



## ARAŞTIRMA / RESEARCH

# Incidence of permanent stoma after rectal cancer surgery and its risk factors

Rektum kanser cerrahisi sonrası kalıcı ileostomi insidansı ve risk faktörleri

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### Abstract

**Purpose:** A significant number of the protective stomas temporarily applied in order to reduce the effects of anastomosis complications after rectal cancer surgery cannot be closed and become permanent. In this study, the causes that can lead to a permanent stoma were investigated.

**Materials and Methods:** Patients who underwent elective surgery with low anterior resection and protective ileostomy due to rectal cancer were included in the study. Patients whose stoma could not be closed within one year were evaluated as permanent stoma.

**Results:** 66 patients were included in the study. The mean closing time for the stomas were found as 5, 6 ±2,5 (1-12)months. The stomas of twelve (18.2%) of the patients could not be closed and became permanent. The presence of metastatic disease at the time of diagnosis, the proximity of the anastomosis to the anal entry, coloanal anastomosis, and the final pathology showing stage IIIC were found to be risk factors for permanent stoma.

**Conclusion:** Some of the stomas applied temporarily due to surgical treatment of rectal cancer became permanent. Before the index operation, the patient and their relatives should be informed that in the presence of certain risk factors, these stomas may not be closed and become permanent.

**Keywords:** Rectum cancer, Permenant stoma

### Öz

**Amaç:** Rektum kanseri cerrahisi sonrası anastomoz komplikasyonlarının etkilerini azaltmak amacı ile geçici amaçla uygulanan koruyucu stomaların önemli bir kısmı kapatılmayarak kalıcı hale gelmektedir. Bu çalışmada kalıcı stomaya neden olabilecek nedenler araştırılmıştır.

**Gereç ve Yöntem:** 2015-2018 tarihleri arasında elektif şartlarda rektum kanseri nedeni ile aşağı anterior rezeksiyon ve koruyucu ileostomi uygulanan hastalar çalışmaya alındı. Bir yıl içerisinde stoması kapatılmayan hastalar kalıcı stoma olarak değerlendirildi.

**Bulgular:** Çalışmaya 66 hasta dahil oldu. Stomaların ortalama kapatılma süresi 5,6 ±2,5 (1-12) ay olarak bulundu. On iki hastanın (%18,2) stoması kapatılmayarak kalıcı hale geldi. Tanı anında metastatik hastalık varlığı, anastomozun anal girime yakınlığı, koloanal anastomoz yapılması, cerrahi sonrası patoloji sonucunun evre IIIC olması stoma kapatılmaması açısından risk faktörü olarak bulundu.

**Sonuç:** Rektum kanseri cerrahi tedavisinde geçici amaçla uygulanan stomaların bir kısmı kalıcı hale gelmektedir. İndeks operasyondan önce hasta ve yakınlarına, bazı risk faktörü ya da faktörleri varlığında bu stomaların kapatılmayarak kalıcı hale gelebileceği bilgisi verilmelidir.

**Anahtar kelimeler:** Rektum kanseri, Kalıcı stoma

## INTRODUCTION

Sphincter-sparing surgeries have recently become increasingly common, due to advancing stapler technology and preoperative chemoradiotherapy, in

patients with rectal tumors to avoid abdominoperineal resection and a permanent stoma. However, as the level of anastomosis decreases, the risk of complications increases and the need for protective stomas also increase<sup>1,2</sup>. According to many large scale studies in the literature, the

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prevalence of non-closure of temporary stomas after colorectal resections were reported as 6% to 32% for various reasons such as; advanced age, postoperative radiotherapy, cancer recurrence, anastomosis-related complications, and unsatisfactory anorectal functions<sup>3-5</sup>.

Stomas are a life experience which have a negative impact on the self-consciousness, self-esteem, body image and social life of a person and disturbs the daily lives of patients<sup>6,7</sup>. Additionally, they causes a wide range of medical complications. Dermatitis due to leaks around the stoma bag, dehydration due to high flow of stoma, electrolyte imbalance, peristomal hernia, stomal retraction and stoma prolapse are some of them<sup>8,9</sup>. Although stoma closure is recommended in 8-12 weeks, there are some studies suggesting earlier closure in the literature<sup>10-12</sup>.

The aim of this study was to evaluate the long-term permanent stoma rate for patients who underwent low or ultra-low rectal resection and to identify the risk factors associated with a permanent stoma.

