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Laparoscopic versus open gastrectomy: Is there scope for minimal access surgery in gastric carcinomas

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Abstract

In the recent times, laparoscopic methods have gained popularity in management of Gastric carcinoma . There are very few studies in literature that have compared the efficacy and safety of laparoscopic and open gastrectomy in advanced carcinoma stomach.

Hence we conducted this study to compare and contrast the safety and efficacy of laparoscopic vs open gastrectomy for patients with gastric carcinoma.

Keywords: Hyponatremia; Loss of Appetite; Abdominal Mass; Laparoscopic methods

1. Introduction

Carcinoma of the stomach continues to plague the world as the second more recurring cause of cancer-related deaths worldwide, despite geographical variations (1). The reason for the deaths is due to the delayed presentation of such patients, often with vague symptoms, while the rest are incidentally detected. While a strong genetic predisposition exists for such patients, modifiable risk factors such as chronic atrophic gastritis, *H. pylori,* smoking, alcohol consumption, smoked food, salted food etc (2).

Patients presenting with loss of appetite and weight loss often are in the advanced stages of the disease. When evaluated, we most often find them to have metastatic disease. Palliative surgical options do exist for such patients, as well as debulking procedures in the form of total gastrectomy with lymph node dissection.

In the recent times, laparoscopic methods have gained popularity in management of Gastric carcinoma (3,4) . However, it is not without its share of problems. There are very few studies in literature that have compared the efficacy and safety of laparoscopic and open gastrectomy in advanced carcinoma stomach.

Laparoscopy assisted distal gastrectomy was popularized by Kitano et al, while Goh et al extended the technique to a Billroth Type II gastrectomy. (5,6)

Hence we conducted this study to compare and contrast the safety and efficacy of laparoscopic vs open gastrectomy for patients with gastric carcinoma.

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2. Material and methods

This was a prospective observational study that was done in Department of General Surgery in a tertiary care center between January 2014 and January 2019. 51 biopsy proven patients of Carcinoma stomach were recruited to the study.

Data was collected by history taking, meticulous physical examination, per abdominal examination, per rectal examination and appropriate serological investigations. Patients with unresectable disease or those that undergone previous palliative procedures or were excluded from the study.

All the patients were evaluated with routine blood investigations like Complete Blood Picture, Renal Profile, Echocardiogram, Chest Xray and 2D TECHO in a patient who had previous Ischaemic Heart Disease. CECT Abdomen and pelvis was done for staging of the tumour and tumour resectability. UGI endoscopy and biopsy for confirmation of diagnosis was performed.

2.1. Pre-operative preparation

All the patients received intravenous antibiotic prophylaxis at the time of skin incision and all the patients are kept nil per oral 8 hours before surgery. All patients underwent open or laparoscopic gastrectomy.

2.2. Post-operative follow-up

Oral feeds were initiated on Day 3 for Laparoscopic and Day 5 in Open group after due assessment of bowel movements. In those with suspected paralytic ileus, NG tube was retained till bowel movements improved. Post operative period, antibiotics were continued.

All the patients were mobilized after 12hours after surgery with abdominal binder All the patients surgical wounds were inspected on post operative day 2 and seroma if any found was drained.

PostoperativelyTpatientsTwereTdischargedTafterTpatientsTtoleratingTorallyTadequatelyTandTmobilizingTnormally

2.3. Statistical analysis

DataTwereTanalyzedTusingTtheTStudentsT‟t‟Ttest,TFisher‟sTExactTtest,TandTtheTchi-squareTtest, and a p value of less thank 0.001 was considered statistically significant.

3. Observation and results

This study included 51 patients with resectable gastric carcinoma. We observed that the mean age of the patients in the laparoscopic group was 58.17 years, while in the open group was 66.21 years. However, this difference was not statistically significant. (p value 0.053).

In the laparoscopic group, majority of patients were male (65.38%) while in the open group, the M:F ratio was nearly 1:1.

Of the 26 patients that underwent laparoscopic procedures, 2/3rds of the patients underwent distal gastrectomy.

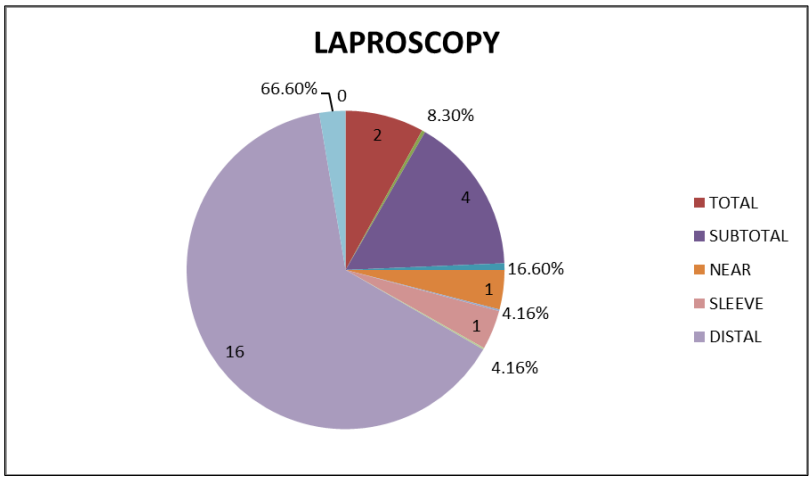

Figure 1 Type of Gatrectomy in laproscopic patients

In the open group, majority underwent sleeve gastrectomy followed by distal gastrectomy.

