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# Factors Associated with Anastomotic Leakage Following Colorectal Surgery: A Prospective Observational Study

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## ABSTRACT

***Background:*** Anastomotic leakage (AL) is one of the most serious complications following colorectal surgery and is associated with substantial morbidity, mortality, prolonged hospitalization, and increased healthcare burden. Identification of factors associated with AL may facilitate risk stratification and improve perioperative management.
**Objective:** To evaluate clinical and operative factors associated with anastomotic leakage following colorectal surgery in a tertiary care setting.
***Methods:*** A prospective observational study was conducted in the Department of General Surgery of a tertiary care teaching hospital over a period of 12 months. Adult patients undergoing elective or emergency colorectal resection with primary intestinal anastomosis were included. Demographic characteristics, comorbidities, operative variables, and postoperative outcomes were recorded prospectively. Associations between clinical and operative factors and anastomotic leakage were assessed using Fisher's exact test, with $p<0.05$ considered statistically significant.
***Results:*** A total of 25 patients were included in the study. Anastomotic leakage occurred in 4 patients (16.0%). Smoking (75.0% vs. 23.8%; p=0.047), diabetes mellitus (75.0% vs. 19.0%; p=0.031), hypoalbuminemia (75.0% vs. 14.3%; p=0.018), and ASA grade III–IV (75.0% vs. 19.0%; p=0.031) were significantly associated with anastomotic leakage. Emergency surgery, colorectal anastomosis, prolonged operative duration (≥180 minutes), increased intraoperative blood loss (≥500 mL), and absence of a protective stoma were more frequent among patients with leakage; however, these associations were not statistically significant. Among patients with leakage, 75.0% required reoperation. Overall ICU admission and mortality rates were 20.0% and 4.0%, respectively.
***Conclusion:*** Anastomotic leakage remains a clinically significant complication following colorectal surgery. Smoking, diabetes mellitus, hypoalbuminemia, and higher ASA grade were significantly associated with the occurrence of leakage. Preoperative optimization of nutritional status and comorbid conditions, along with careful perioperative monitoring of high-risk patients, may contribute to improved surgical outcomes. Larger multicenter studies are required to validate these findings.

***Keywords:*** Anastomotic leakage; Colorectal surgery; Associated factors; Hypoalbuminemia; Diabetes mellitus; Postoperative complications.

## INTRODUCTION

Colorectal surgery is a cornerstone in the management of a broad spectrum of gastrointestinal pathologies, ranging from benign conditions to life-threatening malignancies. Colorectal cancer remains a significant global health challenge, with its incidence more than doubling over the last three decades to reach an estimated 2.17 million cases annually.[1] Concurrently, the rising prevalence of inflammatory bowel disease and other complex diverticular conditions in middle-SDI countries has further increased the volume of surgical interventions required to maintain public health.[2] In nearly all these surgical procedures, the restoration of bowel continuity through an intestinal anastomosis is a critical step, as it directly impacts the patient's postoperative quality of life and long-term recovery.[3]

Anastomotic leakage is widely regarded as the most dreaded complication following colorectal resection, carrying profound implications for patient morbidity and mortality. The International Study Group of Rectal Cancer defines AL as a defect in the intestinal wall at the anastomotic site that creates a communication between the intra- and extraluminal compartments.[4] Despite significant refinements in surgical technique and perioperative protocols, the reported incidence of AL remains highly variable, with studies citing rates between 2.8% and 30% depending on the specific surgical site and patient population.[5] Standardizing the reporting of this complication remains a challenge, as many investigations fail to consistently incorporate subclinical or radiological leaks into their final analysis.[6]

The pathophysiology of anastomotic healing is a multifactorial process influenced by both modifiable and non-modifiable risk factors. Factors associated of leakage identified in multivariable models include a high American Society of Anesthesiologists classification, heavy alcohol consumption, and the performance of emergency surgery, with the latter carrying an odds ratio as high as 32.2 in some cohorts.[7] Furthermore, biological factors such as advanced age particularly in patients over 70 years and male gender significantly elevate the risk due to associated comorbidities and the technical challenges of a narrower pelvis. The interplay of these factors often leads to compromised microcirculation and tissue ischemia at the suture line, which are the primary drivers of anastomotic breakdown.[8]

Recent advances in perioperative care have focused on the early identification of patients at risk of leakage using systemic biomarkers to facilitate prompt intervention. Studies have demonstrated that monitoring the trajectory of C-reactive protein and procalcitonin levels in the early postoperative period can help identify patients at low likelihood of major dehiscence.[9] While international benchmarks provide a framework for risk assessment, emerging prospective data from Indian centers indicate that regional factors such as prevalent malnutrition (hypoalbuminemia <3.5 g/dL) and prolonged operative times significantly impact local AL rates.[10,11]

Consequently, there is a clear rationale for conducting focused institutional studies to identify specific factors associated, thereby enabling tailored surgical strategies and more vigilant postoperative monitoring for high-risk patients. Therefore, the present study was undertaken to evaluate clinical and operative factors associated with anastomotic leakage following colorectal surgery in a tertiary care setting.

