

Clinical Images

Multifocal branch-duct pancreatic intraductal papillary mucinous neoplasms

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Running title: Multifocal branch duct IPMNs of the pancreas

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Abstract

The appropriate management for multifocal branch duct intraductal papillary mucinous neoplasms (IPMNs) of the pancreas involving the entire pancreatic gland remains unclear. We present a 66-year-old female who underwent a pylorus-preserving pancreaticoduodenectomy for a branch duct intraductal papillary mucinous carcinoma demonstrating a grape-like multilocular cyst, 35 mm in diameter, in the head of the pancreas along with numerous number of small branch duct IPMNs in the whole pancreas. Histologically, the multifocal cystic lesions were lined by a single row of columnar mucin-containing epithelial cells without atypia. The patient has been doing well without any recurrence during the 9-year follow-up after surgery. Surgical removal of the prominent lesions suspicious of malignancy and a close observation of the remaining lesions in the remnant pancreas may be a reasonable treatment plan for patients with multifocal branch duct IPMNs involving the entire pancreatic gland.

A 66-year-old female with multifocal cystic lesions of the pancreas was admitted to our hospital with a complaint of back pain. Tumor markers, including carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA19-9), were within normal limits. A CT scan of the abdomen showed a multilocular cystic mass, measuring 35 mm in diameter, in the head of the pancreas along with multifocal unilocular cysts in the entire pancreatic gland. Magnetic resonance cholangiopancreatography (MRCP) depicted a grape-like multilocular cyst in the pancreas head and numerous small cystic lesions involving the whole pancreas (**Figure 1**). Endoscopic retrograde pancreatography (ERP) with the use of a balloon catheter demonstrated a cystically dilated branch duct with filling defects in the pancreas head and multifocal cystic lesions communicating with a moderately dilated main pancreatic duct (**Figure 2**). At ERP, a widely dilated ampulla of Vater with extrusion of mucin was identified. These findings were compatible with a diagnosis of multifocal branch duct intraductal papillary mucinous neoplasms (IPMNs) of the pancreas. The patient underwent a laparotomy in June 1998 for a potential malignancy because of the large-sized multilocular cystic mass exceeding 30 mm in diameter and the associated main pancreatic duct dilatation. An intraoperative ultrasonography confirmed mural nodules within the multilocular cyst in the head of the pancreas, and a pylorus-preserving

pancreaticoduodenectomy was the procedure of choice. The surgical margin of the pancreatic stump was free of atypical or cancer cells by frozen section examination. Histologically, the multilocular cystic mass was a noninvasive adenocarcinoma of IPMN. Meanwhile, the multifocal unilocular pancreatic cysts in the resected specimen were lined by a single row of columnar mucin-containing epithelial cells without atypia, being clearly distinguishable from the epithelial linings of the multilocular cyst presenting with marked papillary proliferations with atypia. The patient has been doing well without any recurrence during the 9-year follow-up after surgery. A recent MRCP showed no changes in size and form of the multifocal branch duct IPMNs in the remnant pancreas (**Figure 3**).

Comments

IPMNs of the pancreas present unique clinical features characterized by the massive production and accumulation of mucin in the pancreatic duct, cystic dilatation of the main and/or branch pancreatic duct, less aggressive biological behavior, and a better prognosis. IPMNs arise from the main pancreatic duct or its major branches. Main duct IPMNs are often malignant and thus require a surgical resection. Whereas the appropriate management for branch duct IPMNs remains unclear because IPMNs can exhibit a wide

spectrum of histological differentiation, ranging from benign to malignant, i.e., hyperplasia, adenoma, borderline, carcinoma in situ, and invasive carcinoma even within the same tumor,¹ the prevalence of malignancy in branch duct IPMNs is low. Due to less aggressive biological behavior of branch duct IPMNs, some surgeons propose limited pancreatic resections as well as careful observation without surgery. Conversely, others advocate aggressive surgery because of the likelihood of malignancy. The acceptable indications for surgery in patients with branch duct IPMN, at present, may include a lesion size >30 mm, the presence of mural nodules, and/or complaints of symptoms, because these parameters are the best predictors of malignancy.

