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Case report

Metastatic small cell lung cancer presenting as acute pancreatitis: Diagnosis with magnetic resonance cholangiopancreatography ☆

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ABSTRACT

We detail a case of a right hilar small cell lung cancer with pancreatic metastases presenting as acute pancreatitis and being diagnosed on Magnetic Resonance Cholangiopancreatography (MRCP). A 59-year-old male patient had an MRCP performed following an initial computed tomography scan of the abdomen as part of the investigations following admission with acute pancreatitis. The diagnosis was not clear on CT but MRCP was able to confirm the likely diagnosis of pancreatic metastases with primary lung cancer as the underlying cause. The case illustrates the clinical radiological conundrum concurrent acute pancreatitis can produce to the diagnosis of pancreatic metastases along with how the superior tissue characterization of MRI despite the absence of intravenous contrast can be utilized to better identify solid pancreatic lesions and contribute towards the diagnosis. The superior field of view T2 coronal and localizer images on MRCP, compared to other standard abdominal imaging modalities, in this scenario enabled the right hilar lung primary to be diagnosed.

Introduction

Acute pancreatitis has many causes; primary pancreatic cancer or metastases are among the less common aetiological factors. Computed tomography (CT) of the abdomen is frequently used to confirm the diagnosis, grade the severity of disease as well as assess for gland necrosis and local complications. MRCP is often used to assess for gallstones (a common aetiological factor) and exclude choledochliathisis or other biliary pathology particularly in the setting of biliary dilatation or associated biochemical derrangement. When magnetic resonance cholangiopancreatography (MRCP) is performed in the context of acute pancreatitis it can potentially identify malignant pancreatic pathology on a background of inflammation better than other imaging modalities due to the superior soft tissue characterization and its wide field of view (FOV) can demonstrate abnormalities not covered on abdominal CT.

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Clinical presentation

A 59 years old male with a past medical history of myocardial infarction in 2004 and recurrent episodes of chest pain over the preceding 8 months which had been diagnosed in the primary care setting as angina, presented with a 3 day history of progressive acute severe epigastric pain. His blood test revealed a significantly elevated serum amylase of 1075 (U/L) and there was a high clinical suspicion for acute pancreatitis. A contrast enhanced CT of the abdomen and pelvis was performed to confirm the diagnosis and exclude other acute intra-abdominal pathology.

Investigations

The contrast enhanced CT images were acquired in the portal venous phase which is the standard acute abodmen protocol in our institute and demonstarted a swollen apperance to the head of the pancreas with areas of lower attenuation in the body and surrounding peri-pancreatic stranding (Fig. 1A). There was marked intra and extrahepatic biliary duct dilatation with a high attenuation filling defect obstructing the distal CBD (Fig. 1B). Appearances were concluded as acute pancreatitis with potential areas of parenchymal necrosis or underlying primary malignancy and concern for choledocholithiasis or a biliary soft tissue stricture. A MRCP was subsequently preformed to further clarify. The MRCP protocol in our institute constitutes of axial and coronal T2 HASTE, axial T2 TRUFI and coronal T2 SPACE with MIP images.

The MRCP showed significant intra- and extrahepatic duct dilatation due to compression from an intermediate T2 signal mass measuring $31 \times 24 \times 32$ mm within the pancreatic head seen on the axial and coronal sequences (Figs. 2A and B). Three further smaller deposits with similar morphology were demonstrated within the neck and body of the pancreas (Figs. 2C and D). There was high T2 signal inflammatory stranding around the body and tail of the pancreas supportive of acute pancreatitis (Figs. 2C and D). The majority of the main pancreatic duct was of normal calibre apart from focal dilation in the head of pancreas where it measured 6.5 mm (Fig. 2E). The other significant finding was a 15 mm intermediate T2 signal lesion in the subcutaneous layer of the posterior back at T10 (Fig. 2F).

The differential diagnosis at this stage included acute pancreatitis, primary pancreatic malignancy, pancreatic metastases, or autoimmune pancreatitis.

On review of the coronal T2 weighted sequences a 48 mm x 39 mm right hilar mass was identified in the thorax (Fig. 3). All findings detailed above were new compared to previous CT imaging from 6 years ago and considered highly likely to represent malignancy.

The case was reviewed at the regional hepatopancreaticobiliary multidisciplinary team meeting and a decision was made to perform an Endoscopic retrograde cholangiopancreatography (ERCP) and an Endoscopic ultrasound (EUS) to obtain a tissue diagnosis and treat the biliary obstruction. A CT thorax was also performed, which confirmed the right hilar mass and identified no further sites of disease.

