

Pancreatic Cysts

Peter Muscarella II, MD
The Ohio State University Medical Center
December 19, 2014

Pancreatic Cysts

- Increasingly identified due to the widespread use of cross sectional imaging
- 2% of patients undergoing CT or MRI will have pancreatic cysts
- Incidence increases with age (10% patients older than 70)
- One of the most commonly seen problems in HPB, pancreatology surgery clinics
- 35.5% of 273 patients discussed at our Multidisciplinary Pancreas Tumor Board 2011-2013
- Decisions regarding further evaluation and indications for surgical resection can be a dilemma and remain under debate

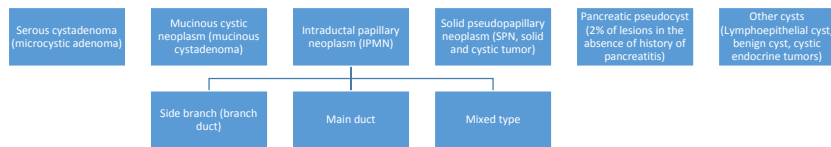
Potential Scenarios

25-year-old healthy female marathon runner with a 6 cm cystic lesion in the tail of the pancreas, epigastric pain, weight loss, solid component on imaging that is suspicious for possible malignancy.

90-year-old male with multiple medical problems, coronary artery disease, on Plavix with a less than 1.0 cm cystic lesion in the uncinated process of the pancreas, no suspicious feature, incidentally identified on imaging for evaluation of an aortic aneurysm.

Majority of patients fall between these extremes!

Classification



Evaluation

Careful history and physical examination

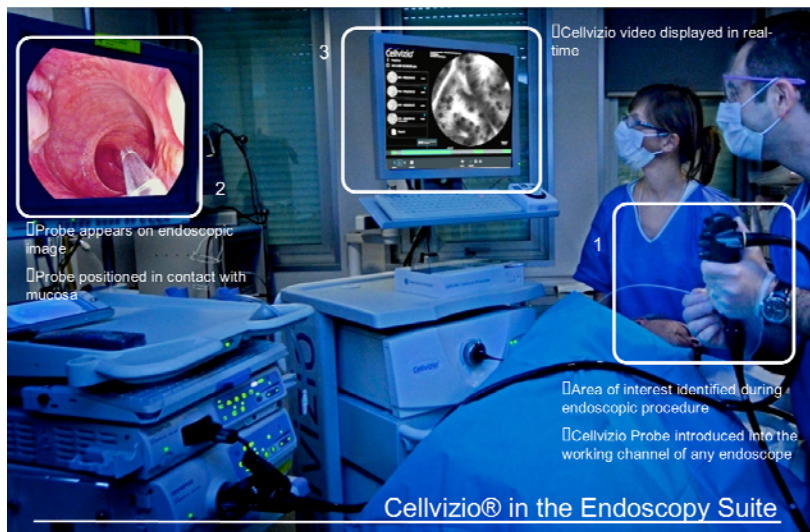
- Symptoms, history of pancreatitis, diabetes, weight loss, exocrine insufficiency

Review of images (CT versus MRI)

Use of endoscopic ultrasound (EUS)

- Suspicious features (mural nodularity, solid component)
- Cyst fluid analysis (CEA, amylase)
- Confocal microscopy (Cellvizio)
- Cytology

Laboratory analysis (LFT's, CA 19-9)



CELLVIZIO BRINGS THE MISSING PIECE TO PANCREATIC CYST CHARACTERIZATION

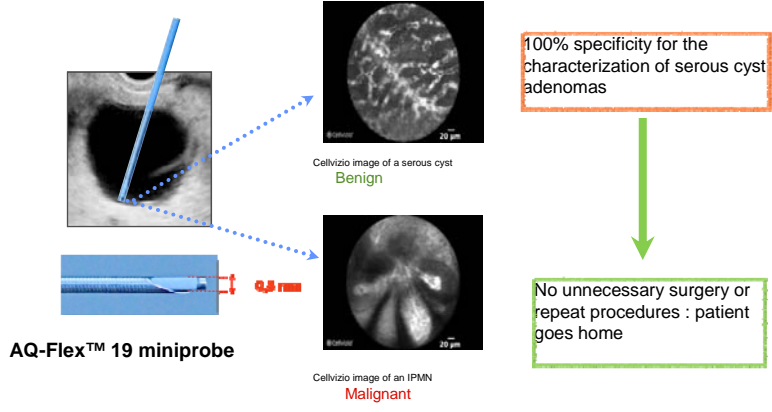
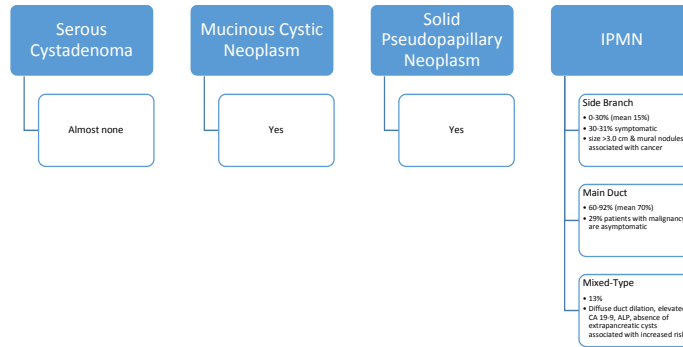


Table 2. Key Features of Neoplastic Pancreatic Cysts

	Intraductal Papillary Mucinous Neoplasms	Mucinous Cystic Neoplasms	Serous Cystadenomas	Solid and Pseudopapillary Tumors
Sex distribution	M = F	F > M	F > M	F > M
Historical age of presentation	7th decade	5th to 7th decade	7th decade	2nd and 3rd decade
Clinical presentation	Incidental, abdominal pain, pancreatitis, symptoms or signs of malabsorption	Incidental, abdominal pain, or palpable mass	Usually incidental, rarely abdominal pain or palpable mass	Usually incidental, rarely abdominal pain or palpable mass
Morphology/imaging characteristics	Dilated main pancreatic duct or pancreatic duct branches; solid component, if present may suggest malignancy	Unilocular cyst. Septations and wall calcifications may be present. Solid component, if present may suggest malignancy	Microcystic/honeycomb appearance typical. Oligocystic appearance less common	Solid and cystic mass
Fluid characteristics	Usually thick	Usually viscous	Thin, if sufficient fluid aspirated from a dominant cyst	Often bloody
Cytology	Stains positive for mucin. Columnar cells with variable atypia; yield >90%	Stains positive for mucin. Columnar cells with variable atypia; yield <50%	Cuboidal cells stain positive for glycogen; yield <50%	Characteristic branching papillae with myxoid stroma; yield very high from solid component.
Accuracy of cyst CEA (ng/mL)	>192, 0.75% sensitivity	Under curve on receiver operating characteristic*	<5, 67%	
Malignant potential	Yes	Yes	No	Yes
Treatment	Resection for main duct IPMN and resection or surveillance for branch duct IPMN depending upon the clinical situation	Resection is generally recommended in appropriate candidates	No surveillance or treatment unless symptomatic	Resection

*The performance characteristics of fluid CEA level in IPMN and mucinous cystadenoma have not been studied separately. M = male; F = female; CEA = carcinoembryonic antigen.

Malignant Potential



An Aggressive Resectional Approach to Cystic Neoplasms of the Pancreas

Karen D. Horvath, MD, John A. Chabot, MD, *New York, New York*

CONCLUSIONS: The good outcomes in this study support an aggressive surgical approach to all patients diagnosed with a cystic neoplasm of the pancreas, if medically fit to tolerate surgery. This approach is justified for the following reasons: (1) preoperative differentiation of a benign versus malignant tumor is unreliable and routine testing for this purpose is of questionable utility; (2) potential adverse consequences of nonresectional therapy are significant; (3) perioperative morbidity and mortality of pancreatic surgery is low; and (4) prognosis with curative resection is good. *Am J Surg.* 1999;178:269-274. © 1999 by Excerpta Medica, Inc.

