

Original Article

Impact of Neoadjuvant and Adjuvant Concurrent Chemoradiotherapy on Anastomotic Outcomes after Rectal Cancer Resection: A Single-center Experience

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Key Words

Rectal cancer;
Chemoradiotherapy;
Anastomotic leakage;
Anastomotic stricture;
Neoadjuvant therapy;
Surgical outcomes

Purpose. This study compared the anastomotic leakage and stricture rates in patients undergoing straight colorectal or coloanal anastomosis after neoadjuvant or adjuvant concurrent chemoradiotherapy (CCRT).

Methods. We retrospectively evaluated patients with rectal cancer who underwent curative surgical resection following CCRT between February 2015 and March 2021 at MacKay Memorial Hospital. Clinical and surgical data were collected, and the risk factors associated with anastomotic leakage and stricture were analyzed using univariate and multivariate logistic regression analyses.

Results. Of the 132 patients, 101 received neoadjuvant CCRT and 31 received adjuvant CCRT. In the neoadjuvant group, 74.3% had lower rectal tumors, 57.4% underwent laparoscopic surgery, and 54.5% underwent coloanal anastomosis. Protective ileostomy was performed in 57.4% of the cases. In the adjuvant group, 71% had lower rectal tumors, 77.4% underwent open surgery, and 96.8% had colorectal anastomosis, with one patient (3.2%) receiving protective ileostomy. Anastomotic leakage occurred in 7.9% of patients in the neoadjuvant group and 3.2% in the adjuvant group. Anastomotic strictures were observed in 14.8% and 6.4% of patients in the neoadjuvant and adjuvant groups, respectively. Although the differences in complication rates were not statistically significant, multivariate analysis revealed a trend toward an increased risk of stricture in the neoadjuvant group.

Conclusion. Neoadjuvant CCRT remains the standard treatment for locally advanced rectal cancer. In this study, postoperative outcomes, including anastomotic leakage and stricture, did not differ significantly between patients receiving neoadjuvant or adjuvant CCRT. These results provide additional insight into perioperative risks but do not warrant deviation from current guideline-recommended practice.

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Colorectal cancer (CRC) is the third most common cancer in men and the second most com-

mon cancer in women worldwide. In Taiwan, CRC is the most commonly diagnosed cancer in men and the

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second most common cancer in women. Rectal cancer accounts for approximately one-third of all CRC cases.^{1,2} Surgical resection remains the cornerstone of curative treatment for rectal cancer, whereas concurrent chemoradiotherapy (CCRT) is now a key component of multimodal therapy for locally advanced diseases.

Neoadjuvant CCRT is the current standard of care for patients with stage II or III rectal cancer. It offers several benefits, such as enhanced tumor resectability, a greater likelihood of achieving clear surgical margins (R0 resection), reduced risk of local recurrence, and improved feasibility of sphincter-preserving surgery in low-lying tumors.⁸ The standard protocol includes long-course radiotherapy (45-50.4 Gy over 5-6 weeks) with fluoropyrimidine-based chemotherapy, followed by surgery after a 6-10 week interval.^{8,10}

Despite its benefits, neoadjuvant CCRT has several drawbacks. Radiation-induced fibrosis, reduced tissue perfusion, and increased surgical complexity may adversely affect anastomotic healing. Postoperative complications, such as anastomotic leakage and stricture, are significant concerns because they can increase morbidity and delay further oncologic treatment.³⁻⁵ In contrast, adjuvant CCRT is used for patients with unexpected locally advanced disease identified postoperatively and remains a valid option in selected clinical settings.

Although the oncologic benefits of neoadjuvant CCRT are well-established, its potential link to postoperative anastomotic complications, particularly leakage and stricture, warrants further investigation. Some studies suggest higher complication rates with preoperative treatment, whereas others have not demonstrated significant differences. This study aimed to compare the incidence of anastomotic leakage and stricture between patients receiving neoadjuvant and adjuvant CCRT to inform surgical planning and optimize treatment strategies for patients with rectal cancer.

Patients and Methods

Study design

We conducted a retrospective study of patients

with rectal cancer who received chemoradiotherapy followed by curative-intent surgery with intestinal anastomosis at MacKay Memorial Hospital between February 2015 and March 2021. Patients were divided into two groups based on the timing of CCRT: neoadjuvant or adjuvant therapy.

