

Laparoscopic treatment of annular pancreas in adults: report of a case

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The annular pancreas in adults is a rare congenital anomaly that is detected after development of complications, such as gastric outlet obstruction, recurrent pancreatitis, and peptic ulcer. Duodenal bypass is the procedure of choice for treating duodenal obstruction caused by the annular pancreas in both children and adults. Duodenoduodenostomy is routinely performed in neonates and children. In adults, duodenojejunostomy or gastrojejunostomy are recommended, because the duodenum is less mobile. We report a case of annular pancreas in a 33-year-old male that was successfully treated with laparoscopic gastrojejunostomy. (*Korean J Hepatobiliary Pancreat Surg 2012;16:43-45*)

Key Words: Annular pancreas; Duodenal bypass; Laparoscopy; Gastrojejunostomy

INTRODUCTION

The annular pancreas is a rarely reported congenital anomaly that forms a ring of pancreatic tissue leading to partial or complete encirclement of the descending duodenum.^{1,2} Although it is usually found in neonates, the annular pancreas in an adult is reported infrequently.¹ Neonatal patients present with specific symptoms caused by duodenal obstruction, and adult patients present with abdominal pain, nausea, vomiting, weight loss, and jaundice. Bypass surgery is the treatment of the annular pancreas in order to relieve duodenal obstruction.

We encountered an adult case of annular pancreas with successful laparoscopic gastrojejunostomy and vagotomy.

CASE

A 33-year-old male patient was admitted to the Department of Surgery of Chung-Ang University Hospital complaining of recurrent upper abdominal discomfort and vomiting that had developed 12 months prior. Five months before the admission, he visited our hospital presenting with upper abdominal pain. The computed tomography (CT) findings at that time suggested the possibility

of the annular pancreas, but he was discharged without further evaluation, because his symptoms improved. At his second visit, the laboratory studies and simple radiographs were unremarkable. CT showed a mass encircling the second portion of the duodenum with stenosis and food residue, suggesting annular pancreas (Fig. 1).

After admission, an upper gastrointestinal (UGI) series and magnetic resonance cholangiopancreatography (MRCP) were performed (Fig. 2, 3). A UGI series demonstrated



Fig. 1. Computed tomography scan shows circumferential soft tissue density around the second portion of the duodenum with luminal narrowing.

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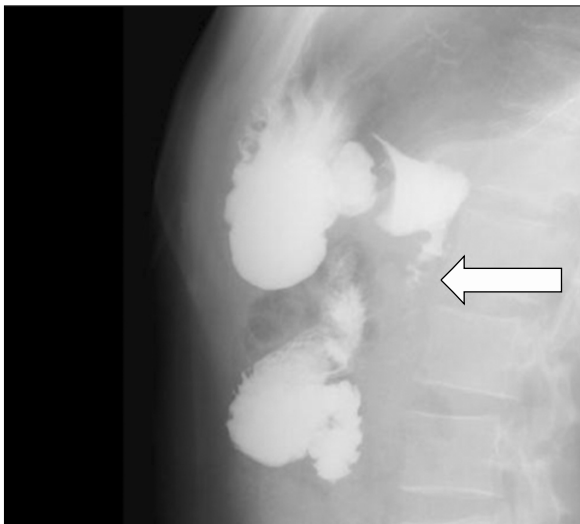


Fig. 2. Upper gastrointestinal series shows 2.4 cm segmental narrowing on the second portion of the duodenum.

an approximately 2.4 cm long luminal narrowing of the descending duodenum. The MRCP finding was similar to the CT finding. The patient was diagnosed with annular pancreas complicated by duodenal obstruction.

The patient underwent laparoscopic surgery. A laparoscopic gastrojejunostomy with vagotomy was performed. Under general anesthesia, the patient was placed supine in the reverse Trendelenburg position. An 11 mm-sized camera port was inserted in the supra-umbilicus by the Hasson method. Three 5 mm-sized trocars were placed on the right upper and left lower abdominal wall and below the xyphoid process. A 12 mm-sized port was inserted in the right lower abdomen for the surgeon's dominant hand and a laparoscopic linear stapler. Laparoscopic findings confirmed the annular pancreas without additional abnormal findings. First, a truncal vagotomy was performed. Then, the greater curvature of the stomach from 10 cm above the pylorus to proximal 10 cm was cleared in order to perform a gastrojejunostomy. A loop of the proximal jejunum, 50 cm distal to the ligament of Treitz, was utilized for construction of the antecolic gastrojejunal anastomosis. A small gastrotomy and enterotomy were made. Then, a 60 mm linear stapler (Autosuture™ Endo GIA, Covidien, Mansfield, MA, USA) was used to fashion the side-to-side gastrojejunal anastomosis, as it was fired between the opposing walls of the viscera. The enterotomy was closed laparoscopically in 2 layers with absorbable sutures. A surgical drain was not placed.

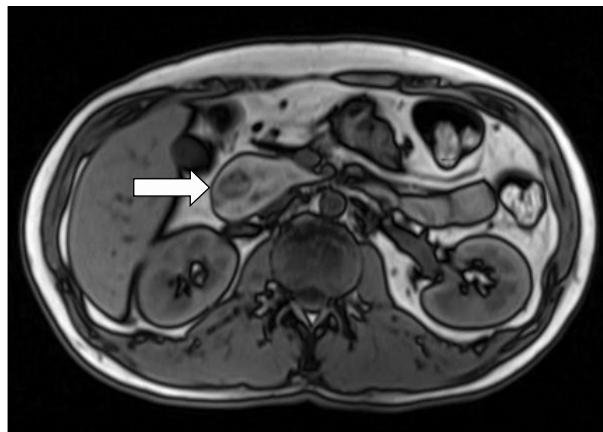


Fig. 3. Magnetic resonance image shows circumferential pancreas around the second portion of the duodenum with luminal narrowing.

Postoperatively, an oral diet was started on the third, postoperative day. The patient recovered successfully without any complications. One year after surgery, there was no evidence of symptoms having recurred.

DISCUSSION

The annular pancreas is a rare congenital anomaly that affects males more commonly than females and occurs at a frequency of 1 : 20,000 births. Of annular pancreas cases, 25% form a complete pancreatic ring, and 75% have a partial ring.³ Although the etiology of the annular pancreas has not been fully elucidated, multiple developmental factors have been implicated in the pathogenesis of the annular pancreas.⁴ Other congenital anomalies, including Down syndrome, intestinal atresia, pancreatico-biliary malrotation, and pancreas divisum, are associated with the annular pancreas.⁵

The annular pancreas can present itself in a wide range of clinical severities according to the degree of duodenal obstruction. In adults, annular pancreas occurs most commonly in the decades of 20s to 50s. Since these conditions in adults are usually asymptomatic, a number of diagnoses can be made by chance. The symptoms of adult annular pancreas include abdominal pain, nausea, vomiting, weight loss, jaundice, and abdominal fullness. When obstructive jaundice occurs, the possibility of a carcinoma of the ampulla of Vater should be considered.⁶ The patient in this report presented with typical symptoms of the an-

nular pancreas.

A 'double bubble' sign on the simple radiograph can help to make a diagnosis of the annular pancreas. However, this has limited diagnostic value, because it is neither specific nor sensitive.⁷ In adult patients, UGI series have been considered the study of choice.² There are some findings that are typical, including annular defect on the second portion of the duodenum, dilatation of the proximal lumen, and retrograde intestinal movement from the proximal part to obstruction.⁵ Stenosis of the second portion of the duodenum was found in this study. An endoscopic retrograde cholangiopancreatography (ERCP) can make a specific diagnosis when the pancreatic duct is outlined. However, it is difficult to use ERCP to diagnose patients with annular pancreatic ducts joining the accessory pancreatic duct or with duodenal obstruction.³ In addition, it is invasive and can cause iatrogenic pancreatitis. MRCP is a less invasive diagnostic tool. In addition, it is the most useful method to study abnormal pancreatic duct progression.^{2,8} Abdominal CT and endoscopic ultrasonography are helpful to diagnose the annular pancreas.

The definitive treatment of the annular pancreas is surgery, which can resolve a duodenal obstruction that causes symptoms. Bypass is superior to local resection of the annular pancreas, which may be complicated with postoperative pancreatitis, pancreatic fistula, or recurrent duodenal stenosis.⁹ Since Vidal first reported successful gastrojejunostomy in a 3-year-old patient with annular pancreas in 1905, Zyromski et al.¹⁰ reported that duodenoduodenostomy or duodenojejunostomy caused less anastomotic site ulcers than gastrojejunostomy.¹⁰ Although duodenoduodenostomy is a routine procedure in neonates and children, duodenojejunostomy or gastrojejunostomy is recommended in adult patients due to less mobility of the duodenum.

The minimally invasive procedures are generally performed due to less postoperative complications and a

short recovery time. Laparoscopic gastrojejunostomy has been widely performed in patients with obesity or gastrointestinal cancers. This suggests that laparoscopic gastrojejunostomy is a useful treatment modality of the annular pancreas. It has been reported that laparoscopic duodeno-duodenostomy and laparoscopic gastrojejunostomy are successfully performed in pediatric patients and in adult patients, respectively.^{5,10} We performed vagotomy in order to avoid an ulcer of the anastomotic site, which is one of the complications of gastrojejunostomy.

We suggest that laparoscopic gastrojejunostomy with vagotomy is a good treatment option for adult patients with annular pancreas.

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