## MATERIALS & METHODS

This hospital-based prospective observational study was conducted in the Department of General Surgery of a tertiary care teaching hospital among patients undergoing colorectal surgery with creation of intestinal anastomosis. The study was carried out over a period of 12 months. The study population included adult patients aged ≥18 years who underwent elective or emergency colorectal resection with

primary anastomosis. Patients undergoing surgery without anastomosis, permanent stoma formation, pregnant women, patients unable to provide consent, and patients with severe immunocompromised conditions were excluded from the study. Consecutive sampling technique was employed, and all eligible patients presenting during the study period were enrolled. Data were collected using a predesigned and pretested semi-structured case record form containing demographic details, clinical profile, laboratory investigations, operative findings, and postoperative outcomes.

Data collection was performed prospectively from admission until 30 days postoperatively. Variables including age, sex, body mass index, smoking, alcohol intake, diabetes mellitus, anemia, hypoalbuminemia, ASA grade, operative duration, intraoperative blood loss, emergency surgery, site of anastomosis, protective stoma, ICU admission, postoperative hospital stay, reoperation, and mortality were recorded. Anastomotic leak was operationally defined as clinical or radiological evidence of communication between intra- and extraluminal compartments due to disruption of the integrity of the intestinal wall within 30 postoperative days, consistent with previously published definitions.

## Statistical Analysis

Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized as frequencies and percentages. Associations between clinical and operative factors and anastomotic leakage were assessed using Fisher's exact test. A p-value of less than 0.05 was considered statistically significant.

**Ethical consideration:** Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study through ref no. VIMS/IEC/E/2025/119, and written informed consent was obtained from all participants. Confidentiality and anonymity of patient information were strictly maintained throughout the study.

## RESULT

A total of 25 patients undergoing colorectal surgery with primary intestinal anastomosis were included in the study. The majority of patients belonged to the age groups of 40–59 years (44.0%) and ≥60 years (44.0%). Males constituted 64.0% of the study population. Smoking history was present in 32.0% of patients, while diabetes mellitus, anemia, and hypoalbuminemia were observed in 28.0%, 40.0%, and 24.0% of patients, respectively. Most patients were classified as ASA grade I–II (72.0%) (Table 1).

**Table 1: Distribution of Study Participants According to Baseline Demographic and Clinical Characteristics (N=25)**

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| **Age Group (Years)** | | |
| <40 | 3 | 12.0 |
| 40–59 | 11 | 44.0 |
| ≥60 | 11 | 44.0 |
| **Gender** | | |
| Male | 16 | 64.0 |
| Female | 9 | 36.0 |
| **BMI** | | |
| Normal (<25 kg/m²) | 14 | 56.0 |
| Overweight/Obese (≥25 kg/m²) | 11 | 44.0 |
| **Smoking History** | | |
| Present | 8 | 32.0 |

| | | |
|---|---|---|
| Absent | 17 | 68.0 |
| **Alcohol Consumption** | | |
| Present | 6 | 24.0 |
| Absent | 19 | 76.0 |
| **Diabetes Mellitus** | | |
| Present | 7 | 28.0 |
| Absent | 18 | 72.0 |
| **Hypertension** | | |
| Present | 9 | 36.0 |
| Absent | 16 | 64.0 |
| **Anemia** | | |
| Present | 10 | 40.0 |
| Absent | 15 | 60.0 |
| **Hypoalbuminemia** | | |
| Present | 6 | 24.0 |
| Absent | 19 | 76.0 |
| **ASA Grade** | | |
| I–II | 18 | 72.0 |
| III–IV | 7 | 28.0 |

Colorectal malignancy was the most common indication for surgery (72.0%). Elective procedures accounted for 80.0% of surgeries. Colorectal anastomosis was the most frequently performed procedure (44.0%), and open surgery was performed in 68.0% of patients. A protective stoma was not created in 80.0% of cases. The duration of surgery was less than 180 minutes in 56.0% of patients, while intraoperative blood loss was less than 500 mL in 76.0% of patients (Figure 1).

