

# World Journal of *Gastroenterology*

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## Mass forming chronic pancreatitis mimicking pancreatic cystic neoplasm: A case report

Keum Nahn Jee

Keum Nahn Jee, Department of Radiology, Dankook University Hospital, Chungcheongnam-do 330-715, South Korea

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ORCID number: Keum Nahn Jee: (0000-0003-2669-4381).

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**Correspondence to:** Keum Nahn Jee, MD, PhD, Professor, Department of Radiology, Dankook University Hospital, Mang-hyang Street 201, Anseo-dong, Dongnam-gu, Cheonan, Chungcheongnam-do 330-715, South Korea. [jkn1303@dkuh.co.kr](mailto:jkn1303@dkuh.co.kr)  
Telephone: +82-41-5506921  
Fax: +82-41-5529674

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### Abstract

Mass forming chronic pancreatitis is very rare. Diagnosis could be done by the pathologic findings of focal inflammatory fibrosis without evidence of tumor in pancreas. A 34-year-old man presented with right upper abdominal pain for a few weeks and slightly elevated bilirubin level on clinical findings. Radiological findings of multidetector-row computed tomography, magnetic resonance (MR) imaging with MR cholangiopancreatography and endoscopic ultrasonography revealed focal branch pancreatic duct dilatation with surrounding delayed enhancing solid component at uncinate process and head of pancreas, suggesting branch duct type intraductal papillary mucinous neoplasm. Surgery was done and pathology revealed the focal chronic inflammation, fibrosis, and branch duct dilatation. Herein, I would like to report the first case report of mass forming chronic pancreatitis mimicking pancreatic cystic neoplasm.

**Key words:** Chronic pancreatitis; Pseudotumor; Computed tomography; Magnetic resonance imaging; Endoscopic ultrasound

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**Core tip:** Extremely unusual radiological manifestation of mass forming chronic pancreatitis mimicking pancreatic cystic neoplasm is the first case report in the English-written medical literature.

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## INTRODUCTION

Chronic pancreatitis represents a recurrent, prolonged inflammatory process and progressive fibrosis of the pancreas. These results in irreversible morphologic change of the pancreas, clinical symptoms of abdominal pain, and insufficiency of exocrine and endocrine function<sup>[1-3]</sup>. On computed tomography (CT) and magnetic resonance (MR) image, dilatation of the main pancreatic duct, parenchymal atrophy, pancreatic calcification or stone, focal pancreatic enlargement or inflammatory pancreatic mass, bile duct dilatation, attenuation change of peripancreatic fat and fluid collection are frequent findings<sup>[4-6]</sup>.

Inflammatory mass in chronic pancreatitis retain a large degree of fibrosis like pancreatic carcinoma<sup>[7-9]</sup>, and both lesions are shown as a gradual progressive enhancement on contrast-enhanced CT and dynamic MR imaging, making the discrimination of the two entities difficult<sup>[5,6,10]</sup>.

In the case of mass forming chronic pancreatitis, diagnosis of inflammatory pancreatic mass could be almost impossible if associated radiological findings of chronic pancreatitis is not shown.

This paper presents a very unique case of mass forming chronic pancreatitis mimicking pancreatic cystic neoplasm.

## CASE REPORT

A 34-year-old man complained for right upper abdominal pain for a few days. His laboratory findings including white blood cell count, C-reactive protein, alkaline phosphatase, liver enzyme level and tumor markers of carbohydrate antigen 19-9 and carcinoembryonic antigen were within normal range except slight elevation of total bilirubin (1.3 mg/dL, normal range of 0.2-1.2), gamma-glutamyl transferase (108 IU/L, normal range of 8-60) and lipase (90 U/L, normal range of 30-60). The patient had past medical history of admission due to acute alcoholic pancreatitis 13 years ago and social history of daily alcohol consumption for 15 years and having smoked 20 pack years.

