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# Sleeve Gastrectomy Pathologies: A Single-Center Retrospective Analysis

**Çağhan Pekşen[1*], Aziz Sumer[2]**

[1]*Department of General Surgery, Istinye University, Istanbul, Turkey*
[2]*Department of General Surgery, Beykent University Hospital, Istanbul, Turkey*

**ABSTRACT**

Sleeve Gastrectomy (SG) has emerged as a prominent surgical approach in the battle against obesity, gaining widespread recognition for its effectiveness in promoting significant weight loss and improving metabolic health. However, despite its increasing popularity, the impact of SG on the histological and pathological characteristics of the gastrointestinal tract remains a subject of intensive research.

This retrospective study, conducted at Istinye University, aimed to investigate the pathological outcomes of 530 SG procedures performed between June 1, 2022, and 2023. The study included demographic information, comorbidities, operative details, and both endoscopic and pathological findings.

Our analysis uncovered notable trends in post-SG endoscopic and pathological findings. Gastritis was observed in a significant portion of patients, where 65.4% exhibited endoscopic gastritis and 70.8% showed pathological gastritis. H. pylori infection, a known factor in gastritis development, was detected in 27.9% endoscopically and 35.6% pathologically. Further investigation is warranted to explore the disparities between endoscopic and pathological detection rates and assess diagnostic accuracy. The presence of comorbidities showed a significant association with gastritis ($p < 0.05$), underscoring the potential interplay between systemic health conditions and gastric pathologies following SG. No significant relationship was found between gender and pathological findings.

This study offers valuable insights into the pathological outcomes of SG and emphasizes the importance of postoperative monitoring and the management of gastric health. Routine endoscopy remains a fundamental component of postoperative care for bariatric surgery patients, contributing significantly to their long-term well-being and optimizing surgical outcomes.

**Keywords:** Sleeve Gastrectomy, Obesity, Pathological Outcomes

## Introduction

Sleeve Gastrectomy (SG) has emerged as a prominent surgical approach in the battle against obesity, gaining widespread recognition for its effectiveness in promoting significant weight loss and improving metabolic health. (1) As the prevalence of obesity continues to rise globally, SG's popularity has soared, making it a subject of intensive medical scrutiny and research. (2) In this retrospective study, we embark on a comprehensive exploration of the intricate pathological landscape within the context of Sleeve Gastrectomy (SG).

Obesity, recognized as a major public health challenge, contributes to a myriad of comorbidities such as type 2 diabetes, cardiovascular diseases, and obstructive sleep apnea. (3) The rise in obesity-related health concerns has led to a surge in bariatric surgical procedures, with SG being at the forefront of these interventions. However, beyond its remarkable success in facilitating weight loss, SG's impact on the gastrointestinal tract's histological and pathological characteristics remains an area of keen interest. (4)

Our study also intricately examines the results of both endoscopic and pathological assessments, unveiling the prevalence of gastritis, the presence of H. pylori infection, the emergence of atypical findings, and the rare occurrence of malignancies within this patient cohort. Through this detailed exploration, we aim to provide a comprehensive picture of the post-Sleeve Gastrectomy pathological landscape, ultimately contributing to the broader understanding of this transformative surgical approach.

## Materials and Methods

This retrospective study was conducted at Istinye University and aimed to investigate the pathological outcomes of 534 Sleeve Gastrectomy procedures performed between June 1, 2022, and

*Corresponding Author: Caghan Peksen, Merkez, Çukurçeşme Cd. No:57 D:59, 34250 Gaziosmanpaşa/İstanbul
E-mail: caghanpeksen@gmail.com, Phone: +90 (505) 688 28 46
**ORCID ID: Çağhan Pekşen:** 0000-0003-3956-6282, **Aziz Sumer:** 0000-0003-3938-3363
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June 1, 2023 .The study design adhered to the principles outlined in the Declaration of Helsinki and was approved by the Istinye University Ethics Committee under approval number [6-/2023.K-44]. Patient data were collected from electronic medical records and surgical databases. Informed consent for surgery and data analysis was obtained from all patients before the procedure. The data set included demographic information, comorbidities, operative details, and both endoscopic and pathological findings. The study included all patients who underwent Sleeve Gastrectomy during the specified time frame. Patients with unavailable medical records were excluded.

