Metastatic Pancreatic Cancer: An Abdominal Occham’s Razor

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HPI: The patient is a 60 year old man with T2DM and a 50 pack-year smoking history who presents with a petechial rash on both shins.

- rash: purple, palpable, pruritic, plaque-like
- increasing fatigue and SOB on exertion
- subjective fever that “comes and goes”
- abdominal pain and bloating
- lower extremity swelling bilaterally
- calf pain, increased with walking

Image source: www.uklupus.co.uk/purp.jpg
Lower extremity US

Initial outside hospital work-up

- Non-compressible vein (left image)
- Echogenic thrombus in the popliteal vein
- Lack of venous blood flow on Doppler

Diagnosis: Bilateral DVTs

Images courtesy of Dr. Karen Lee, BIDMC PACS
Chest CTA:
Multiple filling defects

segmental
subsegmental

Diagnosis: segmental and subsegmental PEs

Image source: www.lumen.luc.edu/.../Pulmonary/PE16.jpg
They also ran a few labs...

- CBC with differential
- Chem 7, Ca, Mg, Phos
- PT, PTT, INR
- Haptoglobin
- B12
- Folate
- Reticulocyte count
- MCV
- RDW
- Ferritin
- TIBC
- ESR
- AST/ALT
- Alkaline Phosphatase
- LDH
- Total bilirubin
- Hepatitis B and C
- HCV
- HIV
- Babesiosis
- Lyme
- Erlichia
- Parvovirus B19
- EBV

...which still provided no clear diagnosis!
The patient was transferred to BIDMC for further work-up

First step: Abdominal CT!
Abdominal CT: splenic abnormalities

- Numerous wedge-shaped perfusion defects
- Preservation of capsular enhancement
- Thrombosis of the splenic vein

Ddx:
- Venous thrombi
- Arterial emboli
- Infection, ex: fungal
- Metastases
- Lymphoma
Key point: splenic capsule enhancement

- The splenic capsule has a different blood supply than the splenic parenchyma.
- Preserved enhancement is highly specific for infarction.
Abdominal CT: liver lesions

- Innumerable low density lesions
- Extensive arterial shunting

Ddx:
- Metastases
- Infection/Microabscesses
  - Amoebic, Fungal, Bacterial
  - Septic emboli
- Hepatic hemangiomas
- Biliary hamartomas
- Primary hepatic neoplasm
Key points: liver lesion ddx

1. **Arterial shunting**
   - lesions cause obstruction of flow from low pressure portal venous system
   - preferential arterial supply (hepatic artery)
   - non-specific (metastases, abscesses, emboli, etc.)

2. **“Wash out”** of contrast during delay phase
   - often seen with primary hepatic neoplasm
   - these metastases get more enhancing over time
Abdominal CT: renal perfusion defects

- Wedge-shaped perfusion defects
- Bilateral
- Extension to capsule

Ddx:
- Infarcts (likely arterial emboli)
- Renal metastases
Key point:
Arterial and venous thrombosis

- Differential diagnosis:
  - Genetic: Protein C/S, Factor V Leiden, Thrombin
  - Paradoxical emboli due to cardiac septal defect
  - Heparin-induced thrombocytopenia (HIT)
  - Hypercoagulability of malignancy

- Further work-up:
  - Echo bubble study (evaluates for septal defect): negative
  - HIT: PF4 Ab screen was positive, started on argatroban
Abdominal CT: pancreatic mass

- Heterogeneous mass
- Tail of the pancreas
- Low attenuation

Ddx:
- Adenocarcinoma
- Neuroendocrine/
  Islet cell tumor
- Thrombosis

19 mm x 39 mm
Key point:
Pancreatic carcinoma on CT

**Hypoenhancing** in arterial phase:
- Indicates adenocarcinoma
- Most common type of pancreatic cancer (90%)

**Hyperenhancing** in arterial phase:
- Indicates neuroendocrine tumor
- Examples include insulinoma, gastrinoma, somatostatinoma
Abdominal CT: diffuse lymphadenopathy

- Enlarged lymph nodes present throughout thorax and abdomen
  - pericardial, peripancreatic, lesser sac, porta hepatis, retroperitoneal
- Central necrosis

Ddx:
- Metastases
- Infection (ex: TB, MAI)
- Lymphoma (less likely)
Summary of CT findings:

1. Geographic splenic infarcts
2. Numerous hypodense liver lesions
3. Wedge-shaped renal perfusion defects
4. Hypoenhancing pancreatic tail mass
5. Diffuse lymphadenopathy
Next step: liver biopsy

- **Guidance methods:**
  - U/S: preferred
  - CT: secondary choice if poorly visualized on U/S
- **Biopsy gun tissue sample**

Result of pathology:
- Poorly differentiated adenocarcinoma
- Immunohistochemistry positive for tumor markers CD-7 and CD-20

Diagnosis: metastatic pancreatic adenocarcinoma
Pulling it all together:
Metastatic pancreatic adenocarcinoma

- **Menu of imaging techniques:**
  - CT w/ contrast: best sensitivity (90%) and specificity (95%)
    - Best imaging technique useful for staging
  - U/S: decreased sensitivity (80%) and specificity (90%)
  - ERCP: useful if CT and U/S inconclusive and possible chronic pancreatitis
  - MRI/MRCP: good for anatomy of biliary tract and pancreatic duct

Source: UpToDate
Presentation and prognosis

- **Hypercoagulability of malignancy**
  - Common with GI, ovarian, prostate, lung neoplasms
  - *Trousseau’s syndrome*: migratory superficial thrombophlebitis (10% pancreatic adenocarcinoma)

- **Patient prognosis**
  - Pancreatic tail masses have a worse prognosis given later presentation
  - 52% of patients have stage IV disease at diagnosis
  - 6% 5 year survival with metastatic disease

Source: UpToDate
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References


All radiographic images are from BIDMC PACS unless otherwise noted.