EUS findings: A 40 mm irregular pancreatic head hypoechoic lesion. Fine needle biopsy performed using 20 g needle. The CBD was dilated up to 20 mm and contained sludge.

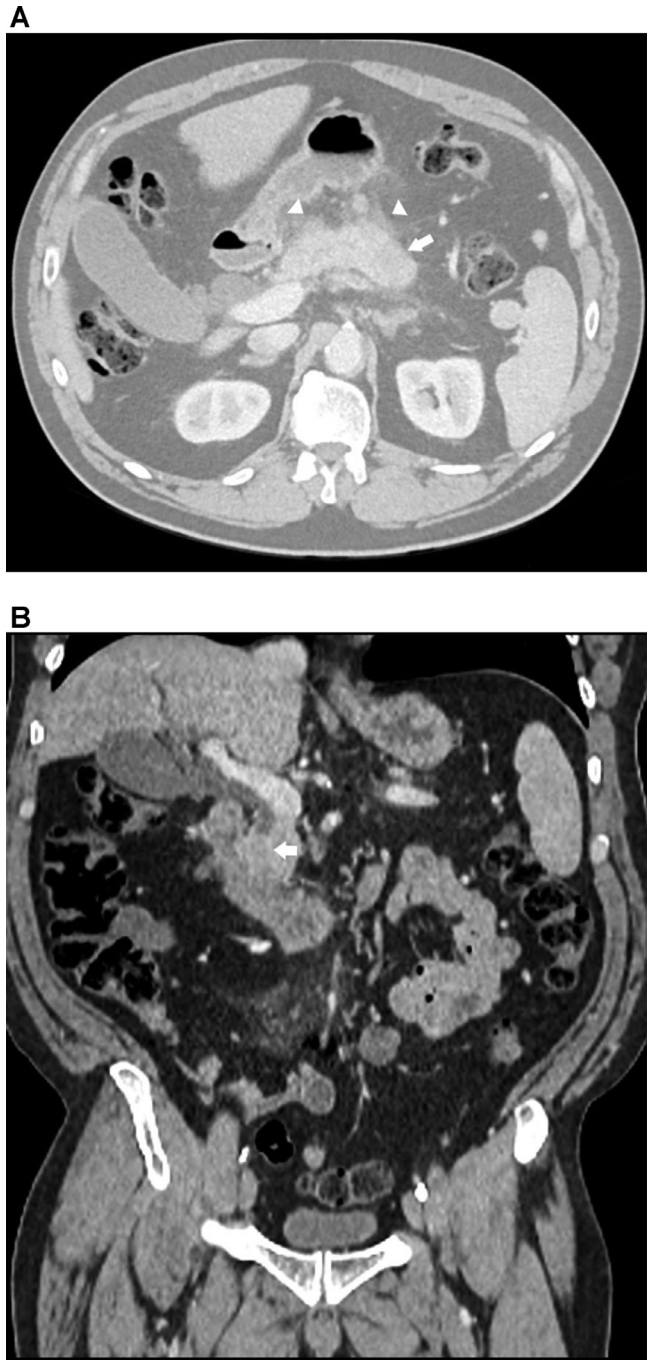

Fig. 1 – (A) Contrast-enhanced axial CT image in the portal venous phase. Peripancreatic stranding is seen (white arrow heads). An area in the body of the pancreas of lower attenuation than the remaining parenchyma is visible (white arrow). (B) Contrast-enhanced coronal CT image in the portal venous phase showing a high attenuation filling defect causing distal CBD obstruction (white arrow).

