



## Prevalence of Leak in Rectal Anastomosis Surgery without Diverting Ileostomy: A Case - Control Study Including 32 Patients Who Underwent Low Anterior Resection Surgery

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### Abstract

**Objectives:** A case – control study including 32 patients who underwent low anterior resection surgery. Investigating the prevalence of leakage in patients who do not have an ileostomy diverting.

Colorectal carcinoma is the most common malignancy of the digestive tract. The biology of rectal adenocarcinoma is similar to colon adenocarcinoma, and the principles of colon resection surgery, such as complete removal of the tumor along with the lymphatic bed and all involved organs, also apply to rectal carcinoma. Five things that increase the chance of leakage from the anastomosis site include intestinal ischemia due to reduced blood supply to the anastomosis site, receiving neoadjuvant chemoradiotherapy before the operation, excessive tension at the anastomosis site, poor intestinal preparation before the operation, and infection.

**Method and Material:** 2 out of 16 patients in the case group (without an ileostomy loop insertion) had a leak, and their common risk factor was male gender, and 2 out of 16 patients in the control group (with an ileostomy loop insertion) had a leak from the anastomosis site, which is the same risk factor as the case group. The mutual factor between these two groups is being male. The rate of complications caused by ileostomy loop insertion in this study was reported as a percentage.

**Result:** In recent studies, it has been noted that ileostomy loop installation does not reduce the possibility of leakage and its existence is associated with complications and morbidity. In this study, the prevalence of leak was 12.5% in the control group and 12.5% in the case group.

**Conclusion:** It is recommended not to use the diverting ileostomy loop routinely in patients undergoing LAR surgery. This method should be used in patients who have multiple risk factors to increase the possibility of leakage after surgery.

**Keywords:** Rectal Adenocarcinoma; Protective Ileostomy; Neoadjuvant Treatment; Anastomosis Leaking; Lower Rectal Surgery

### Introduction

Rectal cancer is a common type of gastrointestinal cancer, and its incidence is increasing year by year. Surgery is the major treatment modality and is often supplemented by preoperative neoadjuvant radiotherapy and chemotherapy or postoperative

adjuvant [1-3]. Low anterior resection (LAR) with colorectal or coloanal anastomosis for mid to distal rectal cancer less than 10 cm from the anal verge is associated with higher risk of anastomotic leak compared to high anterior resection and restorative colonic procedures.

In some cases, anastomotic leakage leads to devastating results, such as peritonitis, pelvic abscess, and rectovaginal fistula. Other important factors in the successes or failures of the procedure are male gender, emergency surgery, intra-abdominal contamination, radiation, hypoalbuminemia, and significant patient comorbidities, such as chronic obstructive pulmonary disease or diabetes. Technical consideration most often relates to tension and inadequate blood supply [4-6].

Some surgeons use a protective stoma after LAR to prevent anastomotic leakage in the hope that by diverting the fecal stream and keeping the anastomosis free material, leakage will be less likely [1,7-10]. While other surgeons have reported that covering the protective stoma had no influence on anastomotic leakage and reoperation rates, the further complications that can be caused by the stoma itself should not be ignored, as they include discomfort and inconvenience, high output with consequent dehydration, and anastomotic complications at the stoma closure site [12].

Colorectal carcinoma is the most common malignancy of the digestive tract [6]. More than 140,000 new cases are diagnosed in the United States each year, and more than 50,000 patients die from the disease each year, making colorectal cancer the third most deadly cancer in the United States [6,7].

Outbreak leakage	NO	YES	
Count	14	2	16
Within group %	87/5%	12/5%	100 %
count	14	2	16
Within group %	87/5%	12/5%	100%
Count	28	4	32
Within group %	87/5%	12/5%	100%

**Table 1:** Comparison of the prevalence of leakage from the anastomosis site in case and control groups.

### Methods and Materials

The biology of rectal adenocarcinoma is similar to colon adenocarcinoma, and the principles of colon resection surgery, such as complete removal of the tumor along with the lymphatic bed and all involved organs, also apply to rectal carcinoma, but considering the anatomy of the pelvis and its proximity to other structures (ureter, bladder), prostate, vagina, iliac vessels and sacrum) rectal cancer resection is more challenging and requires a different approach.

This study was conducted in Taleghani Hospital affiliated to Beheshti University and included 32 patients with rectal adenocarcinoma who were candidates for Low Anterior Resection (LAR) surgery. The entry of patients in to this study was based on an informed consent in which all the complications and benefits of ileostomy loop diverting were explained to the patients and they were divided in to two groups of 16 people a case group and a control group.

