

AMSER Rad Path Case of the Month:

85-year-old man with a history of thyroid cancer

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Patient Presentation

HPI: 85 yo M with a history of **papillary/anaplastic thyroid cancer** s/p total thyroidectomy (1.5 years ago), radioactive iodine, and external beam radiation, presenting for **surveillance CT neck/chest**

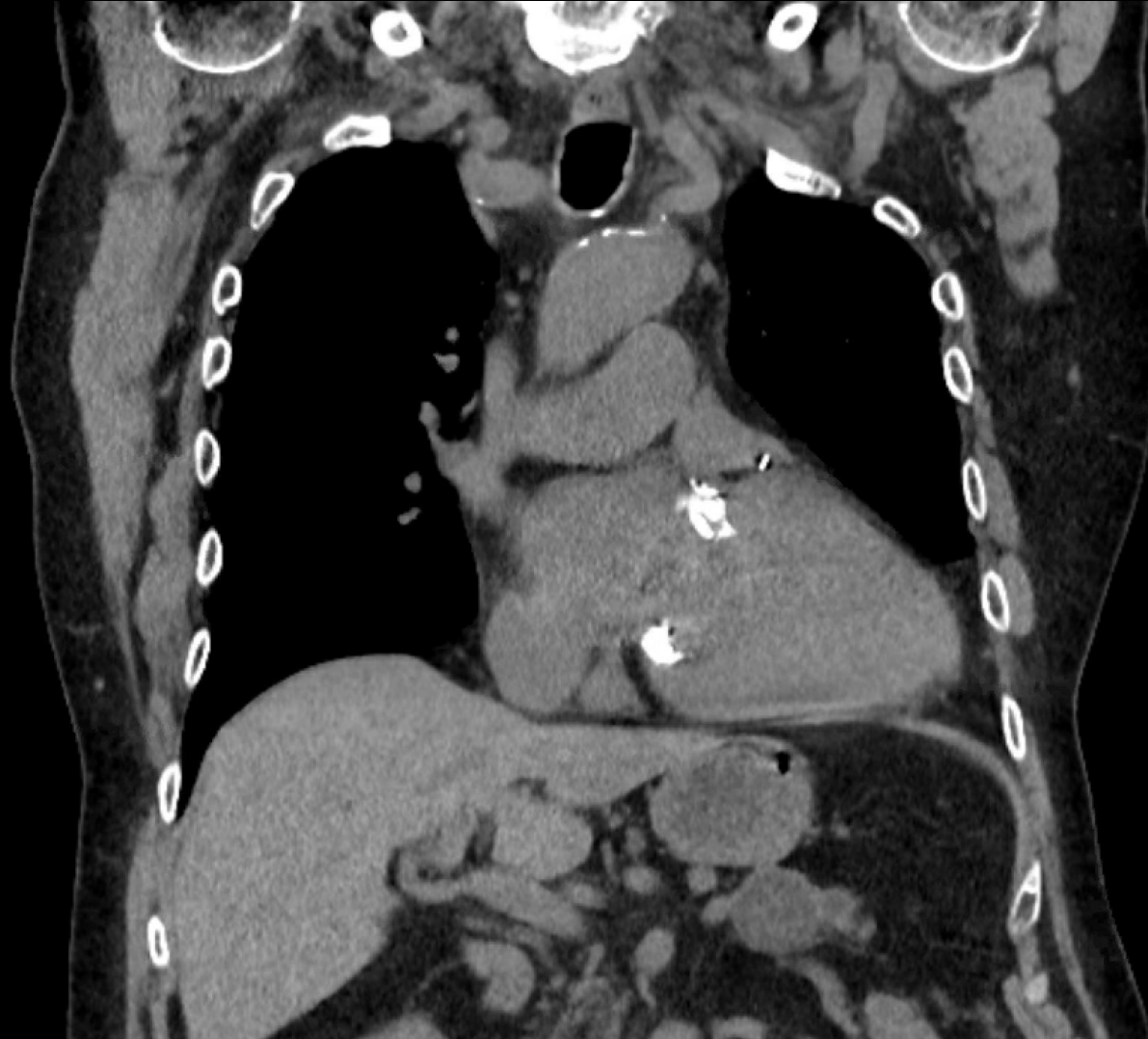
- **No history of metastatic disease**
- Euthyroid. No dysphagia, difficulty breathing, or hoarseness. No fevers, chills, night sweats, or weight loss.

