Unveiling the Masquerade: Early Gastric Cancer Mimicking Advanced Disease with Ectopic Pancreas Intrusion

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Gastric cancer is a significant health concern worldwide, and its diagnosis and management are of paramount importance. Ectopic pancreas (EP) refers to an embryological abnormality where healthy pancreatic tissue develops without anatomical, vascular, or neural communication with the normal pancreas. We report the case of a patient whose initial endoscopic evaluation suggested early gastric cancer, but computed tomography scan (CT scan) and endoscopic ultrasound (EUS) indicated a locally advanced tumor. After a collegial evaluation and in accordance with the main diagnostic suspect, the patient underwent laparoscopic subtotal gastrectomy with D2 lymphadenectomy and Roux-en-Y reconstruction. Histopathological analysis post-surgery revealed an early-stage T1b gastric cancer coexisting with ectopic pancreatic tissue. The presence of ectopic pancreas in the stomach is a rare but noteworthy entity, often presenting a diagnostic challenge due to its varied clinical and histological features. Our case report aims to shed light on this condition by presenting a detailed clinical case, including clinical presentation, imaging findings, histological features, and treatment outcomes. Always improving our endoscopic practice and seeking an early diagnosis is the way to avoid post-staging surprises and misdiagnoses.

Keywords: gastric cancer; aberrant pancreas; rare location; staging; endoscopic diagnosis; failure of imaging techniques

Introduction

Gastric cancer is the fifth most diagnosed malignancy worldwide and is usually staged by computed tomography (CT), endoscopic ultrasound, Positron Emission Tomography (PET), and laparoscopy [1]. Although incidence rates are declining in most countries, the number of gastric cancer diagnoses is expected to increase in the future due to aging populations [2].

An adequate staging of early gastric cancer can lead to curative endoscopic resection. The main criteria to identify lesions suitable for endoscopic resection are early T-stage, tumor size, grade of differentiation, and presence of ulceration.

Ectopic pancreas (EP) refers to an embryological anomaly characterized by the presence of healthy pancreatic tissue that lacks anatomical, vascular, or neural connections with the normal pancreas [3]. EP develops in the gastrointestinal tract (90%), biliary system, liver, lung, mediastinum, and brain [4]. Within the gastrointestinal tract, the most common site for heterotopic pancreatic tissue is the stomach, followed by the duodenum (25–35%) and jejunum (16%) [5].

Most of the specimens found on endoscopic ultrasound are located within the submucosal layer of the antrum and prepyloric region on the greater curvature or posterior wall. Still, it can also be found in the muscular (17%) or subserosal (10%) layers, and differentiating this entity from other mesenchymal tumors such as gastrointestinal stromal tumors (GISTs) may prove a challenge—taking into account that tissue specimen usually cannot be obtained with standard endoscopic biopsy technique [6, 7].

Ectopic pancreas is usually found incidentally, is asymptomatic, and malignant transformation is extremely rare [5] so in the absence of symptoms this entity is generally regarded as benign, and surgery or endoscopic resection is not necessary.

Case Report

A 60-year-old woman sought our attention for a follow-up endoscopy due to chronic atrophic gastritis and low-grade dysplasia, both identified incidentally through random biopsies. Interestingly, no lesions were endoscopically visible.

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Fig. 1. Esophagogastroduodenoscopy revealed a 20 mm slightly elevated area localized at the body-antrum passage.