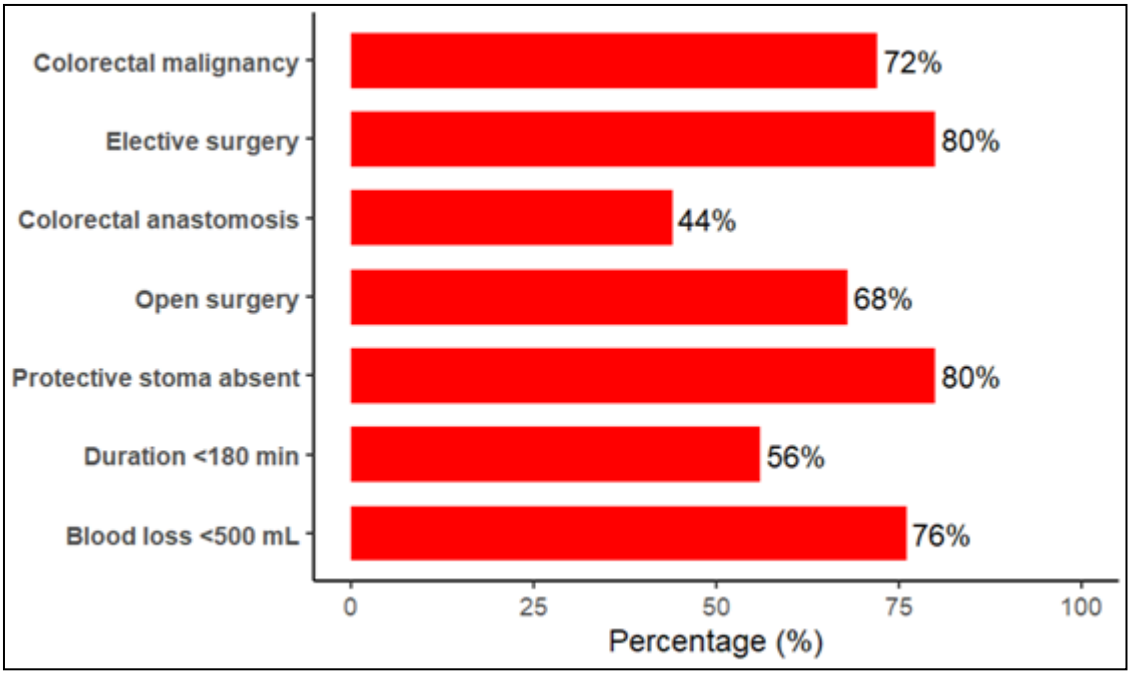


**Figure 1. Distribution of study participants according to operative characteristics (N = 25).**

Anastomotic leakage occurred in 4 patients (16.0%), whereas 21 patients (84.0%) had an uncomplicated postoperative course. Among patients who developed leakage, clinical leaks accounted for 75.0% of cases and radiologically diagnosed leaks for 25.0%. Reoperation was required in three patients with leakage (75.0%). Overall ICU admission and mortality rates were 20.0% and 4.0%, respectively (Table 2).

**Table 2: Clinical Profile and outcome of Anastomotic Leak Among Study Participants (N=25)**

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| **Anastomotic Leak** | | |
| Present | 4 | 16.0 |
| Absent | 21 | 84.0 |
| **Type of Leak (n=4)** | | |
| Clinical | 3 | 75.0 |
| Radiological | 1 | 25.0 |
| **Management of Leak (n=4)** | | |
| Conservative | 1 | 25.0 |
| Reoperation | 3 | 75.0 |
| **ICU Admission** | | |
| Yes | 5 | 20.0 |
| No | 20 | 80.0 |
| **Mortality** | | |
| Yes | 1 | 4.0 |
| No | 24 | 96.0 |

Analysis of baseline clinical characteristics demonstrated that smoking, diabetes mellitus, hypoalbuminemia, and higher ASA grade (III–IV) were significantly associated with the occurrence of anastomotic leakage. Smoking was present in 75.0% of patients with leakage compared with 23.8% of those without leakage (p=0.047). Similarly, diabetes mellitus (75.0% vs. 19.0%, p=0.031), hypoalbuminemia (75.0% vs. 14.3%, p=0.018), and ASA grade III–IV (75.0% vs. 19.0%, p=0.031) showed significant associations with leakage. Although anemia was more common among patients with leakage, the difference did not reach statistical significance (p=0.142) (Table 3).

