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RESEARCH ARTICLE

Endoluminal Vacuum Therapy for Anastomotic Leakage Following Rectal Cancer Resection: A Retrospective Case Series

Abdullah Güneş, Ömer Akay, Murat Özdamar

University of Health Sciences Türkiye, Kocaeli City Hospital, Clinic of General Surgery, Kocaeli, Türkiye

ABSTRACT

Aim: Anastomotic leakage (AL) remains one of the most serious complications following rectal cancer surgery, particularly in low rectal anastomoses. Endoluminal vacuum therapy (EVT) has emerged as a minimally invasive treatment option aimed at controlling pelvic sepsis and preserving the anastomosis. This study aimed to evaluate the clinical outcomes, safety, and feasibility of EVT in the management of AL following rectal cancer resection.

Method: A retrospective two-center case series was conducted between January 2020 and December 2025, including patients who developed AL following rectal cancer surgery and were treated with EVT. Clinically stable patients without generalized peritonitis were included, whereas patients requiring emergency surgical intervention were excluded. Demographic characteristics, leakage features, EVT-related variables, treatment outcomes, and complications were analyzed.

Results: A total of 13 patients were included in the study. The mean age was 57.7±12.3 years, and all patients had a protective diverting stoma at the time of EVT initiation. AL was diagnosed at a median of 10 postoperative days (range, 6-115), with most leaks located in low rectal anastomoses (mean leak level: 4.7±1.8 cm from the anal verge); EVT was initiated at a median of 12 postoperative days (range, 8-120). The median number of EVT sessions was three (range, 2-6), and the median time to clinical healing was 16 days (range, 12-34). Clinical resolution of AL was achieved in 12 patients, resulting in an overall success rate of 92.3%; EVT-related complications occurred in 2 patients (15.4%), including one anastomotic stricture, successfully managed with endoscopic balloon dilatation, and one rectovaginal fistula, which required a Hartmann procedure and was considered a treatment failure. No pelvic abscess was observed. Diverting ileostomies were closed 1 month after confirmed healing in all eligible patients.

Conclusion: EVT appears to be a promising and feasible minimally invasive treatment option for AL following rectal cancer surgery, particularly in carefully selected clinically stable patients with low rectal anastomoses. The high success rate, acceptable morbidity, and low need for reoperation suggest that EVT may represent a valuable anastomosis-preserving strategy. Larger prospective studies are needed to better define optimal patient selection and treatment timing.

Keywords: Endoluminal vacuum therapy, anastomotic leakage, rectal cancer, case series, colorectal surgery

Introduction

Rectal cancer remains a major global health burden in terms of incidence, morbidity, and mortality.[1] Surgical resection continues to represent the cornerstone of curative treatment for rectal cancer[2]; however, it is associated with a substantial risk of postoperative complications. Anastomotic leakage (AL) and other colorectal defects, such as Hartmann's stump leakage, represent some of the most serious complications following rectal cancer resection and are associated with significant morbidity and mortality.[3] In rectal cancer surgery, the reported incidence of AL varies according to the level of the anastomosis, ranging from 6% to 30%, with an average incidence of approximately 11%.[3] Despite advances in surgical techniques, perioperative care, and neoadjuvant treatment strategies, the incidence of AL remains unacceptably high. AL is associated

Address for Correspondence: Abdullah Güneş, MD, University of Health Sciences Türkiye, Kocaeli City Hospital, Clinic of General Surgery, Kocaeli, Türkiye
E-mail: apogunes@hotmail.com **ORCID ID:** orcid.org/0000-0003-3755-1749
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with prolonged hospital stay, increased rates of reoperation, impaired functional outcomes, and adverse oncological consequences, including delayed initiation of adjuvant therapy and higher local recurrence rates.[4,5] Therefore, effective management of AL is critical to improving both short- and long-term outcomes following rectal cancer surgery.