Inclusion and exclusion criteria

The inclusion criteria were as follows: 1) histologically confirmed rectal adenocarcinoma, 2) completion of CCRT, 3) surgery with anastomosis, and 4) availability of complete clinical data. The exclusion criteria were as follows: 1) incomplete chemoradiotherapy, 2) surgery without anastomosis (e.g., diversion colostomy), and 3) and who received APR with end colostomy (Fig. 1).

Statistical analysis

Data were collected from electronic medical records, including demographic characteristics, tumor location, pathological stage, surgical approach, anastomosis type, and use of protective ileostomy. All statistical analyses were performed using the SPSS software (version XX, IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean $\pm$ stan-

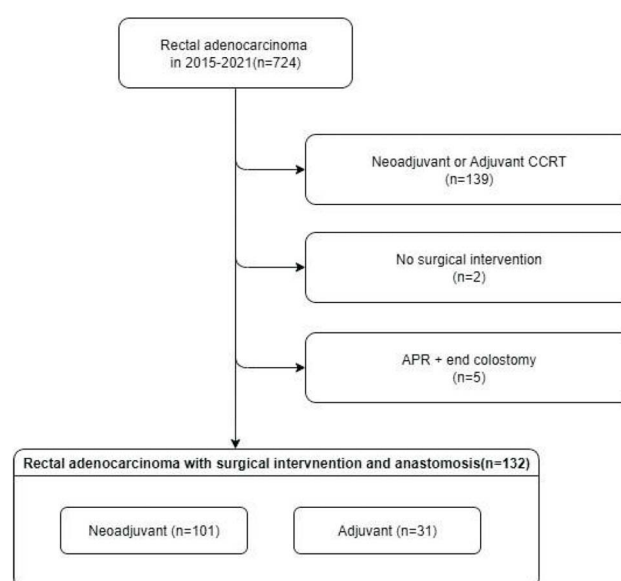


Fig. 1. Selection algorithm.

dard deviation and were analyzed using the independent t-test. Categorical variables were compared using the chi-square test. A p -value < 0.05 was considered statistically significant.

In the univariate logistic regression analysis, each variable was analyzed independently to determine its individual association with the outcome. This step serves as a preliminary screening to identify potentially significant predictors.

Variables with a p -value less than 0.05 in the univariate analysis — or those deemed clinically important — were then included in the multivariate logistic regression analysis. The multivariate model allows for simultaneous adjustment of multiple variables, helping to control for confounding factors and to determine the independent effect of each variable on the outcome of interest.

Results from both analyses were reported as odds ratios (ORs) with corresponding 95% confidence intervals (CIs) and p -values. This approach helps to clarify which factors are statistically and clinically significant predictors of the outcome after adjusting for other covariates.

For the complication, the primary indicator of anastomotic leakage is often the appearance of fluid from the surgical drain. A change in the color or component of the drainage — particularly the presence of feculent or purulent discharge — can suggest leakage from the anastomotic site. The stricture was defined as the inability of the colonoscope to pass the anastomotic site during routine postoperative surveillance.

Result

Patient characteristics

A total of 132 patients were included in the study, comprising 101 in the neoadjuvant group and 31 in the adjuvant group. The baseline characteristics of the patients are presented in Table 1.

In the neoadjuvant group, yp staging revealed that 18.8% of patients had stage I disease, 25.7% had stage II, 45.5% had stage III, and 9.9% had stage IV disease. Open surgery was performed in 42.6% of the patients,

whereas 57.4% underwent laparoscopic surgery. Colorectal anastomosis was performed in 45.5% of the patients and coloanal anastomosis was performed in 54.5% of the patients. A protective stoma was created in 57.4% of the patients. In the adjuvant group, most patients (90.3%) had stage III disease, and 77.4% underwent open surgery. Colorectal anastomosis was performed in 96.8% of the patients, whereas coloanal anastomosis was performed in only 3.2% of the patients. Only one patient received a protective stoma.