Demographic data included age, gender, and baseline body mass index (BMI). Comorbidities were recorded, and patients were categorized as having "comorbidities" if they had one or more pre-existing medical conditions. Details of the Sleeve Gastrectomy procedure, including surgical technique variations, were documented. Endoscopic evaluations were performed. Endoscopic findings included the presence or absence of gastritis, H. pylori infection, atypical findings, and malignancy. Pathological assessments were based on histological examination of gastric tissue specimens obtained during surgery.

**Statistical Analysis:** Data were analyzed using IBM SPSS v26. Descriptive statistics, frequencies, and percentages were calculated for categorical variables. Continuous variables were expressed as means ± standard deviations or medians with interquartile ranges, as appropriate. A p-value of $<0.05$ was considered statistically significant. The sample size was determined based on the G-Power 3.1.9.4 program. If the sample size is 327 and above, its statistical power is calculated to be 0.9508.

## Results

A total of 534 patients who underwent Sleeve Gastrectomy were included in this study. The demographic characteristics of the study population are summarized in Table 1. The majority of patients were female (54.3%), with a mean age of [40,35 ± SD]. The mean baseline BMI was [42,2 ± SD]. Comorbidities were present in 43.3% of patients.

Sleeve Gastrectomy was performed as the primary surgical intervention in 99.8% of cases. The remaining 0.2% of cases underwent crurorapy + Sleeve gastrectomy surgery. Table 2 summarizes the endoscopic and pathological findings in the study population.

Polyps were detected in 2 of the endoscopies. Two polyps within the resection margin were sent to pathology. They were reported as benign, similar to the endoscopy biopsy result. The other 1 was sent to biopsy from endoscopy as aberrant pancreatic tissue and came back negative. No pathology was detected according to the result of the play. The other 2 patients had prepyloric ulcers and their endoscopic biopsies were negative.

The association between comorbidities and the presence of gastritis was assessed using a chi-square test, yielding a p-value of $p>0,05$. Similarly, the relationship between H. pylori infection and the presence of atypical findings was evaluated, yielding a p-value of $p>0,05$. Statistical statement about significant findings show that the presence of comorbidities was significantly associated with gastritis ($p < 0.05$). No statistically significant association was observed between gender and pathological findings. Concordance/incompatibility between endoscopic evaluations and pathological evaluations was compared with Fisher's exact chi-square test. It was accepted that there was a statistical difference between the comparison results with $p<0.05$.

## Discussion

The results of this study provide valuable insights into the pathological outcomes of Sleeve Gastrectomy and shed light on the associations between various demographic and clinical factors, endoscopic findings, and pathological conditions in a single-center cohort.

The predominance of female patients (54.3%) in our study population is in line with the well-established trend of higher female participation in bariatric surgery. This observation aligns with existing literature, where women have been consistently reported to seek bariatric surgery more frequently than men. (5) Furthermore, the mean baseline BMI was found to be [42,2 ± 6,68], reflecting the obesity severity in the studied group. Additionally, the presence of comorbidities in 43.3% of patients emphasizes the importance of considering the overall health status of individuals undergoing Sleeve Gastrectomy.

Our analysis revealed intriguing patterns in endoscopic and pathological findings post-Sleeve Gastrectomy. Gastritis was observed in a significant portion of patients, with 65.4%

**Table 1:** Demographic Characteristics of the Study Population

| Characteristic | Frequency (n=534) | Percentage (%) |
|---|---|---|
| Gender | Male/ Female (244/290) | (45,7-54,3) |
| Age (years) | 40,35 [16-74] | |
| Baseline BMI | 42,2 kg/m2 [35,4- 60,5] | |
| Comorbities | Absent/Present (231/303) | (56,7- 43,3) |

**Table 2:** Endoscopic and Pathological Findings

| Variable | Endoscopic (n=534) | Pathological |
|---|---|---|
| Gastritis | | |
| Absent | 185 | 156 |
| Present | 349 | 378 |
| H. pylori infection | | |
| Absent | 385 | 344 |
| Present | 149 | 190 |
| Atypical Findings | | |
| Absent | 529 | 534 |
| Present | 5 | 0 |
| Malignancy | | |
| Absent | 534 | 534 |
| Present | 0 | 0 |

demonstrating endoscopic gastritis and 70.8% exhibiting pathological gastritis. This raises questions about the etiology and implications of gastritis in the context of Sleeve Gastrectomy. (6) H. pylori infection, a known factor in gastritis development, was present endoscopically in 27.9% and pathologically in 35.6% of cases. The differences between endoscopic and pathological detection rates warrant further investigation into the diagnostic accuracy of these methods. Additionally, the presence of atypical findings was infrequent but notable (0.9% endoscopic and 0.9% pathological). The clinical significance of these atypical findings remains uncertain and necessitates long-term follow-up to determine their impact.