The management of rectal AL is primarily determined by the patient's clinical status, the severity and anatomical location of the defect, and the presence of a diverting stoma. Patients presenting with generalized peritonitis typically require urgent surgical reintervention with dismantling or revision of the anastomosis. In contrast, clinically stable patients, particularly those with a protective stoma, may be suitable candidates for less invasive, non-operative treatment approaches. These approaches include percutaneous image-guided drainage, endoscopic clipping techniques, and endoluminal vacuum therapy (EVT).[6]

EVT has emerged as a promising minimally invasive technique for the treatment of AL following rectal cancer resection. By applying continuous negative pressure to the leakage cavity, EVT facilitates effective drainage, reduces local inflammation, and promotes granulation tissue formation, resulting in progressive cavity shrinkage and defect closure.[7,8] Recent studies have reported clinical success rates ranging from 85% to 89%, with high rates of anastomotic preservation, supporting the growing adoption of EVT in the management of rectal AL.[9,10]

Despite these encouraging results, data regarding the clinical effectiveness of EVT, optimal patient selection, timing of therapy initiation, and its overall impact on patient recovery remain limited. Accordingly, this case series aimed to evaluate the clinical outcomes, safety, and feasibility of EVT in patients treated for AL following rectal cancer surgery. This case series has been reported in line with the PROCESS 2025 Guideline.[11]

Materials and Methods

Study Design and Patient Selection

This retrospective, two-center study was conducted following approval from the institutional ethics committee of Kocaeli City Hospital (approval no: 2025-186, date: 25.12.2025). Both centers represented consecutive institutional settings of the same colorectal surgery team following institutional relocation in 2023. Therefore, all patients were managed by the same surgical team using a consistent treatment strategy throughout the study period. The study was conducted in accordance with the principles of the Declaration of Helsinki. Patients who developed AL following rectal cancer resection and were treated with EVT between January 2020 and December 2025 were included. All consecutive eligible patients managed with EVT during the study period were included in the analysis. No additional eligible cases were intentionally excluded. All patients were followed up until clinical resolution of AL or discontinuation of EVT.

AL was diagnosed based on clinical findings, radiological imaging, and endoscopic evaluation. Patients presenting with generalized peritonitis at the time of diagnosis were excluded from the study and managed with emergency surgical intervention according to standard clinical practice. Only clinically stable patients without signs of generalized peritonitis in whom EVT was applied as part of the treatment strategy were included in the analysis.

Demographic, clinical, perioperative, and EVT-related data were retrieved from electronic medical records, operative reports, endoscopy records, and follow-up charts. Case identification was performed using institutional colorectal surgery databases and was confirmed by operative reports, endoscopy records, and follow-up charts.

Endoscopic Assessment and EVT Procedure

Following the diagnosis of AL, all patients underwent endoscopic evaluation to assess the level of the anastomosis, size of the defect, and the presence and extent of the associated leakage cavity. The decision to initiate EVT was based on endoscopic findings and the patient's overall clinical condition, and EVT was initiated once the patient was deemed clinically suitable.

EVT was performed under general anesthesia or sedoanalgesia, with the patient in the lithotomy position, using a sponge-based vacuum system. A handmade EVT device was prepared using a standard vacuum-assisted closure sponge, trimmed to the dimensions of the anastomotic defect and cavity, and then securely attached to a Nelaton catheter**.** The sponge was prepared individually based on the size of the anastomotic defect and leakage cavity. Under direct endoscopic visualization, with additional assessment via digital rectal examination when appropriate, the sponge was positioned to adequately fill and seal the leakage cavity. Proper positioning of the sponge was confirmed endoscopically and, when appropriate, via digital rectal examination.

Following correct placement, continuous negative pressure of 40-50 mmHg was applied using a standard vacuum source; EVT dressings were routinely exchanged every 3-5 days. During each exchange, the leakage cavity was reassessed endoscopically, and sponge size and positioning were adjusted based on changes in cavity size and the extent of granulation tissue formation. The same handmade EVT system, the same experienced colorectal surgery team, and the same treatment protocol were used consistently across all patients throughout the study period to ensure procedural standardization and safety, and to minimize inter-operator variability; EVT was continued until clinical resolution of the AL was achieved.

