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## Management of gastric ectopic pancreas identified in preoperative evaluation of bariatric surgery – A case report

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### ABSTRACT

**BACKGROUND:** The diagnosis of gastric lesions, such as the Ectopic Gastric Pancreas (GEP), has become more frequent after the increase in bariatric surgeries. The most frequently used surgical options are: Sleeve Gastrectomy (SG) and Roux-en-Y Gastric Bypass (RYGB). The scientific papers about GEP in Bariatric Surgery consisted of intraoperative findings, approach the lesion with gastrectomy and the need to change the initial surgical strategy of the Sleeve for others techniques which allow extended gastric resections.

**PRESENTATION OF CASE:** This is a report on a 21-year-old female patient with class 3 obesity whose preoperative evaluation showed two lesions suggestive of GEP. Simultaneous surgical video-laparoscopic treatment of lesions associated with SG aided by intraoperative Upper Endoscopy (UE) was performed with no perioperative complications.

**CONCLUSION:** It is possible to associate the treatment of rare gastric lesions with traditional surgery techniques for obesity.

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## 1. Introduction

Surgery is the most effective therapeutic option for obesity treatment. It should be considered in patients who are refractory to conventional clinical treatments. The most frequently used surgical options are: Sleeve gastrectomy (SG) and Roux-en-Y Gastric Bypass (RYGB).

The increase in the surgical treatment of obesity has allowed the more frequent diagnosis of rare gastric pathologies, such as the Ectopic Pancreas.

**Abbreviations:** SG, Sleeve Gastrectomy; RYGB, Roux-en-Y Gastric Bypass; EP, ectopic pancreas; GEP, Gastric Ectopic Pancreas; UE, Upper Endoscopy; EUS, Endoscopic Ultrasound; MB, methylene blue; GIST, gastrointestinal stromal tumor.

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The ectopic pancreas (EP) is defined as pancreatic tissue without communication with the main pancreas and with an independent vascular and ductal supply [1]. It is a rare lesion, located mainly in the stomach, being known as Gastric Ectopic Pancreas (GEP), usually asymptomatic and of which treatment is surgical, due to the associated risks [2–4].

The scientific papers about EP in Bariatric Surgery consisted of intraoperative findings [5–8] and, in two cases, in which the initial strategy was the SG, it was necessary to change the surgical approach [7,8].

The patient in the following case was managed in a public and academic institution. This work has been reported in line with the SCARE criteria [9].

## 2. Presentation of case

This is a report on a 21-year-old, asymptomatic female patient, with class 3 obesity (BMI = 43.5 kg/m<sup>2</sup>), whose comorbidity was Systemic Arterial Hypertension, and who sought our institution to perform bariatric surgery. There are no relevant past medical, previous surgeries, family history or psychosocial history. Before surgery, the patient underwent comprehensive evaluation. The



Fig. 1. Lesions in the intraoperative Upper Endoscopy vie.

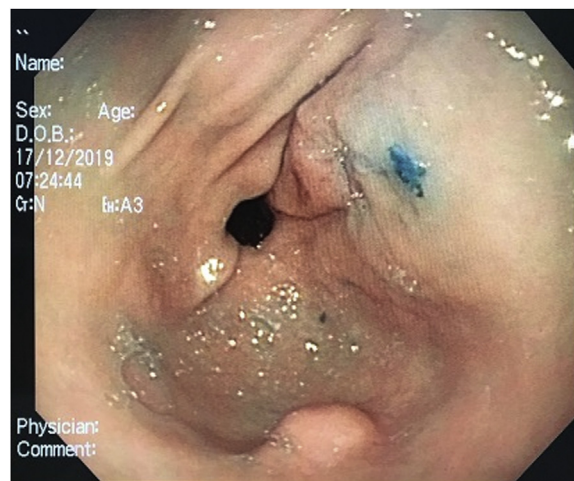


Fig. 2. Lesion 'tattoo' with Methylene Blue.