PMH: Prostate cancer s/p radiation, CABG

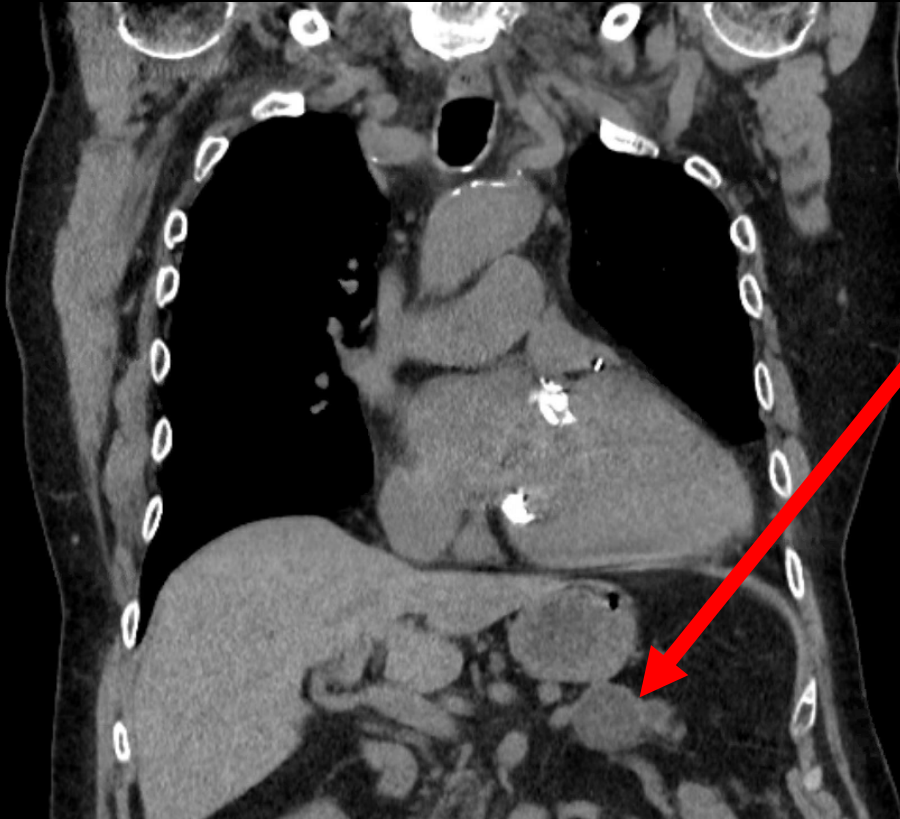
SH: Never smoker, 1 beer/month

Physical Exam: Normal exam. **No palpable thyroid tissue, masses.**

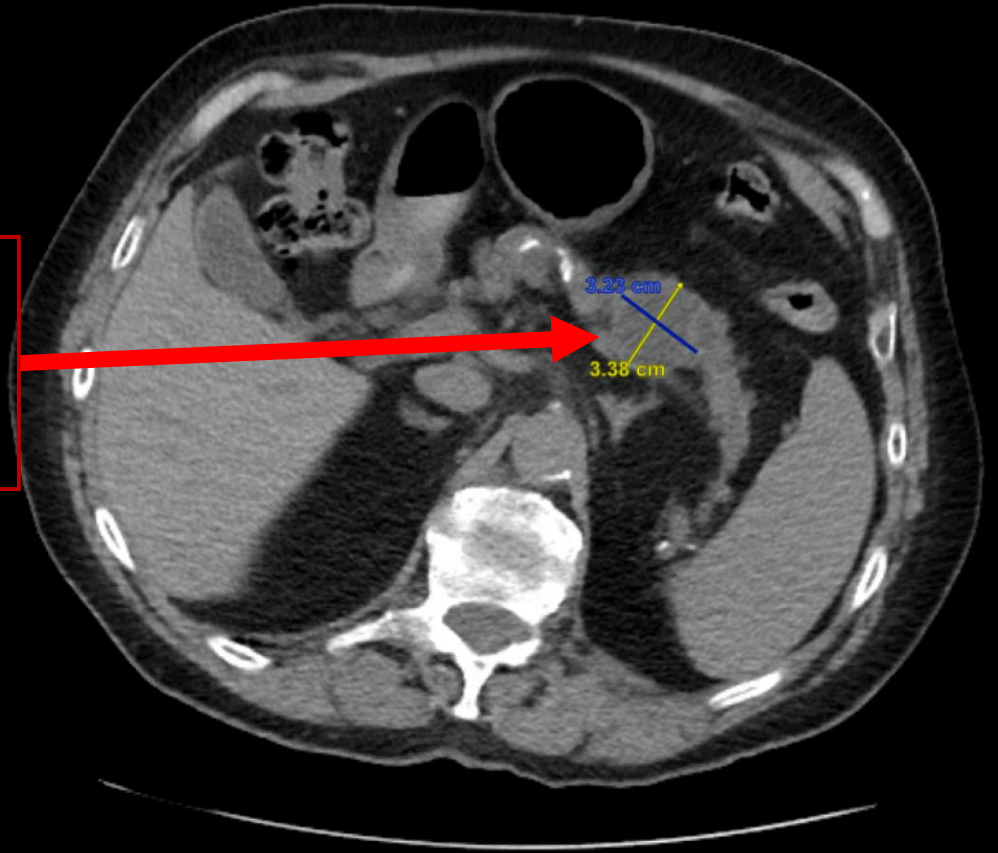
CT Chest w/o IV contrast



CT Chest w/o IV contrast



3.3 cm cystic lesion in
pancreatic body/tail –
New since last scan 7
months prior



DDX for pancreatic cystic lesion

- Most frequently encountered: ¹

- **Intraductal papillary mucinous neoplasm (IPMN)**