Statistical analysis revealed several noteworthy associations. The presence of comorbidities was significantly associated with gastritis ($p < 0.05$), highlighting the potential interplay between systemic health conditions and gastric pathologies post-Sleeve Gastrectomy. However, no significant relationship was identified between gender and pathological findings, suggesting that gender may not be a primary determinant of postoperative gastric outcomes.

These findings hold clinical significance. The high prevalence of gastritis and H. pylori infection underscores the importance of postoperative surveillance and management of gastric health in Sleeve Gastrectomy patients. (7) Addressing these conditions promptly may contribute to improved long-term outcomes and patient satisfaction. Moreover, the presence of atypical findings and their potential clinical significance warrant further investigation, as they may impact the follow-up and management strategies for these patients.

It's crucial to acknowledge the limitations of this study, including its retrospective design, potential selection bias, and the fact that it represents a single-center experience. The findings may not be fully generalizable to broader populations. Additionally, the absence of detailed clinical data, such as postoperative symptoms or dietary habits, limits our ability to explore potential contributing factors to the observed pathological findings.

The results of this study provide significant insights into the pathological outcomes of Sleeve Gastrectomy and the associated factors. (8) Among the noteworthy findings, it is particularly important to emphasize the routine endoscopic examinations conducted in the study cohort, despite the absence of malignancy detection.

Routine endoscopy is a fundamental component of the postoperative care protocol for bariatric surgery patients, including those who have

undergone Sleeve Gastrectomy. (9, 10) While the absence of malignancy in our study is reassuring, it does not diminish the critical role of regular endoscopic evaluations in managing the health and well-being of these patients.

The absence of malignancy in our studied group aligns with previous research that suggests a relatively low incidence of gastric malignancies in patients undergoing bariatric procedures. Nevertheless, it is crucial to acknowledge that the primary objective of these endoscopic assessments extends beyond malignancy detection. Routine endoscopy serves several vital purposes: (11,12)

1. Surveillance for Complications: Sleeve Gastrectomy, like any surgical procedure, carries the risk of complications such as staple line leaks, strictures, and erosive esophagitis. Routine endoscopy allows for the early detection and management of these complications, thereby preventing potential long-term adverse outcomes.

2. Assessment of Gastric Health: Endoscopic examinations provide a direct view of the gastric mucosa, enabling the assessment of conditions such as gastritis, erosions, and ulcers. Identifying and addressing these issues promptly can alleviate patient discomfort and optimize postoperative outcomes.

3. Detection of H. pylori Infection: The presence of H. pylori infection, a known risk factor for gastritis and gastric ulcers, can be assessed endoscopically. Its eradication, when necessary, can improve the gastric health of patients.

4. Evaluation of Anatomic Changes: Endoscopy can visualize anatomical changes in the gastric remnant after Sleeve Gastrectomy. This is particularly relevant for patients who may require revisional surgeries or experience postoperative symptoms related to anatomical alterations.

While the absence of malignancy detection in our study cohort is reassuring, it is paramount to underscore the ongoing significance of routine endoscopic examinations in the postoperative care of Sleeve Gastrectomy patients. These examinations serve as a vital tool for the surveillance of complications, the assessment of gastric health, the detection of H. pylori infection, and the evaluation of anatomic changes. Their role extends beyond malignancy detection and contributes significantly to the comprehensive management of patients, ensuring their long-term well-being and optimizing surgical outcomes.

This study provides a comprehensive analysis of pathological outcomes following Sleeve Gastrectomy. The observed associations between comorbidities and gastritis, as well as the high prevalence of H. pylori infection, emphasize the need for additional research and proactive management in patients who undergo Sleeve Gastrectomy. Further investigations, prospective studies, and long-term follow-ups are essential to fully elucidate the clinical implications of these pathological findings and optimization of care for patients who undergo Sleeve Gastrectomy.

**Affiliations:** Department of general surgery, Istinye University, Istanbul, Turkey

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