RESEARCH PAPER

Clinically Silent Periampullary Carcinoma: Implications For Early Detection

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Abstract

Periampullary carcinoma commonly presents with painless progressive jaundice and weight loss. However, atypical presentations may mimic benign acute abdominal conditions, leading to delayed diagnosis. We report two cases of periampullary carcinoma presenting with atypical features. A 68-year-old male presented with acute onset epigastric pain radiating to the back, associated with vomiting, initially suggestive of acute pancreatitis. A 64-year-old male presented with right upper quadrant abdominal pain and nausea, mimicking biliary colic. Neither patient had classical features of progressive painless jaundice at presentation. On evaluation, both patients demonstrated mild derangement of liver function tests with evidence of biliary obstruction. Imaging with ultrasonography followed by contrast-enhanced computed tomography revealed periampullary masses with dilatation of the common bile duct and pancreatic duct. Diagnosis was confirmed with endoscopic evaluation and histopathology. One patient underwent pancreaticoduodenectomy, while the other was managed with [curative/palliative approach] depending on disease stage. Periampullary carcinoma can rarely present as acute abdominal pain, mimicking more common benign conditions. A high index of suspicion and timely imaging are essential for early diagnosis and improved outcomes in such atypical presentations.

Keywords: Periampullary Carcinoma, Acute Abdomen, Atypical Presentation, Pancreaticoduodenectomy, Biliary Obstruction.

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Introduction

Periampullary carcinoma encompasses a group of malignant tumors arising within 2 cm of the ampulla of Vater, including tumors of the pancreatic head, distal common bile duct, ampulla, and duodenum. These neoplasms account for a significant proportion of periampullary malignancies and are clinically important due to their relatively better prognosis compared to pancreatic ductal adenocarcinoma when detected early.

Classically, periampullary carcinoma presents with painless progressive obstructive jaundice, often accompanied by pruritus, dark urine, pale stools, and weight loss. Other associated features may include anorexia and generalized weakness. Because of this relatively characteristic presentation, diagnosis is often suspected early in patients with overt biliary obstruction. However, atypical presentations can occur and may pose a diagnostic challenge. Acute abdominal pain as the initial presenting symptom is uncommon and can mimic more frequently encountered conditions such as acute pancreatitis, biliary colic, or acute cholecystitis. In such scenarios, the absence of classical features like jaundice may delay appropriate imaging and definitive diagnosis. With the increasing use of advanced imaging modalities such as contrast-enhanced computed tomography (CECT), incidental or atypical presentations of periampullary malignancies are being recognized more frequently. Early identification remains crucial, as timely surgical intervention, particularly pancreaticoduodenectomy, offers the best chance for long-term survival in resectable cases.

In this report, we present two cases of periampullary carcinoma presenting with acute abdominal pain, highlighting the diagnostic challenges and the importance of maintaining a high index of suspicion in atypical clinical settings.

Case Presentations

Case 1: A 68 Year Old male with epigastric tenderness of acute onset

A 68yearold female presented with a 5–6 day history of progressive loss of appetite, unintentional weight loss, vomiting, and generalized tiredness. She denied any history of jaundice, fever, or abdominal pain. Physical examination revealed mild epigastric tenderness but no palpable mass or organomegaly. Laboratory tests showed elevated total bilirubin (4.8 mg/dL), direct bilirubin (3.2 mg/dL), alkaline phosphatase (312 U/L), and gammaglutamyl transferase (245 U/L). CA 199 was raised to 187 U/mL.

A contrastenhanced CT (CECT) of the abdomen was performed. It demonstrated an irregular, heterogeneously enhancing soft tissue lesion measuring 25 × 24 mm in the periampullary region. (**Figure 1**). The hepatic artery and portal vein were completely separate from the mass, with no encasement or contact (**Figure 2**). The mass closely indented the second part of the duodenum laterally and the head of the pancreas medially, with complete loss of the intervening fat plane (**Figure 3**). No intraluminal extension into the duodenum or obvious infiltration of the pancreatic head was seen on the current scan.

There was gross dilatation of the common bile duct, right and left hepatic ducts, intrahepatic biliary radicals (both lobes), the main pancreatic duct and the cystic duct – the classic "double duct sign" (**Figure 1** and **Figure 4**). The gastroduodenal artery was closely indented by the mass, with more than 180° of contact but no complete encasement (**Figure 5**). The gall bladder was overdistended secondary to obstruction.