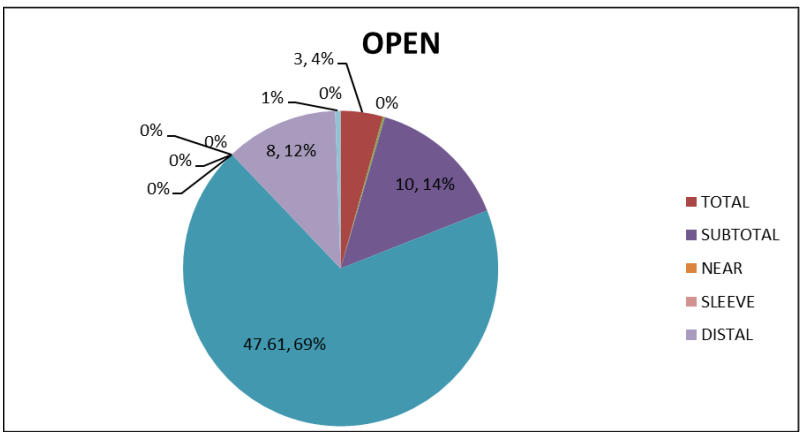

Figure 2 Type of gastrectomy in open group

Table 1 Cross table of pathological classification of tumors

Pathological classification	Laproscopy	Open	Total
Well differentiated	7	4	11
	29.1%	21.0%	25%
Moderately differentiated	1	2	3
	4.1%	10.5%	6.8%
Poorly differentiated	7	11	19
	29.1%	57.8%	43.1%
Inconclusive	9	2	11
	37.5%	10.52%	25%
Total	26	25	51
	100%	100%	100%

Analysing the recovery post operatively is an important parameter towards assessing the efficacy of the procedure used i.e laparoscopic vs open. In our study, we observed a statistically significant difference between the ECOG score in Laparoscopic and open method.

Only 1 patient amongst the open surgery group received NACT.

Table 2 Cross table of type of lymphadenectomy

Type of lymphadenectomy	Laproscopy (%)	Open (%)	Total(%)
D1	4	7	11
	15.3%	28%	21.5%
D2	16	18	34
	61.5%	72%	66.66%
NeitherT	5	0	5
	19.2%	0.0%	9.8%
TotalT	26	25	51
	100%	100%	100%

Majority of patients in the laparoscopic and open group underwent D2 lymphadenectomy (61.5% vs 72%). There were 5 patients in the laparoscopic group that didn't undergo lymphadenectomy.

Laparoscopic procedures have an advantage of having lower blood loss. However, in our study, we found no difference between the intra-operative bleeding between both groups.

The mean hospital stay in the laparoscopic group was significantly lower (7.8 +/- 2.26 days; p value <0.001) than the open group (10.69 +/- 3.34 days)

Similarly, the mean ICU stay in the laparoscopic group was significantly lower (1.46 +/- 0.745) in comparison to the open group (2.958 +/- 1.68)

Despite the reduced ICU and hospital stay, we didn't find any significant difference in the post-operative complications between the two groups.

It was observed that majority of the patients in the laparoscopic and open group had stage 2B disease. This difference was not statistically significant.

While laparscopic procedures has its advantages, it does have a longer learning curve, is technically challenging, and hence can increase operative time. In this study, we find that the mean operative time was significantly higher in the laparoscopic group. (5.13 hours)

2 patients died in the laparoscopic group, while one died in the open group. This difference was not statistically significant.

On follow up, we observed that none of the patients had any evidence of recurrence. This shows that laparoscopic method can offer good tumour clearance, and is comparable in all aspects, except operative time, to the open method.

4. Discussion

Laparosopy has seen a rise in the last 2 decades for surgical managment in carcinomas, as it can offer good tumour clearance and well as lymph node dissection. Moreover, it has the added advantage of reduced blood loss, reduced hospital stay and earlier recovery. However, it is not without disadvantages- longer learning curve, need for specialized equipment, increased operative time and complications associated with the CO2 insufflation.

As the number of studies showed laparoscopic gastrectomy is superior to open gastrectomy, it has been worldwide accepted as the alternative to open gastrectomy.

In the present study, conducted onT51 patients mean age for laparoscopic gastrectomy was 58.167 and in open gastrectomy is 66.208. In the study conducted by Huscher etTal, (9) the mean age was comparable to that of our study.

In the present study, there are more female patients compared to male patients, which is similar to the findings of the study by Huscher et al (9).

The ECOG score was significantly better in the laparoscopic group in our study, similar to the findings of a study by Havercamp et al (6).

In our study, the majority of the study participants in both groups underwent distal gastrectomy. This was also observed in a study by Jiang et al (7). Lymph node clearance is an important part of surgery for carcinoma stomach, and we found that in majority of the patients, we could achieve D2 lymphadenectomy. Similar findings were observed in a study by Jiang et al(7).

The mean operating time was significantly higher in the laparoscopic group in our study. However, we found that in a study by Jiang et al (7), the mean operating time between the two groups was comparable.

The intraoperative blood loss between the two groups was comparable. However, in a study by Kim et al (8), the blood loss was significantly higher in the open group.

When we compared the mean ICU stay and hospitalization, we found that it was significantly lesser in the patients that underwent laparoscopic sugery. This was comparable with the findings of a study by Huscher et al (9).

In this study, we didn't observe any major post-operative complications in either groups. However, in a study by C Huang et al (10), they observed a significantly higher complication rate in the open group.

5. Conclusion

We conclude that laparoscopic gastrectomy and lymph node dissection is safe and efficacious in comparison to the gold standard open method for gastric carcinoma. However, larger randomized controls trials are required before we make a transition, and offer laparoscopic surgery to all patients with resectable gastric carcinoma.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

Ethical committee clearance sought

Statement of informed consent

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

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