Autoimmune Pancreatitis: A Great Imitator

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Autoimmune Pancreatitis: Learning Objectives

- Clinical manifestations
- Pathology
- Typical and atypical imaging feature
- Diagnostic Criteria
- Treatment
Autoimmune Pancreatitis: Background

Autoimmune Pancreatitis (AIP) is a disorder of presumed autoimmune etiology that is associated with characteristic clinical, histologic, and morphologic findings.

Depending on the specific pathologic findings and the presence of extrapancreatic manifestations, it has been referred to by a variety of names including sclerosing pancreatitis, tumefactive pancreatitis, and nonalcoholic destructive pancreatitis.

Once considered rare, it is now increasingly recognized.

Clinical Features of AIP

- Young-Middle aged 40-65
- Male >> Women
- Mild symptoms
  - Abdominal pain, but without frequent attacks of pancreatitis, are unusual.
- Presentation with obstructive jaundice
Clinical Features of AIP (Cont’d)

- Can occur with other autoimmune diseases: Sjögrens syndrome, PSC, UC, Rheumatoid arthritis
- Presence of other auto-antibodies (ANA), rheumatoid factor (RF)
- Pancreatic biopsies reveal extensive fibrosis and lymphoplasmacytic infiltration
Autoimmune Pancreatitis (AIP): Histopathological Features

- **Extensive lymphoplasmacytic infiltrate with dense fibrosis**

- Changes predominant in periductal

- Islet cell encasement with intralobular fibrosis
Autoimmune Pancreatitis (AIP): Histopathological Features

- Diffuse swelling to varying degree of pancreatic parenchymal atrophy

- Pancreatic ducts exhibit no calcification or plugging but are slit-like or star-shaped.
CT Features
Pancreas-Typical

- Diffuse enlargement
- Featureless morphology
- “Halo” around the pancreas
- Heterogenous parenchyma
- Attenuated or irregular pancreatic duct

Sahani D et al. Radiology 2004
Kawamoto et al. AJR 2005
Manfredi R et al. Radiology 2008
IMAGING FINDINGS

- Diffuse Swelling
- Heterogeneous
- Loss of lobularity

- Featureless, sausage-shaped pancreas

- Involution of tail
  - “tail cut off”
  - Halo

- Peripancreatic stranding

- Peripancreatic Fluid
Pancreas: Diffusely enlarged & Featureless
AIP: Imaging Features in the Pancreas

Pancreas

- Focal mass like enlargement of head & uncinate in 20-30%

- Lack of vascular invasion
AIP- Ductal Changes

- PD – Diffuse / Irregular Narrowing
- CBD – Tapered Narrowing with IHBR dilataion
- PD – Initial Prominence
ERCP Findings

- Diffuse PD narrowing
- CBD stricture
- Stricture of intrahepatic radicals
- PD stenosis
MRI & MRCP

Attenuated PD

CBD stricture

PSC like stricture of intrahepatic radicals
Extrapancreatic manifestations of AIP: > 30% of cases

- Inflammatory bowel disease - primarily UC
- Bile duct strictures, especially long strictures without beading
- Lung nodules
- Lymphadenopathy
- Infiltrates in the liver, kidneys
- Retroperitoneal fibrosis
- Sjögrens Syndrome/Salivary gland involvement

Sahani D et al. Radiology 2004
Kawamoto et al. AJR 2005
Takahashi N et al. Radiology 2007
Manfredi R et al. Radiology 2008
IMAGING FINDINGS

- LN
- Mass effect on vessels
- Multiple organs inv.
Natural Evolution - MDCT

↑ in parenchymal and peri-panc. changes, PD atten. followed by gradual resolution

Sausage shaped panc. Swelling, Tail cut off progressing to involution of tail & atrophy

Evolution

Swelling
Heterogenicity
Halo
MPD Attenuation
Tail Cut off

MPD
irregularity

Mass

Evolution

Gradual resolution of findings

Atrophy
CBD/PD stricture
EVOLUTION

Steroids
STAGING

- **Zamboni’s Histopathological Grading (I – IV)** (Virchows Arch. 2004;445:552-63)

- **Proposed Staging**
  - Focal – Diffuse swelling
  - Halo
  - Peripan. changes
  - Ductal attenuation

  {\begin{itemize}
  \item Inflammatory (Grade I/II)\item Favorable response to corticosteroids
  \end{itemize}}

  {\begin{itemize}
  \item Focal mass–like lesion
  \item Atrophy
  \item PD/CBD stricture
  \end{itemize}}

  {\begin{itemize}
  \item Fibrosis / Sclerosis (Grade III/IV)
  \item Suboptimal response to corticosteroids
  \end{itemize}}
Diagnostic Criteria (HISORT): The Mayo Clinic Experience*

- (H) Histology
- (I) Pancreatic Imaging
- (S) Serology (IgG4 > 140 mg%)
- (O) Other Organ Involvement
  - Biliary strictures, parotid/Lacrimal gland involvement, mediastinal lymphadenopathy, retroperitoneal fibrosis
- (RT) RESPONSE TO STEROID TREATMENT-
  Resolution/marked improvement of pancreatic and extrapancreatic manifestations
Proposed Diagnostic Criteria

AIP can be Dx with $\geq 1$ of these criteria

- Diagnostic Histology
- Characteristic Imaging on CT and pancreatography with elevated 1gG4 levels
- Response to steroid therapy of pancreatic/extrapancreatic manifestations
Differential Diagnosis of Autoimmune pancreatitis (AIP)

