CASE REPORT

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Dual-Focused Type I Heterotopic Pancreas in the Gastric Antrum: A Rare Case with Clinical-Anatomical Implications

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Abstract

Heterotopic pancreas (HP) is a rare congenital anomaly defined by pancreatic tissue outside the normal anatomical pancreas without ductal or vascular continuity. Although frequently asymptomatic, lesions located in the gastric antrum may produce dyspeptic symptoms and delayed gastric emptying because of their proximity to the pylorus. This study reports a case of a 40-year-old male with an exceptionally rare dual-focal Type I HP confined to the gastric antrum who recovered uneventfully following laparoscopic wedge resection. Endoscopic ultrasonography demonstrated a submucosal protrusion, and contrast-enhanced computed tomography revealed a 4-cm mass. Laparoscopic wedge resection was performed; however, intraoperative exploration revealed a second synchronous 2-cm lesion that was also excised. Histopathological evaluation confirmed Heinrich Type I HP with acini, ducts, and islets. Postoperatively, the patient recovered uneventfully and was discharged on day three. This case highlights the diagnostic challenge of antral lesions and emphasises the clinical relevance of anatomical localization, as even small lesions may cause symptoms when two foci coexist. Dual-focal antral involvement is exceptionally rare and contributes novel evidence to the literature.

Keywords: Heterotopic pancreas, gastric antrum, laparoscopy, submucosal tumor, case report

INTRODUCTION

Heterotopic pancreas (HP), also termed ectopic or aberrant pancreas, is characterised by pancreatic acinar and/or ductal tissue residing outside the pancreas without anatomical continuity. HP is seen in 0.5-14% of autopsies.[1,2] The stomach, particularly the antrum, the duodenum, and the jejunum are the most frequent sites.[3] Most lesions are solitary and asymptomatic, but those located close to the pyloric canal may obstruct gastric emptying or mimic other submucosal tumours, including gastrointestinal stromal tumour (GIST) or neuroendocrine tumour.[3,4] Two synchronous lesions in the same gastric segment are extremely uncommon and have important diagnostic implications. From an embryological perspective, HP is believed to arise from abnormal migration, separation, or persistence of pancreatic tissue during foregut rotation and pancreatic bud development. During normal embryogenesis, the dorsal and ventral pancreatic buds rotate and fuse; disruption of this process may lead to ectopic pancreatic tissue being embedded within the gastric wall, particularly in foregut-derived regions such as the antrum.[3,5]

CASE REPORT

A 40-year-old male patient presented to the gastroenterology outpatient clinic with intermittent epigastric pain for approximately three years. The pain was unrelated to meals and there was no history of weight loss, haematemesis, melena, nausea or vomiting. Physical examination was normal, and laboratory tests showed no pathology. Serum amylase and lipase levels were within normal limits. Endoscopic ultrasound

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revealed a submucosal bulge (Figure 1). Contrast-enhanced abdominal computed tomography (CT) showed a 4-cm submucosal lesion near the greater curvature of the gastric antrum (Figure 1). At this stage, it was considered a single HP. A laparoscopic wedge resection was planned; during the operation, a second 2-cm mass was detected on the greater curvature of the gastric antrum. Both masses were excised laparoscopically. The postoperative course was uneventful, and the patient was discharged on the third day. Macroscopic examination of the resection specimens revealed that the specimens measured 7.5×2×2 cm and 6×2×2 cm and contained masses measuring 3×1.7×1.7 cm and 2.6×1.6×1.6 cm, respectively (Figure 2). Microscopic examination revealed acini, ducts, and islets of Langerhans in the submucosa and muscularis propria, beneath the normal gastric mucosa (Figure 3). The findings were consistent with Heinrich Type I HP. Following the acquisition of written informed consent, the patient's clinical data and imaging findings were included in this case report for publication.

