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Laparoscopy in Large Size GIST with Review of Literature

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Abstract
Introduction: *In the present study investigated the laparoscopic management of gastric GIST in various locations in stomach.*
Method: *This study was retrospective review of all GIST patients admitted between Oct2015-Jan 2018 in our institute Fortis Memorial Research Institute were analysed. Patients demographics, clinical presentation, tumour characteristics, radiological, pathological and immunohistochemical findings, techniques of laparoscopic resection, recurrence , postoperative outcome were analysed.*
Result: *Total 18 patients were taken for laparoscopic excision of GIST tumor of these 16 patients were excised laparoscopically and 2 converted to open partial gastrectomy. In total of 16 patients, 13 patients resected laparoscopically and 3 patients were converted to open.*
Conclusion: *GIST larger than 5 cm should not be contraindication for laparoscopic resection but may require open surgery.*

Introduction

GIST is the most common mesenchymal tumor of gastrointestinal tract and its incidence is 0.1 to 3% of gastrointestinal malignancies. The term GIST was coined by Mazur and Clark in 1983.This tumor equally distributed between the men and women. Median age of diagnosis is 60 year (range 40-80 yr.). GIST most commonly present in stomach (60%-70%) and more rarely outside the GI tract, including the mesentry, omentum and retroperioneum . Most common presentation of GIST is Gastrointestinal bleeding, followed by abdominal pain, anaemia, palpable mass. Dysphagia, obstruction and weight loss. However, a significant number are discovered incidentally on imaging performed for other reasons.

Patients and Methods

The aim of our study is to know the feasibility of laparoscopy in large size GIST in various location in stomach and postoperative outcome. The present study was retrospective study in which we analysed all the patients admitted for gastric GIST surgery, irrespective of tumor location and size from Oct 2015-Jan 2018. In this study duration, total 18 patients were taken for laparoscopic excision of gastric GIST, of which 2 patients converted to open surgery. CECT abdomen was done in GIST patients to know the tumor location and growth pattern. Different laparoscopic approaches in treatment of gastric gastrointestinal GIST tumor were done, laparoscopic sleeve gastrectomy, lap wedge resection and lap partial gastrectomy. In laparoscopic excision, after

creating the pneumoperitoneum, standard ports were placed (2, 10 mm, supraumbilical, epigastric. 3, 5mm, right and left lateral to rectus and one left anterior axillary line. Greater curvature of stomach mobilized and short gastric vessels were divided with harmonic, than GE junction was mobilized for the localization of tumor. Excision of tumor done with 60mm endostapler with 2 cm negative tumor resection margin. Excised tumor sent for HPE and immunohistochemistry. Pathological findings were confirmed to know the GIST and differentiate the GIST from other mesenchymal tumor. GIST diagnosis confirmed by immunohistochemistry and risk stratification was done based on mitotic rate/hpf and Ki – 67 proliferation index Intraoperative in all the patients' methylene blue test was done to know the leak. All the patients were also analysed to know the mean surgical duration, mean duration of hospital stay, and postoperative complications, as anastomotic leak, delayed gastric emptying and GE reflux.

Results

In our study 18 patients of GIST were analysed from Oct 2015- Jan 2018. Mean age was 57.40 years (range 28-83). In total 18 patients, 13 were male and 5 were female. In all the patients most common presentation was melena (8/18) 44.44%, abdominal pain (7/18) 38.88%, anaemia (6/18) 33.33%, haemetemiasis (6/18) 33.33% .Patients were also present with weakness with jaundice (2/18) 11.11%, cholelithiasis (2/18) 11.11% , loss of appetite (8/18) 44.44%, loss of weight (4/18) 22.22%, In 4 patients, GIST also presented as incidental finding in CECT examination . (table1)

In all the cases tumor size was calculated on the basis of CECT findings. and mean tumor size was 8.84cm (range 3.5-13.8cm). The most common location was fundus (posteriorly) (7/18) 38.88%, greater curvature of stomach (4/18) 22.22%, and body of stomach (3/18) 16.66%. It may also occur near the gastroesophageal Junction (2/18) 11.11%, lessor curvature (1/18) 5.55%, and fundus anteriorly (1/18) 5.55%. (table 2) . On the basis of CECT and endoscopic findings we concluded that, (7/18) patients had exophytic growth pattern, (6/18) patient had endophytic growth pattern and (5/18) exoendophytic growth pattern was detected (table 3). Laparoscopic surgery was attempted in total 16 patients out of 6 patients laparoscopic sleeve gastrectomy was done, 4 patients laparoscopic wedge resection, and 3 patients laparoscopic partial gastrectomy was done (table 4). In 3 cases laparoscopic surgery converted to open and the cause for conversion was large size GE junction tumor adherent to adjacent structure. Laparoscopic excision can be done successfully even in large size tumor (11.5x8.5x7.5cm), located in posterior wall of fundus of stomach. Decision to open resection for GIST tumor depend upon the CECT finding.

