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Imaging of Rare Complications of Pancreatitis – A Case Series

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Abstract

Acute pancreatitis is an inflammatory condition with a wide clinical spectrum, ranging from mild interstitial involvement to severe necrotizing disease. Imaging plays a vital role in identifying complications, assessing severity, and guiding timely clinical decisions. This study presents a series of three radiologically confirmed cases that illustrate the diverse complications of pancreatitis, including pseudocyst formation, walled-off necrosis, infected necrosis, pseudoaneurysm, splenic vein thrombosis and pancreaticopleural fistula. Cross-sectional imaging, particularly contrast-enhanced CT, was essential in detecting these findings and revealing critical complications such as hemorrhagic transformation, vascular involvement, and thoracic extension. Recognition of these varied imaging patterns is crucial, as complications may mimic other pathologies and significantly influence prognosis and management. A thorough understanding of the radiologic spectrum of pancreatitis-related complications enables accurate diagnosis and effective multidisciplinary care.

Keywords: Acute pancreatitis, Necrotizing pancreatitis, Walled off necrosis, Infected pancreatic necrosis, Pancreatic pseudocyst, Hemorrhagic pseudocyst, Pseudoaneurysm, Contrast enhanced CT, Pancreaticopleural fistula, Splenic vein thrombosis

1 Introduction

Pancreatitis is a common clinical condition encountered in radiology, with most cases presenting with typical features and well-known complications. However, a subset of patients may develop rare or atypical complications, which can present significant diagnostic challenges. These uncommon manifestations often mimic other intra-abdominal or thoracic pathologies, necessitating a high index of suspicion and advanced imaging for accurate identification.

Cross-sectional modalities such as contrast-enhanced computed tomography (CECT) and magnetic resonance imaging (MRI) play a crucial role not only in the diagnosis of pancreatitis but also in delineating these unusual complications, guiding appropriate clinical and surgical management. Recognizing these imaging patterns early can prevent misdiagnosis and reduce morbidity.

In this case series, we present and discuss the imaging findings of several rare complications of pancreatitis encountered in our institution, including pseudoaneurysm formation, pancreaticopleural fistula, hemorrhagic pseudocyst, and others, emphasizing their radiological appearance, diagnostic approach, and clinical relevance.

2 Cases

2.1 Case 1

36 year old female came with complaints of epigastric pain for 2 weeks followed by fever for 1 week. She had experienced similar episode 2 months back and was diagnosed as acute necrotizing pancreatitis. She was a case of t-all on chemo and rt for 5 months. Her amylase and lipase levels were 30 iu/l and 48 iu/l respectively. On imaging, multiple well defined peripherally enhancing heterodense cystic lesions with internal air pockets noted in head, body and tail of pancreas with surrounding fat stranding and enlarged peripancreatic lymph nodes. Splenic vein not visualized and replaced by collaterals.

Diagnosis – Infected Necrosis

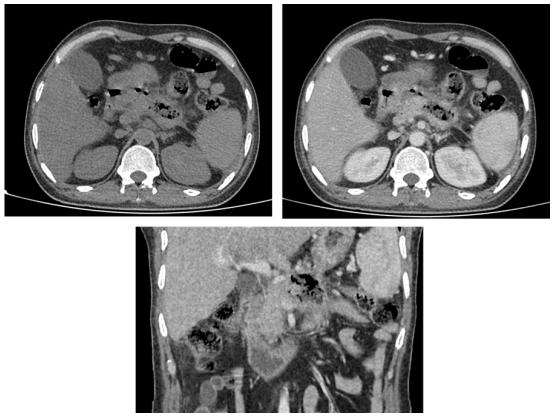

Fig. 1: a- Noncontrast axial; b & c- Contrast enhanced images of abdomen showing multiple well defined peripherally enhancing heterodense cystic lesions with internal air pockets (arrow) noted in head, body and tail of pancreas with surrounding fat stranding

2.2 Case 2

A 48 year old male presented with abdominal pain for 20 days. He had history of chronic pancreatitis with pseudocyst. On CT, pancreas appears bulky with surrounding fat stranding. Multiple chunky calcifications noted in head, uncinate process and body of pancreas. Evidence of well defined hypodense cystic lesion with internal hemorrhage (+60 hu) noted in the body of pancreas. Evidence of well defined contrast filled outpouching noted arising from splenic artery within the pseudocyst. Filling defect noted in main portal vein and in left branch of portal vein. Splenic vein is not visualized.

