

Original Article

Chylous Ascites Risk Factors and Effects on Colorectal Cancer Surgical Outcomes

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Key Words

Chylous ascites;

Colorectal cancer;

Outcome;

Overall survival;

Disease free survival

Purpose. This study aimed to identify risk factors for chylous ascites (CA) and to assess its impact on long-term oncologic outcomes following curative resection for stage I to III colorectal cancer.

Methods. We retrospectively analyzed 841 patients who underwent curative surgery for stage I to III colorectal adenocarcinoma between August 2008 and December 2019. Patients with advanced disease or non-curative resection were excluded. Chylous ascites was defined as peritoneal drainage with a triglyceride concentration > 110 mg/dL. Multivariate logistic and survival analyses were performed to evaluate risk factors and survival outcomes.

Results. Chylous ascites occurred in 33 patients (3.9%). Minimally invasive surgery and higher tumor stage were independently associated with chylous ascites. Patients with chylous ascites had a significantly higher rate of wound infections and poorer disease-free survival, particularly among those with left-sided stage III tumors. Overall survival showed a non-significant trend toward worse outcomes in the CA group.

Conclusions. Postoperative chylous ascites is an uncommon but clinically relevant complication. Minimally invasive surgery and advanced tumor stage are independent predictors. Although CA is often managed conservatively, its association with inferior long-term oncologic outcomes underscores the importance of vigilant follow-up.

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Chylous ascites (CA) is a rare but clinically significant condition characterized by the accumulation of chyle within the peritoneal cavity. Chyle, a milky fluid rich in lymph and triglycerides, typically circulates through the lymphatic system.¹ A diagnosis of CA is given when the triglyceride concentration in peritoneal fluid exceeds 110 mg/dL, which is the threshold used to distinguish it from other forms of ascites.^{6,7} Chyle can leak into the abdominal cavity and result in CA if the lymphatic system is disrupted or obstructed.

The etiology of CA is diverse and potentially attributable to several underlying causes. Trauma and surgical procedures, particularly those involving the retroperitoneal or abdominal regions, are among the most common iatrogenic causes. Malignancies, including lymphoma and abdominal tumors, can also contribute to lymphatic obstruction or leakage. In addition, infections such as tuberculosis and filariasis may damage lymphatic vessels. Congenital lymphatic malformations represent a less frequent but key cause of CA, particularly in pediatric populations.²⁻⁵

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CA is frequently observed in surgeries involving the gynecologic, urologic, and pancreatic regions, where extensive lymphatic dissection is often required. The condition is not as frequently observed in surgeries involving the colorectal region, and its development in that region is an understudied surgical complication.⁸⁻¹² CA has profound clinical implications for patients with cancer, and a loss of chyle, which is rich in essential nutrients, lymphocytes, and immunoglobulins, can lead to nutritional deficiencies, lymphocytopenia, and an increased risk of systemic infections. These complications may delay recovery, prolong hospital stays, and adversely affect long-term health outcomes.^{10,12,13}

Given the potential severity of CA and its effect on prognosis, identifying the risk factors associated with its development in colorectal cancer surgery is essential. Furthermore, understanding the long-term health outcomes of patients who develop this complication is critical for improving postoperative management and patient care. This study investigated the risk factors contributing to the development of CA following surgical resection for colorectal cancer and evaluated its effects on short- and long-term health outcomes. Being able to identify high-risk patients and implement preventive measures can reduce the incidence of this complication and improve overall surgical outcomes.

Materials and Methods

Study design and setting

This was a single-center, retrospective cohort study. The study investigated the risk factors associated with the development of CA in patients undergoing surgery for stage I-III colorectal cancer and evaluated its effects on postoperative outcomes.

Study population

A total of 1,094 consecutive patients who had undergone surgical resection for colorectal cancer between August 2008 and December 2019 were identified. Exclusion criteria were applied to this group of

patients, with those excluded who had synchronous colon cancer ($n = 19$), underwent palliative or R2 resection ($n = 148$), had carcinoma in situ ($n = 36$), or had stage IV disease ($n = 50$). The final study cohort comprised 841 patients (Fig. 1).

Data collection

Demographic, clinical, and surgical data were collected from electronic medical records. The variables of interest included age, sex, body mass index, tumor location, tumor stage (based on American Joint Committee on Cancer [AJCC] staging system), surgical approach (open vs. minimally invasive), extent of lymph node dissection, operative time, estimated blood loss, and postoperative complications. Tumor location was classified according to the intraoperative findings documented in the operative records. Specifically, tumors located in the cecum, ascending colon, hepatic flexure, and the proximal two-thirds of the transverse colon were defined as right-sided colon cancer, whereas those in the distal one-third of the transverse colon, splenic flexure, descending colon, and sigmoid colon were defined as left-sided colon cancer. AJCC stage, T stage, and N stage were determined according to the postoperative pathological reports (pathologic staging). All patients had a surgical drain routinely placed after surgery, so that the diagnostic assessment for chylous ascites was standardized among all patients.

