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Annular Pancreas in Adults: Clinical Presentations, Diagnosis, and Management

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Abstract: ***This article delves into the rare congenital anomaly known as annular pancreas, characterised by the encasement of the duodenum by pancreatic tissue during embryogenesis. While often asymptomatic, a subset of individuals may experience clinical manifestations. This study presents a case report of a 60 - year - old male with gastric outlet obstruction due to annular pancreas, detailing the diagnostic journey and successful modified Kimura operation. The rarity of this condition in adults is explored, highlighting the significance of advancements in diagnostic imaging techniques for accurate identification and management.***

Keywords: Annular pancreas, congenital anomaly, duodenoduodenostomy, diagnostic modalities, gastric outlet obstruction

1. Introduction

Annular pancreas (AP) is a rare congenital anomaly characterised by partial or complete circumferential encasement of the second part of the duodenum by a band of pancreatic tissue during embryogenesis. With the advent of newer and improved diagnostic modalities, this condition is being recognised more frequently. Many individuals with this anomaly remain asymptomatic throughout their lifetime and are often diagnosed incidentally on imaging or during autopsies. However, a fraction of patients with AP tend to present with clinical manifestations either early in life or during adulthood usually between 20 and 50 years of age. It can be of complete or incomplete type. Complete type AP shows pancreatic parenchyma or annular duct completely encircling the second part of the duodenum confirmed by macroscopic inspection, and incomplete type AP demonstrates partial circumferential encasement of the duodenum by pancreatic tissue confirmed by endoscopic retrograde cholangiopancreatography (ERCP) or surgical evaluation.

It usually affects neonates, but in adults it can mimic a wide range of entities like pancreatitis, peptic ulcer disease, obstructive jaundice, gastric outlet obstruction, etc., thereby making the diagnosis difficult. Diagnosis can be made by computerised tomography (CT), ERCP &magnetic resonance cholangiopancreatography (MRCP).

2. Case Report

A 60 year old male, resident of Bilaspur, Himachal Pradesh, India, who was a known case of peptic ulcer disease and was on treatment for the same for past 20 years, smoker, no other co morbidities, now presented with complain of vomiting from past 2 months, 4 to 6 hoursafter intake of food, which is projectile, bilious, copious in amount, foul smelling, consisting of partially digested food particles and was not blood stained. Patient had 8 - 10 episodes of pain in epigastric region in past 2 months, usually after meals, which was burning in nature, mild to moderate in intensity, non radiating, relieved by vomiting.

On examination the patient was of thin built. General physical examination was normal. Per abdomen examination did not reveal any mass and was normal. Routine haematological investigations were normal. Ultrasonography of abdomenwas normal. Upper gastrointestinal endoscopy revealed presence of pinhole opening at pylorus, scope not negotiable beyond it. No ulcer or growth was seen. Mucosa was normal. CT abdomen was performed showing over distended stomach with air fluid levels with normal wall thickness and enhancement. Pancreas is seen encircling the D2 segment of duodenum in the anterolateral and posterolateral part with luminal compromise suggestive of annular pancreas.

Laparotomy was undertaken which showed pancreas encircling D2 portion of duodenum in posterolateralpart with presence of fibrous band anteriorly, causing partial obstruction confirming the diagnosis of annular pancreas. Pylorus was normal. Modified kimura'soperation (diamond shaped duodenoduodenostomy) with excision of fibrous band was done. Post operative period was uneventful. He was discharged on post operative day8 on full oral diet. Patient on follow up is asymptomatic and has also gained weight.