Before matching, patients in the neoadjuvant CCRT group and the adjuvant CCRT group showed significant differences in tumor stage ($p < 0.001$), surgical procedure ($p = 0.001$), presence of a protective ileostomy ($p < 0.001$), and type of anastomosis ($p < 0.01$). No significant differences were observed in age, gender distribution, BMI, or comorbidities including hypertension, diabetes mellitus, and end-stage renal disease (Table 1).

After 1:1 matching, 24 patients were included in each group. Baseline characteristics were well balanced between the two groups, with no statistically significant differences in age, gender, BMI, comorbidities, tumor stage, surgical procedure, or anastomotic site. A mild imbalance remained in tumor location and ileostomy, but these did not reach statistical significance ($p = 0.079$ and $p = 0.042$, respectively).

Regarding postoperative outcomes, there were no statistically significant differences in the incidence of anastomotic leakage (12.5% vs. 4.2%, $p = 0.296$) or anastomotic stricture (20.8% vs. 4.2%, $p = 0.081$) between the matched groups (Table 1).

Risk factor analysis

In the comparison between the neoadjuvant CCRT and adjuvant CCRT groups, comorbidities such as hypertension, diabetes mellitus, and end-stage renal disease (ESRD) showed no statistically significant differences. Furthermore, these comorbidities did not have a significant impact on the occurrence of anastomotic leakage or stricture in either univariate or multivariate analyses (Table 2). With respect to tumor location, multivariate analysis revealed that patients with low rectal tumors had a significantly lower risk

Table 1. Characteristics of the patients

	Before matching			After matching		
	Neoadjuvant (n = 101)	Adjuvant (n = 31)	<i>p</i> -value	Neoadjuvant (n = 24)	Adjuvant (n = 24)	<i>p</i> -value
Age	58.76 ± 11.096	58.35 ± 9.076		63.75 ± 10.872	58.5 ± 9.170	
Gender			0.952			
Male	69 (68.3%)	21 (67.7%)		14 (58.3%)	18 (75%)	0.251
Female	32 (31.7%)	10 (32.3%)		10 (41.7%)	6 (25%)	
BMI	24.108 ± 3.276	24.01 ± 4.578		23.579 ± 3.193	24.908 ± 4.607	
Comorbidity						
HTN	28 (27.7%)	9 (29.0%)	0.887	8 (33.3%)	8 (33.3%)	1.00
DM	24 (23.8%)	5 (16.1%)	0.369	7 (29.2%)	5 (20.8%)	0.149
ESRD	3 (3.0%)	0 (0%)	0.332	2 (8.3%)	0 (0%)	
Stage (ypTMN)			0.000	(ypTMN)		0.282
I	20 (19.8%)	0 (0%)				
II	26 (25.7%)	1 (3.2%)		2 (8.3%)	1 (4.2%)	
III	45 (44.6%)	29 (93.5%)		18 (75%)	22 (91.7%)	
IV	10 (9.9%)	1 (3.2%)		4 (16.7%)	1 (4.2%)	
Tumor site			0.815			0.079
Upper/middle	26 (25.7%)	9 (29.0%)		13 (54.2%)	7 (29.2%)	
Lower	32 (74.3%)	10 (71%)		11 (45.8%)	17 (70.8%)	
Surgical procedure			0.001			0.303
Laparotomy	43 (42.5%)	24 (77.4%)		20 (83.3%)	17 (70.8%)	
Laparoscopic	58 (57.4%)	7 (21.8%)		4 (16.7%)	7 (29.2%)	
Ileostomy			< 0.001			0.042
(-)	43 (57.4%)	30 (96.9%)		18 (75%)	23 (95.8%)	
(+)	58 (42.6%)	1 (3.2%)		6 (25%)	1 (4.2%)	
Anastomotic site			< 0.01			0.220
Coloanal	55 (54.5%)	1 (3.2%)		5 (20.8%)	2 (8.3%)	
Colorectal	46 (45.5%)	30 (96.8%)		19 (79.2%)	22 (91.7%)	
Leakage			0.346			0.296
(-)	93 (92.0%)	30 (96.8%)		21 (87.5%)	23 (95.8%)	
(+)	8 (7.9%)	1 (3.2%)		3 (12.5%)	1 (4.2%)	
Stricture			0.067			0.081
(-)	86 (85.1%)	29 (93.9%)		19 (79.2%)	23 (95.8%)	
(+)	15 (14.8%)	2 (6.4%)		5 (20.8%)	1 (4.2%)	

