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Case Report

Annular pancreas: A rare cause of duodenal obstruction in elderly

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ABSTRACT

Pancreas annulare is a rare congenital anomaly in which a band of pancreatic tissue partially or completely encloses the second part of the duodenum. The anomaly may be asymptomatic throughout life; when symptomatic, it may manifest as pancreatitis, peptic ulcer, duodenal obstruction, or rarely, extrahepatic biliary obstruction. We report a patient aged 74 years who presented with signs of gastric outlet obstruction. The diagnosis was confirmed preoperatively by computed tomography as duodenal stenosis due to a annular pancreas and was successfully treated with surgical duodenojejunostomy. Only a few similar cases have been described in the published medical literature. This case highlights the need to think beyond the common causes of gastric outlet or duodenal obstruction. In addition, cross-sectional abdominal imaging has become an inevitable tool in diagnosing and treating abdominal pathologies, allowing accurate diagnosis and planned surgical interventions.

1. Introduction

An annular pancreas (AP) is a rare congenital anomaly with pancreatic tissue encircling the duodenum [1] The estimated prevalence is 3.4 per 100,000 in abdominal imaging surveys and 5-15 per 100,000 adults in autopsy series. [2,3] The first description of an AP dates to 1818, by Tiedman, an incidental autopsy finding. The anomaly results from a malrotation of pancreatic buds during development. Most cases remain asymptomatic and are incidentally detected during abdominal imaging. [1] When symptomatic, it manifests mostly in childhood as duodenal obstruction. However, presentation as obstruction is less frequent in adults, and pancreatitis is the most common association. [4] Most cases of symptomatic annular pancreas in adults have been reported between the ages of 20 and 60 years. [5] Only a handful of cases of the AP have been reported in the literature, presenting as intestinal obstruction beyond the seventh decade of life, highlighting the rarity of this case.

2. Case Presentation

A 74-year-old male presented with a history of recurrent vomiting of a month duration. The vomitus was non-bilious, non-hemorrhagic, and contained undigested food particles. He reported postprandial abdominal bloating, anorexia, and unexplained loss of weight for the past year. He denied abdominal pain, jaundice, or melena. He was pale and poorly nourished on examination, with a distended epigastrium and visible gastric peristalsis. Succussion splash was elicited, but there was no mass palpable and no organomegaly. Abdominal X-ray showed a dilated stomach with an air-fluid level. Contrast-enhanced computed tomography revealed an annular pancreas with mucosal edema at the second part of the duodenum, causing luminal narrowing with dilation of the stomach (Figure 1). The rest of the pancreatic tissue and other intra-abdominal

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organs were reported to be normal. Upper gastrointestinal endoscopy confirmed the duodenal narrowing but was otherwise normal.

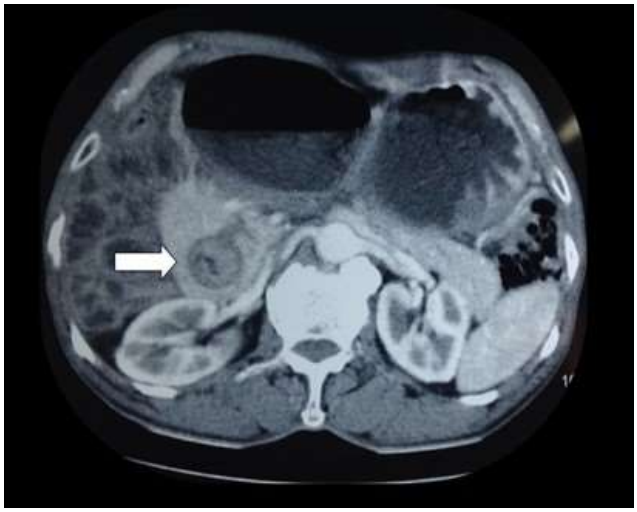

Figure 1: CT abdomen showing dilated stomach and first part of duodenum. The second part of the duodenum showed encirclement with annular pancreatic tissue (arrow) and luminalnarrowing.

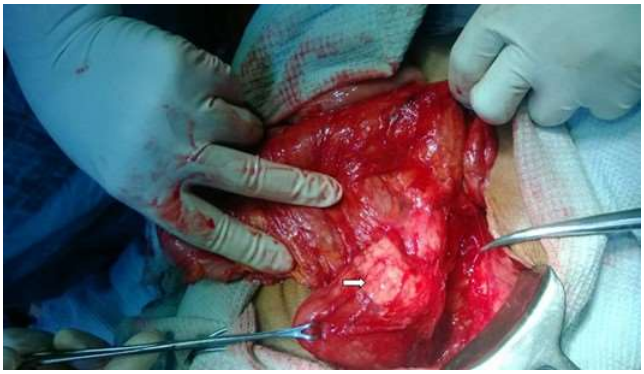

Figure 2: Intraoperative image showing annular pancreatic tissue (arrow) encircling the second part of duodenum.

