



Original Article

Emergency surgery for complicated colorectal cancer in central Brazil



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ABSTRACT

Objective: to report clinical and pathological features of patients with colorectal cancer diagnosed during emergency abdominal surgery.

Methods: records of 107 patients operated between 2006 and 2010 were reviewed.

Results: there were 58 women and 49 men with mean age of 59.8 years. The most frequent symptoms were: abdominal pain (97.2%), no bowel movements (81.3%), vomiting (76.6%), and anorexia (40.2%). Patients were divided into five groups: obstructive acute abdomen ($n=68$), obstructive acute perforation ($n=21$), obstructive acute inflammation ($n=13$), abdominal sepsis ($n=3$), and severe gastrointestinal bleeding ($n=2$). Tumors were located in the rectosigmoid (51.4%), transverse colon (19.6%), ascending colon (12.1%), descending colon (11.2%), and 5.6% of the cases presented association of two colon tumors (synchronous tumors). The surgical treatment was: tumor resection with colostomy (85%), tumor resection with primary anastomosis (10.3%), and colostomy without tumor resection (4.7%). Immediate mortality occurred in 33.4% of the patients. Bivariate analysis of sex, tumor location and stage showed no relation to death ($p > 0.05$).

Conclusions: colorectal cancer may be the cause of colon obstruction or perforation in patients with nonspecific colonic complaints. Despite the high mortality rate, resection of tumor is feasible in most patients.

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Cirurgia de emergência para o câncer colorretal complicado no Brasil central

R E S U M O

Palavras chave:

Tumor colorretal
Obstrução intestinal
Perfuração intestinal
Cirurgia colonica
Adenocarcinoma

Objetivo: analisar os aspectos clínicos e patológicos de pacientes operados de cancer colorretal diagnosticados durante operações abdominais de urgencia.

Métodos: foram estudados os prontuários de 107 pacientes operados entre 2006 e 2010. **Resultados:** Foram incluídos 58 mulheres e 49 homens com idade média de 59,8 anos. Os sintomas mais frequentes foram: dor abdominal (97,2%), parade de eliminação de gases e fezes (81,3%), vomitos (76,6%) e anorexia (40,2%). Os pacientes foram divididos em cinco grupos: abdomen agudo obstrutivo (68), abdomen agudo perforativo (21), abdomen agudo inflamatorio (13), sepsis abdominal (3) e hemorragia digestive baixa (2). Os tumores localizavam-se no rec-tossigmoide (51,4%), colon transverso (19,6%), colon ascendente (12,1%), colon descendente (11,2%) e 5,6% dos pacientes apresentavam tumors sincronicos. O tratamento cirurgico foi: colectomia com colostomy (85%), colectomia com anastomose primaria (10,3%) e colostomia sem ressecção do tumor (4,7%). Mortalidade immediate ocorreu em 33,4% dos pacientes. Analise bivariate de sexo, localização do tumor e estadio não foi relacionada a mortalidade ($P > 0,05\%$).

Conclusões: o cancer colorretal pode ser a causa de obstrução colonica ou perfuração in pacientes com queixas inespecificas. A despeito da alta taxa de mortalidade, a ressecção do tumor pode ser realizada na maioria dos pacientes.

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Introduction

Colorectal cancer (CRC) is one of the most common cancers in Europe and United States with increasing incidence with aging.¹⁻⁵ Cancer epidemiology in developing countries is getting similar to the developed world.⁶⁻⁸ Colorectal cancer has been addressed as a preventable cancer^{7,8} and that early diagnosis may be achieved with fecal occult blood test and colonoscopy.⁹⁻¹¹ However, a high proportion of CRC may present as a surgical emergency. Large bowel obstruction has been reported in approximately 30% while perforation may occur in 3-8% of patients with CRC.¹²⁻¹⁴

This retrospective study aimed to analyze the clinical presentation and early outcomes of patients presenting with complicated CRC who underwent emergency surgery at the Hospital de Urgências de Goiânia (HUGO), State of Goiás, Brazil. To the best of our knowledge there are no similar data available in English medical literature for this region.

