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Chronic Pancreatitis in Annular Pancreas: A Case Report

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Abstract **Case Report**

Annular pancreas is a rare congenital anomaly that can remain asymptomatic until adulthood or manifest with various digestive symptoms. Its association with chronic pancreatitis is uncommon but clinically significant. We report the case of a 63-year-old patient in whom investigations revealed an acute episode of pancreatitis on a chronic background associated with an annular pancreas, a rare combination. This case highlights the importance of imaging, particularly CT scans, in diagnosing this association and optimizing therapeutic management.

Keywords: Annular pancreas, Chronic pancreatitis, Acute pancreatitis, Congenital anomaly, CT scan.

INTRODUCTION

Annular pancreas is a rare congenital anomaly that causes duodenal obstruction of varying severity. It can remain asymptomatic until adulthood and present with nonspecific digestive symptoms. The association with chronic pancreatitis is rare but possible [1, 2]. Here, we present an illustrative case.

CASE REPORT

The 63-year-old patient had experienced intermittent early postprandial vomiting for three years. The worsening of symptoms over the past three months, along with acute epigastric pain and weight loss, prompted consultation. Clinical examination revealed a conscious patient, hemodynamically and respiratory stable, with conjunctival pallor and a BMI of 23.5 kg/m2. Abdominal examination showed moderate epigastric tenderness, succussion splash on an empty stomach, and periumbilical tympanism.

Biological tests revealed hypochromic microcytic anemia.

An abdominal CT scan was performed with fine slices before and after the injection of an iodinated contrast agent in the arterial and portal phases, allowing optimal characterization of the pancreatic and duodenal structures.

The scan revealed an annular pancreas surrounding the second portion of the duodenum, associated with moderate duodenal stenosis. (fig. 1)

Additionally, the CT scan showed global pancreatic swelling with multiple punctate calcifications and peripancreatic collections, indicative of evolving chronic pancreatitis. No signs of ductal dilatation or underlying mass were detected. (fig. 2)

The patient received symptomatic management, including hospitalization with continuous monitoring of vital signs and digestive rest, with temporary cessation of all oral intake. Intravenous rehydration, adjusted based on clinical needs, was initiated, along with analgesic treatment using paracetamol and opioids and antiemetics.

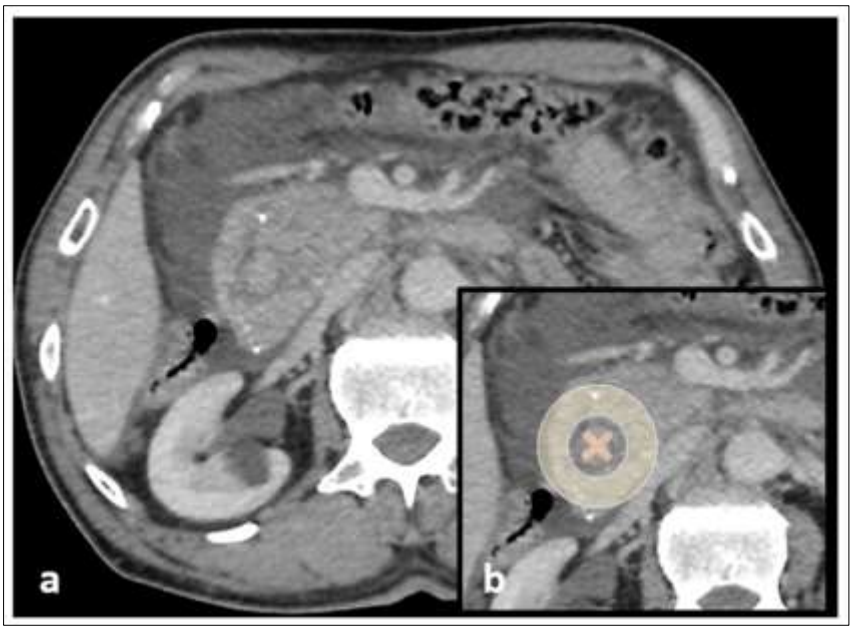

Figure 1: Axial CT slice at the level of the pancreatic head in the portal phase after contrast agent injection (a), showing a complete annular pancreas encircling the second portion of the duodenum, schematized by a cross in the image (b)

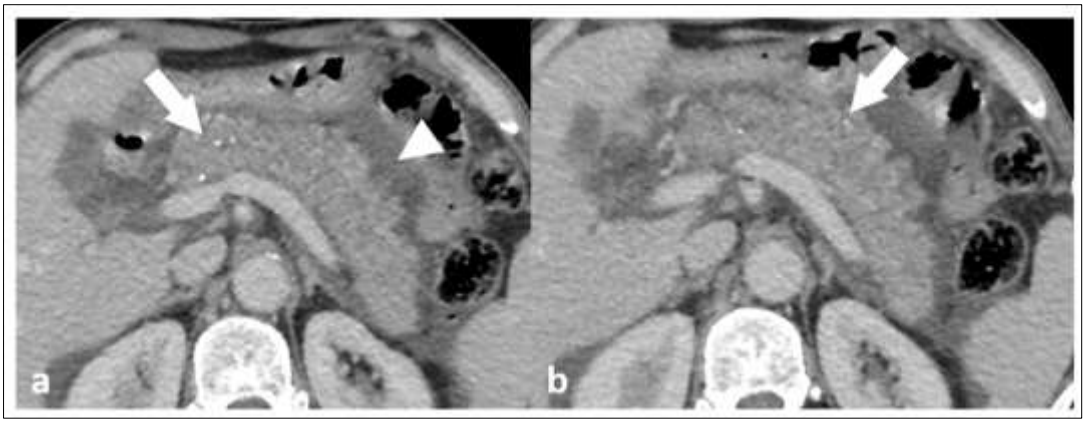

Figure 2: Axial CT slices at the level of the corpo-caudal pancreas in the portal phase after contrast agent injection, showing global pancreatic swelling with multiple punctate calcifications (arrows) and peripancreatic collections (arrowheads)

DISCUSSION

Annular pancreas is a rare congenital anomaly characterized by a band of pancreatic tissue encircling the second portion of the duodenum. While it often presents during infancy with symptoms of duodenal obstruction, up to 50% of cases are discovered in adulthood, frequently as incidental findings during imaging for unrelated complaints [1][2].

