DOI: 10.1590/0100-6991e-20181998 Original Article

Factors preventing restoration of bowel continuity in patients with rectal cancer submitted to anterior rectal resection and protective ileostomy.

Fatores associados a não reconstrução do trânsito intestinal em pacientes com câncer retal submetidos à ressecção anterior do reto e ileostomia de proteção.

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A B S T R A C T

Objective: to evaluate the factors associated with non-closure of protective ileostomy after anterior resection of the rectum with total mesorectum excision for rectal cancer, the morbidity associated with the closure of ileostomies and the rate of permanent ileostomy in patients with rectal adenocarcinoma. **Methods:** we conducted a retrospective study with 174 consecutive patients diagnosed with rectal tumors, of whom 92 underwent anterior resection of the rectum with coloanal or colorectal anastomosis and protective ileostomy, with curative intent. We carried out a multivariate analysis to determine the factors associated with definite permanence of the stoma, as well as studied the morbidity of patients who underwent bowel continuity restoration. **Results:** In the 84-month follow-up period, 54 of the 92 patients evaluated (58.7%) had the ileostomy closed and 38 (41.3%) remained with the stoma. Among the 62 patients who had the ileostomy closed, 11 (17.7%) presented some type of postoperative complication: three had ileal anastomosis dehiscence, five had intestinal obstruction, two had surgical wound infection, and one, pneumonia. Eight of these patients required a new stoma. **Conclusion:** according to the multivariate analysis, the factors associated with stoma permanence were anastomotic fistula, presence of metastases and closure of the ileostomy during chemotherapy.

Keywords: Ileostomy. Colorectal Surgery. Anastomotic Leak. Chemotherapy. Chemotherapy, Adjuvant.

INTRODUCTION

In recent years, remarkable advances have been described in the treatment of rectal cancer. In the late 1970s, the use of circular staplers facilitated the surgical technique, allowing anterior resection of the rectum with anastomoses near the sphincter. The acceptance and diffusion of the total mesorectum excision (TME) allowed 30% to 50% relapse rates, demonstrated in some series, to be reduced to 6% to 10%. It has also been shown that at least 1cm tumor-free distal margins are oncologically safe[1]. These factors allowed the routine performance of low coloanal or colorectal anastomoses.

Although theoretically advantageous by avoiding a permanent colostomy of the abdominoperineal resection (APR) of the rectum, low coloanal and colorectal anastomoses are technically-difficult, high-morbidity procedures. Fistula rates increase significantly with the proximity of the anastomosis with the anal border. Those located less than 8cm from the anal border show dehiscence rates of up to 24%[2]. Due to these high rates, most authors recommend perfuming a loop ileostomy for protection of these anastomoses[3].

After anterior resection of the rectum and TME with protective ileostomy for treatment of rectal tumors, the goal is to reconstruct the intestinal transit in eight to 12 weeks. However,

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some patients never have their bowel continuity restored, and the ileostomy, initially called "temporary", remains definitively. Several authors describe a prevalence between 12% and 43% for this state, due to several causes, including patients with benign and malignant diseases[4,5]. In addition, those who undergo reconstruction of the intestinal transit also exhibit significant rates of postoperative complications and, sometimes, there is a need to build a new stoma. Morbidity after reversal of decompression stoma varies between 17% and 45%. The most common complications are wound infection, intestinal obstruction and anastomosis dehiscence, with mortality ranging from 0% to 3.5%[6,7].

This study aims to assess the factors associated with the non-closure of the protective ileostomy after anterior resection of the rectum and TME due to rectal cancer, the morbidity associated with the ileostomy closure, and the rate of stoma permanence after a long follow-up period in a cohort of patients with rectal adenocarcinoma.

METHODS

We retrospectively studied 174 consecutive patients diagnosed with rectal tumors, of whom 92 had adenocarcinoma and underwent anterior resection of the rectum (ARR) with TME, coloanal or colorectal anastomosis, and protective ileostomy, with curative intent. All patients were 18 years of age or older.