The patient was initially managed conservatively; however, he continued to be symptomatic and was unable to tolerate a regular diet. After a detailed patient and family discussion, it was decided to proceed with surgical intervention per the patient's preference. Intraoperatively annular pancreatic tissue encircling the second part of the duodenum, obstructing the junction of the second and third parts of the duodenum, was confirmed with dilated proximal, duodenum, and stomach (Figure 2). The rest of the bowel and abdominal viscera were normal. Duodenojejunostomy was performed, bypassing the obstructed segment. The postoperative period was uneventful, and the patient was able to tolerate a regular diet. The patient continues to be asymptomatic, now nearly five years following surgery.

3. Discussion

The pancreas develops from the dorsal and ventral buds, the outpouchings of primitive foregut, during the fourth week of gestation. Defective rotation of the ventral pancreatic bud leads to an AP, that is, pancreatic tissue encircling the 2nd part of the duodenum, partial or complete. [6] AP most commonly affects males and is associated with other congenital anomalies like Down's syndrome, tracheo-esophageal fistula, and other intestinal anomalies. [7] The anomaly may remain asymptomatic lifelong; when symptomatic, it may present as pancreatitis, peptic ulcer disease, duodenal obstruction, or rarely extrahepatic biliary obstruction. [8–10] The median age of presentation in adults is 47 years. [1] The associated incidence of pancreatitis and gastric or duodenal ulcers is 15-30% and 26-40% respectively. [11] Maker et al. suggested a classification system: type 1 (extramural) presenting as duodenal obstruction and type 2 (intramural) presenting as duodenal ulcers. [12]

In most cases, the diagnosis is confirmed through abdominal imaging, often supplemented by endoscopy. Both computed tomography (CT) and magnetic resonance imaging (MRI) are instrumental in detecting the presence of a ring of pancreatic tissue encircling the descending duodenum. [13] Magnetic resonance cholangiopancreatography (MRCP) provides clear visualization of the pancreatic duct as it encircles the duodenum. Secretin-enhanced MRCP is the non-invasive investigation of choice in diagnosing the ductal configuration and the presence of disease in AP. [14] ERCP is more specific and depicts similar findings to that of MRCP, although it is currently less recommended for diagnostic purposes. ERCP studies have shown that the annular duct joins the main pancreatic duct in 85% of cases. [1,15] It's worth noting that the findings may range from normal to revealing duodenal narrowing during endoscopy. Despite the advancements in diagnostic procedures, up to around 40% of cases of AP are still diagnosed intraoperatively. [13] Surgery remains the treatment of choice in symptomatic patients; often resorted options include duodeno-duodenostomy or duodeno-jejunostomy. [16,17] Gastrojejunostomy is an alternative in acute situations with fibrotic changes in the duodenum. [17] Annular pancreatic tissue is preferably left untouched, given complications like a pancreatic leak or fistula.

In this case report, we present a patient who, beyond his seventh decade of life, experienced symptomatic duodenal obstruction because of an AP. Owing to its rarity, it is seldom on the list of clinicians' differentials for duodenal obstruction, irrespective of the patient's age. With the rapid advancements in radiology, it should be a prompt diagnosis for someone aware of this rare anomaly. An accurate

preoperative diagnosis allows proper surgical planning and ensures the best treatment outcome. This case report intends to familiarize the readers with this rare anomaly, its clinical presentations, and, more importantly, a visual impression of its appearance at abdominal imaging. Furthermore, it reminds all clinicians that the AP should be included in the differential diagnosis for patients with duodenal or gastric outlet obstruction symptoms, irrespective of age.

4. Conclusion

In conclusion, this case report sheds light on the exceedingly rare presentation of symptomatic duodenal obstruction caused by an annular pancreas in an elderly patient. While the annular pancreas predominantly manifests in childhood, this case underscores the importance of recognizing its potential occurrence even in older individuals. Furthermore, this report serves as a valuable reminder for clinicians to include the annular pancreas in the differential diagnosis for patients presenting with duodenal or gastric outlet obstruction symptoms, particularly when other common etiologies have been ruled out.

4.1. Consent

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

4.2. Authors' contribution

All authors contributed to the completion of this work. The final manuscript was read and approved by all authors.

5. Source of Funding

None.

6. Conflict of Interest

None.

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