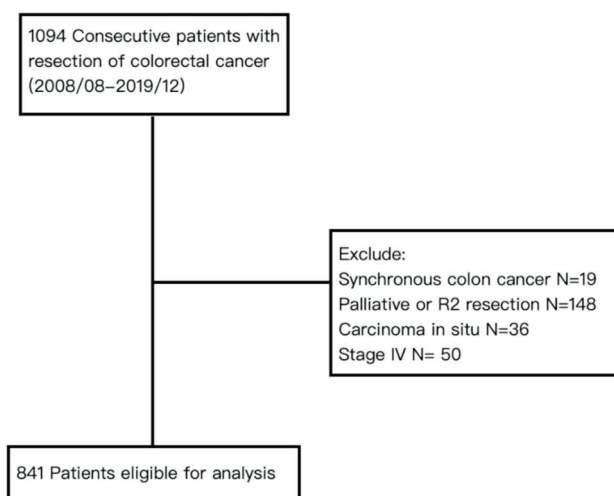


Fig. 1. Flow diagram of colorectal cancer patients analyzed in this study.

Clinically, chylous ascites was suspected when the drainage fluid appeared milky in color or when the drainage volume increased markedly. The diagnosis was confirmed by measuring the triglyceride (TG) concentration in the drainage fluid, and a TG level greater than 110 mg/dL was considered diagnostic for chylous ascites (CA).

Outcome measures

The primary outcome was the incidence of CA following surgical resection for colorectal cancer. The secondary outcomes included postoperative complications (e.g., infection, prolonged hospital stay, nutritional deficiencies, and lymphocytopenia), disease-free survival (DFS), and overall survival (OS). Long-term outcomes were assessed using data from imaging studies and clinical evaluations.

Statistical analysis

Descriptive statistics were used to summarize patient characteristics and clinical outcomes. Continuous variables were expressed as means $\pm$ standard deviations or medians (interquartile ranges). Categorical variables were expressed as frequencies and percentages. Comparative analyses were performed using the Chi-square test for categorical variables and the independent *t*-test for continuous variables. To identify independent risk factors associated with the development of CA, univariate analysis was conducted, with this followed by multivariable logistic regression analysis. Variables with a *p* value of < 0.05 in the univariate analysis were included in the multivariable model.

Survival outcomes (i.e., DFS and OS) were analyzed using Kaplan-Meier curves, and differences between groups were compared using the log-rank test. A *p* value of < 0.05 was considered significant. All statistical analyses were performed using IBM Statistical Package for Social Sciences (SPSS, version 29).

Results

Among the 841 patients included in this study, 33

(3.9%) developed postoperative CA and were categorized into a CA group. The patients who did not develop postoperative CA were categorized into a non-CA group. The baseline and perioperative characteristics of the patients are summarized in Table 1. No significant between-group differences were observed in terms of sex distribution ($p = 0.13$), age ($p = 0.45$), body mass index ($p = 0.60$), American Society of Anesthesiologists classification ($p = 0.87$), tumor location ($p = 0.71$), tumor size ($p = 0.98$), surgical approach ($p = 0.15$), operative time ($p = 0.49$), number

Table 1. Characteristics of all patients

	No chylous ascites (n = 808)	Chylous ascites (n = 33)	<i>p</i>
Sex			0.13
Male	440	13	
Female	368	20	
Age (years)	65.77 $\pm$ 13.19	67.55 $\pm$ 13.15	0.45
BMI (kg/m ²)	24.25 $\pm$ 4.07	23.87 $\pm$ 3.73	0.6
ASA			0.87
1, 2	714	29	
3, 4	94	4	
Location			0.71
Right colon	295	14	
Left colon	513	19	
AJCC stage			0.01
I	179	0	
II	242	15	
III	387	18	
T stage			0.08
T1	121	4	
T2	112	1	
T3	428	17	
T4	147	11	
N stage			0.09
N0	419	14	
N1	260	9	
N2	129	10	
Tumor size (cm)	4.53 $\pm$ 2.29	4.51 $\pm$ 1.42	0.98
Surgical procedure			0.15
Open	499	25	
Minimal invasive	309	8	
Operative time (mins)	154.8 $\pm$ 50.9	148.64 $\pm$ 47.94	0.49
Number of LNs retrieved	25.73 $\pm$ 11.72	26.21 $\pm$ 11.51	0.82
Number of LNs metasis	1.98 $\pm$ 3.96	3.25 $\pm$ 5.61	0.08
Length of hospital stay	10.41 $\pm$ 6.07	12.06 $\pm$ 10.93	0.14

* AJCC stage, T stage, and N stage were determined according to the postoperative pathological reports (pathologic staging).

of retrieved lymph nodes ($p = 0.82$), number of metastatic lymph nodes ($p = 0.08$), or length of hospital stay ($p = 0.14$).