Experienced coloproctology surgeons performed all operations for both tumor resection and restoration of bowel continuity. All patients underwent anterograde bowel preparation prior to surgery. The TME time followed the principles of the technique described by Heald *et al.*[8]. In the patients who underwent reestablishment of the bowel transit, all anastomoses were performed manually, with or without resection of the intestinal segment that contained the ileostomy.

Neoadjuvant radiotherapy associated with chemotherapy was indicated for patients with infiltrative lesions of the lower and middle rectum classified as T3 or T4 and/or for those who had lymph nodes suspected of being metastatic. When indicated postoperatively, chemotherapy and radiotherapy (the latter if it had not been used for neoadjuvance), were performed for the majority of cases with stage II and III lesions. All patients classified as stage IV, besides receiving adjuvant chemotherapy, had a liver or lung resection proposal with curative intent.

The potential risk factors analyzed for the non-closure of the ileostomy were gender, age (younger and older than or equal to 65), tumor distance from the anal margin (thus considered: distal rectum - tumors located up to 4cm from the anal margin; middle rectum - between 4cm and 8cm; and proximal rectum - between 8.1cm and 12cm), carcinoembryonic antigen (CEA) values (smaller and greater than or equal to 5ng/ml), neoadjuvant radiotherapy and chemotherapy, occurrence of anastomotic fistula, pathological staging (pT, pN, and M), tumor staging, time between the ARR and the operation to restore bowel continuity, complications of the ileostomy closure, ileostomy closure during chemotherapy, postoperative radiotherapy and adjuvant chemotherapy. In relation to pT, pN, and M, we rearranged them in two groups: pT0, pT1 and pT2 *versus* pT3 and pT4; pN0 *versus* pN1 and pN2; M0 *versus* M1. We also regrouped the AJCC classification stages into two categories: 0/I-II *versus* III-IV.

Similar to other studies, we considered an ileostomy definitive when the closure operation was not performed after 12 months of its manufacture and when there was no programming to perform restoration of bowel continuity[9,10]. We defined the tumor location in the rectum by rectal digital examination and rigid rectosigmoidoscopy. We considered an anastomotic fistula the presence of fever associated with purulent or fecal discharge in the pelvic drainage, drainage of purulent secretion from the rectum or vagina and/or radiological signs of air outside the colon or opening of the colic wall. We defined ileostomy time as the period in months between the ARR with TME and the operation restore bowel continuity.

We considered the follow-up period as the one from the date of the operation to treat the rectal tumor until the last date registered in the patient's medical record or death date, counted in months. Patients were evaluated every three months in the first two years after the operation for treatment of the tumor, then every six months till completing five years of the procedure, and then annually onwards. During the follow-up visits, we submitted the patients to anamnesis and physical examination. We requested CEA dosages in the first two years of follow-up every three months, then every six months up to the first five years. Computed tomography of the abdomen and thorax were performed annually in the first five years of follow-up. Colonoscopies were performed after the first year of operation, and every two or three years thereafter. In case of new symptoms or suspected relapse, we could advance such examinations or request specific tests, such as magnetic resonance imaging, positron emission tomography.

We analyzed the categorical variables using the Chi-square test, and quantitative ones with the Student's t-test (mean and SD) for variables with normal distribution, and the Mann-Whitney test for non-normally distributed ones (median and interquartile range - IQR).

Initially, we performed a univariate analysis of each independent variable with the response variable. We considered as candidates for the multivariate model all variables that had *p*-value ≤0.20. We started the multivariate analysis with all the candidate variables and carried out a stepwise exclusion of those with the highest *p-value*, until reaching the model where all were significant at the 0.05 level.

We calculated the estimated probability of non-closure of the ileostomy according to the Kaplan-Meier method. The level of significance considered in this study was 0.05. The software used to perform the statistical calculations was the Statistical Package for Social Sciences (SPSS) version 20.0.

The project of this study, as well as the informed consent form, were approved by the Ethics in Research Committee of the Federal University of Minas Gerais, under CAAE register 0739.0.203.000-12.

RESULTS

The mean follow-up period was 29.7 months (standard deviation [SD]: ±22.8 months) and the total follow-up period was 84 months. Of the 92 patients evaluated, 30 remained with the ileostomy, while 62 underwent restoration of bowel continuity. After ileostomy closure, eight patients had a reconstructed stoma.

