Chapter 24
Surgical Management of IPMN

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1 Introduction

Once considered as a “rare” entity, intraductal papillary mucinous neoplasm (IPMN) of the pancreas is nowadays more commonly recognized, thanks to the widespread use of cross-sectioning imaging techniques (1, 2). At our institution, IPMN has become the second most common indication for pancreatic resection, following ductal adenocarcinoma.

Since its first description by Ohashi in 1982, knowledge of the clinical, radiologic, and pathologic characteristics of IPMN has increased rapidly (3). Several series have documented the prevalence of malignancy and the risk of tumor recurrence after surgical resection among these patients. However, much of the natural history of IPMN still remains unknown.

In 2000 the World Health Organization (WHO) divided IPMN into two different entities: main-duct and branch-duct IPMN. Main-duct IPMNs are characterized by involvement of the main pancreatic duct with or without associated involvement of the branch ducts (combined IPMNs) (2). They commonly present with a dilated (≥1 cm) main pancreatic duct full of mucus that may extrude through a bulging ampulla. Some have cystic dilation of the main pancreatic duct (4). Main-duct IPMNs are usually located in the proximal portion of the gland, but can spread longitudinally along the duct, even to involve the entire main pancreatic duct. Patients affected by main-duct IPMN may present with abdominal pain, pancreatitis, steatorrhea, and weight loss. Diabetes is indicative of late-stage deterioration, and jaundice commonly indicates malignant degeneration (5–8).

Branch-duct IPMNs originate in the side branches of the pancreatic ductal system, appearing as a cystic lesion communicating with a nondilated main pancreatic duct. This neoplasm more commonly occurs in the uncinate process, but it can also be seen in the head, neck, and distal pancreas. Multifocal involvement of the gland with two or more branch-duct IPMNs is not an uncommon finding (1). Even though patients affected by branch-duct IPMN can present with abdominal pain, pancreatitis, or other symptoms, many are completely asymptomatic and are incidentally detected during radiologic workup performed for other reasons (9–11).
IPMN occurs more frequently in the seventh and eighth decades of life, which is important when considering the potential treatment. Although pancreatic resection can be safely performed in elderly patients in experienced centers (2), the presence of significant comorbidities must be factored into therapeutic decisions.

Histologically, IPMN encompasses a wide spectrum of epithelial changes ranging from adenoma to invasive carcinoma, with borderline neoplasms and carcinoma-in-situ in between (2, 5–8). Different degrees of dysplasia can be found within the same lesion. Moreover, in our experience the average age of patients with malignant main-duct IPMN is 6.4 years older than that of patients with adenoma or borderline tumor (7). These observations support the theory of a “clonal progression” to malignancy, at least in this variant (13).

In a recent review of the literature, Tanaka et al. found that main-duct and branch-duct IPMN were associated with malignancy in 70% and 25% of the cases, respectively, whereas the rate of invasive carcinoma was 43% for main-duct IPMN and 15% for branch-duct type (2). Because of this lower likelihood of malignancy and because branch-duct IPMN is often asymptomatic (9–11), the International Association of Pancreatologists recently proposed to manage asymptomatic patients with small (<30 mm) branch-duct IPMN without nodules with careful observation (2).

2 The Role of Imaging

Different imaging studies are nowadays available for the diagnosis and the characterization of IPMNs: computed tomography (CT), magnetic resonance with or without cholangiopancreatography (MRCP), endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasound (EUS), and positron emission tomography with 18F-fluorodeoxyglucose (FDG-PET) (14). First, it is necessary to differentiate IPMNs from other cystic lesions of the pancreas, which can be non-neoplastic (i.e., pseudocyst) or neoplastic (i.e., mucinous cystic neoplasms, characterized by the absence of a communication with the ductal system and, histologically, by the presence of an ovarian-like stroma). Second, it is important to distinguish between main-duct or combined main-duct/branch-duct IPMNs and branch-duct IPMNs, since the biological behavior of these neoplasms seems to be different. Third, imaging studies should characterize the lesion, evaluating the number and site of the cyst/cysts within the gland, and the presence of those findings suggestive of malignancy such as thick walls and mural nodules, with the goal of differentiating between benign and malignant IPMNs. Furthermore, in the case of malignant neoplasms, an accurate preoperative staging must be performed, including the search for mesenteric or hepatic vascular encasement and distant metastases.

MRCP can adequately indicate the site and the extension of main pancreatic duct dilatation, the presence of a communication between the duct and the cyst lesion, the presence and size of mural nodules, and the presence of multifocal branch-duct IPMNs (1, 4, 15). High-resolution multislice helical CT can provide unique details of the morphologic characteristics IPMNs (16), whereas MRCP