preoperative Upper Endoscopy (UE) showed two extra-mucosal lesions in the antrum. The histopathological examination did not allow a definitive diagnosis. Thus, the patient was submitted to an Endoscopic Ultrasound (EUS) that showed, on the posterior antral wall, two lesions located in the submucosal layer – the first located in the middle third with central umbilication, measuring 7 × 6 mm, and the second located in the antral-pyloric region, measuring 22 × 12 mm. The ultrasonographic characteristics showed hypoechoic, homogeneous, well-defined lesions. Then the PEG diagnosis was suggested, but other diagnoses were possible, such as gastrointestinal stromal tumor (GIST). Other preoperative exams were normal.

In December 2019, simultaneous surgical treatment of lesions associated with SG was indicated with the patient's agreement. The preoperative care included administration of subcutaneous enoxaparin at a prophylactic dose the night before the day of the surgery as Venous thromboembolism prophylaxis; wearing compression stockings on lower limbs during surgery. The operation was performed in the supine position under general anesthesia. Starting with insufflation of the abdomen by a Veress needle at the left upper quadrant to create a pneumoperitoneum. The intra-abdominal pressure was maintained at 15 mmHg. Six ports were inserted under vision starting from the 12 mm left supraumbilical port, one 10 mm trocar were installed in the right mesogastric along midclavicular line, one 5 mm trocar in hypochondriac region, one 5 mm trocar in epigastric area and two 5 mm trocars in left flank. The trocars disposition is the same for all bariatric surgeries. Intraoperatively, the SG was started with the dissection of the greater omentum close to the stomach wall starting at 4 cm from the pylorus and continuing along the greater curvature to the Angle of His, using an ultrasonic scalpel. Normally, that would be followed by gastric division, but we started by approaching the gastric lesions assisted by intraoperative UE (Fig. 1). The lesions were identified by endoscopist with 2 ml of methylene blue (MB) diluted in 8 ml of purified water (Fig. 2). The lesions were also identified, during the laparoscopy, through endoscopic transillumination (Fig. 3). The dissection of the most distal lesion up to the stomach mucosa was successfully identified with MB (Figs. 3–5). Then, vertical gastric division was resumed, which occurred with the creation of a 150 cm<sup>3</sup> pouch, using an automatic stapler applied alongside the calibrating 32-French bougie introduced by the anesthesiologist. After the gastric division, MB is injected by the anesthesiologist through the tube to check for leaks in the gastric sleeve, which was not verified. Subsequently, a stapler line reinforcement by adsorbable suture over-sewing was performed, followed by fixation of the omentum to the gastric sleeve. No routine/prophylactic drain was

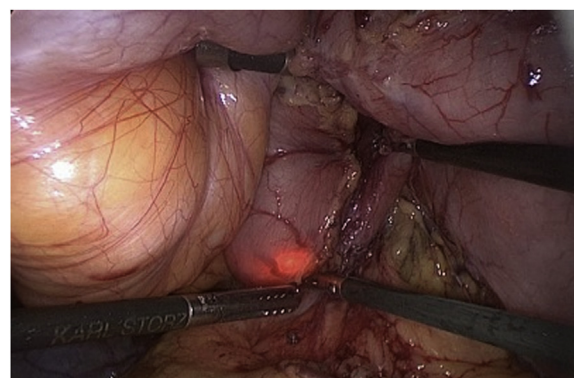


Fig. 3. Video-laparoscopic view with endoscopic transillumination of the region to be dissected.