DISCUSSION

HP is often diagnosed incidentally and remains asymptomatic in many patients. Its clinical significance becomes evident when lesions involve functional regions of the gastrointestinal tract, particularly the gastric antrum. Given the antrum's key role in gastric propulsion and pyloric regulation, even small submucosal lesions may cause dyspepsia or epigastric pain. In our case, antral localization likely explains the patient's long-standing symptoms, supporting previous reports that anatomical location may be more clinically relevant than lesion size alone.[1,3]

The classification introduced by von Heinrich[5] remains the foundation for histologic diagnosis. Type I HP, as identified in both masses in this patient, contains acini, ducts, and pancreatic islets, representing a fully constituted pancreatic unit.[5] This composition suggests potential for both endocrine and exocrine activity, which may contribute to mucosal irritation, cyst formation, recurrent microinflammation, or, albeit rarely, malignant transformation. Importantly, the risk of malignant transformation is exceedingly low, particularly in the absence of dysplasia, as observed in the present case. While dysplasia was not identified in our case, the presence of two synchronous Type I foci increases the theoretical biological activity and the cumulative mass effect. This adds weight to the decision to perform surgical resection, particularly in symptomatic patients or those with uncertain radiologic differentiation. The presence of two independent HP foci within the same gastric segment may also be explained by embryological mechanisms. Abnormal foregut rotation or fragmentation of pancreatic tissue during pancreatic bud migration could result in multiple pancreatic tissue deposits along the developing gastric wall. This embryological interpretation supports the concept that multifocal HP may be underrecognized rather than truly rare.[5]

Preoperative identification of HP remains challenging. Although endoscopy, CT, and endoscopic ultrasonography (EUS) are valuable in delineating submucosal growth patterns, radiologic overlap with GIST, leiomyoma, lipoma, and neuroendocrine tumours is well recognised.[3,6]

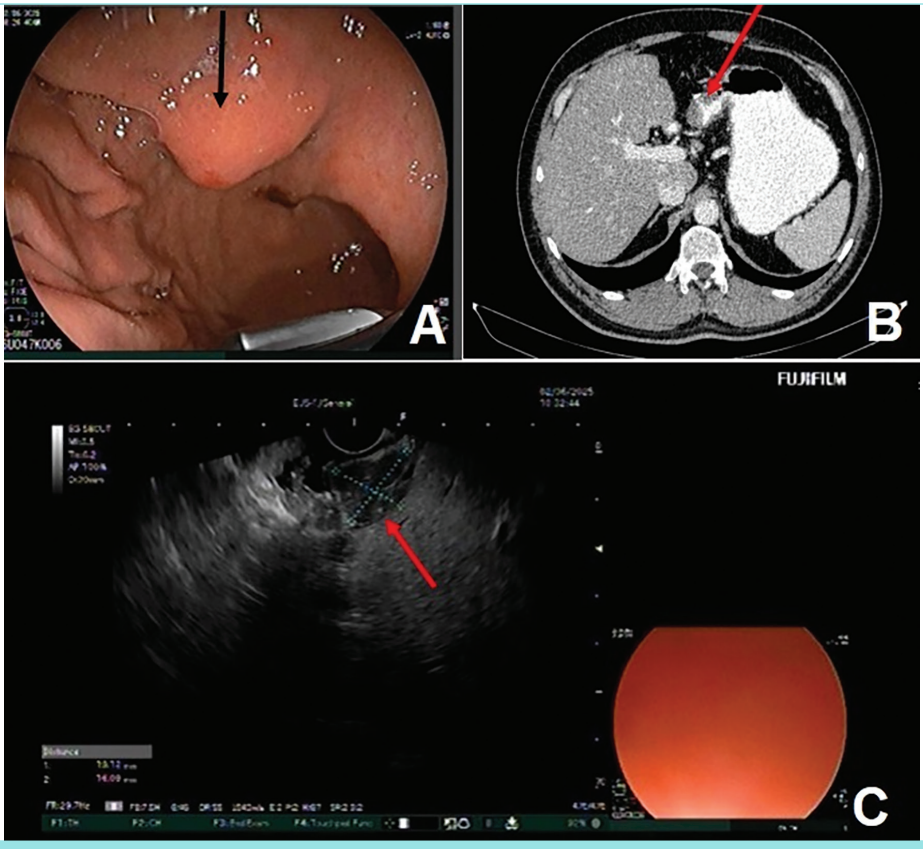

Figure 1. Images of HP in the stomach antrum. **A.** Mucosal bulging associated with a submucosal mass on endoscopy. **B.** Submucosal mass in the stomach antrum on abdominal CT. **C.** Origin of the lesion from the submucosal layer on endoscopic ultrasonography (EUS).

HP: Heterotopic pancreas, CT: Computed tomography.

