

Endoscopic Ultrasound (EUS) as a Diagnostic option for Annular Pancreas: A Case Report

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ABSTRACT

Annular pancreas is a rare congenital condition of the pancreas where pancreatic tissue either partially or completely covers the duodenum by forming a ring. Endoscopic ultrasound is rarely considered as an initial diagnostic tool for annular pancreas. We here present the case of a 48-year-old male primarily provisionally diagnosed with a pancreatic mass for which a pancreatoduodenectomy was planned. However, an endoscopic ultrasound confirmed the diagnosis of annular pancreas.

Keywords: Annular Pancreas; Endoscopic ultrasound; Pancreatic anomaly

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INTRODUCTION

Annular pancreas is a rare congenital anomaly of the pancreas that occurs in one of every 12,000-15,000 live births. In annular pancreas the pancreatic tissue surrounds the duodenum by forming a ring, either partially or completely(1). Diagnostic imaging options such as abdominal radiograph, barium-meal study, computed tomography (CT), magnetic resonance imaging (MRI) and MR cholangiopancreatography (MRCP) have been widely used to assist with the preoperative diagnosis(2), however less emphasis

has been given to endoscopic ultrasound (EUS). We present a case of annular pancreas where EUS has assisted with the definitive, confirmative diagnosis missed by other diagnostic options.

CASE REPORT

A 48-year-old male was hospitalized because of epigastric pain and vomiting for more than one month. Abdominal CT examination revealed a space-occupying lesion in the pancreatic head (2 cm x 2.7 cm). An enhanced scan in the arterial phase showed a low density; high density was observed in the venous phase. The pancreatic, intrahepatic bile and extrahepatic bile ducts were mildly dilated. There was no enlargement of the retroperitoneal lymph node(Figure 1).

A provisional diagnosis of pancreatic mass was made and the patient was admitted for a definitive diagnosis. The attending physician recommended an EUS plus a fine needle aspiration (FNA) of the mass.

Gastroscopy showed a smooth duodenal mucosa; the descending part of the duodenum was tortuous, and the major papilla was visualized, however

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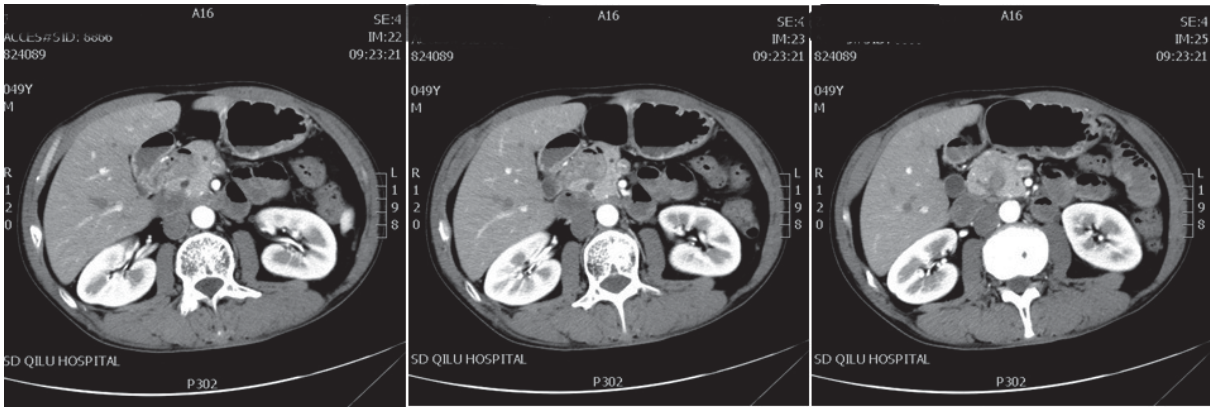


Fig1: Abdominal CT of the patient

the distal end of the descending part was barely accessible. EUS showed a homogenous echo in the pancreatic body and tail, no obvious abnormality was seen except for a slightly dilated pancreatic duct. Upon exploration of the pancreatic head through the duodenal bulb no obvious lesion was seen (PV -1.4 cm, CBD -0.6 cm)(Figure 2).



Fig2: Endoscopic Ultrasound of the patient.

