

Annular Pancreas Accompanied by Hematochezia

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History

A 46-year-old male patient, suffering from acute hematochezia and unconsciousness, was transferred to our hospital. He had a history of recurrent hematochezia over the past 5 years and had undergone colonoscopy in the referring hospital. This had revealed multiple right-sided hemorrhagic diverticula. His past treatments included endovascular embolization and pharmacotherapy. A Dual Energy (DE) CT was performed for evaluation.

Diagnosis

CT images revealed multiple diverticula in the ascending colon. The descending duodenum appeared to be narrowed, with localized wall thickening and inhomogeneous enhancement. The boundaries of the duodenal wall to the head of the pancreas were unclear (Fig. 1). These findings raised the suspicion of a duodenal tumor, potentially invading the pancreatic head. As the scan was performed using DE, images could be displayed at 45 keV using Monoenergetic Plus.

This significantly enhanced the image contrast, demonstrating clearer boundaries of the duodenum wall to the pancreatic head. A partial encircling of the annulus, giving a 'crocodile jaw' appearance, without signs of a significant duodenal narrowing or pancreatic duct obstruction, was also visualized (Fig. 2). An annular pancreas was diagnosed and subsequently confirmed during a right hemicolectomy due to an uncontrollable hematochezia.

Examination Protocol

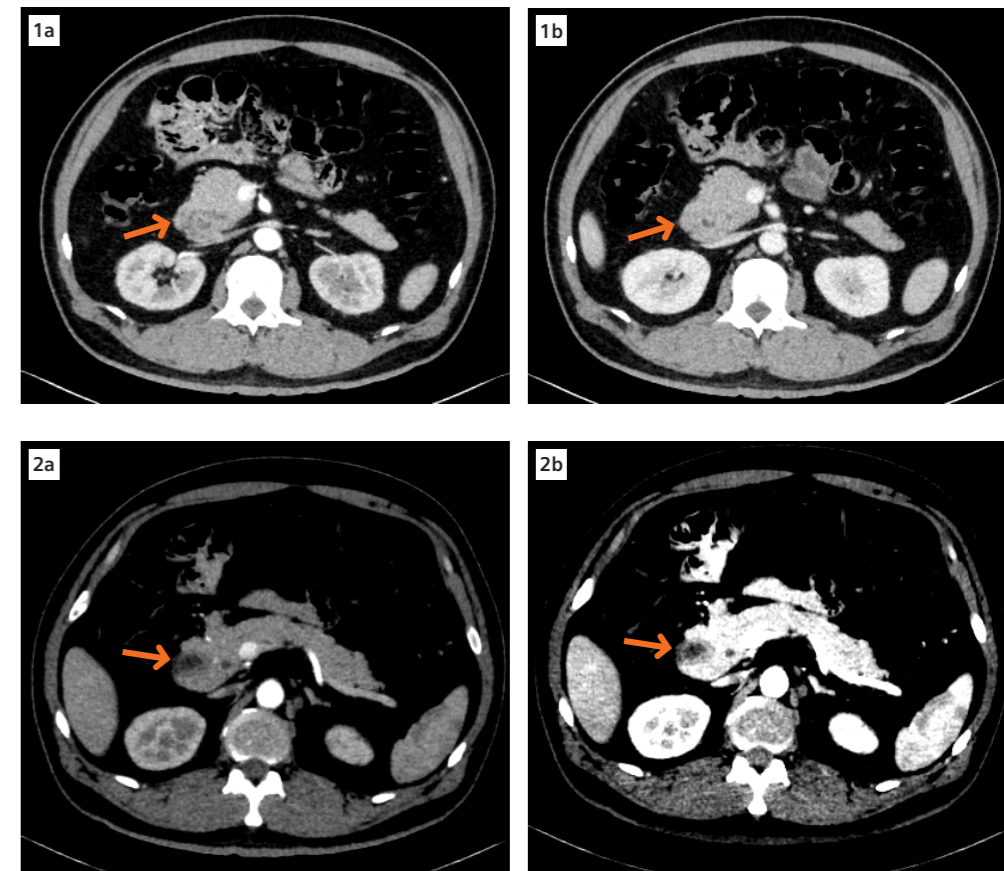
Scanner	SOMATOM Force		
Scan area	Abdomen / Pelvis	Rotation time	0.5 s
Scan mode	Dual Source Dual Energy	Pitch	0.6
Scan length	477 mm	Slice collimation	128 × 0.6 mm
Scan direction	Cranio-caudal	Slice width	1.5 mm
Scan time	10.2 s	Reconstruction increment	1.0 mm
Tube voltage	100 & Sn150 kV	Reconstruction kernel	Qr40 (ADMIRE 3)
Effective mAs	125 / 64 mAs	Contrast	320 mg/mL
Dose modulation	CARE Dose4D	Volume	80 mL + 40 mL saline
CTDI _{vol}	7.3 mGy	Flow rate	3 mL/s
DLP	371.2 mGy cm	Start delay	Bolus tracking in the abdominal aorta @ 100 HU + 10 s

Comments

An annular pancreas is a rare congenital anomaly, in which the pancreatic tissue forms a complete or partial ring around the descending duodenum. It can remain asymptomatic, or appear in variable clinical presentations, such as duodenal obstruction or pancreatitis. An annular pancreas can be overlooked or misdiagnosed, and radiologists should be aware of the imaging findings. Typical CT image findings include pancreatic tissue extending posterior to the second part of the duodenum, or a 'crocodile jaw' configuration, where the pancreatic head is found anterior and posterior to the second part of the duodenum, or the presence of pancreatic tissue posterolateral to the duodenum. These findings are highly suggestive of an annular pancreas. DE CT allows images to be displayed at 45 keV, significantly enhancing the contrast. This helps the physicians differentiate the tissues of the duodenal wall and the pancreatic head, ending the suspicion of a duodenal tumor invading the pancreatic head. Cinematic volume rendering technique (cVRT) improves depth and shape perceptions, allowing a life-like 3D demonstration. ●

The outcomes by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.

In clinical practice, the use of ADMIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.



1 Axial images of the arterial (Fig. 1a) and venous (Fig. 1b) phases. The descending duodenum appears to be narrowed with localized wall thickening and inhomogeneous enhancement, as well as unclear boundaries to the pancreatic head (arrows). These findings lead to the suspicion of a duodenal tumor invading the pancreatic head.

2 Axial images show a partial encircling of the annulus, giving a 'crocodile jaw' appearance, without signs of significant duodenal narrowing or pancreatic duct obstruction (arrows). The contrast is significantly enhanced in the image displayed at Monoenergetic Plus 45 keV (Fig. 2b), in comparison to that of the mixed image (Fig. 2a), showing clearer boundaries of the duodenum wall to the pancreatic head. Note that both images are displayed in the same window setting.

3 A cVRT image shows an annular pancreas in 3D.

