

# Anastomotic Leakage in Colorectal Cancer Surgery in Syria: Risk Factors and Improvements Following Guideline Implementation – A Retrospective Cohort Study

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## Principle investigator:

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## Background:

Anastomotic leakage (AL) is one of the most serious complications following colorectal surgery, associated with increased morbidity, mortality, prolonged hospital stays. It occurs when there is a disruption at the surgical connection between two segments of the bowel, most commonly involving the colon or rectum. Despite advances in surgical techniques and perioperative care, AL remains a persistent concern, particularly in colorectal cancer patients undergoing resection.

This study was conducted in Damascus, Syria—a country that has endured over a decade of armed conflict, leading to profound disruptions in the healthcare system. Hospitals in such settings face ongoing shortages of medical supplies and limited access to updated surgical technologies. Laparoscopic surgery is not routinely available, and open surgery continues to be the standard approach for most colorectal procedures, including elective cases. Given these challenges, there is a critical need for context-specific data to guide clinical decision-making and improve patient outcomes.

The present study aims to identify the risk factors associated with anastomotic leakage among colorectal cancer patients who underwent surgery in a resource-limited, conflict-affected setting. Understanding these factors can contribute to safer surgical practice and more informed perioperative management in similar environments worldwide.

## Objective:

To identify clinical, demographic, surgical, and pathological factors associated with an increased risk of anastomotic leakage in patients undergoing surgery for colorectal cancer.

## **Study Design:**

- **Study Type:** Observational
- **Study Design:** Retrospective Cohort Study
- **Time Perspective:** Retrospective
- **Study Period:** January 2016 to February 2024
- **Data Source:** Patients medical records and surgical reports from Damascus Hospital.

## **Study Population:**

### **Inclusion Criteria**

- Patients who underwent colorectal cancer surgery for tumor-related indications.

### **Exclusion Criteria**

- Emergency cases.
- Non-tumor related colorectal surgeries.

## **Primary Outcome Measures:**

Association Between Patient- and Surgery-Related Risk Factors and the Incidence of Anastomotic Leakage.

## **Variables and Data Collection:**

Data was extracted from patient files, operative reports, and follow-up records. Additional follow-up was performed via a structured questionnaire where applicable. Collected variables include:

### **Demographic & Clinical Variables:**

- Age, sex
- Smoking status
- Medical history (diabetes, hypertension)

### **Tumor Characteristics:**

- Tumor Site (Rectum / Sigmoid colon)
- Radiotherapy (in case of rectum mass)
- TNM
- Tumor differentiation grade.

### **Surgical Factors :**

- Type of surgery (open / laparoscopic).
- Peri-operative blood transfusion.
- Closing Method (manual / staplers)
- Surgical Contamination.

### **Postoperative Data:**

- Post-operative ICU.
- Post-operative Complications.
- Ileostomy.
- Steroids use.
- Serum Albumin level.
- Occurrence of anastomotic leakage
- Patient Final status.

### **Sample Size:**

All eligible patients meeting the inclusion criteria within the defined period were included. The final sample size was 100 patients.

### **Statistical Analysis:**

All collected data was entered into a secure, password-protected database. Descriptive statistics were used to summarize patient demographics, tumor characteristics, and surgical variables. Categorical variables were presented as frequencies and percentages, while continuous variables were reported as means with standard deviations or medians with interquartile ranges, as appropriate.

Univariate analyses was performed to evaluate the association between each potential risk factor and the occurrence of anastomotic leakage within 30 days postoperatively.

Statistical analysis was conducted using SPSS software, version 26 (IBM Corp., Armonk, NY, USA). A p-value < 0.05 was considered statistically significant. Data validation and quality control procedures were applied throughout the analysis to ensure accuracy and consistency.

### **Ethical Considerations:**

This study was approved by the IRB of Syrian Private University (IRB No. 1497/436).

Since this is a retrospective cohort study with no direct patient contact and anonymized data, the requirement for informed consent has been waived. Data confidentiality and patient privacy were strictly maintained.

### **Limitations:**

One limitation of this study is the absence of a laparoscopic surgery comparison group, which may limit the generalizability of the findings to settings where minimally invasive techniques are routinely used. However, given the resource-constrained environment in which this study is conducted, the results are expected to provide valuable insights for similar healthcare contexts, particularly in conflict-affected or low-income regions.

### **Timeline:**

**Study Start Date:** Mar/04/2024

**Primary Completion Date:** Apr/08/2024

**Study Completion Date:** Jul/20/2024

