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Case Report

Annular Pancreas in an Eleven-year-old Male Ethiopian Child at the University of Gondar Hospital; A Case Report

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Abstract

Background: Annular pancreas is a rare congenital anomaly characterized by the presence of ectopic pancreatic tissue surrounding the duodenum. It is equally seen in the pediatric patient population and adults usually symptomatic in the first weeks of life with duodenal obstruction in children. Mostly asymptomatic in adults, but can manifest as pancreatitis, duodenal stenosis, or duodenal or gastric ulceration. A case of 11 years old patient is presented with epigastric pain and vomiting of year's duration, in which radiological investigations showed an annular pancreas. At operation, a complete obstruction of the duodenum between its first and second parts was found caused by an annular pancreas. A gastroenterostomy was performed and the patient improved.

Material and Methods: A case report documents that radiologic examination with barium meal, abdominal ultrasound and computed tomography (CT) scan disclosed annular pancreas with duodenal stenosis which was confirmed surgically.

Results: A properly performed CT examination revealed the ring of pancreatic tissue which encircled the duodenum supplementing suggestive imaging findings seen on ultrasound of the abdomen and barium meal study. The diagnosis is confirmed and the problem is corrected surgically.

Keywords: Annular Pancreas; Ethiopia

Introduction

Annular pancreas is a rare congenital anomaly of the pancreatic ducts [1]. This anomaly is due to incomplete rotation of the ventral pancreatic bud. Annular pancreas is diagnosed with nearly equal frequency in children and adults [2]. Symptoms are usually due to recurrent pancreatitis, duodenal stenosis, and duodenal or gastric ulceration [3]. A first reported case of annular pancreas in Ethiopia with duodenal obstruction is presented.

Case Report

An 11-year-old male child presented with a recurrent history of epigastria pain, nausea and vomiting for more than 5 years worsening in the past 1 year. On physical examination, he was found to have succession splash. Barium meal study showed contrast distended stomach and dilated first part of the duodenum having a smooth tapered narrowing at the second part (Figure 1). Abdominal ultrasound examination also showed fluid distended stomach

and duodenum up to the second part where rim pancreatic head tissue appears to surround the duodenum (Figure 2). Abdominal CT scanning showed an annular pancreas encircling the second part of the duodenum together with proximally fluid distended stomach (Figure 3). Laparatomy confirmed annular pancreas encircling the duodenum with gastric outlet obstruction at second part of the duodenum. No other congenital anomaly of the intra abdominal organs was noted. A gastroenterostomy was performed and the patient made an excellent recovery (Figures 4).

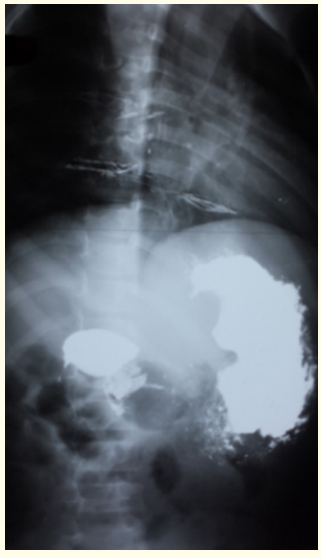

Figure 1: Barium meal spot image with smooth tapered 2nd part duodenal obstruction (arrow).

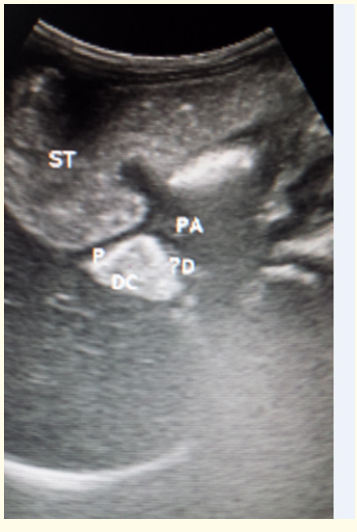

Figure 2: Ultrasound image of the patient with fluid distended stomach (long arrow) and splitting pancreatic tissue at the head of the pancreas (short arrow).

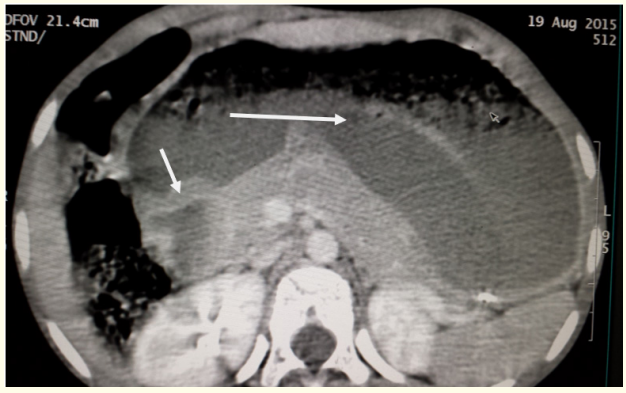

Figure 3: CT scan of the abdomen of this patient showing a rim pancreatic tissue surrounding the second part of the duodenum(small arrow) and fluid distended stomach (long arrow).

