

Case Report

Usefulness of preoperative dynamic magnetic resonance imaging of the pancreas in diagnosing tumor-forming pancreatitis mimicking pancreatic cancer

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Abstract

Differential diagnosis between pancreatic carcinoma and tumor-forming pancreatitis remains difficult, which can cause serious problem because the management and prognosis of these two focal pancreatic masses are entirely different. We report herein a case of tumor-forming pancreatitis mimicking pancreatic carcinoma in an 80-year-old woman. Computed tomography revealed a solid mass in the head of the pancreas, and endoscopic retrograde cholangiopancreatography showed a complete obstruction of the main pancreatic duct in the head of the pancreas. Dynamic contrast-enhanced MRI demonstrated a time-signal intensity curve (TIC) with a slow rise to a peak (1 min after administration of contrast material), followed by a slow decline at the pancreatic mass, indicating fibrotic pancreas. Under the diagnosis of tumor-forming pancreatitis, the patient underwent a segmental pancreatectomy instead of a pancreaticoduodenectomy. The histopathology of the pancreatic mass showed chronic pancreatitis without malignancy. The pancreatic TIC obtained from dynamic-contrast MRI can be helpful in differentiating tumor-forming pancreatitis from pancreatic carcinoma and in avoiding any unnecessary major pancreatic surgery.

Introduction

Although various diagnostic modalities have been proposed to provide an accurate diagnosis, the differential diagnosis of pancreatic carcinoma and tumor-forming pancreatitis remains unsettled.¹⁻⁴ The differential diagnosis between pancreatic carcinoma and tumor-forming pancreatitis is exceedingly important because there is an extreme difference in the management and prognosis of these two pancreatic entities. We have reported that a time-signal intensity curve (TIC) of the pancreas obtained from dynamic contrast-enhanced magnetic resonance imaging (MRI) is a reliable indicator of pancreatic fibrosis.⁵ In addition, pancreatic TIC from dynamic MRI provides dependable information for differentiating pancreatic carcinoma from tumor-forming pancreatitis.⁶ We report herein the usefulness of the pre-operative pancreatic TIC from dynamic MRI in the diagnosis of tumor-forming pancreatitis mimicking pancreatic carcinoma.

Case report

An 80-year-old female was referred to our department for the treatment of a mass in the head of the pancreas. She had no complaint, and no abnormalities were found on physical examination. She had no history of alcohol consumption. Preoperative blood examinations were within normal limits, except for elevated carbohydrate antigen 19-9 levels of 101 IU/ml (normal range, 0-37 IU/ml), DU-PAN-2 levels of 560 IU/ml (normal range, 0-150 IU/ml), and serum IgG levels of 1850 mg/dl (normal range, 870-1700 mg/dl) and IgG4 levels of 198 mg/dl (normal range, 4.8-105 mg/dl). Carcinoembryonic antigen levels were within normal limits. Computed tomography (CT) revealed a solid mass in the head of the pancreas, 3.0 cm in diameter, which showed slight enhancement in the delayed phase (Fig. 1). Endoscopic retrograde cholangiopancreatography (ERCP) revealed a complete obstruction of the main pancreatic duct in the head of the pancreas (Fig. 2). There were no malignant cells in pancreatic juice collected by endoscopic cannulation and brushing cytology. Dynamic contrast-enhanced MRI demonstrated a TIC profile with a slow rise to a peak (1 min after administration of contrast material),

followed by a slow decline (type-II) at the pancreatic mass in the head of the pancreas (Fig. 3). The pancreatic parenchyma distal to the mass lesion also showed a type-II TIC. At the nontumorous pancreatic parenchyma proximal to the mass lesion, dynamic contrast-enhanced MRI showed a TIC profile with a rapid rise to a peak (25 s after injection of contrast material), followed by a rapid decline (type-I). We thus diagnosed the pancreatic mass as being tumor-forming pancreatitis. The patient underwent surgical resection with segmental pancreatectomy instead of receiving a pancreaticoduodenectomy. Histopathologic examination of the resected pancreatic mass revealed pronounced inflammatory cell infiltration around the main pancreatic duct.

