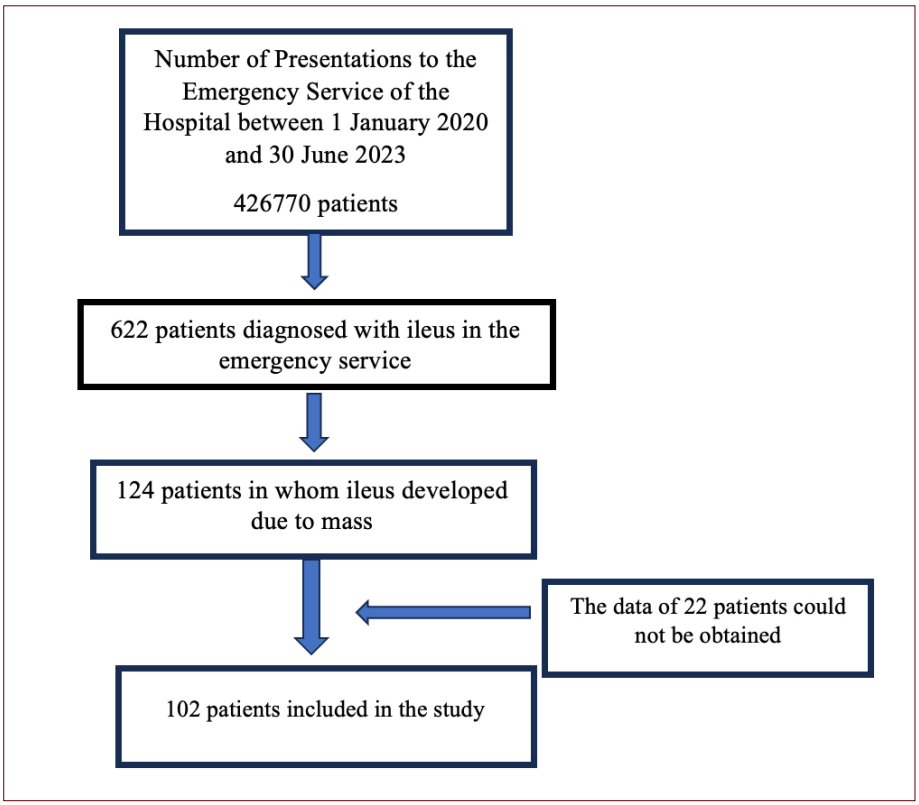

Figure 1. Study flow chart

enhanced abdominal computerized tomography (CT) images taken in the emergency service, and the data regarding the pathological diagnoses during their inpatient treatment were derived from the patient files. Whether the patients presented to the emergency service or polyclinic for any reason that might be related to colorectal cancer before diagnosis, such as abdominal pain, nausea, vomiting, and changes in bowel movements, was evaluated.

Emergency Service Management

For patients who present to the emergency service with non-specific symptoms, such as nausea, vomiting, abdominal pain, or an inability to excrete gas or stool, a physical examination is made, laboratory and imaging tests are requested according to the current clinical view, and fluid resuscitation is initiated. If the examination findings suggest an obstruction, abdominal plain radiography is performed to verify the preliminary diagnosis. For eligible patients, contrast-enhanced abdominal computerized tomography (CT) is performed to determine the degree of obstruction, etiology and complications, and a consultation is requested with the relevant polyclinic. For patients for whom the use of contrast agent is contraindicated and pregnant patients, bedside abdominal ultrasonography (USG) is performed. USG is used only in specific patient groups because it has limited efficacy in imaging gas-filled structures and restrictions regarding determining the location, cause, and potential complications of an obstruction.

Imaging Technique and Radiological Findings

Intravenous contrast-enhanced CT scanning (12) was performed with a 16-slice CT scanner (Alexion TSX-034A, Toshiba, Shimoishigomi, Shimoishigomi, Otawara-Shi, Toschigi-Ken, Japan), in line with the recommendations of the American College of Radiology (ACR). Iodine-based contrast medium (Iopromide, Ultravist, 300mg I/mL, Bayer Schering Pharma, Berlin, Germany) was administered intravenously through a peripheral venous vascular access at a rate of 4.0 ml s-1.

Each CT scan performed in the emergency service is simultaneously interpreted by the radiologist in charge via remote access after the scanning. The CT images of the patients included in the study were re-evaluated by a radiologist with 20 years of experience to ensure the standardization of the measurements retrospectively, after the initial evaluation. Tumor size, location, perforation, necrosis, proximal and paraaortic lymph node metastasis, and distant organ metastasis were recorded.