The 92 patients had a mean age of 55.6 years (SD: ±13.6 years), and 71 (77.2%) were less

than 65 years old, with a predominance of men (53.3%).The median CEA value was 4.5ng/ml (IQR 1.8-17.7ng/ml), with the majority presenting dosages lower than 5ng/ml (53.3%). The median tumor distance relative to the anal margin was 6cm (IQR 3.0-8.0cm) with 41.3% of tumors located less than 4cm to the anal margin, and 37% between 4cm and 8cm. Most of the patients underwent neoadjuvant radiotherapy and chemotherapy (71.7%).

Most tumors were classified as pT3 and pT4 (65.2%), pN0 (59.8%) and M0 (72%), and 52 patients (56.5%) had tumor stages 0/I-II. Only eight patients (8.7%) received radiotherapy in the postoperative period. On the other hand, 73 (79.3%) were treated with adjuvant chemotherapy. Table 1 brings the patients' demographic and clinicopathological characteristics.

Factors related to non-closure of theileostomy after anterior resection of the rectum

Of the 92 patients, 62 (67.4%) had the ileostomy closed in the median of eight months (IQR: 5.0-10.0 months). Figure 1 shows the number of patients who had the ileostomy closed at each follow-up month after ARR with TME. Of the 30 patients who did not have ileostomy closed, 17 (56.6%) showed disease progression, nine (30%) were on chemotherapy for more than 12 months, two (6.7%) had comorbidities that prevented closure and other two (6.7%) had complications of the first operation.

Table 2 presents the data comparing the patients who had restoration of bowel continuity with those who did not have the ileostomy closed after ARR. We observed a difference with statistical significance for the CEA values, occurrence of anastomotic fistula, presence of lymph node and systemic metastasis, and tumor staging.

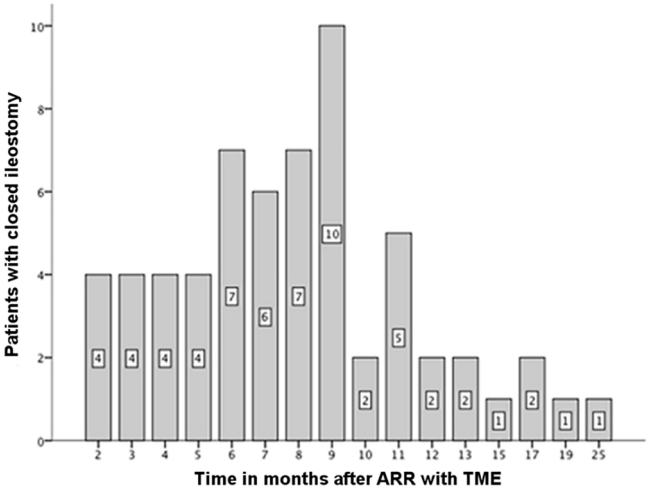

Figure 1. *Number of patients with closed ileostomy, at each month of follow-up after anterior rectal resection (ARR) with total mesorectum excision (TME) (n=62).*

Table 3 shows the univariate analysis of the factors associated with non-closure of the ileostomy after anterior resection of the rectum with total mesorectum excision and protective ileostomy. The variables CEA values greater than 5ng/ml, presence of anastomotic fistula, pN1-pN2 stages, presence of metastases, and tumor stage III-IV showed statistically significant differences.

According to the multivariate analysis, patients who presented with anastomotic fistula and systemic metastases had a higher risk of not having the ileostomy closed after ARR. Patients with anastomotic fistula had a 2.93-fold higher chance of not having the ileostomy closed when compared with those who did not present this complication (95% CI: 1.23-6.97, p=0.015). The occurrence of systemic metastases, even if potentially resectable at the time of diagnosis of the rectal tumor, increased 3.64 times the risk of non-closure of the ileostomy after ARR with TME and protective ileostomy (95% CI: 1.75-7.60, p=0.001).