Mean surgical duration 167.9 min (lap/open) (131/222min) (Table5). Intraoperative, methylene blue dye test was negative in all the cases and postoperatively, gastrograffin study was also done to know the leak before stating orally liquid diet. Thus liquid diet was started 3-5 days. Delayed gastric emptying and GE reflux occur in one case that was managed conservatively (table6). On immunohistochemistry, CD 117, CD 34 positive in 16/18. DOG1 was positive in 2/18 cases, Vimentin positive in 13/18 cases and S -100 positivity was present in 11/18 cases (table7). Patients risk stratification was done on the basis of Ki proliferation index. In 14/18 cases <10, and 2/18 cases> 10 (table8).

4/18 cases confirmed high risk stratification on the basis of mitosis /hpf and Ki proliferation index irrespective of tumor size. In all cases 2 cm resection margin was negative. In our case series, recurrence was occurred in 2 cases in which Ki proliferation index >10, and >10 MITOSIS /HPF even after Ro resection. (table 9)

Table 1: Showed demographic characteristics and presenting symptoms

Characteristic	n=18 (n%)
Mean Age	57.40 (28-83)
Gender (Male /Female)	13/5
Presenting symptoms	
Anemia	6/18 (33.33%)
Malena	8/18 (44.44%)
Haemetemiasis	6/18 (33.33%)
Abdominal Pain	7/18 (38.88%)
Weakness with Jaundice	2/18 (11.11%)
Cholelithiasis	2/18 (11.11%)
Loss of Appetite	8/18 (44.44%)
Loss of weight	4/18 (22.22%)
Incidental finding	4/18 (22.22%)

Table 2: Showed size and location of gastric GIST

Peoperative GIST Diagnosis	
Tumor size (range) cm	8.84 (3.5-13.8)
Tumor location, n (%)	
1. GE Junction	2(11.11)
2. Lesser Curvature	1(5.55)
3. Fundus (Posteriorly)	7(38.88)
4. Fundus (Anteriorly)	1(5.55)
5.Greater curvature of stomach	4 (22.22)
6.Body of stomach	3(16.66)

Table 3 Growth pattern of GIST on the basis of CECT finding

Growth pattern	n =18
1. Exophytic	7
2.Exo-endophytic	5
3.Endophytic	6

Table 4: Laparoscopic Approaches in Treatment of Gastric Gastrointestinal Tumors

Intraoperative tumor rupture, n (%)	Nil
Conversion to open surgery, n (%)	3 (30%)
Median surgical duration (range), min[a]	167.9 (L/O 131/222)
Methylene Blue dye leak test	Negative in all

Table 5: Intraoperative findings during resection of GIST

Laparoscopic sleeve gastrectomy	Laparoscopic Wedge resection	Laparoscopic partial Gastrectomy	Lap converted to open	Open Partial Gastrectomy
6	4	3	3	2

Table 6 : Postoperative findings after GIST Resection

Mean time to tolerate a fluid diet (range), days[a]	**3.6 (2-6)**
Median length of post-operative hospital stay (range), days[a]	5.6 (4-9)
Complications, n (%)	1/10
Anastomotic bleeding, n (%)	0 %
Delayed gastric emptying, n (%) GE Reflux	1/10

