CASE REPORT

A Strange Case of Double Annular Pancreas

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ABSTRACT

Context The pancreas is a soft lobulated gland situated transversely across the upper part of the posterior abdominal wall. Its parts include the head, neck, body and tail. Annular pancreas is a rare condition where the head of the pancreas surrounds the second part of the duodenum like a ring. **Case report** We observed a rare type of double annular pancreas where the uncinate process encircled the third part of the duodenum. A process from the head of the pancreas encircled the junction between the first and second parts of the duodenum incompletely. There was a large artery running along the anterior border of the pancreas. The artery took origin from the superior mesenteric artery. **Conclusion** This case may be of interest to gastroenterologists and surgeons.

INTRODUCTION

Annular pancreas is a rare type of congenital anomaly where the head of the pancreas surrounds the second part of the duodenum like a ring. It is estimated to occur in 1 out of 12,000-15,000 newborns [1]. But all the cases are not symptomatic [2]. Though in majority of cases, it results due to embryonic causes, the adult cases can also develop [3]. It may result in clinical complications like obstruction of the duodenum or pancreatitis. In addition to this, it can also result in obstructive jaundice, peptic ulcer, and perforation of the duodenum or peritonitis. We observed a strange case of annular pancreas during the cadaveric dissections.

CASE REPORT

During the dissection classes for medical undergraduates, we observed a case of double annular pancreas in a cadaver approximately aged 60 years. The uncinate process was larger than usual. It surrounded the third part of the duodenum from front, below and behind (Figures 1 and 2). The third part of duodenum appeared to be a bit narrow at the point where the annulus surrounded it. There was an extension from the upper part of the right border of the head of the pancreas, which surrounded the front and lateral side of the junction between the first and second parts of the duodenum (Figure 2). There was a large artery running along the anterior border of the body of the pancreas (Figures 1 and 2). The artery was a branch of superior mesenteric artery. Initially the artery ran along the border and then entered the substance of the pancreas. There were no other associated anomalies in the abdomen.

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Key words Annular pancreas; Duodenum; Mesenteric Artery, Superior; Pancreas

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DISCUSSION

Annular pancreas is a congenital anomaly. The pancreas develops from the endoderm of the caudal part of the foregut. Its development begins with the formation of dorsal and ventral pancreatic buds. The dorsal pancreatic bud grows in the dorsal mesentery and the ventral grows in the ventral mesentery of the duodenum. Later the ventral bud rotates along with the rotation of the duodenum and fuses with the dorsal pancreatic bud. The dorsal pancreatic bud forms the upper part of the head, neck, body and tail of the pancreas whereas the ventral bud forms the lower part of the head and the uncinate process. In some rare cases, the ventral pancreatic bud divides into right and left parts. The two parts then surround the second part of the duodenum like a ring and cause annular pancreas [4]. This anomaly may remain asymptomatic throughout life and may go unnoticed. On the other hand, it may cause duodenal constriction and obstruction at any age. It can also result in inflammation or malignancies of the annulus. This anomaly is more common in males and may develop in postnatal life also. A case of annular pancreas causing upper gastrointestinal bleeding has been reported recently [5]. Portal annular pancreas is a rare anatomical anomaly in which the pancreatic tissue

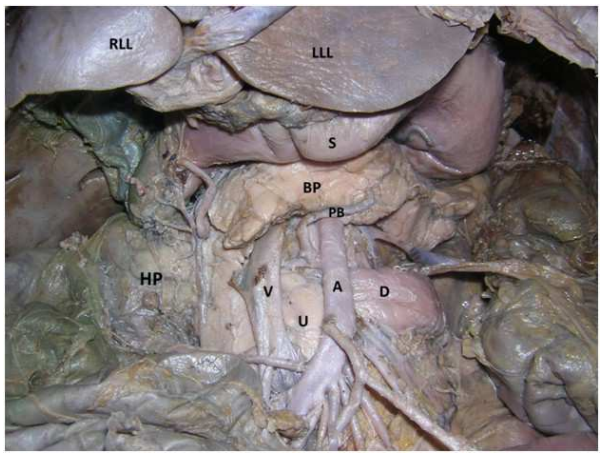

Figure 1. Dissection of the upper abdomen showing the pancreas and its relations. Note the uncinate process covering the third part of the duodenum completely.
A: superior mesenteric artery; BP: body of the pancreas; D: 4th part of the duodenum; HP: head of the pancreas; LLL: left lobe of the liver; PB: pancreatic branch of the superior mesenteric artery; RLL: right lobe of the liver; S: stomach; U: uncinate process; V: superior mesenteric vein

