Radiologic workup of pancreatic masses

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Pancreatic anatomy reminder I

Gray’s Anatomy, from Bartelby.com
Pancreatic anatomy reminder II

Posterior view

CBD

Mesenterics
Our Patient

A.W. is a 64 yo female who underwent L knee arthroscopy 5/01, which was complicated by DVT.

In the interim she developed **RUQ pain radiated in to R flank and back**

She then developed visual changes in her left eye. **Ophtho eval revealed retinal clot in OS.**

She had a transesophageal echo which revealed **patent foramen ovale.**

Workup for DVT led to **ultrasound** which revealed **pancreatic mass….”**
Ultrasound Pancreas
Transverse

PanB=Pancreas Body
PanT=Pancreas Tail
PorV=Portal Vein

IVC=Inferior Vena Cava
A=Aorta
SplV=Splenic Vein

From virtualhospital.com
Complex cyst in the head of the pancreas
She was referred to CT….meanwhile, serum **CA99** was 1000 U/dl and serum **lipase** was 600 U/dl…

Mass was 3.3 x 4.3 cm
Our Patient Axial CT
Our Patient Axial CT
CTA reconstructions

Invasion of portal vein?
More CTA reconstructions
Other CT findings:

- Nodes between IVC and portal vein
- Dilation of pancreatic duct, atrophy of pancreatic tail
- Fat stranding around celiac axis
- All vessels patent
- Normal adrenals
- Several hypodense areas in liver

*Mass was of “limited conspicuity” so MR was suggested…*
Our Patient: MRCP (T2WI)
Our Patient: T1WI (pre-Gadolinium)
Our Patient: T1WI (post-Gadolinium)
Our Patient: MRCP reconstruction

- GB
- St
- M
- Duodenum
Our Patient: More recons…
Our Patient: More recons…
Pancreatic cancer

Overwhelming majority (90%) of lesions are ductal cell adenoCA

Fifth leading cause of cancer death in US

29,000 cases projected in US in 2001

Average survival is 15-20 months

Only 15-20% of patients present with resectable disease

Those who receive surgery have a 25-30% 5-yr survival, 10% if node-positive

Risk factors: FHx, smoking, diabetes, pancreatitis
Clinical presentation suggestive of pancreatic cancer:

Dull ache upper abdomen radiating to back, exacerbated by eating

Weight loss, early satiety

Steatorrhea

Classically: painless jaundice

Unexplained thrombophlebitis

20% have palpable abdominal mass

Rarely: Virchow’s node

Our patient, AW
Serum markers

Bilirubins

Alkaline phosphatase

CA 19-9: Sensitivity 80%, specificity 90%
  High levels a/w nonresectable disease
  Can be elevated in benign pancreatic disease
  Levels over 37 U/mL predictive of malignancy
    (Kim et. al., Am J Gastroenterol, 1999)
  Can be used to follow treatment
Imaging in pancreatic cancer

CT

Ultrasound

Endoscopic ultrasound

Endoscopic Retrograde Cholangiopancreatuography

Fine Needle Aspiration

MRI
Computed Tomography

Good when intestinal gas obscures u/s visualization

Can assess for lesions throughout abdomen

Helical CT plus i.v. contrast can assess vascular involvement

Fast, compatible with post-cholecystectomy patients

BH not needed

Currently the best noninterventional modality
CT Anatomy of the Pancreas

From Paul and Juhl's Essentials of Radiologic Imaging, 7th ed.
Patient 2

Comparison of CT and plain film in a patient with a pancreatic mass

(No contest!)

From Paul and Juhl's Essentials of Radiologic Imaging, 7th ed. 25
Patient 3

Comparison of CT and Ultrasound in a patient with a normal pancreas

From Paul and Juhl's Essentials of Radiologic Imaging, 7th ed.
Endoscopic ultrasound:

Advantages include:

- Imaging and bx of small nodes, sampling of cysts
- Better assessment of vascular involvement
- Combo of imaging and intervention
- Can do neurolysis of celiac plexus for palliation

From www.medinfo.ufl.edu, University of Florida
Endoscopic ultrasound: the evidence is piling up...

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* Gold standards differ between studies

Adapted from Gress et. Al., Ann Intern Med 2001
ERCP:

Useful when CT or US misses suspected masses

Diagnoses pancreatic CA w/ sens/spec in 90-95% range

From www.medinfo.ufl.edu, University of Florida
ERCP:

The “double-duct” sign

Patient 6

From www.medinfo.ufl.edu, University of Florida
Patient 7

Proximal CBD “filling” defect due to cholangiocarcinoma

Barish et. al., NEJM 1999
Comparison of imaging modalities in pancreatic cancer

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✓ = Used to stage pancreatic CA

From UpToDate
Acknowledgements

• Gillian Lieberman, MD
• Pamela Lepkowski
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