Cystic Lesions of the Pancreas: Selection Criteria for Operative and Nonoperative Management in 209 Patients

Peter J. Allen, M.D., David P. Jaques, M.D., Michael D'Angelica, M.D., Wilbur B. Bowne, M.D., Kevin C. Conlon, M.D., Murray F. Brennan, M.D.

J GASTROINTEST SURG 2003;7:970-977

A Selective Approach to the Resection of Cystic Lesions of the Pancreas

Results From 539 Consecutive Patients

Peter J. Allen, MD, Michael D'Angelica, MD, Mithat Gonen, PhD, David P. Jaques, MD, Daniel G. Coit, MD, William R. Jarnagin, MD, Ronald DeMatteo, MD, Yuman Fong, MD, Leslie H. Blumgart, MD, and Murray F. Brennan, MD

Ann Surg 2006;244: 572-582

International Consensus Guidelines for Management of Intraductal Papillary Mucinous Neoplasms and Mucinous Cystic Neoplasms of the Pancreas

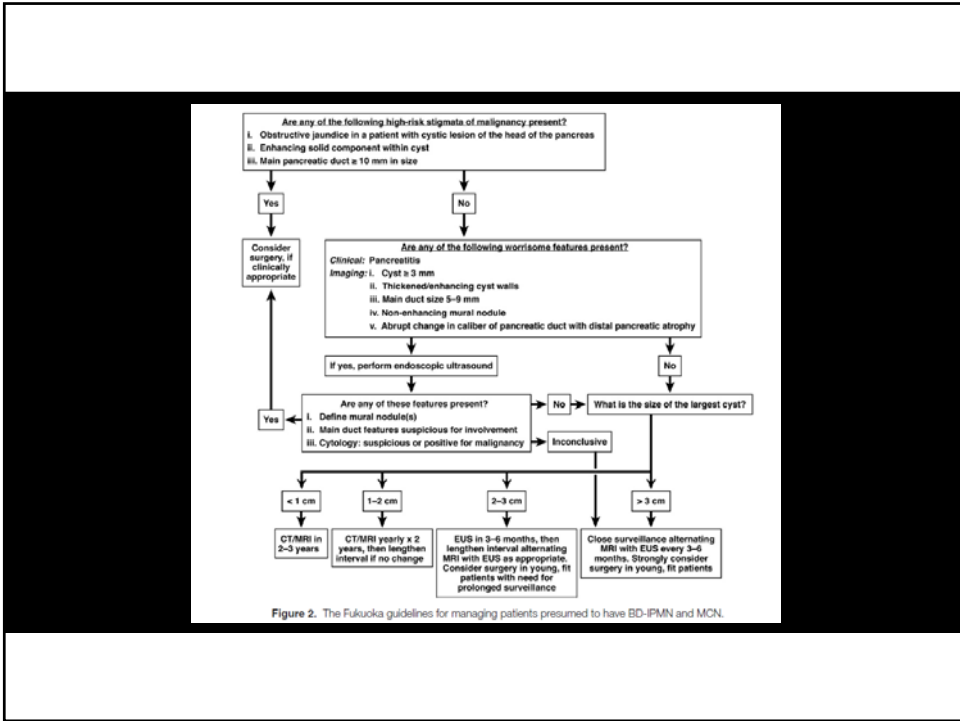
Masao Tanaka^a, Suresh Chari^b, Volkan Adsay^c, Carlos Fernandez-del Castillo^d, Massimo Falconi^e, Michio Shimizu^f, Koji Yamaguchi^a, Kenji Yamao^g, Seiki Matsuno^h

Pancreatology 2006;6:17-32

International consensus guidelines 2012 for the management of IPMN and MCN of the pancreas

Masao Tanaka^{a,*}, Carlos Fernández-del Castillo^b, Volkan Adsay^c, Suresh Chari^d, Massimo Falconi^e, Jin-Young Jang^f, Wataru Kimura^g, Philippe Levy^h, Martha Bishop Pitmanⁱ, C. Max Schmidt^j, Michio Shimizu^k, Christopher L. Wolfgang^l, Koji Yamaguchi^m, Kenji Yamaoⁿ

Pancreatology 12 (2012) 183-197



Surgical Decision-Making

Patients need to be carefully assessed individually

Key patterns should be kept in mind during assessment

Guidelines and multidisciplinary review are helpful

Diagnostic uncertainty can be an indication for surgery, particularly in young patients

Patients should be included in the decision making process

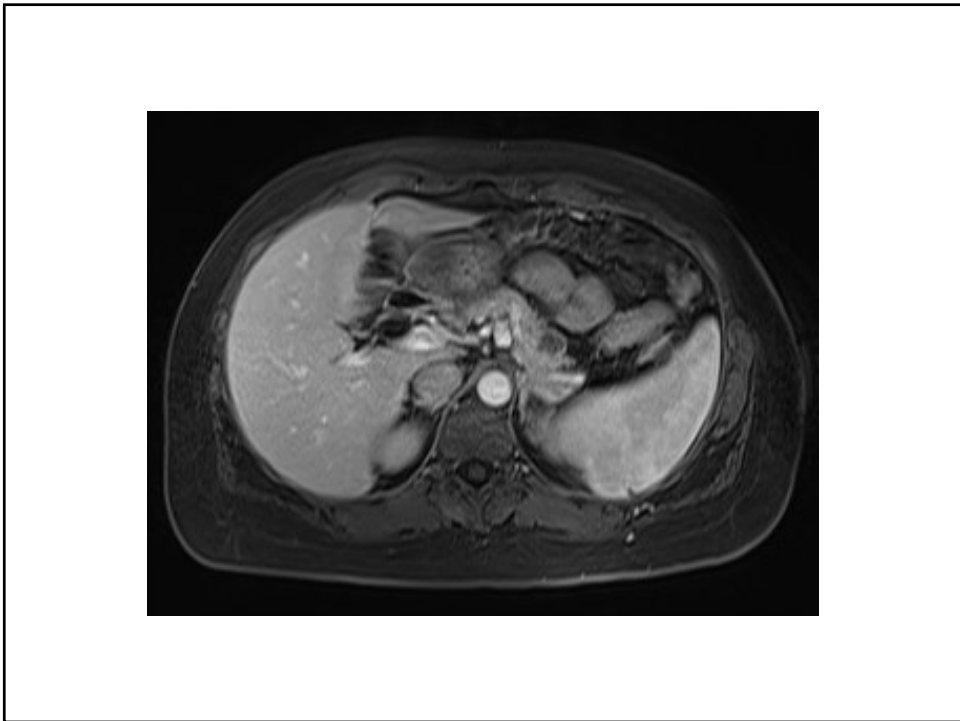
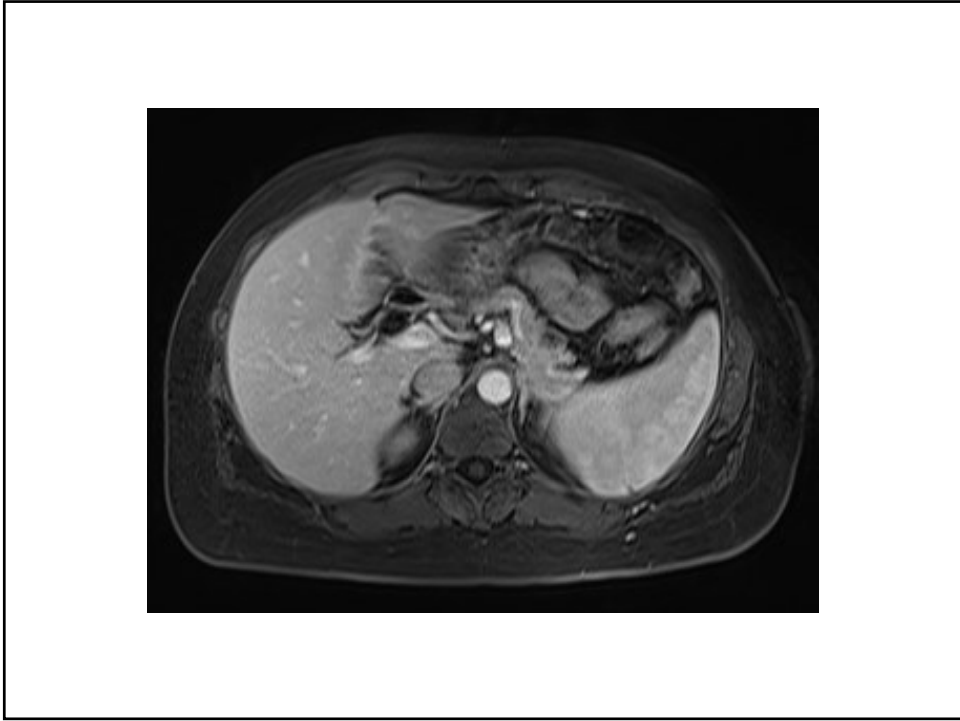
Indications for surgery