## MATERIALS AND METHODS

After receiving the 01.02.2019 85/4 dated and numbered approval from the Cukurova University Faculty of Medicine Ethics Committee, this study included patients who underwent elective diverting ileostomy due to rectal cancer and underwent elective lower anterior resection, from January 2015 to January 2018 in the General Surgery department of Cukurova University Faculty of Medicine. Patients who underwent palliative surgery, those undergoing emergency operation, patients undergoing abdominoperineal resection, patients undergoing Hartmann colostomy, and those who developed mortality within three months of elective surgery were excluded from the study. 66 patients who met these criteria were evaluated.

Tumors remaining within 15 cm of the anal entry were evaluated as rectal cancer. All patients underwent staging, thorax and abdominal computed tomography and pelvic magnetic resonance imaging. Patients who were evaluated as local advanced disease were reevaluated after long-term chemoradiotherapy and were operated at least 8 weeks after the completion of neoadjuvant therapy. Along with open or laparoscopic total mesorectal excision with rectum resection, and protective ileostomy after end-to-end colorectal or coloanal

anastomosis were performed. At the end of the treatment, the closure of the stoma was planned at the end of the treatment for patients who received adjuvant treatment, and it was planned to be closed 2-3 months after the surgery for patients who did not receive adjuvant treatment. All anastomoses were evaluated endoscopically and radiologically before the stoma was closed. A stoma was considered permanent if it could be closed within 12 months, or it was not planned to close.

The following data were extracted: age, sex, body mass index (kg/m<sup>2</sup>), ASA score, comorbid diseases, tobacco use, CEA levels, preoperative staging, neoadjuvant chemotherapy status, type of operation, anastomosis technique, perioperative blood use, distance of anastomosis to the anal canal, postoperative complications and pathological staging.

## Statistical analysis

SPSS 24.0 package program was used for statistical analysis of the data. Categorical measurements were summarized as number and percentage, and continuous measurements as mean and standard deviation (median and minimum-maximum where necessary). Chi Square statistics were used to compare categorical variables. In the comparison of continuous measurements between the groups, the distributions were controlled and Student T test was used for the parameters that normally distributed according to the number of variables. Mann-Whitney U test was used for the parameters not showing normal distribution. Kaplan-Meier analysis and Log Rank test were used for survival analysis. Statistical significance level was taken as 0.05 in all tests.

## RESULTS

During the study, 163 patients were operated on for rectal cancer. 24 patients with abdominoperineal resection, 12 patients with Hartmann colostomy, 4 patients lost in 3 months, 53 patients without stoma and 4 patients whose data were not reached were excluded, 66 remaining patients were evaluated (50 male, 16 female). The mean age of the patients was 58.5 (23-83) (Table 1).

Forty-eight patients (72.7%) received long term neoadjuvant chemoradiotherapy. Complete laparoscopic resection was achieved in 39 patients

(59.1%). Eight patients had a laparoscopic operation that was converted to an open procedure. Eleven patients (16.6%) had metastatic disease during surgery.

The rate of total permanent stoma was 18.2%. While the risk of having a permanent stoma was not affected by the age of the patient, ASA score, body

mass index, receiving neoadjuvant chemoradiotherapy, the surgery being laparoscopic or open, or conversion from laparoscopic to open; existence of metastasis during surgery, the closeness of the anastomosis to the anal canal, handsewn anastomosis, final pathology outcome showing stage III and local recurrence were identified as risk factors (Tables 1 and 2).

**Table1. Demographic characteristics, operative details and long-term results**

Parametres	Stoma Temporary n: 54	Stoma Permanent N: 12	p*
Age (min-max)	58.1±10.9 (23-75)	61.67±12.0 (37-83)	0.335
Sex			
Female	14 (25.9)	2 (16.7)	0.360
Male	40 (74.1)	10 (83.3)	
ASA score			
1	32 (59.3)	6 (50.0)	0.717
2	17 (31.5)	4 (33.3)	
3	5 (9.3)	2 (16.7)	
BMI (min-max)	27.0±6.9 (18-62)	26.0±4.5 (22-37)	0.655
CEA	4.74±10.7 (0.67-73)	116.5±332.3 (1.01-1162)	0.014
Neoadjuvant chemotherapy	41 (75.9)	7 (58.3)	0.216
Type of Operation			
Open	20 (37.0)	7 (58.3)	0.175
Laparoscopic	34 (63.0)	5 (41.7)	
Coverted to open surgery	7 (20.6)	1 (16.7)	0.825
Type of anastomosis			
Handsewn	3 (5.6)	4 (33.3)	0.017
Stapler	51 (94.4)	8 (66.7)	
Distance of anastomosis (cm)	4.39±2.9 (0-9)	2.33±2.0 (0-5)	0.025
Local recurrence	1 (1.9)	3 (25.0)	0.002
Distant organ metastasis	6 (11.1)	5 (41.7)	0.027

