

Should every laparoscopic wedge resection of gastric gastrointestinal stromal tumours be assisted by endoscopy?

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ABSTRACT

Introduction: Gastrointestinal stromal tumours (GIST) are rare mesenchymal tumours of the gastrointestinal tract. Laparoscopic wedge resection is the first and most appropriate option. It is becoming increasingly common to use intraoperative endoscopy to ensure adequate surgical margins. In this study, we tried to make a suggestion by examining the clinical and operative features of gastric GIST patients in whom we performed endoscopy-assisted laparoscopic wedge resection.

Materials and Methods: Patients underwent laparoscopic wedge resection for tumors located in various locations of the stomach with another surgeon providing endoscopic support. Age, gender, endoscopic and radiological localization of the tumor, tumor size, type of operation, duration of operation, amount of bleeding during operation were recorded from file data; and tumor cell type, size, surgical margin distance, number of mitosis, and GIST risk scores were recorded from pathology reports. We especially examined completeness of resection in pathology reports.

Results: During the four-year study period, 22 patients underwent resection for gastric GIST. No complications occurred during the surgery. The mean tumor size was 4.5 cm (2-7). We achieved complete resection in 100% of cases.

Conclusion: Preserving the gastric tissue as much as possible and maintaining proper functions are achieved with wedge resections rather than formal gastrectomy. In this study, we tried to show that endoscopy is useful in wedge resections for these tumours regardless of localisation, not only at the junction or in difficult locations. We believe that endoscopic control before and after wedge resection for any localised tumour will reduce the number of complications and provide a safer operation, as well as having a positive effect on the surgical margin. We can say that endoscopic support is advantageous in confirming complete resection and absence of stenosis, deformation and leakage at the stapler line, and we recommend routine endoscopy support in these operations.

Keywords: Gastrointestinal stromal tumors, laparoscopy, stomach



Received: 15.04.2025 Revision: 21.10.2025 Accepted: 28.10.2025

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Introduction

Gastrointestinal stromal tumors (GIST) are rare mesenchymal tumors of the gastrointestinal tract. Although GISTs can be observed in the entire gastrointestinal tract, the stomach is the most commonly involved part with a rate of 50-60%.^[1]

Due to advances in technology and the benign nature of gastric GISTs, open surgery for this disease has become less common. In metastatic or recurrent masses, medical management is the first and most appropriate option, whereas in primary resectable tumors, surgical treatment with curative intent is the first and most appropriate option. The fact that lymphadenectomy is often not needed in surgical treatment and organ resection and even wedge resection providing 1-2 cm surgical margin is sufficient is an important difference from other gastrointestinal mass treatments.^[2] In anatomical locations such as the esophagogastric junction where limited resections are impossible, gastrectomy may be the only option. Although there are exceptions, these tumors are not suitable for enucleation due to the possibility of local recurrence and R0 resection is the key to successful surgery.^[3]

Laparoscopy is as safe, effective and oncologically appropriate as open surgery in appropriate tumors, unless contraindicated.^[4] and is our primary choice.

It is becoming increasingly common to use intraoperative endoscopy to ensure adequate surgical margins. Laparoscopy together with intraoperative endoscopy provides clear surgical margins and reduces trauma to the normal anatomical structure.^[5] Especially for tumors located in the posterior corpus, endoscopy offers a significant advantage.^[6] However, regardless of localization, the question of whether the use of endoscopy provides an advantage has attracted our attention.

In this study, we demonstrate the clinical and operative features of gastric GIST patients in whom we performed endoscopy-assisted laparoscopic wedge resection.

Materials and Methods

The medical records of patients who underwent endoscopy-assisted laparoscopic wedge resection for gastric GIST in the General Surgery Clinic of the Health Sciences University Gazi Yaşargil Training and Research Hospital between January 2020 and July 2024 were retrospectively reviewed. Informed consent was obtained from all patients included in the study. Institutional review board approval was not obtained because of the retrospective design.

All patients underwent standard preoperative evaluation, including gastroscopy for tumor localization and thoraco-abdominal contrast-enhanced computed tomography (CT).

Demographic data (age, gender), tumor localization by endoscopy and CT, tumor size, type of operation, duration of surgery, and intraoperative blood loss were recorded from patient files. Pathological data including tumor cell type, size, surgical margin distance, number of mitoses, and GIST risk classification were retrieved from pathology reports.

Surgical Technique

The operating table was arranged with the patient in the supine position and the surgeon between the legs. After the pneumoperitoneum was provided with a trocar entered from the periumbilical region, the abdomen was explored in case of an unexpected intraabdominal spread. The tumor location was determined by gastroscopy (Fujifilm Corporation, Japan) performed by another surgeon, and the other trocars were inserted to provide most feasible angulation for resection. For proximal lesions, trocars were inserted higher and to the left, whereas for distal lesions, lower trocars were preferred. An access was made from the xiphoid region for the liver retractor, as needed.

In cases of large posterior or anterior masses, the gastrocolic omentum was opened along the greater curvature and the stomach was freed. Wedge resection was performed with a laparoscopic stapler and cutting device (Endo GIA 45 mm medium/thick, Covidien, USA) under endoscopic control. During and after resection, the staple line was evaluated endoscopically for margin adequacy, luminal narrowing, bleeding, and air leakage. The specimen was removed in a sterile retrieval bag through an enlarged port site.