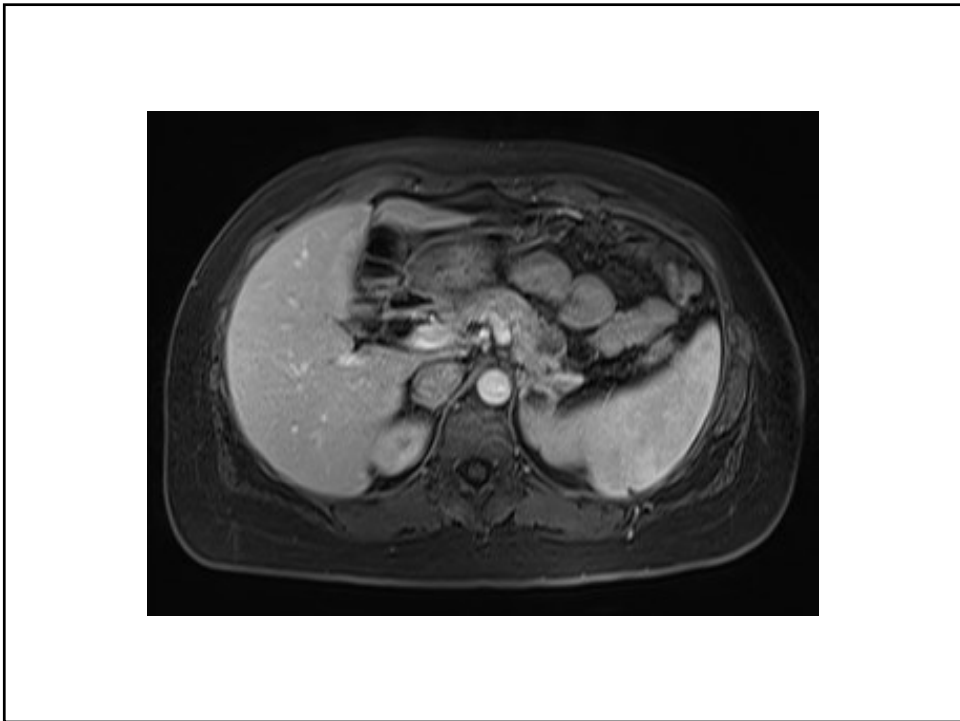
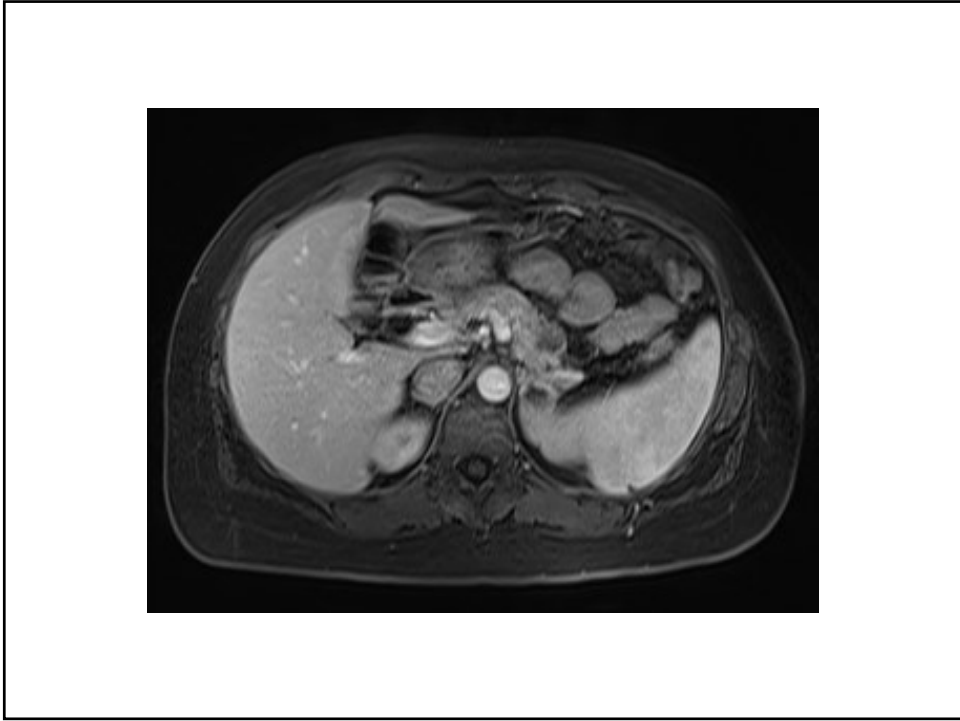
- Symptoms
- Suspicious features (mural nodules)
- Main duct involvement
- Elevated tumor markers
- MCN and SPN should be resected
- Lesions > 3 cm, particularly in young, fit patients

