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Gastrointest Endoscopy Clin N Am
15 (2005) 485–496

GASTROINTESTINAL
ENDOSCOPY CLINICS
OF NORTH AMERICA

Approach to Cystic Pancreatic Lesions

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Cystic neoplasms of the pancreas represent the best example of a malignant precursor in the pancreas. There are many parallels between pancreatic cystic neoplasms and the colon polyp-cancer sequence. In the past, cystic neoplasms of the pancreas were thought to be relatively rare, composing less than 10% of cancers of the pancreas. With the greater use of cross-sectional imaging, an increasing number of these neoplasms are being seen.

The malignancies represented by cystic neoplasms of the pancreas range from benign lesions to premalignant and malignant cystic lesions. In general, from a clinical and operational perspective, it is useful to divide cystic neoplasms into nonmucinous (nonmalignant) and mucinous (premalignant and malignant) [1]. Nonmucinous cystic lesions are represented by serous cystadenomas. There are two types of mucinous lesions: the mucinous cystic neoplasm (MCN) and the closely related lesion, the intraductal papillary mucinous tumor (IPMT). Both types of lesions may be benign, contain a focus of malignancy, or be frankly malignant. Incidentally noted early pancreatic cancers in autopsy studies are frequently mucinous cystic neoplasms [2].

Epidemiology

The prevalence of pancreatic cysts has been examined with cross-sectional imaging studies in the United States and autopsy studies in Japan, with similar results. In clinical studies of CT and MR imaging, the prevalence of cystic lesions has been estimated to be between 1% to 2% [3]. Small cystic lesions in 1374 autopsied pancreata from elderly patients were analyzed histologically [4]. The cysts were located throughout the pancreatic parenchyma and were not

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1052-5157/05/$ – see front matter
doi:10.1016/j.giec.2005.03.006

related to the presence of chronic pancreatitis. The epithelium of the cysts displayed a range of early malignancy, including atypia (2.4%) and carcinoma in situ (0.6%). The malignant epithelium was more commonly found in small cystic lesions rather than large lesions. These lesions most likely represent early forms of IPMTs.

Clinical epidemiology

MCNs account for approximately 2% to 5% of all exocrine pancreatic tumors and are the more common type of cystic lesion. Women are affected far more commonly than men (9:1 ratio), with a mean age at diagnosis in the fifth decade.

IPMTs share many of the features of MCNs. Their true incidence is uncertain, but estimates range from 1% to 8% of all pancreatic tumors. IPMTs affect men and women equally or men predominantly, depending on the reported series, and they tend to occur in an older age group than MCNs.

Serous cystadenomas have been estimated to account for about 25% of all cystic neoplasms of the pancreas [5]. Serous cystadenomas were not established as an independent clinical or pathologic entity until 1978 when the unique bland, cuboidal, periodic acid Schiff-positive epithelial features that distinguish them from mucinous cystic tumors were accepted. Estimates of the incidence and prevalence vary. Using surgical pathology studies, it has been estimated that serous cystadenomas account for about 1% to 2% of all exocrine pancreatic neoplasms.

Serous cystadenomas occur in adults with a median age in the sixth or seventh decade. The vast majority of patients with serous cystadenomas are female [6]. About half of these tumors are discovered as incidental findings during abdominal imaging, surgery, or at autopsy.

Pathology

Detailed histologic studies of cystic lesions of the pancreas can accurately predict the biologic behavior of the tumor and are predictive of patient survival. In general, small, superficial malignancies are rarely associated with metastases or poor prognosis [7]. Invasive malignancies confer a poor prognosis similar to the prognosis seen with solid tumors of the pancreas.

Serous cystadenomas (Fig. 1) are benign, solitary, cystic tumors that arise from centro-acinar cells with an even distribution through the gland [8]. Although the majority of serous cystadenomas have microcystic morphology, there are two other variants based on growth pattern: (1) macrocystic and (2) solid. Microcystic serous cystadenomas are composed of a well-defined lesion with a honeycomb-like appearance on cross-section. Microcystic serous cystadenomas may grow to a large diameter over the long term, and the large lesions often have a complex fibrotic or calcified center. The parenchyma of the lesions is vascular with multiple, small, vessels coursing through the lesion. Macrocystic serous