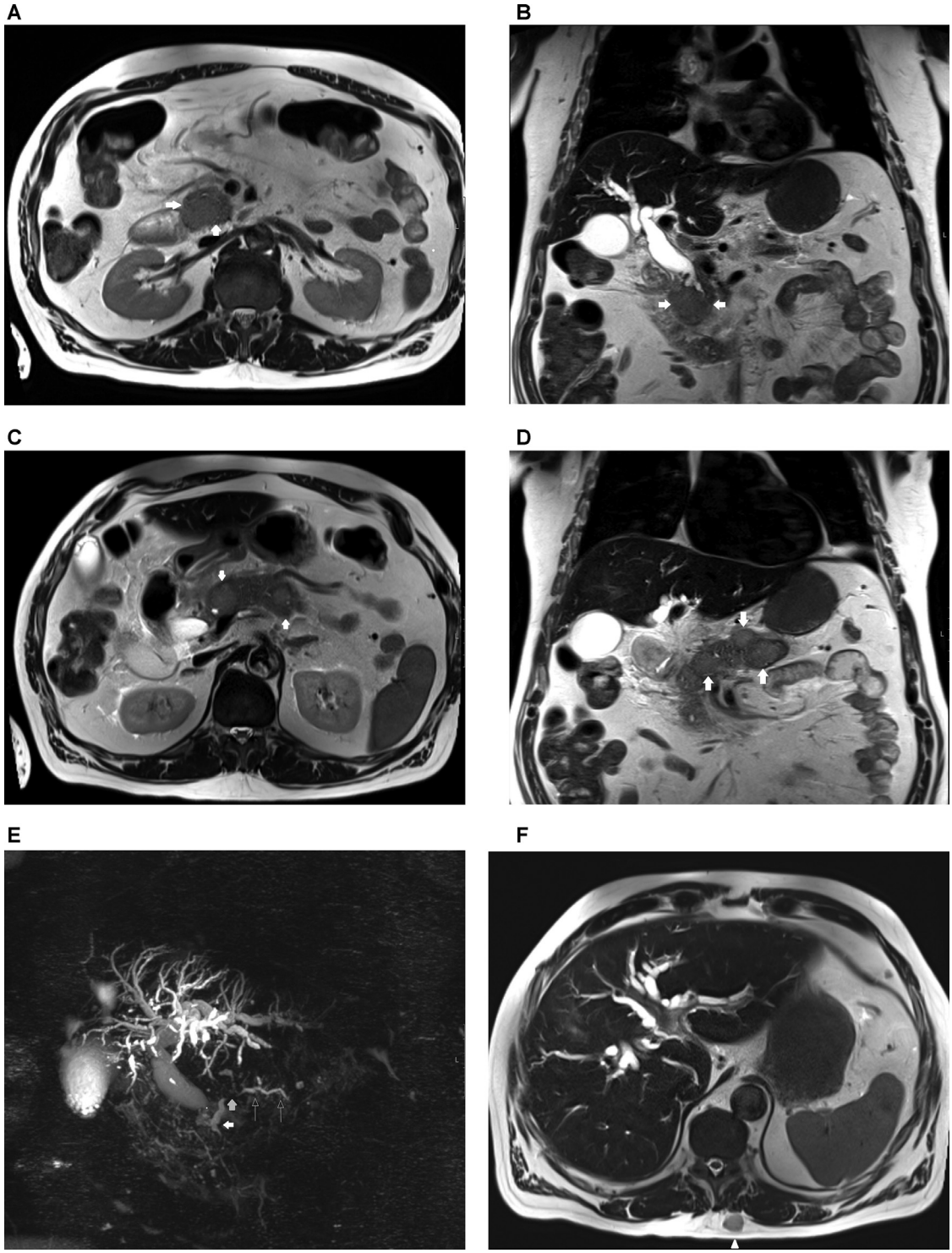

Fig. 2 – (A) Axial T2 weighted MRI image showing a 32 mm mass lesion of intermediate to slightly high signal in the head of the pancreas (white arrows). (B) Coronal T2 weighted MRI image showing the same mass lesion (white arrows) causing double duct dilatation. (C) Axial T2 weighted MRI image demonstrating 2 intermediate to slightly high signal pancreatic lesions in the body of the pancreas (white arrows). These are better depicted than on the CT in Fig. 1A which is at a comparable axial slice. (D) Coronal T2 weighted MRI image demonstrating multiple pancreatic lesions again (white arrows) and high T2 fluid and/or stranding around the head and/or body of the pancreas in keeping with a degree of acute pancreatitis. (E) T2 maximum intensity projection (MIP) MRI image showing gross biliary duct dilatation and a focally dilated main pancreatic duct (PD) in the region of the head (white arrow- caliber 6.5 mm). The grey arrow highlights the duct interruption from a pancreatic metastasis and the clear arrows highlight the normal caliber PD in the body and tail of pancreas. (F) Axial T2 weighted MRI image showing a 15 mm intermediate signal nodule in the subcutaneous tissue of the midline lower back (white arrowhead).

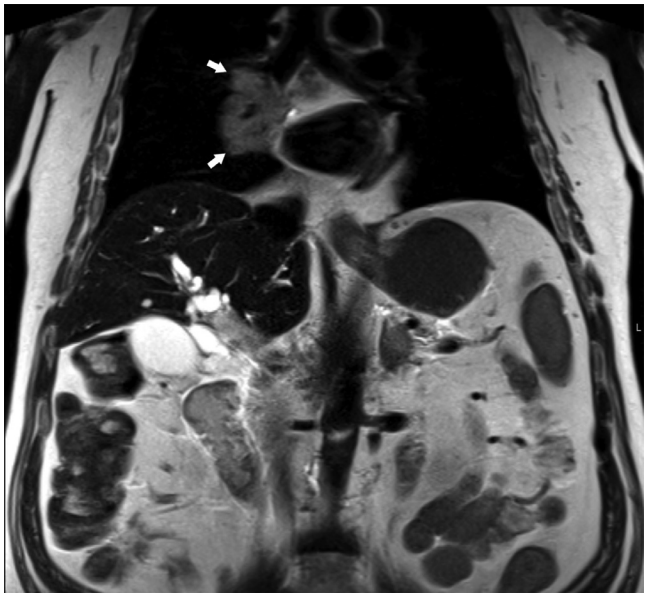

Fig. 3 – Coronal T2 weighted MRI images demonstrating a 48 mm right hilar mass (white arrows) later confirmed as a small cell lung primary malignancy.