The distribution of AJCC stages differed significantly between the groups ($p = 0.01$). The CA group had more severe cancer than did the non-CA group. In the CA group, no patients had stage I disease, whereas in the non-CA group, 179 patients (22.2%) had stage I disease. Stages II and III disease were more prevalent in the CA group than in the non-CA group. Substantial between-group differences in T stage ($p = 0.08$) and N stage ($p = 0.09$) were also observed. These differences approached statistical significance and suggest a possible trend toward more advanced local and nodal disease in patients who received radical surgical resection, which may increase the risk of developing CA (Table 1).

The two groups had similar demographics and perioperative factors. The CA group presented with a higher pathological disease burden, as reflected in the distribution of AJCC stage.

Independent risk factors

A multivariable logistic regression analysis was conducted to identify independent risk factors for postoperative CA. The following 10 variables were included in the analysis: tumor location (right vs. left side), number of retrieved lymph nodes, number of metastatic lymph nodes, operative time, surgical approach, body mass index, AJCC stage, T stage, N stage, and tumor size (Table 2). Among these variables, two emerged as significant predictors of CA: surgical approach and T stage.

Patients who underwent minimally invasive surgery had a higher risk of CA than did those who underwent open surgery (odds ratio [OR] = 2.539, $p = 0.033$). T stage was also significantly and positively correlated with CA incidence (OR = 1.503, $p = 0.037$), suggesting that more advanced local tumor invasion may predispose patients to this complication. None of the other variables examined in the multivariable analysis were significantly correlated with CA incidence (all $p > 0.05$).

These findings highlighted the importance of both

surgical approach and local tumor extent in predicting the risk of postoperative CA. Further investigation may elucidate the underlying mechanisms and guide perioperative strategies aimed at reducing CA incidence in patients with colorectal cancer.

Postoperative outcomes

Postoperative outcomes and complication rates are presented in Table 3. No significant between-group differences in outcomes and in rates of most complications were observed. A significant difference was observed only in the wound infection rate (CA group, 9%; non-CA group, 2.1%; $p = 0.04$). These findings suggest that CA is associated with an increased risk of wound infection and does not significantly prolong hospital stay or increase the risk of other perioperative complications.

Table 2. Multivariable analysis of the risk factors for chylous ascites

	Odds ratio (95% CI)	<i>P</i>
Right vs. left side	0.631	0.239
Number of retrieved LNs	0.997	0.872
Number of LN metastasis	1.050	0.326
Operative time (min)	0.996	0.355
Operation method (minimal invasive vs. open)	2.539	0.033
BMI	0.989	0.815
AJCC stage	1.279	0.646
T stage	1.503	0.037
N stage	1.078	0.283
Tumor size (cm)	0.946	0.602

* AJCC stage, T stage, and N stage were determined according to the postoperative pathological reports (pathologic staging).

Table 3. Postoperative outcomes and complication rates

	No chylous ascites (n = 808)	Chylous ascites (n = 33)	<i>p</i>
Length of hospital stay (days)	10.44 ± 6.11	12.19 ± 11.08	0.13
Intraabdominal abscess	6 (0.7%)	1 (3%)	0.65
Wound infection	17 (2.1%)	3 (9%)	0.04
Wound dehiscence	3 (0.3%)	1 (3%)	0.37
Anastomosis leak	2 (0.24%)	0	0.926
Enterocutaneous fistula	2 (0.24%)	0	0.926
UTI	9 (1.1%)	1 (3%)	0.85
Ileus	59 (7.3%)	4 (12%)	0.47

Disease-free survival

Kaplan-Meier curve analysis revealed that DFS was significantly worse in the CA group than in the non-CA group (Fig. 2). The CA group was more likely to experience relapse (hazard ratio [HR] = 2.57, 95% CI: 1.366-1.545, log-rank $p = 0.0022$). These findings suggest that postoperative CA is associated with a higher risk of relapse in patients who have undergone surgical resection for colorectal cancer.

Subgroup analysis of DFS by AJCC stage

A subgroup analysis was performed to compare DFS across AJCC stages I-III (Figs. 3-4). The absence of CA among patients with AJCC stage I disease precluded any comparison in this subgroup.

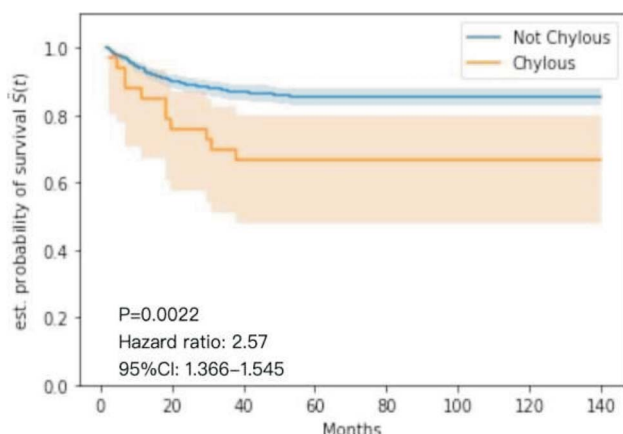


Fig. 2. Kaplan-Meier survival curves for disease-free survival (DFS) of both groups.