Neoadjuvant, neoadjuvant CCRT; Adjuvant, adjuvant CCRT; BMI, body mass index; HTN, hypertension; DM, diabetes mellitus; ESRD, end-stage renal disease; CCRT, concurrent chemoradiotherapy.

of developing anastomotic stricture compared with those with non-low rectal tumors (OR = 0.182, 95% CI: 0.040-0.816, $p = 0.026$).

Risk factor analysis for anastomotic stricture (Table 3) indicated that, in univariate analysis, the presence of a protective ileostomy (OR = 3.472, $p = 0.028$) and colorectal anastomosis (OR = 0.332, $p = 0.038$) were significantly associated with stricture formation. However, these variables lost statistical significance in the multivariate model. Notably, although the multivariate odds ratio for neoadjuvant CCRT was 2.730, this association did not reach statistical significance ($p = 0.379$). Overall, while several factors showed

potential risk tendencies in the univariate analysis, no independent predictors of anastomotic stricture were identified in the multivariate analysis (Table 2, Table 3).

Discussion

Our findings revealed that patients who received neoadjuvant CCRT had higher rates of anastomotic leakage and stricture than those who received adjuvant CCRT, although the differences were not statistically significant. Notably, anastomotic strictures demonstrated a trend toward statistical significance (p

Table 2. Risk factors for anastomotic leakage (univariate and multivariate analysis)

	Univariate			Multivariate		
	OR	CI	p-value	OR	CI	p-value
Gender (Female)	1.687	0.335-1.501	0.648			
Comorbidity						
HTN	0.718	0.142-3.628	0.689	0.689	0.112-4.289	0.687
DM	0.424	0.051-3.737	0.428	0.535	0.052-5.484	0.598
ESRD	0.000	0.000-	0.999	0.000	0.000-	0.999
Tumor site (Lower)	0.440	0.111-1.739	0.241	0.268	0.052-1.376	0.115
Surgical procedure (Laparoscopic)	1.839	0.421-8.037	0.418	1.989	0.365-10.842	0.427
CCRT (Neoadjuvant)	2.581	0.310-21.482	0.381	2.234	0.220-22.669	0.497
Ileostoma (+)	1.597	0.409-2.637	0.500	1.195	0.261-5.468	0.818
Anastomotic site (Coloanal)	0.672	0.171-2.634	0.568	0.568	0.206-3.893	0.884

Neoadjuvant, neoadjuvant CCRT; Adjuvant, adjuvant CCRT; HTN, hypertension; DM, diabetes mellitus; ESRD, end-stage renal disease; CCRT, concurrent chemoradiotherapy.

Table 3. Risk factors for anastomotic stricture (univariate and multivariate analysis)

	Univariate			Multivariate		
	OR	CI	p-value	OR	CI	p-value
Gender (Female)	0.878	0.288-2.677	0.820			
Comorbidity						
HTN	1.081	0.353-3.313	0.892	0.497	0.113-2.195	0.356
DM	1.580	0.507-4.291	0.430	2.344	0.532-10.341	0.260
ESRD	3.531	0.303-41.204	0.314	6.339	0.491-81.838	0.157
Tumor site (Lower)	0.647	0.220-1.902	0.429	0.182	0.040-0.816	0.026
Surgical procedure (Laparoscopic)	2.340	0.752-7.275	0.142	2.261	0.545-9.387	0.261
CCRT (Neoadjuvant)	0.546	0.718-44.427	0.1	2.730	0.291-25.807	0.379
Ileostoma (+)	3.472	1.147-10.510	0.028	2.126	0.624-7.246	0.228
Anastomotic site (Coloanal)	0.332	0.117-0.941	0.038	0.543	0.178-1.657	0.248

Neoadjuvant, neoadjuvant CCRT; Adjuvant, adjuvant CCRT; HTN, hypertension; DM, diabetes mellitus; ESRD, end-stage renal disease; CCRT, concurrent chemoradiotherapy.