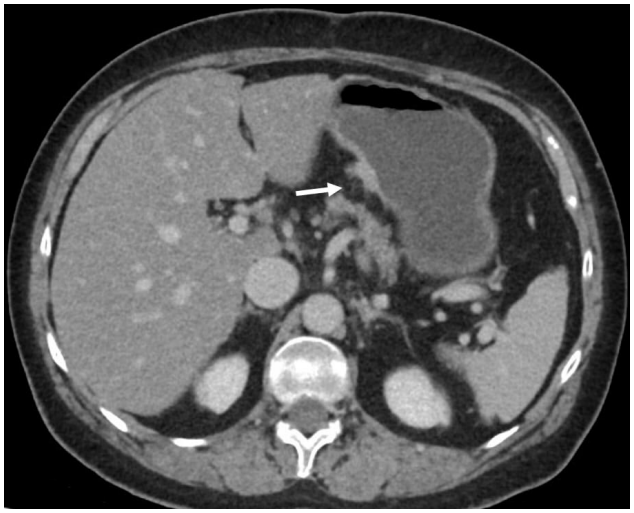

Fig. 2. Focal thickening of the gastric lesser curvature wall with digitations extending to the perivisceral fat (white arrow). Axial portal phase image.

Her medical history is notable for childhood appendectomy, open cholecystectomy, right ovariectomy, and a prior intestinal resection for a benign condition. Adding a layer of complexity, her family history includes a cousin who succumbed to gastric cancer at 72 years old and another cousin who, at 70 years old, underwent surgery for gastric cancer. On physical examination, the patient appeared generally well, without any complaints of abdominal pain or palpable masses. Further investigation through laboratory tests, including serum tumor markers such as carcinoembryonic antigen (1.1 ng/mL) and cancer antigen 19-9 (25.2 U/mL), revealed values within the normal range.

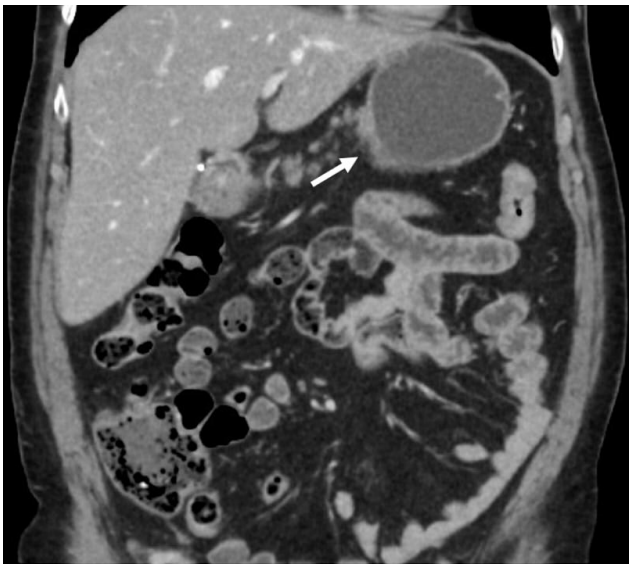

Fig. 3. Coronal view of the gastric wall thickening (white arrow). Portal phase image.