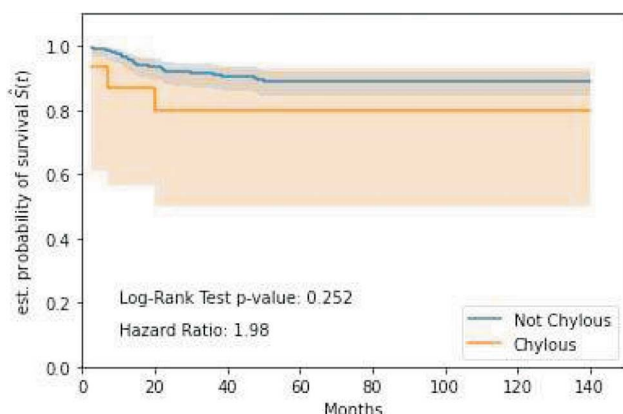


Fig. 3. Kaplan-Meier survival curves for disease-free survival (DFS) of stage II patients.

Among patients with AJCC stage II or III disease, those with CA had a higher risk of relapse than did those without CA (HR = 1.98 for stage II disease and 2.32 for stage III disease). This risk was significant for those with stage III disease (log-rank $p = 0.019$ for stage II disease and 0.019 for stage III disease). In other words, CA is inversely correlated with DFS among patients with stage II or III disease, and this correlation is stronger and significant among patients with stage III disease. Further studies with larger sample sizes could help clarify the influence of CA on long-term oncologic outcomes across different cancer stages.

Subgroup analysis of DFS by tumor location and AJCC stage

To further clarify the prognostic effect of CA, we analyzed DFS on the basis of AJCC stage (I, II, and III) and tumor location (right vs. left colon). Kaplan-Meier curves for each subgroup are presented in Figs. 5-6.

Right-sided colon cancer

- **Stage I:** No patients in this subgroup developed CA, precluding analysis in this subgroup.
- **Stage II:** DFS was worse in the CA group than in the non-CA group (HR = 1.37, log-rank $p = 0.677$).
- **Stage III:** DFS was worse in the CA group than in the non-CA group (HR = 2.29, log-rank $p = 0.244$).

Left-sided colon cancer

- **Stage I:** No patients in this subgroup developed CA, precluding comparison.

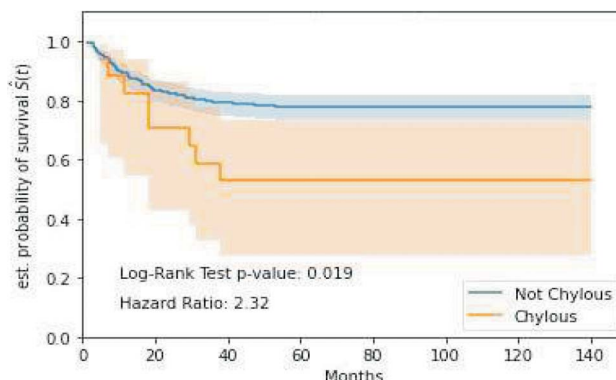


Fig. 4. Kaplan-Meier survival curves for disease-free survival (DFS) of stage III patients.

- **Stage II:** DFS was worse in the CA group than in the non-CA group (HR = 2.99, log-rank $p = 0.269$).
- **Stage III:** DFS was significantly worse in the CA group than in the non-CA group (HR = 2.42, log-rank $p = 0.034$).

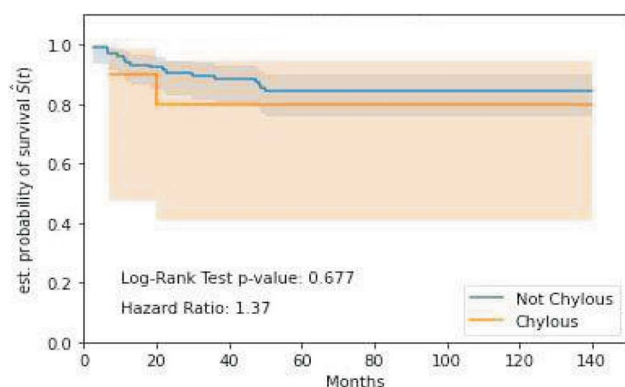


Fig. 5. Kaplan-Meier survival curves for DFS of right-side lesion stage II patients.

