

# Laparoscopic transgastric resection of gastroduodenal intussusception due to gastric leiomyoma

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## SUMMARY

**Gastric leiomyoma of the antrum intussuscepted into first part of the duodenum is a rare complication. We report here an 80-year-old woman who presented at the Sarawak General Hospital, Kuching, Sarawak, Malaysia with early satiety and epigastric fullness for 3 months. She had no prior medical or surgical history other than an uneventful open cholecystectomy. Upper endoscopy showed a large submucosal mass in the first part of duodenum with pyloric converging gastric folds. Computed tomography scan of the abdomen showed a gastroduodenal intussusception with a 4x6cm mass at the junction between the first and second part of duodenum. Laparoscopic transgastric resection was performed. Histopathological examination of the resected specimen confirmed leiomyoma. She remained well at 43 months follow-up.**

## INTRODUCTION

Gastroduodenal intussusception is a rare form of adult intussusception. It is caused by the prolapse of the tumour followed by invagination of a portion of stomach wall into the duodenum. Leiomyomas of the stomach are rare mesenchymal tumour of the stomach.<sup>1</sup> They are commonly located in the gastric cardia, with the antrum as an unusual location.<sup>1</sup> Gastroduodenal intussusception of a leiomyoma is a rare complication that typically presents with partial or complete gastric outlet obstruction. Partial obstruction typically causes chronic intermittent symptoms as in our case, while complete obstruction may cause acute symptoms. Herein, we present a case of gastroduodenal intussuscepted leiomyoma that was successfully treated by laparoscopic transgastric resection.

## CASE REPORT

An 80-year-old woman presented to our outpatient clinic at the Sarawak General Hospital, Kuching, Sarawak, Malaysia with symptoms of early satiety after meal and epigastric fullness for 3 months. Past surgical history was significant for open cholecystectomy 10 years ago. Physical examination did not reveal any significant abnormality. Oesophagogastroduodenoscopy (OGDS) showed a large submucosal mass in the first part of the duodenum with pylorus-converging gastric folds. Computed tomography (CT) scan of the abdomen of the patient showed a gastroduodenal intussusception with a 4x6cm mass at the junction between

the first and second part of duodenum (Figure 1). With the initial diagnosis of gastroduodenal intussusception secondary to antral submucosal tumour, the patient underwent a laparoscopic exploration and resection.

Surgery was performed with the patient placed in a modified lithotomy position with both legs supported. The surgeon stood between the legs with the assistant to the right of the patient. The laparoscopy stack systems were placed at the top left of the patient. Four ports were utilised: a 10-mm infra-umbilical port, a 5-mm right midclavicular port, a 5-mm left midclavicular port and a 5-mm left anterior axillary line port. Initial diagnostic laparoscopy was performed followed by a longitudinal gastrostomy made proximal to the pylorus. The prolapsed mass was sequentially reduced with traction pressure applied to the mucosal folds proximal to the mass using an atraumatic grasper. The mass was reduced and extracted out through the gastrostomy. This allowed a wedge resection of the mass to be undertaken using an Echelon™ (Johnson&Johnson, New Brunswick, NJ, USA) endocutter with 3.8mm staples (Figure 2). Care was taken not to incorporate the gastrostomy edges during firing of the stapler. The specimen was placed in a specimen retrieval bag and placed temporarily in the splenic fossa. The gastrostomy was closed using a single running 2-0 (Polyglactin 910) suture. Minimal irrigation and suction of the Morrison's pouch was performed for leaked gastric and bile juices. Finally, the bagged specimen was retrieved through an extended subumbilical port site incision. Histopathological examination confirmed a completely excised leiomyoma, measuring 65x50x25mm, with positive immunohistochemical stain for smooth muscle actin, and negative for CD117 and CD34. Postoperative recovery was uneventful. She was allowed clear fluids the following morning and started on soft diet on day-2. She was discharged home on postoperative day-3. At 43-month follow up, she was well with no recurrence.