= 0.09), suggesting a potential association with preoperative treatment. In the univariate analysis, protective ileostomy and colorectal anastomosis were associated with an increased risk of stricture; however, these associations were not significant in the multivariate analysis. No independent predictors of anastomotic leakage or stricture were identified.

These findings are consistent with those of previous studies that reported no significant increase in anastomotic complications following preoperative CCRT. However, it remains biologically plausible that radiation-induced fibrosis, impaired microcirculation, and tissue stiffness may contribute to technical difficulties and impaired healing at the anastomotic site.

In patients receiving neoadjuvant CCRT, a pro-

TECTIVE ileostomy is routinely created at the time of surgery. As previously discussed, chemoradiation can affect tissue quality, rendering it more fragile and potentially impairing healing at the anastomotic site. Consequently, surgeons often have heightened concern regarding anastomotic integrity in these cases. The creation of a diverting ileostomy serves to reduce the risk and clinical severity of anastomotic leakage, allowing the distal bowel to heal under reduced stress and minimizing the consequences of potential complications.

In the case of adjuvant CCRT, a protective stoma was created during surgery. During the intraoperative air leakage test, a small amount of air bubbles was observed at the anastomotic site. Although the defect

was repaired, the surgeon remained concerned about the integrity of the anastomosis. Given the potential risk of leakage and the impact of previous treatment on tissue healing, a protective ileostomy was performed to divert fecal flow and reduce stress on the anastomosis, thereby minimizing the risk of postoperative complications.

The primary indicator of anastomotic leakage is often the appearance of fluid from the surgical drain. A change in the color or component of the drainage — particularly the presence of feculent or purulent discharge — can suggest leakage from the anastomotic site. When the drainage output is inadequate or obstructed, clinical assessment becomes essential. Signs such as fever, abdominal pain, leukocytosis, elevated inflammatory markers (e.g., CRP), and hemodynamic instability may indicate peritonitis or sepsis resulting from a leak. In such cases, imaging studies (e.g., CT scan with contrast) will be arranged to confirm the diagnosis and guide further management.

Previous studies have shown that the anastomotic leakage rate following low anterior resection for rectal cancer typically ranges from 5% to 20%.^{1,2} However, one study focusing on patients with locally advanced rectal cancer who underwent neoadjuvant CCRT reported a significantly higher leakage rate of 27.6%.³ This elevated risk may be influenced by the interval between the completion of CCRT and the timing of surgery. Some evidence suggests that extending this interval to approximately eight weeks may reduce the likelihood of anastomotic leakage. Additionally, creation of a diverting stoma during surgery has been shown to effectively reduce the incidence of leakage in these patients.³

Upon detailed review of clinical cases, some surgeons have expressed concerns regarding the use of neoadjuvant concurrent chemoradiation therapy (CCRT) prior to surgery in patients with rectal cancer. These concerns primarily relate to potential complications during surgery and impaired postoperative healing at the anastomotic site. Based on both clinical experience and literature review, tissues exposed to radiotherapy often become more fragile and edematous, increasing the risk of intraoperative injury to adjacent structures such as the ureters or the presacral venous

plexus, which may result in significant bleeding. Another common rationale for opting for upfront surgery followed by adjuvant CCRT is the presence of complications at diagnosis, such as bowel obstruction or active bleeding. In such cases, immediate surgical intervention is prioritized to manage the acute symptoms, with chemoradiation deferred until after resection.

In some patients with yp Stage I rectal cancer who received neoadjuvant CCRT, it is likely that the extent of tumor invasion was overestimated based on initial imaging studies. This may have led to the decision to proceed with preoperative chemoradiation, reflecting the inherent limitations in radiologic staging accuracy. Additionally, in cases where patients express a strong desire to preserve anal sphincter function, and the tumor is located very close to the anal verge (less than 4 cm), neoadjuvant CCRT may be intentionally administered to downstage the tumor. This approach increases the feasibility of sphincter-preserving procedures such as coloanal anastomosis during surgery, thereby avoiding permanent colostomy.

Anastomotic stricture is another significant complication of colorectal cancer surgery, with an estimated incidence of 2-5%.⁴ Unlike leakage, strictures typically do not manifest immediately after surgery but tend to develop progressively over time.

