ANNULAR PANCREAS AS A CAUSE OF NEONATAL DUODENAL OBSTRUCTION: A CASE REPORT

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ABSTRACT

The annular pancreas is a rare congenital anomaly that encircles a portion of the duodenum, causing duodenal obstruction with a wide range of clinical presentations. In neonates, it is one of the primary causes of duodenal obstruction, presenting as frequent vomiting, dehydration, abdominal distention, and tenderness. In adults, it can present as pancreatitis, duodenal or gastric outlet obstruction, or stenosis. This condition should be recognized early, as early intervention yields better outcomes. We present a case of a 6-day-old neonate with duodenal obstruction caused by the annular pancreas—the neonate presented with persistent vomiting and abdominal distention with severe dehydration and electrolyte derangements. X-ray of the abdomen showed a classic double bubble sign indicative of duodenal obstruction. The infant underwent resuscitation with intravenous fluids, analgesics, and a surgical laparotomy. Where the bowel was decompressed and duodenodenostomy was performed. Postoperatively, the patient's recovery was uneventful, and he was discharged home. Feeding was gradually introduced with no complications. The rarity of this condition, its presentation, and its successful management have prompted us to present the case.

KEYWORDS: *Annular Pancreas, Duodenal Obstruction, Neonate, Pancreatic Congenital Anomaly*

INTRODUCTION

The term "annular pancreas" refers to a thin rim of pancreatic tissue encircling a portion of the duodenum, typically the second portion, resulting in distal bowel obstruction .[1,2] With an incidence of 1 in 20,000 live births, it is one of the rarest congenital anomalies, classified into six types. Type 1 is the most prevalent, in which the annular duct flows directly into the main pancreatic duct. Type 2 encircles the Wirsung's duct and drains into the major duodenal papilla. The other four types are rare.[3] The annular pancreas is one of the primary causes of partial or complete duodenal obstruction.[4] It is also associated with other conditions, such as cardiac defects, duodenal atresia, and intestinal malrotation.[5] The annular pancreas exhibits symptoms based on the severity of compression it applies to the duodenum, varying from asymptomatic cases throughout life to complete bowel obstruction, even in the early neonatal period.[6] Due to the rarity of this condition, we are prompted to report a case of annular pancreas with duodenal atresia and obstruction in a neonate.

CASE PRESENTATION

We report a 6-day-old male neonate who presented to the emergency department at Lady Reading Hospital, Peshawar, with frequent episodes of bilious vomiting and decreased oral intake. He was born full term, with a birth weight of 2.5 kg, through a normal vaginal delivery at the hospital, along with normal height and head circumference fontanelles. He had a normal Apgar score at birth. Both his parents are in their late twenties and are in good health. There was no significant antenatal history of TORCH infections or exposure to teratogens. Additionally, his mother had no comorbid conditions, such as gestational diabetes and hypertension, indicating an uncomplicated full-term pregnancy. Upon examination, the neonate appeared unwell, lethargic, drowsy, dehydrated, and febrile, with weak Moro and suck reflexes. The abdominal

examination revealed a distended abdomen with no visceromegaly. Bowel sounds upon auscultation were high-pitched and audible. The anus was normally positioned and patent. The genitourinary examination revealed that both testes were normally located in the scrotum and had normal male genital and urethral anatomy. The chest examination showed no signs of distress, with normal vesicular breathing noted bilaterally on auscultation. He had normal heart sounds with no murmur. The neurological examination revealed weak Moro and grasp reflexes, along with normal muscle tone. A plain radiograph of the abdomen was advised, which showed the classic double bubble sign indicative of duodenal obstruction, as illustrated in Figure 1.

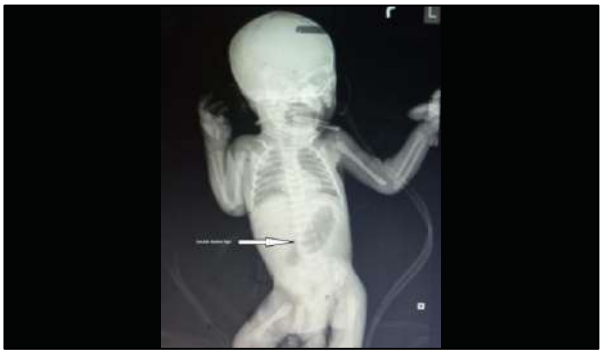

Figure 1: Plain Radiograph Shows Classic Double Bubble Sign (White Arrow) Suggestive of Duodenal Obstruction

Baseline investigations revealed deranged serum electrolytes, including hyponatremia and hypokalemia. Urea, creatinine, PT, and aPTT levels were slightly abnormal. The remaining baseline investigations were within normal ranges. The patient received resuscitation with intravenous fluids and supportive treatment. A surgical consultation was requested. Laparotomy was performed on an emergency basis due to acute intestinal obstruction. Preoperatively, it was observed that a portion of the pancreas encircling the duodenum was grossly dilated, and part of the duodenum was also atretic, as shown in Figure *2*.