Representative endoscopic images of AL cavities and the EVT system used in this study are shown in Figures 1 and 2, respectively.

Following documented closure of the AL, all patients underwent routine rectosigmoidoscopic evaluation 3 weeks after healing to confirm sustained closure and mucosal integrity. In patients with a diverting ileostomy, stoma closure was planned and performed 1 month after confirmed healing, provided that no contraindications were present.

Treatment Follow-up

EVT was performed as part of a multidisciplinary treatment strategy that also included antibiotic therapy, clinical monitoring, and nutritional support when required. The therapy was continued until clinical resolution of the AL, defined as closure of the leakage cavity with sufficient granulation tissue and absence of clinical or radiological signs of ongoing leakage or infection. No patients required premature discontinuation of EVT during the treatment period. The total number of EVT sessions, therapy duration, and time to clinical resolution were recorded for each patient. Patients were closely monitored throughout the treatment period, with EVT-related complications, need for additional interventions, and overall clinical course documented. In patients with a diverting stoma, stoma closure was evaluated following successful resolution of the AL. All patients had a minimum follow-up duration of 6 months after documented healing, and no patients were lost to follow-up.

Outcome Measures

The primary outcome measure was clinical resolution of AL following EVT. Secondary outcomes included the duration of EVT, the number of sponge exchanges, the time to leakage resolution, anastomotic preservation, and EVT-related complications. AL severity was retrospectively classified according to the International Study Group of Rectal Cancer (ISREC) grading system, and post-treatment adverse events were graded using the Clavien-Dindo classification.

Statistical Analysis

Given the limited sample size, statistical analysis was primarily descriptive. Continuous variables with approximately symmetric distribution were expressed as mean ± standard deviation, whereas skewed variables were presented as median (minimum-maximum). Categorical variables were presented as frequencies and percentages. No comparative statistical analysis or hypothesis testing was performed.

RESULTS

A total of 13 patients who developed AL following rectal cancer resection and were treated with EVT were included in the study. The mean age of the cohort was 57.7±12.3 years, and the majority of patients were men [9 (69.2%) vs. 4 women (30.8%)]. All patients had a protective diverting stoma at the time of EVT initiation, and neoadjuvant therapy had been administered in 11 patients (84.6%). All included leaks were retrospectively classified as ISREC Grade B AL. Low anterior resection was the predominant surgical procedure, performed laparoscopically in most patients. Circular stapled anastomosis was used in most cases, most commonly with a 31-mm stapler.

AL was diagnosed at a median of 10 postoperative days (range, 6-115). The patient diagnosed on postoperative day 115 had initially undergone emergency open low anterior resection with protective diverting stoma formation and experienced an uneventful early postoperative course. During routine rectosigmoidoscopic evaluation prior to planned stoma closure, a clinically silent anastomotic leak was identified, and EVT was subsequently initiated. The mean tumor distance from the anal verge was 7.7±3.7 cm, and the mean anastomotic leak level was 4.7±1.8 cm from the anal verge, indicating that most leakages occurred in low rectal anastomoses. Endoscopic evaluation revealed a leakage cavity in all patients, with a median cavity diameter of 20 mm (range, 15-30 mm). EVT was initiated at a median of 12 postoperative days (range, 8-120).

The median number of EVT sessions was three (range, 2-6). Clinical resolution of AL was achieved in 12 patients, resulting in an overall EVT success rate of 92.3%. The median time to clinical healing was 16 days (range, 12-34).

