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Histopathological Examination of Gastrectomy Specimens After Laparoscopic Sleeve Gastrectomy and the Importance of Preoperative Endoscopy

Özgür Öztütüncü[1], Ahmet Necati Şanlı[2], Halit Eren Taşkın[3], Batuhan Tozakoğlu[3], Abdullah Kağan Zengin[3]

[1]Department of General Surgery, Eyüp State Hospital, İstanbul, Turkey
[2]Department of General Surgery, Silivri State Hospital, İstanbul, Turkey
[3]Department of General Surgery, İstanbul University-Cerrahpaşa, School of Medicine, İstanbul, Turkey

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Abstract

Objective: Laparoscopic sleeve gastrectomy is the most commonly performed procedure for the surgical treatment of obesity. In this study, we aimed to analyze the histopathological specimens of laparoscopic sleeve gastrectomy patients.

Methods: A total of 232 patients who have undergone the laparoscopic sleeve gastrectomy procedure between the years 2015 and 2020 were included in this study. The pathology reports of these patients were evaluated from the patient files retrospectively. The age, gender, comorbid diseases, and the body mass index of each patient were noted from the patient files. None of the patients had undergone preoperative endoscopy.

Results: In the study, 87 (37.5%) of the patients were male and 145 (62.5%) were female. The mean age of the patient was 42.9 ± 12.0 years and the mean body mass index was 40.2 ± 4.9. As for the comorbidities, 24.2% had diabetes mellitus, 23.3% had hypertension, and 7.8% had obstructive sleep apnea. The histopathological specimens revealed that 22 patients had intestinal metaplasia, 3 patients had gastrointestinal stromal tumor, 2 had neuroendocrine tumor, 2 had leiomyoma, 1 had squamocolumnar changes, and 1 had a hyperplastic polyp.

Conclusion: Preoperative endoscopy may reveal possible benign or malignant pathologies, which will lead to better treatment of the patients. Furthermore, the post-operative histopathological analysis can reveal important pathologies that may go unnoticed in the preoperative period.

Keywords: Endoscopy, histopathology, laparoscopic sleeve gastrectomy, obesity

Obesity is a global health problem and the number of obese people around the world has increased dramatically. It is a chronic disease that leads to various morbidities and increased mortality.[1] Surgical method is the most effective and permanent treatment method for obesity and obesity-related chronic diseases. Bariatric surgical procedures not only lead to weight loss but also increase health, well-being, and survival.[2] Laparoscopic sleeve gastrectomy (LSG) is a commonly used procedure in bariatric surgery due to its advanced surgical technique. Each patient must undergo a detailed preoperative evaluation including medical, biochemical, and psychological parameters.[3,4] Atrophic gastritis, intestinal metaplasia, and gastric cancer are known to have an increased incidence in obese patients. Furthermore, malignant lesions such as gastrointestinal stromal tumors (GISTs) and neuroendocrine tumors may be seen in the specimens. Surgical procedures without the preoperative knowledge of these benign and malignant lesions can lead to increased mortality in morbidity.[4,5] We aimed to determine the incidence of such lesions in patients who have undergone sleeve gastrectomy and to emphasize the importance of preoperative endoscopy in light of the literature.

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Corresponding author: Ahmet Necati Şanlı, Department of General Surgery, Silivri State Hospital, İstanbul, Turkey
e-mail: ahmetnecatisanli@gmail.com
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Methods

In this single-center study, patients who have undergone LSG between the years 2015 and 2020 were included. Laparoscopic sleeve gastrectomy was performed for patients with a body mass index (BMI) higher than 40 or who had comorbid diseases along with a BMI between 35 and 40. All patients were 18 years of age or older. The demographic data of each patient such as age, gender, BMI, and comorbidities were determined retrospectively. The patients with a BMI lower than 35 and those who have undergone other surgical procedures were excluded. In addition, patients who underwent other surgical procedures were not included in the study. Endoscopic findings could not be evaluated because preoperative upper gastrointestinal system endoscopy was not performed.