**Table 3. Association of Baseline Clinical Factors with Anastomotic Leakage**

| Variable | Leak Present (n=4) | Leak Absent (n=21) | p-value |
|---|---|---|---|
| **Smoking** | | | |
| Present | 3 (75.0) | 5 (23.8) | 0.047* |
| Absent | 1 (25.0) | 16 (76.2) | |
| **Diabetes mellitus** | | | |
| Present | 3 (75.0) | 4 (19.0) | 0.031* |
| Absent | 1 (25.0) | 17 (81.0) | |
| **Anemia** | | | |
| Present | 3 (75.0) | 7 (33.3) | 0.142 |
| Absent | 1 (25.0) | 14 (66.7) | |
| **Hypoalbuminemia** | | | |
| Present | 3 (75.0) | 3 (14.3) | 0.018* |
| Absent | 1 (25.0) | 18 (85.7) | |
| **ASA Grade** | | | |
| III–IV | 3 (75.0) | 4 (19.0) | 0.031* |
| I–II | 1 (25.0) | 17 (81.0) | |

***Note: Fisher's exact test applied. *Statistically significant at p < 0.05.***

Operative factors associated with anastomotic leakage are presented in Table 4. Emergency surgery was performed in 50.0% of patients who developed anastomotic leakage compared with 14.3% of patients without leakage (p=0.102). Colorectal anastomosis was more common among patients with leakage than those without leakage (75.0% vs. 38.1%; p=0.174). All patients who developed leakage underwent an open surgical procedure, whereas 61.9% of patients without leakage underwent open surgery (p=0.264). Prolonged operative duration (≥180 minutes) was observed in 75.0% of patients with leakage compared with 38.1%

of patients without leakage (p=0.174). Similarly, intraoperative blood loss ≥500 mL was more frequent among patients with leakage than among those without leakage (50.0% vs. 19.0%; p=0.229). Absence of a protective stoma was observed in all patients who developed leakage and in 76.2% of patients without leakage (p=0.543). Although these operative factors were more frequently observed among patients with anastomotic leakage, none demonstrated a statistically significant association with leakage (p>0.05).

**Table 4. Association Between Operative Factors and Anastomotic Leakage**

| Variable | Leak Present (n=4) | Leak Absent (n=21) | p-value |
|---|---|---|---|
| **Type of Surgery** | | | |
| Elective | 2 (50.0) | 18 (85.7) | 0.102 |
| Emergency | 2 (50.0) | 3 (14.3) | |
| **Type of Anastomosis** | | | |
| Colorectal | 3 (75.0) | 8 (38.1) | 0.174 |
| Other anastomoses | 1 (25.0) | 13 (61.9) | |
| **Surgical Approach** | | | |
| Open | 4 (100.0) | 13 (61.9) | 0.264 |
| Laparoscopic | 0 (0.0) | 8 (38.1) | |
| **Duration of Surgery** | | | |
| <180 min | 1 (25.0) | 13 (61.9) | 0.174 |
| ≥180 min | 3 (75.0) | 8 (38.1) | |
| **Intraoperative Blood Loss** | | | |
| <500 mL | 2 (50.0) | 17 (81.0) | 0.229 |
| ≥500 mL | 2 (50.0) | 4 (19.0) | |
| **Protective Stoma** | | | |
| Present | 0 (0.0) | 5 (23.8) | 0.543 |
| Absent | 4 (100.0) | 16 (76.2) | |

**Note: Fisher's exact test applied. *p < 0.05 considered statistically significant.***

## DISCUSSION

Anastomotic leakage remains one of the most serious complications following colorectal surgery because of its association with increased morbidity, prolonged hospitalization, reoperation, and mortality. In the present study, anastomotic leakage occurred in 16.0% of patients. Among those who developed leakage, 75.0% required reoperation, highlighting the substantial clinical burden associated with this complication. The observed incidence falls within the range reported in previous studies, where leakage rates have varied from 2.8% to 30% depending on patient characteristics, type of surgery, and criteria used for diagnosis.[5,12]

The present study identified smoking and diabetes mellitus as factors significantly associated with anastomotic leakage. Smoking was present in 75.0% of patients who developed leakage compared with 23.8% of those without leakage, while diabetes mellitus was observed in 75.0% and 19.0% of patients, respectively. These findings are consistent with previous reports that have identified both conditions as important contributors to impaired anastomotic healing.[7] Smoking adversely affects tissue oxygenation through vasoconstriction and reduced microvascular perfusion, whereas diabetes mellitus impairs wound healing through microangiopathy, altered immune function, and delayed collagen synthesis.[3] Collectively, these mechanisms may compromise anastomotic integrity and increase susceptibility to leakage.