One patient (Patient No. 2) developed a late rectovaginal fistula on postoperative day 120, after prior initial closure of the AL confirmed endoscopically following completion of EVT. This patient had received neoadjuvant radiotherapy prior to surgery. During follow-up, the patient developed malodorous vaginal discharge, prompting further colonoscopic evaluation, which revealed a rectovaginal fistula. No clear warning signs of persistent leakage were identified between the documented endoscopic closure and the subsequent fistula formation, and the patient subsequently required reoperation with a Hartmann's procedure. This was considered treatment failure (Clavien-Dindo Grade IIIb). EVT-related morbidity was limited. One patient (7.7%) developed an anastomotic stricture during follow-up, which was successfully managed with endoscopic balloon dilatation (Clavien-Dindo Grade IIIa). No other major EVT-related complications were observed. Overall, two EVT-related complications (15.4%) occurred, including one rectovaginal fistula and one anastomotic stricture; however, only the rectovaginal fistula was considered treatment failure.

Following confirmed closure of the AL, diverting ileostomies were closed approximately 1 month after documented healing in all eligible patients. The median follow-up duration was 23 months (range, 6-62 months). Except for the previously

described rectovaginal fistula case, no recurrent AL was detected following documented healing. Baseline demographic and clinical characteristics of the patients are summarized in Table 1, and detailed patient-level data are presented in Table 2. Considerable heterogeneity was observed in baseline characteristics, timing of postoperative leak diagnosis, and EVT treatment burden. The number of EVT sessions ranged from 2 to 6. Clinical healing was achieved in the majority of patients, with limited post-treatment morbidity.

Discussion

In the present case series, EVT achieved a high clinical success rate of 92.3% for treating predominantly low rectal AL, with a low need for reoperation and acceptable morbidity. These findings indicate that EVT can be an effective minimally invasive option for controlling pelvic sepsis while preserving the anastomosis in selected patients.

AL remains one of the most severe complications following rectal cancer surgery, particularly in low rectal anastomoses, and is associated with increased morbidity, prolonged hospitalization, and compromised oncological outcomes.[5] In this context, EVT has gained increasing attention as a treatment strategy that promotes continuous drainage, reduces local inflammation, and facilitates defect closure without the need for immediate surgical reintervention.[6,12]

The favorable outcomes observed in our cohort are consistent with previous reports indicating that EVT is particularly suitable for low rectal anastomoses, in which surgical revision is technically challenging and carries substantial risk. By allowing repeated endoscopic assessment and stepwise management, EVT enables individualized treatment while maintaining a minimally invasive approach. Overall, our findings support EVT as a practical and effective treatment option in routine clinical practice and contribute additional clinical evidence to the evolving literature on AL management.

Previous studies have consistently reported high success rates for EVT in managing colorectal AL. Jagielski et al.[13] reported successful transrectal vacuum-assisted endoscopic treatment

Table 1. Baseline demographic, clinical, and treatment characteristics of the study cohort

Variables		
Age, (mean ± SD)		57.7±12.3
Sex	**Male n (%)**	9 (69.2%)
	Female n (%)	4 (30.8%)
Body mass index, kg/m² (mean ± SD)		25.3±1.6
Tumor distance from anal verge, cm (mean ± SD)		7.7±3.7
Anastomotic leak level from anal verge, cm (mean ± SD)		4.7±1.8
Time to diagnosis of anastomotic leakage, days (median, range)		10 (6-115)
Leakage cavity diameter, mm (median, range)		20 (15-30)
Neoadjuvant therapy, n (%)		11 (84.6%)
Protective stoma, n (%)		13 (100%)
Time to EVT initiation after surgery, days (median, range)		12 (8-120)
Number of EVT sessions (median, range)		3 (2-6)
Time to clinical healing, days (median, range)		16 (12-34)
Follow-up duration, months (median, range)		23 (6-62)
EVT clinical success, n (%)		12 (92.3%)
EVT failure, n (%)		1 (7.7%)
ISREC grade B, n (%)		13 (100%)
ASA II, n (%)		8 (61.5%)
ASA III, n (%)		5 (38.5%)
Intraoperative air leak test performed, n (%)		13 (100%)
EVT-related stricture (Clavien-Dindo IIIa), n (%)		1 (7.7%)
Late fistula requiring Hartmann procedure (Clavien-Dindo IIIb)		1 (7.7%)