Diagnosis – Acute on Chronic pancreatitis with hemorrhagic pseudocyst with pseudoaneurysm of splenic artery and splenic vein thrombosis with partial portal vein thrombosis

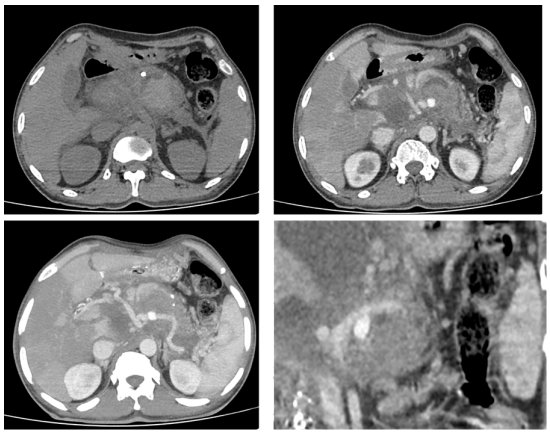

Fig. 2: a- Non contrast axial; b & d- Contrast enhanced axial and coronal CT images showing Acute on chronic pancreatitis with pseudoaneurysm of splenic artery (Arrow)

2.3 Case 3

A 40 year old female who was a known case of acute necrotizing pancreatitis and has been hospitalized for 4 months. Now complaints of dyspnea and cough for 1 month. On imaging, multiple peripherally enhancing hypodense cystic lesions noted in the head and body of pancreas. The cystic lesion in the head shows air fluid level and is seen to track along the esophageal hiatus of the diaphragm to communicate with the right pleural cavity resulting in right hydropneumothorax. Air pockets in the right pleural cavity and in the cyst could be the result of bronchopleural fistula which is difficult to demonstrate radiologically.

Diagnosis – Walled of necrosis with pancreaticopleural fistula

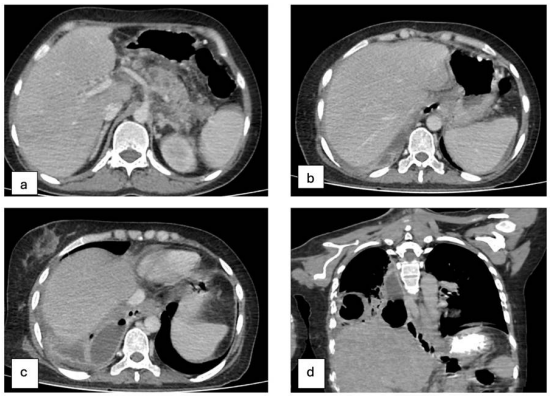

Fig. 3: a, b, c- Axial and d- coronal contrast enhanced CT abdomen images showing walled of necrosis with pancreaticopleural fistula (Arrow) with the right pleural cavity

3 Discussion

The revised Atlanta classification divides local complications of pancreatitis into acute peripancreatic fluid collections (APFCs), pseudocysts, acute necrotic collections (ANCs), and walled-off pancreatic necrosis (WOPN)[3, 4]. These are best characterized using contrast-enhanced CT or MRI. APFCs arise early and lack encapsulation. Pseudocysts, which evolve after four weeks, have a well-defined wall but contain only fluid. ANCs are heterogeneous with fluid and necrotic debris. WOPN is a mature encapsulated necrotic collection forming after four weeks.

Pancreatic necrosis is a key prognostic factor. The Modified CT Severity Index (CTSI) evaluates inflammation and necrosis extent to predict outcomes[7]. Infected necrosis may present with intralesional gas or systemic sepsis.

Pseudocyst complications include infection (suggested by internal gas and wall irregularity), hemorrhage (from pseudoaneurysm formation), rupture into adjacent structures, and compression-related obstruction[2]. Multidetector CT angiography is optimal for evaluating bleeding, while MRCP excels in detecting ductal fistulas[2, 3].

Vascular and thoracic complications include splenic or portal vein thrombosis, pseudoaneurysms, and hemorrhagic necrosis, which are potentially fatal. Mediastinal or pleural extension of pseudocysts can impair respiration[2, 3].

Systemic inflammatory response syndrome (SIRS) and multiorgan dysfunction are serious sequelae, especially with necrotizing pancreatitis and high modified CTSI scores. Imaging may reveal pleural effusions or ascites, which are linked to worse prognosis[5].

Among rare complications, groove pancreatitis is a chronic form affecting the groove between the pancreatic head, duodenum, and common bile duct. CT/MRI may show sheet-like soft tissue with delayed enhancement and cysts in the duodenal wall. It may mimic malignancy but lacks aggressive features[3].

Emphysematous pancreatitis is a life-threatening infection of necrotic pancreatic tissue by gas-forming organisms, visible on CT as gas within the pancreas without GI communication. It demands early surgical intervention[2].

Pseudoaneurysms from vessel wall erosion—most commonly splenic or gastroduodenal arteries—appear as enhancing lesions on CT angiography. Catheter angiography confirms the diagnosis and enables embolization[2, 3].

Pancreaticopleural fistula, due to ductal or pseudocyst rupture, causes large pleural effusions with high amylase. CT or MRCP visualizes the tract. Management includes duct decompression via endoscopic stenting[2].

4 Conclusion

Radiologists play a pivotal role in identifying the less common complications of pancreatitis, which can often be life-threatening or mimic other disease processes. Timely detection of these rare entities—such as pseudoaneurysms, hemorrhagic pseudocysts, and fistulous communications—can dramatically alter patient management and improve outcomes.

Advanced imaging techniques, particularly contrast-enhanced CT and MRI, are invaluable for characterizing these complications with precision. Familiarity with their typical and atypical imaging appearances ensures that subtle but critical findings are not overlooked.

This case series highlights the spectrum of rare complications and underscores the importance of integrating clinical context with imaging findings for accurate diagnosis and effective multidisciplinary care in pancreatitis.

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