Methods

This study was approved by the Research Ethics Committee of the Hospital de Urgências de Goiânia (CEP/HUGO/SES no. 042/09).

This is a cross-sectional, observational, retrospective, and descriptive study carried out between January 2006 and June 2010 at HUGO, using the medical charts as data source.

All patients had the diagnosis of CRC confirmed by histopathology. Exclusion criteria were: benign neoplasias, no histopathology report, intestinal obstruction or perforation due to other causes, and vulnerable groups.

Histopathology report used World Health Organization (WHO) classification.¹⁵ Histological grading of CRC takes into consideration the extension of the glandular appearance of the tumor. The tumors were staged using Dukes' classification and TNM staging system (tumor, lymph nodes, and metastasis).¹⁶

The medical charts of a convenience sample of 1363 patients that underwent emergency large bowel surgeries at HUGO, excluding appendectomies, were reviewed. A total of 143 patients presented suspicious masses for intraoperative malignant colon tumor. Pathology examinations confirmed 107 cases. Excluded cases were: 14 had benign diseases and 22 did not undergo biopsy. Benign diseases mimicking malignant neoplasias were: non-specific chronic inflammatory process ($n = 5$), pseudotumoral diverticulosis ($n = 4$), pseudotumoral appendicitis ($n = 4$), and Crohn's disease ($n = 1$).

All the data were imported into MS Excel® worksheets and posteriorly analyzed using SPSS 13.0. Quantitative variables were analyzed as mean \pm standard deviation and qualitative variables were described as frequency and percentage.

The comparative analysis was performed using Pearson's chi-square test (χ^2) at a significance level of $p < 0.05$. The variables age group, sex, tumor location and staging were compared with the variable death using bivariate analysis.

Results

Among the 107 patients with CRC diagnosis confirmed by histopathology examinations, 54.2% lived in the metropolitan region of Goiânia, 43.9% lived in the interior of the state of Goiás, and 54.2% ($n = 58$) were female. Mean age was 59.81 ± 17.08 years, while 52 (48%) had more than 60 years.

Table 1 – Signs and symptoms at hospital admission.

Signs and symptoms	n	%
Abdominal pain	104	97.2
No bowel movements	87	81.3
Vomiting	82	76.6
Anorexia	43	40.2
Weight loss	31	29.0
Tenderness	28	26.2
Bleeding	18	16.8
Tenesmus	7	6.5

The signs and symptoms at hospital admission of patients presenting with CRC are shown in Table 1. Digital rectal examination was performed in 26.2% of the patients and comorbidities were present in 35.5% of the subjects.

In 86% of the patients, the syndromic preoperative diagnosis was based on the association of clinical history and physical examination, biochemical exams, and plain abdomen X-rays. Patients were divided into five preoperative groups: acute abdomen with obstruction ($n=68$), acute abdomen with perforation ($n=21$), acute abdomen with inflammation ($n=13$), abdominal sepsis ($n=3$), and severe gastrointestinal bleeding ($n=2$).

Laparotomy showed 70 cases with obstruction and 37 of perforation. Perforations occurred at the tumor site in 24 patients and close to the tumor in 13 patients. The tumors were located: in the rectosigmoid (51.4%), in the transverse colon (19.6%), in the ascending colon (12.1%), in the descending colon (11.2%), and 5.6% of the cases presented association of two bowel tumors (synchronous tumors).

Adenocarcinoma was the most frequent histologic tumor type ($n=105$) and two patients presented intestinal lymphoma. Tumor staging was performed according to tumor differentiation grade and Dukes' classification (Table 2).

Tumor invasion was locally limited in 28% of the patients while 16.8% had peritoneal tumor deposits. Distant metastases were seen in 15.9% and the most commonly affected organ was the liver ($n=16$) and one case of cerebral metastasis was recorded. TNM staging system for CRC is presented in Table 3.

