Case reports

Barrier to Transit – Annular Pancreas Causing Gastric Outlet Obstruction in an Adult Male: A Case Report

ABSTRACT

Introduction: Annular pancreas is an uncommon congenital disorder, first reported in 1818. This is a rare anomaly that presents as a significant barrier to the digestive transit. Careful navigation through this complex clinical scenario is needed for precise evaluation and better management strategies.

Presentation of Case:A 54-year-old diabetic male presented with manifestations of progressive emesis and reduced weight. Investigative findings indicated an annular pancreas that caused gastric outlet obstruction. Due to the worsening of the obstructive symptoms operative management was preferred. Intraoperatively pancreatic tissue was visualized encasing the 2nd part of the duodenum circumferentially with enlargement of the 1st part of the duodenum and stomach proximally. A Duodeno-Jejunostomy with the Roux limb was performed, resolving the symptoms.

Discussion and Conclusion: Symptomatology varies based on the age of presentation in the annular pancreas. Radiological and endoscopic procedures are critical for the diagnosis of the annular pancreas. We report a case of an annular pancreas with gastric outlet obstruction in conjunction with insights into the patient's management. Surgical bypass procedures successfully alleviate the obstruction and ensure excellent results. Adults suffering from upper GI obstruction might consider the annular pancreas in differentials.
reliability.

Keywords: Annular pancreas, Obstruction, Duodeno-Jejunostomy, Roux limb, Surgical bypass.

1. INTRODUCTION

During embryonic development, if the ventral pancreatic duct undergoes mal-rotation, it can lead to a hereditary disorder called the "annular pancreas" (AP). First documented in 1818, this condition can manifest as a fractional or a total rim of pancreas tissue encircling the duodenum. According to autopsy studies, the annular pancreas occurs in approximately 1 in every 20,000 cases.[1],[2]Tiedemann first documented this congenital defect and Ecker

defined it in 1862, coining the term annular pancreas. [3] The annular pancreas has been linked to several congenital anomalies. [4]

The annular pancreas is categorized into “intramural” and “extramural”. In the “extramural” variant, the pancreatic duct (ventral) wraps around the duodenum before merging with the major pancreatic duct. In the “intramural” form, pancreatic cellular tissue blends with muscle fibers inside the intestinal wall, while minute ducts open straight into the duodenum. Patients having extramural AP present with signs and symptoms of significant gastrointestinal obstruction whereas “intramural” type develops signs and symptoms of duodenal ulcers. [5]

2. PRESENTATION OF CASE

A 54-year-old gentleman with a prior diagnosis of diabetes manifested with complaints of frequent vomiting during the past two months. Vomiting episodes were gradual, progressive, projectile, and included food particles. There had been a history of weight loss in the association.

The blood metrics at the time of hospitalization were within acceptable limits.

Ultrasonography (USG) of the abdomen revealed an annular pancreas with pancreatic head enlargement. X-rays of the erect abdomen and chest showed no discernible abnormalities. A computed tomography (CT) image of the abdomen disclosed that the head of the pancreas enfolds the 2ndsegment of the duodenum (D2), causing constriction and back pressure changes in the first segment of the duodenum (D1) and stomach.

The conservative approach was initiated, followed by Duodeno-Jejunostomy (DJ) due to the worsening of the obstructive symptoms.

Intraoperatively, pancreatic tissue encompassing the D2 region was visualized with distention of the D1(Figure 1) and stomach proximally with collapsed distal bowel loops. A Duodeno-Jejunostomy (DJ) was performed, creating a Roux limb (Figure 2). The postoperative recovery was smooth and on the 11th day after the surgery patient was discharged.