Statistical Analysis

All statistical analyses were performed using SPSS software for Windows, version 24.0 (SPSS Inc., Chicago, IL, USA). Data were presented as mean±standard deviation for normally distributed variables or as median (minimum–maximum) for non-normally distributed data.

Results

During the four-year study period, 25 patients underwent surgery for gastric GIST. Sixteen tumors (64%) were located in the gastric body or fundus, six (24%) were in the antrum, and three (12%) were at the gastroesophageal junction (GEJ).

Table 1. Demographic and postoperative pathological characteristics of the patients

Mean age (max-min)	54.1 (46-75) years
Gender, n (%)	
Male	15 (68.2)
Female	7 (31.8)
ASA, n (%)	
1	2 (9.1)
2	16 (72.7)
3	4 (18.2)
Localisation, n (%)	
Corpus-Fundus	16 (72.7)
Antrum	4 (18.2)
Gastroesophageal Junction	2 (9.1)
Tumour size mean (min- max)	4.5 (2-7)
R0 ratio	100
Fletcher Risk Classification, n (%)	
Low Risk	11 (50)
Medium Risk	9 (9.1)
High Risk	2 (9.1)

All demographic and postoperative pathological characteristics of the patients were summarized in Table 1.

One patient who underwent laparoscopic antrectomy and two who required conversion to open surgery were excluded from the study. The remaining 22 patients underwent endoscopy-assisted laparoscopic wedge resection. During the study period, 3 of the 25 gastric GIST resections were excluded from the “endoscopy-assisted wedge resection” cohort due to different surgical strategies: A primary laparoscopic antrectomy for an antral tumor that precluded wedge resection, and two conversions to open surgery (due to extensive adhesions/oncological exposure concerns). In these cases, intraoperative endoscopy was not used to guide wedge resection with stapling and therefore could not be compared to the target technique

Fifteen patients (68.2%) were male and seven (31.8%) were female, with a mean age of 54.1 years (range: 46–75).

According to the American Society of Anesthesiologists (ASA) classification, two patients (9.1%) were ASA I, sixteen (72.7%) were ASA II, and four (18.2%) were ASA III.

No intraoperative or early postoperative complications were observed. The mean hospital stay was 3 days.

Pathological Findings

The mean tumor size was 4.5 cm (range: 2–7 cm). R0 resection was achieved in all cases (100%). According to the Fletcher risk classification, two patients (9.1%) were in the high-risk group, nine (40.9%) were in the moderate-risk group, and eleven (50%) were in the low-risk group.

Discussion

GISTs are mesenchymal tumors that can be seen throughout the gastrointestinal tract and are treated surgically. It is most commonly observed in the stomach with a rate of 50-60%.^[1] Surgery is the main treatment for gastric GISTs, and laparoscopy is increasingly being used.^[7] The advantages of laparoscopy, such as less pain, shorter hospital stay, intraoperative bleeding and greater comfort, cannot be ignored. However, some guidelines state that laparoscopy should be avoided in large tumors (e.g., larger than 5 cm) due to concerns about peritoneal implantation and inability to provide appropriate surgical margins.^[8,9]

Considering that survival is related to tumor size and histology,^[10] it can be concluded that major resections can be avoided for gastric GISTs and minimally invasive techniques can be used.^[11] Therefore, preserving the gastric tissue as much as possible and maintaining proper functions are achieved with wedge resections rather than formal gastrectomy. It is a natural consequence that laparoscopy comes to the fore in such limited surgeries.

In this study, we report that endoscopy is useful in wedge resections for these tumors regardless of localization, not only at the junction or in difficult locations. There are publications showing that endoscopic support is quite useful and safe in tumors with the mentioned location.^[12,13] We believe that endoscopic control before and after wedge resection for any localised tumor will reduce the number of complications and provide a safer operation, as well as having a positive effect on the surgical margin. Incorporating endoscopic control before and after stapling appears to reduce unrecognized narrowing and supports complete resection. In our own study, we also had patients with tumors located in different locations of the stomach, including distal and proximal; and we benefited from endoscopy in all of them. We say this based on the advantage of seeing our surgical margins clearly during surgery and our complete resection rate.

The use of endoscopy in laparoscopic tumor surgery is becoming increasingly widespread and accepted.^[14,15] While

the use of endoscopy is limited to tumors with difficult locations in many studies, we believe that endoscopy-assisted gastric wedge resections for every location makes the surgery safer. We believe that routine use of endoscopy can be recommended in these operations because adding endoscopy to the operation is easy, inexpensive, and does not require any extra expertise.

We are aware that the most important limitation of our study is the low number of patients, but it can be considered sufficient to give an idea about a rare tumor.

Conclusion

Benefits such as smaller incisions and a quicker return to normal life are among the advantages of developing technology. In addition to these benefits to the patient, we believe that endoscopy also provides advantages to the surgeon during the operation, regardless of tumor localization. We demonstrate that routine intraoperative endoscopic assistance is feasible across all gastric locations and may enhance margin assessment and staple-line safety.

Disclosures

Ethics Committee Approval: Institutional review board approval was not obtained because of the retrospective design.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authorship Contributions: Concept – O.O., E.G.; Design – O.O., E.G.; Supervision – I.H., O.B.; Funding – V.E.A., Y.Y.; Materials – I.H., O.O.; Data Collection – E.G., I.H., A.T.; Analysis and/or interpretation – O.B., V.E.A.; Literature Search – O.B., V.E.A.; Writing – Y.Y., A.T.; Critical Review – Y.Y., A.T.

Acknowledgements: The authors declare no acknowledgements.

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