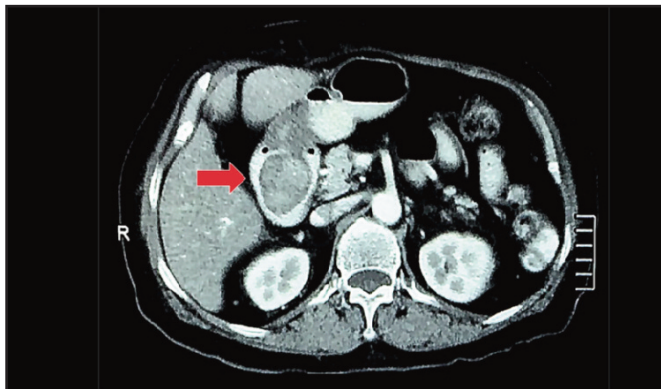
## DISCUSSION

Leiomyomas of the stomach are benign submucosal tumours (SMTs) originating from smooth muscle cells. They arise from the muscularis mucosae or muscularis propria within the wall of stomach.<sup>2</sup> Unlike in the oesophagus, leiomyomas are rare in the stomach and almost always located in the gastric cardia.<sup>1</sup> They have an endophytic, endomural or exophytic growth pattern. The mucosa of the stomach in the antropyloric region is closely bound to the submucosa, which

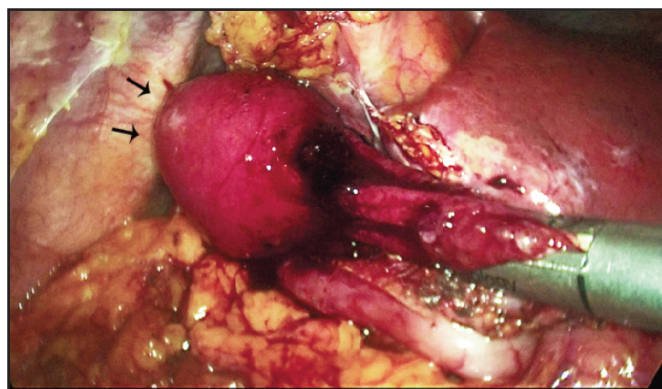
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**Fig. 1:** Axial CT scan showing a mass at the junction between the first and second part of duodenum (arrow).



**Fig. 2:** Stapled transection of the submucosal mass (arrows) after it was extracted out through the gastrotomy.

in turn, is loosely attached to the muscularis externa.<sup>3</sup> In our patient, the prolapse of endophytic leiomyoma through the pylorus further exaggerates the submucosal/muscularis looseness resulting in invagination of a portion of stomach wall into the duodenum. Such a rare complication is often managed by open approach. Our case represents a successful surgical resection using laparoscopic approach.

Leiomyomas are slow growing tumours that are usually asymptomatic. They are often discovered incidentally during endoscopic assessment when they cause specific symptoms. Our patient had symptoms of partial gastric outlet obstruction as a result of the intussusception which prompted her to seek treatment. The diagnosis of gastroduodenal intussusception involving gastric SMTs was first suspected during OGDS. Several features suggesting transpyloric prolapse of SMT include a mucosal fold extending through the pylorus into the duodenum, eccentric deformity of pyloric ring and intact mucosal over the mass in the duodenum.

Preoperative diagnosis of gastroduodenal intussusception is often established by imaging modalities such as CT, magnetic resonance imaging and endoscopic ultrasound. However, the aetiology of the mass is only established after the histopathological examination of the resected specimen. Many leiomyomas are diagnosed as gastrointestinal stromal tumours (GISTs) before the surgery as they are the most common mesenchymal tumours in the stomach. This was our initial diagnosis until the histological and immunohistochemical findings were available. The diagnosis of leiomyoma in our case is based on the spindle cell morphology and immunohistochemical positivity for smooth muscle actin and negativity for CD117.

The definite treatment for intussuscepted leiomyoma is reduction of the intussusception followed by resection of the lead point through endoscopy, laparoscopy or laparotomy. Resection can be achieved by a wedge resection of the stomach or an en bloc resection involving formal types of gastrectomy if reduction is not feasible.<sup>4</sup> Regardless of the surgical approach, the goal of treatment follows the same principles as those for GISTs, i.e., to achieve a complete resection with a negative microscopic margin (R0) resection.<sup>5</sup>

This is particularly important as the diagnosis is only established microscopically and immunohistochemically after surgery. Laparoscopic approaches are best suited for resection of SMTs as routine lymph node dissection is generally not required. Transgastric approach is one of the approaches advocated for SMTs located in the posterior wall, near the gastroesophageal junction and pylorus.<sup>5</sup> Careful handling is required to avoid tumour rupture during the procedure. In our case, gentle traction applied to the mucosal folds proximal to the tumour using atraumatic grasper was sufficient to reduce and deliver it into the gastrotomy wound prior to stapled transection. Leiomyomas are benign smooth muscle tumours; the surgery is therefore considered curative because of the complete resection.

## CONCLUSIONS

Gastroduodenal intussusception involving gastric leiomyomas is rare. The laparoscopic approach is safe and technically feasible in managing such a rare complication. We believe that it is the best treatment option for elderly patients who are fit for surgery.

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## DECLARATIONS

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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