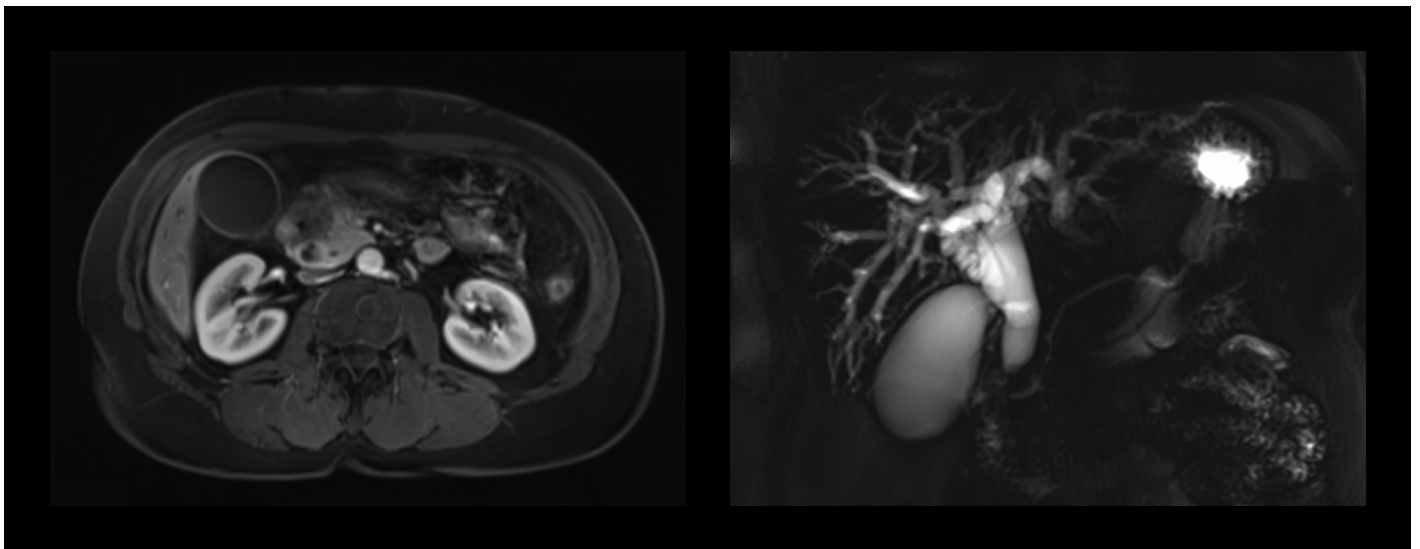


## CASE STUDY

# MRI of the liver/pancreas



Images and content are courtesy of:

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# MRI of the liver/pancreas

## Medical history of the patient

55 year-old female patient presenting with nausea, vomiting, upper abdominal pain and jaundice

## Preliminary diagnostics

The patient has undergone an abdominal CT scan which has revealed severe bile duct dilatation. There are equivocal findings in the pancreatic head.

## Indication for MRI

An MRI examination was requested to investigate the large mass between pancreatic head and duodenum seen on the CT scan.

## Scan protocol includes

### MRI: 3T

1. 3D T1 Dixon for in-phase and out-of-phase
2. Axial 3D T1 GE Dixon
3. Coronal T2w imaging with long TE for MRCP
4. Coronal T2w SSTSE
5. Axial DWI with 3 b-values : 50, 400 and 800.  
Reconstruction of the adc map
6. Axial T2w with FS and motion artefacts reduction
7. Axial 3D T1 GE with FS before contrast injection
8. Axial 3D T1 GE with FS after contrast injection at the arterial phase
9. Axial 3D T1 GE with FS after contrast injection at the venous phase
10. Axial 3D T1 GE with FS after contrast injection at a delayed phase
11. Coronal 3D T1 GE with FS after contrast injection at a delayed phase

## Injection protocol

Patient weight 68 kg

### GBCA injection

Gadobutrol 0.1 mmol/kg	7.5 mL – 2 mL/sec
0.9 % NaCl	40 mL
Administration mode	With injector



## Findings of the MRI examination

Dilatation of the intrahepatic bile ducts and the common bile duct down to the pancreatic head duct can be seen.

In the pancreatic head, a tumour measuring 3.6 cm in diameter is visible.

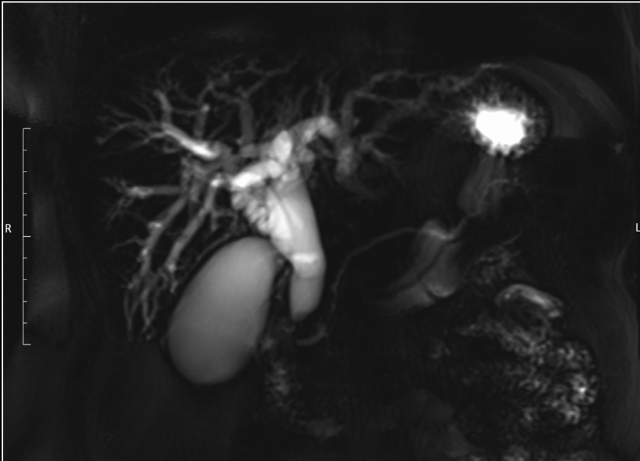
It is suspicious for malignancy (pancreatic ductal adenocarcinoma).