The gastric specimens were routinely analyzed microscopically for the presence of any accompanying lesions. The specimens were stained with hematoxylin and eosin and microscopically analyzed. Furthermore, specimens were stained with Giemsa and PAS/alcian blue for *Helicobacter pylori* and for intestinal metaplasia. Inflammation due to *H. Pylori* was evaluated as mild, moderate, and severe according to the Sydney grading system.[6] CD117 immunohistochemical staining was performed for GIST. The specimens with macroscopic lesions were stained with SMA, Desmin, and S-100 in order to search for mesenchymal tumors. The histopathological data were noted from patient files.

Table 1. Demographics of the Patients

	Mean ± SD	Minimum	Maximum
Age (years)	42.9 ± 12	18	71
Height (cm)	170 ± 9.6	148	200
Weight (kg)	113.3 ± 25.5	62	230
BMI (kg/m^2)	40.2 ± 4.9	35	68.7
		n	%
DM	+	56	24.14
	–	176	75.86
HT	+	54	23.28
	–	178	76.72
Sleep apnea	+	18	7.76
	–	214	92.24

BMI, body mass index; DM, diabetes mellitus; HT, hypertension.

The study protocol was approved by İstanbul University-Cerrahpaşa School of Medicine Clinical Researches Ethics Committee (Date: June 2, 2020, No: 83045809-604.01.02). The study complied with the Declaration of Helsinki. Patients were not required to give their informed consent for inclusion in this retrospective study, because we used anonymous clinical data and any individual cannot be identified according to the data present.

Statistical analysis

Data were presented as mean ± standard deviation. As the overall number of cases was relatively small, no inferential statistical analysis was undertaken.

Results

A total of 232 patients who have undergone sleeve gastrectomy for obesity were included in this study. Of these patients, 87 (37.5%) were male and 145 (62.5%) were female. The mean age of the patients was 42.9 years and the mean BMI was 40.2. As for the comorbidities, 24.14% had diabetes mellitus, 23.28% had hypertension, and 7.76% had obstructive sleep apnea. Only 3.02% of the patients had insulin resistance. The comorbidities are summarized in Table 1. *Helicobacter pylori* was positive in 17 (19.5%) of the male and 43 (29.7%) of the female patients; *H. Pylori* colonization ratios are given in Table 2. Histopathological analyses revealed intestinal metaplasia in 22 patients, GIST in 3 patients, neuroendocrine tumors in 2 patients, leiomyoma in 2 patients, squamocolumnar changes in 1 patient, and a hyperplastic polyp of 16 mm in 1 patient.

Table 2. *Helicobacter pylori* Colonization

		Male		Female	
		n	%	n	%
Helicobacter pylori	Mild (Grade 1)	8	9.2	30	20.7
	Moderate (Grade 2)	5	5.7	12	8.3
	Dense (Grade 3)	4	4.6	1	0.7

Discussion

Bariatric surgery is a widely accepted treatment for obesity when noninvasive methods are ineffective.[7] One of the bariatric procedures, LSG is becoming very popular recently. The LSG has restrictive and endocrine effects but has no malabsorptive effects. The stomach is transformed into a tube once the majority of it is removed. Pathological analysis of the resected stomach specimen reveals incidental GISTs, dysplasia, maltoma, hiatal hernia, esophagitis, ulcers, and gastritis.[1,8-10] Moreover, patients undergoing these procedures need special preoperative examination.[3,4] There are controversial opinions regarding the necessity, advantages, and costs of preoperative upper GI endoscopy for these patients.[1] It was reported that preoperative endoscopy revealed benign or malignant pathologies ranging from 4.9% to 12%.[11,12] We report a ratio of 12.9% (n = 30) which is slightly higher than the literature. Upper gastrointestinal endoscopy is routinely recommended in the European Association for Endoscopic Surgery guideline.[13] We think that the reason for the high level of pathological findings in our study is that preoperative endoscopy was not routinely performed.