Nutritional and physiological status also demonstrated a significant relationship with anastomotic leakage in the present study. Hypoalbuminemia and higher ASA grade (III–IV) were significantly more common among patients who developed leakage. Serum albumin is widely recognized as an indicator of nutritional reserve and tissue

healing capacity. Inadequate nutritional status may impair collagen deposition and wound repair, thereby increasing the likelihood of anastomotic failure.[3] Similarly, a higher ASA grade reflects greater systemic disease burden and reduced physiological reserve, which may adversely affect postoperative recovery. Previous studies have likewise reported an increased risk of leakage among patients with poor nutritional status and higher perioperative risk profiles.[7]

Although operative factors such as emergency surgery, colorectal anastomosis, prolonged operative duration, greater intraoperative blood loss, and absence of a protective stoma were more frequently observed among patients with leakage, none of these variables reached statistical significance. Emergency procedures were performed in 50.0% of patients with leakage compared with 14.3% of those without leakage, while prolonged operative duration (≥180 minutes) was observed in 75.0% and 38.1% of patients, respectively. These trends are consistent with existing literature suggesting that technically demanding procedures, emergency operations, and prolonged surgical duration may adversely affect anastomotic healing.[8,13,14] However, the absence of statistical significance in the present study may be attributable to the limited sample size and small number of leakage events.

An important finding of the present study was the considerable morbidity associated with anastomotic leakage. Most leak cases were diagnosed clinically, and three-fourths required surgical reintervention. Furthermore, ICU admission and mortality were observed among affected patients, emphasizing the potentially life-threatening consequences of this complication. Previous studies have similarly demonstrated that anastomotic leakage is associated with increased postoperative complications, prolonged recovery, and higher mortality rates.[5,6,15] Early recognition and prompt management therefore remain essential components of postoperative care.

Smoking cessation, strict glycemic control, and correction of nutritional deficiencies may contribute to improve anastomotic healing and reduced postoperative complications. Careful perioperative monitoring of high-risk patients may facilitate earlier detection and management of leakage.

Future studies involving larger multicenter datasets and multivariable analytical approaches may provide a better understanding of factors associated with anastomotic leakage and facilitate improved risk stratification of patients undergoing colorectal surgery.

***Limitations:*** The relatively small sample size and single-center design may limit the generalizability of the findings. In addition, only four leakage events were observed, reducing the statistical power to detect significant associations for several operative variables. Larger multicenter prospective studies are required to validate these findings and further evaluate factors associated with anastomotic leakage following colorectal surgery.

***Recommendations:*** The findings underscore the need for thorough preoperative risk assessment, optimization of nutritional status and comorbid conditions, and careful perioperative management to minimize the risk of anastomotic failure. Early identification and close postoperative monitoring of high-risk patients may facilitate timely intervention and improve surgical outcomes. Further large-scale multi-center prospective studies are warranted to validate these findings and further clarify clinical and operative factors associated with anastomotic leakage following colorectal surgery.

## CONCLUSION

Anastomotic leakage remains a significant postoperative complication following colorectal surgery and was associated with considerable morbidity in the present study,

including a high rate of reoperation, ICU admission, and mortality. The incidence of anastomotic leakage was 16.0% among patients undergoing colorectal resection with primary anastomosis.

Smoking, diabetes mellitus, hypoalbuminemia, and higher ASA grade were significantly associated with the occurrence of anastomotic leakage, highlighting the importance of patient-related factors in anastomotic healing. Although operative variables such as emergency surgery, prolonged operative duration, increased intraoperative blood loss, and absence of a protective stoma were more frequently observed among patients who developed leakage, these associations did not reach statistical significance.

