

# Feasibility of minimal access surgery in benign gastric tumour resections: report of 5 cases

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## Abstract

With the advent of modern techniques including the widespread use of gastric endoscopy, benign gastric lesions are diagnosed more frequently and can be characterized by means of biopsy. Of all gastric tumours, less than 5% are benign and 90% of these are polyps. The treatment options for benign gastric tumours vary from mucosal resection to limited gastric resection. Many different minimal access approaches to the limited resection of benign gastric tumours have now been described in the literature with reduced morbidity. This case report reviews the feasibility of laparoscopic approaches to surgical resection in 5 cases of benign gastric tumour, identified radiologically by computed tomography and histologically by gastroscopy and biopsy. Tumour size ranged from 2 cm to 5 cm in diameter. The mean operative time was 60 min, and mean blood loss was 50 mL. Bowel function returned on the second postoperative day. The mean length of hospital stay was 4 days. There has been no tumour recurrence over a mean follow-up of 24 months, with no complications and no mortality. The laparoscopic approach is ideal for the treatment of benign tumours of the stomach. Various options including a total laparoscopic approach or a combined laparoscopic and open approach are used depending on the site and type of tumour.

## Keywords

Benign gastric tumours; combined approach; laparoscopic limited resection; GIST; lipoma.

## Introduction

There has been an increased incidence in the diagnosis of benign gastric lesions in recent years because of a higher level of clinical suspicion and the availability and widespread application of diagnostic tools such as gastrointestinal endoscopy. Benign gastric tumours are uncommon, with an incidence of 0.4% in autopsy series and 3–5% in upper endoscopy series, most of them performed for unrelated reasons. Polyps account for 3.1% of all gastric tumours, and 90% of benign gastric tumours. They sometimes appear eroded but bleeding is an unusual symptom. Large distal lesions have been associated with symptoms of gastric outlet obstruction.

Benign neoplastic lesions can arise from any component of the gastric epithelium: glandular, endocrine, or mesenchymal. All the layers of the stomach wall have the potential to produce tumours; 40% of the lesions are mucosal. The gastric endothelium is composed of numerous epithelial, neural, and endocrine cells arranged into glands that perform specialized functions. Any of these cells have the potential for neoplastic transformation. Fewer than 5% of all stomach tumours are benign. Most are asymptomatic and are found during examinations performed for unrelated symptoms. The most common presenting finding is anaemia from chronic occult bleeding. Less common symptoms include epigastric pain or acute gastrointestinal bleeding, and vomiting caused by gastric outlet obstruction. Gastrointestinal stromal tumours (GIST) account for 1-3% of all resected gastric tumours and are the most common solitary, asymptomatic submucosal masses found in the stomach. A GIST may be benign or malignant; they usually present with bleeding and obstruction. Establishing a diagnosis is not usually possible with limited biopsies.

Submucosal gastric tumours are rare, accounting for 5% of all gastric tumours. The diagnosis is based on endoscopy, contrast-enhanced computed tomography (CECT) and endoscopic ultrasonography. The latter is the only method that can identify the intramural nature of the tumour, with a diagnostic precision of 92%. The precise localization of the tumour in the different layers may be suggestive of the histological type, but the entire tumour must be examined to establish a definite diagnosis. Surgery is mandatory for symptomatic tumours, but its role in asymptomatic tumours remains controversial.

Laparotomy has been the preferred procedure for resection despite significant morbidity, but minimally invasive surgery is becoming increasingly feasible with its attendant limited complications and morbidity. A small number of cases have been reported in the literature.

## Case report

We describe 5 patients presenting with benign gastric tumours. Three were cases of GIST, 1 of which presented with bleeding and severe anaemia, 1 case of a bleeding lipoma, and 1 case of enterochromaffinoma with raised gastrin levels. Symptoms included vague upper abdominal pain, upper gastrointestinal bleeding with severe anaemia, and dyspepsia. Endoscopy and biopsy were carried out in all cases. Endoscopically, the lesions were well circumscribed, with mucosal ulceration. Multiple biopsies were taken. Histopathological examination confirmed the diagnosis. Three cases of GIST were positive for CD117, and the enterochromaffinoma was associated with raised gastrin levels. CECT of the abdomen showed no serosal involvement and no lymph node enlargement in any of the cases. The size of the tumours ranged from 2 to 5 cm. The extent and type of resection was based on the exact tumour location.

All 5 operations were carried out under general anaesthesia with the patient in the lithotomy position, the surgeon standing between the legs of the patient and the camera assistant standing on the patient's right. Four ports were placed; a 10-mm trocar in the umbilicus, a 12-mm trocar in the left midclavicular line (right hand working port), a 5-mm trocar in the right midclavicular line and a 5-mm trocar under the xiphoid for liver retraction.