On the other hand, branch duct IPMNs can often be multifocal. It has been reported that among 89 patients with branch duct IPMNs, 57 (64%) had multifocal disease, located in a single area of the pancreatic gland only in one-third of the patients, which may allow for standard pancreatic resections, whereas the disease involved the entire gland or the pancreatic head and tail in the remaining patients.² This may indicate that about two-thirds of the patients with multifocal branch duct IPMNs require a total or subtotal extensive pancreatectomy to perform radical surgery. The recent IAP (International Association of Pancreatology) guidelines for the management of IPMNs and MCNs (mucinous cystic neoplasms) of the pancreas³ recommended for branch

duct IPMNs that a yearly follow-up be performed if the lesion is <10 mm in size, a 6-12 monthly follow-up for lesions between 10 and 20 mm, and a 3-6 monthly follow-up for lesions >20 mm, while a cyst size >30 mm, the appearance of symptoms, the presence of intramural nodules, and the dilatation of the main pancreatic duct (>6 mm) would be indications for performing a resection. However, it is uncertain whether these parameters can be applicable to patients with numerous number of branch duct IPMNs. In addition, it is unclear if all branch duct IPMNs have a malignant potential or what length of time is required for the progression of a benign lesion to malignancy. Although some patients indeed require an aggressive surgery, such as a total pancreatectomy, we believe that the advantage of a surgical approach in the treatment of patients with multifocal branch duct IPMNs must be balanced against the surgical risk and the postoperative poor quality of life with pancreatic endocrine and exocrine insufficiency, especially in elderly patients. In multifocal branch duct IPMNs involving the entire pancreatic gland, therefore, surgical removal of the prominent lesions presenting with clinico-radiological parameters suspicious of malignancy and a close observation of the remaining lesions in the remnant pancreas may therefore be a reasonable treatment plan for such patients.