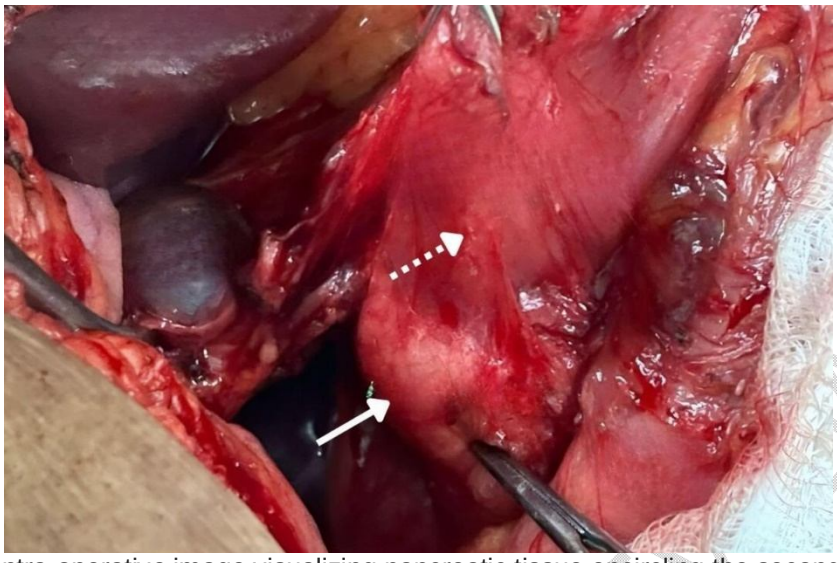

Figure 1: Intra-operative image visualizing pancreatic tissue encircling the second segment of the duodenum (D2) (White arrow) with distention of the first segment of the duodenum (D1) (Dotted white arrow).

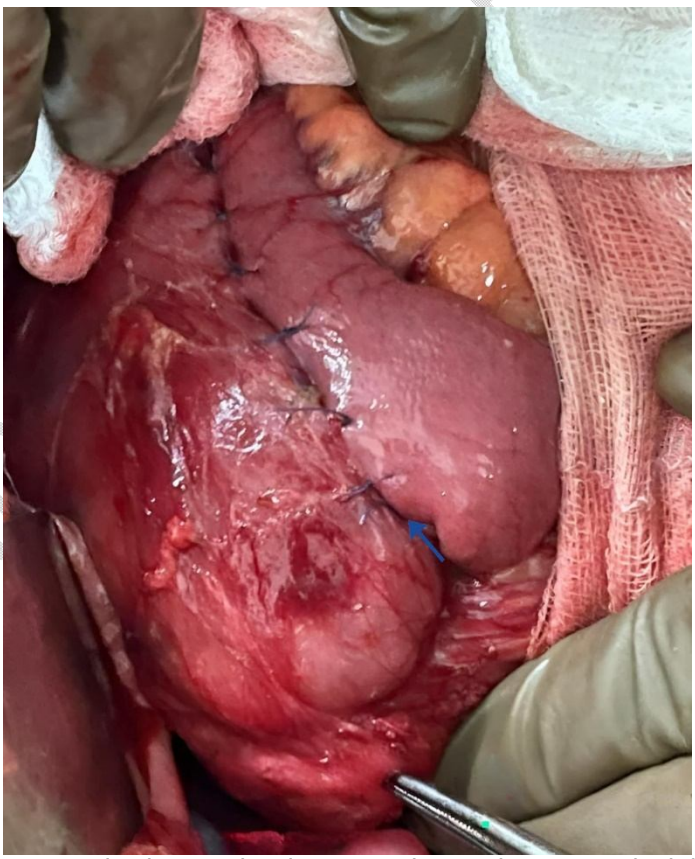

Figure 2**:** Intraoperative image showing a Duodeno-Jejunostomy (DJ) (Blue arrow) performed, creating a Roux limb.

The histopathology report indicates that there is no evidence of malignancy.
Patient follow-up was conducted for one year using USG and X-rays, which was uneventful.

3. DISCUSSION

Two hypotheses, Lecco and Baldwin, have been postulated to explicate the etiopathogenesis of extramural AP. According to Lecco's hypothesis, the ventral bud(right) sticks to the wall of the duodenum and encircles the intestine as a result of normal foregut rotation, but Baldwin's idea postulates that the persistent ventral bud(left) encircles the duodenum (Figure 3). [6]