A few discrete, noncalcified, nonnecrotic lymph nodes were seen in the periportal, peripancreatic, bilateral paraaortic, aortocaval, and periduodenal regions, the largest measuring 9.5 × 7.5 mm. A tiny hypodense, nonenhancing lesion (3.6 × 3.2 mm) was noted in segment VII of the liver, subcapsular in location, which was considered indeterminate and recommended for followup or PETCT.

Impression: Periampullary carcinoma with regional lymphadenopathy. Endoscopic evaluation and biopsy were suggested.

Case 2: A 64 Year old with abdominal pain and vomiting

A 64 year old male presented with acute abdominal pain and vomiting. No signs of jaundice/ loss of appetite/ weight. Physical examination showed right upper quadrant and epigastric tenderness without guarding or rigidity. No palpable mass or organomegaly. Laboratory Findings:Liver function tests revealed mild hyperbilirubinemia with elevated transaminases and raised alkaline phosphatase , suggestive of cholestasis. Serum amylase and lipase were normal.

The CECT revealed an illdefined, heterogeneously enhancing soft tissue lesion measuring approximately 1.8 × 1.7 × 2.0 cm in the periampullary region (**Figure 6**). There was upstream dilatation of the common bile duct, common hepatic duct, main pancreatic duct, cystic duct, right and left hepatic ducts, as well as central and peripheral intrahepatic biliary radicles (**Figure 7,9 and 10**). The double duct sign was again present.**(Figure 7).** The gall bladder was overdistended, with mild wall thickening and oedema (3 mm) but no calculi or focal wall abnormality (**Figure 6 and 8**). Few periportal and peripancreatic lymph nodes were identified, the largest measuring 1.4 × 1.0 cm in the peripancreatic region. The portal and hepatic veins appeared normal (**Figure 9**). The spleen was normal.

Impression: Illdefined heterogeneously enhancing lesion in the periampullary region with upstream biliary and pancreatic ductal dilatation – likely neoplastic aetiology. Endoscopic ultrasound and biopsy were recommended.

Discussion

Periampullary carcinomas present a diagnostic challenge because they arise in a small anatomical region where the common bile duct, main pancreatic duct, and duodenum converge. The two cases described here illustrate the typical imaging findings on CECT, which remains the first line cross-sectional imaging modality for suspected periampullary malignancy (4).

The Double Duct Sign

Both cases demonstrated simultaneous dilatation of the common bile duct and the main pancreatic duct – the "double duct sign". This sign is highly suggestive of a periampullary or pancreatic head neoplasm, although it can occasionally be seen in benign conditions such as chronic pancreatitis or choledocholithiasis (5). In a series by Ahn et al., the double duct sign had a positive predictive value of 88% for malignancy when both ducts were dilated >10 mm (6). In our cases, the CBD was dilated to 18 mm and 23 mm, and the pancreatic duct to 11 mm and 5.4 mm, respectively. The presence of this sign, combined with an identifiable softtissue mass, strongly favours a malignant cause.

Vascular Assessment

Evaluation of vascular involvement is critical for surgical planning and prognosis. Tumours that encase the superior mesenteric artery, coeliac axis, or portal vein are generally considered unresectable (7). In Case 1, the gastroduodenal artery had >180° contact with the mass, but no complete encasement; the hepatic artery and portal vein were free. This suggests a potentially resectable tumour, though further assessment with CT angiography or endoscopic ultrasound may be needed to confirm the absence of superior mesenteric artery involvement. In Case 2, the portal and hepatic veins were normal, and no arterial encasement was reported.

Lymph Node and Metastatic Assessment

Regional lymphadenopathy was present in both cases. In Case 1, nodes were seen in multiple stations (periportal, peripancreatic, paraaortic, aortocaval), the largest 9.5 mm. In Case 2, the largest peripancreatic node was 14 mm. Enlarged lymph nodes (>10 mm short axis) are suspicious for metastasis, but definitive confirmation requires pathological sampling (8). The tiny hypodense liver lesion in Case 1 is indeterminate; it could represent a benign cyst or a small metastasis. Followup imaging or PETCT is recommended, as liver metastases would upstage the disease to Stage IV and preclude curative resection.

Differential Diagnosis

The main differential diagnoses for a periampullary mass include pancreatic head adenocarcinoma, distal cholangiocarcinoma, duodenal adenocarcinoma, and ampullary neuroendocrine tumours (9). Distinguishing these entities on imaging alone is difficult, as they often appear as hypovascular, enhancing masses with similar secondary signs. Endoscopic ultrasound (EUS) with fine needle aspiration (FNA) is the gold standard for tissue diagnosis.