Unenhanced abdomen CT image showed slight low attenuating lesion involving pancreatic uncinata process and head (Figure 1A). Contrast-enhanced abdominal CT images showed a delayed enhancing solid portion surrounding a few tubular cystic attenuating lesion sized about 2.5 cm × 2.1 cm in pancreatic uncinata process and head, and mild dilatation of common bile duct (CBD) and gallbladder (Figure 1B and C). MR cholangiopancreatography showed branch pancreatic

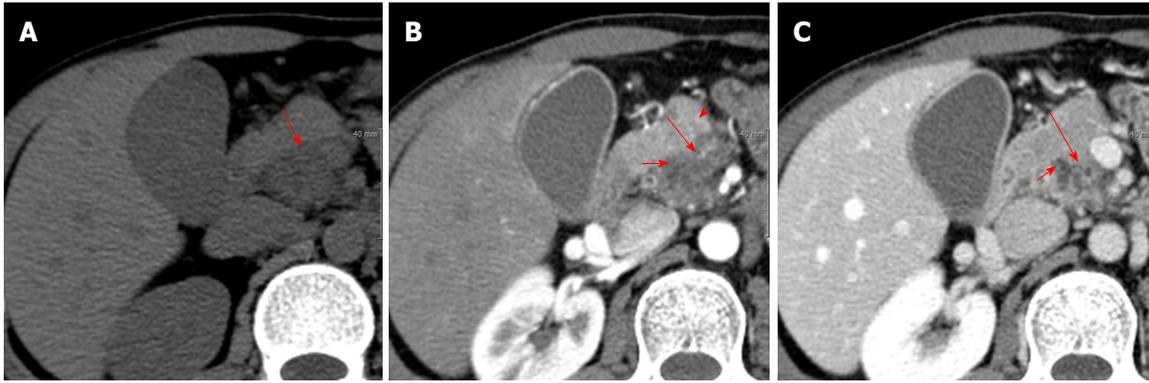
duct dilation in head and uncinata process causing extrinsic indentation and tapering of distal CBD, and mild dilatation of proximal CBD and gallbladder (Figure 2A). Fat-saturated T2-weighted MR image showed a slight high signal intensity solid component surrounding bright signal intensity branch duct dilatation in pancreatic uncinata process and head, with the lesion sized about 2.6 cm × 2.2 cm (Figure 1B). Fat-suppressed T1-weighted MR image showed a well-demarcated low signal intensity lesion in head and uncinata process of pancreas (Figure 2C), and delayed contrast-enhancing solid component surrounding low signal intensity branch-duct dilatation in pancreatic uncinata process and head was shown on fat-suppressed T1-weighted dynamic gadolinium-enhanced MR images (Figure 2D and E). Diffusion-weighted MR images showed higher signal intensity on low *b* factor (*b* = 20 s/m<sup>2</sup>) image and low signal intensity on high *b* factor (*b* = 800 s/m<sup>2</sup>) image, suggesting no diffusion restriction on apparent diffusion coefficient map (Figure 2H), which reflecting the large area of cystic component of the lesion. Endoscopic ultrasonography (EUS) showed pruning pattern, anechoic branch duct dilatation containing a few small hyperechoic mural nodules (Figure 3A and B).

The lesion located in uncinata process and head of pancreas with indenting distal CBD and dilatation of proximal CBD, without dilatation of main pancreatic duct due to anatomic variation of pancreatic divisum which was detected on MR image (Figure 2B). Radiological diagnostic impression was branch duct type intraductal papillary mucinous neoplasm (IPMN) of pancreas. However, some worrisome features of delayed contrast-enhancing solid component around the wall of dilated branch duct on CT and MR images and small mural nodules in dilated branch ducts on EUS were shown. EUS guided fine needle aspiration (FNA) cytology was obtained from the solid component along the wall of dilated duct and suggested the possibility of intraductal-growing epithelial neoplasm.