EUS Histology: Poorly differentiated neuroendocrine carcinoma favoring small cell carcinoma.

Outcome

Diagnosis was a right hilar small cell lung cancer with pancreatic, adrenal and soft tissue metastases. The patient was referred to Oncology for palliative treatment.

Discussion

Metastatic lesions of the pancreas are rare accounting for only 2%-3% of solid pancreatic lesion and originate most commonly from lung, renal, melanoma or GI tract primary malignancies [1-2]. Pancreatic metastases are frequently asymptomatic or present with nonspecific symptoms similar to primary pancreatic cancer such as abdominal pain, back pain, and weight loss [3]. Less commonly pancreatic metastases can present with acute pancreatitis which can make it harder to diagnose, particularly if the primary malignancy is unknown at the time of presentation [4].

Pancreatic metastases have 3 patterns of disease: multiple coalescing micronodules, diffuse infiltration or as a discrete mass which is commonest [5-6]. Appearances on CT include deformity in the contours of the pancreas with areas of bulging or distinctive lesions of similar or slightly reduced attenuation to the background parenchyma on non-contrast imaging [7]. When discrete lesions are present the larger lesions (>1.5 cm) may show peripheral rim enhancement and central areas of lower attenuation. This enhancement pattern is replicated on postcontrast MRI and is supportive of pancreatic metastasis rather than pancreatic adenocarcinoma [6,8-10]. If concurrent pancreatic inflammation is present there can be overlap in the clinical and imaging presentation making it harder to discriminate areas of parenchymal necrosis from true mass lesions. This is especially true when a portal-venous phase contrast enhanced CT is only acquired and intra-lesion enhancement patterns cannot be evaluated. There have been no studies showing a significant difference in the diagnostic capabilities of MRI compared to CT in identifying pancreatic malignancy [11-12], however in our case MRI depicted the solid pancreatic lesions on the background of pancreatic inflammation better compared to the portal venous phase contrast enhanced CT (Figs. 2A-]D). This is likely due to the inherent superior tissue characterization capabilities of MRI which improved visualization of the multifocal pancreatic lesions in this case despite the absence of intravenous contrast (compare Fig.1A with Fig. 2C). On MRI pancreatic metastases appear as well defined lesions with a slightly higher T2 signal compared to the background pancreatic parenchyma [13] (Figs. 2A-D).

Pancreatic metastases have no specific pattern of distribution unlike primary adenocarcinoma which has preponderance for the head. As a result biliary and main pancreatic duct dilatation from tumor involvement occurs less frequently [6,7,9,10]. However, in our case there were multiple pancreatic deposits including one in the head of the pancreas causing double duct sign with focal main duct dilatation in the pancreatic head (Figs. 2B and E). The presence of multifocal pancreatic lesions combined with the presence of another site suspicious for metastatic disease (soft tissue nodule Fig. 2F) increased the confidence towards the diagnosis [14].

Autoimmune pancreatitis can present with focal or diffuse pancreatic enlargement and can have some overlap with the imaging features demonstrated in our case study; however, knowledge of the primary malignancy at the time of image interpretation was the single most important factor for diagnosing pancreatic metastasis and excluding the differentials. In our study the superior FOV of the coronal T2 sequences enabled visualization and diagnosis of the unknown lung primary on MRCP. The right hilar mass was only visible on the localizers and coronal T2 images of the MRCP which covered the lower/mid thorax to the level of T4 compared to the CT abdomen and/or pelvis which only imaged the lung bases upwards to T9. Our case highlights the importance of reviewing the coronal T2 sequence on MRCP for nonhepatobiliary pathology due to a wider scan field. The greater FOV on the MRCP coronal images compared to other related abdominal imaging modalities such as CT and plain radiograph has not been highlighted in previous studies and needs considering during the image interpretation as pathology not covered on the other abdominal imaging modalities maybe demonstrated.

Author contributions

RB study concept and design, RB drafting of the manuscript, JS & IB critical revision of the manuscript.

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