

# Imaging and Endoscopic Approaches to Pancreatic Cancer



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## KEYWORDS

- Imaging • Endoscopy • Pancreatic adenocarcinoma • Cancer diagnosis
- Cancer staging

## KEY POINTS

- Imaging and endoscopy have complementary strengths that should be used as part of a multidisciplinary oncology care plan.
- Computed tomography (CT) is the primary imaging modality for routine diagnosis, staging, and monitoring of patients with cancer, but MRI and PET with fludeoxyglucose F 18 (FDG-PET) can be useful in certain problem-solving situations.
- Endoscopy provides accurate local and regional nodal staging via endoscopic ultrasonography (EUS) and can provide immediate diagnostic tissue sampling and supportive interventions.

## INTRODUCTION

Noninvasive imaging and endoscopy play important and complementary roles in the diagnosis and management of patients with pancreatic cancer. Imaging, primarily in the form of ultrasonography (US) and CT, is often the first line of investigation for the symptoms of pancreatic cancer. Imaging is widely available and can provide noninvasive diagnostic and staging information, while endoscopy offers complementary diagnostic and therapeutic tools throughout the spectrum of care. The following sections examine the roles and importance of each of these modalities for pancreatic cancer.

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## NONINVASIVE IMAGING IN PANCREATIC CANCER

### *Image-Based Anatomy of the Pancreas*

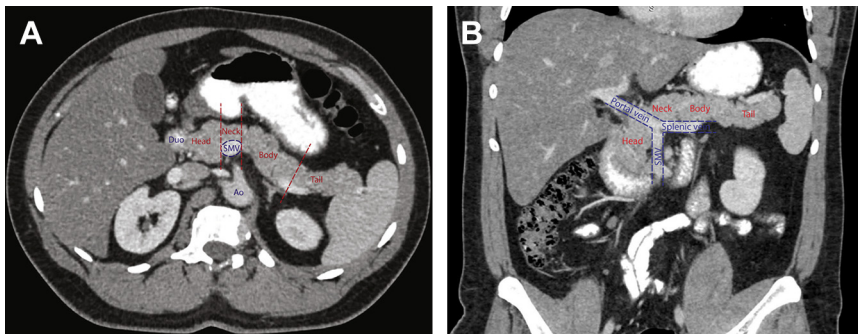
As shown in **Fig. 1**, the pancreas is conceptually divided into 4 parts based on adjacent landmarks, as follows:

- **Head:** The head is the rightmost portion of the pancreas. All parenchyma to the right of the superior mesenteric vein (SMV) is included in the pancreatic head. The head contains the common bile duct and central portion of the pancreatic duct.
- **Neck:** The pancreatic neck is a narrow band of tissue that is located anterior to the SMV. This part is defined medially by the right edge of the portal vein and laterally by the left edge of the portal vein-SMV confluence.
- **Body:** The body of the pancreas is located lateral to the left edge of the portal vein-SMV confluence. While the American Joint Committee on Cancer (AJCC) manual states that the left edge of the aorta is the dividing line between the body and tail, this often results in little or no parenchyma in the body and is not uniformly accepted.<sup>1</sup> The empirical division is often chosen to be 2 to 3 cm to the left of the aorta.
- **Tail:** The tail of the pancreas is the most lateral component and all pancreatic tissue lateral to the pancreatic body. The tail is typically located near the splenic hilum.

In addition, the uncinate process is a small, variable projection of the pancreatic head that extends posterior to the SMV.

### *Ductal anatomy*

There are 2 ductal systems that traverse the pancreas: the pancreatic ducts and the common bile duct. **Fig. 2** shows the typical configuration of these ductal systems within the pancreas.



**Fig. 1.** CT anatomy of the pancreas. Axial (A) and coronal (B) curved reformats from a portal venous phase CT of the pancreas demonstrate the normal appearance of pancreatic parenchyma and the surrounding landmarks. The head of the pancreas lies to the right of the superior mesenteric vein (SMV) and the neck is immediately anterior to the SMV and portal confluence. The parenchyma to the left of the portal confluence is divided into the body and tail. While the American Joint Committee on Cancer manual identifies the left border of the aorta as the landmark that divides the body and tail, this is not widely used because it frequently results in a small or absent pancreatic body. The empirical division is often chosen to be 2 to 3 cm to the left of the aorta. The splenic vein extends along the posterior margin of the body and tail, and the portal vein extends superiorly and to the right from the portal confluence. The duodenum travels along the right and inferior margins of the pancreatic head.

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