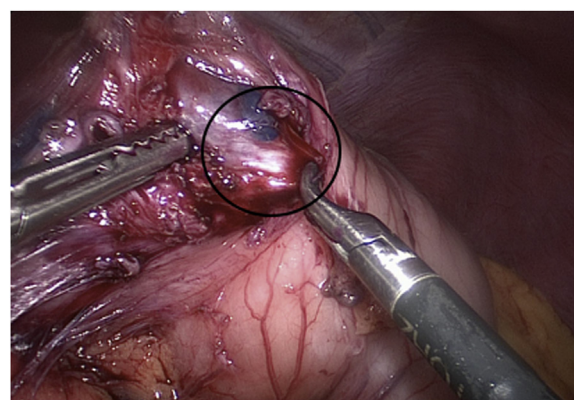


Fig. 4. Distal lesion (antrum-pyloric) dissection.

used. The resected stomach was removed from the 12 mm port. The most proximal lesion was removed along with the stomach removal. A second test was performed to check for leaks in the gastric sleeve: failure to inflate the stomach removed with gas can also indicate leaks in the gastric sleeve, which did not occur. Closure of the 12 mm port fascia was done using Vicryl. The skin incisions were closed using Nylon. The surgery was uneventful and was performed by the team, consisted of 3 experienced in laparoscopy bariatric surgeons.

The patient had a good postoperative evolution without complications. Postoperative care consisted of administration of

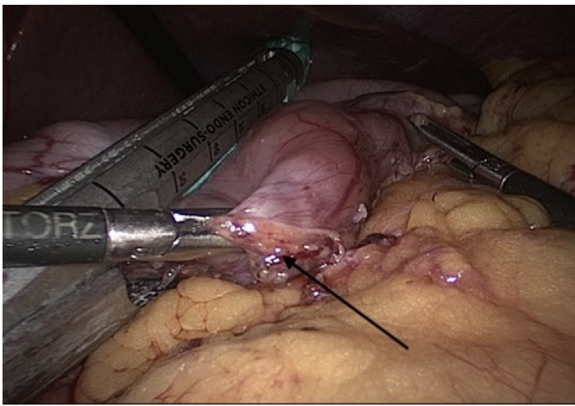


Fig. 5. Gastric division using automatic stapler including the proximal lesion.

proton-pump inhibitor and enoxaparin both at a prophylactic dose from the immediate postoperative period and throughout hospital stay and stimulation of early ambulation on the 1<sup>st</sup> postoperative day. As this is an initial bariatric surgery service, a more conservative routine was adopted, with the implementation of a liquid diet in small quantities only on the 3<sup>rd</sup> postoperative day and hospital discharge on the 4<sup>th</sup> postoperative day. The patient's evolution after the hospital discharge was favorable, with no complications at 3 months and 6 months postoperatively and was losing acceptable weight to these time periods. The patient remains in follow-up and is satisfied with the result of the treatment. The anatomopathological study of the specimen confirmed the diagnosis: "pancreatic tissue heterotopia (complete form) on the gastric wall".

### 3. Discussion

The diagnosis of EP is an incidental finding in endoscopies, abdominal surgeries or autopsies. The most common location is in the stomach, particularly in the antrum. Other locations include the duodenum, jejunum, Meckel's diverticulum, ileum, liver, spleen, biliary tract, and the mesentery [1] among others. It is a rare lesion, occurring in 0.9% of gastrectomies [2] and 0.5% in bariatric surgeries [5]. However, it has been observed that the lesion is not so uncommon in autopsies, with an incidence varying from 1 to 13% [1].

The pathogenesis remains unknown. There are theories that correlate the presence of EP to defects in the migration of pancreatic tissues; metaplasia from endodermal tissues in embryogenesis or genetic mutations [1,10].

Most patients with GEP have no complications. However, when present, they can manifest clinically as obstruction [4,11], bleeding, pain, infection [12] and, rarely, malignancy [3,13].

The diagnostic suspicion of GEP is based on endoscopic and radiographic findings. In the stomach, the most common location is in the greater curvature of the antrum and the typical endoscopic presentation is an extra-mucosal, intramural endoluminal growth lesion, with a wide base and smooth surface, which may show central umbilication. It rarely has an ulcerated appearance. Superficial biopsy by EUS is often inconclusive. Due to its subepithelial location, its main differential diagnosis is the GIST. The EUS allows the characterization of the lesion morphology and location on the intestinal wall: hypochoic submucosal nodule. Moreover, the EUS allows biopsy by fine needle aspiration [10].