HP may appear as a homogeneous subepithelial lesion on CT, while EUS often demonstrates a hypoechoic or mixed-echogenicity structure originating from the submucosa or muscularis propria. However, radiological accuracy can decrease when lesions are small, flat, multilayered, or multifocal. This was exemplified in our case, in which the second mass remained undetected until laparoscopic exploration despite clear preoperative visualisation of the primary lesion (Figure 1). Endoscopic ultrasound-guided biopsy or fine-needle aspiration was not performed in this case because the lesions were localized deep in the submucosa and muscularis propria, where diagnostic yield is limited and procedural risk may be increased. This reinforces the importance of careful intraoperative inspection of the entire antral circumference, especially when initial imaging suggests a single mass.

From a surgical perspective, persistent symptoms, lesion growth, or diagnostic uncertainty warrant intervention. Laparoscopic wedge resection is a safe and effective approach, associated with low morbidity and rapid recovery.[1,4] The uneventful postoperative course in our case

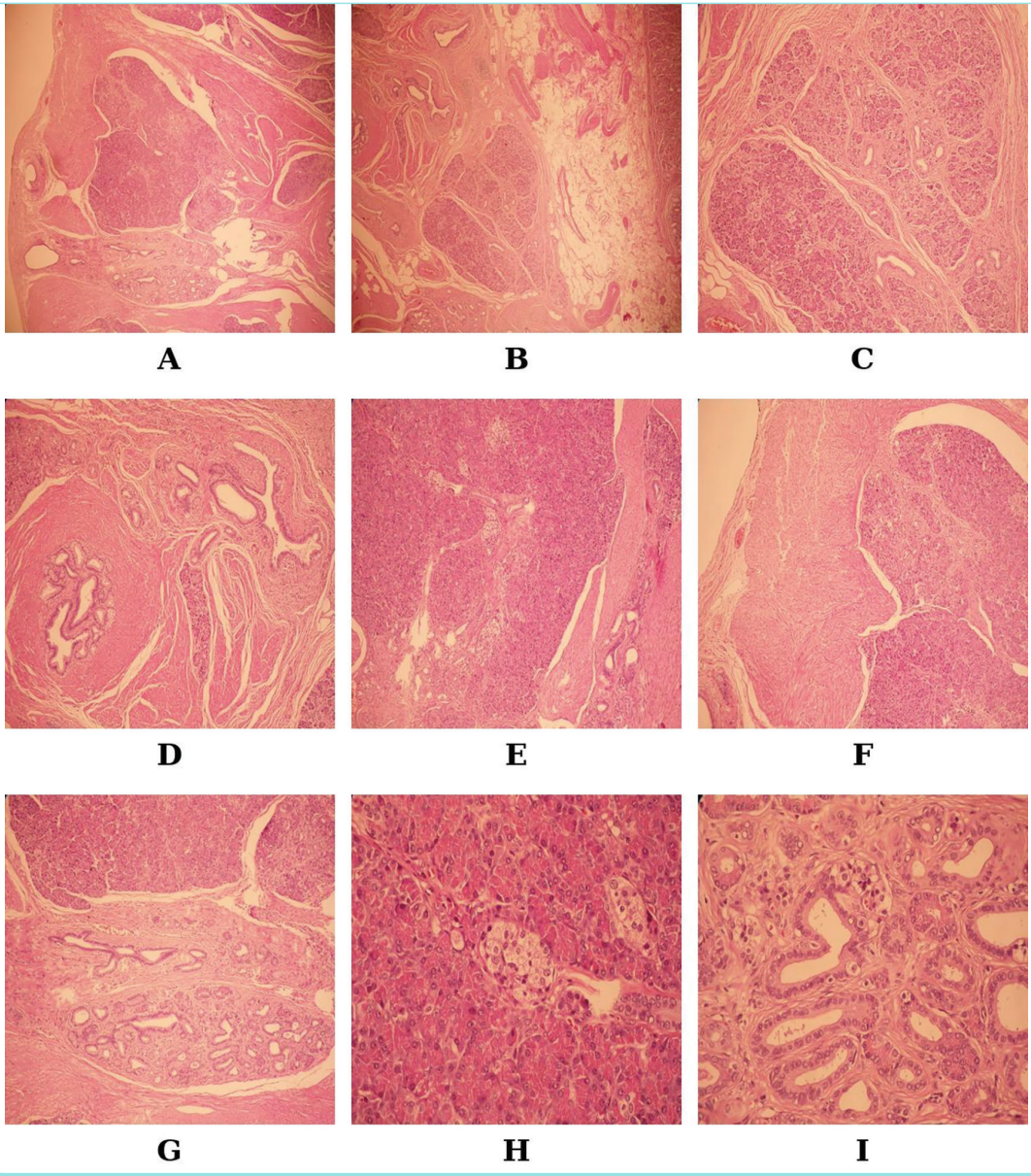

Figure 2. Histopathological appearance of Type I HP in the stomach antrum. **A.** At low magnification, heterotopic pancreatic tissue containing all components within the muscularis propria (Haematoxylin-Eosin, ×4). **B.** Low magnification, pancreatic tissue beneath the submucosa and within the muscularis propria (Haematoxylin-Eosin, ×4). **C.** Medium magnification, acini, ducts, and islets (Haematoxylin-Eosin, ×10). **D.** Ducts and acini within the muscularis propria at medium magnification (Haematoxylin-Eosin, ×10). **E.** Acini, islets, and ducts at medium magnification (Haematoxylin-Eosin, ×10). **F.** Acini at medium magnification (Haematoxylin-Eosin, ×10). **G.** Acini and ducts at medium magnification (Haematoxylin-Eosin, ×10). **H.** Acini, two islets, and one duct at high magnification (Haematoxylin-Eosin, ×40). **I.** Pancreatic ducts at high magnification (Haematoxylin-Eosin, ×40).

HP: Heterotopic pancreas.

Figure 3. Two submucosal masses in the gastric antrum following laparoscopic resection (macroscopic appearance).

further supports the use of minimally invasive excision, which also provides a definitive histopathological diagnosis.

Dual-focal gastric HP is exceptionally rare. Most published reports describe solitary HP tissue, most commonly located in the gastric antrum, whereas the simultaneous presence of two gastric foci has been reported only sporadically.[1,6] Large literature reviews and recent case series indicate that approximately 85-95% of gastric HP cases are localized to the antrum and that most lesions correspond histologically to Type I HP.[1,3,7]