References

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Figure Legends

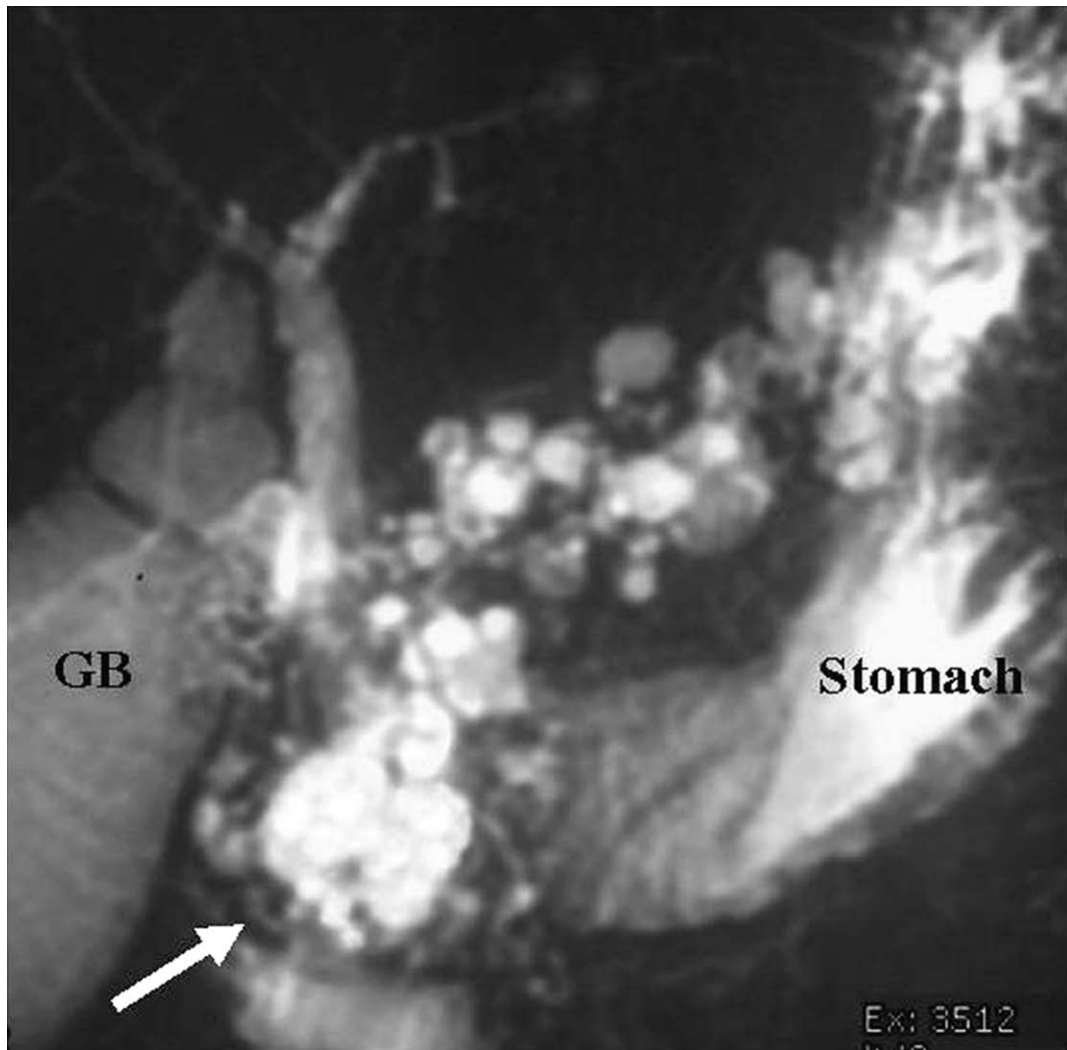


Figure 1. Magnetic resonance cholangiopancreatography (MRCP) shows a grape-like multilocular cystic lesion (arrow) in the head of the pancreas and multiple pancreatic cystic lesions involving the entire pancreatic gland. GB; gallbladder.