### *Declaration by Authors*

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### REFERENCES

1. GBD 2019 Colorectal Cancer Collaborators. Global, regional, and national burden of colorectal cancer and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet Gastroenterol Hepatol. 2022 Jul;7(7):627-647. doi: 10.1016/S2468-1253(22)00044-9.
2. Zhang Z, Tang XL, Ma R, Hao L, Jiang BW, Zhang ZN et.al. Global, regional, and national burdens of colorectal cancer and inflammatory bowel disease, 1990-2021 and projections to 2050: a cross-sectional study. Int J Surg. 2026 Feb 12. doi: 10.1097/JS9.0000000000004428.
3. Rosendorf J, Klicova M, Herrmann I, Anthis A, Cervenkova L, Palek R, Treska V, Liska V. Intestinal Anastomotic Healing: What do We Know About Processes Behind Anastomotic Complications. Front Surg. 2022 Jun 7; 9:904810. doi: 10.3389/fsurg.2022.904810.
4. Rahbari NN, Weitz J, Hohenberger W, Heald RJ, Moran B, Ulrich A, et al. Definition and grading of anastomotic leakage following anterior resection of the rectum: a proposal by the International Study Group of Rectal Cancer. Surgery. 2010 Mar;147(3):339-51. doi: 10.1016/j.surg.2009.10.012.
5. Rennie O, Sharma M, Helwa N. Colorectal anastomotic leakage: a narrative review of definitions, grading systems, and consequences of leaks. Front Surg. 2024 May 2; 11:1371567. doi: 10.3389/fsurg.2024.1371567.
6. Vallance A, Wexner S, Berho M, Cahill R, Coleman M, Haboubi N, Heald RJ, Kennedy RH, Moran B, Mortensen N, Motson RW, Novell R, O'Connell PR, Ris F, Rockall T, Senapati A, Windsor A, Jayne DG. A collaborative review of the current concepts and challenges of anastomotic leaks in colorectal surgery. Colorectal Dis. 2017 Jan;19(1): O1-O12. doi: 10.1111/codi.13534.
7. Chitca DD, Mihalache O, Bobircă F, Botezatu C, Popescu V, Andras D et.al. Understanding Anastomotic Healing in Colo-Rectal Surgery; a Multicentric 5-Year Analysis of Predictive Factors for Integrity and Fistula Formation. Diagnostics (Basel). 2026 Mar 11;16(6):837. doi: 10.3390/diagnostics16060837.
8. Bhattacharya, Kaushik. Colorectal Anastomotic Leak – Anything New?. Indian Journal of Colo-Rectal Surgery 6(2): p 23-25, May–Aug 2023. | DOI: 10.4103/IJCS.IJCS_2_24
9. Giaccaglia V, Salvi PF, Antonelli MS, Nigri G, Pirozzi F, Casagranda B, et al. Procalcitonin reveals early dehiscence in colorectal surgery: the PREDICS study. Ann Surg. 2016;263(5):967-72. doi:10.1097/SLA.0000000000001365.
10. Guren MG. The global challenge of colorectal cancer. Lancet Gastroenterol Hepatol. 2019 Dec;4(12):894-895. doi: 10.1016/S2468-1253(19)30329-2.
11. Maldonado-Hernández IG, Vega-Chavarría E, Nacud-Bezies YA, Cordero-Franco HF, Palacios-Saucedo GC. Procalcitonin and C-reactive protein: markers in the early diagnosis of anastomotic leak. Cir Cir. 2023;91(4):542-549. English. doi: 10.24875/CIRU.22000116.
12. Sparreboom CL, van Groningen JT, Lingsma HF, Wouters MWJM, Menon AG, Kleinrensink GJ, Jeekel J, Lange JF; Dutch ColoRectal Audit group. Different Risk Factors for Early and Late Colorectal

Anastomotic Leakage in a Nationwide Audit. Dis Colon Rectum. 2018 Nov;61(11):1258-1266. doi: 10.1097/DCR.0000000000001202.
13. Frasson M, Flor-Lorente B, Rodríguez JL, Granero-Castro P, Hervás D, Alvarez Rico MA, Brao MJ, Sánchez González JM, Garcia-Granero E; ANACO Study Group. Risk Factors for Anastomotic Leak After Colon Resection for Cancer: Multivariate Analysis and Nomogram From a Multicentric, Prospective, National Study With 3193 Patients. Ann Surg. 2015 Aug;262(2):321-30. doi: 10.1097/SLA.0000000000000973.
14. Sciuto A, Merola G, De Palma GD, Sodo M, Pirozzi F, Bracale UM, Bracale U. Predictive factors for anastomotic leakage after laparoscopic colorectal surgery. World J Gastroenterol. 2018 Jun 7;24(21):2247-2260. doi: 10.3748/wjg. v24.i21.2247.
15. McDermott FD, Heeney A, Kelly ME, Steele RJ, Carlson GL, Winter DC. Systematic review of preoperative, intraoperative and postoperative risk factors for colorectal anastomotic leaks. Br J Surg. 2015 Apr;102(5):462-79. doi: 10.1002/bjs.9697.

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