

Risk Factors for Postoperative Morbidity Following Gastrectomy for Gastric Adenocarcinoma

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1. Abstract

1.1. Background: Gastric adenocarcinoma remains a major public health concern, associated with high postoperative morbidity and poor prognosis. Curative gastrectomy with adequate lymph node dissection is the standard treatment, but postoperative complications remain frequent.

1.2. Objective: To evaluate postoperative morbidity following gastrectomy for gastric adenocarcinoma and identify independent risk factors for complications.

1.3. Methods: We conducted a retrospective study including 37 patients who underwent curative-intent gastrectomy over 12 years at the Military Hospital of Tunis. Clinical, therapeutic, and histopathological data were analyzed. Postoperative complications were classified as procedure-specific or non-specific, and multivariate analysis was used to identify independent predictors of morbidity.

1.4. Results: Among 37 patients (mean age 64 years; 43.2% women), total gastrectomy was performed in 9 cases, subtotal in 25, and extended gastrectomy in 3. D1.5 and D2 lymphadenecto

gastrectomy is still associated with a substantial rate of postoperative morbidity, making the identification of factors associated with postoperative complications essential.

The aim of this study was to evaluate postoperative morbidity following gastrectomy for gastric adenocarcinoma and to identify the main factors associated with the occurrence of complications.

3. Materials and Methods

This was a retrospective analytical study including 37 patients who underwent curative-intent gastrectomy for gastric adenocarcinoma over a 12-year period at the Department of General Surgery, Military Hospital of Tunis. Clinical, paraclinical, therapeutic, and histopathological data were collected and analyzed. Postoperative morbidity was assessed, and factors associated with the occurrence of postoperative complications were evaluated.

4. Results

A total of 37 patients underwent surgery for gastric adenocarcinoma. The study was conducted at the Military Hospital of Tunis over a 12-year period, from January 1, 2008, to December 31, 2019. The study population included 16 women (43.2%) and 21 men (56.8%), with a sex-ratio of 1.3 (figure 1).

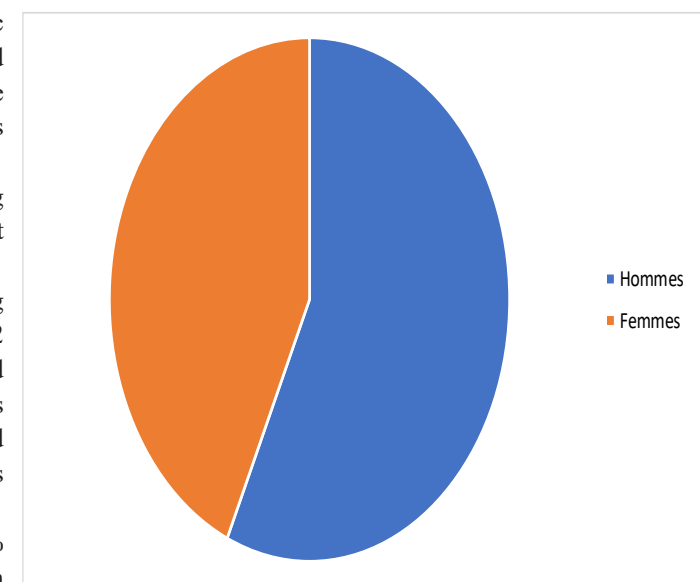


Figure1: Distribution of patients by sex.

2. Introduction

Gastric adenocarcinoma remains a major public health concern, associated with high morbidity and a poor prognosis.

Gastrectomy combined with adequate lymph node dissection represents the standard of curative treatment. However, despite advances in surgical techniques and perioperative management,

The mean age was 64 years (range: 38–86 years), and 10 patients were older than 70 years. The interval between symptom onset and medical consultation ranged from 2 to 24 months, with a median of 5 months (figure 2).