The anastomotic stricture was successfully managed endoscopically and, therefore, was not considered EVT failure

EVT: Endoluminal vacuum therapy, SD: Standar deviation, ISREC: International Study Group of Rectal Cancer

Table 2. Individual patient-level perioperative characteristics, EVT treatment details, and clinical outcomes

Patient no.	Age (years)	Sex	BMI (kg/m²)	Comorbidity	ASA class	Tumor distance from anal verge (cm)	Leak diagnosis (POD)	EVT initiation (POD)	EVT sessions (n)
1	64	M	26.4	None	III	10	14	17	3
2	34	F	23.2	None	II	6	6	9	4
3	67	F	25.4	Diabetes	III	5	10	12	2
4	68	M	26.1	Hypertension	II	15	7	8	3
5	60	M	24.2	None	II	7	16	18	4
6	59	M	24.5	Arrhythmia	III	3	45	50	6
7	42	M	24.9	None	II	5	10	12	3
8	45	M	26.5	None	II	15	115	120	4
9	58	M	24.5	CAD	III	8	12	15	3
10	48	F	25.2	None	II	6	8	9	3
11	73	F	29.7	Diabetes, COPD	III	7	9	12	3
12	74	M	24.1	Hypertension, Diabetes	II	12	6	8	3
13	58	M	24.5	Hypertension	II	5	14	16	5

Table 2. Continued

Patient no.	Cavity Diameter (mm)	Healing time (days)	Post-treatment complication	Neoadjuvant Therapy	Follow-up (months)	TNM Stage	Surgical procedure	Anastomotic technique
1	20	34	None	Yes	62	Stage 1	Lap LAR	31 mm Circular stapler
2	15	21	Rectovaginal fistula	Yes	48	Stage 2	Lap LAR	31 mm Circular stapler
3	30	14	None	Yes	44	Stage 1	Lap LAR	31 mm Circular stapler
4	25	12	None	Yes	38	Stage 0	Open LAR	31 mm Circular stapler
5	20	16	None	Yes	26	Stage 1	Lap LAR	31 mm Circular stapler
6	30	25	None	Yes	24	Stage 1	Lap LAR (pull-through coloanal anastomosis)	No stapler
7	25	15	Stricture	Yes	23	Stage 0	Lap LAR	29 mm Circular stapler
8	15	19	None	No	17	Stage 1	Open LAR	31 mm Circular stapler
9	20	26	None	Yes	12	Stage 0	Lap LAR	31 mm Circular stapler
10	15	12	None	Yes	12	Stage 1	Lap LAR	29 mm Circular stapler
11	25	16	None	Yes	9	Stage 2	Lap LAR	31 mm Circular stapler
12	30	15	None	Yes	8	Stage 2	Open LAR	31 mm Circular stapler
13	20	16	None	No	6	Stage 1	Lap LAR	31 mm Circular stapler

POD: Postoperative day, EVT: Endoluminal vacuum therapy, ASA: American Society of Anesthesiologists physical status classification, BMI: Body mass index, LAR: Low anterior resection, Lap: Laparoscopic, Open: Open surgery, CAD: Coronary Artery Disease, COPD: Chronic Obstructive Pulmonary Disease TNM stages represent pathological staging (ypTNM after neoadjuvant therapy when applicable). Stage 0 indicates complete pathological response.