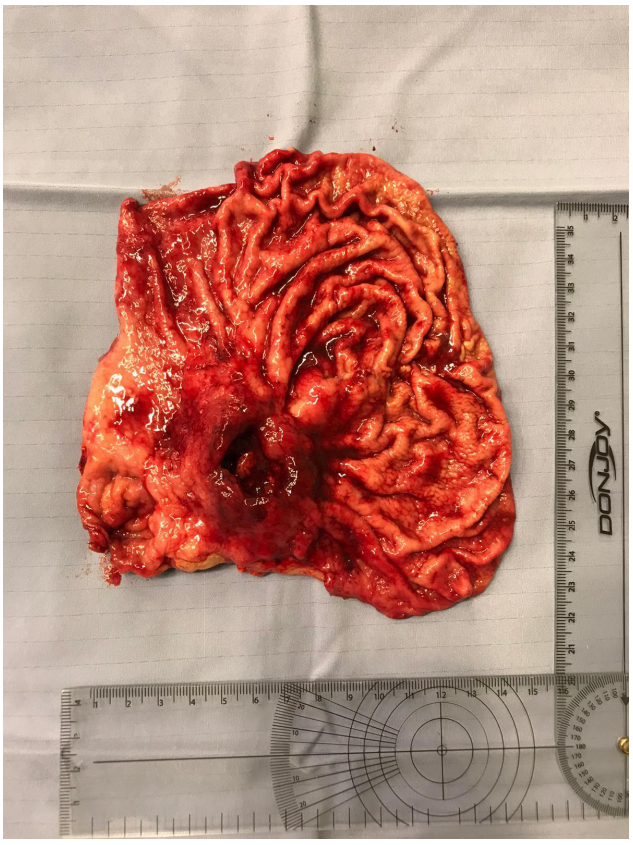

Fig. 4. Surgical specimen: Subtotal gastrectomy. Stomach measuring 8 cm along the lesser curvature and 16 cm along the greater curvature. 6 cm from the margin there is a 1.5 cm area of thickened mucosa.

Imaging and Staging

Esophagogastroduodenoscopy performed in September 2020 revealed hyperemic and dyschromic mucosa in the

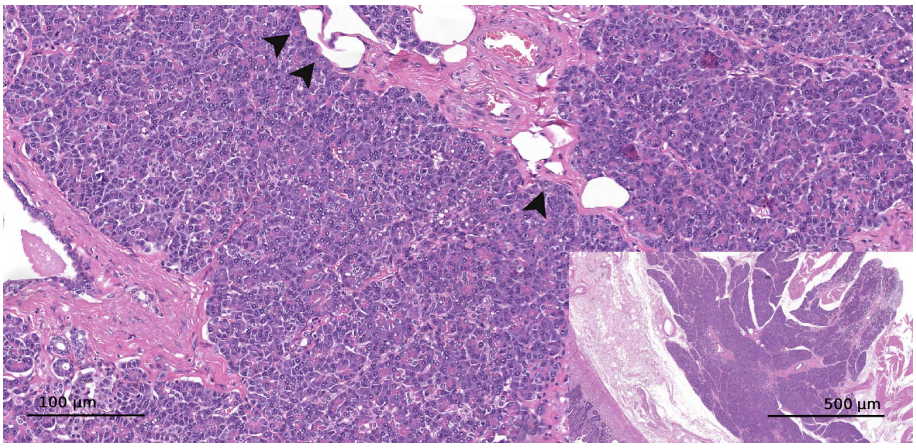

Fig. 5. Ectopic pancreatic tissue is located in the deeper layers of the stomach (small picture on the bottom right, magnification 20×). Pancreatic tissue is represented at a higher power field (magnification 100×) and the arrowheads indicate the normal acinar component.

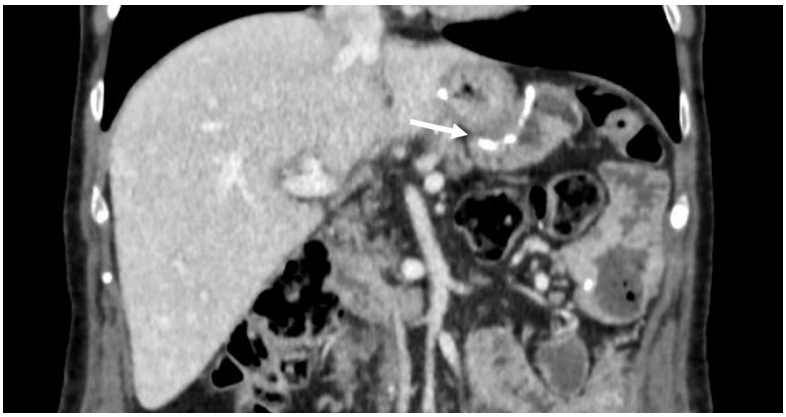

Fig. 6. Computed Tomography scan of the patient, showing the gastric remnant and the gastro-enteric anastomosis (white arrow), without signs of recurrence or loco-regional lymphadenopathy.

antrum due to diffuse intestinal metaplasia; white-light evaluation and chromoendoscopy allowed the identification of a slightly elevated area (type 0-IIa according to Paris Classification) of 20 mm of maximum dimension localized at the body-antrum passage (Fig. 1). Targeted biopsies confirmed the diagnosis of gastric ulcerated carcinoma, diffuse type according to Lauren Classification and poorly cohesive according to World Health Organization classification 2019 [8].