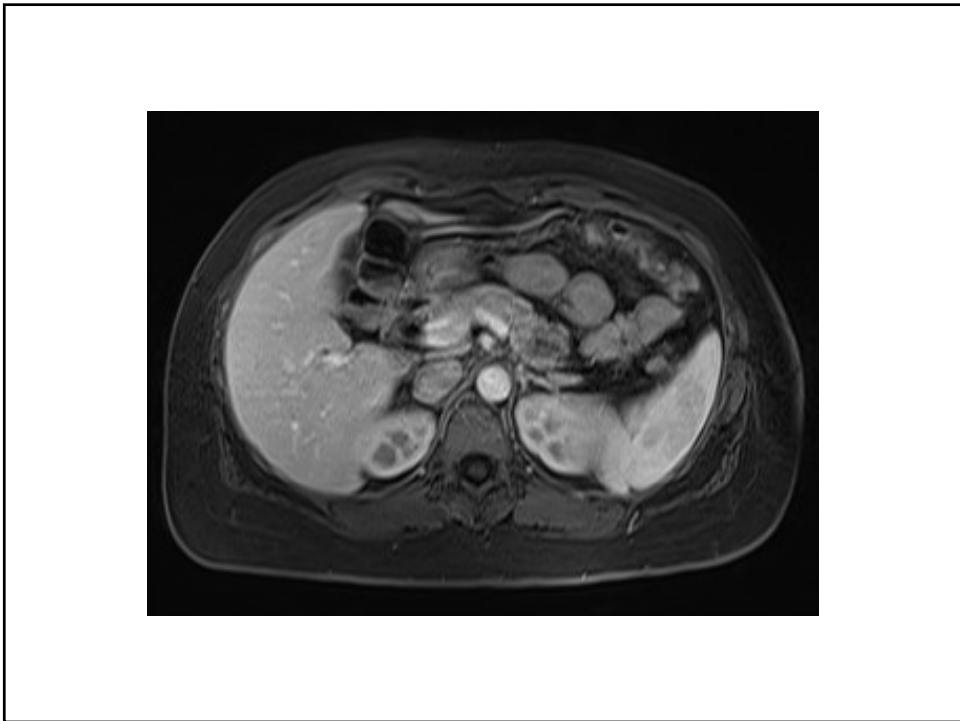
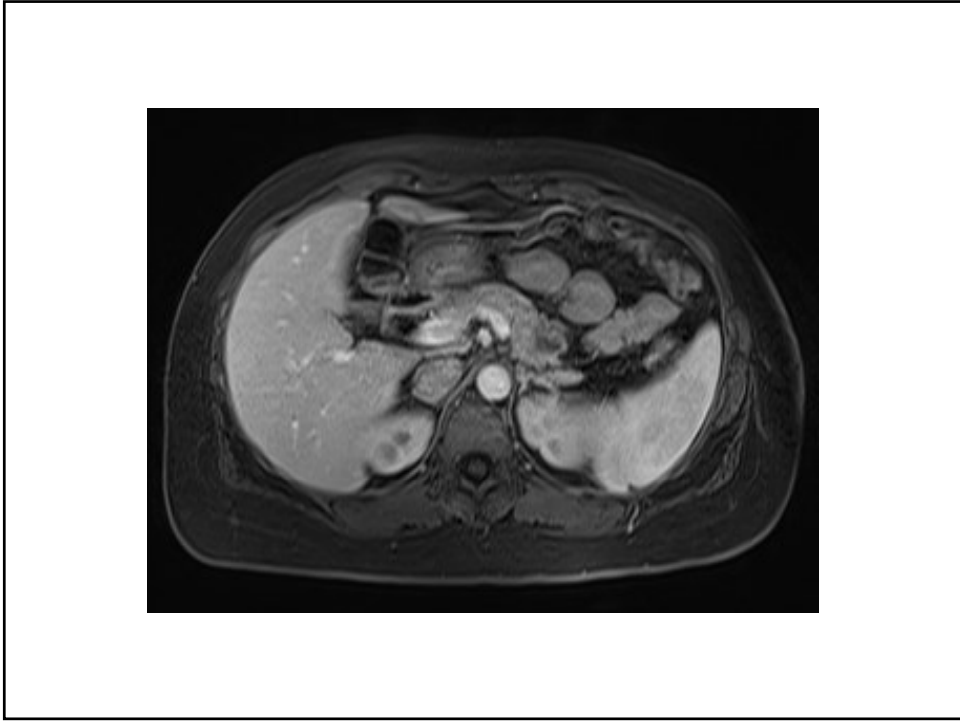
Case presentations

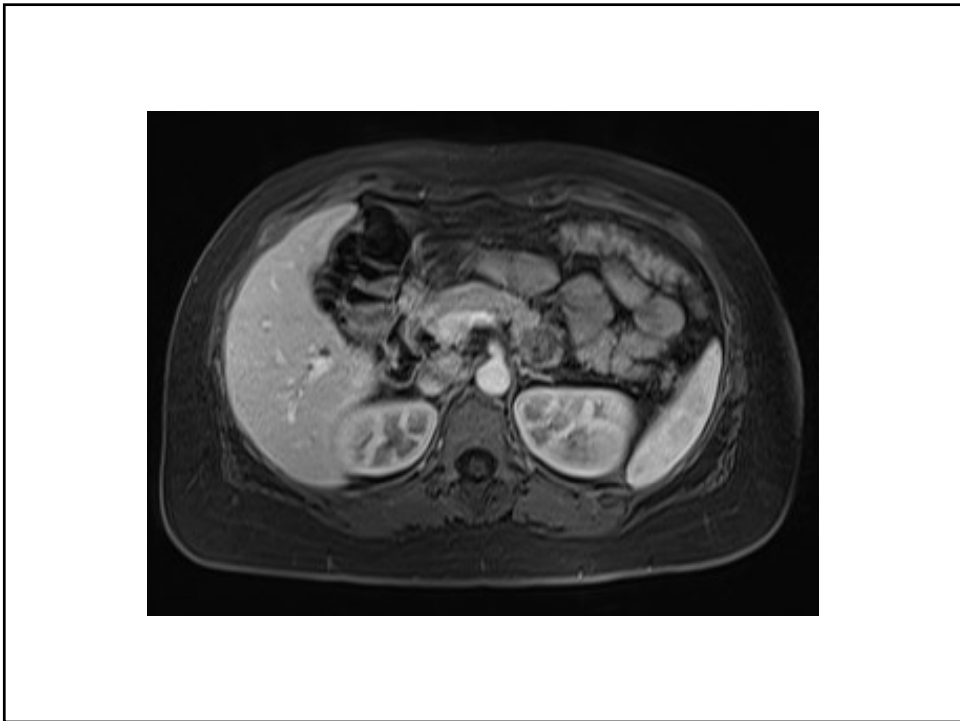
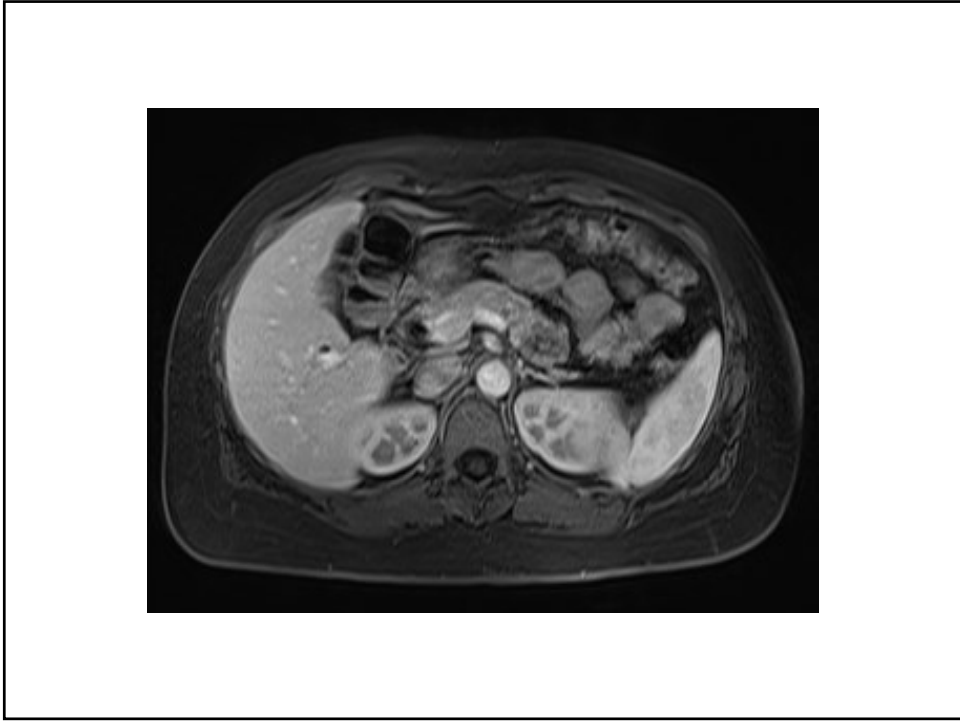
Case #1

