Mucinous Cystadenocarcinoma Initially Diagnosed as Recurrent Infected Pancreatic Pseudocyst After Acute Pancreatitis - Report of a Case

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Abstract
We report a case initially diagnosed as infected pancreatic pseudocyst after acute pancreatitis and treated by repeated endoscopic drainage, in which the final diagnosis was mucinous cystadenocarcinoma.

A 60-year-old woman was admitted to our hospital's gastroenterology department after developing acute pancreatitis and what seemed to be recurrent infected pseudocyst of the pancreatic tail. This was treated by endoscopic transpapillary drainage. However, because the cyst enlarged on imaging and serum carbohydrate antigen 19-9 level increased, we decided to treat the case surgically. Postoperative pathological examination revealed mucinous cystadenocarcinoma with direct invasion of the spleen and transverse colon.

Key words: acute pancreatitis, infected pancreatic pseudocyst, mucinous cystadenocarcinoma

Introduction
Acute pancreatitis sometimes gives us an opportunity to detect latent pancreatic cancer. We therefore perform endoscopic retrograde cholangiopancreatography (ERCP) to investigate the causes of pancreatitis in cases where pancreatic cancer is thought to be possible.

In general, advanced pancreatic cancer gradually narrows the pancreatic duct proximally, while the tail of the duct becomes dilated. This process may trigger mild attacks of pancreatitis.

In the present case, we performed endoscopic drainage repeatedly for what seemed to be an infected pancreatic pseudocyst following acute pancreatitis. Cytodiagnosis was performed simultaneously, yielding no malignant findings.

Eventually, the rapidly increasing tumor marker level and enlarging pancreatic cystic tumor prompted us to perform surgery because of the possibility of malignancy. The final diagnosis was mucinous cystadenocarcinoma (MCC). Herein we report the case and provide a brief review of the relevant literature.

Case Report
A 60-year-old woman with a chief complaint of abdominal pain consulted the gastroenterology department of our hospital in June 2007. She was diagnosed with acute pancreatitis and infected pseudocyst of the pancreatic tail and was hospitalized. Her past history included hypertension, diabetes mellitus, and thyromma.

When she was first admitted to the gastroenterology department in June 2007, abdominal computed tomography (CT) showed a cystic tumor measuring...
MCC after infected pancreatic pseudocyst

81 mm in maximum diameter at the pancreatic tail. Plain CT showed some areas of calcification and an enhancement effect within the tumor (Fig. 1). ERCP demonstrated the communication between the cystic lesion and main pancreatic duct, which was filled with pus and necrotic debris. Cytological studies on the pancreatic juice revealed normal duct cells (class I). We inserted an endoscopic naso-pancreatic drainage (ENPD) tube, and performed drainage (Fig. 2).

Between June and October 2007, despite multiple endoscopic drainages, the patient developed several episodes of reinfection, including unusual variants such as communication with the pancreatic duct. Conservative therapy was therefore terminated. Because imaging showed enlargement of the cyst, and serum levels of the tumor marker carbohydrate antigen 19-9 rapidly increased, the patient was considered to have intractable infected pancreatic pseudocyst with a possibility of malignancy. Therefore, the patient was transferred to our department (of surgery) in May 2008. We show temporal change of the tumor in maximum diameter (Fig. 3).

Upon transfer, laboratory data were obtained. Serum level of glucose (GLU) was slightly increased at 253 mg/dl. Serum levels of the following tumor markers were increased: carbohydrate antigen (CA)19-9, 11620 U/ml; carcinoembryonic antigen (CEA) 10.1 ng/ml in May 2008 and CA19-9, 99.6 U/ml; CEA 4.5 ng/ml in Jun 2007.

Abdominal contrast enhanced CT suggested further enlargement of the cystic lesion of the pancreatic tail as well as possible splenic invasion (Fig. 4). Intraoperatively, an 8-cm continuous cystic lesion was observed extending from pancreatic tail to the spleen. The lesion was firmly adherent to the transverse colon. Intraoperative histopathological examination of the pancreatic tail tumor was performed, and findings were consistent with adenocarcinoma. We therefore performed distal pancreatectomy with splenectomy, partial transverse colectomy, and left adrenalectomy.

