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Annular pancreas presenting as gastric outlet obstruction in adult: A rare case report

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Abstract

Annular pancreas (AP) is a rare congenital anomaly where pancreatic tissue encircles the duodenum. While typically presenting in infancy, adult-onset AP is uncommon and often masquerades as other upper gastrointestinal pathologies, making it a diagnostic challenge. This report highlights an adult case of AP presenting with classic gastric outlet obstruction.

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Introduction

The annular pancreas (AP) is a rare congenital anomaly characterized by a ring of pancreatic tissue that partially or completely encircles the second part of the duodenum. Arising from a failure of the ventral pancreatic bud to rotate properly during 5-7 weeks of gestation, AP a diagnostic challenge due to its infrequent occurrence and varied presentation.[2]

While often identified in the neonatal period as acute duodenal obstruction, adult presentation is rare. Systematic reviews suggest that individuals remain asymptomatic until 3rd to 4th decade of life, with symptoms often mimicking peptic ulcer disease or pancreatitis.[3] However, a particularly common presentation is gastric outlet obstruction (GOO), where extrinsic compression of the duodenum leads to persistent vomiting and postprandial fullness.[4] In rare instances, it may even present as upper gastrointestinal bleeding.[1]

This case report describes a unique instance of an adult patient presenting with classic signs of GOO, which turned out to be because of AP. Use of advanced imaging and clinical correlation, we aim to highlight the importance of this embryological malformation in the differential diagnosis of GOO in adult.

Case report

A 56-year-old male presented to the emergency department with generalized abdominal pain for one year relieved by proton pump inhibitors and postprandial, non-projective vomiting for 14 to 15 days. The patient had a history of hypertension for two years, for which he was not taking medication.

On examination, the patient was thin-built (BMI: 18.31 kg/m²) with normal vital signs. Abdominal examination revealed mild epigastric tenderness and a positive succussion splash. Bowel sounds were normal. Per rectal examination was unremarkable.

Upper gastroduodenal endoscopy revealed a bezoar obstructing the pyloric lumen. Abdominal ultrasound showed a distended stomach with to-and-fro moving contents and a tubular hyperechoic area in the pancreatic head. Contrast-enhanced computed tomography demonstrated a dilated stomach and duodenal bulb with pancreatic tissue surrounding approximately 180 degrees of the second part of the duodenum, creating a "crocodile jaw" appearance and luminal narrowing. These findings were consistent with gastric outlet obstruction secondary to an incomplete annular pancreas, Figure 1.

Exploratory laparotomy confirmed the diagnosis of annular pancreas covering 180 to 270 degrees of duodenum with pyloric narrowing. Pyloric exclusion with stapled gastrojejunostomy (GJ) and jejunojejunostomy (JJ) was performed, Figure 2. Right pelvic and left peri-splenic drains were placed.

The postoperative course was uneventful. At discharge, vomiting and abdominal pain had resolved. Patient was advised on dietary modifications and scheduled for follow-up.

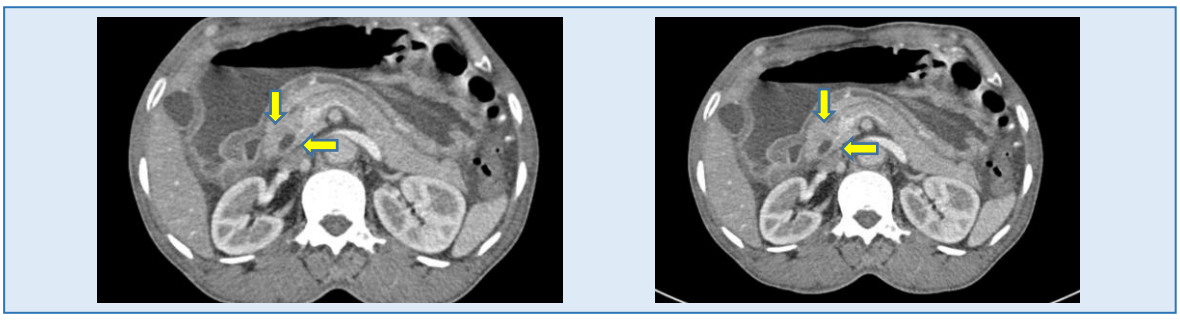

Figure 1. Contrast-enhanced computed tomography (CECT) showing dilated stomach and duodenal bulb, pancreatic tissue surrounding the left lateral wall of the duodenum 2nd part with narrowing duodenum (crocodile jaw appearance)