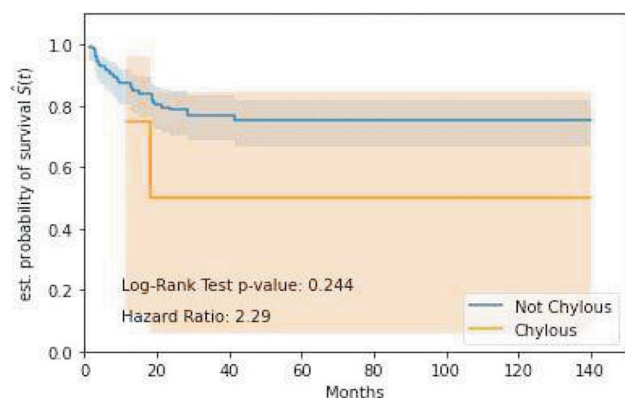


Fig. 6. Kaplan-Meier survival curves for DFS of right-side lesion stage III patients.

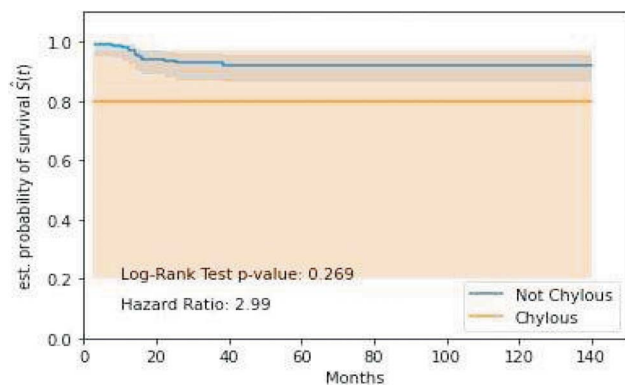


Fig. 7. Kaplan-Meier survival curves for DFS of left side lesion stage II patients.

These findings suggested that the prognostic influence of CA may differ by both cancer stage and anatomic location. Although only one subgroup analysis (i.e., stage III left-sided colon cancer) yielded a significant result, the overall trend was for worse DFS, particularly among patients with more advanced disease stages. Further research with larger, stage-specific cohorts is warranted to confirm these observations and to elucidate underlying pathophysiological mechanisms.

Overall survival

Fig. 9 illustrates the Kaplan-Meier curves for OS. OS was worse in the CA group than in the non-CA group (HR = 1.952, 95% CI = 0.905-1.437, log-rank $p = 0.08$). Postoperative CA is associated with worse OS but is not associated with worse survival when all stages and tumor locations are combined.

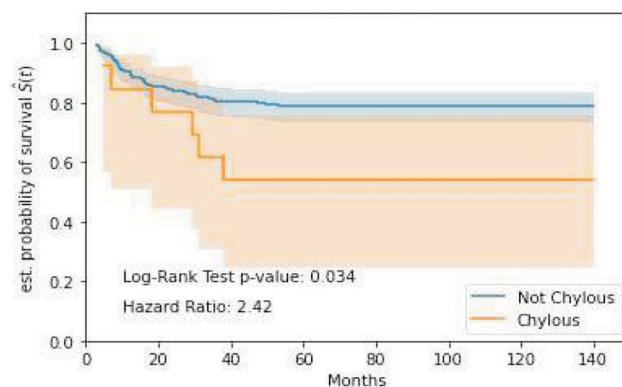


Fig. 8. Kaplan-Meier survival curves for DFS of left-side lesion stage III patients.

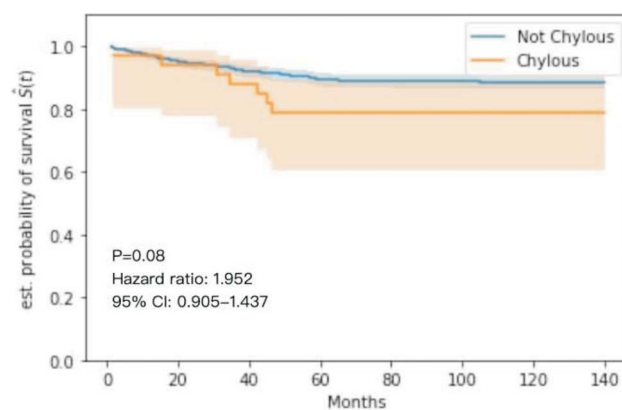


Fig. 9. Kaplan-Meier survival curves for overall survival (OS) of both groups.

Subgroup analysis of OS by AJCC stage

Further subgroup analyses were conducted for stages I, II, and III (Figs. 10-11):

- **Stage I:** As with the DFS findings, no meaningful comparison could be made because of an absence (or extremely low incidence) of CA events.
- **Stage II:** OS was worse in the CA group than in the non-CA group (HR = 0.65, log-rank $p = 0.670$).
- **Stage III:** OS was significantly worse in the CA group than in the non-CA group (HR = 2.40, log-rank $p = 0.035$). This suggests that CA play a more critical role in advanced-stage disease.