Table 1. *Demographic and clinicopathological characteristics of the study patients (n=92).*

Variables	n (%)
Gender	
Male	49 (53.3)
Female	43 (46.7)
Age (years)	
Mean±SD	55.6±13.6
Age group (years)	
<65	71 (77.2)
≥65	21 (22.8)
CEA* (ng/ml)	
Median (IQR)	4.5 (1.8-17.7)
CEA* (ng/ml) - range	
≤5	49 (53.3)
>5	43 (46.7)
Tumor distance to the anal margin (cm)	
Median (IQR)**	6.0 (3.0-8.0)
Tumor distance to anal margin - range (cm)	
≤4	38 (41.3)
4.1-8	34 (37.0)
8.1-12	20 (21.7)
Neoadjuvant radiotherapy-chemotherapy	
Yes	66 (71.7)
No	26 (28.3)
pT Stage	
pT0/pT1/pT2	32 (34.8)
pT3/pT4	60 (65.2)
pN Stage	
pN0	55 (59.8)
pN1-pN2	37 (40.2)
M Stage	
M0	72 (78.3)
M1	20 (21.7)
AJCC staging***	
0/I-II	52 (56.5)
III-IV	40 (43.5)

*SD: standard deviation; *CEA: carcinoembryonic antigen; **IQR: interquartile range; ***AJCC: American Joint Committee on Cancer.*

Table 2. *Comparison of factors related to ileostomy closure and persistence of ileostomy after anterior resection of the rectum due to rectal cancer (n=92).*

Variables	Ileostomy closure n=62 (%)	Persistence of ileostomy n=30 (%)	Total (%)	*p*
Gender				
Male	32 (51.6)	7 (56.6)	49 (53.3)	0.649[1]
Female	30 (48.4)	13 (43.3)	43 (46.7)	
Age group (years)				
<65	47 (75.8)	24 (80.0)	71 (77.2)	0.653[1]
≥65	15 (24.2)	6 (20.0)	21 (22.8)	
CEA ranges (ng/ mL)				
≤5	38 (61.3)	11 (36.7)	49 (53.3)	0.026[1]
>5	24 (38.7)	19 (63.3)	43 (46.7)	
Tumor distance to anal margin - ranges (cm)				
<4	25 (40.3)	13 (43.3)	38 (41.3)	0.948[1]
4.1-8	23 (37.1)	11 (36.7)	24 (37)	
8.1-12	14 (22.6)	6 (20.0)	20 (21.7)	
Neoadjuvant radiotherapy-chemotherapy				
Yes	43 (69.4)	23 (76.7)	66 (71.7)	0.465[1]
No	19 (30.6)	7 (23.3)	26 (28.3)	
Anastomotic fistula				
Yes	4 (6.5)	7 (23.3)	7 (23.3)	0.035[2]
No	58 (93.5)	23 (76.7)	81 (88.0)	
pT Stage				
pT0/pT1/pT2	24 (38.7)	8 (26.7)	32 (34.8)	0.256[1]
pT3/pT4	38 (61.3)	22 (73.3)	60 (65.2)	
pN Stage				
pN0	44 (71.0)	11 (36.7)	55 (59.8)	0.002[1]
pN1/pN2	18 (19.0)	19 (63.3)	37 (40.2)	
M Stage				
M0	56 (90.3)	16 (53.3)	72 (78.3)	<0.0001[1]
M1	6 (9.7)	14 (46.7)	20 (21.7)	
AJCC Tumor Classification				
0/I-II	43 (69.4)	9 (30.0)	52 (56.5)	<0.0001[1]
III-IV	19 (30.6)	21 (70.0)	40 (43.5)	

[1]Asymptotic Pearson Chi-square test; [2]Exact Pearson Chi-square test.