Adult patients may present with abdominal pain, postprandial vomiting, or complications such as chronic pancreatitis, which was the case in our patient [3].

Central Role of Imaging in Diagnosis and Management

Imaging plays a pivotal role in the diagnosis and management of annular pancreas, especially in adults where symptoms are often nonspecific and insidious. Cross-sectional imaging not only allows identification of the pancreatic ring but also enables evaluation of complications such as duodenal obstruction, chronic pancreatitis, or neoplastic transformation.

Contrast-enhanced CT is often the first-line imaging modality due to its availability and rapid acquisition. It allows high-resolution multiplanar reconstruction and optimal visualization of the annular tissue. Typical findings include a ring of pancreatic tissue—often isodense to the pancreatic head—partially or completely encircling the descending duodenum. In incomplete forms, the pancreas may extend

anterolaterally or posterolaterally, with a "crocodile jaw" configuration [4].

In our case, CT allowed confident diagnosis of an annular pancreas based on circumferential enhancement and duodenal narrowing. Importantly, it also revealed signs of chronic pancreatitis, including pancreatic enlargement, punctate calcifications, peripancreatic fat stranding, and small collections. These imaging features are essential for distinguishing chronic pancreatitis from neoplasia, particularly in elderly patients presenting with weight loss and epigastric pain [2- 5].

MRI and MRCP serve as complementary tools to CT, particularly for detailed assessment of ductal anatomy. On T1- and T2-weighted sequences, annular pancreatic tissue demonstrates similar signal intensity to the native pancreas, helping differentiate it from fibrosis or neoplasm. MRCP can reveal a segment of the main pancreatic duct encircling the duodenum—an imaging hallmark of annular pancreas. The use of secretin-enhanced MRCP further improves visualization by dilating pancreatic ducts and increasing the sensitivity for detecting ductal anomalies [4, 5].

Endoscopic ultrasound (EUS) provides high-resolution assessment of parenchymal texture and ductal anatomy. It may demonstrate a hypoechoic band of tissue surrounding the duodenum, with features of chronic pancreatitis such as hyperechoic foci, lobularity, or ductal dilation. Although EUS is not routinely used for primary diagnosis, it is particularly useful when CT or MRI findings are inconclusive, or when biopsy is required to exclude malignancy [2].

Barium studies, once the cornerstone of diagnosis, are now mostly historical but may still show a characteristic smooth narrowing of the medial duodenal wall corresponding to the pancreatic ring.

Endoscopic techniques, such as ***ERCP***, play a key role in visualizing the annular pancreas and diagnosing duodenal obstruction, as demonstrated by several authors in referral centers [6].

This approach helps confirm structural abnormalities and assess the functional impact on the gastrointestinal tract.

Differential Diagnosis and Imaging Clues

Imaging must distinguish annular pancreas from other causes of duodenal stenosis or encircling masses. Pancreatic adenocarcinoma typically appears as a poorly enhancing mass with upstream ductal dilation and loss of normal lobular architecture. GISTs, duodenal adenocarcinomas, and duodenal duplication cysts may mimic annular pancreas on axial imaging, but careful attention to enhancement patterns, continuity with pancreatic parenchyma, and ductal anatomy helps make the distinction [5- 7].

Embryological and Clinical Context

From an embryological perspective, the anomaly results from abnormal migration or fusion of the ventral pancreatic bud. Several theories exist, with Baldwin and Lecco's models explaining the circular formation via misrotated or persistent ventral components [1].

The presence of annular pancreas increases the risk for pancreatitis, likely due to ductal outflow obstruction or stenosis. Histologically, the annular segment may drain via multiple small ducts into the duodenum, which can predispose to stasis and inflammation [1].

In our patient, chronic inflammation was evident on imaging, with calcifications and peripancreatic collections—a radiological pattern often restricted to the annular portion, with preservation of the pancreatic body and tail.

In adults, annular pancreas is also associated with an increased risk of pancreaticobiliary neoplasms, warranting close imaging surveillance in selected cases [7].

Therapeutic Implications and Imaging Guidance

Surgical treatment is considered in symptomatic cases with significant obstruction. Imaging findings such as duodenal narrowing, upstream gastric dilatation, or fixed annular tissue are crucial for preoperative planning. Duodenojejunostomy is the preferred surgical approach. Pancreatic resection is rarely indicated and carries a higher risk of morbidity. Postoperative imaging follow-up is essential to assess for residual obstruction or recurrent pancreatitis [7].

CONCLUSION

This case highlights the importance of considering annular pancreas in adults presenting with chronic digestive disorders. The association with chronic pancreatitis is rare and warrants thorough investigation for appropriate management. Imaging, particularly contrast-enhanced CT scans, plays a fundamental role in diagnosis and therapeutic planning.

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