- 31-year-old female no significant previous medical history who was noted to have abdominal pain during pregnancy
- Symptoms were consistent with acute cholecystitis/gallstone disease
- Elevated LFTS
- Right upper quadrant ultrasound demonstrated gallstones, an 8 mm common bile duct, and a cystic lesion in the tail of pancreas
- MRI showed a 4.8 x 4.0 cm lesion in the tail of pancreas
- ERCP was unremarkable, although there may have been some sludge in the duct
- EUS demonstrated a cystic lesion in the tail of the pancreas that was 46 x 27 mm in size. It appeared to be consistent with a pseudocyst, but the CEA was 0.5 and amylase was 35
- She underwent robotic cholecystectomy for her symptomatic cholelithiasis
- Initial follow up MRI demonstrated a 3.5 cm cystic lesion in the tail the pancreas
- Repeat MRI today showed a 4 cm solid and cystic lesion in the tail of the pancreas











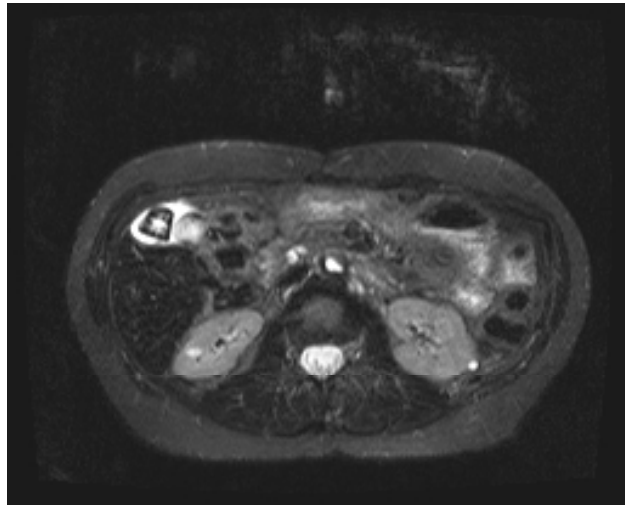
Diagnosis

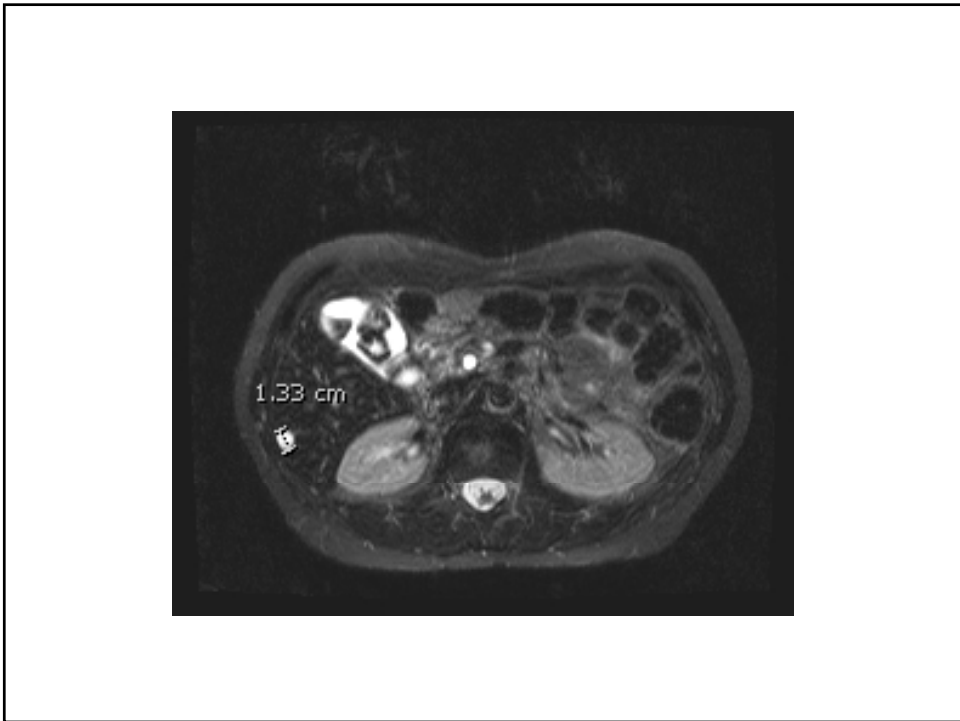
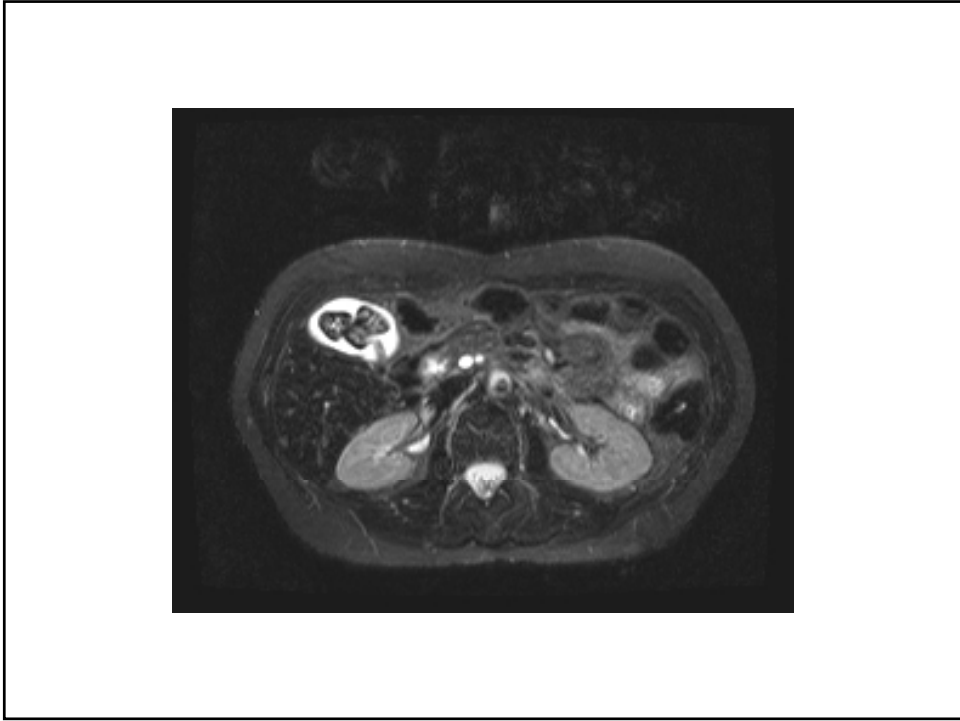
Diagnosis