16 patients who were included in the group were not fitted with an ileostomy diverting at the time of LAR surgery and post operation in term of the presence of leakage symptoms it was examined and compared with the control group that had an ileostomy inserted. In this study 2 patients out of 16 patients in case group had leakage symptoms and were taken back to the operating room and 2 out of 16 patients in the control group also showed leakage from the anastomosis site and were taken to the operating room again due to the appearance of sepsis symptoms.

According to the P Value (0.999) obtained no significant difference was found between the two groups of case and control.

### Other finding obtained in this study include:

The patients who experienced leakage from the anastomosis site in both groups were male gender.

3 patients from the control group suffered from ileostomy complication unfortunately one patient presented with severe symptoms of dehydration and died due to severe electrolyte disturbances.

Currently, due to the technological progress of different techniques with new innovative staplers and the promotion of the use of total mesorectal excision for rectal cancer and as a result the subsequent increase in anal preservation (compared to rectal surgeries in previous years) in these years, the amount Rectal cancer surgery with free margin and subsequent anastomosis has increased.

Although the use of these methods still has risks and problems. Anastomosis leakage is currently one of the major serious complications after rectal tumor surgery, which has a serious impact on the patient’s quality of life after surgery and increases the economic and family burden [1,3,14]. As a result, surgeons used

methods to reduce the possibility of leakage, one of these methods was the installation of a diverting ileostomy loop in these patients, which currently the most conditions that encourage surgeons to install an ileostomy loop include young surgeons who have surgery and laparoscopic anastomosis in the distal 2/3 of the rectum, or patients who underwent neoadjuvant chemoradiotherapy before surgery [2-4].

Five things that increase the chance of leakage from the anastomosis site include intestinal ischemia due to reduced blood supply to the anastomosis site, receiving neoadjuvant chemoradiotherapy before the operation, excessive tension at the anastomosis site, poor intestinal preparation before the operation, and infection [3]. As a result, by improving surgical methods and preventing the tension of the anastomosis site or maintaining blood supply to the site, surgeons can reduce the possibility of leakage and infection, which itself is a factor in increasing the possibility of leakage.

According to the findings of this study, insertion of diverting ileostomy loop in patients with adenocarcinoma of 2/3 of the distal of the rectum who underwent low anterior resection and very low anterior resection surgery, failure to insert diverting ileostomy loop in these patients causes an increase in leakage rate in the case group. Compared to the control group, on the other hand, the installation of ileostomy loop caused complications in the follow-up after the surgery, one case died due to dehydration following the discharge of watery stool from the ileostomy as a result of that dehydration and the resulting electrolyte disorder, one case was hospitalized for a long time. After adjusting the stool output and creating consistency from the ileostomy loop, as well as a case of severe dermatitis around the ileostomy loop, but no significant difference with the control group was seen in the statistical analysis.

In this study, out of 16 patients who were included in the group, who had a leak from the anastomosis site, whose common feature was male gender, one of the patients had received neoadjuvant treatment and the other had not. In the same way, out of 16 control cases, 2 leak cases were reported, and like the case group, their gender was male, one of the patients had received neoadjuvant treatment and the other had not received neoadjuvant chemoradiotherapy.

According to this study, there was no significant difference between the installation of diverting ileostomy loop and its non-installation, which can confirm other studies that reminded surgeons that the installation of diverting ileostomy loop as a routine surgical procedure in patients with cancer in 2/3 Distal rectum that does not undergo LAR and VLAR surgery.

Niu and his colleagues, who investigated the possibility of increased leakage from the anastomosis site in 347 patients who underwent LAR surgery and 95 patients had ileostomy loop, based on the results showed, there was no significant difference in increasing the possibility of leakage in people without a loop. There was no protective ileostomy and no evidence of increased leakage was reported, similar to our findings in this study [4].

In the study of WANG and his colleagues on 307 people who underwent laparoscopic LAR surgery, 140 patients were without ileostomy loop, and in this study, there was no significant difference in the increase of leak in patients without ileostomy loop [5].

In the study of Marinescu and his colleagues, they investigated the risk factors that increase the leakage of the anastomotic site in patients who underwent elective LAR and VLAR surgery. In this study, it was mentioned that the insertion of an ileostomy loop did not reduce the risk of leakage from the anastomotic site, but in case of leakage from the location of anastomosis reduces the need for re-surgery [6].