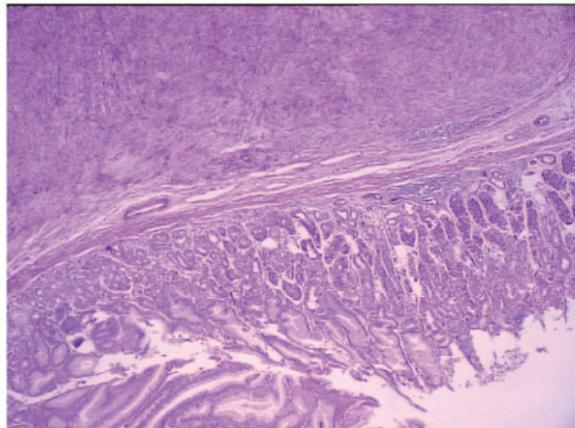
In each case, the tumour was first located accurately, as the location determined the method and extent of resection. In the 3 cases of GIST, the tumours were on the greater curvature, the bleeding lipoma was in the gastric antrum and the enterochromaffinoma was at the fundus. Omental dissection was carried out in all cases, and for the tumours at the greater curvature and the fundus, a limited resection of the greater curvature along with the tumour was carried out using an Endo GIA stapler. Following resection, a leak test with methylene blue was carried out and no leaks were identified. For the bleeding lipoma located at the antrum, a submucosal resection was carried out via an anterior gastrostomy which was sutured after resection.

All the resected specimens were sent for histopathological examination. The histopathological picture of the lipoma showed multivacuolated lipoblasts, myxoid areas, and a plexiform capillary network. The enterochromaffinoma showed a glandular, trabeculated, insular pattern of bland nuclei with salt and pepper chromatin, prominent vessels and rare mitotic figures with no necrosis. Keratin stained with chromogranin.

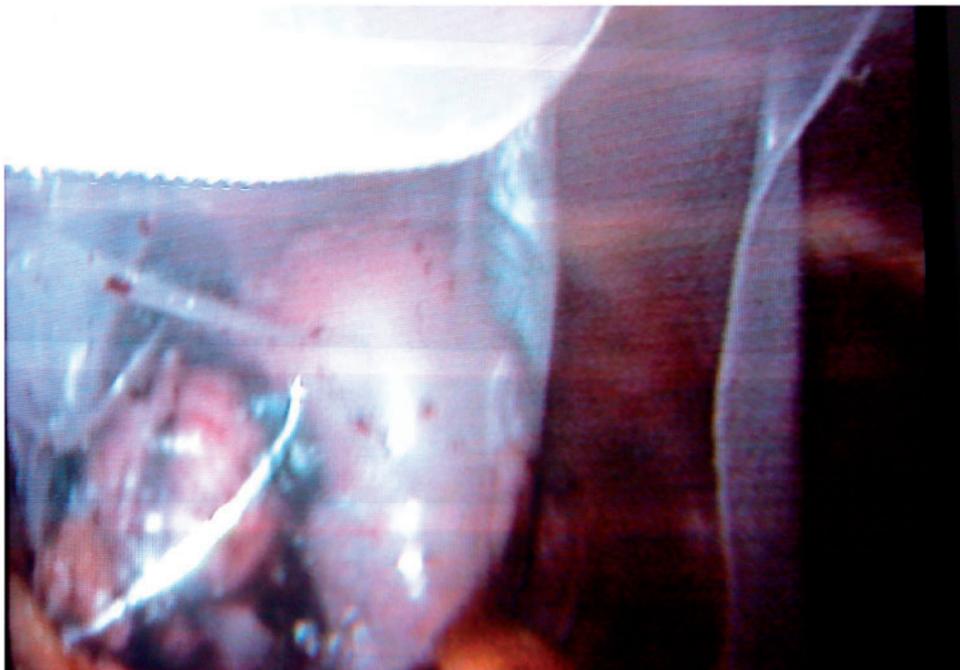
The GIST specimens revealed normal gastric mucosa with normal glands and surface endothelium. Each consisted of a submucosal, circumscribed, partially capsulated mass with sheets of oval spindle cells containing elongated nuclei and no cellular atypia. Mitotic activity was at a level of 3-4/10 high power fields and the intervening stroma was scanty. All resected margins were free of tumour with no evidence of malignancy (Figs. 1-4).



**Fig. 1.** Endoscopic view of GIST.



**Fig. 2.** Microscopic view of GIST.



**Fig. 3.** Macroscopic view of GIST.

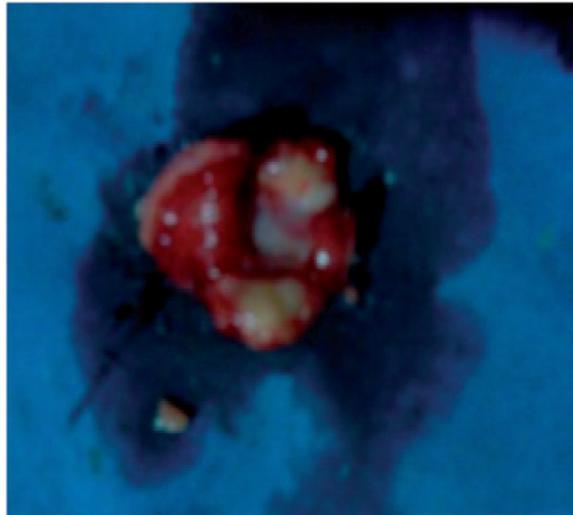


Fig. 4. Resected specimen of enterochromaffinoma.