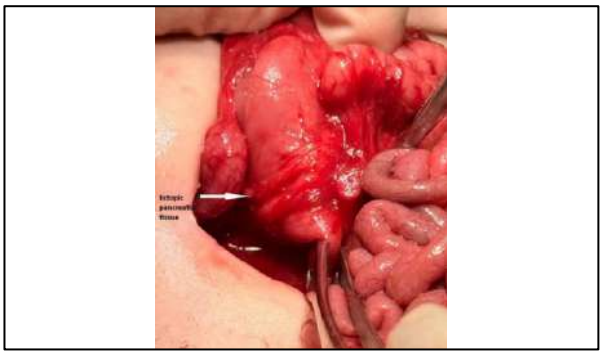

Figure 2: Per-Operative Image Showing Ectopic Pancreatic Tissue (White Arrow) Encircling Duodenum

Obstruction was relieved, and a duodenostomy was performed. Postoperatively, the patient was kept nil per mouth, and intravenous fluids, analgesics, and antibiotics were administered. Recovery progressed without complications, and the patient was monitored in the ward for proper management.

DISCUSSION

The annular pancreas is a rare congenital anomaly in which ectopic pancreatic parenchymal tissue encircles the duodenum, potentially leading to duodenal obstruction.[1,2] Its pathogenesis involves certain genetic factors, which are supported by the association with microduplication on chromosome 6q24. The annular pancreas is often associated with other congenital anomalies of the gastrointestinal system, including malrotation of the intestine, atresia, imperforate anus, tracheoesophageal fistula, and cardiac abnormalities.[1,2] Annular pancreas on antennal scan usually presents with polyhydramnios due to duodenal obstruction. Shortly after birth, a neonate with an annular pancreas usually presents with bilious vomiting, abdominal distention, and delayed passage of meconium .[2,6] Jaundice results from obstruction of the intrapancreatic portion of the common bile duct due to edema of the pancreatic head.[7] In adults, the majority of cases remain asymptomatic until the third to sixth decade of life and then present with various complications like peptic ulcer, duodenal obstruction, pancreatitis, and obstructive jaundice.[8] The initial diagnosis can be made by a plain X-ray, which shows the classic double bubble sign.[9] CT scan or MRI studies show enlargement of the pancreatic head with enhancement of the 2nd portion of the duodenum.[10] MRI is best compared to a CT scan due to the high signal intensity of T1 fat-suppressed imaging. ERCP is the gold standard for preoperative diagnosis of annular pancreas.[11] Despite radiological studies, surgical confirmation is needed in 40% of cases and is the gold standard method for confirmatory diagnosis, with the added advantage of surgical correction.[6] Treatment depends upon clinical presentation and varies from case to case. Generally, it includes symptomatic treatment for acute pancreatitis and surgical interventions, such as bypass techniques. Doudenoduodenostomy is the most successful surgical treatment, followed by the division of a portion of the annular pancreas and either gastrojejunostomy or duodenojejunoostomy with a Roux-en-Y loop. Pancreatic resection is reserved for cases with a high suspicion of pancreatic malignancy.[6,12]

CONCLUSIONS

In conclusion, Annular pancreas, despite its rarity, is an

important cause of duodenal obstruction in neonates. Early diagnosis through clinical evaluation and imaging, followed by immediate resuscitation and surgical management with correction, remains key for a better prognosis in neonates. Clinicians should include this condition in the differential diagnosis when neonates present with signs and symptoms of intestinal obstruction. Further research and reporting of similar cases are recommended, as they may provide valuable knowledge regarding the management of this rare condition.

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AUTHORS CONTRIBUTION

Karishma Siraj - *Concept & Design; Data Acquisition; Drafting Manuscript; Critical Revision; Supervision; Final Approval*
Saqib Zaman - *Concept & Design; Data Acquisition; Drafting Manuscript; Critical Revision; Final Approval*
Lyaba Atta - *Concept & Design; Data Acquisition; Drafting Manuscript; Critical Revision; Final Approval*
Fatima Shafiq - *Concept & Design; Data Acquisition ;Drafting Manuscript; Critical Revision; Final Approval*
Haseena Ali - *Concept & Design; Data Acquisition; Drafting Manuscript; Critical Revision; Final Approval*
Mohammad Waqar - *Concept & Design; Data Acquisition; Drafting Manuscript; Critical Revision; Final Approval*

The authors accept responsibility for all aspects of the work and will ensure that any concerns regarding the accuracy or integrity of any part are properly investigated and resolved.