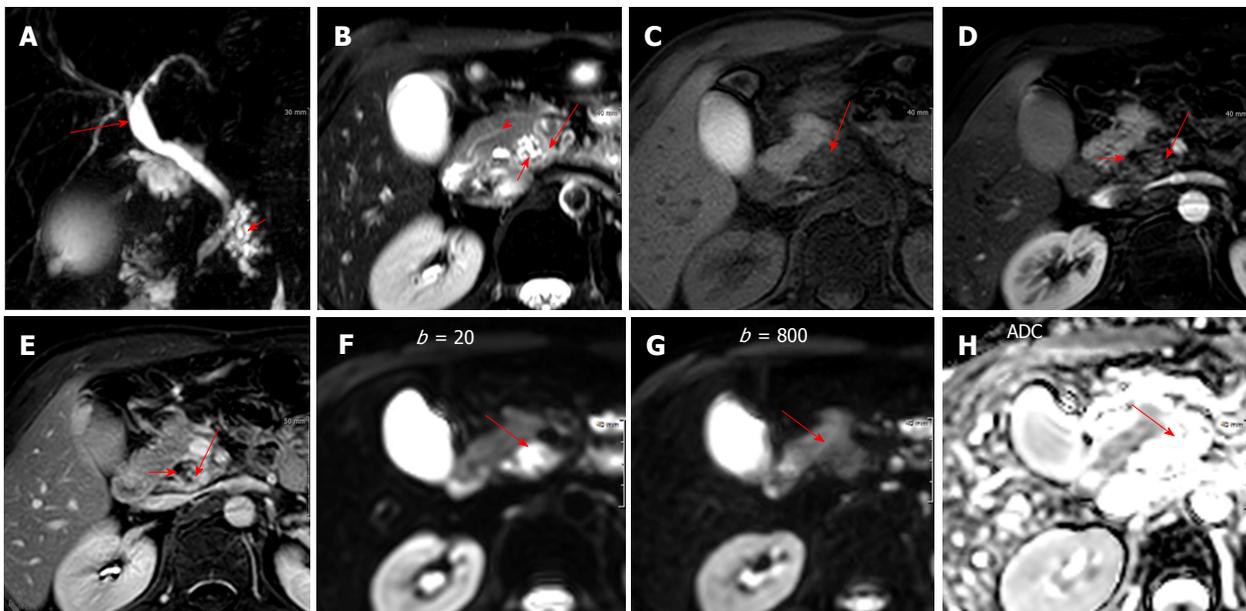
The patient underwent pylorus-preserving pancreaticoduodenectomy, due to considering FNA finding, imaging findings of CT, MRI, and EUS and aggravated right upper abdominal pain and persistent mild elevation of bilirubin and gamma-glutamyl transferase levels without response to conservative medical treatment for four weeks. The gross pathology of resected specimen showed whitish hard infiltrating lesion in pancreatic uncinata process and head portion (Figure 4A). The histopathologic report revealed periductal inflammation with fibrosis and mild dilatation of branch pancreatic ducts and intralobular fibrosis, consistent with chronic pancreatitis (Figure 4B).

## DISCUSSION

Chronic pancreatitis is defined as inflammatory and fibrotic disease of pancreatic tissue, characterized by irreversible functional and morphologic change.



**Figure 1 Findings from computed tomography.** A: Unenhanced computed tomography (CT) image shows a slight low attenuating lesion (arrow) in pancreatic uncinated process and head and dilatation of gallbladder; B: Contrast-enhanced arterial phase CT image shows minimal enhancing low attenuating lesion (long arrow) surrounding a few tubular low cystic attenuating structures (short arrow), and homogenous highly enhancing normal pancreas (arrowhead); C: Contrast-enhanced portal venous phase CT image shows delayed enhancing lesion (long arrow) containing a few tubular cystic structures (short arrow).



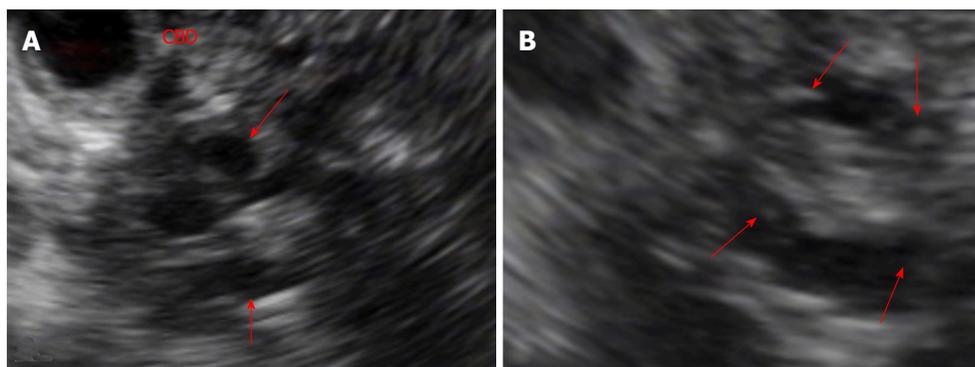
**Figure 2 Findings from magnetic resonance image.** A: Magnetic resonance (MR) cholangiopancreatography shows localized branch pancreatic duct dilatation (short arrow) in head of pancreas with tapering of distal common bile duct and dilatation of proximal common duct (long arrow); B: T2-weighted MR image shows slight high signal intensity lesion (long arrow) containing bright intensity branch duct dilatation (short arrow) in head and uncinated process of pancreas, and incidental finding of pancreatic divisum (arrowhead); C: Fat-suppressed T1-weighted MR image shows a well-demarcated low signal intensity lesion (long arrow) in uncinated process and head of pancreas; D-E: Fat-suppressed T1-weighted gadolinium-enhanced arterial- (D) and delayed-phase (E) MR images show delayed highly enhancing solid mass-like lesion (long arrows) containing non-enhancing dark intensity branch duct dilatation (short arrows) in pancreatic head; F: The higher signal intensity lesion (arrow) on diffusion-weighted image obtained with  $b = 20 \text{ s/m}^2$  shows as low signal intensity (arrow) on diffusion-weighted image obtained with  $b = 800 \text{ s/m}^2$  and as higher (arrow) apparent diffusion coefficient (ADC) without diffusion restriction.

Alcohol abuse is the most common (70%-80%) cause of chronic pancreatitis in the developed countries<sup>[1,2,3,7]</sup>. In addition, smoking, gene mutations, autoimmune syndromes, metabolic disturbances, environmental conditions and anatomical abnormalities are suggested as other associated factors with occurrence of the disease<sup>[3,11,12]</sup>.

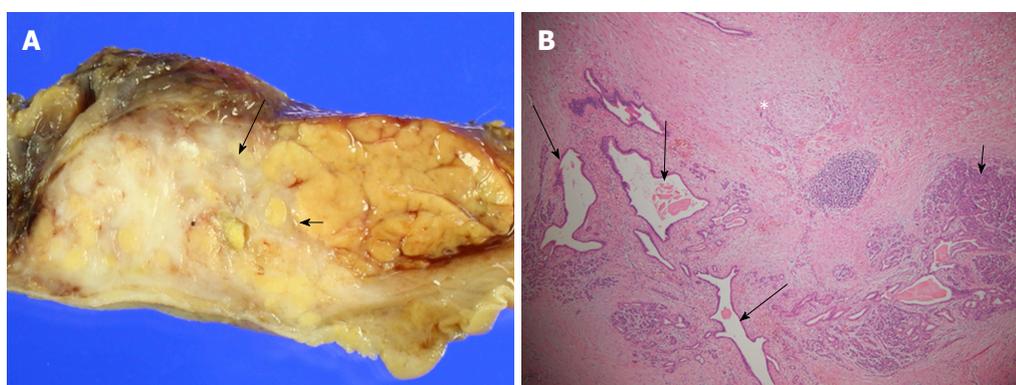
The pathology of advanced alcoholic chronic pancreatitis revealed a firm consistency of pancreas with an irregular contour without the normal lobulation<sup>[13]</sup>. The fibrosis may diffusely affect the entire gland, but

occasionally it is unevenly distributed, with preserved normal lobular pattern in some areas. The severity of the duct changes depends on the extent of the surrounding fibrosis. Thus, the main duct may be focally or diffusely involved with obstruction, irregular dilatation and distortion<sup>[14,15]</sup>. Fibrosis in the pancreas head may cause a tapering stenosis of CBD<sup>[16]</sup>.

In this case, initial clinical symptom of right upper abdominal pain was developed due to dilatation of gallbladder by stenosis of distal CBD, and the causative lesion of CBD obstruction was a focal mass lesion,



**Figure 3 Findings from endoscopic ultrasound.** A: EUS shows a few anechoic tubular structures (arrows), causing indentation of distal CBD and dilatation of proximal bile duct; B: EUS shows small hyperechoic mural nodules (arrows) in the dilated branch pancreatic ducts. EUS: Endoscopic ultrasound; CBD: Common bile duct.



