



“LAPAROSCOPIC INTRAGASTRIC EXCISION OF POSTERIORLY LOCATED GASTRIC GIST USING CONVENTIONAL LAPAROSCOPIC INSTRUMENTS – A CASE REPORT”

Surgery

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ABSTRACT

Background: Gastro-intestinal stromal tumour (GIST) commonly involves stomach. Recently there has been an inclination towards managing these benign but potentially malignant lesions by minimal invasive techniques. Surgical excision of gastric GIST mostly requires anterior wall gastrotomy especially for intraluminal lesions. The size and location of the lesion are critical from technical point of view. Lesions located at gastro-esophageal junction requires larger anterior gastric wall opening to reach the site of tumour for excision. Endoscopic excision for such lesions is not always amenable. **Methods:** We performed excision of a posteriorly located gastric GIST at GE junction by hitching the anterior gastric wall with the anterior abdominal wall and by directly creating pneumogastrum percutaneously for placing three intra-gastric trocars. **Results:** Patient was discharged on post-operative day 3 in a satisfactory condition. Histopathology revealed complete resection of GIST lesion with margins free from tumour. Immuno-histochemistry (IHC) confirmed it to be GIST with low malignant potential and patient was advised regular follow up. **Conclusion:** Laparoscopic intra-gastric excision of a posteriorly located gastro-oesophageal junction GIST lesion after creating pneumogastrum and using conventional laparoscopic instruments is a safe procedure.

KEYWORDS

Laparoscopic, pneumogastrum, GIST, intragastric, gastric

INTRODUCTION:

Medical science is an ever evolving field and minimal invasive surgery (MAS) is no exception. The reach of MAS has extended beyond age and conditions. It has reached patients as young as neonates and for very advanced reconstructive procedures. Literature is flooded with various techniques for surgically removing GIST like LLR (Laparoscopic Local Resection), LEWR (Laparoscopic exo-gastric wedge resection), LTR (Laparoscopic transgastric resection) and Endoscopic assisted Laparoscopic intra-gastric resection for Gastroesophageal junction tumours.[1] We present a novel surgical technique for surgically treating a Gastric GIST located at posterior edge of gastro-oesophageal junction using conventional laparoscopy instruments.

Case History:

A young male aged 36 years presented to casualty with history of upper GI (gastro-intestinal) bleed. Patient had history of melena for the past 6 months. After resuscitation patient was subjected to upper GI endoscopy which showed an umbilicated ulcerated swelling of 3 x 3 centimetres at Gastro-oesophageal (GE) region located posteriorly endophytic in nature with high probability of GIST (Figure 1a). CECT abdomen revealed a 25 mm x 30 mm sub-mucosal growth on the posterior wall of stomach in the fundus near GE junction (Figure 1b). Patient was subjected to Laparoscopic excision of the lesion by a technique involving intra-gastric approach and creation of Pneumogastrum. Pathological biopsy showed mitotic index of < 5/50 HPF and size < 3 centimetres making it very low for malignant potential. Immuno-histochemistry (IHC) was positive for DOG1 (4+ score) and CD 117 (4+ score) confirming it to be GIST. Patient was kept under surveillance with regular follow up visits. Procedure was done under general anaesthesia with patient lying supine. Pneumoperitoneum up to 15 mm of Hg was created using veress needle and carbon dioxide (CO₂). Port Placement were done as shown in (Figure 1c). A 10 mm Supra-umbilical port (Point A), a 10 mm right lateral port 5 centimetres above umbilicus along mid clavicular line (Point B) and a 5 mm port below right subcostal margin along anterior axillary line (Point C) were placed. A 10 mm 30° telescope was inserted through umbilical port and abdominal surfing was done; Under telescopic guidance using two upper ports as working ports anterior gastric wall was hitched to the anterior abdominal wall using 2-0 prolene sutures at 2 places near greater curve and at 1 place near lesser curve (Figure 1d); Under telescopic guidance 10 mm right lateral (point B on abdominal wall) trocar was advanced through the anterior gastric wall (Figure 2a) and was attached with CO₂ insufflation creating