Statistical Analysis

All analyses were conducted in Jamovi V.1.6 statistical software (The Jamovi Project (2021) Computer Software (Sydney, Australia.) The categorical data were expressed as frequencies (n) and percentages. The continuous variable data with normal distributions were defined as means and standard deviations (SDs), while the data with non-normal distributions were defined as medians and interquartile ranges (IQRs). The normality of the distributions was evaluated using the Shapiro–Wilk test. In the comparison of the continuous variables, a t-test was performed in the case of normal distributions, and the Mann–Whitney U test was performed in the case of non-normal distributions. To compare the categorical variables between the groups, a Chi-squared test was used. In all statistical analyses, p values <0.05 were considered significant.

RESULTS

Masses were detected in 124 (19.9%) of 622 patients diagnosed with ileus within the time interval in which the study was planned. However, 22 patients were excluded from the study, as their data could not be obtained, and 102 patients (16.4%) were included in the study. Of these patients, 60.8% were male, and their mean age was 66.50 ± 12.30 (mean ± standard deviation). The most common reason for presentation to the emergency service was abdominal pain (43.1% of patients; n = 44), an inability to excrete gas or stool (22.5%; n = 23), and constipation accompanying abdominal pain in (14.7%; n = 15). Before the presentation to emergency services, 78.4% of the patients (n = 80) had previously presented to any department of the hospital due to their existing complaints, and 56.2% of these patients (n = 45) presented to both the emergency service and the polyclinic due to their existing abdominal pain (59.7%; n = 61). The median onset value of the pre-diagnostic complaints of the patients was 20 days (IQR 10.00–30.00; 3–60 days). Upon physical examination, 3.9% of the patients (n = 4) were diagnosed with unstable vital signs, and a vasoconstrictor agent was added to their treatment, along with fluid resuscitation. Furthermore, nasogastric catheters were inserted into 78.4% of the patients before hospitalization upon the detection of obstructions during the imaging examinations. Ninety-eight percent of the patients (n = 100) were admitted to the polyclinic to arrange their follow-up and treatment, and 90.1% (n = 92) were operated on. Their demographic and presentation characteristics are indicated in Table 1.

CCI was 1.00 [IQR 0.00–2.00], while the median value of mGPS before diagnosis in the emergency service was 1.00 [IQR 0.00–2.00]. The median value obtained from the laboratory examinations was 38.00 [IQR 33.00–41.00] for albumin, 1.20 [IQR 0.92–1.67] for lactate, and 27.50 [IQR 9.25–76.50] for C-reactive protein (CRP). In 36.3% (n = 37) of the masses detected in the patients who presented

Table 1. The Patients' Demographic Data and Baseline Characteristics

Characteristics, n = 102	Value
Gender	
Male, n (%)	62 (60.8)
Female, n (%)	40 (39.2)
Age (years), mean ± sd	66.50 ± 12.30
Comorbidities	
Hypertension, n (%)	60 (58.8)
CAD, n (%)	16 (15.7)
Diabetes, n (%)	15 (14.7)
Atrial fibrillation, n (%)	11 (10.8)
COPD, n (%)	9 (8.8)
Presentation Complaints	
Abdominal pain, n (%)	44 (43.1)
Inability to excrete gas/stool, n (%)	23 (22.5)
Abdominal pain + constipation, n (%)	15 (14.7)
Nausea/vomiting + abdominal pain, n (%)	10 (9.8)
The other presentation*, n (%)	10 (9.8)
Duration of the Presentation Complaint (days), median (IQR)	20.00 (10.00 – 30.00)
Presentation to any Department	
Emergency and polyclinic presentation, n (%)	45 (44.1)
Polyclinic presentation, n (%)	20 (19.6)
Emergency presentation, n (%)	15 (14.7)
No presentation, n (%)	22 (21.6)
Complaints for the Previous Hospital Presentations	
Abdominal pain, n (%)	61 (59.7)
Nausea/vomiting, n (%)	10 (9.8)
Dyspepsia, n (%)	6 (5.9)
The other presentation*, n (%)	3 (2.9)
No presentation, n (%)	22 (21.6)
Treatment after Hospitalization	
Surgical treatment, n (%)	92 (90.1)
Medical follow-up, n (%)	10 (9.8)
mGPS during Emergency Presentation, median (IQR)	1.00 (0.00-2.00)
CCI during Emergency Presentation, median (IQR)	1.00 (0.00-2.00)
Mortality rate within the 3-Month, n (%)	13 (12.7)
Mortality rate within the 1-Year, n (%)	31 (30.4)

