

Low Anterior Resection – Emergency Versus Elective Surgery in Rectal Cancer Treatment – Comparative Analysis

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Rezumat

Rezecția anterioară joasă - urgență versus elecție în tratamentul cancerului rectal - analiză comparativă

Introducere: Cancerul de rect reprezintă o problemă de sănătate publică, fiind una dintre localizările neoplazice cu cea mai mare incidență. Managementul chirurgical actual al acestei patologii include rezecția anterioară joasă cu anastomoză colorectală. Prezentarea în urgență a acestor pacienți și necesitatea unei intervenții imediate fac imposibilă urmarea managementului multi-modal necesar. Studiul de față își propune evaluarea comparativă a unei serii de cazuri la care intervenția a avut un caracter programat, respectiv de urgență.

Metode: Studiul este retrospectiv, observațional, descriptiv, unicentric, care a avut loc în perioada 1 ianuarie 2010 - 31 decembrie 2018 în cadrul secției Chirurgie Generală și Urgență III, a Spitalului Universitar de Urgență din București. Am inclus în studiu pacienții cu diagnosticul de externare de neoplaziei rectale care au fost supuși unui tratament chirurgical curativ constând în rezecție anterioară joasă, efectuată în conformitate cu principiile de siguranță oncologică.

Concluzie: Caracterul de urgență al intervenției chirurgicale influențează realizarea unei rezecții de tip R0, datorită lipsei unei evaluări preoperatorii adecvate (stadializare) și a absenței tratamentului neoadjuvant, mai degrabă decât a unui defect tehnic.

Key words: cancer rectal, urgență, rezecție anterioară joasă

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Abstract

Background: Rectal cancer is a public health problem, being one of the most prevalent neoplastic localizations. The current surgical management of this pathology includes low anterior resection with colorectal anastomosis. The presentation as an emergency of these patients and the need for immediate intervention make it impossible to follow the necessary multimodal management. The present study proposes a comparative assessment of a series of cases where the intervention was elective, respectively emergency.

Methods: This is a retrospective, observational, descriptive, unicentric study, that took place between 1st of January 2010 and 31st of December 2018 in the 3rd Department of General Surgery of the University Emergency Hospital Bucharest. We included in the study patients with the discharge diagnosis of rectal neoplasm who underwent curative surgical treatment consisting of low anterior resection performed in compliance with oncological safety principles.

Conclusion: The emergency nature of the surgery influences whether or not a R0 type resection is obtained due to lack of adequate preoperative assessment (stadialization) and the presence or absence of neoadjuvant treatment rather than a technical defect.

Key words: rectal cancer, emergency, low anterior resection

Introduction

Neoplastic pathology is an important public health issue, both in industrialized countries and in less developed regions. The increasing incidence is on the one hand due to changes in demographic factors (population growth and population aging) and on the other hand due to the increased prevalence of risk factors and changes in the reproductive pattern (fewer births, first birth in old age).

GLOBOCAN publishes data provided by the International Agency for Research on Cancer (IARC) on cancer incidence, prevalence and mortality throughout the world. The global incidence in 2018 was reported to be 18 million cases of malignancies, with a mortality of nearly 10 million (1).

Colorectal cancer mortality has declined over the past 20 years in most countries due to screening programs, decreased prevalence of risk factors, and improvements in multidisciplinary methods of diagnosis and treatment (2). However, the mortality rate continues to grow in regions with limited economic resources, such as Eastern Europe or South America, where lately there is a higher incidence of this type of cancer, probably due to the increased prevalence of risk factors such

as obesity, smoking, unhealthy eating habits (3).

In Romania, 83461 new cases of cancer were reported in 2018, with an incidence of 426 cases / 100,000, with 25% lower than the European average, being one of the countries with the lowest incidence. In terms of mortality due to neoplastic disease, Romania is also below the European average of 260 / 100,000, with 50,902 deaths in 2018.

Currently, the anterior resection of the rectum with digestive continuity restoration, preceded by radio / chemo-radiotherapy, can cure patients with rectal neoplasm provided that the basic criteria of rectal surgery are met, namely total excision of the mesorectum and removal of the surgical specimen with negative margins (R0- both micro and macroscopically uninvaded by the tumor), while preserving sphincter function, sexual and urinary functions (5).

The immediate postoperative period may be impeded by the occurrence of local complications (hemorrhage, anastomotic fistula, occlusion, parietal suppuration) or systemic complications (cardiac, pulmonary, neurological, pulmonary thromboembolism).