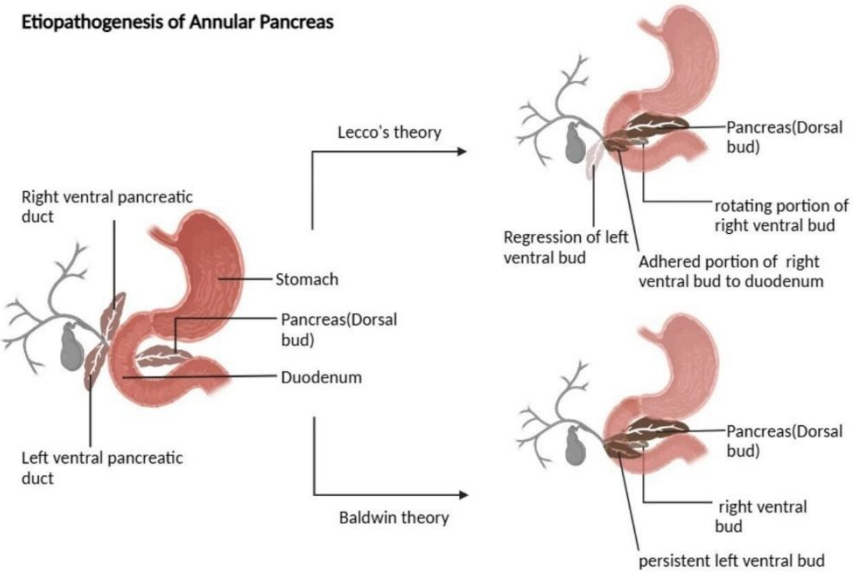

Figure 3: Graphical image demonstrating theories of etiopathogenesis in the annular pancreas.

More than two-thirds of neonatal AP cases will have obstructive characteristics, such as abdominal distention, bilious vomiting, reduced meconium passage, and feeding intolerance. Furthermore, newborns with annular pancreas are more inclined to develop Down's syndrome, esophageal and duodenal atresia, cardiac abnormalities, “Meckel's diverticulum”, “pancreatic divisum”, and “imperforate anus”. The median age of presentation is one day following birth. It is shown that between 50% and 75% of annular pancreas patients stay asymptomatic until the third to sixth decades and appear with various problems. [7]

Upper GI tract blockage symptoms define adult AP, including epigastric discomfort, nausea, Gastric outflow blockade, ulcer-related illness with upper GI bleeding, acute or chronic pancreatitis, pancreatic head malignancy, and blocked bile ducts are all possible implications in adults. The clinical symptoms were associated with the degree of duodenal or common bile duct compression by the AP.

Imaging methods such as ultrasonography, conventional gastrointestinal (GI) radiography, and upper GI series can all reveal duodenal blockages. Abdominal CT and MRI images (contrast-enhanced) can disclose the pancreas head around the D2 region. “Endoscopic Ultrasound (EUS)”, “Endoscopic Retrograde Cholangio-Pancreatography(ERCP)”, and

"Oesophago-Gastro-Duodenoscopy (OGD Scopy)", can provide a precise preliminary estimate of the amount of pancreas encasing the duodenum, alongside the pancreato-biliary ductal system. [8]

Surgery is the preferred therapy for AP that causes effective duodenal blockage. A surgical bypass can circumvent duodenal compression. Bypass procedures may include Gastro-Jejunostomy (GJ), Duodenoduodenostomy, or Duodeno-Jejunostomy (DJ). In 20% of adult patients with AP, there is an association with complicated pancreaticobiliary disease that requires surgery. Surgery options for complicated pancreaticobiliary disease include Pancreatico-duodenectomy, biliary sphincteroplasty, Lateral Pancreato-Jejunostomy (LPJ), and biliary system shunting. [9]

Laparoscopic bypass can also be performed, which allows for earlier mobilization, feeding, and a shorter hospital stay than the open operation. [10]

In children, the prognosis is excellent, whereas in adults, the prognosis is favorable provided there is no underlying cancer. [9]

4. CONCLUSION

AP is a rare anomaly which is ought to be looked into in adults who have upper gastrointestinal obstructive symptoms. The patient with considerable obstructive symptoms needs surgical bypass procedures. Both laparoscopic and open procedures can be explored, however further comparative research is a requisite to decide on the technique of choice. When dealing with the annular pancreas in the elderly and adults, it is important to consider the possibility of cancer.

CONSENT (WHEREEVER APPLICABLE)

"All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal."

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