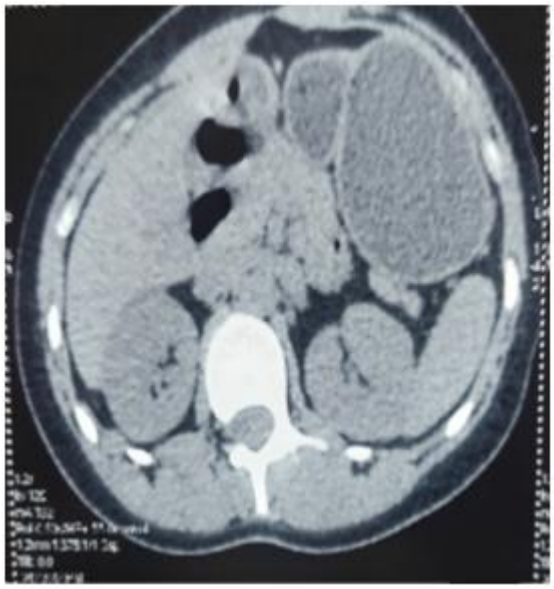

Figure 1: CT abdomen showing pancreas

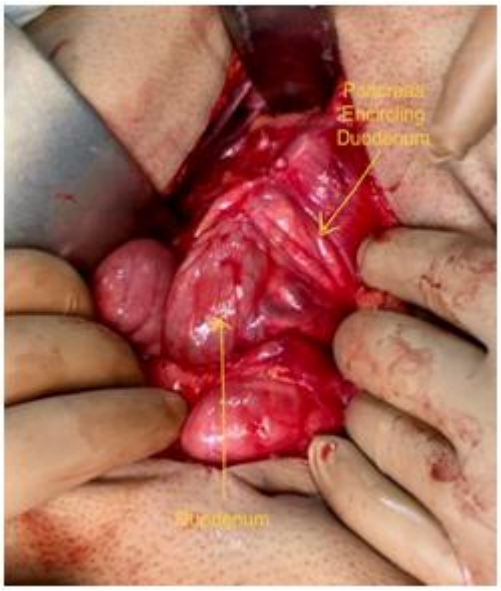

Figure 2: Operative photograph

Encircling D2 anterolateral and posteriorly. Showing pancreatic tissue encircling Second partof duodenum.

3. Discussion

Annular pancreas is one of the rare congenital anomalies apart from pancreas divisum and portal annular pancreas. Annular pancreas is a rare occurrence in adults. It was first reported by Tiedermann in 1818 [1] and named as annular pancreas by Eckerin 1862 [2]. The first surgical treatment for obstructive AP was performed by Vidal in 1905 [3]. True prevalence of annular pancreas is currently unknown owing to the rarity and infrequent reporting of this congenital anomaly. Before the availability of contemporary imaging, this anomaly was noted incidentally in 3 of 20, 000 autopsies and in 3 of 24, 519 individuals who underwent abdominal surgeries [4] [5]. With the availability of novel imaging modalities, the prevalence of AP has marginally increased and is estimated to be approximately 1 in 1000 cases [6] [7] [8]. AP affects both sexes with a slight male preponderance, which has been a contentious issue [9] [10].

Leeco's and Baldwin's theories are most accepted among all the postulated theories of origin of annular pancreas [11] [12]. Leeco postulated that it is the adherence of the ventral pancreatic bud to the duodenal wall and subsequent failure of its migration which leads to the formation of annular pancreas, whereas Baldwin reported that this condition occurs as a result of abnormal movement of the ventral pancreatic bud. D2 is involved in 74% of the cases [7].

The spectrum of clinical presentation in adult population is quite variable and may present as duodenal obstruction, pancreatitis or as symptoms of peptic ulcer disease [9]. It may rarely be associated with obstructive jaundice and even rarely malignancy [13]. Diagnosis may require surgical confirmation in >40% of cases [14] as each imaging modalities has its limitations. Surgical intervention is required if annular pancreas is symptomatic. Patients presenting as gastric outlet obstruction can undergo duodenoduodenostomy, as it is most physiological with least complications. Inflammation and adhesions of duodenum can make this procedure difficult requiring gastrojejunostomy. Pancreatic resection is reserved only for those cases where possibility of malignancy can not be ruled out [15].

4. Conclusion

A diagnosis of annular pancreas should be kept in mind in adult patients presenting with gastric outlet obstruction, pancreatitis, peptic ulcer disease, etc. Treatment options should be individualised.

Conflict of interest No competing or financial interests.

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