surrounds the superior mesenteric vein and portal vein like a ring. A few cases of portal annular pancreas have been reported in which the uncinate process surrounded the portal vein [6, 7]. These types of cases have to be considered carefully during pancreatic resections. Rarely the annular pancreas can cause duodeno-pancreatic reflux. Duodenoduodenostomy is the surgery of choice in such cases [8]. Jimenez *et al*. did an extensive review of patients with annular pancreas. In their study, 25% of the patients were premature, 75% presented during the first week of life and the remainder within the first year. Ninety-four percent presented with vomiting, which was nonbilious, 31% had chromosomal anomalies, and 38% had other major congenital malformations [9]. Annular pancreas can result in abdominal pain, nausea and vomiting at any age group [10] and its diagnosis can be made using MRI with cholangiopancreatography [11]. Maker *et al*. have done an extensive review of annular pancreas cases presented in a century. According to their observation, despite all present diagnostic tools including endoscopic retrograde cholangiopancreato-graphy diagnosis at best is made in only 60% of patients preoperatively. Enteroenterostomy seems to be the intervention of choice for a multitude of anatomic and physiologic reasons and with a wide array of surgical options available when additional factors need to be addressed [12].

The case we are reporting is unique because of the presence of two rings of pancreatic tissue around the duodenum. This anomaly is likely to be a postnatal development rather than a congenital anomaly. Here the danger of the compression of duodenum is doubled because of the presence of a double ring. The ring of pancreatic tissue around the third part of the duodenum was directly related to the superior mesenteric vessels and abdominal aorta. It might compress these vessels if hypertrophied. The surgeons operating on liver, kidney, bile duct and duodenum should be aware of the possibility of this type of variation. Normally the superior mesenteric artery gives only one branch to the pancreas, namely the inferior pancreaticoduodenal artery. This artery normally runs between the head of the pancreas and the duodenum. In the current case there was an anomalous branch of superior mesenteric artery which ran across the anterior border of the pancreas. Though the pancreas can enjoy the additional blood supply through this artery, the surgeons need to be aware of this artery while performing pancreatic surgery.

Conflict interests The authors have no potential conflict of interest

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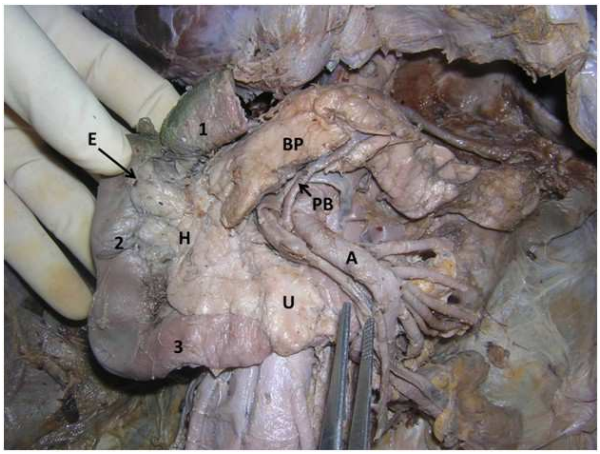

Figure 2. Closer view of the duodenum and pancreas. Note the uncinate process covering the third part of the duodenum completely and another extension from the head covering the junction between the first and second parts of the duodenum.
1: first part of the duodenum; 2: second part of the duodenum; 3: third part of the duodenum; A: superior mesenteric artery; BP: body of the pancreas; E: extension from the head; H: head of the pancreas; PB; pancreatic branch of the superior mesenteric artery; U: uncinate process

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