Clinical Implications

- Periampullary carcinoma may present atypically as acute abdominal pain, even in the absence of classical painless jaundice.
- Elderly patients with acute abdomen and subtle cholestatic liver function abnormalities should undergo early cross-sectional imaging to exclude malignancy.
- Maintaining a high index of suspicion enables timely diagnosis and improves the likelihood of curative surgical intervention.

Management

For localized, resectable periampullary carcinoma, pancreaticoduodenectomy (Whipple procedure) is the standard curative treatment (10). Neoadjuvant chemotherapy may be considered for borderline resectable or nodepositive disease. Both patients were referred for EUS and biopsy to obtain histology, followed by multidisciplinary tumour board discussion.

Conclusion

Periampullary carcinoma should be suspected in any patient presenting with obstructive jaundice, but it may also be detected incidentally. CECT is an excellent noninvasive tool for diagnosis, demonstrating the primary tumour, the double duct sign, vascular involvement, and lymphadenopathy. The two cases presented here illustrate the typical imaging findings and underscore the importance of careful evaluation of the periampullary region. Early recognition allows timely tissue sampling and referral for potentially curative surgery.

Figure Legends

- **Figure 1 (Case 1):** Axial CECT image showing gross dilatation of the common bile duct (CBD) and main pancreatic duct (MPD) – the classic "double duct sign".
- **Figure 2 (Case 1):** Coronal CECT at the level of the portal vein. The hepatic artery and portal vein are completely separate from the mass lesion, with no encasement or contact.
- **Figure 3 (Case 1):** Axial CECT demonstrating an irregular, heterogeneously enhancing soft tissue mass (25 × 24 mm) in the periampullary region, indenting the second part of the duodenum laterally and the head of the pancreas medially.
- **Figure 4 (Case 1):** Axial CECT image showing gross dilatation of the common bile duct, right and left hepatic ducts, and intrahepatic biliary radicals (IHBR) involving both lobes.
- **Figure 5 (Case 1):** Coronal CECT showing the gastroduodenal artery closely indenting the periampullary mass with >180° contact, but no complete encasement.
- **Figure 6 (Case 2):** Coronal CECT revealing an ill-defined, heterogeneously enhancing mass (arrow) in the periampullary region, measuring approximately 1.8 × 1.5 cm.

- **Figure 7 (Case 2):** Coronal CECT image demonstrating the double duct sign: dilated common bile duct (CBD) and main pancreatic duct (MPD). The gall bladder is over distended with reactive wall oedema.
- **Figure 8 (Case 2):** Axial CECT showing a dilated cystic duct (arrow) secondary to distal obstruction.
- **Figure 9 (Case 2):** Coronal CECT image demonstrating marked dilatation of intrahepatic biliary radicles. The portal vein (arrow) and hepatic veins appear normal.

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Case 1:

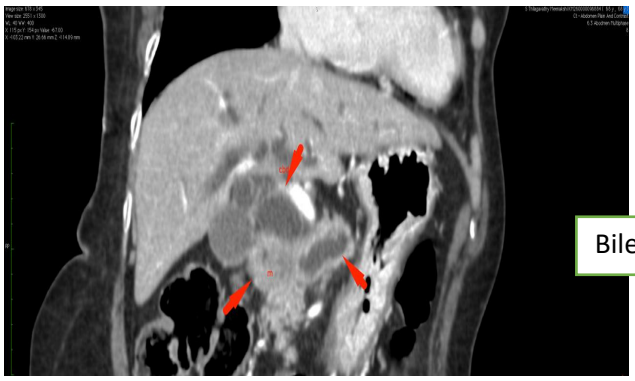


Figure 1

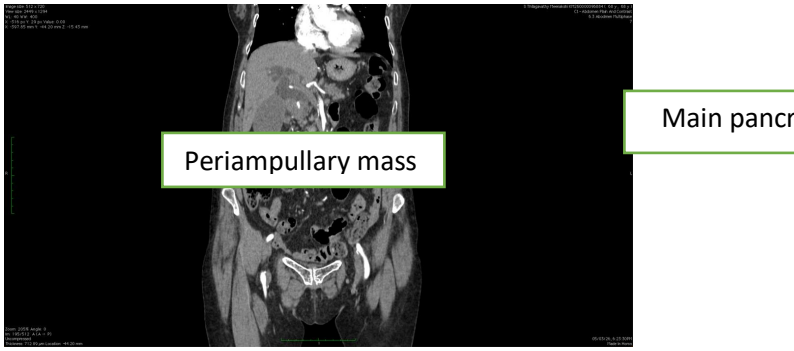


Figure 2

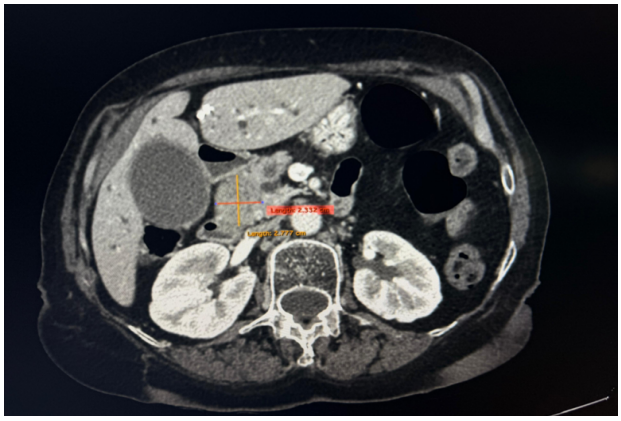
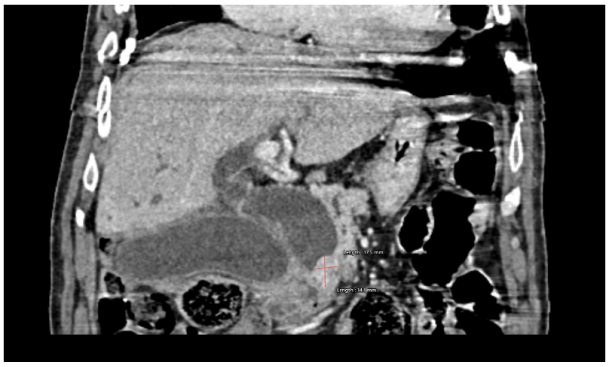


Figure 3

Figure 4

Figure 5

CASE 2:



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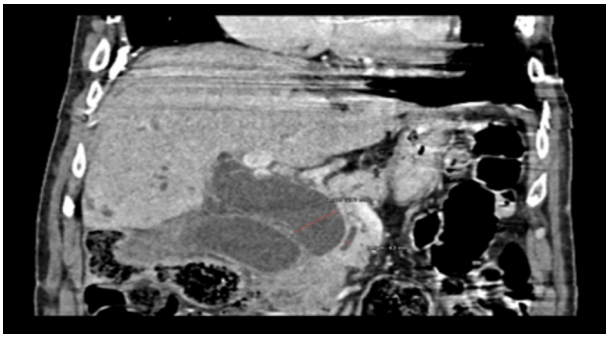
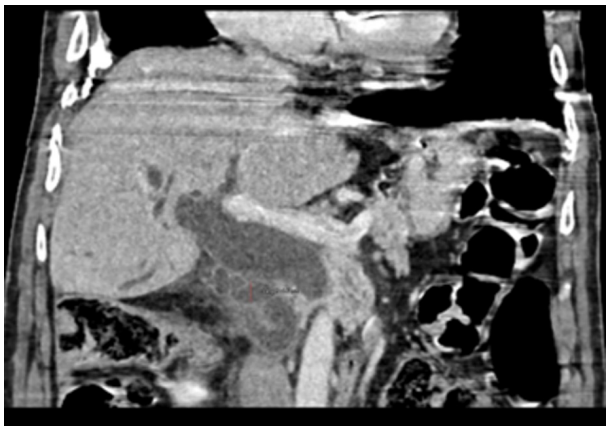


Figure 7



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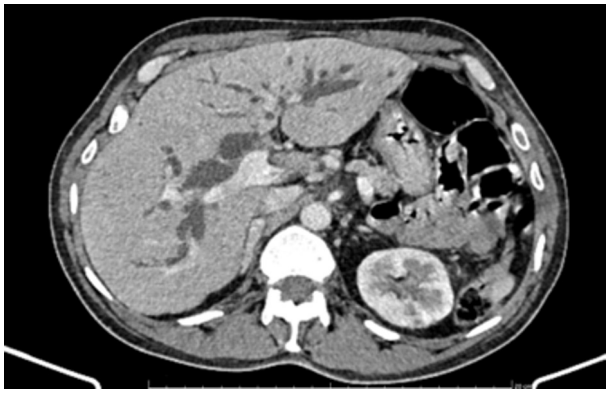

Figure 9: