Diagnostic pitfalls in pancreatic cancer: imaging and tissue?

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I- Pitfalls in Imaging

Typical cancer of the pancreas

Hypodense infiltrative mass
- Short stenosis of MPD
- Upstream
  - Enlargement of MPD
  - Parenchymal atrophy

MPD: main pancreatic duct

Pancreatic mass on imaging: pancreatitis or cancer?

- Take the history of patient into account!
  - Alcohol, young age, few symptoms, CA 19.9 normal
  - time for investigations and observation is needed

Cancer? history of patient

Abdominal pain
Suspicion of cancer

Pseudotumour: history of patient

1 month before:
acute pancreatitis / pseudocyst

Pseudotumour: history of patient

44-year old woman, pancreatic pain
Good condition, history of Hashimoto’s disease, CA 19.9: 10 U/mL
Pancreatic mass on imaging: pancreatitis or cancer?
- Take the history of patient into account:
  - alcohol, young age, few symptoms, normal CA 19.9
  - time for investigations and observation
- Careful analysis of imaging data:
  - diffuse abnormalities, calcifications, pseudocyst?
    - CP
  - enlargement of MPD diffuse or downstream the mass?
    - CP or IPMT
  - signs compatible with autoimmune pancreatitis?

CP: chronic pancreatitis
MPD: main pancreatic duct
IPMT: intraductal papillary mucinous tumour

Pseudotumour: focal pancreatitis

Stenosis of MPD but branch ducts remain visible

Pseudotumour: length of stenoses

Focal pancreatitis
- Long/incomplete stenosis
- Different level CBD

Cancer
- Short /complete
- Same level as CBD

CBD: common bile duct

Suspicion of cancer on MRI: pitfall

Doubtful « stop » and upstream enlargement of MPD

For calcifications in chronic pancreatitis: CT scan > MRI
Pancreatic mass on imaging: pancreatitis or cancer?

**Chronic pancreatitis often present beside a cancer...**

In a segment of pancreas, focal enlargement of main pancreatic duct upstream a mass

... Chronic pancreatitis: risk factor for cancer (x 10-15)

Chronic pancreatitis known for long time becomes symptomatic again

Calcifications are pushed around the mass

Extrapancreatic spreading of the tumour

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Adenocarcinoma and PET-scan

- 112 patients, initial suspicion of cancer → CT and PET
- Final: malignant: n = 78, benign: n = 34
- Diagnosis of malignancy:
  - Sensitivity: CT > PET (89% vs 73%)
  - Specificity: CT = PET (65% vs 60%)
- Doubtful CT: n = 30, PET true +ve: 40%

May help (normal glycemia), but false positive (inflammation, autoimmune pancreatitis ++)

Lytras et al., Dig Surg 2005

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Atypical cancer: MRI diffusion in the future?

PET/CT

MRI diffusion

Search for cancer in pancreatitis

Cancer: 7/33

→ Sensitivity 92% with both methods

Matos C, H Erasme, ULB, Bruxelles

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Cancer can be isodense on CT

CT scan

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Cancer isodense on CT: role of EUS

- 10%-15% of cases
- Better for lesions < 2 cm

- Causes of false negative CT:
  - Chronic pancreatitis
  - Diffuse, infiltrative lesion
  - Recent acute pancreatitis

Excellent negative predictive value of EUS (~100%)

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Cancer isodense on CT: role of MRI

CT scan

MRI: Hypointense T1

Hyperintense T2

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MRI diffusion in atypical cancer: promising?

Isodense mass on CT scan
Sensitive...

Cancer or autoimmune pancreatitis?

Suspicion of tumour → resection → not confirmed (CP)

...but specificity?

Cancer or autoimmune pancreatitis?

Delayed enhancement

Cancer or autoimmune pancreatitis?

MPD: ≥ 2 stenoses
Pseudotumour: biopsy
Measurement of serum / tissue expression (biopsy) of IgG4

Pseudotumour: therapeutic test
Measurement of serum / tissue expression (biopsy) of IgG4
Therapeutic test with steroids —— resolution (symptoms, imaging)

Cystic dystrophy of duodenal wall
- Alcohol consumption
- Multiple cysts
- Interduodeno-pancreatic

II- Pitfalls in Pathology

The specimen received by the pathologist is a critical point...
- Tumour biopsy under CT guidance (pancreas or liver metastasis)
- Duodenum involvement: perendoscopy biopsy
- ERCP: cytology
- EUS fine-needle aspiration +++

Quality of specimen and pathology
Micro-biopsy:
- Poor material, haemorrhagic
- Formol
- Rigorous method

Proof of adenocarcinoma?
Quality of specimen and pathology

Micro-biopsy:
- Poor material, haemorrhagic
- Formal
- Rigorous method

Adenocarcinoma
- Architecture: often present, in few areas
- Atypical cells, mucosecretion often present (blue alcian)

ERCP: endoscopic retrograde cholangio-pancreatography
EUS: endoscopic ultrasonography

Adenocarcinoma: pathology
- Immunophenotype: Muc1, Muc2, p53, Mib-1
- Cytokeratines, specific markers

Differential diagnosis
Tumour necrosis, acute pancreatitis in the vicinity of the cancer

Pitfall: acute pancreatitis

Pitfall: endocrine tumour
Well differentiated tumour
Immunohistochemistry
Synaptophysin, chromogranin+
MIB-1

Pitfall: endocrine tumour

Rodallec, Pancreatology 2006
Pitfall: endocrine tumour

Poorly differentiated tumour
Diagnosis is more difficult
Sheets of irregular cells, necrosis
Synaptophysin+, chromogranin+
MIB-1++

Pitfall: metastasis

Metastasis of renal cancer, vimentin +

Take home message

1- Several imaging methods for assessment!

2- To avoid pitfalls in case of atypical tumour
   . Take into account the patient history
   . Do not hesitate to biopsy

3- Provide enough informations and good tissue material to pathologist!

Thanks

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