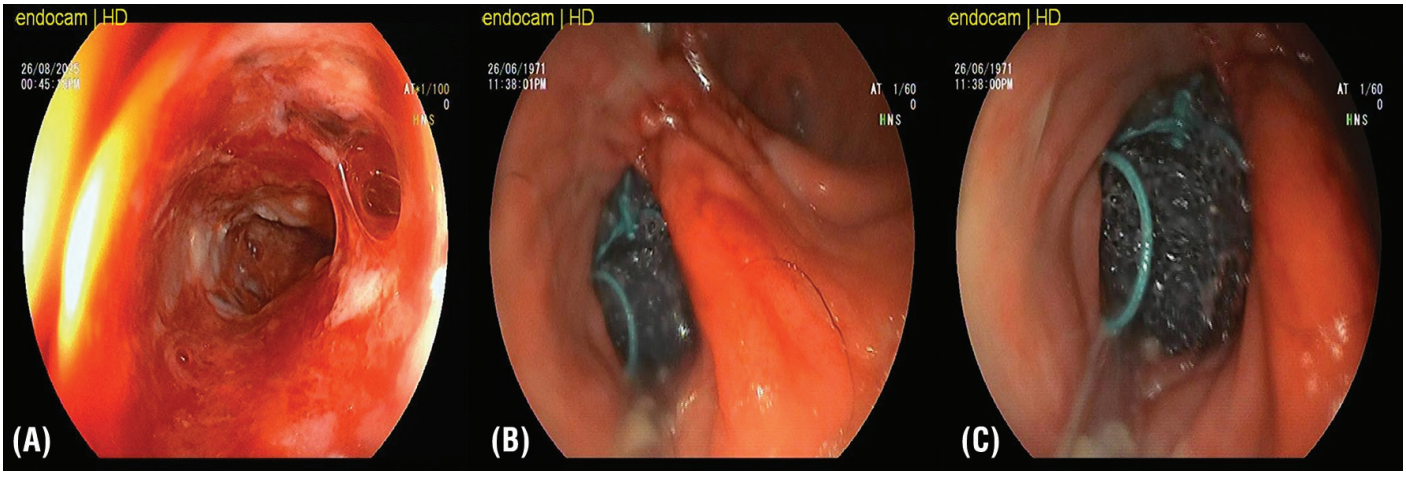

Figure 1. Endoscopic views of rectal anastomotic leakage and endoluminal vacuum therapy (EVT)
(A) *Endoscopic appearance of the fistula tract following rectal cancer resection,* ***(B)*** *Endoscopic view demonstrating placement of the vacuum sponge within the fistula tract,* ***(C)*** *Endoscopic view showing the vacuum sponge positioned inside the fistula tract during EVT.*

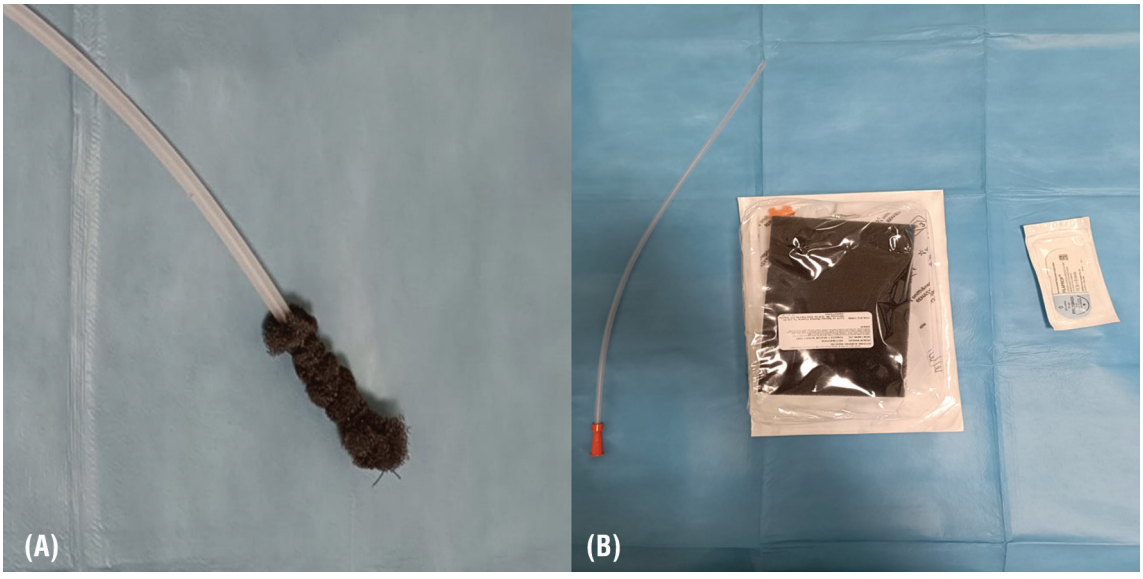

Figure 2. Preparation of the endoluminal vacuum therapy (EVT) system
(A) *Vacuum sponge prepared by fixation to a Nelaton catheter prior to insertion,* ***(B)*** *Materials used for EVT, including the polyurethane sponge and drainage components.*