Discussion

Preoperative differentiation between tumor-forming pancreatitis and pancreatic carcinoma is difficult because the imaging findings of these masses are extremely similar.¹⁻⁴ Recently, various diagnostic techniques have been proposed for the accurate differential diagnosis of pancreatic masses. Endoscopic ultrasound (EUS)-guided fine needle aspiration biopsy has been reported to be useful in differential diagnosis of pancreatic mass, including tumor-forming pancreatitis and pancreatic carcinoma.⁷ Okai et al.⁸ have reported that EUS combined with ERCP is useful for differentiation of tumor-forming pancreatitis from malignant tumor, for early diagnosis, and for monitoring therapeutic effects. In contrast, Ohtsubo et al.⁹ have reported that hypermethylation analyses of the cancer-specific genes in pure pancreatic juice supports differential diagnosis. However, these diagnostic modalities are both relatively an invasive.

Our previous study on the differentiation of focal pancreatic masses with dynamic contrast-enhanced MRI demonstrated that TIC profile analysis is useful for the diagnosis of pancreatic masses.⁶ The patterns of pancreatic TIC were

classified into 4 types according to the time to a peak: 25 s and 1, 2, and 3 min after the bolus injection of contrast material, namely, type-I, II, III, and IV, respectively. The normal pancreas shows the type-I TIC. In the previous study, pancreatic carcinomas demonstrated type-III or type-IV TIC, and the type-IV TIC was only recognized in pancreatic carcinoma.⁶ Meanwhile, tumor-forming pancreatitis showed type-II or type-III. The type-III TIC showed an overlap in the TIC profile between pancreatic carcinoma and tumor-forming pancreatitis. In contrast, the type-II TIC exhibited a unique profile indicative of chronic pancreatitis, including tumor-forming pancreatitis. In the present case, the focal mass lesion demonstrated a type-II TIC. Therefore, we diagnosed the mass as tumor-forming pancreatitis, and performed segmental pancreatectomy as a total biopsy of the mass lesion.

In conclusion, the pancreatic TIC profile from dynamic MRI can help to differentiate tumor-forming pancreatitis from pancreatic carcinoma. This imaging technique is a less invasive diagnostic tool than other diagnostic modalities that enables us to eliminate over-diagnosis and/or unnecessary major pancreatic surgery.

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Figure legends

Fig. 1. Abdominal computed tomography scan showing a solid mass 3.0 cm in diameter in the pancreatic head.

Fig. 2. Endoscopic retrograde cholangiopancreatography showing obstruction of the main pancreatic duct in the pancreatic head.

Fig.3. Dynamic contrast-enhanced MRI showing type-II TIC at the pancreatic mass in the pancreatic head. The regions of interest are placed at the pancreatic mass (No. 1) and the non-tumorous pancreatic parenchyma proximal to the mass lesion (No. 2).