**Figure 4 Macroscopic and microscopic findings of resected specimen.** A: Gross specimen shows whitish hard infiltrating mass-like lesion (arrows) focally replaced head and uncinate process of pancreas; B: Microscopy (hematoxylin and eosin, x 40) shows perilobular and intralobular fibrosis (asterisk) replaces normal pancreatic acini with focal perivascular lymphocyte infiltration (short arrow) and dilated branch ducts (long arrows).

including branch duct dilatation with surrounding solid component in uncinate process and head of pancreas, detected on CT, MRI and EUS findings. The diagnostic impression based on radiological imaging findings was branch duct type IPMN most likely and serous cystadenoma as a possible differential diagnosis. In thinking of branch duct type IPMN, analyses of imaging findings included the “worrisome features” of contrast-enhancing ductal margin on CT and MRI and mural nodules in dilated duct on EUS<sup>[17-19]</sup>. In addition, FNA suggested intraductal-growing epithelial neoplasm though scant cellularity. Surgery was the best choice at that time, considering aggravated clinical symptom, radiological findings, opinion of FNA, and patient’s young age. However, final pathologic result revealed interlobular and intralobular inflammation and fibrosis associated with branch duct dilatation, compatible with chronic pancreatitis. It was a totally unexpected one, even though considering patient’s past medical history of severe alcoholic pancreatitis and social history of frequent alcohol consumption and heavy smoking.

There have been many reports for the differentiation mass forming chronic pancreatitis from pancreatic adenocarcinoma such as dynamic enhancement of CT and MR imaging, Perfusion CT imaging, dual energy

CT in spectral imaging mode, 18F fluorodeoxyglucose positron emission tomography/CT combined with carbohydrate antigen 19-9, and quantitative endoscopic ultrasound elastography, but still it is very difficult to distinguish accurately between the two<sup>[5,10,20-24]</sup>. MRI is much better than CT for detection and characterization of focal pancreatic lesion, but it could not differentiate mass forming chronic pancreatitis from pancreatic carcinoma, even using diffusion-weighted functional MR imaging technique<sup>[5,10,25,26]</sup>. In addition, none of the above mentioned papers included a case of a solid mass containing cystic lesion like this in their research of differentiation between mass forming pancreatitis and pancreatic carcinoma.

Among the papers on relationship between main pancreatic duct (MPD) and the mass, the “duct-penetrating” sign of MPD on MR cholangiopancreatography was reported to be helpful with relatively high sensitivity and specificity, and the result was smoothly stenotic or normal MPD penetrating a mass was seen more frequently in inflammatory pancreatic mass than in pancreatic carcinoma<sup>[27]</sup>. However, in this peculiar case, inflammatory mass possessed dilated branch pancreatic duct without stenosis.

In this very unique case, it could be comprehended

uneven fibrosis and inflammation developed in localized area of uncinate process and head of pancreas, focal severe perilobular and interlobular fibrosis caused stricture and dilatation of branch pancreatic duct in uncinate process, and the these outbreaks led to very distinctive and peculiar radiological features of mass forming chronic pancreatitis and clinical symptoms of bile duct obstruction.

There has been no literature about focal fibrotic mass forming chronic pancreatitis containing branch duct dilatation, and incidentally this lesion showed almost typical imaging findings of pancreatic cystic neoplasm.

## ARTICLE HIGHLIGHTS

### Case characteristics

A 34-year-old man was referred to our hospital with right upper abdominal pain, and a pancreatic solid and cystic lesion found on computed tomography (CT), magnetic resonance (MR) image with MR cholangiography, and endoscopic ultrasonography (EUS).

### Clinical diagnosis

Branch duct type intraductal papillary mucinous neoplasm.

### Differential diagnosis

Serous cystadenoma among solid and cystic pancreatic neoplasms.

### Laboratory diagnosis

Abnormal laboratory results included slightly elevated level of total bilirubin (1.3 mg/dL, normal range of 0.2-1.2) and gamma-glutamyl transferase (108 IU/L, normal range of 8-60).

### Imaging diagnosis

CT and MR imaging showed a delayed contrast-enhanced solid lesion containing pruning-pattern branch duct dilatation in uncinate process and head of pancreas, with small hyperechoic mural nodules in the dilated branch ducts on EUS.

### Pathological diagnosis

Microscopic findings of resected specimen revealed mass forming chronic pancreatitis including branch duct dilatation.

### Treatment

The patient was treated with pylorus-preserving pancreaticoduodenectomy.

### Related reports

There have been many reports for the discrimination between mass forming chronic pancreatitis and pancreatic adenocarcinoma using various imaging modalities.

### Term explanation

There are no non-standard medical terms used in this manuscript.

### Experiences and lessons

The author presents this case to share the very unusual but important knowledge that mass forming chronic pancreatitis might include the branch duct dilatation.

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