On the contrasted radiography, 20% of GEP lesions typically shows a central barium-filled pit, or umbilication [10]. Computed tomography has a sensitivity close to 100% and a specificity of 85%, when two or more of the following criteria are present: pre-pyloric or duodenal antral location; ill-defined borders; endo-

luminal growth; enhancement of the overlying mucosa; ratio > 1.4 between the largest and the smallest diameters [14]. The use of these criteria contributes to diagnostic differentiation between GEP and GIST. However, the definitive diagnosis is obtained through the anatomopathological study [1].

Surgical treatment is usually reserved for complications [1]. However, for lesions larger than 3 cm, lesions with histopathological evidence of malignancy or those present in the muscle itself, either subserous or serous, even if they are asymptomatic, must be resected, preferably by laparoscopic access [15,16]. Similarly, lesions incidentally identified during the surgical procedure should also be treated [8].

The protocol of the Bariatric and Metabolic Surgery Service of Hospital José Martiniano de Alencar (HMJMA) recommends the performance of UE for all patients undergoing preoperative evaluation. This conduct aims to identify, mainly, the presence of Gastroesophageal Reflux Disease and its complications. Although scientific publications have reported the incidental intraoperative diagnosis of GEP, the use of routine UE allows the diagnosis of rare gastric lesions in the preoperative period. The previous identification of these lesions provides better preoperative surgical planning, resulting in a lower incidence of complications.

Although the patient was asymptomatic, the lesions were resected, as there was no specific diagnosis. Through a minimally-invasive surgery, the bariatric surgery was performed, associated with resection of the lesions, with the aid of intraoperative UE. During the surgical procedure, it was possible to include one of the lesions in the SG surgical specimen. The other lesion, located in the antrum-pyloric region, was resected separately to prevent the occurrence of stenosis in the remaining stomach. Similarly, Ahmad et al. mentions the use of intraoperative UE as a tool to help the surgical team identify the precise location of the lesion [7]. In this specific case, the antrum-pyloric lesion 'tattoo' with MB was also used (Fig. 2).

The use of this surgical strategy allowed the SG to be performed, unlike other studies [7,8]. This procedure has a lower rate of complications and allows endoscopic monitoring of the remaining stomach.

### 4. Conclusion

The surgical strategy for gastric lesions considered rare, such as the Gastric Ectopic Pancreas, may involve resection by video-laparoscopy with the aid of intraoperative Upper Endoscopy and, at the same time, a Sleeve Gastrectomy.

### Declaration of Competing Interest

The authors report no declarations of interest.

### Funding

This work was supported by the authors themselves.

### Ethical approval

This study obtained ethical approval.

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### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

### Author contribution

Bruno G. B. Silva: Conception and design study, Literature Review, Data collect including images, Analysis and/or data interpretation, Writing the manuscript and references, Final review and approval, Translation.

Adriano V. Oliveira: Conception and design study, Analysis and/or data interpretation, writing the manuscript, Final review and approval.

Antonio Gláucio S. Nóbrega: Conception and design study, Methodology (Surgery), Analysis and/or data interpretation, Writing the manuscript, Final review and approval.

Marcio A. S. Jucá: Methodology (Surgery), Final review and approval.

Paulo. M. Lopes: Conception and design study, Methodology (Surgery), Final review and approval.

José Walter F. Gomes: Conception and design study, Final review and approval.

André A. A. Barros: Conception and design study, Methodology (Upper Endoscopy), Final review and approval.

### Registration of research studies

This study is not first-in-man or animal case report.

### Guarantor

Bruno Gadelha B. Silva is the guarantor and accepts full responsibility.

### Provenance and peer review

Not commissioned, externally peer-reviewed.

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