IQR: Interquartile Range (25p, 75p), sd: standard deviation, CAD: Coronary Artery Disease, COPD: Chronic Obstructive Pulmonary Disease, *: Atypical causes of admission (such as shortness of breath, back pain, etc.), mGPS: modified Glasgow Prognostic Score, CCI: Charlson Comorbidity Index

to the emergency service with non-specific obstruction findings and were diagnosed with ileus upon contrast-enhanced CT, which was performed according to ACR recommendations, Most of the masses were located in the sigmoid colon in 36.3% (n=37) of the cases, in 11.8% (n=12) of the cases the masses were located in the rectosigmoid colon, the locations in the right or left colons were identical in both areas, and the masses in these locations occurred at a rate of 17.7% (n=18). The median value for tumor size was 53.00 [IQR 38.00– 73.30] x 16.00 [IQR 12.00– 20.00] mm. Upon CT, proximal lymph nodes (87.3% of the patients; n = 89), paraaortic lymph nodes (9.8%; n = 10), invasion of the surrounding adipose tissue (52%, n = 53), necrosis of tumoral tissue (41.2%; n = 42), distant organ metastasis (25.5%; n = 26), and perforation (11.8%; n = 12), were encountered. Upon the pathologic evaluation of the masses, adenocarcinoma was detected in 94.1% (n = 96; Table 2).

No statistical difference was detected between the twelve patients with perforation and non-perforation patients in terms of presentation complaints, duration of complaints, tumor localization, and tumor type. No significance difference could be found regarding CCI (p = 0.76), while mGPS was statistically significantly higher in perforation group as compared with non-perforation group (p < 0.001; Table 3).

Table 2. Characteristics on Computerized Tomography

Characteristics, n = 102	Value
Location Area of the Mass	
Sigmoid colon, n (%)	37 (36.3)
Left colon, n (%)	18 (17.6)
Right colon, n (%)	18 (17.6)
Rectosigmoid colon, n (%)	12 (11.7)
Rectum, n (%)	7 (6.8)
The other location, n (%)	10 (9.8)
Size of the Mass	
Height (mm), median (IQR)	53.00 (38.00-73.30)
Width (mm), median (IQR)	16.00 (12.00-20.00)
CT Findings of the Mass*	
Tumoral tissue necrosis, n (%)	42 (41.2)
Invasion to surrounding adipose tissue planes, n (%)	53 (52.0)
Proximal lymph node metastasis, n (%)	89 (87.3)
Paraaortic lymph node metastasis, n (%)	10 (9.8)
Distant organ metastasis, n (%)	26 (25.5)
Perforation, n (%)	12 (11.8)
Histopathologic Characteristic of the Mass	
Adenocarcinoma, n (%)	96 (94.1)

IQR: Interquartile Range (25p, 75p), sd: standard deviation, CT: Computerized Tomography, *: More than one pathology can be seen on CT

Table 3. Characteristics of the Patients Detected with Perforation

Characteristics	Total Group (n=102)	Perforation Group (n=12)	Non-Perforation Group (n=90)	P value
Presentation complaints				
Abdominal pain, n	44	6	38	
Nausea/vomiting, n	23	2	21	
Inability to excrete gas/stool, n	15	0	15	0.398
Nausea/vomiting and abdominal pain, n	10	2	8	
The other presentation*, n	10	2	8	
Duration of the presentation complaint, (days), median (IQR) 20.00 (10.00 - 30.00)		27.50 (20.80-41.30)	20.00 (10.00-30.00)	0.081
Presentation to any Department				
Emergency and polyclinic presentation, n	45	6	39	
Polyclinic presentation, n	20	2	18	0.950
Emergency presentation, n	15	2	13	
No presentation, n	22	2	20	
Complaints for the Previous Hospital Presentations				
Abdominal pain, n	61	8	53	
Nausea/vomiting, n	10	1	9	
Dyspepsia, n	6	1	5	
The other presentation*, n	3	0	3	0.975
No presentation, n	22	2	20	
mGPS during Emergency Presentation, median (IQR)	1.00 (0.00-2.00)	2.00 (2.00-2.00)	1.00 (0.00-1.75)	**<0.001**
CCI during Emergency Presentation, median (IQR)	1.00 (0.00-2.00)	1.00 (0.00-2.00)	1.00 (0.00-2.00)	0.764
Histopathologic Characteristic of the Mass				
Adenocarcinoma, n	96	11	85	0.500
Location Area of the Mass				
Sigmoid colon, n	37	4	33	
Left colon, n	18	4	14	
Right colon, n	18	2	16	
Rectosigmoid colon, n	12	1	11	0.364
Rectum, n	7	1	6	
The other location, n	10	0	10	