 - Branch duct, main duct, and combined forms
- Serous cystadenoma (SCA) – very rarely malignant
- **Mucinous cystic neoplasm with ovarian stroma (MCN)**
- **Solid pseudopapillary epithelial neoplasm**
- **Cystic pancreatic neuroendocrine tumor (cPNET)**

- Pseudocyst

- Rare: ¹

- True epithelial cyst
- Lymphoepithelial cyst
- Mucinous non-neoplastic cyst

Pancreatic cystic neoplasms (>50% of pancreatic cysts)²

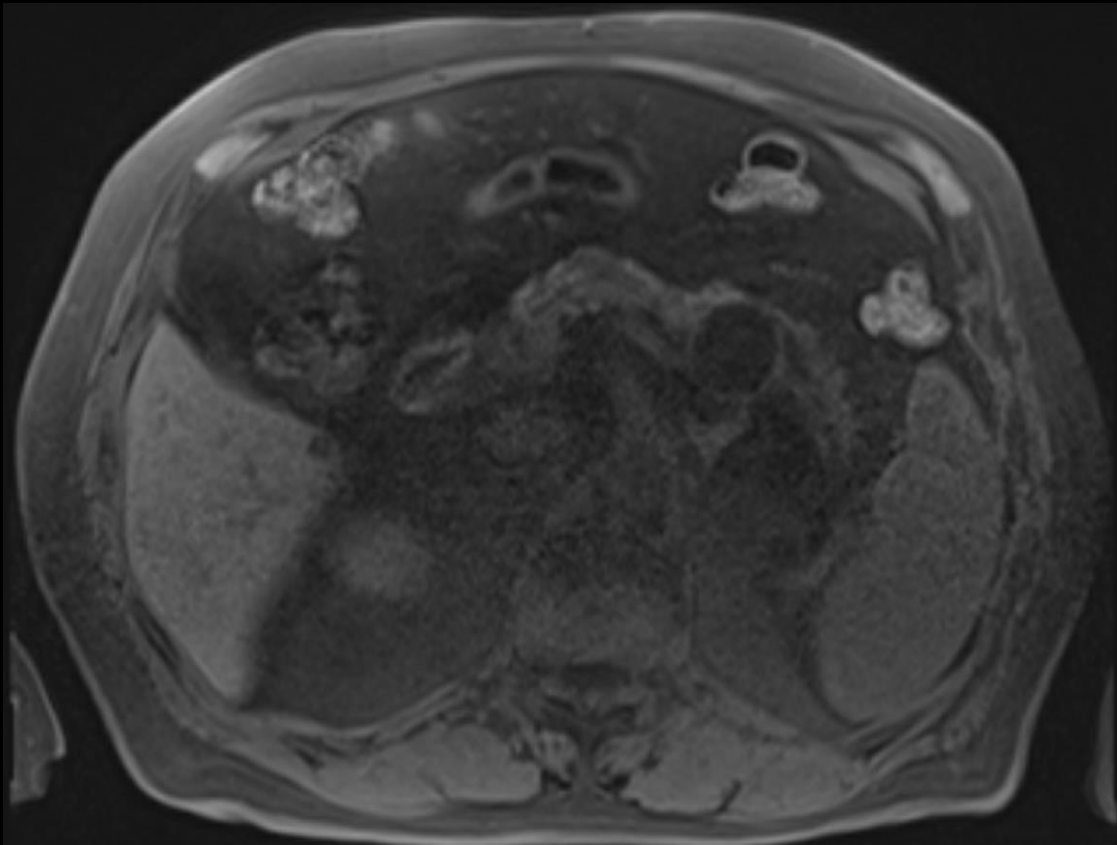
Malignant potential (virtually only in mucinous cysts)¹