Subsequent CT showed an enhanced 17 mm lesion involving the whole gastric wall; therefore, at radiological staging, it appeared as cT3 cancer (Figs. 2,3). Small and rounded lymph nodes were also visible in the contiguous adipose tissue. No metastatic localizations were detected. Considering the first endoscopy suggesting early cancer in disagreement with CT detection, the staging was completed by endoscopic ultrasound (EUS), which confirmed a locally advanced cancer with complete disruption of gastric wall stratification, leading to a uT3N0 stage.

The case was reviewed by an experienced multidisciplinary tumor board, considering the mismatch between endoscopic imaging and the radiological findings. Ultimately, given the primary diagnostic suspicion of locally advanced

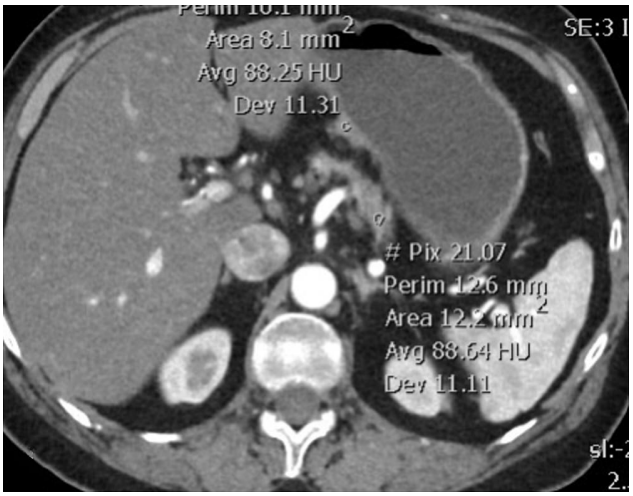

Fig. 7. The pathological thickening shows enhancement in the arterial phase similar to the pancreatic parenchyma (88HU).

gastric cancer without metastatic disease or peritoneal involvement, along with the patient's long-standing history of atrophic gastritis, age, and performance status, a careful assessment of the risks and benefits was conducted. Following the European Society for Medical Oncology guidelines, definitive surgical treatment was planned.

We chose a laparoscopic approach under general anesthesia, with the patient positioned supine and their legs separated. Pneumoperitoneum was created with an insufflation pressure of 10 mmHg, and five trocars were utilized. During the procedure, a gastroscope was employed to more accurately identify the tumor location and preserve as much stomach as possible while ensuring oncological radicality. A subtotal gastrectomy with D2 lymphadenectomy was performed, with Roux-en-Y reconstruction (Fig. 4).

Outcome and Follow-up

The postoperative course was complicated by an episode of hyperpyrexia linked to the appearance of a thickening area in the left basal lung area, effectively treated with broad-spectrum empiric antibiotic therapy with Piperacillin/Tazobactam 9 gr per die for seven days, and the patient was discharged on the 11th postoperative day.

Histological analysis surprisingly showed an early gastric cancer, Lauren diffuse type, poorly cohesive, T1b at Tumor-Node-Metastasis staging , and small mucosal submucosal type according to Kodama classification. The same tissue removed also included muscular and peritoneal layers containing ectopic pancreas (Fig. 5).

At the 24-month follow-up, the patient remained in good overall health, and subsequent CT imaging studies (Fig. 6) and endoscopy of the gastric remnant revealed no evidence of recurrence.

Discussion

This case reports a rare combination of early gastric cancer and ectopic pancreas. Previous authors already published similar case reports [6, 7, 9] but it is again an opportunity to reiterate the importance of early diagnosis of gastric cancer and accurate preoperative staging.