With contrast, assessment of the peripancreatic vessels can be made: vessels are clear.

It is important for the planning of the surgical resection.

Assessment whether liver metastases are present: no metastases are visible.

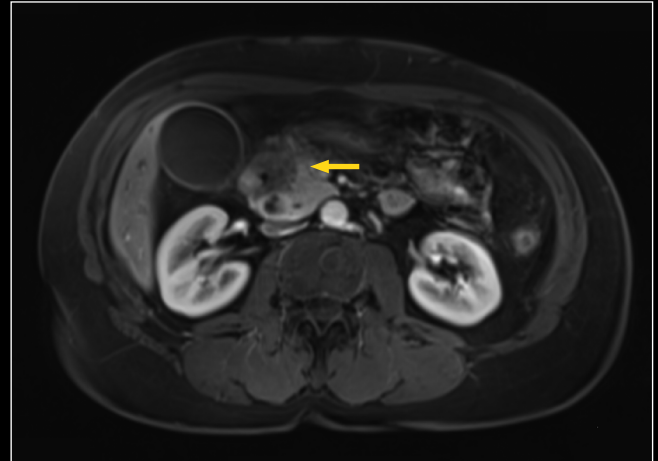
T2 Single Shot Turbo Spin Echo



### T2 Single-Shot Turbo Spin Echo sequence:

Showing severe biliary ductal dilatation with stenosis of common bile duct in the pancreatic head.

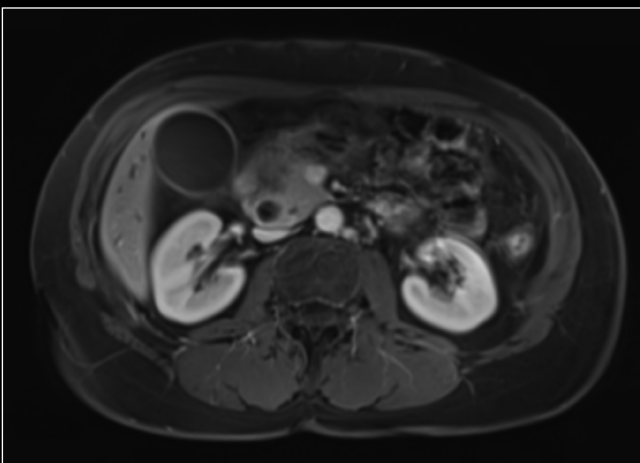
Axial 3D T1 GE at arterial phase



### Arterial phase:

Showing a hypointense (hypovascular) mass located in the pancreatic head (yellow arrow). It compresses the common bile duct next to the papilla. The bile duct dilatation leads to less contrast enhancement.

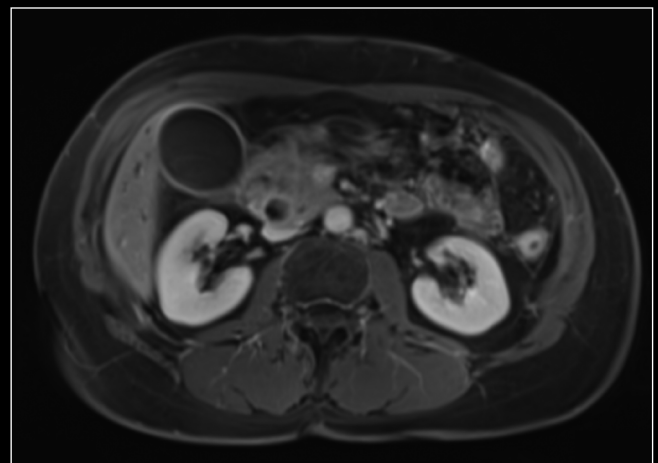
Axial 3D T1 GE at venous phase



### Venous phase:

Assessment of liver for presence of liver metastases: no focal lesions are seen.

Axial 3D T1 GE at delayed phase



### Delayed phase:

Lesion isointense compared to the pancreas parenchyma.



The assessment of patients with suspected pancreatic cancer has to include assessment of liver (for metastases). Patients with pancreatic head cancer often suffer from jaundice (cholestasis due to bile duct obstruction). In this case an extracellular GBCA is preferred over liver-specific MR contrast agent that are not helpful in this situation (no sufficient hepatocellular uptake).



## Diagnosis and therapy or follow-up:

Tumour in pancreatic head suspicious for pancreatic ductal adenocarcinoma, no liver metastases are present.

MRI shows surgical resectability. The tumour board decision was for surgery.

### Abbreviations:

adc: apparent diffusion coefficient

DWI: Diffusion-Weighted Imaging

FS: fat saturation

GBCA: gadolinium-based contrast agent

GE: gradient echo

MRCP: Magnetic Resonance Cholangio-Pancreatography

SSTSE: Single Shot Turbo Spin Echo

TE: Time to Echo