Yie et al.[6] reported a rare case of synchronous ectopic pancreatic tissue involving two separate gastric regions-the cardia and the antrum-in a 45-year-old male; the lesions were detected incidentally on imaging. In contrast, the present case demonstrates two distinct Type I HP foci confined to the same anatomic segment of the gastric antrum in a 40-year-old male with long-standing abdominal pain. Unlike previously reported cases that were incidental or spatially separated, both lesions in our patient were located in the antrum and clinically relevant.

This finding highlights that HP may present as multifocal disease within a single gastric segment despite preoperative imaging suggesting a solitary lesion, and underscores the importance of including HP in the differential diagnosis of antral submucosal masses and performing careful surgical exploration.[1,3,6]

CONCLUSION

This case underscores the rarity of dual-focal HP in the gastric antrum and highlights the diagnostic value of recognising such presentations within the broader spectrum of pancreatic ectopia. Beyond reiterating known clinical features, this report contributes to the understanding of heterotopic tissue behaviour by demonstrating that multifocality can exist within a single gastric segment and may remain undetected on preoperative imaging.

By documenting two independent Heinrich Type I pancreatic foci confined to the same anatomic region, this case expands current morphological and embryological perspectives on HP. It emphasizes the importance of careful evaluation of submucosal gastric masses and suggests that multifocal HP may be underdiagnosed, rather than truly rare, particularly when lesions are small or asymptomatic.

Ultimately, this case uniquely demonstrates dual, synchronous Heinrich Type I HP confined to the same gastric segment, suggesting that multifocality may exacerbate functional symptoms despite the small size of individual lesions. Accumulation of additional cases and long-term follow-up are needed to clarify the clinical significance of dual-focus HP.

MAIN POINTS

- Gastric antral heterotopic pancreas (HP) can cause chronic epigastric symptoms and mimic other submucosal tumors.
- Preoperative imaging may identify only the dominant lesion. Synchronous foci can be detected only intraoperatively.
- Dual Heinrich Type I HPs (acini-ducts-islets) within the same anatomic segment are exceedingly uncommon.
- Careful circumferential inspection of the antrum during minimally invasive surgery may prevent missed lesions.

ETHICS

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

Footnotes

Authors Contributions

Surgical and Medical Practices: M.S., Concept: Z.K.B., Design: Z.K.B., T.E., Data Collection and/or Processing: M.S., T.E., Analysis and/ or Interpretation: Z.K.B., M.S., T.E., Literature Search: Z.K.B., M.S., T.E., Writing: Z.K.B., M.S., T.E.

DISCLOSURES

Conflict of interest: No conflict of interest was declared by the authors.

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