Ectopic or heterotopic pancreas is a pancreatic tissue that lacks anatomical and vascular connections to the original pancreas, and it is often asymptomatic and accidentally detected in the stomach, with an incidence rate across all sites that varies from 0.55% to 13.7% in autopsy study [10]. Complications are infrequent and malignant transformation is also rare [4] with an estimated incidence ranging from 0.7% to 1.8%. Järvi and Laurén [11] outlined three essential criteria for the diagnosis of carcinoma arising from heterotopic pancreatic tissue. First, the carcinoma must be located within the heterotopic pancreatic tissue. Second, there should be clear evidence of a direct transition between the pancreatic structures and the carcinoma. Finally, the non-neoplastic pancreatic tissue should contain fully developed acinar and ductal structures . European Society of Gastrointestinal Endoscopy (ESGE) guidelines recommend against follow-up for typical pancreatic rest in the gastric antrum [12].

This case diverges from the established criteria, as the early gastric cancer was a distinct pathological entity from the underlying heterotopic pancreas, and no histological alterations were detected in the heterotopic pancreatic tissue.

However, malignant evolution has been described and sometimes the association with gastric malignancies leads to unclear relationships and confusing evidence about potential evolution. Attempts have been made to demonstrate the possibility of differentiating gastric ectopic pancreas (GEP) from other gastric submucosal lesions using imaging techniques. These efforts have had moderate success, showing that the majority of GEPs appear as homogeneously extramucosal masses with similar or higher attenuation compared to the pancreas. This result may be attributed to the histological similarity of GEPs to normal pancreatic tissue, particularly acini [10].

Accurate endoscopic diagnosis means adequate time for mucosal inspection. Chronic atrophic gastritis and diffuse intestinal metaplasia are precancerous conditions while gastric dysplasia is a direct neoplastic precancerous lesion. Evaluating these kinds of patients should always require high-definition chromoendoscopy [11]. Western countries also need to ensure adequate training for performing high-quality endoscopy in this setting. Artificial intelligence has presented a new frontier in recent years in the diagnosis of gastrointestinal malignancies. Some evidence shows its possible role in the future management of chronic gastritis to increase diagnostic accuracy, simplify follow-up pathways, and even reduce costs [13].

Performing upper gastrointestinal endoscopy can sometimes bring to unusual benign findings that however must be recognized and evaluated.

In this case, CT imaging did not match the confident endoscopic finding for early-stage gastric cancer; the thickening involving the whole wall with signs of infiltration of the perigastric fat led to a tumor staging with an advanced T.

Only a retrospective review of the CT images could raise the question of the presence or concomitance of a non-neoplastic finding: the thickened gastric wall segment presented postcontrastography enhancement values measured in Hounsfield Units similar to the pancreatic parenchyma (Fig. 7). The millimeter-sized contiguous solid formations adjacent to the gastric wall thickening could be interpreted as lobes of the portion of the ectopic pancreas developing into the perivisceral fat. It should be emphasized that these are only considerations made a posteriori based on the anatomopathological report of radiological signs generally attributable to a locally advanced gastric tumor.

Conclusions

This case reports the uncommon occurrence of early gastric cancer in conjunction with ectopic pancreas, challeng-

ing the conventional diagnostic criteria, and stressing the complexity of interpreting imaging results and the importance of considering atypical benign findings during the diagnostic process to achieve an accurate preoperative staging. Vigilance is crucial in diagnostic approaches, particularly for cases that deviate from established norms. The integration of evolving technologies, such as artificial intelligence, holds promise for advancing the field of gastroenterology.

Availability of Data and Materials

All experimental data included in this study can be obtained by contacting the first author if needed.

Author Contributions

LSo, CF, and GE contributed to the conceptualization and supervision of this work. VZ drafted the manuscript and collected the data. GG, MS and PM have discussed and revised the data according to their field of competence. LSa provided the most appropriate pathological figures. All authors contributed to important editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This case report was conducted in accordance with the principles outlined in the Declaration of Helsinki. The patient's rights, dignity, and privacy were respected throughout the study, and written informed consent was obtained prior to the publication of any personal or clinical details.

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Conflict of Interest

The authors declare no conflict of interest.

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