The most common and most feared complication of rectal resection with total excision of

the mesorectum is anastomotic fistula. In literature, reports of incidence of anastomotic insufficiency in anterior resections vary between 1% and 20%, the risk being even higher as the anastomosis is lower situated (6). For subperitoneal and coloanal anastomoses the incidence of anastomotic fistula is between 11% and 37% (7).

The present study aims to evaluate a group of patients by identifying significant differences between those who underwent emergency low anterior resection and those who underwent elective surgery.

Materials and Method

This is a retrospective, observational, descriptive, unicentric study, that took place between 1st of January 2010 and 31st of December 2018 in the 3rd Department of General Surgery of the University Emergency Hospital Bucharest.

We included in the study patients with the discharge diagnosis of rectal neoplasm who underwent curative surgical treatment consisting of low anterior resection performed in compliance with oncological safety principles. We excluded from the study the patients with local excision and palliative interventions.

The evaluation of the cases included in the research was based on the demographic, anamnestic, clinical, biological and imaging data contained in the medical chart of the patients, supplemented with therapeutic data contained in the operative register.

Results

The study group consisted of 80 cases, of which 14 (17.5%) underwent emergency intervention and 66 (82.5%) were scheduled for elective surgery.

The age of the patients enrolled in the study ranged from 42 years to 90 years, with an average of 61.81 ± 10.97 . Regarding the nature of the surgery (emergency or elective), age did not show statistically significant differences ($P = 0.662$) (Table 1).

Of the total of 80 patients enrolled in the study, 47 (58.7%) were men and 33 (41.2%) were women. Regarding the nature of surgery (emergency or elective), the sex of the patients did not show significant differences ($p = 0.173$) (Table 1).

The size of the tumor, measured as its maximum diameter, varied between 1 and 7.9 cm, with an average value of 3.91 ± 1.91 cm. In the group of patients who underwent a scheduled surgical intervention, the size range was 1.1-7.4 cm with an average of 3.56 ± 1.69 cm, while for the emergency patients the interval was 1-7.9 cm with an average of 5.55 ± 2.12 cm. Although the minimum and maximum sizes are similar between the two groups, the average for emergency surgery is significantly higher ($p < 0.001$) (Table 2).

Regarding the tumor stage, the highest number of cases, 38, representing 47.5%, were classified in stage T3, while only 6 cases, representing 7.5%, were in stage T1 (Table 3). The distribution of cases according to the tumor stage and the nature of the surgical intervention reveals in stage T4 a higher incidence of cases in

Table 1. Comparisons of the demographic structure for the elective surgery and emergency groups

Demographic characteristics	Study groups		p-value
	Elective surgery (n=66)	Emergency (n=14)	
Age (mean \pm sd)	62.06 ± 11.06	60.64 ± 10.84	0.662*
Gender			0.173**
M	36	11	
F	30	3	

* Student t-test, ** Chi-square test

Table 2. Comparisons of the tumor size for the elective surgery and emergency groups

Max diameter of tumor (cm)	Study groups		p-value
	Elective surgery (n=66)	Emergency (n=14)	
Tumor size (mean±sd)	3.56 ± 1.69	5.55 ± 2.12	<0.001*

* Student t-test

Table 3. Distribution of cases according to the tumor stage and the nature of the surgery

Tumor stage	Study groups		OR	CI (95%) for OR
	Elective surgery (n=66)	Emergency (n=14)		
T1 (n=6)	5	1	0.94	0.11-7.45
T2 (n=13)	12	1	0.393	0.05-2.78
T3 (n=38)	34	4	0.55	0.23-1.31
T4 (n=23)	15	8	2.514	1.33-4.76

which the surgery had an emergency character (OR 2.514) (Table 3).

Operative time was between 110 and 186 minutes, with an average value of 148.18 ± 24.40 minutes, with no statistically significant differences between the two groups (p = 0.91) (Table 4).

Intraoperative incidents and accidents were more common in the group of emergency patients with an odds ratio of 5.55 (95% CI: 1.4 to 22.04) for total number of intraoperative

events (Table 5).

The histopathological result also included the integrity of the rectal fascia by means of the R-classification, where R0 stands for the complete preservation of the fascia. In the studied group, a number of 67 cases, representing 84%, had an R0 resection type. Of these, 8 cases underwent emergency surgery. From the 13 patients with R1 resection, 6 patients underwent emergency surgery (Table 6).

