Imaging of autoimmune pancreatitis

Fergus Coakley MD, Professor of Radiology and Urology, Vice Chair for Clinical Services, Chief of Abdominal Imaging, UCSF
A 72 year old woman with rheumatoid arthritis has a contrast-enhanced CT for pelvic discomfort. Her pancreatic head is swollen without biliary dilatation, and a PET scans shows diffuse pancreatic FDG uptake. Her CA 19-9 is 160 U/mL (normal < 36). Which statement is TRUE:

A. Adenocarcinoma is the most likely diagnosis
B. CA 19-9 elevation excludes autoimmune pancreatitis
C. Neuroendocrine tumor is the most likely diagnosis
D. PET findings suggest metastases to the pancreas
E. A trial of steroids is appropriate
Objectives

- Describe the CT and MRI features of autoimmune pancreatitis
- Recognize and list a differential diagnosis for other atypical solid pancreatic masses
- Knowledge gap addressed: Limited awareness of autoimmune pancreatitis and related differential diagnoses among radiologists
Autoimmune pancreatitis

- Rare form of chronic pancreatitis:
  - Aka lymphoplasmacytic (sclerosing) pancreatitis
  - Inflammatory infiltrate around pancreatic (+/- bile) ducts
  - Associated with other autoimmune conditions
  - IgG and antinuclear antibody levels often increased
  - Can mimic cancer and CA 19-9 can be elevated
  - Not associated with alcohol use

*Am J Gastroenterol* 2003; 98: 2694 –2699

IgG4 positive plasma cell infiltrate in autoimmune pancreatitis

*From: Mod Pathol* 2007; 20: 23-8
Autoimmune pancreatitis: Imaging

- Diffuse or focal iso/hypodense enlargement
- Little to no duct dilatation

Radiology 2009; 250: 118-29    AJR 2009; 193: 343-348

49 YEAR OLD MAN WITH ABDOMINAL PAIN AND BLOATING

AUTOIMMUNE PANCREATITIS DIAGNOSED AFTER WHIPPLES
Autoimmune pancreatitis: Imaging

- Peripancreatic stranding ("halo" sign)
- Diffuse FDG uptake (rare in other conditions)

Radiology 2009; 250: 118-29    AJR 2009; 193: 343-348

PET/CT FOR WORK-UP OF PNEUMONIA IN 77 YEAR OLD MAN

CA 19-9 OF 325 U/MI (<36)
Halo sign and steroid response

84-year-old woman with abdominal pain and jaundice

*From Radiology 2009; 250: 18-129*
### Other atypical solid masses

<table>
<thead>
<tr>
<th><strong>ANY OF:</strong></th>
<th><strong>THINK OF:</strong></th>
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<tbody>
<tr>
<td>No duct dilatation</td>
<td>Neuroendocrine tumor</td>
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<tr>
<td>Well defined</td>
<td>Metastases</td>
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<tr>
<td>Large (over 5 cm)</td>
<td>Autoimmune/groove pancreatitis</td>
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<tr>
<td>Young patient</td>
<td>Solid &amp; papillary epithelial neoplasm</td>
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<tr>
<td>Incidental</td>
<td>Lymphoma</td>
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<tr>
<td>Hypervascular</td>
<td>Neuroendocrine tumor</td>
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<td>RCC metastases</td>
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<td>Intrapancreatic spleen</td>
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Synonym = pancreatic islet cell tumors:
- Incidence of 5 per million per year
- Usually sporadic, can occur in MEN I
- May be functional or nonfunctional
- *Histology does not predict behavior*

CT findings:
- Variable size (larger if non-functional)
- Often well circumscribed
- Often hypervascular (all phases)
- Duct obstruction uncommon

*AJR 2002; 179:725-730*
Neuroendocrine tumor

Pancreatic mass found at screening US in 57 year woman with hepatitis B

ATYPICAL FEATURES
No ductal dilatation
Well defined
Incidentally discovered
And another case…