Specifically, a stricture was defined as the inability of the colonoscope to pass the anastomotic site during routine postoperative surveillance.

The decision to administer neoadjuvant or adjuvant treatment is often influenced by the accuracy of the initial staging or intraoperative findings. In our study, the adjuvant group included patients who were clinically under staged prior to surgery. Given the multifactorial nature of anastomotic complications, including factors such as blood supply, tension, and technical variables, future research should aim to stratify these risks more precisely.

However, the standard treatment for Stage III rectal cancer involves a multimodal approach combining chemoradiation, surgery, and chemotherapy. Preoperative (neoadjuvant) chemoradiation using fluoropyrimidine-based regimens with pelvic radiation is commonly administered to reduce tumor size, facilitate

sphincter-preserving surgery, and lower local recurrence rates. This is typically followed by total mesorectal excision (TME), which remains the cornerstone of curative surgery. Adjuvant chemotherapy is then recommended to address micrometastatic disease and improve overall survival. An emerging approach — total neoadjuvant therapy (TNT) — administers both systemic chemotherapy and chemoradiation before surgery, aiming to enhance pathological complete response rates and increase treatment compliance. Each treatment step offers distinct benefits: neoadjuvant therapy improves local control, TME achieves definitive resection, and chemotherapy reduces systemic recurrence risk. However, drawbacks include potential surgical complications, chemoradiation toxicities, and the fact that advanced treatments like immunotherapy are limited to genetically defined subgroups. Therefore, individualized treatment planning based on tumor staging, molecular profile, and patient condition is essential for optimizing outcomes in Stage III rectal cancer.

This study had some limitations, including its retrospective design, single-center setting, and limited sample size, particularly in the adjuvant treatment group. We acknowledge the absence of comorbidity-related variables in our analysis. Important factors such as body mass index (BMI), chronic diseases (including hypertension, diabetes mellitus, and end-stage renal disease on hemodialysis), as well as perioperative nutritional care, were not included. These variables may significantly influence surgical outcomes and postoperative recovery, and their omission represents a limitation of our study. Additionally, the diagnosis of anastomotic strictures in our cohort was not based on standardized or quantitative criteria; instead, it was identified through outpatient clinical documentation, which may have varied depending on the physician's judgment. A more rigorous and standardized assessment, such as documenting the time of onset and severity of strictures, could enable a more detailed and objective analysis in future studies. Future prospective studies with larger cohorts and standardized protocols are warranted to validate these findings and to explore strategies for minimizing anastomotic complications.

Conclusion

Currently, neoadjuvant concurrent chemoradiation therapy (CCRT) is the guideline-recommended standard treatment for patients with locally advanced rectal cancer. This study primarily aimed to investigate potential postoperative complications associated with neoadjuvant versus adjuvant CCRT. In the present analysis, no statistically significant differences were found between the neoadjuvant and adjuvant groups regarding rates of anastomotic leakage or stricture. While these findings contribute valuable insight into perioperative outcomes, they do not provide sufficient evidence to justify any deviation from the established treatment guidelines.

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Conflicts of Interest

The authors declare no potential conflicts of interest.

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References

1. Kang CY, Halabi WJ, Chaudhry OO, Nguyen V, Pigazzi A, Carmichael JC, Mills S, Stamos MJ. Risk factors for anastomotic leakage after anterior resection for rectal cancer. *JAMA Surg* 2013;148:65-71. doi:10.1001/2013.jamasurg.2
2. Fang AH, Chao W, Ecker M. Review of colonic anastomotic leakage and prevention methods. *J Clin Med* 2020;9:4061. doi:10.3390/jcm9124061
3. Swellengrebel HA, Marijnen CA, Verwaal VJ, Vincent A, Heuff G, Gerhards MF, van Geloven AA, van Tets WF, Verheij M, Cats A. Toxicity and complications of preoperative chemoradiotherapy for locally advanced rectal cancer. *Br J Surg*