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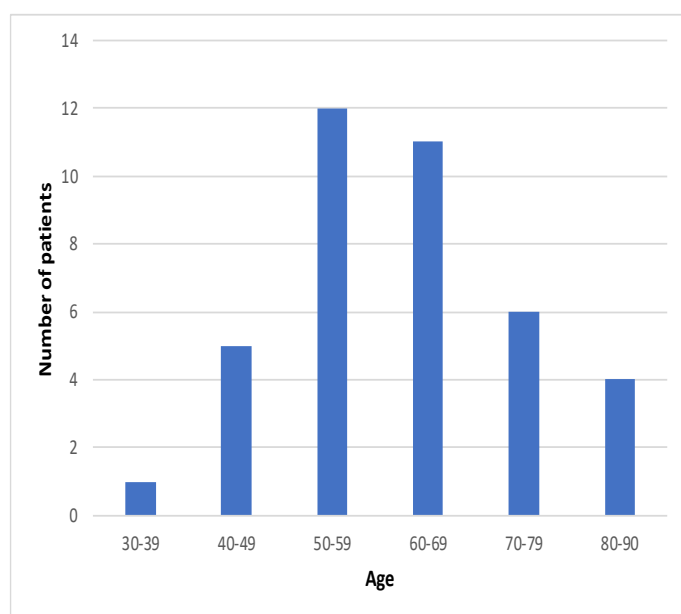


Figure 2: Distribution of patients by age.

Tumor location was predominantly antral–pyloric in 45.9% of cases, followed by the gastric body in 24.3%, fundus in 10.8%, cardia in 2.7%, and extensive involvement in 16.2% of cases.

Surgical treatment consisted of total gastrectomy in 9 patients, subtotal (four-fifths) gastrectomy in 25 patients, and extended gastrectomy in 3 patients (figure 3).

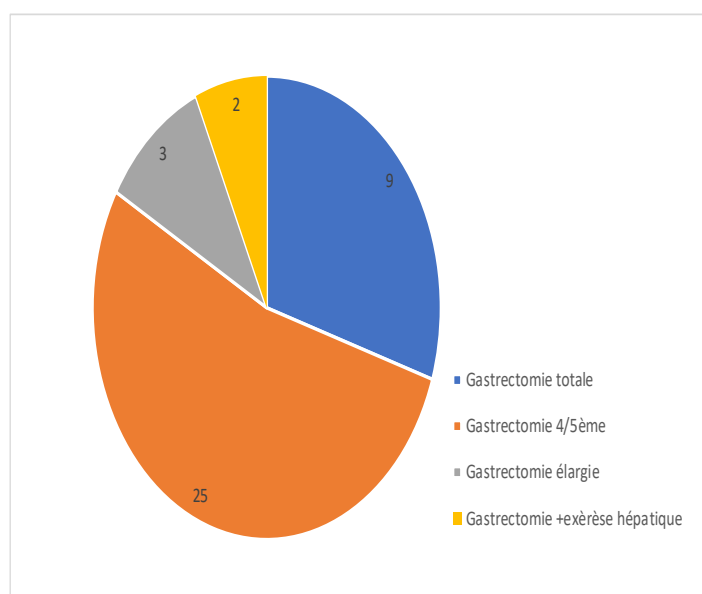


Figure 3: Types of Gastrectomy Performed with Curative Intent

Lymphadenectomy was D1.5 in 24 patients, D2 without splenectomy in 11 patients, and standard D2 in 2 patients. No D3 or D4 lymph node dissections were performed.

Postoperative complications occurred in 11 patients. Non-specific complications were observed in 4 patients (10.8%), including one

case of wound abscess treated with local care and antibiotics, one case of left lower limb deep vein thrombosis treated with anticoagulation, one urinary tract infection, and two cases of bronchopulmonary infection managed with antibiotics and respiratory physiotherapy. One patient experienced two postoperative complications (wound abscess and deep vein thrombosis).