Obese people are more likely to develop chronic gastritis as a result of their poor eating habits and dietary choices. Obesity-related gastritis is the name given to this condition.[14] Pre-surgical medical treatment can be required for patients with symptomatic *H. pylori* infection. Unless multiple gastric erosions, pyloric ulcer, and *H. pylori* are treated, they can cause gastric outlet obstruction after bariatric surgery and gastric stricture around the pylorus.[15] There are still no definite data on whether *H. pylori* positivity causes anastomosis problems.[16] It is known that *H. Pylori* has a role in the evolution of gastric cancer and its precursor lesions such as intestinal metaplasia.[14] We report the presence of intestinal metaplasia in 9% of the patients and *H. Pylori* in 25.9% of the patients.

There are also some reports of increased incidence of GIST in obese patients.[14] With the increased number of bariatric surgical procedures, incidental GISTs have been reported in LSG patients. GIST during LSG was first reported by Beltran et al. and the procedure was completed without interruption.[17] The incidence of GISTs varies between 0.1% and 1.2% in the pathology specimens.[9,18] Because of the low occurrence of benign and malignant lesions in large clinical series and the majority of lesions, routine histological investigation is not suggested. Furthermore, the histological results discovered have no relation to surgical problems or their management. In terms of cost and time, it is considered that doing a microscopic inspection of necessary specimens as a result of a careful macroscopic examination will be superior.[19] In our study, we report the presence of GIST in 3 of our patients, and the operations were completed without any change in procedure due to the anatomical location of the lesions (Figures 1 and 2).

To our knowledge, there is no date regarding a relationship between gastric neuroendocrine tumors and obesity; and neuroendocrine tumors to be determined during the preoperative evaluations do not hold as contraindications for bariatric surgical procedures.[12] We report neuroendocrine tumors in 2 patients and the procedures were performed without any change in the technique.

The limitations of our study are the limited sample size and the obligation of the data regarding *H. pylori*. The frequencies of chronic active and inactive gastritis in sleeve gastrectomy specimens were reported to be 1.6-35% and 12.1-74.5%, respectively. One of the limitations of our study is the lack of data for gastritis.[8,14,20] In addition, the follow-up information of the patients with pathological findings could not be reached. Comparative analysis could not be performed due to inadequate data.

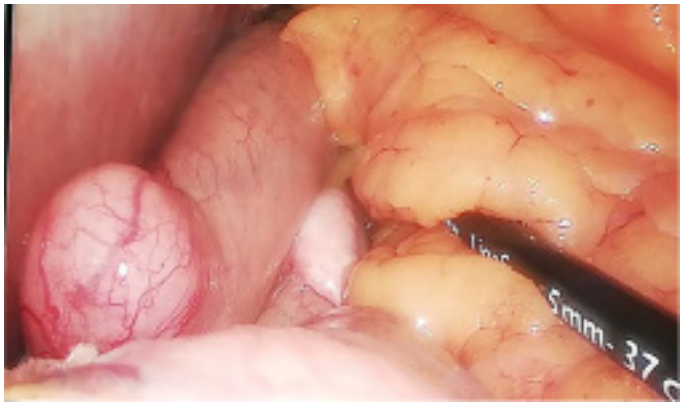

Figure 1. Gastrointestinal stromal tumor in the greater curvature (3 × 2 cm).

Figure 2. The procedure was not changed due to its localization.

Preoperative endoscopy is of utmost importance since it can reveal pathologies that may change the bariatric surgical procedure. Thus, we believe that it should be routinely performed before sleeve gastrectomy. Furthermore, histopathological analysis of the specimen of LSG must be performed.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of İstanbul University-Cerrahpaşa School of Medicine (Date: June 2, 2020, Number: 83045809-604.01.02).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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