The mean perioperative blood loss was about 50 ml. The mean operating time was 60 min and conversion to open laparotomy was not required in any of the cases. Recognized complications include haemorrhage, wound infection and anastomotic leak, but none of these occurred. All patients were started on a liquid diet on the second postoperative day, a soft diet the next day, and were discharged on the fourth day. Drainage tubes were kept in for 48 h in all cases. The patients were followed up with repeat endoscopy for 2 years and no evidence of recurrence was noted.

## Discussion

Endoscopy is the gold standard investigation for gastric neoplasia, both for initial diagnosis and for to identify the causes of complications such as bleeding, obstruction and malignant transformation. It is also the mainstay of treatment for small benign lesions such as polyps that can be snared, and for follow-up after more major procedures. For broad-based lesions, endoscopic ultrasonography is useful for diagnosis. Laparoscopic ultrasonography is useful for identifying small intramural lesions, tumours lying close to the pylorus and for lesions located near the gastro-oesophageal junction. Endoscopy is useful in determining the extent of resection, as well as postoperative bleeding or stenosis.

In all 5 cases reported, a limited gastric resection under general anaesthetic was carried out, and the approach was varied according to the disposition of the tumour. Bowel function returned on the second postoperative day and all the patients were discharged on the third or fourth postoperative day. The laparoscopic minimally invasive procedure proved safe and effective with a short recovery time compared with an open procedure and no morbidity or mortality.

Lipomas are rare submucosal tumours, sometimes indistinguishable clinically from GIST. They represent deposits of adipose tissue in the wall of the stomach, usually in the submucosa. They generally cause symptoms when they exceed a size of 2 cm. The standard treatment is surgical resection.

Indications for gastric resections include a tumour size greater than 5 cm, widely implanted tumours, tumours involving gastric orifices, and tumours with complications such as bleeding or perforation. Gastrectomy and partial gastrectomy increase the risk of contamination and anastomotic site bleeding. The site of the lesion is the main criterion that determines whether an intra- or extragastric approach is the most appropriate. Various minimal invasive approaches are described in the literature for gastric benign tumours. These include

- laparoscopic approach
- endoscopic approach
- combined approach
- transgastric tumour-everting resection<sup>[1]</sup>
- enucleation

Laparoscopic approaches include

- transgastric endoluminal resection
- wedge resection<sup>[2,3]</sup>
- intragastric resection
- distal gastrectomy
- gastrojejunostomy.

Combined approaches include

- endo-organ intragastric resection
- double endoscopic intraluminal operation (DEILO)<sup>[4]</sup>; this approach allows precise localization of the lesion by direct visualization

Tumours involving the oesophagogastric junction require additional expertise because of relative anatomical inaccessibility. For GIST tumours, a laparoscopic approach is ideal<sup>[5-9]</sup>. Tumours of the anterior gastric wall are resected using intragastric resection with an anterior gastrotomy. Tumours of the posterior wall are resected by using a lesion-lifting approach combined with a wedge resection, which requires opening of the lesser sac.

For tumours located in the fundus, the entire stomach has to be mobilized. For tumours located in the cardia or pylorus, precautions must be taken to avoid stenosis and they usually therefore require distal gastrectomy with gastrojejunostomy.

Laparoscopic resection of benign gastric tumours is a reliable and safe method as shown by the data in the literature. But tumour spillage is more commonly encountered during the laparoscopic approach. This can be prevented by using a bag for tumour extraction, avoiding tumour manipulation, and washing out the peritoneum and ports at the end of the procedure. The conversion rate has varied from 0% to 28%. There is an advantage in terms of less postoperative pain, earlier oral feeding, and shorter hospital stay. The mean duration of the postoperative hospital stay was 5 days in our patients, similar to that in many reports. Other case series have compared the open procedure with the laparoscopic approach in terms of hospital stay, intra-operative blood loss, complications such as leaking, bleeding, pain, and recurrence rate: All these case series concluded that the laparoscopic approach is safe and more feasible than laparotomy.

### Teaching points

- Laparoscopic limited gastric resection is becoming the first-line approach for benign gastric tumours.
- In this short series, it appears safe and effective with a shorter hospital stay and reduced morbidity.
- Further work with more patients is required to render these conclusions more secure and statistically viable.

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### Conflict of interest

None

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