in 17 of 18 patients (94.4%), with a mean treatment duration of 22 days and an average of six procedures per patient. Similarly, in the initial description of EVT, Weidenhagen et al.[7] achieved treatment success in 28 of 29 patients (96.6%), albeit with a longer mean treatment duration of 34 days and a higher number of endoscopic procedures. In contrast, van Koperen et al.[14] reported lower closure rates in patients treated later after surgery, with successful closure in 75% of patients who started EVT within 6 weeks, compared with 38% in those treated later. These findings suggest that treatment timing may contribute to outcome differences, although patient selection and leak complexity should also be considered. In the present study, EVT achieved an overall clinical success rate of 92.3%, which is comparable to the higher success rates reported in previous series. Although the median time to diagnosis of AL was 10 days (range, 6-115), the limited sample size precluded formal analysis of the relationship between treatment timing and outcome. Therefore, no definitive conclusions regarding the impact of EVT timing can be drawn from our data. Nevertheless, the favorable results observed in our cohort further support the effectiveness of EVT in managing low colorectal AL.

In a recent study comparing different non-operative treatment modalities for AL in patients with rectal cancer, EVT was reported to achieve the highest success rate among the evaluated approaches, with leak resolution in approximately

90% of cases.[15] Importantly, this comparison was limited to non-surgical management strategies, and EVT outperformed other conservative and endoscopic treatment options within this context.

These findings further support the effectiveness of EVT as a key non-operative treatment modality for AL following rectal cancer surgery, particularly in patients for whom an anastomosis-preserving approach is desirable. When interpreted alongside our results, the available evidence suggests that EVT represents an effective component of non-surgical leak management in appropriately selected patients.

Treatment burden and timing of therapy are important considerations in EVT for AL. In a recent retrospective series of 25 patients with rectal cancer treated with EVT, Kaya et al.[16] reported that earlier initiation of EVT was significantly associated with shorter treatment duration (p=0.0003) and a higher likelihood of ileostomy closure (p=0.035). These findings support the concept that timely EVT initiation may improve treatment efficiency and downstream recovery. In our series, EVT was initiated at a median of 12 postoperative days (range, 8-120), and clinical healing was achieved in 92.3% of patients. Although direct comparisons should be interpreted with caution due to differences in cohort characteristics and treatment protocols, the available evidence suggests that earlier EVT initiation may be an important determinant of treatment outcomes. Notably, Patient 6 in our cohort underwent a technically challenging hand-sewn pull-through coloanal anastomosis without circular stapling and required the highest number of EVT sessions. This distinct anastomotic configuration may have contributed to the prolonged EVT course observed in this patient.

Economic considerations are also relevant when evaluating EVT in routine clinical practice. Although repeated endoscopic procedures, anesthesia or sedoanalgesia requirements, and use of endoscopy unit resources may increase short-term treatment costs, successful non-operative management may reduce the need for major reoperation, permanent stoma formation, and prolonged hospitalization. In addition, timely stoma reversal in eligible patients may provide further clinical and economic benefits. Formal cost-effectiveness analyses were beyond the scope of the present study and should be addressed in future prospective investigations.