pneumogastrum. The oropharynx was blocked using ribbon gauze to avoid CO₂ leak. The 10 mm telescope was removed from umbilical port and inserted through Point B trocar visualizing the intra-gastrum. Lesion was seen along with Ryle's tube (Figure 2b) at GE junction along posterior wall of stomach; Umbilical port (Point A) and Right subcostal (Point C) trocar advanced through the anterior gastric wall to work as intra-gastric working ports (Figure 2c). Excision of lesion at GE junction was started and completed using Harmonic shears taking care not to injure the GE junction (Figure 2d). The rent created in posterior gastric wall was sutured using 2-0 barbed Vicryl suture taking care not to compromise the lumen of GE junction. (Figure 3a & 3b). Ryle's tube was pulled into lower oesophagus before commencing suturing near GE junction and again pushed forward after completion of suturing the defect. Finger glove was used as specimen extraction from stomach and thereafter from abdominal cavity. Specimen was sent for histopathology examination and IHC (Figure 3c, 3d & 4a). After taking down the gastric hitch sutures rents in the anterior gastric wall created due to 10 mm and 5 mm ports were closed using 2-0 Vicryl barbed suture (Figure 4b & 4c). Stomach was distended using methylene blue dye instilled through Ryle's tube and by compressing pyloro-duodenal region using atraumatic grasper to check for any leaks (Figure 4d). Abdominal drain was kept at Morrison's pouch. Abdominal surfing and de-sufflation was done followed by removal of ports and oropharyngeal ribbon gauze. Port sites were closed using 4-0 polypropylene suture. Orals were started on 2nd post operative day and the patient was discharged on post operative day 3 after removal of abdominal drain.

DISCUSSION:

GIST is the most common gastro-intestinal tumour of mesenchymal origin and accounts for about 1%-3% of all primary gastrointestinal tumours. In the last decade, deeper insights into pathogenesis of majority GISTs have led to better understandings with respect to management. The median size at presentation is approximately 5 centimetres (3 centimetres in our case) and median age at presentation range between 66-69 years (36 years in our case). The most common mode of presentation is upper GI bleed (33%) which can be occult or overt. Endoscopy may reveal a submucosal lesion with umbilication denoting a deep ulceration because of bleeding. Biopsy is rarely indicated for fear of tumour dissemination. Literature is flooded with various techniques for surgically removing GIST like LLR (Laparoscopic Local Resection), LEWR (Laparoscopic exo-gastric wedge resection), LTR (Laparoscopic transgastric resection) and Endoscopic assisted Laparoscopic intra-gastric resection for

Gastroesophageal junction tumours. [1] Laparoscopic resection of a gastric GIST though discouraged initially was found later to be a safe and feasible technique by many. [2,3] The only concern is whether it upholds the same surgical principles as of traditional surgeries like complete tumour resection without disruption. The approach depends upon the size, location, and type of the lesion. Small lesions located at GE junction along posterior wall projecting intraluminal are a challenge to approach by trans gastric method as it shall require large anterior wall gastrotomy. Approaching such lesions through lesser sac is also difficult as the lesion is projecting intraluminal close to GE junction thus increases chances of stenosis or deformity. [1] Such lesions can be approached by intragastric methods either by endoscopic or laparoscopic approach. [4] Laparoscopic intragastric or “endoluminal” surgery involves the placement of balloon-tipped laparoscopic trocars (2, 5, or 10 mm) percutaneously into the stomach (insufflated by a flexible endoscope) similar to the placement of a percutaneous endoscopic gastrotomy tube. [5] Some surgeons prefer to perform transperitoneal laparoscopy via a single port at the umbilicus prior to inserting transgastric ports, allowing for assessment of the peritoneal cavity and the serosal surface of the stomach. The pylorus may be occluded with a balloon-tipped nasogastric tube, but this is not required always as done in our case. We assume that the distension of stomach with CO₂ led to spasm of the pylorus. Another technique known as combined endoscopic-laparoscopic intragastric resection for gastroesophageal junction stromal tumours using a flexible endoscope as the “camera” and insufflators has been described. But size of the lesion and requirement of retro-viewing endoscope is a deterrent for such approach. [6] Attaining complete tumour resection of R0/R1 is sometimes difficult endoscopically. The best approach seems to be intragastric by laparoscopy after creating pneumogastrum using CO₂. It involves the use of balloon stabilized ports for intragastric view and excision but the cost of such instruments is very high which makes it difficult to popularize in developing world. We used conventional laparoscopic instruments for excising a GE junction GIST lesion along posterior wall. All the principles of the traditional surgery were achieved. HPE revealed complete resection with free margins. Many studies till date, had noted no local or systemic recurrence when such lesions are resected by laparoscopic approach. [2,7,8] The operating time in our case was comparable to global trends of trans gastric approach. Blood loss was minimal, and hospital stay was short among other advantages of this approach. Laparoscopic intra-gastric excision of a posteriorly located gastro-oesophageal junction GIST lesion after creating pneumogastrum is a safe procedure. The profound benefits of varied minimally invasive approaches especially in the developing world have allowed both patients and treating surgeons to make their options desirable and with greater confidence but it requires studies with larger number of cases to be conducted to assess the overall safety and feasibility of the procedure.