Table 3. *Univariate analysis of factors associated with non-closure of the ileostomy after anterior resection of the rectum with total mesorectum excision and protective ileostomy (n=92).*

Variables	PR*	PR*95% CI**	*p*
Gender			
Male	1.15	0.63-2.08	0.650
Female	1		
Age group (years)			
<65	1		
≥65	1.18	0.56-2.51	0.661
CEA***ranges (ng/ml)			
≤5	1		
>5	1.18	1.02-1.37	0.028
Tumor distance to anal margin - ranges (cm)			
<4	1		
4.1-8	0.95	0.49-1.82	0.868
8.1-12	0.88	0.39-1.96	0.748
Neoadjuvant radiotherapy - chemotherapy			
Yes	1.29	0.63-2.64	0.479
No	1		
Anastomotic fistula			
Yes	2.24	1.27-3.94	0.005
No	1		
pT Stage			
pT0/pT1/pT2	1		
pT3/pT4	1.47	0.74-2.91	0.274
pN Stage			
pN0	1		
pN1-pN2	2.57	1.39-4.75	0.003
M Stage			
M0	1		
M1	3,15	1.88-5.29	<0.0001
AJCC tumor Classification			
0/I-II	1		
III-IV	3.03	1.56-5.89	0.001

** PR: prevalence ratio; ** CI: confidence interval; *** CEA: carcinoembryonic antigen.*

Ileostomy closure

Among the 62 patients who had the bowel continuity restored, 11 (17.7%) presented some type of postoperative complication: three had ileal anastomosis dehiscence, five had intestinal obstruction, two had wound infection and one had pneumonia. All patients with complications, except those with surgical wound infection and pneumonia, were reoperated and the stoma was reconstructed (eight patients).

At the end of the follow-up period (84 months), of the 92 patients evaluated, 54 (58.7%) had restoration of bowel continuity and 38 (41.3%) remained with some type of intestinal stoma.

Figure 2 shows the probability curve of non-restoration of bowel continuity over the 60-month period, according to the Kaplan-Meier method. The computed estimate for 60 months was 37%.

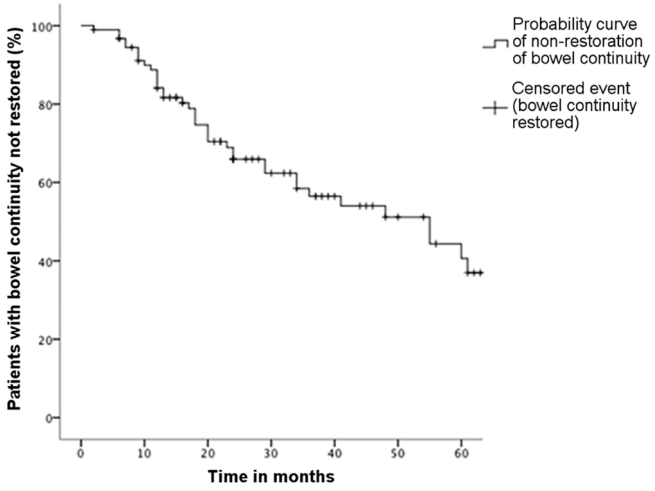

Figure 2. *Probability of non-restoration of bowel continuity during the 60-month follow-up period, according to the Kaplan-Meier method.*

The univariate analysis, carried out to identify the factors related to the permanence of a definitive stoma in patients with rectal cancer treated with ARR with TME and protective ileostomy, identified that the variables pN stage, M stage, AJCC classification and closing of the ileostomy during chemotherapy regimen were related to permanence of the stoma (Table 4).

According to the multivariate analysis, in patients who had the ileostomy closed during chemotherapy, the prevalence was 4.21 times greater for the non-restoration of bowel continuity in relation to those who had it closed outside of an adjuvant chemotherapy treatment (95%CI: 1.003-17.657, p=0.049).

DISCUSSION

The risks related to the closure and permanence of a stoma after several types of colorectal resection were previously addressed by some authors[4,5,9.11-14]. However, research addressing the overall rate of ileostomy persistence after treatment for rectal cancer is rare in the literature[4,15-17]. The present study identified the occurrence of anastomotic fistula after ARR, systemic metastasis and closure of the ileostomy during adjuvant chemotherapeutic treatment as factors associated with the stoma permanence after all the different stages of treatment in a cohort of patients with rectal cancer submitted ARR with TME and protective ileostomy.