Table 7: Distribution of immunohistochemical markers in GIST

Positive for	n =18
CD117	16
DOG1	2
CD34	16
S-100	11
Vimentin	13

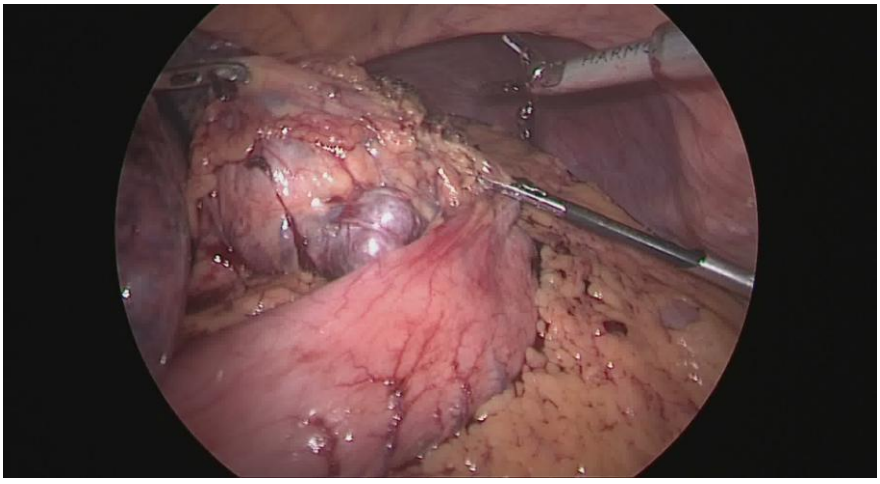

Fig 1: Showed GIST at GE Junction

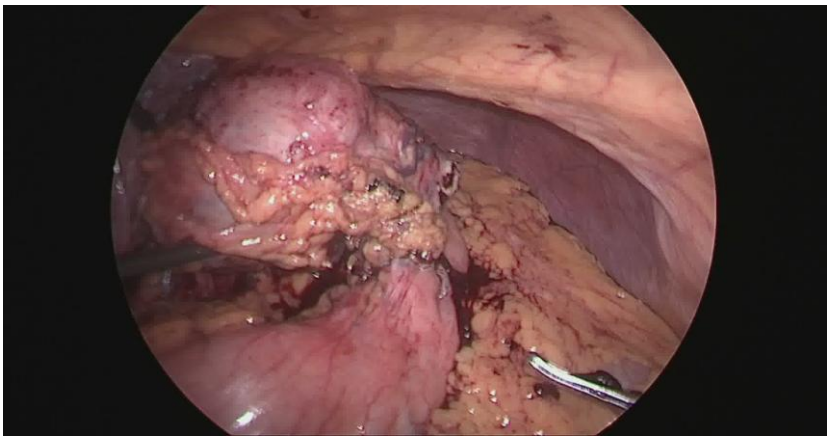

Fig 2: Showed GIST at lessor curvature

Fig 3: Showed GIST at posterior wall of stomach

Fig 4: CECT finding of Gastric GIST

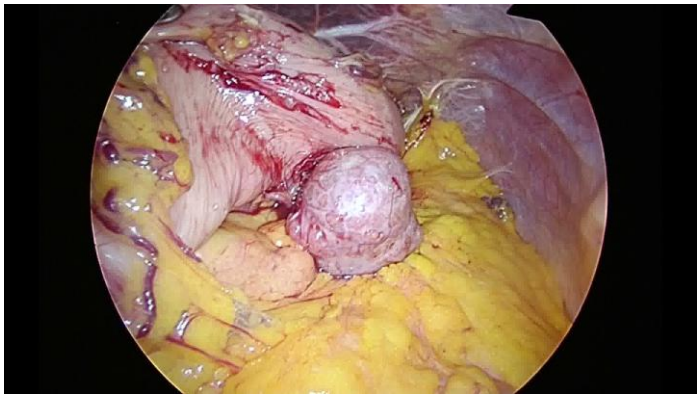

Fig 5: Visualization of Gastric GIST after division of short gastric vessels

Fig 6: Wedge resection of gastric GIST after stapler firing

Table 8 Size of tumor and risk stratification

N =18	SIZE (CM)	Mitotic count	Pathological risk stratification
6	2-5 cm	< 5/50hpf	Low
8	5-10cm	5-10 /50 hpf	Moderate
4	> 10 cm	(n=2) 5-10/50hpf	Moderate
		(n=2)> 10/50hpf	Severe

Table 9: Showed Ki prolification index and risk stratification

K I – 67 Proliferation Index (%)	N =18
< 10	14
> 10	2
RISK STRATIFICATION	
Low	6
Moderate	6
High	4

Discussion

2004, NCCN & ESMO released consensus statements: laparoscopy be limited for GISTs< 2 cm in size due to concerns of tumor rupture and seeding of the peritoneum and the ability to achieve an adequate oncologic margin.[(1)] 2010, NCCN updating their recommendations in their Task Force Report to include GISTs up to 5 cm as acceptable for laparoscopic resection.[(2)] Now, early studies focused on the laparoscopic techniques for the resection of large size GIST [(3,4,5)] even at difficult anatomical locations[(6,7)] and disease free interval following R0 resection[(8)]

In our study, Laparoscopic wedge resection, sleeve gastrectomy and partial gastrectomy s feasible in large size GIST (8-11 cm) and tumor located in posterior wall of stomach. Small size GIST near the GE Junction (4-6 cm) can be excised laparoscopically, but large size GIST > 8-10 cm may need conversion to open because of technical difficulties. Recurrence can occur in gastric GIST if tumor is high grade (Ki proliferation index > 10 irrespective of location and size, and even after R0 resection)

Conclusion

LAP is safe for large size GISTs. GISTs larger than 5 cm should not be a contraindication for laparoscopic tumor excision and may require open surgery.

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