Subgroup analysis of OS by tumor location (right vs. left colon) and AJCC stage

To explore potential variation by anatomic loca-

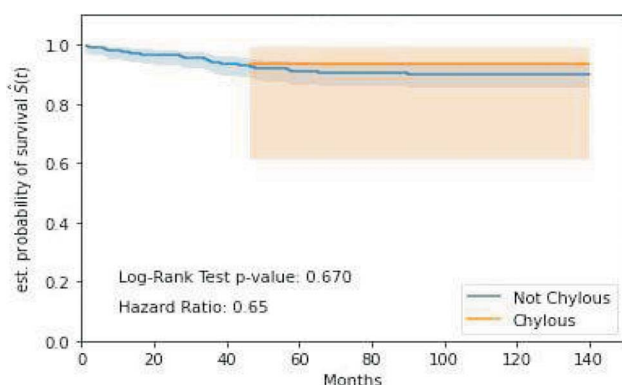


Fig. 10. Kaplan-Meier survival curves for overall (OS) of stage II patients.

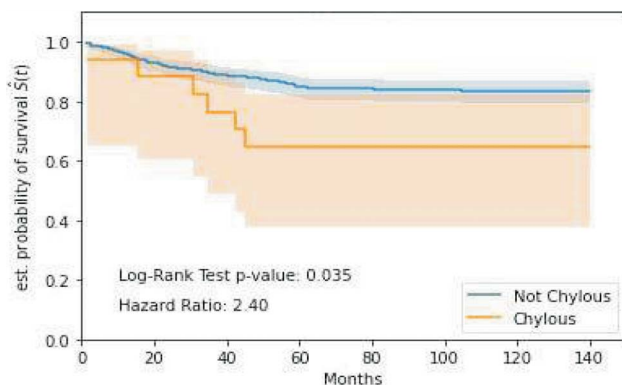


Fig. 11. Kaplan-Meier survival curves for overall (OS) of stage III patients.

tion, we also examined OS for right-sided (cecum to transverse) and left-sided (descending to sigmoid) tumors, with further stratification by stage (Fig. 12). The notable findings are as follows:

Right-sided colon cancer

- **Stage I:** No events of CA were observed, precluding comparison in this subgroup.
- **Stage II:** No events of CA were observed, precluding comparison in this subgroup.
- **Stage III:** OS was significantly worse in the CA group than in the non-CA group (HR = 4.54, log-rank $p = 0.026$), indicating a markedly higher risk of mortality among patients with CA and advanced right-sided tumors.

Left-sided colon cancer

- **Stage I:** No CA events were recorded in this subgroup, precluding comparison.
- **Stage II:** OS was worse in the CA group than in the non-CA group (HR = 2.17, log-rank $p = 0.444$).
- **Stage III:** OS was worse in the CA group than in the non-CA group (HR = 1.90, log-rank $p = 0.212$).

These subgroup analyses suggest that CA may have a more pronounced effect on OS in patients with advanced-stage (especially stage III) right-sided colon cancer. The effect of CA on earlier-stage disease or left-sided tumors appears less conclusive. Additional research with larger sample sizes may help clarify the true prognostic relevance of CA across different tumor locations and stages.

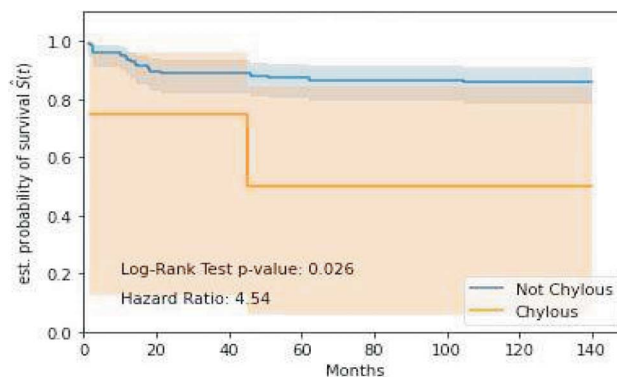


Fig. 12. Kaplan-Meier survival curves for OS of right-side lesion stage III patients.

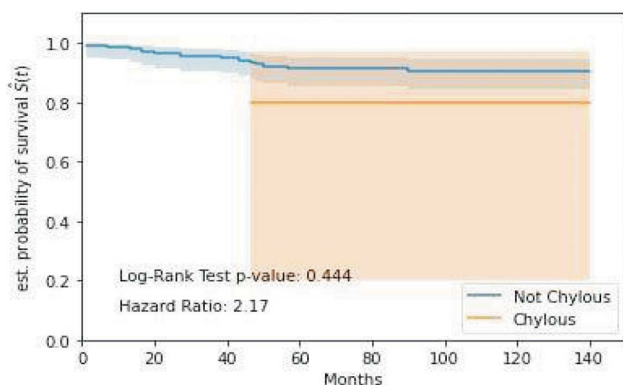


Fig. 13. Kaplan-Meier survival curves for OS of left-side lesion stage II patients.