The mean time between hospital admission and surgery was 17.59 ± 34.84 h. Preoperative water and electrolytes imbalance were corrected, antibiotic therapy initiated and clinical support measures started. Blood transfusion was necessary in 21.5% of patients.

Surgeries were performed using general anesthesia (87.9%), but spinal anesthesia (6.5%), combined anesthesia (3.7%), and continuous epidural anesthesia (1.9%) were also used. The mean time of surgery was 2.39 ± 0.91 h and the surgical

Table 3 – General description, according to TNM staging system.

Diagnosis	Individuals	
	n	%
Stage I	2	1.9
Stage IIA	41	38.3
Stage IIIA	8	7.5
Stage IIIB	27	25.2
Stage IIIC	13	12.1
Stage IV	16	15.0
Total	107	100.0

procedures were: tumor resection with colostomy (85%), tumor resection with primary anastomosis (10.3%), and colostomy without tumor resection (4.7%). All tumor resections included partial colectomy with a 3-cm distal and a 5–7-cm proximal safety margin.

The average hospital stay length was 9 days and during this period 66.4% of the patients survived. 36 patients died and the immediate causes of death were: septic shock (61.12%), multisystem organ failure (19.44%), and acute respiratory failure (19.44%). Among patients who died, half presented initially obstruction and the other half perforation (10 cases presented with perforation at the tumor site).

The age group over 60 years was statistically correlated to death ($p=0.002$). Based on the results of the bivariate analyses, the variables sex, tumor location and staging according to Dukes' classification did not show statistical significance in relation to death (Table 4).

Discussion

This study reported a high mortality rate for complicated colorectal cancer confirming previous literature data.^{17–19} Interestingly, complaints of patients in this study were similar to any other cause of bowel obstruction or perforation.²⁰ Our data did not allow to identify any clinical or pathological factor to characterize or identify patients more favorable to present an obstructive CRC. Operative mortality due to obstruction or CRC perforation remains controversial and has ranged from 16% to 38%.^{20,21} Although high, the results presented in this study are within these limits (33.6%). This may be explained by the poor preoperative clinical condition of the patients (malnutrition, dehydration, advanced age). Many patients presented with secondary peritonitis, intestinal obstruction and/or perforation, requiring extensive intestinal resection, which may have led to hydroelectrolytic

Table 2 – General description, according to differentiation grade and Dukes's classification, of the anatomic pathology characteristics.

Differentiation	n	%	Dukes's classification	n	%
Grade I	8	7.5	A	0	0.0
Grade II	87	81.3	B	58	54.2
Grade III	6	5.6	C	43	40.2
Synchronous	6	5.6	Synchronous	6	5.6
Total	107	100.0	Total	107	100.0

Table 4 – Bivariate analyses of age group, sex, tumor location and staging according to Dukes's classification in relation to death.

Variable	n	Death	%	RR	IC 95%	p
<i>Age group</i>						
<60 years	55	11	20.0	0.42	1.09–1.31	0.002
>60 years	52	25	48.1		1.34–1.62	
<i>Sex</i>						
Female	58	22	37.9	1.33	1.25–1.51	0.208
Male	49	14	28.6		1.15–1.42	
<i>Tumor location</i>						
Rectosigmoid	55	20	36.4	1.00	1.23–1.49	0.959
Descendant colon	12	3	25.0	0.68	0.96–1.54	
Ascendant colon	13	4	30.8	0.85	1.02–1.59	
Transverse colon	21	7	33.3	0.91	1.11–1.55	
Synchronous	6	2	33.3	0.91	0.79–1.87	
<i>Dukes's classification</i>						
B	58	22	37.9	1.00	1.25–1.51	0.574
C	43	12	27.9	0.74	1.14–1.42	
Synchronous	6	2	33.3	0.88	0.79–1.87	

disorders and acid-base imbalances associated with sepsis and advanced-stage tumors.

Patients, in this series, with a diagnosis of CRC and that could be submitted to elective surgery were referred to another center. Therefore, comparison between emergency and elective surgery was not possible in this series.