- 2011;98:418-26. doi:10.1002/bjs.7315
4. Belvedere B, Frattaroli S, Carbone A, Viceconte G. Anastomotic strictures in colorectal surgery: treatment with endoscopic balloon dilation. *G Chir* 2012;33:243-5.
 5. Cheng Y, Tian Z, Gao S, Zhao S, Li R, Zhou J, Sun Q, Wang D. A nomogram of anastomotic stricture after rectal cancer: a retrospective cohort analysis. *Surg Endosc* 2024;38:3661-71. doi:10.1007/s00464-024-10885-w
 6. Nathanson DR, Espat NJ, Nash GM, D'Alessio M, Thaler H, Minsky BD, Enker W, Wong D, Guillem J, Cohen A, Paty PB. Evaluation of preoperative and postoperative radiotherapy on long-term functional results of straight coloanal anastomosis. *Dis Colon Rectum* 2003;46:888-94. doi:10.1007/s10350-004-6679-x
 7. Kao PS, Chang SC, Wang LW, Lee RC, Liang WY, Lin TC, Chen WS, Jiang JK, Yang SH, Wang HS, Lin JK. The impact of preoperative chemoradiotherapy on advanced low rectal cancer. *J Surg Oncol* 2010;102:771-7. doi:10.1002/jso.21711
 8. Duzova M, Basaran H, Inan G, Gul OV, Eren OO, Korez MK. Preoperative versus postoperative chemoradiotherapy for locally advanced rectal cancer: outcomes of survival, toxicity, sphincter preserving and prognostic factors. *Transpl Immunol* 2021;69:101489. doi:10.1016/j.trim.2021.101489
 9. Sauer R, Becker H, Hohenberger W, Rödel C, Wittekind C, Fietkau R, Martus P, Tschmelitsch J, Hager E, Hess CF, Karstens JH, Liersch T, Schmidberger H, Raab R; German Rectal Cancer Study Group. Preoperative versus postoperative chemoradiotherapy for rectal cancer. *N Engl J Med* 2004;351:1731-40. doi:10.1056/NEJMoa040694
 10. Roeder F, Meldolesi E, Gerum S, Valentini V, Rödel C. Recent advances in (chemo-)radiation therapy for rectal cancer: a comprehensive review. *Radiat Oncol* 2020;15:262. doi:10.1186/s13014-020-01695-0

原 著

術前與術後同步化學放射治療對直腸癌切除 術後吻合結果之影響：單一醫學中心經驗分析

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目的 直腸癌手術後吻合處的完整性是否受到同步化學放射治療 (CCRT) 影響，仍存在爭議。本研究旨在比較接受術前或術後 CCRT 的病人，在進行直腸癌切除後接受直腸結腸或結腸肛門吻合術時，其吻合處滲漏與狹窄的發生率差異。

方法 本研究為回溯性分析，納入 2015 年 2 月至 2021 年 3 月間於單一醫學中心接受 CCRT 與根治性直腸癌切除手術的病患。收集資料包含病人基本資料、腫瘤特徵、手術方式、吻合型式、有無預防性迴腸造口，以及術後吻合處併發症。並使用單變量與多變量邏輯迴歸分析可能與吻合處滲漏或狹窄相關的風險因子。

結果 共納入 132 名病患，其中 101 人接受術前 CCRT，31 人接受術後 CCRT。術前組中，74.3% 腫瘤位於下直腸，57.4% 接受腹腔鏡手術，54.5% 進行結腸肛門吻合，且 57.4% 有建立預防性迴腸造口。術後組中，71% 為下直腸腫瘤，77.4% 接受傳統剖腹手術，96.8% 進行結腸直腸吻合，僅有 1 人 (3.2%) 接受預防性迴腸造口。

吻合處滲漏發生率在術前組為 7.9%，術後組為 3.2%；吻合處狹窄發生率則分別為 14.8% 與 6.4%。雖然統計上無顯著差異，多變量分析顯示術前 CCRT 與吻合處狹窄風險上升有一定趨勢。

結論 術前 CCRT 可能與直腸癌手術後吻合處狹窄風險增加有關。本研究結果顯示，對接受術前治療的病患，應加強術前風險評估與術後監測，以降低吻合相關併發症的發生。

關鍵詞 直腸癌、同步化學放射治療、吻合處滲漏、吻合處狹窄、術前治療、手術結果。