The endoscopic ultrasound probe was twisted into the duodenal bulb of the duodenum and pancreatic echoes were detected in $\frac{3}{4}$ circles which was homogenous. No abnormal mass was seen in the uncinata process. The main pancreatic duct, duct of the pancreatic head and the annular pancreas were converged in the pancreatic head and neck junction along with the latero-ventral region of the descending part of the duodenum. EUS results revealed a tortuous descending duodenum and annular pancreas. The original plan for this patient was pancreaticoduodenectomy, however when

the definitive diagnosis of annular pancreas was determined to be the cause for his duodenal stenosis, a duodenal side-to-side anastomosis was planned.

DISCUSSION

Annular pancreas is a clinically rare congenital anomaly that is mostly asymptomatic until adulthood. Symptoms usually include abdominal pain, vomiting, and nausea. In severe cases, this anomaly may lead to biliary obstruction(3). Complications associated with annular pancreas include peptic ulcer (26%-48%), acute pancreatitis (15%-30%) and biliary obstruction(2,4). The pathogenesis of annular pancreas is controversial for which two hypotheses exist: (i) during normal rotation the right ventral bud tip attaches to the duodenal wall to form a ring and (ii) the existing left ventral bud develops to create a circle of pancreatic tissue around the duodenum(1).

Due to the lack of knowledge about this disease and its rareness, it is difficult to diagnose. Current diagnostic options such as an abdominal radiograph show the classic double-bubble sign, air in the stomach and the duodenal bulb(5). ERCP, on the other hand, is widely used and has a high accuracy rate, however it is very expensive. In cases of duodenal obstruction and stenosis, ERCP cannot yield good results(6). Similarly, CT scan and MRI are able to visualize the pancreatic tissue around the duodenum but these findings are highly non-specific because these scans are not clear cut. In case of obstruction in the duodenum the food particles remain as emptying is prolonged, which can be misinterpreted as a mass - similar to the current case(2). MRI shows thickening of the posterior descending

duodenum due to tissues with identical signal intensity and enhancement characteristics similar to pancreatic tissues(7). MRCP, on the other hand, can clearly display the annular duct but sometimes the pancreatic duct without dilation is invisible on MRCP(6). In presence of all these diagnostic options EUS is rarely considered as the first choice for diagnosis. We believe EUS is a valuable, feasible technique for diagnosing an annular pancreas. We suggest that EUS should be considered as the first choice for diagnosis because: (i) EUS can clearly show the pancreatic wrap around the descending part of the duodenum, (ii) in cases of duodenal obstruction and stenosis EUS can access the pancreatic tissues by scanning through the duodenal bulb, (iii) the surgical risk can be reduced as EUS can provide a clear observation of the pancreatic

duct, bile duct and surrounding vessels, (iv) common complications of annular pancreas such as peptic ulcer can be comprehensively evaluated via EUS, (v) in case of duodenal obstruction and stenosis the smaller probe of ultrasound can be used to access duodenal parts by endoscopy, and(vi) enlarged lymph nodes around the mass can be examined via EUS to distinguish between a benign or malignant mass

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REFERENCES

1. Tadokoro H, Takase M, Nobukawa B. Development and congenital anomalies of the pancreas. *Anat Res Int* 2011; 2011:351217.
2. Kandpal H, Bhatia V, Garg P, Sharma R. Annular pancreas in an adult patient: diagnosis with endoscopic ultrasonography and magnetic resonance cholangiopancreatography. *Singapore Med J* 2009;50:29-31.
3. Rizzo RJ, Szucas RA, Turner MA. Congenital abnormalities of the pancreas and biliary tree in adults. *Radiographics* 1995;15:49-68.
4. Jarry J, Wagner T, Rault A, Sa Cunha A, Collet D. Annular pancreas: A rare cause of acute pancreatitis. *Journal of the pancreas* 2011;12:155-7.
5. Dankovcik R, Jirasek JE, Kucera E, Feyereisl J, Radonak J, Dudas M. Prenatal diagnosis of annular pancreas: Reliability of the Double Bubble sign with periduodenalhyperechogenic band. *Fetal Diagn Ther* 2009;24:483-90.
6. Patra DP, Basu A, Chanduka A, Roy A. Annular Pancreas: A rare cause of duodenal obstruction in adults. *Indian J Surg* 2011;73:163-5.
7. Fu PF, Yu JR, Liu XS, Shen QY, Zheng SS. Symptomatic adult annular pancreas: report of two cases and a review of the literature. *Hepatobiliary Pancreat Dis Int* 2005; 4:468-71.