

Gastrointestinal symptomatic outcomes of laparoscopic and open gastrectomy

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Abstract

AIM: To compare the laparoscopic and the open gastrectomy approaches for short term morbidity, length of hospital stay and also long term gastrointestinal symptoms.

METHODS: Patients who have undergone gastrectomy had their medical records reviewed for demographic data, type of gastrectomy, short term morbidity, and length of hospital stay. Patients were contacted and asked to complete the Gastrointestinal Symptom Rating Scale (GSRS). The GSRS measures three domains of GI symptoms: Dyspepsia Syndrome (DS) for the foregut (best score 0, worse score 15), indigestion syndrome (IS) for the midgut (best score 0, worse score 12), and bowel dysfunction syndrome (BDS) for the hindgut (best score 0, worse score 16). Statistical analysis was done using the Mann-Whitney *U*-test.

RESULTS: We had complete data on 32 patients: 7 laparoscopic and 25 open. Of these, 25 had a gastroenteric anastomosis and 6 did not. The table shows the results as medians with interquartile range. Laparoscopic gastrectomy had a better score than open gastrectomy in the DS domain (0 vs 1, $P = 0.02$), while gastrectomy without anastomosis had a better score than gastrectomy with anastomosis in the IS domain (0 vs 1, $P = 0.05$).

CONCLUSION: Patients have little adverse gastrointestinal symptoms and preserve good gastrointestinal function after undergoing any type of gastrectomy. Laparoscopic approach had better dyspepsia and foregut symptoms. Performing an anastomosis led to mild adverse midgut and indigestion effects

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INTRODUCTION

Gastrectomy is the most effective treatment for a variety of gastric pathologies, both benign and malignant, nevertheless it may lead to significant short and long term gastrointestinal symptoms in addition to an associated procedural morbidity and mortality. As minimally invasive surgery has advanced, laparoscopic gastrectomy is advocated as a treatment method for the different gastric pathologies with equivalent pathologic results, faster recovery, shorter length of stay, lower morbidity and earlier return of bowel function^[1-14].

There have been many published studies that compare laparoscopic and open gastrectomy in regards to post operative morbidity and mortality, length of hospital stay and surgical resection adequacy for benign and malignant pathologies. Little data exist that evaluate gastrointestinal symptomatology after either laparoscopic or open

gastrectomy using objective and validated instruments such as the gastrointestinal symptom rating scale.

This study compares the laparoscopic and the open gastrectomy for short term morbidity, length of hospital stay and also long term gastrointestinal symptomatology and compares results to those published in the literature.

MATERIALS AND METHODS

Patients who had undergone elective gastrectomy for benign and malignant pathologies at our institution had their medical records reviewed for demographic data, type of gastrectomy, and short term morbidity, and length of hospital stay. Patients who had emergent surgery or combined procedures performed were excluded from the study.

Patients were contacted and asked to complete the Gastrointestinal Symptom Rating Scale (GSRS). The GSRS measures three domains of GI symptoms: Dyspepsia Syndrome (DS) assesses foregut symptomatology (best score 0, worse score 15), Indigestion syndrome (IS) for the midgut symptomatology (best score 0, worse score 12) and Bowel dysfunction syndrome (BDS) for the hindgut (best score 0, worse score 16).

Statistical analysis was done using the Mann-Whitney *U*-test.

RESULTS

We had complete data on 32 patients: 7 laparoscopic and 25 open. Of these, 23 had a gastroenteric anastomosis and 9 did not, (Table 1). We compared the length of stay between patients who underwent open and laparoscopic gastrectomy, (Table 2) and also between those who did and did not have gastroenteric anastomosis with their gastrectomy, (Table 3).

The results showed that patients who had laparoscopic gastrectomy had a shorter length of hospital stay (mean 5 d) compared to open gastrectomy (mean 9.6 d), (Table 2). These results are comparable to other published studies^[2,6,8,9,12-18].

Table 3 shows that those who had a gastroenteric anastomosis performed with gastrectomy had longer length of hospital stay (Mean 9.8 d) compared to those who did not (mean 5.3 d). Delay in return of bowel function was the main reason behind the prolonged hospital stay.

Median follow up was 37 mo for the open group and 29 mo for the laparoscopic group. Median age was 69 years for the open group and 73 years for the laparoscopic group. Neither comparison was statistically significant, (Table 4). We also noted that the length of time after operation did not seem to affect severity of GI symptoms.

With respect to gastrointestinal symptoms as measured by the GSRS. The comparison revealed that there is a small but statistically significant difference between patients who had open gastrectomy compared to those who had laparoscopic gastrectomy only in the DS Domain with more symptoms in open gastrectomy patients in that domain but not in the two other domains, (Table 5).