- Chronic Pancreatitis
- Pancreatic Adenocarcinoma
- Pancreatic Lymphoma
# Imaging Differences between AIP and Chronic Pancreatitis

<table>
<thead>
<tr>
<th>Feature</th>
<th>AIP</th>
<th>Chronic Pancreatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreas</td>
<td>Diffuse enlargement</td>
<td>Atrophy</td>
</tr>
<tr>
<td>Ducts</td>
<td>Narrow</td>
<td>Dilated/stricture</td>
</tr>
<tr>
<td>Pancreatic Rim Halo</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Calcification</td>
<td>No</td>
<td>usually present</td>
</tr>
<tr>
<td>Pseudocyst</td>
<td>uncommon</td>
<td>may be present</td>
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</table>

![Image of imaging comparison](image)
# Imaging Differences between AIP and Pancreatic Cancer

<table>
<thead>
<tr>
<th></th>
<th>AIP</th>
<th>Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreas Ducts</td>
<td>Diffuse enlargement</td>
<td>focal mass lesion</td>
</tr>
<tr>
<td>Pancreatic Rim Halo</td>
<td>Narrow</td>
<td>Dilated</td>
</tr>
<tr>
<td>Vessel encasement</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td>may be present</td>
<td>may be present</td>
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<tr>
<td></td>
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<td>may be present</td>
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</table>
PANCREATIC LYMPHOMA

- 0.2-2% of NHL involves Pancreas
- Multifocal masses/diffuse mass like swelling
- Heterogeneous
- Lymph node ++/Spleen
  - Absence of jaundice
  - Lack of PD/CDB dilatation
  - No vascular lumen compromise
  - No halo
Treatment of autoimmune pancreatitis

Issues:

• No controlled trials
• Heterogeneous patient groups, Majority: Post Whipple procedures
• Lack of uniform diagnostic criteria in the absence of pancreatic histopathology specimens
• Criteria for initiating treatment and assessing response often not delineated
Corticosteroids

MGH:
Abnormalities in CBD strictures resolved in 3 patients while on Prednisone 40 mg/d x 4-6 weeks

Mayo Clinic: All 15 patients with biliary strictures completed a median of 12 weeks of Prednisone. 4/15 relapsed but responded to a 2nd course of steroid treatment.

Hamano D. *NEJM* 2001; 342:738
6 patients responded to Prednisone 40 mg/d tapered 5 mg/week based on serial imaging studies, IgG, IgG4, or relief of symptoms. Steroids D/C after 37 & 26 months; continued for 55, 27 and 12 months.
Favorable Response to Treatment

↓ Swelling, Heterogeneity, Halo, Tail cut off
Normalization of PD

↓ in CBD Dilatation & IHBR
Favorable Response to Treatment

↓ Swelling, Heterogeneity, Halo, Peri-pancreatic stranding
Unfavorable Response

↑Involution of tail

PD Stricture, Atrophy

Mass lesion
Long Term prognosis of duct narrowing chronic pancreatitis*

- 21 patients with Autoimmune Pancreatitis
  - Immunoserologic abnormality -16
  - Common bile duct stenosis -18
  - Main pancreatic duct narrowing -20

Treatment with Prednisone 30-40 mg/d and tapered at 2.5-10 mg/d at 2 week intervals for a maintenance dose of 2.5-10mg/d according to changes in biochemical results, imaging studies and relief of symptoms. (No details given)
Results

- **Changes in imaging findings:**
  - Pancreatic swelling \(\downarrow\) 21/21
  - MPD narrowing \(\downarrow\) 20/21
  - CBD stenosis \(\downarrow\) 18/21
  - Time interval 2-13 weeks
  - Relapsed during steroid Rx -4
  - In clinical remission off steroids -3
  - In clinical remission on steroids -14
  - ? criteria for continuing steroids

*Wakabayashi, T., et. al., Pancreas 2005; 30: 31-39*
Most reports on Corticosteroid therapy

- Prednisone 30-40 mg/day for 4-6 weeks and then tapering doses of 5 mg/week
- Mayo study-Such a schedule resulted in treatment for a median of 12 weeks.
Take Home Points

- Autoimmune pancreatitis can be diagnosed with one of the following:
  - Diagnostic histology
  - Characteristic imaging on CT and pancreatography with elevated IgG4 levels
  - Response to steroid therapy of pancreatic / extrapancreatic manifestations

- Elevated IgG4 levels occur in up to 75% of cases
- AIP can occur with other autoimmune diseases i.e Sjögrens syndrome, ulcerative colitis, rheumatoid arthritis, retroperitoneal fibrosis
Take Home Points (Cont’d)

- Pancreatic biopsies reveal extensive fibrosis and lymphoplasmacytic infiltration.

- Typical histologic changes can be found in extrapancreatic biopsies (gall bladder, duodenum) and along with an elevated IgG4 level can make the diagnosis in patients with otherwise unexplained pancreatic disease.
Take Home Points (Cont’d)

• 1/3 of cases have bile duct strictures and >70% of patients respond to steroids but 1/3 of responders relapse and require continued steroid treatment

• Corticosteroids are effective in alleviating symptoms, decreasing the size of the pancreas, and reversing histopathologic changes.
Take Home Points

- Natural course is from mild to severe low-grade inflammation to atrophy, stricture and fibrosis.

- Diffuse enlargement of the pancreatic parenchyma and the “halo” were predictors of good response to therapy.

- Strictures in the biliary or pancreatic duct and focal mass in the pancreatic head were predictive of a poor outcome.

- Early institution of steroids may prevent progression to complications like stricture.