Ileostomy is also associated with the various complications, such as dermatitis, para-stomal hernia, stenosis, bleeding, prolapse, retraction and dehydration in 60% of patients. The incidence of these complications increases with the time for restoration of bowel continuity[18,19].

The median time for ileostomy closure of the patients analyzed herein was eight months. It is worth noting that several authors recommend the closure in eight to 12 weeks[20,21], though as the data reported here, most describe significantly longer periods for the restoration of bowel continuity[22-24]. This suggests that, for many patients, the ideal time stipulation for stoma closure is unreal. From small series of patients to large multicenter studies, it is rare to find references to patients who were freed of the stoma in a time considered ideal, up to 12 weeks after the ARR. The periods described for restoration of bowel continuity after rectal cancer treatment vary between four and 12 months[7,9,11,12,20,25]. Factors related to the delay in the reconstruction of intestinal transit are adjuvant chemotherapy, elderly patients, advanced stages of neoplasia and presence of comorbidities[5,20,24].

Table 4. *Univariate analysis of the variables related to the permanence of a definite stoma in patients with rectal cancer submitted to anterior resection of the rectum with total mesorectum excision and protective ileostomy (n=92).*

Variables	PR*	PR*95% CI**	*p*
Gender			
Male	1.50	0.78-2.90	0.225
Female	1		
Age group (years)			
<65	1		
≥65	0.76	0.33-1.73	0.519
CEA***range (ng/ml)			
≤5	1		
>5	1.75	0.91 - 3.35	0.093
Tumor distance to anal margin - range (cm)			
<4	1		
4.1-8	0.670	0.42-1.76	0.670
8.1-12	0.794	0.39-2.07	0.894
Neoadjuvant radiotherapy - chemotherapy			
Yes	1.10	0.53-2.27	0.790
No	1		
Anastomotic fistula			
Yes	1.96	0.90-4.28	0.090
No	1		
pT Stage			
pT0/pT1/pT2	1		
pT3/pT4	2.00	0.92-4.36	0.082
pN Stage			
pN0	1		
pN1-pN2	2.55	1.32-4.93	0.005
M Stage			
M0	1		
M1	2.35	1.23-4.50	0.010
AJCC**** - Tumor Classification			
0/I-II	1		
III-IV	2.5	1.28-4.89	0.007
Closing of ileostomy during chemotherapy			
Yes	4.4	1.05-18.46	0.042
No	1		
Not applicable	-----	----------	------
Adjuvant radiotherapy			
Yes	0.90	0.28-2.93	0.861
No	1		
Adjuvant chemotherapy			
Yes	1.39	0.58-3.32	0.461
No	1		
Local Recurrence			
Yes	1.05	0.44-2.50	0.922
No	1		
Systemic recurrence			
Yes	1.58	0.77-3.24	0.217
No	1		

** PR: prevalence ratio; ** CI: confidence interval; *** CEA: carcinoembryonic antigen; **** AJCC: American Joint Committee on Cancer.*

In the present study, 32.6% of the patients did not have the protective ileostomy closed after ARR. The reported prevalence of stomatal permanence after colorectal resections varies between 12% and 43%[4,5,9,11,15,20,22,24]. This great difference occurs due to the diversity between the studies, which include different types of colorectal resections, as well as covering benign diseases and malignant neoplasias. The factors described as related to the non-closure of the stoma are similar between the different researches and similar to those we found. The following causes are reported: postoperative chemotherapy, advanced age, metastatic disease, previous comorbidities and operative complications during tumor resection[9,20,24,25]. We should also note that in the present study, according to the multivariate analysis, the occurrence of anastomotic fistula and metastases are factors that increase the risk of not having the ileostomy closed after ARR with TME.

The anastomotic fistula after ARR factor is recognized as related to the non-closure of the ileostomy[5,9,16,17,20,25]. A large Dutch study with 924 patients evaluated over seven years also pointed out that anastomotic fistulas, unlike other complications such as bleeding, are associated with more cases of non-closure of the ileostomy after ARR[20]. Moreover, dehiscence of colorectal anastomosis, in addition to technical problems that may prevent the restoration of bowel continuity, such as pelvic fibrosis, causes many patients to be afraid to face serious postoperative complications. As such, they prefer to remain with the permanent stoma. Thus, the decrease in the rate of unexpected, permanent ileostomies requires methods that decrease the rate of anastomotic fistulas.