Histopathological examination of the resected specimen revealed the tumor within the pancreatic tail as a cystic lesion containing necrotic debris and mucus; it had invaded the spleen where a similar cystic lesion had formed (Fig. 5). Inside the large cystic lesion of the pancreatic tail, a small cyst containing fibrous septa was observed. The cystic wall had a papillary growth pattern of high columnar epithelium with mucus secretion (Fig. 6a). Tumor cells varied from adenoma to carcinoma, with some exhibiting features of both (Fig. 6b). Some of the lesion showed ovarian-type stroma (OS) (Fig. 6c), staining of which was negative for estrogen receptors (ER−) and positive for progesterone receptors (PgR+) (Fig. 6d). These features led to a diagnosis of MCC, an invasive cancer derived from mucinous cystic neoplasm.
Fig. 3 Temporal change of the tumor in maximum diameter (computed tomography (CT))
a) 81mm in maximum diameter (June 2007)
b) 38mm (July 2007)
c) 69mm (September 2007)
d) 44mm (December 2007)
※ Endoscopic drainages in June and October 2007

The patient has undergone chemotherapy with S-1, and she remains alive without recurrence, 32 months after surgery.

Discussion
Acute pancreatitis sometimes provides the opportunity to detect latent pancreatic cancer\(^1\). Because pancreatic duct obstruction is considered the mechanism by which pancreatic cancer causes pancreatitis, pancreatic duct stenosis detected by ERCP may point to the possibility of pancreatic cancer\(^2\).

In general, advanced pancreatic cancer leads to gradual narrowing of the pancreatic duct with dilation of its tail, which may be associated with mild attacks of pancreatitis. In the present case, we performed endoscopic drainage repeatedly for infected pancreatic pseudocyst following acute pancreatitis. Cytodiagnosis was performed simultaneously, yielding no malignant findings.

A PubMed search with key words of "acute pancreatitis", "infected pancreatic pseudocyst", and "pancreatic cancer" showed no reports of similar cases.

The differential diagnosis of pancreatic pseudo-
cyst on imaging includes serous cystic neoplasms, mucinous cystic neoplasms, and intraductal tumors such as intraductal papillary mucinous neoplasm (IPMN) and intraductal tubular tumors (ITTs). Further, invasive ductal carcinoma is reported to be associated with cyst formation in 8%, which suggests that it may not be particularly rare for cysts to form in pancreatic cancer. Preoperative imaging diagnosis was fairly difficult in this case. Detailed histopathological evaluation, however, determined that the lesion was MCC, an invasive cancer derived from pancreatic cystic tumor with...
direct invasion to the spleen and the transverse colon.

Recently, an international consensus guideline for IPMN and MCN (mucinous cystic neoplasm) was published to describe the clinicopathological features and treatment policy of cystic tumors of the pancreas based on accumulated case reports. It also suggested that OS must be present for a diagnosis of MCN. According to a survey conducted by the Japan Pancreas Society of MCN cases reported in Japan[9-11], however, cases in which OS was confirmed accounted for only 42.2%, while those without OS confirmation or with no description of the stroma accounted for 43.4%.

Many reports from Japan and the rest of the world have noted that the majority of MCNs occur in the distal pancreas of middle-aged women[9-12]. However, the presence of OS was not confirmed in all of these cases, with the diagnosis being based on other features of MCN in some[9]. This case was an invasive cancer so most of the cystic lesions had predominant tumor cell components, although some OS could be found. In addition, the large cystic lesion of the pancreatic tail contained a small cyst with fibrous septa. The cystic wall showed a papillary growth pattern of high columnar epithelium with mucus secretion. These features are consistent with those of MCN.

In terms of prognosis of MCNs, 5-year survival rate is 100% for mucinous cystadenoma (MCA) and minimally invasive MCC but only 37.5% for invasive MCC[8]. The issue of whether lymph node dissection affects prognosis requires evaluation by accumulation of cases and examination of the recurrent patterns. In the present case, regional lymph node dissection was performed in alignment with the treatment guideline for invasive pancreatic ductal carcinoma. No lymph node metastasis was observed on histopathological examination.

There is no standard regimen of postoperative chemotherapy for this tumor. The present patient has undergone S-1 chemotherapy and has remained alive without recurrence for 32 months after the surgery.

This case was initially diagnosed as infected pancreatic pseudocyst and treated conservatively for 11 months. However, the need for surgery later became apparent when malignancy was suspected. MCN has been considered a slow-growing, low-grade malignancy, but it has a poor prognosis if it becomes invasive. Hence the timing of surgery requires further consideration.

References