## Results

2 out of 16 patients in the case group (without an ileostomy loop insertion) had a leak, and their common risk factor was male gender, and 2 out of 16 patients in the control group (with an ileostomy loop insertion) had a leak from the anastomosis site, which is the same risk factor as the case group. The mutual factor between these two groups is being male. The rate of complications caused by ileostomy loop insertion in this study was reported as a percentage.

## Discussion

Patients who suffered from complications or died in the LAR + ileostomy group included the following:

- The first patient had severe abdominal distension 4 days after the operation. The ileostomy functioned well and was taken back to the operating room after detecting a leak.
- The second patient was discharged but returned with dehydration and a watery stoma. The patient died because of ileostomy complications.
- The third patient died as a result of postoperative complications unrelated to ileostomy insertion or non-implantation.
- The fourth patient had abdominal distention and was taken to the operating room again with the diagnosis of leakage.

Also, in one patient, the duration of hospitalization was prolonged after surgery to regulate ileostomy secretions, and in another patient, dermatitis around the ileostomy was observed.

Patients who had complications or died in the LAR group included the following:

- The first patient got better in general condition, but died after surgery because of complications of chemotherapy.
- The second patient had abdominal distension and fever 4 days after the surgery and was again transferred to the operating room, and irrigation and providing an ileostomy loop performed.
- The third patient had a leak from the anastomosis site, was sent to the operating room again, and an ileostomy loop was performed.

The number of patients in this study was limited, however, due to the covid-19 pandemic, a number of patients did not come to participate in the study, some patients did not agree to participate in this study, and some patients due to the conditions and issues that occurred during the operation. It happened and it was decided to change the surgical procedure or it was necessary to insert an ileostomy loop for them, so they were excluded from this study, which has limited the investigations.

However, despite the mentioned limitations, the to continue this study in a larger number of patients.

## Conclusion

However, despite the mentioned limitations, the results of this study showed that the lack of ileostomy loop does not increase the

rate of leakage in patients with rectal cancer after surgery, and it is recommended.

Due to the progress in surgical techniques and the use of various staplers and the use of neoadjuvant treatment in recent decades, rectal adenocarcinoma has been subjected to curative resection with a higher rate.

In the opinion of some surgeons, embedding an ileostomy diverting in LAR surgery helps to reduce the possibility of a leak from the anastomosis site, and also the presence of an ileostomy due to diverting the fecal path in the event of a leakage causes a better management of the leak and reduces the need for resurgery to prevent sepsis symptoms.

According to this study, which was conducted as a case and control, the absence of ileostomy loop did not increase the prevalence of leakage compared to the group with ileostomy loop diverting. also, in the control group, in 2 patients who had a leak from the anastomosis site, despite having an ileostomy it could not prevent the aggravation of sepsis symptoms in the patients, and they were inevitably taken to the operating room again.

According to the finding of this study, it is recommended not to place ileostomy routinely in patients who have undergone LAR surgery, and placed in ileostomy patients who have at least two or more risk factors that increase the possibility of leakage from the anastomosis site. And finally, it is recommended to conduct more studies in this topic.

According to the statistical results and also observations and clinical examinations of all study cases, the installation of a diverting (protective) ileostomy loop in patients with rectal cancer who have undergone Low Anterior and Very Low Anterior Resection has no specific indication and does not reduce the possibility of leakage in patients with rectal cancer.

Furthermore, performing an ileostomy loop on patients without clear justification is just a further psychological and economic unwanted effect on patients and their families, increases high morbidity and imposes another unnecessary operation on patients.

Although protective stomas are widely used in LAR for rectal cancer, it remains unclear whether such protective stomas are

useful for patients [1-16]. Therefore, we performed this meta-analysis to investigate whether a protective stoma affects the outcomes of patients undergoing LAR for rectal cancer.

Colorectal carcinoma is one of the most common malignancies of the gastrointestinal tract, due to the progress in neoadjuvant treatments and multiple methods and staplers, curative surgery is increasing in patients [15,16]. According to this study, ileostomy loop insertion reduces the Leakage from the anastomosis site was not significantly different between the case and control groups, and it was not helpful in the management of the leak in this study. It is recommended not to use the diverting ileostomy loop routinely in patients undergoing LAR surgery. This method should be used in patients who have multiple risk factors to increase the possibility of leakage after surgery [18-20].

### Ethics Approval

This study was based on an informed consent form from patients with rectal cancer. In this consent form all the complications and benefits of ileostomy diverting were explained to the patients entered this study knowingly and were divided in two groups case and control.

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