Patients with metastases are at greater risk of permanent stomata[26]. Usually, these patients show deterioration of the general state and/or are undergoing chemotherapeutic treatment, factors that are known to delay the closure of the intestinal stoma[24].

The manufacturing of a temporary ileostomy has been shown to be efficient in avoiding complications due to fistulas of low colorectal anastomosis[27,28]. This procedure practically does not increase ARR operative time and overall morbidity. However, proximal deviation of the intestinal transit through an ileostomy is not a procedure that can be considered risk-free. The closure of the ileostomy in this cohort was associated with a complication rate of 17.7%, with 12.9% reoperations, but we observed no mortality. A meta-analysis evaluated 48 studies involving 6017 patients and showed that restoration of bowel continuity is associated with a morbidity of 17%, a reoperation rate of 3.7%, and a mortality rate of 0.4%[29]. In the same review, the most common complications were intestinal obstruction, surgical wound infection and anastomotic fistula, similar to those found in the present study. It is also emphasized that these complications often require operative treatment and need reconstruction of new intestinal stoma. Other authors also reported similar results, in which complication rates ranged from 10% to 60%[6,7,12,13,21].

The present study has some limitations. The main ones are due to being a retrospective cohort, and the inclusion of patients stage IV (20 in total). It is known that patients with advanced disease are at greater risk of not having the intestinal transit reconstructed[30]. The option to include patients with resectable systemic metastases aimed at evaluating the probability of the patient having a definite stoma in a group closer to what the surgeon encounters in real life. All patients included in this condition had hepatic (14) or pulmonary (6) lesions, suitable for resection.

The implications of manufacturing an ileostomy after ARR with TME should not be underestimated, and many patients may not have their bowel continuity restores. In this study, patients who had fistula of the colorectal anastomosis, systemic metastases and closure of the ileostomy during chemotherapy presented a greater risk of remaining with a definite stoma. It is essential to characterize the factors related to the non-closure of ileostomy and to keep in mind the possible complications resulting from it, so that in the preoperative period patients receive realistic guidelines and do not foster false expectations. In addition, patients at high risk of remaining with a definitive ileostomy, in which there is real doubt between APR and a very low distal anastomosis, may have a clinical decision made easier.

R E S U M O

Objetivo: *avaliar os fatores associados ao não fechamento de ileostomia protetora após ressecção anterior do reto com excisão total do mesorreto por câncer retal, a morbidade associada ao fechamento destas ileostomias e a taxa de estomia permanente em pacientes com adenocarcinoma retal.* **Métodos:** *estudo retrospectivo de 174 pacientes consecutivos com diagnóstico de tumores retais, dos quais 92 foram submetidos à ressecção anterior do reto com intenção curativa, anastomose coloanal ou colorretal e ileostomia de proteção. Foi realizada análise multivariada visando a determinar os fatores associados à permanência definitiva da estomia, assim como o estudo da morbidade nos que se submeteram à reconstrução do trânsito.* **Resultados:** *no período de seguimento de 84 meses, 54 dos 92 pacientes avaliados (58,7%) tiveram a ileostomia fechada e 38 (41,3%) permaneceram com a estomia. Entre os 62 pacientes que tiveram a ileostomia fechada, 11 (17,7%) apresentaram algum tipo de complicação pós-operatória: três com deiscência de anastomose ileal, cinco com obstrução intestinal, dois com infecção de ferida operatória e um com pneumonia. Oito destes pacientes necessitaram de um novo estoma.* **Conclusão:** *de acordo com a análise multivariada, os fatores associados à permanência da estomia foram fístula de anastomose, presença de metástases e fechamento da ileostomia durante quimioterapia.*

Descritores: *Ileostomia. Cirurgia Colorretal. Neoplasias Colorretais. Fístula Anastomótica. Quimioterapia Adjuvante.*

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Received in: 09/05/2018
Accepted for publication: 10/25/2018
Conflict of interest: none.
Source of funding: none.

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