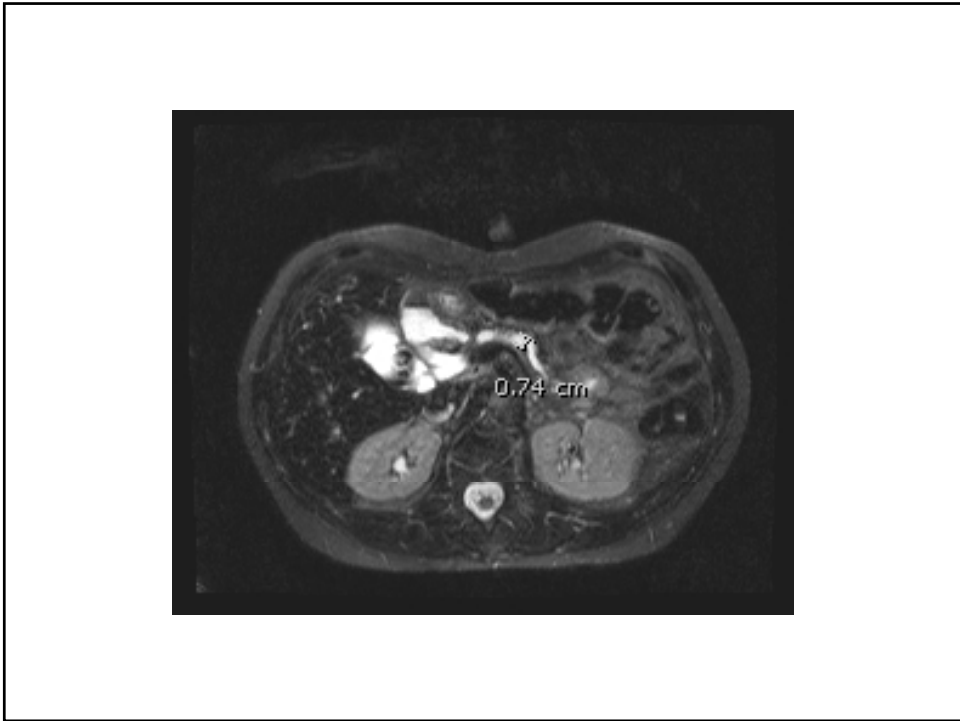
Distal pancreas and spleen, distal pancreatectomy and splenectomy: - Pancreas with **solid pseudopapillary tumor**; See Comment. - Focal chronic pancreatitis and low grade pancreatic intraepithelial neoplasia(PanIN). - Resection margin negative for tumor or high grade dysplasia. - Thirteen lymph nodes negative for tumor (0/13). - Spleen (213.7g) and accessory spleen with congestion.

Case #2

- 61-year-old female with previous medical history significant for obesity for which she underwent a Roux-en-Y gastric bypass in 2005 and an open revision in 2006
- Complains of postprandial abdominal pain for many years and recently developed worsening satiety and a 20-pound weight loss
- CT scan that demonstrated a pancreatic duct abnormality
- MRI demonstrated cholelithiasis, a dilated pancreatic duct, and a 2.4 cm cystic lesion in the body of the pancreas with possible communication with the main pancreatic duct







Diagnosis

Diagnosis

Distal pancreas and spleen, distal pancreatectomy and splenectomy: - **Intraductal papillary mucinous neoplasm (IPMN)** with mild to moderate dysplasia; see note. - IPMN with low to moderate dysplasia is present at pancreatic margin. - Thirty-five lymph nodes negative for malignancy (0/35). - Spleen with focal capsular disruption and hemorrhage.

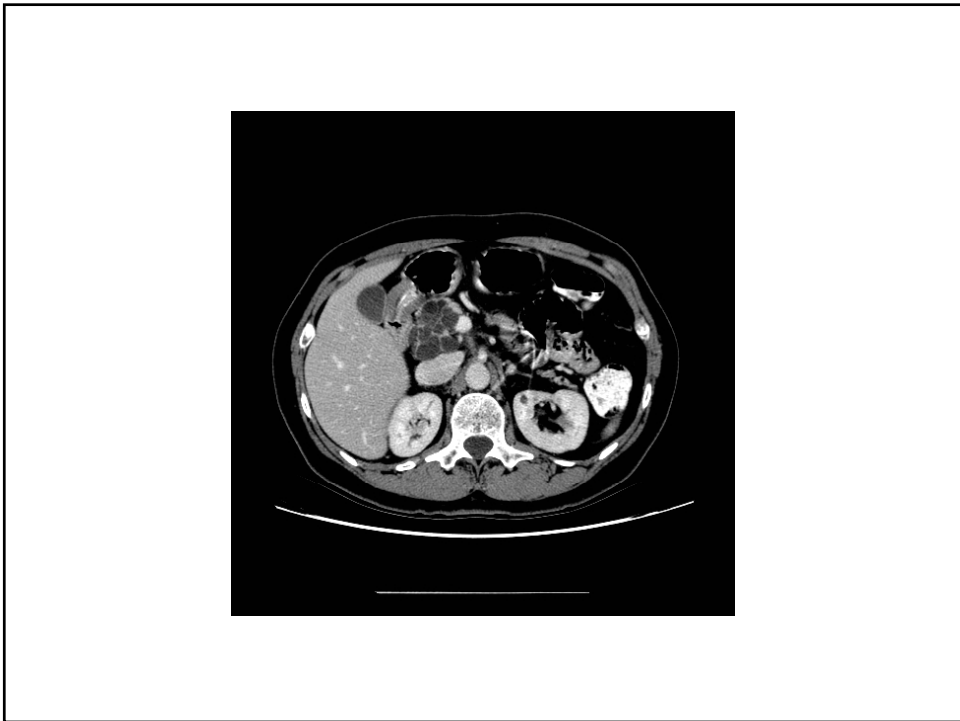
Note: The entire pancreatic cystic lesion was submitted for microscopic evaluation. The IPMN **involves pancreatic main duct and branches and shows low to intermediate grade dysplasia**. No evidence of high-grade dysplasia or invasive component is identified.

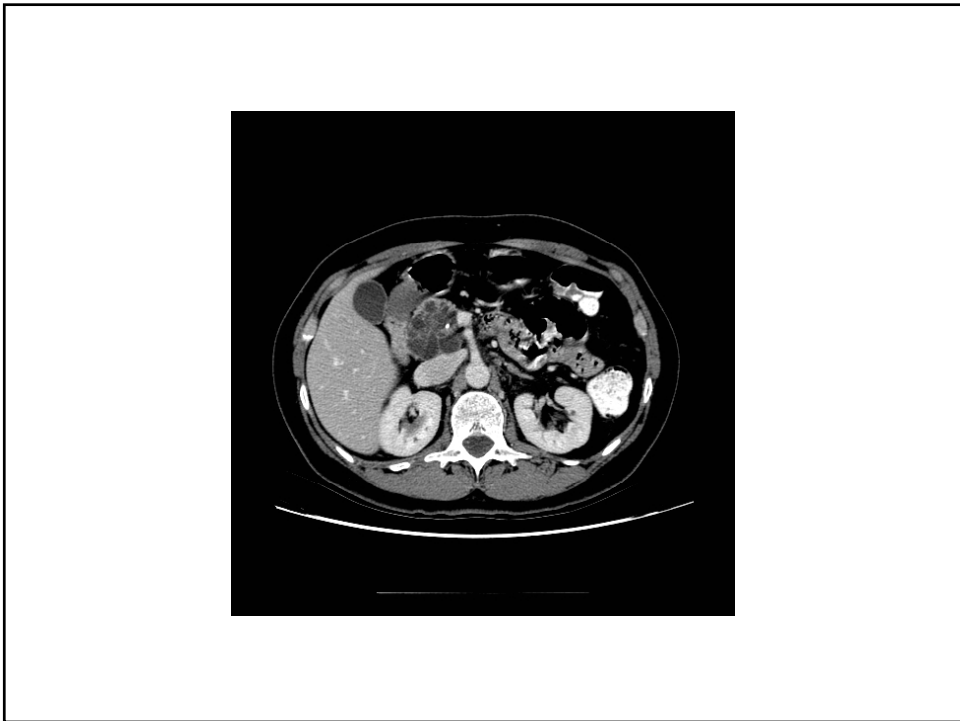
Case #3

- 55-year-old female who presented with left flank pain
- CT stone survey for kidney stones incidentally demonstrated a 4.5 cm mass involving the head of her pancreas
- Repeat CT imaging confirmed the presence of a mass and that has features of a mucinous tumor
- CA 19-9 was within normal limits
- LFTs were mildly elevated