Early specific complications occurred in 7 patients, including anastomotic leakage in 4 cases (10.8%), duodenal stump fistula in 2 cases, and one anastomotic dehiscence complicated by peritonitis. Late complications were observed in 4 patients and included one case of adhesive small bowel obstruction, one incisional hernia, and two functional disorders (pyrosis and dumping syndrome).

Overall postoperative morbidity was 29.7%.

On univariate analysis, age greater than 70 years, presence of comorbidities, total gastrectomy, and extended resection were associated with increased overall morbidity. On multivariate analysis, age greater than 70 years was the only independent predictor of overall morbidity, with a threefold increase in risk (table 1).

Variable	P	Relative risk	Confidence Interval
Age > 70	0,02	3,35	2,31-8,45

Table 1: Predictive Variables of Overall Morbidity in Multivariate Analysis

Regarding specific morbidity, univariate analysis identified preoperative anemia, extended resection to adjacent organs, and total gastrectomy as associated factors. On multivariate analysis, total gastrectomy was the only independent predictor of specific morbidity, increasing the relative risk of specific complications sixfold (Table 2).

Variable	p	Relative risk	Confidence Interval
Total gastrectomy	0,03	6,38	1,2-8,25

Table 2: Predictive Variables of Procedure-Specific Morbidity in Multivariate Analysis

5. Discussion

Gastrectomy for gastric adenocarcinoma remains associated with significant postoperative morbidity. In our series, the overall morbidity rate was 29.7%, which is consistent with the range reported in the literature (10.7–41%) [1,2]. Complications were both early and late, as well as specific and non-specific, highlighting the complexity of perioperative and postoperative management in these patients.

Non-specific complications were mainly infectious and respiratory, consistent with published data, in which pulmonary complications are a major contributor to morbidity and mortality. Their prevention relies on preoperative optimization, including pulmonary rehabilitation, smoking cessation, and appropriate analgesia, as well as the implementation of enhanced recovery after surgery (ERAS) protocols[3,4].

Among specific complications, anastomotic leakage was the main early complication, occurring in 10.8% of cases, a rate comparable

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- to that reported in international series[3,5–7]. Functional disorders, such as dumping syndrome and heartburn, were the predominant late complications, reflecting the long-term functional consequences of extensive gastrectomy.
- Regarding prognostic factors for morbidity, total gastrectomy was identified as an independent risk factor for procedure-specific morbidity, significantly increasing the likelihood of complications, particularly anastomotic leaks[8–10].
- Although resection extended to adjacent organs was associated with increased morbidity in univariate analysis, it was not an independent factor, reflecting the potential oncological benefits of these procedures in locally advanced tumors.
- The type of lymphadenectomy did not affect morbidity in our series. Current guidelines recommend a D2 lymph node dissection sparing the pancreas and spleen in operable patients, whereas extended dissections increase morbidity without demonstrating a survival benefit[11].
- Among patient-related factors, age over 70 years emerged as the only independent predictor of overall morbidity, highlighting the importance of patient condition and physiological frailty in postoperative outcomes[3,12,13]. Sex and comorbidities did not have a significant impact on morbidity in our cohort[14].
- The main limitations of our study include its retrospective design and small sample size, which limit the statistical power of the results. Nevertheless, this series provides important data on postoperative morbidity factors following gastrectomy and highlights the need for careful patient selection, tailored surgical approaches, and optimized perioperative management to improve outcomes. Prospective multicenter studies are needed to confirm these findings and refine management strategies.
- ## 6. Conclusion
- Curative gastrectomy for gastric adenocarcinoma remains associated with significant postoperative morbidity. In our series, gastrectomy was associated with a substantial rate of postoperative complications, predominantly the anastomotic leakage. Age over 70 years and total gastrectomy were identified as independent risk factors for postoperative morbidity.
- A multidisciplinary approach, along with adequate lymph node dissection, is essential to improve patient outcomes. Further large-scale prospective studies are needed to better define prognostic factors and to improve surgical results.
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