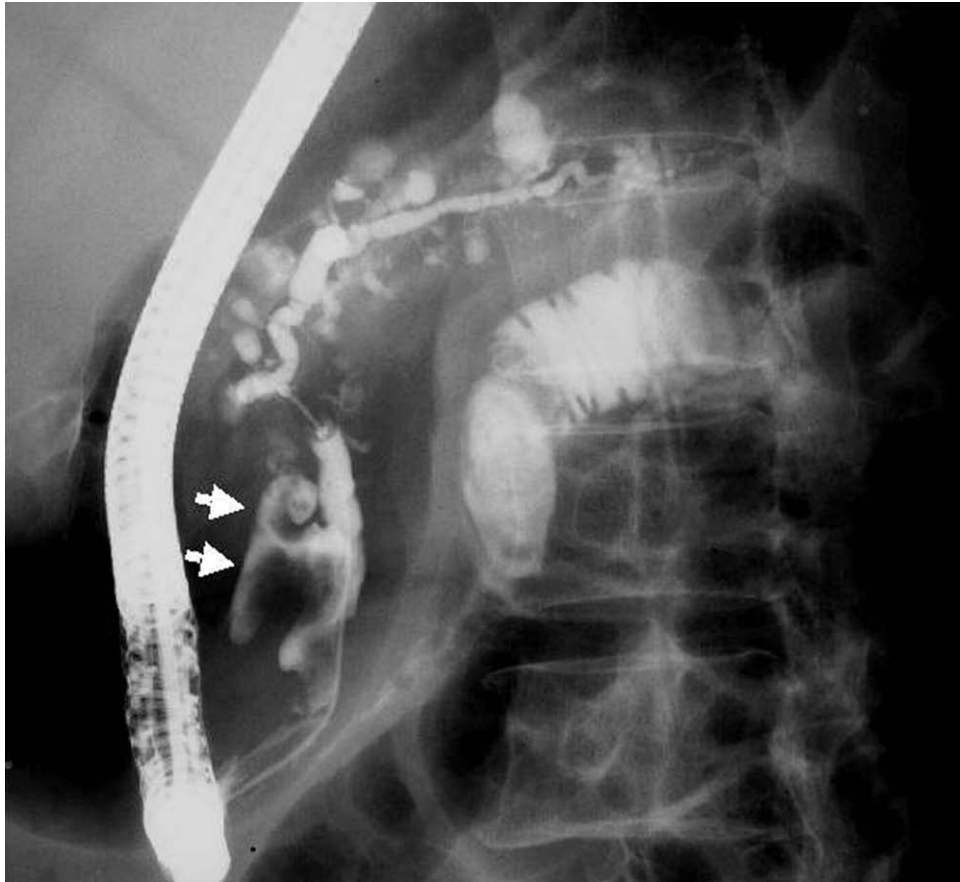


Figure 2. Endoscopic retrograde pancreatography (ERP) with a balloon technique demonstrates a dilated main pancreatic duct and multiple branch type IPMNs in the whole pancreas. A large branch type IPMN with filling defects (arrows) is seen in the head of the pancreas.

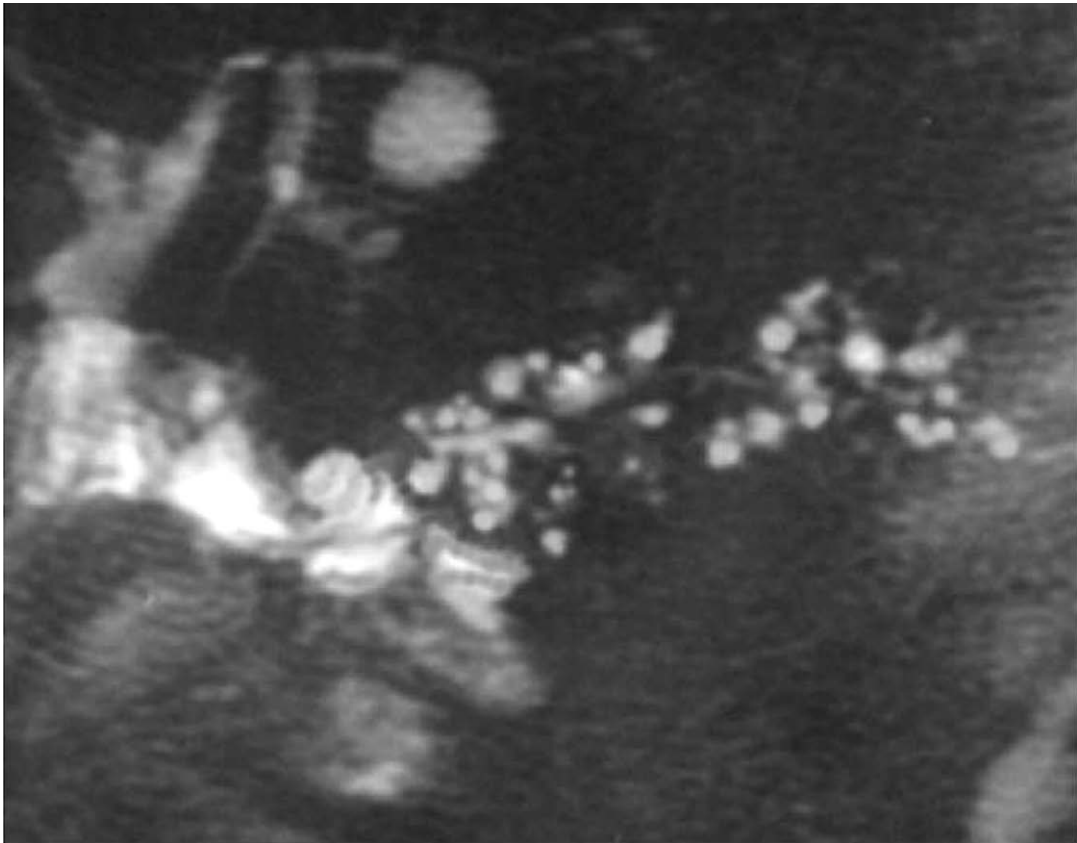


Figure 3. Follow-up magnetic resonance cholangiopancreatography (MRCP) 9 years after the pancreaticoduodenectomy. There are no changes in size and form of the multifocal branch duct IPMNs in the remnant pancreas.