

Safety and efficacy of laparoscopic wedge gastrectomy for large gastrointestinal stromal tumors



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Abstract

Background: Although the feasibility of minimally invasive resection of small gastric GISTs is well established, less is known about safety and efficacy of laparoscopic surgery for large tumors.

Methods: A retrospective analysis was performed, using a prospectively maintained comprehensive database. Patients were divided into two groups according to tumor size: Case group with tumors > 5 cm and control group with tumors <5 cm. Hospital charts were reviewed, and various outcome measures recorded, including operative time, estimated operative blood loss, post-operative leak, stasis, infection and recurrence.

Results: No tumors were ruptured during surgical manipulation and no major morbidity or mortality occurred in either group. Operative time (75,8 ± 33,1 min in large cases vs 75,8 ± 33,1 min in small cases) was similar in both groups (p = 0,61). The incidence of post-operative complications did not differ between the two groups. In details there were 21 out of 25 (84%) uncomplicated cases among small GISTs versus 17 out of 24 (70,8%) uncomplicated cases among large GISTs (p = 0,32).

Conclusion: This matched-pair case control study demonstrates that laparoscopic wedge resection for large gastric GISTs is safe and effective, as demonstrated for small tumors.

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Keywords: Gastrointestinal stromal tumor; GIST; Laparoscopic; Wedge gastrectomy; Gastrectomy

Introduction

Gastrointestinal tumors (GISTs) are the most common mesenchymal tumors of the gastrointestinal tract with the stomach being the most common site of origin.^{1–5}

The primary goal of treatment for localized gastric GISTs is surgical resection with negative margins; it is the only chance to obtain a complete cure.

Hence, gastric GISTs are frequently treated via wedge resections rather than formal gastrectomies when technically feasible.^{3–6}

Simple wedge resection, when feasible, has become the recommended surgical approach. Gastric GIST resection is therefore particularly amenable to a minimally invasive

technique, and an increasing number of laparoscopic experiences have been reported demonstrating the feasibility and safety of this approach.^{7–15}

However, although the feasibility of minimally invasive resection of small gastric GISTs up to 5 cm is well established as stated by The National Comprehensive Cancer Network (NCCN) guidelines,^{16,17} less is known about safety and efficacy of laparoscopic surgery for larger tumors.

The aim of this study is to provide safety and efficacy of laparoscopic surgery for the treatment of GISTs larger than 5 cm.

Methods

A retrospective analysis was performed, using a prospectively maintained comprehensive database, to

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determine the technical pitfalls of the procedure. Written informed consent and Institutional Review Board approval were obtained before review of any patient material.

From January 2003 until December 2014, 49 consecutive patients with primary GISTs of the stomach were treated by laparoscopic resection.

Preoperative diagnosis of gastric GIST was based on endoscopy, computed tomography (CT), and radiologic appearance of the lesion. All patients had an ultrasound and/or CT scan of the abdomen prior to surgery to exclude metastasis preoperatively.

All consecutive patients were considered for laparoscopic excision of the lesions, irrespective of tumor size. Only invasion to adjacent organs was considered a contraindication to laparoscopic surgery and these cases were excluded from the analysis.

All patients were treated by laparoscopy while under general anesthesia. The patient was placed supine in anti-Trendelenburg position and the surgeon stood between the legs.

The first trocar (10 mm) was placed at the umbilicus site; three or four additional trocars were placed depending on the location of the lesion.

The stomach and peritoneal cavity were inspected using a 30° forward oblique laparoscope to rule out invasion of adjacent organs and peritoneal seeding.

Occasionally, gastroscopy was used to assist with identification and extent of the tumor.

Wedge gastrectomy was usually achieved using an Endo GIA™ stapler, and the tumor specimen was extracted using a bag.

Patients were divided into two groups according to tumor size: Case group with tumors >5 cm and control group with tumors <5 cm. Tumor size was defined as the maximal tumor dimension in the resected specimen.

The accessibility of the gastric GISTs was classified as easy-to-access and difficult-to-access according to Hsiao et al.¹⁸ The tumors located in the gastric body (greater curvature and anterior wall), fundus (greater curvature, anterior wall, and posterior wall), or antrum (anterior wall) were classified as easy-to-access; tumors located in the lesser curvature of the body or antrum, at the cardia, or at the prepyloric region were classified as difficult-to-access.

Hospital charts were reviewed, and various outcome measures recorded, including operative time, estimated operative blood loss, post-operative leak, stasis, infection and recurrence.

After hospital discharge, all the patients in both the laparoscopic and open groups received regular follow-ups for at least 12 months at the outpatient clinic. Endoscopy, abdominal CT, or abdominal sonography were performed every 6 months within 2 years and annually from the third postoperative year.

All statistical analyses were conducted using the computer program Statistical Package for Sciences for Window, version 18.0 (SPSS Inc, Chicago, IL, USA). An intention-

to-treat analyses were performed using Mann–Whitney U tests, Chi-squared tests and Fischer's exact test as appropriate. All tests were 2-sided and $P < .05$ was considered statistically significant.

Results

Demographics and disease-related data for each cohort are shown in Table 1. There were no significant differences in terms of age, gender, BMI and ASA score between the two groups. Interestingly the location and thereby accessibilities of tumors were not different between the groups: 16 of 24 (64%) of the large tumors and 12 of 25 (48%) of the small tumors were difficult-to-access ($p = 0,15$).

All GISTs were resectable according to the American Cancer Society both at pre- and intra-operative evaluation. No invasion to adjacent organs have been identified.

No tumors were ruptured during surgical manipulation and no mortality occurred in either group. There were 2 conversions in the large group and 1 conversion in the small group ($p = 0,60$). Even if the mean blood loss was higher in the large patients (Table 2), it was not the reason for conversion in any cases. Switch to open was related in any cases to technical challenges; of interest all converted cases were lesions classified as difficult-to-access. Cooperative endoscopy and laparoscopy was adopted in 9 out of 24 small cases and in 10 out of 25 large cases ($p = 1,0$). Operative time ($75,8 \pm 33,1$ min in large cases vs $75,8 \pm 33,1$ min in small cases) was similar in both groups ($p = 0,61$) (Table 2).

The incidence of post-operative complications did not differ between the two groups as shown in Table 3; In details there were 25 out of 25 (100%) cases among small GISTs versus 21 out of 24 (87,5%) cases among large

Table 1
Patients and disease characteristics.

	Large	Small	p
Size (cm) mean + SD (range)	6.2 ± 1.0 (1–5)	3.0 ± 1.0 (0.5–10)	<0.01
<u>Gender</u>			0.39
Male	11	15	
Female	13	10	
Age	66.6 ± 13.6	60.0 ± 14.2	0.10
BMI	23.8 ± 3.5	24.2 ± 3.3	0.67
<u>ASA</u>			0.06
I	4	11	
II	9	9	
III	11	5	
<u>Symptom</u>			0.10
Dyspepsia	0	2	
Abdominal pain	3	1	
GI bleeding	2	4	
Heartburn	9	3	
Asymptomatic	10	15	
<u>Localization</u>			0.25
Easy-to-access	8	13	
Difficult-to-access	16	12	

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