Redefining MRI:
From Image to Insight

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Imaging Features of "Early" Pancreas Cancer

Dai Inoue

Keiju General Hospital, Japan

Pancreatic cancer is one of the most lethal malignancies, with a 5-year survival rate of approximately 10%. Complete surgical resection remains the only potentially curative treatment. However, because the disease is often diagnosed at an advanced stage, many patients are ineligible for surgery at presentation, and even those who undergo curative resection frequently experience recurrence. These factors contribute to the dismal prognosis of pancreatic cancer.
In contrast, pancreatic cancers measuring 10 mm or less, including pancreatic carcinoma in situ (CIS), have a markedly favorable prognosis, with a reported 5-year survival rate of approximately 80%. Until recently, however, detecting such small lesions by imaging has been extremely challenging, and consequently, only a limited number of patients have been diagnosed at this early, potentially curable stage.

Recent studies have demonstrated that pancreatic CIS and small pancreatic cancers are frequently associated with several characteristic imaging findings. These include localized pancreatic parenchymal atrophy or fatty replacement, small pancreatic cysts, and mild stenosis of the main pancreatic duct with upstream ductal dilatation. Recognition of these indirect imaging findings has led to an increasing number of pancreatic cancers being detected at an early stage. In addition to these findings, our group has focused on the peritumoral fibrosis surrounding pancreatic CIS. We have developed imaging approaches to visualize this fibrosis using equilibrium-phase contrast-enhanced CT and MRI, providing another potential clue for the detection of early pancreatic cancer.

Understanding these imaging findings together with their underlying histopathological correlates enables radiologists and clinicians to suspect early pancreatic cancer on diagnostic imaging. Because patients with early pancreatic cancer are usually asymptomatic, imaging plays a pivotal role in its detection. Therefore, familiarity with these characteristic imaging features is essential for improving the early diagnosis of pancreatic cancer.

In this lecture, I will present a series of pancreatic CIS cases alongside their corresponding histopathological findings to provide a comprehensive understanding of the imaging features of early pancreatic cancer and to facilitate their application in clinical practice.