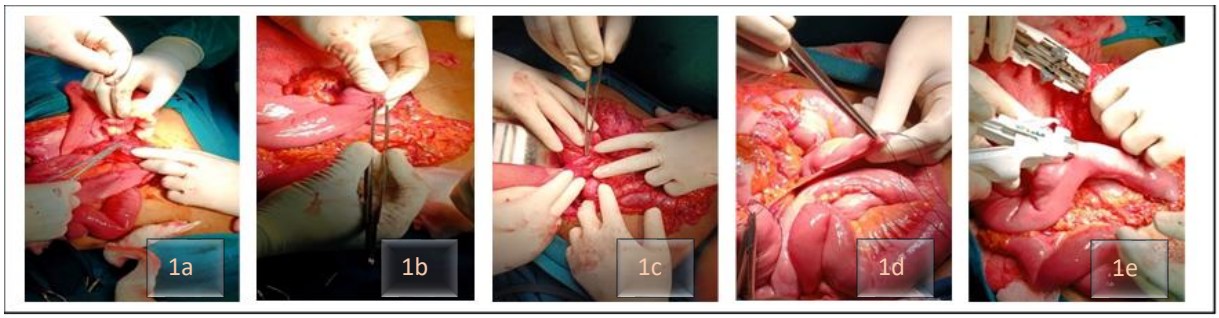

Figure 2. Laparotomy for gastric outlet obstruction (GOO) due to annular pancreas (AP); 1a and 1b- gastro-jejunostomy (GJ) and jejuno-jejunostomy (JJ); 1c- forceps showing pancreatic tissue; 1d and 1e- Stapled GJ

Discussion

This report details the case of a 56-year-old male with GOO secondary to a previously undiagnosed AP. His presentation aligns with the classic adult symptomatology of AP, which includes vague abdominal pain and symptoms of proximal intestinal obstruction, often leading to initial misdiagnosis as peptic ulcer disease or pancreatitis.[3,4] Adult-onset AP is rare, with an estimated incidence between 0.005 and 0.015 percent,[3] and symptoms typically emerge in the third to sixth decades of life.

Two prominent theories have been proposed regarding its embryological origin. Lecco's theory proposes that the right ventral bud adheres to the duodenal wall and becomes stretched and elongated after rotation, resulting in encirclement of the duodenum.[1] Baldwin's theory proposes that the left ventral bud persists and migrates around the duodenum in opposite directions, then fuses with the dorsal bud, encircling the duodenum.[1]

Diagnosis of AP has evolved with imaging technology. Historically, diagnosis relied on ERCP or laparotomy,[1] whereas non-invasive modalities such as CECT and magnetic resonance imaging (MRI) are now the main approaches. Characteristic findings include pancreatic tissue encircling the duodenum, often described as the "crocodile jaw" sign on axial images, which was clearly demonstrated in this case.[5,6] CECT is also helpful in excluding other causes of GOO, making it a suitable first-line investigation.

Management of symptomatic AP is exclusively surgical, with the goal of bypassing the duodenal obstruction. In neonates, duodenoduodenostomy is preferred due to duodenal mobility. In adults, however, the most common and recommended procedure is duodenojejunostomy (DJ), which maintains physiological alimentary continuity and carries a lower risk of marginal ulceration compared to GJ.[7,8] The patient in this case underwent a modified approach with pyloric exclusion and GJ due to the degree of pyloric narrowing and intraoperative findings of dense peri-duodenal inflammation. This highlights an important surgical principle: while DJ is generally recommended for adults,[1,8] the choice of procedure must be individualized based on anatomical findings, presence of inflammation, and surgeon expertise. Case series demonstrate that both DJ and GJ provide excellent long-term symptom relief.

This case illustrates several key learning points: first, AP, though rare, should be included in the differential for adult GOO, especially when symptoms are chronic and partially responsive to acid suppression; second, CECT is a highly effective first-line imaging tool that can demonstrate pathognomonic findings such as the "crocodile jaw" sign; and third, surgical planning requires flexibility, with DJ being the preferred approach but alternative bypass procedures remaining valid options in specific contexts. A limitation of this case report is the lack of long-term follow-up data to assess the durability of the surgical bypass, which would be valuable given the modified approach used.

Conclusion

Annular pancreas, though rare, should be considered in adults presenting with gastric outlet obstruction of unclear aetiology. Cross-sectional imaging, particularly CECT, aids in preoperative diagnosis by revealing characteristic findings such as the crocodile jaw sign. Surgical bypass, individualized to patient anatomy and intraoperative findings, provides effective symptom relief.

Author contribution

Conception, design: BPK, KDB; Data acquisition: BPK; Data analysis, interpretation: BS; Drafting: BPK, BS; Revision: BPK, KDB; Final approval of the version to be published: All; Agreement to be accountable for all aspects of the work: All.

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Conflict of interest

None

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Supplementary material

Data and supplementary material that support the findings of this study are available from the corresponding author upon reasonable request.

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