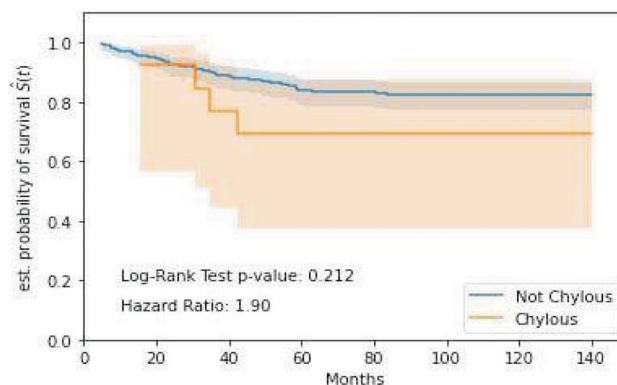


Fig. 14. Kaplan-Meier survival curves for OS of left-side lesion stage III patients.

Discussion

In this retrospective study of 841 patients undergoing surgical resection for stage I-III colorectal cancer, the incidence of postoperative CA was 3.9%. This rate is comparable to those reported in the literature. Postoperative CA was reported to occur in 1.0%-6.6% of patients undergoing colorectal cancer surgery and in up to 11% of patients undergoing major abdominal surgery.^{9,11-13} Patient characteristics, surgical technique, tumor stage distribution, and perioperative management protocols affect CA risk.^{11,12} Notably, our study focused on a mixed cohort of open and minimally invasive surgeries performed over a period of more than a decade, capturing real-world heterogeneity in surgical practice.

Several studies have highlighted that the reported incidence of CA may be influenced by the definition used (e.g., triglyceride threshold), the use of routine drain placement, and whether postoperative fluid is biochemically analyzed.^{6,7} In our cohort, not all patients underwent routine triglyceride concentration checks, which may have led to underestimation of subclinical or low-volume CA cases. Nonetheless, the incidence we noted aligns with that in previously reports, suggesting that symptomatic CA requiring intervention remains a relevant but relatively uncommon complication in colorectal cancer surgery.

Notably, our multivariable analysis identified two independent risk factors for CA: the minimally invasive surgical approach and a higher T stage. Several

potential risk factors for CA, such as older age, hypoalbuminemia, extensive lymphadenectomy, and greater intraoperative blood loss, have been reported in previous studies.^{11,12} Among these, only the extent of lymph node dissection was available for analysis in our dataset, whereas data on serum albumin levels and intraoperative blood loss were incomplete and therefore not included.

These differences in variable availability, along with advances in surgical techniques and perioperative management, may explain the variations between our findings and earlier reports.

Minimally invasive surgery, which is generally associated with reduced morbidity and faster recovery, was linked with a higher incidence of CA in our study. In open surgery, lymphatic channels are more easily visualized and more directly ligated using sutures or clips. By contrast, minimally invasive procedures involve reliance on energy-based devices, which may lead to less reliable closure of fragile lymphatics, particularly in inflamed or fibrotic tissue. In addition, pneumoperitoneum may obscure small lymphatic leaks, delaying recognition and repair. These technical nuances underscore the importance of not only adopting minimally invasive platforms but also refining lymphatic handling techniques within those modalities.¹⁴

T stage, representing the depth of local tumor invasion, was also independently associated with CA.¹⁵ Tumors at greater depths require broader and deeper dissection planes. This, in turn, increases the risk of inadvertent lymphatic injury, particularly near the

mesenteric root or retroperitoneal structures. Moreover, advanced T stage is frequently associated with peritumoral inflammation and fibrosis, both of which may render energy-based devices less effective in achieving complete lymphatic sealing. These findings suggest that heightened intraoperative vigilance and tailored lymphatic control strategies are warranted in patients with higher T-stage tumors.

Notably, we did not observe a significant difference in CA incidence related to tumor location. We had assumed that right-sided colon cancers would pose a greater risk of CA because of their proximity to the cisterna chyli and reliance on superior mesenteric artery drainage.²¹⁻²³ The lack of a significant difference noted in this study may be attributed to the uniform application of surgical technique across procedures or to the limited number of CA events precluding more granular laterality-based analysis. Nonetheless, these findings challenge traditional anatomical assumptions and highlight a need for more detailed lymphatic mapping studies in colorectal surgery.²⁰

Management of CA and short-term outcomes

Consistent with the literature, all CA cases in our study were successfully managed with conservative therapy, including total parenteral nutrition and a low-fat diet enriched with medium-chain triglycerides. No patient required surgical reoperation. These findings reinforce the effectiveness of noninvasive management strategies, particularly when CA is detected early and promptly addressed. Additionally, none of the patients in our cohort experienced severe complications from nutritional therapy, supporting its safety in the postoperative setting.¹⁷⁻¹⁹

Although most short-term outcomes, including length of hospital stay, intraabdominal abscess, ileus, and anastomotic leak, did not differ significantly between the groups, wound infections were significantly more frequent in the CA group. Persistent lymphatic leakage may create a local environment that predisposes to soft tissue infection, with this possibly occurring because of prolonged drain use, compromised wound healing, or loss of immune-rich lymphatic fluid.