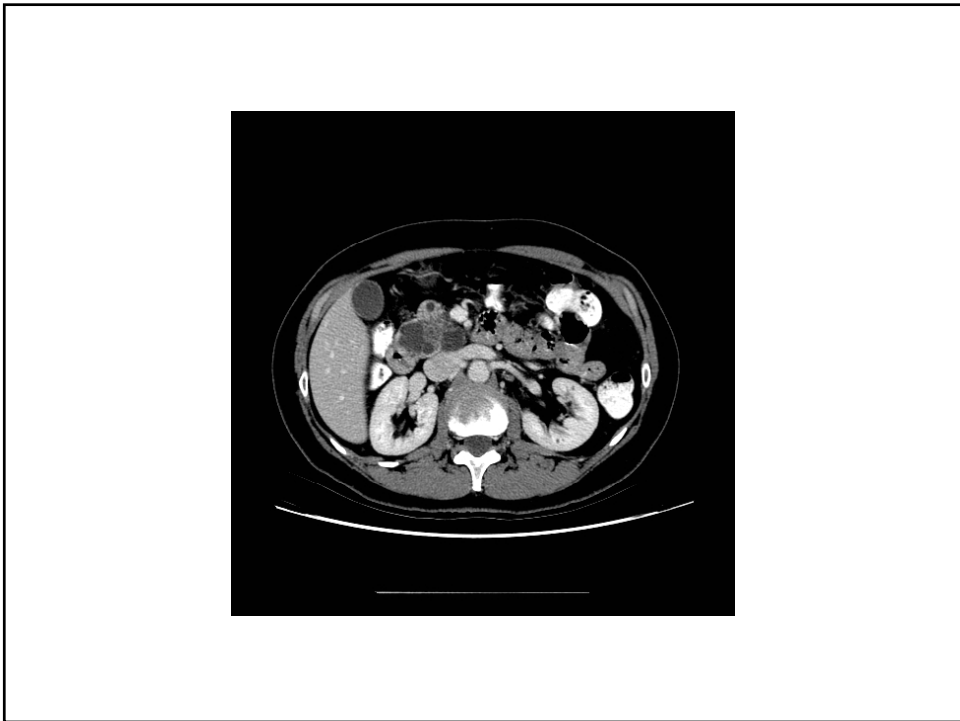




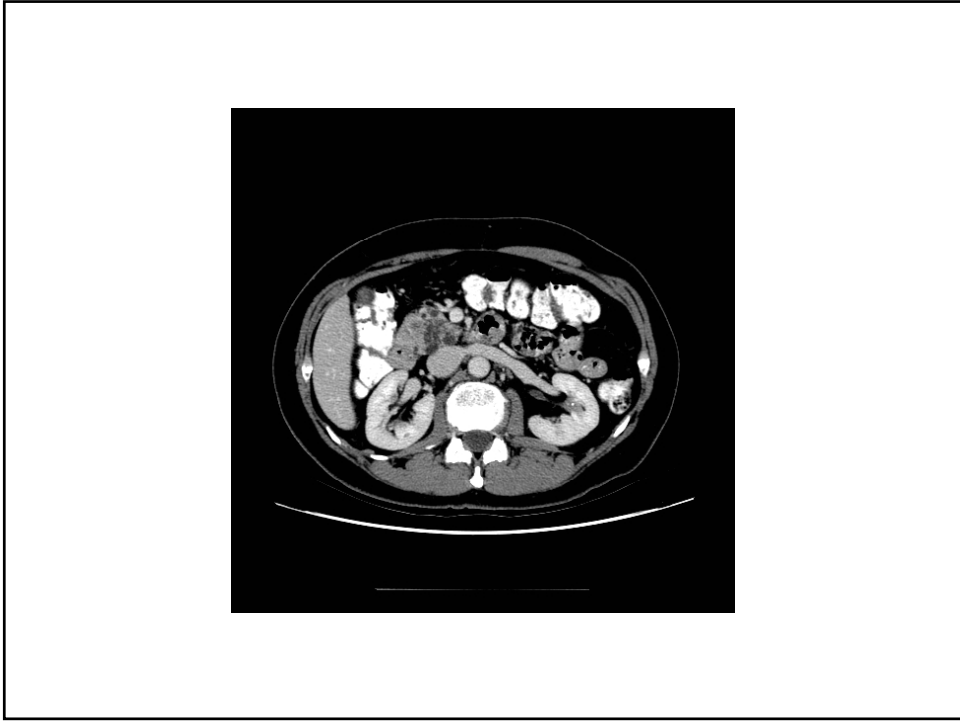












Diagnosis

Diagnosis

Stomach, proximal pancreas, proximal duodenum, common bile duct, Whipple:

- **Serous microcystic adenoma of the pancreas** (4.5 x 3.5 x 2.0 cm)

See Note.

- Margins of resection negative for neoplasm.

- Adjacent pancreas with pancreatic intraepithelial neoplasia (PanIN) 1A.

- Duodenum with ectopic pancreas; negative for carcinoma.

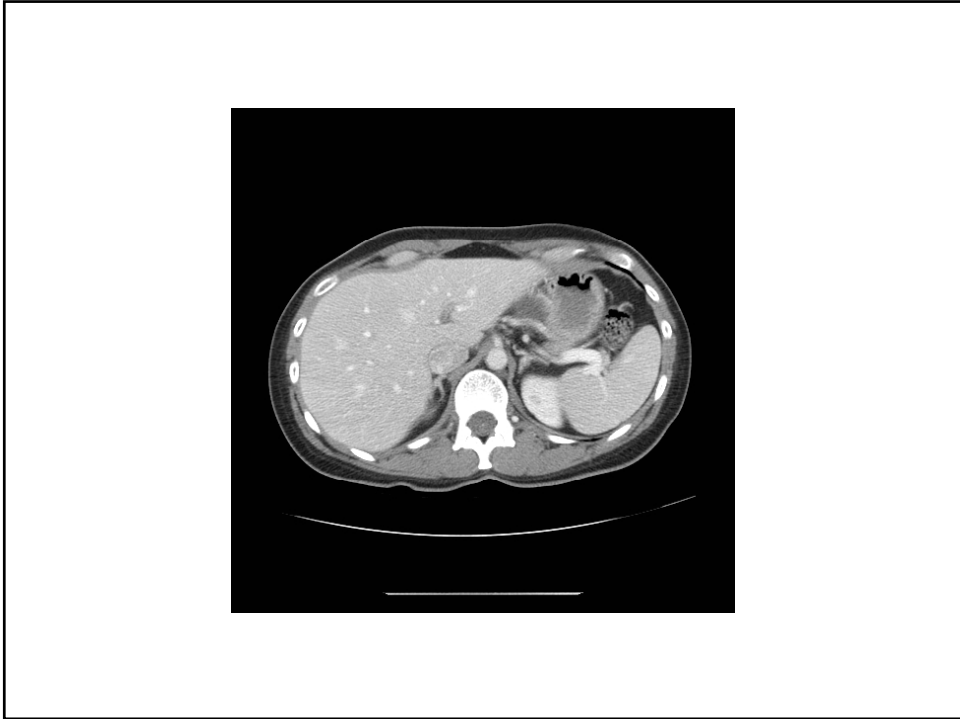
- Unremarkable stomach.