FIGURES

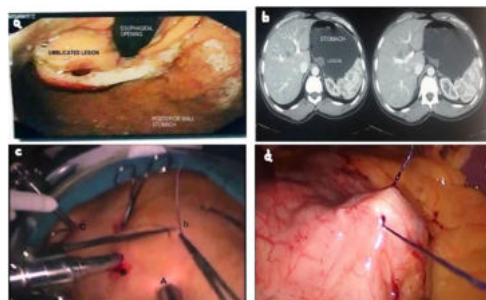


Figure 1a Upper GI endoscopy showing esophageal opening, posterior gastric wall and an umbilicated submucosal lesion at GE junction. Patient presented with recent upper GI bleed and history of malena.

Figure 1b CECT abdomen revealing an intraluminal lesion at posterior gastric wall near GE junction.

Figure 1c showing Port placement marked as 'A, B, C' and anterior gastric wall hitch stitches through anterior abdominal wall marked as 'a, b, c' (see text).

Figure 1d Intra-peritoneal view showing anterior gastric wall being hitched to anterior abdominal wall.

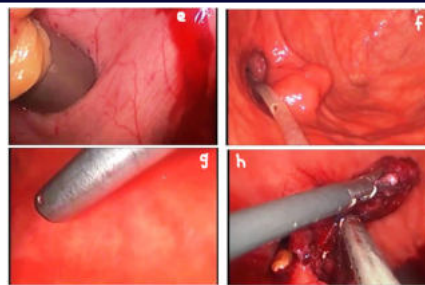


Figure 2e Intra-peritoneal view showing first intragastric trocar being passed under laparoscopic guidance.

Figure 2f Intra-operative intra-gastric view of GIST lesion near gastro-esophageal junction

Figure 2g Intra-gastric view showing 5 mm working port.

Figure 2h Intra-gastric view showing use of Harmonic shears for excision of the lesion. It was possible to lift the lesion and excise taking adequate margins.

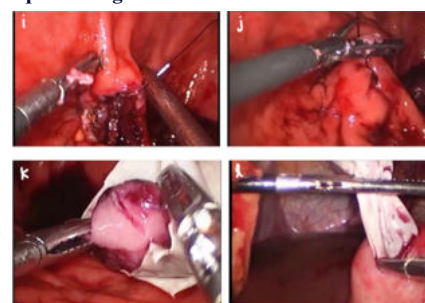


Figure 3i showing closure of the posterior wall defect using 2-0 Vicryl barbed suture.

Figure 3j showing posterior gastric wall defect sutured completely without compromising the gastro-esophageal junction.

Figure 3k resected specimen being retrieved using finger glove.

Figure 3l resected specimen being retrieved through anterior gastric puncture site.

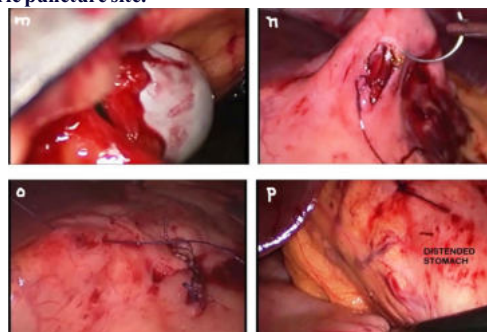


Figure 4m resected specimen being retrieved through anterior abdominal wall.

Figure 4n Anterior gastric wall port site being closed using 2-0 Vicryl Stratafix.

Figure 4o Anterior gastric wall port site closure after completion.

Figure 4p Stomach being distended using methylene blue dye and pyloro-duodenal region blocked using atraumatic laparoscopic instrument to check for any leaks intra-operatively.

The authors acknowledge Dr Imtiaz Hussain, Dr Navreet Kaur, Dr Lubna Nabi for preparation of manuscript.

Conflicting interests: Nil

Sources(s) of support: Nil

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