42 year old man – prior RCC – routine CT

3 CM NEUROENDOCRINE TUMOR FOUND AT SURGERY
Mayo Clinic series (n = 29)

- All underwent Whipple’s procedure
- Endocrine status:
  - 20 nonfunctional
  - 4 somatostatinomas
  - 3 insulinomas
  - 2 gastrinomas
- Nodal involvement in 55%
- Overall 5 year survival of 81%

*World J Surg. 2002; 26: 1267-1271*
Metastases to the pancreas

- Mayo Clinic series of 66 cases
- Primary sites:
  - Renal cell carcinoma (30%)
  - Bronchogenic carcinoma (23%)
  - Others, including breast and colon (47%)
- CT findings:
  - Well defined mass, heterogeneous enhancement
  - *RCC metastases frequently hypervascular*

RCC metastases
RCC metastasis

65 year old man – hematuria

RCC WITH METASTASIS TO THE PANCREAS
Lung cancer metastasis

50 year old man with acute abdominal pain
Another lung cancer metastasis…
And another...

Staging PET/CT in 70 year old man with newly-diagnosed non-small cell lung cancer
Melanoma metastases
Groove pancreatitis

- Rare form of focal chronic pancreatitis:
  - Occurs in “groove” between HOP, duodenum, & CBD
  - Clinical and radiological mimic of HOP carcinoma
  - Usually middle-aged alcoholic men
  - Etiology unknown (blocked Santorini duct, inflamed heterotopic pancreas, other?)

*J Gastroenterol* 1998; 33: 289-294

45 year old man - abdominal pain – heavy drinker - normal US
Groove pancreatitis

- Imaging findings:
  - Slightly high on T2 with late enhancement post-Gad
  - Poorly enhancing at CT
  - Hypoechoic mass at US
  - Little to no duct dilatation
  - Intraleisonal cysts may be seen

JCAT 1994; 18: 911-5
JCAT 1998; 22: 651-65
AJR 2007; 189: 73-80
Groove pancreatitis

56 year old man - abdominal pain and weight loss (ex-drinker)

Biopsy: Inflammatory and some well differentiated adenocarcinoma cells.

Four cycles of chemotherapy given.

Reinterpretation because of discrepancy with CT: “Benign”
SPEN

◆ Solid and papillary epithelial neoplasm:
  – Described by Frantz in 1959, numerous synonyms
  – Rare, 1% of pancreatic neoplasms
  – Benign to low-grade malignancy

◆ Characteristic pathology:
  – Grossly solid with central hemorrhage and cysts
  – Microscopically mixed solid, pseudopapillary and cystic patterns

*J Pancreas (Online) 2006; 7(1S):131-36*
SPEN

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J Pancreas (Online) 2006; 7(1S):131-36
SPEN

- Rare, 1% of pancreatic neoplasms:
  - Typically young women, surgery usually curative
  - Associated with eosinophilia and polyarthralgia

- Imaging - AFIP series n = 56, 53 women:
  - *All had hemorrhage or cystic degeneration*
  - *All well encapsulated*
  - 30 in tail, 18 in head, 8 in body
  - Mean diameter of 9 cm (2-17)
  - Calcification in 16
  - Fluid-debris levels in 10

*Radiology* 1996; 199: 707-711
SPEN

12 YEAR GIRL - MVA

1/4

2/4

3/4

4/4
Pancreatic lymphoma

- Primary pancreatic lymphoma rare
  - < 0.5% of pancreatic tumors
- No duct dilatation (soft)
- Vascular encasement
- Cystic change rare
- Non-surgical treatment

*J Gastroint Liver Dis 2007; 16:101-3*
Really in peripancreatic nodes?

Thorotrast in peripancreatic nodes
Pancreatic lymphoma

Thorotrast in peripancreatic nodes
And another...
Pancreatic mass – surgery?

74 year old woman with chronic abdominal pain

- Intrapancreatic splenule:
  - 2% incidence at autopsy
  - Nucs spleen scan may help

Conclusions

- Autoimmune (and groove) pancreatitis may present as solid pancreatic masses
- Atypical features should suggest diagnosis (and differential diagnoses - especially neuroendocrine tumor and metastasis)
- Remember intrapancreatic splenule in differential for pancreatic tail mass