OBJECTIVES

- Discuss pancreatic abnormalities specific to the pediatric population
- Provide an overview of pancreatic lesions in a case based format
- Review key imaging features
- Explore a few common syndromes which affect the pancreas (usually encountered in children)
We have no financial disclosures.
BENIGN MASSES
18 YEAR OLD ASYMPTOMATIC FEMALE

Axial T1 Weighted Image

Axial T2 Weighted Image
DERMOID CYST (MATURE TERATOMA)

- Most common cystic lesion of the pancreas is a pancreatic pseudocyst; however this patient has no history of pancreatitis.
- Pathology showed this lesion to be a mature teratoma.
- Extra-gonadal germ cell tumor uncommonly found in abdominal organs.
- Slow growing – can become large.
- Usually heterogeneous due to multiple tissue components.

Large cystic component with a solid component seen along the anterior margin - consistent with the additional tissue types seen within a teratoma.

Axial T2 Weighted Image
20 YEAR OLD MALE WITH BACK PAIN

Contrast enhanced axial CT image
TRUE PANCREATIC CYST

- Congenital intrapancreatic epithelium lined cysts
- Do not communicate with the ductal system
- Hypothesized to be due to abnormal development of a duct
- Can be solitary or associated with syndromes such as VHL, ADPKD, and Beckwith-Wiedemann Syndrome

Fluid attenuating lesion without contrast enhancement consistent with a cyst – an incidental finding

Low density lesion within the spine found to be a hemangioma; the cause of patient’s back pain
MALIGNANT MASSES
6 YEAR OLD MALE WITH VAGUE ABDOMINAL PAIN

Contrast enhanced Axial CT images
- Usually presents as a large, well circumscribed mass with mixed cystic and solid components
- Presents in the first decade of life
- Most commonly originates at the pancreatic head
- Usually heterogeneously hyperintense mass on T2 weighted images due to cystic components
- Enhances less than surrounding parenchyma on post contrast images
15 YEAR OLD FEMALE WITH ABDOMINAL PAIN

Axial T2 weighted images
With Fat Saturation (on the right)

Axial post contrast T1 FS image
SOLID PSEUDO PAPILLARY NEOPLASM

- Circumscribed large mass usually affecting the pancreatic tail
- Mixed cystic and solid components causing heterogeneous appearance on all modalities
- Significant female predilection (> 90% cases); more common in East Asians
- Hypovascular tumor with mild peripheral / capsular enhancement
- Intratumoral hemorrhage is a distinguishing feature
- Small malignant potential
3 YEAR OLD MALE PRESENTING WITH PALPABLE ABDOMINAL MASS

Axial T1 weighted image

Axial T1 weighted FS post contrast image

Axial T2 weighted image
**NEUROBLASTOMA WITH METASTATIC DISEASE TO THE PANCREAS**

- Pancreatic metastasis are rare
- Usually the result of direct extension from a contiguous organ as opposed to hematogeneous spread
- Peripancreatic lymph nodes may be difficult to distinguish from a pancreatic parenchymal metastasis
- Lymphoma is most common to metastasize to pancreas
- Others primaries include ovarian, hepatocellular, renal cell carcinomas, and soft tissue sarcomas

Axial T1WI and T1WI+C demonstrates two hypointense lesions in the pancreatic body that become ill-defined on the post-contrast images with peripheral enhancement. Also note the primary large left adrenal mass.
SYSTEMIC / GENETIC DISEASES
16 YEAR OLD FEMALE WITH MULTIPLE RENAL CYSTS

Axial T2 weighted Fat Saturation image

Coronal T2 weighted MR
**Microcystic serous adenomas** contain innumerable small cysts in a “honeycomb” or “sponge like” appearance.

- Commonly appear in the pancreatic head and are well demarcated.
- Can have a central scar with calcification.
- This patient had a known history of Von Hippel Lindau Disease (VHL), suggested by numerous bilateral renal cysts.
- Patients with VHL also have increased propensity for pancreatic cysts and neuroendocrine neoplasms.

Coronal T2 WI through the pancreas shows characteristic honeycomb appearance of serous microcystic adenoma in the pancreatic head.
15 YEAR OLD MALE WITH TUBEROUS SCLEROSIS (TS) AND ABDOMINAL PAIN

Axial T1 weighted image

Axial T1 weighted FS post-contrast image

Axial T2 weighted image
Pancreatic abnormalities are not common in patients with tuberous sclerosis (TS)

If lesions are seen in the pancreas, they are often dismissed as cysts or angiomyolipomas

One study showed that of all lesions that occur within the pancreas in patient’s with TS, neuroendocrine tumors are the most common

These tumors are typically malignant and can be locally aggressive

Axial T1 post contrast image and T2 weighted image demonstrates a T2 hyperintense mass in the pancreatic head that avidly enhances.
14 YEAR OLD MALE WITH ABDOMINAL DISCOMFORT

Axial contrast enhanced CT image
Most common manifestation in the pancreas in patients with cystic fibrosis (CF) is fatty atrophy

May see pancreatic calcifications (7%) and simple cysts

Various abnormalities of the duct can occur including strictures, beading, dilation, and frank obstruction

Increased risk of developing of pancreatic adenocarcinoma

Axial CT through the abdomen demonstrates diffuse fatty atrophy of the pancreas, consistent with CF. Also seen on this image is a soft tissue mass in the lateral left hepatic lobe, representing metastatic Ewing’s Sarcoma for which this patient was imaged.
MIMICS OF TUMOR
13 YEAR OLD MALE WITH ELEVATED LIVER ENZYMES AND JAUNDICE

Axial 2D FIESTA MRI image
Focal, mass-forming, multifocal or diffuse enlargement of the pancreas

Halo of low density is often seen surrounding

Discontinuous contiguous strictures of the main pancreatic duct and bile duct seen on MRCP

When focal, pancreatitis may mimic tumor
15 YEAR OLD FEMALE WITH RECURRENT EPIGASTRIC PAIN

Axial contrast enhanced CT image
PANCREATIC PSEUDOCYST

- Collection of fluid, blood, enzymes, and debris within a fibrous capsule
- Demonstrates enhancement of fibrous capsule without enhancement of internal contents
- Gas within the collection can indicate infection
- Arterial attenuation within the cyst wall can indicate pseudoaneurysm

Axial contrast enhanced CT demonstrates normal pancreatic enhancement
REFERENCES