In the present study, the mean age of the patients with CRC was 59.8 years, similar to the results obtained in other studies.^{22,23} Our data showed an equal distribution of patients under 60 years (52%) and with more than 60 years (48%). Some authors report similar results,¹⁴ but others found a predominance of patients over 60 years old.^{14,21} Considering age, sex, tumor site and Dukes' classification, only age showed statistical importance to death with almost half of patients with more than 60 years dead (Table 4). This may be attributable to less coexisting diseases in younger patients. However, the finding in our series of a high proportion of patients under 60 years is not clear when compared to others.^{22–25}

Concerning sex, it may or may not have a predominance in different studies. But, in fact, sex did not influence mortality rate (Table 4). McArdle and Hole²⁶ reported a small predominance of men for elective surgery and of women for emergency surgery.

Obstruction in CRC is not clear. Some factors may be involved as change in colonic flora, inflammatory edema, impaction of solid feces, fatigue of intestinal muscle proximally to stenosis, elasticity of intestinal wall and the amount of fibrosis present.²⁷ More studies must be done to clarify such possible causes of the obstructing mechanism.

When obstruction occurs in right side of the colon the surgical treatment is less controversial and a right colectomy with ileo-transverse anastomosis is the choice for the majority of patients. The discussion is what is the best approach to left-sided colonic obstruction.²⁸

In the present study we considered that one-third of patients had a right-sided obstruction (ascendant and transverse colon). However only 10% of all patients had primary anastomosis. This surgical option may be due to the fact that the patients were operated by different surgeons with

different experience dealing with CRC. Breitenstein et al.²⁹ reviewing studies of left-sided colonic obstruction concluded that one-stage surgery appears to be superior to two or three-stage procedures considering mortality rates but not morbidity rates. The incidence of obstruction of right colon may vary from 15% to 44% in the world.^{19,30} Our data did not show statistical difference in mortality rate between right-sided and left-sided colonic obstruction. This may be due to a small number of patients with one-stage surgical operation in this series. Two-stage surgical procedures – first, tumor resection with colostomy and, posteriorly, intestinal reconstruction – represented the most frequent choice (85% of the cases) in the present study. This was mainly a consequence of the poor clinical condition of our patients, inappropriate colon preparation, and hemodynamic instability, in some cases.

The choice of surgical procedure for CRC depends mainly on the location of the lesion and the general state of patient to tolerate a specific procedure. Surgical treatment of complicated CRC has becoming more radical and the immediate resection of the tumor has been recommended for majority of patients. If intraoperative colonic preparation can be performed, in good clinical condition, an one-stage surgical procedure for CRC can be carried out, with tumor resection and primary anastomosis.

Some patients (21.5%) needed blood transfusions, and the mean time of surgical procedure was approximately 140 min. Both variables did not show relation to death rate. But a possible negative effect of blood transfusion on survival rate may occur, despite other variables.

Palliative procedures may be used in selected patients, such as emergency endoscopy, laser coagulation, self-expanding metallic stents, among others. It may be used as a bridge to convert a surgical emergency into an elective surgery or for patients who cannot undergo a surgical procedure due to their present clinical condition.

Advanced CRC is associated with higher incidence of complications and mortality rate. Multivariate analysis revealed that the independent factors favorable to 5-year cancer-free survival were female gender, well-differentiated pathology,

uncomplicated cases, colon versus rectal location, and early stage.^{13,26} Although more advanced-stage CRC often results in higher mortality rates, in this study it was not statistically significant, probably because we had no patients presenting with Dukes's A tumors and the distribution of patients with Dukes' B and C tumors was homogeneous.

Conclusions

A higher prevalence of elderly and female individuals presenting non-specific complaints was observed among the patients with CRC who underwent emergency surgeries in this series.

The reasons why many patients are asymptomatic until a sudden obstructive onset remain unclear and require further investigation.

Conflicts of interest

The authors declare no conflicts of interest.

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