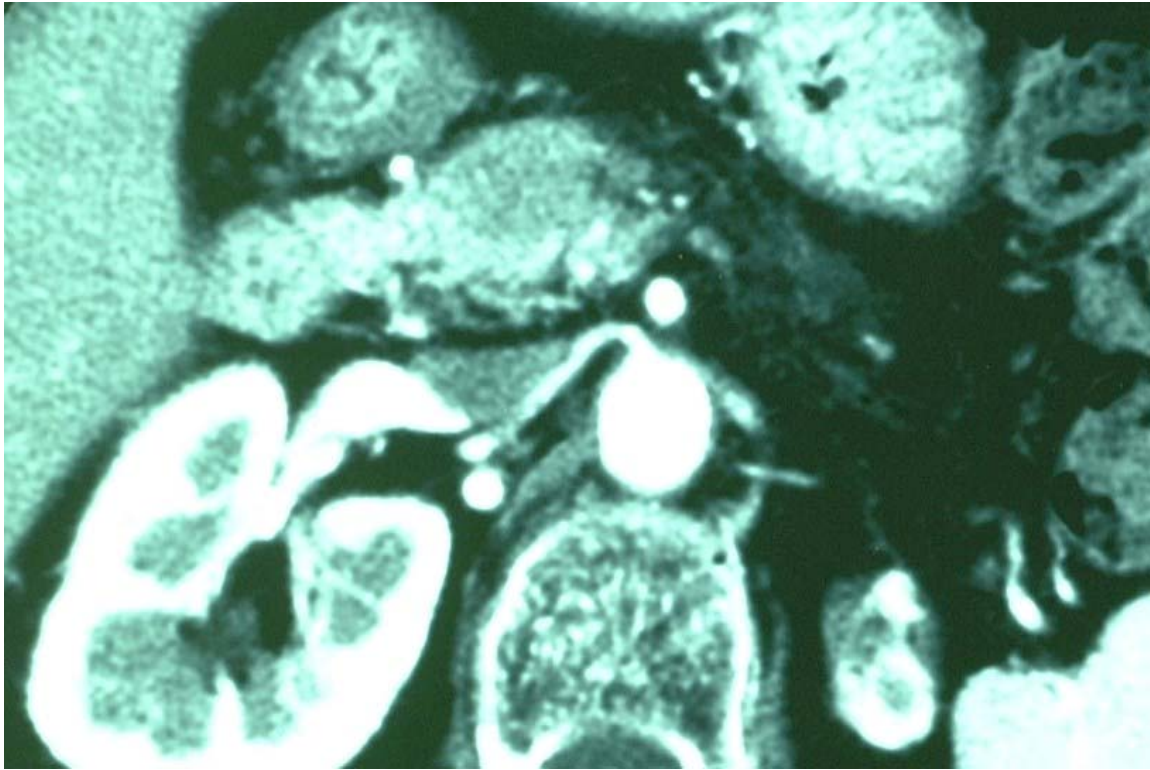


Fig. 1.



Fig. 2.

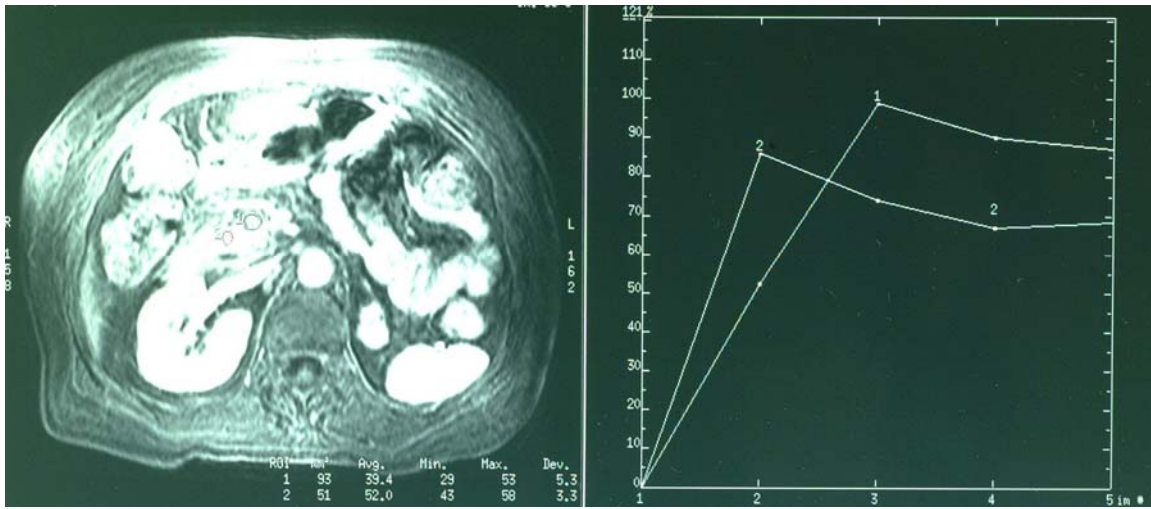


Fig. 3.