Reported complication rates associated with EVT vary widely in the literature. In a meta-analysis by Kühn et al.[17], the weighted mean complication rate associated with EVT was reported as 12.1% (95% CI: 9.7%-15.2%). Similarly, Shalaby et al.[10] reported complication rates ranging from 0% to 34.5%, with a pooled mean complication rate of 11.1% across published studies. According to the review by Nagell and Holte[18], pelvic abscess represents the most frequently reported complication, accounting for approximately 11.5% of cases, a finding also supported by Shalaby et al.[10] In most cases, pelvic abscesses can be managed conservatively or with repeated EVT, achieving success rates of 71%-75%, whereas Hartmann or Miles procedures are generally reserved for treatment failure.

In the present series, EVT-related complications were observed in two patients (15.4%). One patient developed an anastomotic stricture during follow-up, which was successfully managed with endoscopic balloon dilatation. Another patient developed a rectovaginal fistula following initial clinical closure of the AL and subsequently required reoperation with a Hartmann procedure, which was considered EVT failure. Notably, no pelvic abscess was observed in our cohort. These findings indicate that, although EVT-related complications may occur, they are generally manageable, and serious septic complications can be effectively avoided in appropriately selected patients.

The effectiveness of EVT is not limited to colorectal surgery. In a comprehensive review by Virgilio et al.[19], EVT was shown to be a highly effective treatment modality for AL following major resective surgery for esophageal and gastric cancer, with reported closure rates ranging from 66.7% to 100% across 209 patients. These findings suggest that EVT is applicable across different gastrointestinal regions and anastomotic configurations, further supporting its role as a versatile and effective treatment option for postoperative AL.

It should be emphasized that the favorable outcomes observed in our cohort may, at least in part, be influenced by careful patient selection and close multidisciplinary management, underscoring the importance of individualized treatment strategies when considering EVT.

Study Limitations

This study has several limitations that should be acknowledged. First, its retrospective design and case series structure limit the generalizability of the findings. Second, the relatively small sample size reduces the statistical power of the analysis and precludes a formal evaluation of factors that may influence EVT outcomes, including the timing of therapy initiation. In addition, the absence of a control group treated with alternative management strategies prevents direct comparison of EVT with other therapeutic approaches. Moreover, selection bias cannot be excluded, as EVT was applied in clinically stable patients deemed suitable for endoscopic management. Additionally, denominator data regarding the total number of rectal resections and the overall incidence of AL during the study period were not systematically available. Therefore, the relative proportion of patients treated with EVT and the distribution of alternative management strategies could not be accurately determined, potentially limiting the contextual interpretation of the reported success rates. Finally, long-term functional outcomes and quality-of-life measures were not

systematically assessed. In addition, detailed data regarding the timing of adjuvant chemotherapy were not uniformly available, precluding assessment of the potential impact of leak management and EVT treatment on postoperative oncological care. Despite these limitations, the present study provides valuable real-world data supporting the feasibility and potential clinical utility of EVT in the management of low rectal AL.

Conclusion

EVT appears to be a promising and feasible minimally invasive treatment option for AL following rectal cancer surgery, particularly in carefully selected clinically stable patients with low rectal anastomoses. In this case series, EVT achieved a high clinical success rate with acceptable morbidity, a low need for reoperation, and preservation of the anastomosis in the majority of patients. These findings, together with growing evidence from the literature, suggest that EVT may represent a useful non-operative management strategy for rectal AL. Larger prospective, multicenter studies are warranted to better define optimal patient selection, treatment timing, and long-term functional and oncological outcomes.

Ethics

Ethics Committee Approval: This study was approved by the Scientific Research Ethics Committee of Kocaeli City Hospital (approval no: 2025-186, date: 25.12.2025).

Informed Consent: Given the retrospective design of the study, the requirement for informed consent was waived.

Footnotes

Authorship Contributions

Surgical and Medical Practices: A.G., M.Ö., Concept: A.G., M.Ö., Design: A.G., Ö.A., Data Collection or Processing: A.G., Ö.A., Analysis or Interpretation: A.G., M.Ö., Literature Search: Ö.A., M.Ö., Writing: A.G., Ö.A.

Conflict of Interest: The authors declare that they have no conflicts of interest relevant to the content of this article.

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