IQR: Interquartile Range (25p, 75p), sd: standard deviation, *: Atypical causes of admission (such as shortness of breath, back pain, etc.), mGPS: modified Glasgow Prognostic Score, CCI: Charlson Comorbidity Index

DISCUSSION

Emergency services have become an area in which patients with chronic diseases, such as cancer, frequently present with non-specific complaints and are diagnosed coincidentally. In particular, the masses detected on CT scans performed for acute, emerging conditions, such as trauma, dyspnea, abdominal pain, and changes in consciousness, allow for diagnosis in these patients (13). In this study, the patients presented to various departments of the hospital, including emergency services, due to their existing complaints; however, they were not diagnosed until the development of ileus. The rates of such delays ranges widely, from 17% to 40%, due to differences in healthcare systems across countries, as well as socio-demographic differences (14-16). In our study, this rate was found to be 19.9%, which is similar to that reported in the literature.

Although colorectal cancers are one of the most frequently detected tumors (17), there has been an increase in the number of the diagnoses upon the presentation of patients to the emergency service with non-specific complaints (5). The patients diagnosed in the emergency service frequently present with complications such as ileus, perforation, and peritonitis. In the study, the patients presented with complaints such as abdominal pain, an inability to excrete gas and stool, and constipation, which may be indicative of pathology, both in their previous presentations and their presentations to the emergency service. This indicates the necessity of presenting to the emergency service due to the mere presence of ongoing symptoms rather than the severity of such symptoms. This is also supported by the fact that the duration of symptoms described by the patients ranged widely, from 3 to 60 days. Also, the diagnostic interval for these patients was shorter than for the elective group because the healthcare services provided through the emergency service are more accessible as compared to those received at polyclinics. Another indicator of accessibility is that 98% of the patients included in the study were hospitalized by the relevant polyclinic following presentation and 90% were treated surgically following hospitalization.

The studies carried out in relation to the newly diagnosed cancer patients in the emergency service show that age, gender, and socioeconomic status increase the possibility of being diagnosed (18). In our study, age was found to be effective in the diagnosis of colorectal cancer. However, a difference was found in terms of gender. While female patients are more prominent in the literature, male patients appeared at a higher rate (60.8%) (1,16) in our study. We believe that this difference arises from the fact that the sample group used in this study has a different socio-cultural structure than other samples.

The morbidity and mortality rates of patients who present due to complications are higher than those diagnosed under elective conditions (19). In our study, 12.7% of the patients died within the first 3 months and 30.4% died within the first year after diagnosis. The results obtained are similar to the data available in the literature (7,20). The usability of GPS and CCI, which are included among the practical scoring systems used for the evaluation of prognosis, especially in the patients who present to the emergency service, has been accepted as reliable for this patient group (9,11). Also, in this study, mGPS and CCI were evaluated, and mGPS was found to be statistically significant in the subgroup of the patients with perforation. However, no difference could be detected between this subgroup and the other patients in terms of tumor size, localization, and pathological type.

Differences are observed between patients in terms of tumor localization, clinical view, and histopathologic characteristics. Most tumors are endoluminal adenocarcinomas originating from the mucosa, and 55–70% of these are located in the distal part of the colon (21,22). In our patients who were newly diagnosed in the emergency

service, parallelism with the literature was found in terms of histopathologic diagnosis and localization. At the time of diagnosis, if distant metastasis is found, the involvement of the lymph nodes, liver, and lungs is observed most frequently in patients (20%) (23). Although dissemination is considered an adverse prognostic factor, it also constitutes the starting point of the symptoms that trigger patients to consult with a physician. In this study, the rates of lymph node and distant organ metastasis were similar to those observed in other studies.

The fact that the study was carried out retrospectively with a limited sample group limits the reliability of the results. The fact that our findings were mainly obtained from the hospital records suggests that certain data may have been affected by these limits. Since the study was retrospective, we did not calculate the sample size. Another limitation of our study was that we did not examine the previous screening tests of the patients included in it. Moreover, the fact that the sample group consisted of only the patients diagnosed coincidentally renders our results prejudicial. The fact that there are uncertainties regarding patients' ability to recall the emergence of the first symptoms and the time at which this occurred also leads to restrictions.

CONCLUSION

Ileus may be encountered as a complication in colorectal cancer patients, and the multidisciplinary approach is important in the detection of masses during presentation to the emergency service. In Turkey, family physicians and public health clinics offer free screening programs for colorectal cancers. Despite this, we believe that community-based screening programs for undiagnosed colorectal patients can increase awareness and reduce overall mortality rates, as well as the number of emergency cases. However, extensive well-designed studies are required to test this hypothesis.

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