**Table 2. Stoma non-closure rates according to stages**

Stage	Stoma Temporary n: 54	Stoma Permanent N: 12	p*
0	1 (1.9)	0 (0.0)	0,001
1	17 (31.5)	1 (8.3)	
2	2 (3.7)	0 (0.0)	
2A	4 (7.4)	0 (0.0)	
2B	12 (22.2)	1 (8.3)	
3A	1 (1.9)	0 (0.0)	
3B	10 (18.5)	0 (0.0)	
3C	5 (9.3)	7 (58.3)	
4	2 (3.7)	3 (25.0)	

## DISCUSSION

The majority of patients with rectal cancer can be treated with sphincter-sparing surgery without compromising oncological principles<sup>13</sup>. It has been

shown that diverting stoma performed after low anterior resection for rectal cancer reduces the outcomes of anastomotic complications in many studies and metaanalysis, although it is not clear whether it reduces anastomotic complications<sup>1,2,14</sup>. Stoma applied for a temporary period of time has its

own complications, and one of the most undesirable is the stoma becoming permanent. This rate has been reported as 3-24% in the literature and this ratio increases as follow-up periods increase<sup>1,15</sup>. A permanent stoma negatively affects not only the patient but also their relatives' quality of life<sup>16</sup>.

In our study, the rate of permanent stoma was found to be 18%, and the presence of metastases during surgery, the proximity of the anastomosis to the anal canal, handsewn anastomosis, and local recurrence were found to be risk factors for stoma non-closure; while anastomotic leakage, anastomosis narrowness, ASA score, age, neoadjuvant chemoradiotherapy, body mass index, type of operation, conversion of laparoscopy to open surgery were not found to be risk factors.

Although the recommended time for loop ileostomy closure is usually within the first three months, in most patients this time is greater than recommended<sup>8</sup>. In a study, the lengthening of the duration was explained by postoperative adjuvant chemotherapy, non-surgical complications and symptomatic anastomotic leakage and small bowel obstruction<sup>17</sup>. In our study, this period was determined to be 5-6 months and the most common reason for prolongation of this time was to wait for completion of adjuvant therapy.

Anastomotic complications and local recurrence are well known risk factors for permanent stoma<sup>16</sup>. Anastomotic leakage is one of the most feared complications after low anterior resection and has been reported as 9-19% in the literature<sup>18</sup>. In our study, anastomotic leak was observed in 4 patients (6.1%) and was not found to be a risk factor for permanent stoma, unlike those reported in the literature. However, the rate of permanent stoma was found to be higher in patients with local recurrence. In 3 patients who developed local recurrence, pathologic specimen examination after surgical resection was revealed stage IIIC disease despite neoadjuvant therapy and one of these patients underwent abdominosacral resection due to local recurrence and the other two patients were exitus at 14th and 17th months due to disease-related reasons.

Metastatic disease at the time of diagnosis is another risk factor for permanent stoma<sup>18-20</sup>. In these patients, Having disease progression after surgery, having a short survey and long-lasting chemotherapy may cause the stoma to become permanent in these

patients. In our study, the rate of permanent stoma was higher in patients with stage IV disease. In parallel with this finding, serum CEA levels were higher in those with a permanent stoma.

Surgical dissection and anastomosis become more difficult as rectal cancer is closer to the anal opening and complication rates are higher in lower anastomosis<sup>21</sup>. Anastomoses with stapler have been shown to be associated with less anastomotic leakage than manual anastomoses<sup>22</sup>. In our study, the rate of permanent stoma was found to be higher in anastomoses with a lower level and in handsewn anastomosis. The limitations of our study retrospectively and the small number of patients

In our study, 18.2% of ileostomies created for rectal cancer was not closed. Metastatic diseases, height of anastomosis, hand-sewn anastomosis, pathological stage IIIC disease were identified as significant risk factors for permanent stoma. Prior to index surgery, especially in the presence risk factors mentioned in the literature, the possibility of some stomas becoming permanent should be shared with the patient and their next of kin.

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