There was also a small but statistically significant difference between patients who had gastrectomy with an

Table 1 Distribution of patients

	w/ anastomosis	w/o anastomosis	
Open gastrectomy	21	4	25
Laparoscopic gastrectomy	2	5	7
	23	9	32

Table 2 Comparison of length of stay between open and laparoscopic gastrectomy

Length of stay	Median/mean in days	<i>P</i>
Open gastrectomy (<i>n</i> = 25)	7/9.6	
Laparoscopic gastrectomy (<i>n</i> = 7)	4/5	0.0026

Table 3 Comparison of length of stay between gastrectomy w/ and w/o anastomosis

Length of stay	Median/mean in days	<i>P</i>
Gastrectomy w/ anastomosis (<i>n</i> = 23)	8/9.8	
Gastrectomy w/o anastomosis (<i>n</i> = 9)	5/5.3	0.0007

Table 4 Comparison of age and follow up between open and laparoscopic gastrectomy

	Median age in years	Median follow up in months
Open gastrectomy (<i>n</i> = 25)	69	37
Laparoscopic gastrectomy (<i>n</i> = 7)	73	29
<i>P</i>	NS	NS

NS: Not significant.

anastomosis and those who did not have a gastroenteric anastomosis in the IS Domain with patients who had the anastomosis having more symptoms. There was no statistically significant difference in the two other domains between these two groups, (Table 6).

Total morbidity rate was approximately 40% in the open gastrectomy group including 16% wound complications (SSI, Hernia); four patients (16%) with gastrointestinal obstruction, one with post operative MI and one patient with pneumonia. The postoperative morbidity rate in the laparoscopic group was 28%; (one patient had UTI and another had urinary retention with acute renal failure), with no wound complications. These morbidity data were equivalent to that published in the literature^[1,3,6,8,11-13,16,17].

DISCUSSION

Overall, patients have relatively few adverse gastrointestinal symptoms in any of the GSRS domains after both open and laparoscopic gastrectomies, whether or not a gastroenteric anastomosis was performed. This implies that most patients return to relatively good gastrointestinal function after gastrectomy. Patients with laparoscopic gastrectomy had a slightly better median score in the DS domain compared to the open technique, while patients who had gastrectomy without an anastomosis had a

Table 5 Median GRS scores (with interquartile range) for open and laparoscopic gastrectomy

GSR domain	Open gastrectomy	Laparoscopic gastrectomy	P value
Dyspepsia syndrome	1 (0-3)	0 (0-3)	0.02
Indigestion syndrome	1 (0-2)	0 (0-2)	NS
Bowel dysfunction syndrome	2 (1-4)	1 (0-4)	NS

GSR: Gastrointestinal Symptom Rating Scale.

Table 6 Median GRS scores (with interquartile range) for gastrectomy w/ and w/o anastomosis

GSR domain	Partial gastrectomy w/ anastomosis	Partial gastrectomy w/o anastomosis	P value
Dyspepsia syndrome	1 (0-3)	0 (0-1)	NS
Indigestion syndrome	1 (0-4)	0 (0-1)	0.05
Bowel dysfunction syndrome	2 (1-4)	1 (0-1)	NS

better median score in the IS domain implying that an anastomosis had mild adverse midgut effects.

Performing open gastrectomy resulted in longer length of hospital stay and greater wound complications compared to laparoscopic gastrectomy. While performing gastroenteric anastomosis lead to slightly more Indigestion Symptomatology and longer hospital stay compared to gastrectomies without anastomosis.

These data reflect advantages for laparoscopic gastrectomy and increased midgut symptoms, albeit minor, for gastroenteric anastomosis. The results of this study will be valuable for surgeons counseling patients on the long-term effects of these operations on their quality of life.

COMMENTS

Background

Gastrectomy is the most effective treatment for a variety of gastric tumors. This study compares different aspects comparing the two most commonly used gastrectomy methods, open vs laparoscopic.

Research frontiers

Gastrectomy can lead to significant gastrointestinal symptoms. As minimally invasive surgery has advanced, laparoscopic gastrectomy is advocated as a treatment method with equivalent pathologic results, with faster recovery.

Innovations and breakthroughs

Very little data using objective, validated instruments of gastrointestinal symptoms to compare laparoscopic and open gastrectomy exist. This study compares the two methods using the Gastrointestinal Symptomatic Rating Scale (GSR) as an objective instrument. It also compares other aspects of post operative course.

Applications

Having a better understanding of, and objective data for the comparison between the outcomes of these common gastrectomy methods will aid physicians and patients in clinical discussion and decision making.

Terminology

Gastrectomy or gastric resection is a surgical procedure for stomach resection due to variable benign and malignant causes including peptic ulcers and tumors. Laparoscopic Surgery is a minimally invasive procedure that involves the use of ports, camera and smaller incisions.

Peer review

The authors compared gastrointestinal symptomatic outcomes of laparoscopic

and open gastrectomy. They found that patients have relatively little adverse gastrointestinal symptoms in any of the types of gastrectomies in any of the GSR domains. This paper is well written and easy to read.

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