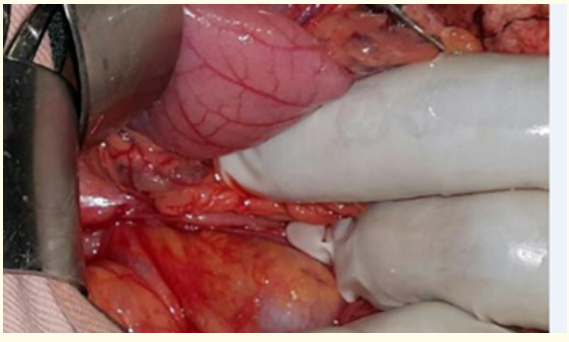

Figure 4: Intra operative confirmation of annular pancreases.

Discussion

Annular pancreas is a rare congenital anomaly (the incidence is approximately 3 in 20000), and it is the most common anomaly of the pancreatic ducts after pancreas divisum [2]. The pancreas is a soft lobulated gland that is situated close to the posterior abdominal wall about 15-20 cm long [3]. It is a mixed gland; partly exocrine and partly endocrine [3]. The exocrine part is represented by the serous pancreatic acini and drained by a major and an accessory pancreatic duct which opens into the second part of the duodenum on the summit of the major and minor duodenal papilla respectively [3]. The pancreas has a head, a neck, a body, a tail and an uncinate process. All the parts except the tail are retroperitoneal [3].

The pancreas develops from a single dorsal and two ventral buds that first appear in the fifth week of gestation as outgrowths

of the primitive foregut. The two ventral buds rapidly fuse. By the seventh gestational week, expansion of the duodenum causes the ventral bud to rotate and pass behind the duodenum from right to left and fuse with the dorsal bud. The ventral bud forms the uncinate process and the head of the pancreas, and the dorsal bud gives rise to the tail and the body. Fusion of the ducts of the two buds produces the main pancreatic duct. Annular pancreas results from failure of the ventral bud to rotate with the duodenum, resulting in envelopment of the duodenum [5]. More than one third (37.5%) of patients in are said to have a radiologically incomplete annulus on images while the remaining have complete ring of pancreatic tissue surrounding the duodenum [5].

In children, annular pancreas appears most often in the first weeks of life by symptoms related to duodenal stenosis. Associated congenital malformations have been reported like common mesentery, heart defects, Down syndrome (Trisomy 21), imperforate anus, or tracheoesophageal malformations [2,5]. In adults, the age of revelation is usually between 20 and 50 years. The most frequently found symptoms are: abdominal pain (70%), vomiting and nausea (47%), and they are generally reflecting a proximal intestinal obstruction [8]. Other clinical manifestations have been reported: peptic ulcer secondary to stasis upstream of duodenal stenosis, acute or chronic pancreatitis due to the default flow of pancreatic secretions in the annular pancreas, and jaundice due to the common bile duct stenosis by the annular pancreas or related to a lithiasic origin [2]. Occasionally it may remain asymptomatic throughout life and may go unnoticed; on the other hand, it may cause duodenal constriction and obstruction at any age [3].

This anomaly affects males more commonly than females [3]. The diagnosis of annular pancreas used to be based on duodenography which showed duodenal stenosis corresponding to the pancreatic ring while CT scan recently allows us to see the pancreatic ring encircling the duodenum [2]. The echo endoscopy also allows approaching the diagnosis by showing the ring of normal pancreatic tissue encircling the duodenum, but MRI of pancreas remains the most reliable diagnostic tool and allows to high light the presence of a pancreatic duct encircling the duodenum [2]. Endoscopic retrograde cholangiopancreatography (ERCP) can also make the diagnosis, but it remains invasive and sometimes impossible in case of an uncrossable stenosis of the duodenal lumen [2].

The treatment of annular pancreas is surgical. Its aim is relief of the duodenal obstruction. For this, there are various procedures being used. The first one is to directly attack the obstruction by dividing or removing a portion of the annular pancreas despite the associated hazards of pancreatic or duodenal fistula [2]. Furthermore, the division of the annular pancreas is often followed by persistent symptoms, particularly abdominal pain (up to 50% of cases) [2]. On the other side, the majority of surgeons have elected to bypass the obstruction by establishing a gastrojejunostomy, a latero lateral anastomosis of the first part of the duodenum with the jejunum, or a duodeno-jejunal anastomosis with Roux en Y loop [2]. The frequent association of peptic ulcer and the risk of anastomotic ulcer suggest the need for a procedure like vagotomy which reduces acid secretion by the stomach. Thus from available evidence it appears corrective operations for annular pancreas should include vagotomy and gastrojejunostomy and avoid the duodenum and the annular pancreas [2].

Conclusion

Annular pancreas is a rare malformation that manifests itself primarily by signs related to duodenal stenosis. The diagnosis is currently based on abdominal CT scan and MRI of the pancreas. Treatment is exclusively surgical, and a by-passing procedure is the method of choice in the treatment of annular pancreas. Both the rarity of this congenital abnormality, lack of report of the case in Ethiopia and its successful correction by surgical means has been the reason to make this case presentation.

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