Table 4. Comparisons of the operative time for the elective surgery and emergency groups

Operative time	Study groups		p-value
	Elective surgery (n=66)	Emergency (n=14)	
Mean ±sd	148.31±24.05	147.57±26.93	0.910*

* Student t-test

Table 5. Comparisons of the intraoperative incidents for the elective surgery and emergency groups

Intraoperative incidents	Study groups		OR	CI (95%) for OR
	Elective surgery (n=66)	Emergency (n=14)		
Significant hemorrhage	1	1	5	0.29-85.16
Difficult dissection	4	3	4.22	0.82-21.54
Necessity of splenectomy	1	1	5	0.29-85.16
TOTAL	6	5	5.55	1.40-22.04

Table 6. Comparisons of the intraoperative incidents for the elective surgery and emergency groups

R-classification	Study groups		p-value*
	Elective surgery (n=66)	Emergency (n=14)	
R0	59	8	<0.001
R1	7	6	<0.001

* Fisher's Exact Test

Regarding the postoperative evolution of patients, evaluated by the number of hospitalization days, we observed an interval of 8 to 42 days, with no significant differences between the two groups ($p = 0.830$) (Table 7).

Concerning postoperative complications presented in Table 8, a higher proportion is observed for emergency interventions, with higher odds for local or general complications, in the group of emergency surgery – OR 6.33 (95% CI: 1.79-22.36). There were 2 deaths in the group of elective surgical interventions, while in the group of emergency surgeries

there was only 1 death, with no statistical significance (Data not shown, $p = 0.96$).

Discussions

An exclusively surgical treatment of rectal cancer associates a high rate of local pelvic recurrence, of 5% -19% in stage I, 15% -30% in stage II, and 50% in stage III, in the absence of adenopathies (7). For patients with rectal neoplasm, the MRI evaluation of mesorectal fascia and mesorectal tissue whose invasion is directly correlated with local relapse and survival is

Table 7. Comparisons of the postoperative evolution for the elective surgery and emergency groups

Hospital stay (days)	Study groups		p-value
	Elective surgery (n=66)	Emergency (n=14)	
Mean \pm sd	16.48 \pm 6.80	16.07 \pm 6.00	0.830*

* Student t-test

Table 8. Comparisons of the postoperative complications for the elective surgery and emergency groups

Postoperative complications	Study groups		OR	CI (95%) for OR
	Elective surgery (n=66)	Emergency (n=14)		
Local				
Anastomotic fistula	1	1	5	0.29-85.16
Intestinal obstruction	0	1	14.77	0.57-382.53
Intraperitoneal hemorrhage	1	0	1.5	0.58-38.86
Peritoneal abscess / peritonitis	1	1	5	0.29-85.16
Parietal suppuration	3	1	1.61	0.15-16.78
General				
Urinary dysfunction	0	1	14.77	0.57-382.53
Acute myocardial infarction	1	1	5	0.29-85.16
Pulmonary thromboembolism	1	0	1.5	0.58-38.86
Cerebrovascular accident	1	1	5	0.29-85.16
TOTAL	9	7	6.33	1.79-22.36

more important than the TNM stage in establishing the protocol (8). Patient presentation in emergency, such as obstruction, perforation, or bleeding may require radical resection without prior imagistic evaluation and without the opportunity of neoadjuvant therapy.

In this study, patients who necessitated emergency surgery exhibited more R1 type resections compared to the group of patients operated after imaging staging and neoadjuvant therapy. Also, the group of patients whose intervention had an emergency character showed an advanced tumor stage.

An important limitation of this study is the reduced number of cases included. In the case of some parameters, such as intraoperative incidents or postoperative complications, that appear to have an empiric correlation, we were unable to demonstrate the statistical significance due to this fact.

Conclusion

The emergency nature of the surgery influences whether or not a R0 type resection is obtained due to lack of adequate preoperative assessment (stadialization) and the presence or absence of neoadjuvant treatment rather than a technical defect. Also, it is necessary to further evaluate the same group of patients in terms of long-term survival, disease free survival, quality of life, presence or absence of low anterior resection syndrome and, of course, the presence of genito-urinary dysfunctions, in order to obtain a complete evaluation of the implications of emergency surgery comparative to elective management of rectal cancer patients.

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