Whereas in thoracic and upper abdominal surgery, CA is often associated with substantial nutritional and immunologic compromise, in colorectal surgery, CA appears to carry a more selective morbidity profile, with wound-related complications being the most prominent postsurgical problems.

Long-term outcomes: DFS and oncologic implications

One of the most striking findings of our study was the significantly worse DFS among patients who developed CA. Although the causal mechanism remains to be fully elucidated, several hypotheses exist. For example, lymphatic fluid may serve as a conduit for tumor cell dissemination, particularly if the lymphatic leak occurs in proximity to residual tumor or micro-metastatic deposits. Furthermore, CA may serve as a surrogate marker for more aggressive surgical resections, delayed recovery, or compromised immune response, all of which can negatively affect tumor control.

Two prior studies have similarly reported poorer survival outcomes in patients with postoperative CA, suggesting that this complication may carry long-term oncologic consequences beyond its immediate clinical presentation.^{12,13} Our study demonstrated a non-significant association between postoperative CA and worse OS. However, subgroup analyses revealed that patients with stage III right-sided colon cancer who developed CA had significantly worse OS (HR = 4.54, log-rank $p = 0.026$). Our study also demonstrated an association between postoperative CA and worse DFS. The association with DFS was significant and remained robust across subgroup analyses, particularly those involving stage III disease and left-sided tumors. These findings warrant further investigation because they raise the possibility that CA is not merely a technical problem but may play a role in biological recurrence pathways.

Future studies in this area should characterize the cytological and molecular content of chylous fluid, evaluate its relationship with circulating tumor cells, and determine whether early aggressive management of CA can mitigate the risk of recurrence. Such inves-

tigations could ultimately reshape how clinicians monitor and treat patients who develop this complication.

Limitations

This study has several limitations. First, the study is a retrospective analysis conducted at a single institution, which may limit its generalizability. Second, postoperative drain fluid triglyceride concentrations were not routinely measured, potentially leading to underdiagnosis or misclassification of subclinical CA. Third, surgical techniques, including the extent of mesocolic excision, were not consistently documented, preventing definitive correlation with operative planes. Finally, the relatively small number of CA cases limited the power of some subgroup analyses. Future multicenter, prospective studies with standardized operative protocols and postoperative CA monitoring are required to validate our findings and inform prevention strategies.

Conclusion

CA is an uncommon but clinically relevant complication following colorectal cancer surgery, with an incidence of 3.9% observed in our cohort. The minimally invasive surgical approach and a higher T stage emerged as independent risk factors for CA, with these likely reflecting technical and anatomical contributors to lymphatic disruption. Focusing on achieving thorough lymphatic sealing — particularly when energy-based devices are used — may be critical in mitigating this risk. All CA cases were effectively managed with conservative strategies, such as total parenteral nutrition and a low-fat diet enriched with medium-chain triglycerides, obviating the need for surgical reintervention. Nonetheless, an association was noted between CA and inferior DFS that raises key concerns regarding its potential oncologic implications. Future studies should refine intraoperative techniques for lymphatic preservation and further investigate the biological and prognostic effects of postoperative CA in patients with colorectal cancer.

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原 著

結直腸癌手術後乳糜腹水之危險因子 及其對預後之影響

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目的 本研究旨在探討大腸直腸癌第一至第三期根治性手術後發生乳糜腹水之危險因子，並評估其對長期腫瘤預後的影響。

方法 本研究回溯分析 2008 年 8 月至 2019 年 12 月間，共 841 位接受第一至第三期大腸直腸腺癌根治性手術之病患，排除晚期疾病或非根治性手術者。乳糜腹水定義為腹腔引流液中三酸甘油脂濃度超過 110 mg/dL。以多變項迴歸及生存分析評估其危險因子與生存預後。

結果 共 33 位病患 (3.9%) 發生乳糜腹水。微創手術及較高腫瘤分期為其獨立危險因子。發生乳糜腹水者傷口感染風險較高，且在無病生存率方面顯著較差，尤以左側第三期腫瘤病患最為明顯；總生存率則呈現較差趨勢，但未達統計顯著。

結論 術後乳糜腹水雖為少見，但具臨床意義之併發症。微創手術與腫瘤分期偏高為其主要風險因子。儘管大多採保守治療，其與長期預後不良之關聯，顯示此族群應加強後續追蹤與管理。

關鍵詞 乳糜腹水、結直腸癌、預後、總生存率、無病生存率。