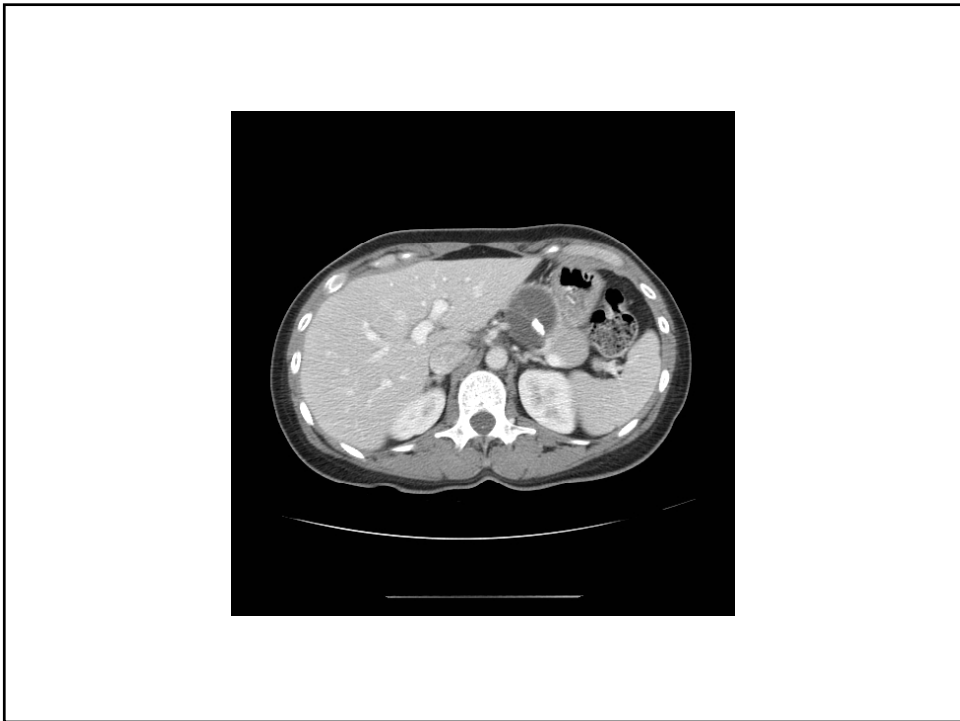
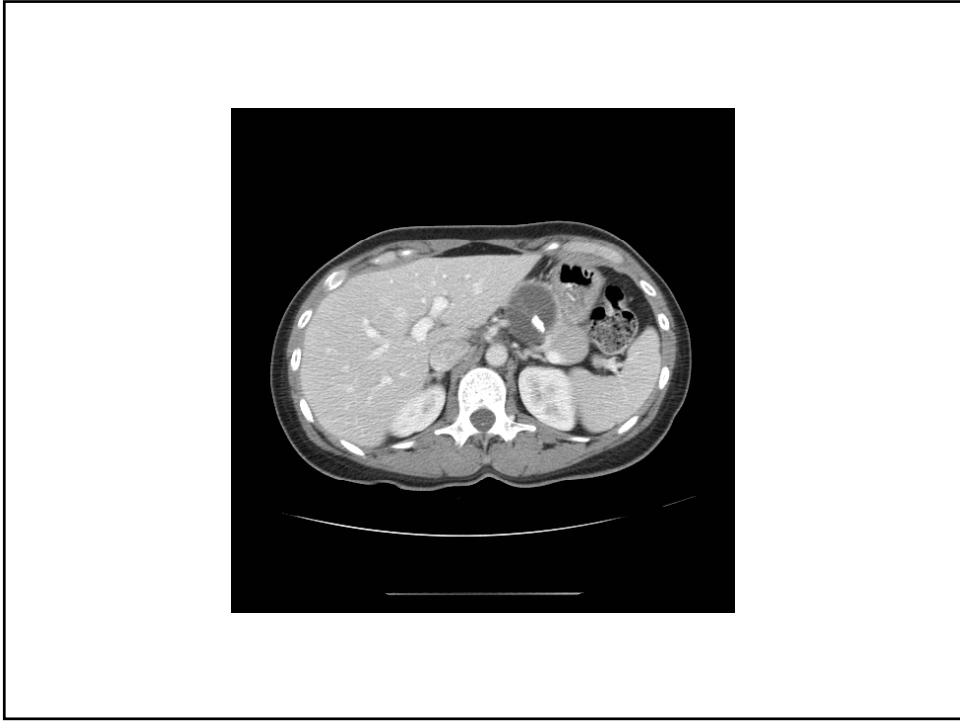
- Eighteen benign lymph nodes (0/18).

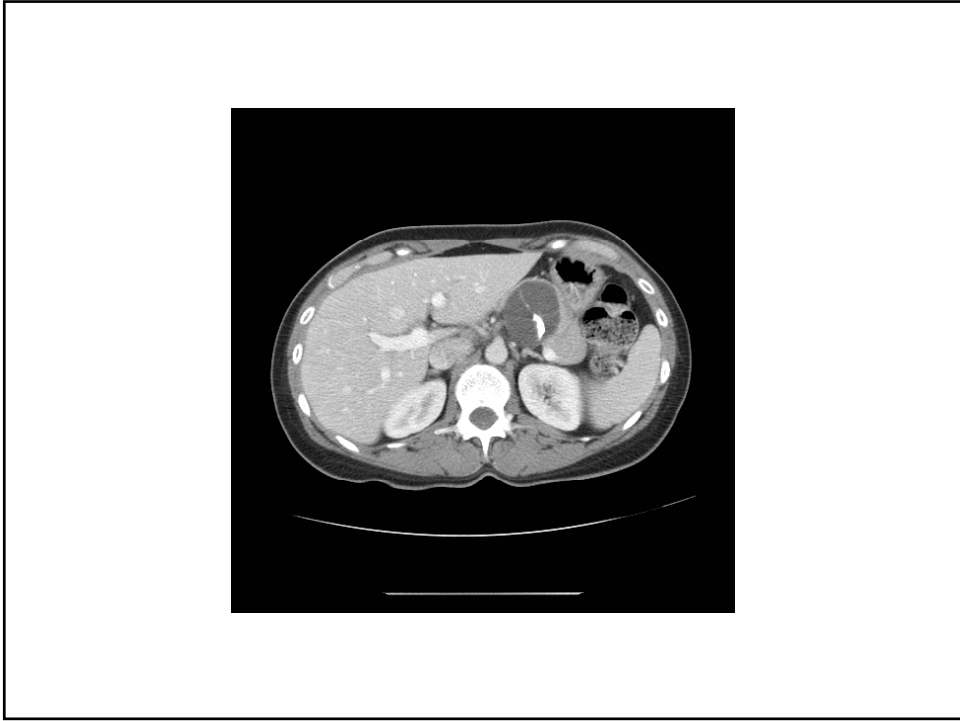
Case #4

- 44-year-old female with no significant previous medical history who presented with a 2-week history of epigastric abdominal pain
- CT scan of the abdomen and pelvis demonstrated a cystic mass within the body of the pancreas
- Endoscopic ultrasonography demonstrated a 4.3 x 3.5 cm cystic lesion in the body and tail
- Cyst-fluid amylase 108
- Cyst-fluid CEA 2,797















Diagnosis

Diagnosis

Pancreas, distal pancreatectomy:

- **Mucinous cystic neoplasm** with low grade dysplasia, see note.
- Pancreatic margin does not contain mucinous cystic neoplasia.
- Pancreatic intra-epithelial lesion/neoplasia (PanIN) low grade.
- Focal chronic pancreatitis.

Note: The stroma appears extensively hyalinized and calcified, but focally there is ovarian-type stroma underlying the mucinous epithelium.
Dr. W Marsh reviewed select sections.

Conclusions

Pancreatic cystic lesions are common

Most asymptomatic

Treatment should be individualized (guidelines available)

Clinicians should recognize key patterns and use diagnostic tools appropriately

Surgical resection is the only diagnostic tool that is 100% accurate

Surveillance is appropriate for unresected lesions and for evaluation of the remnant pancreas in patients with IPMN following resection

Multidisciplinary review of cases is encouraged