Evaluation of pancreatic cyst: Imaging²

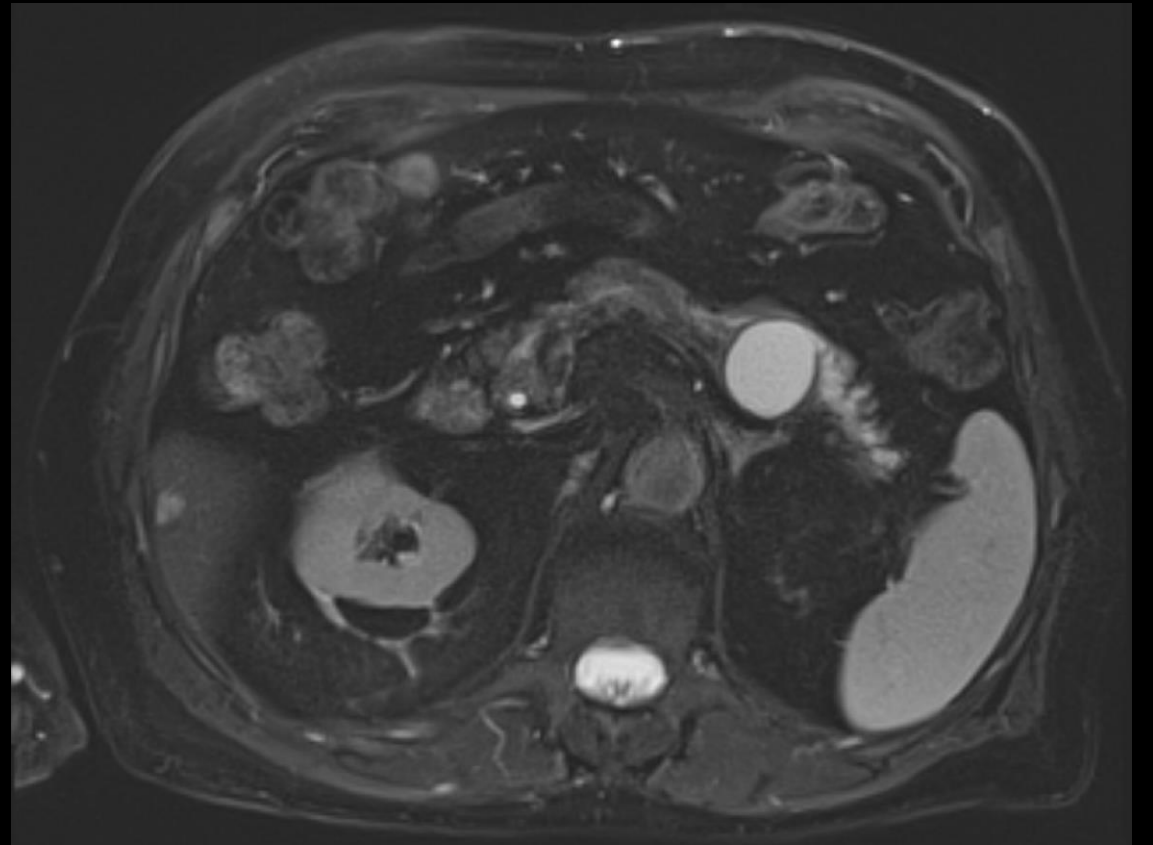
Recommended: MRI with Magnetic Resonance Cholangiopancreatography (MRCP)

Alternative: Dedicated Pancreatic Protocol CT

Non-contrast Axial MRI: T1 vs T2

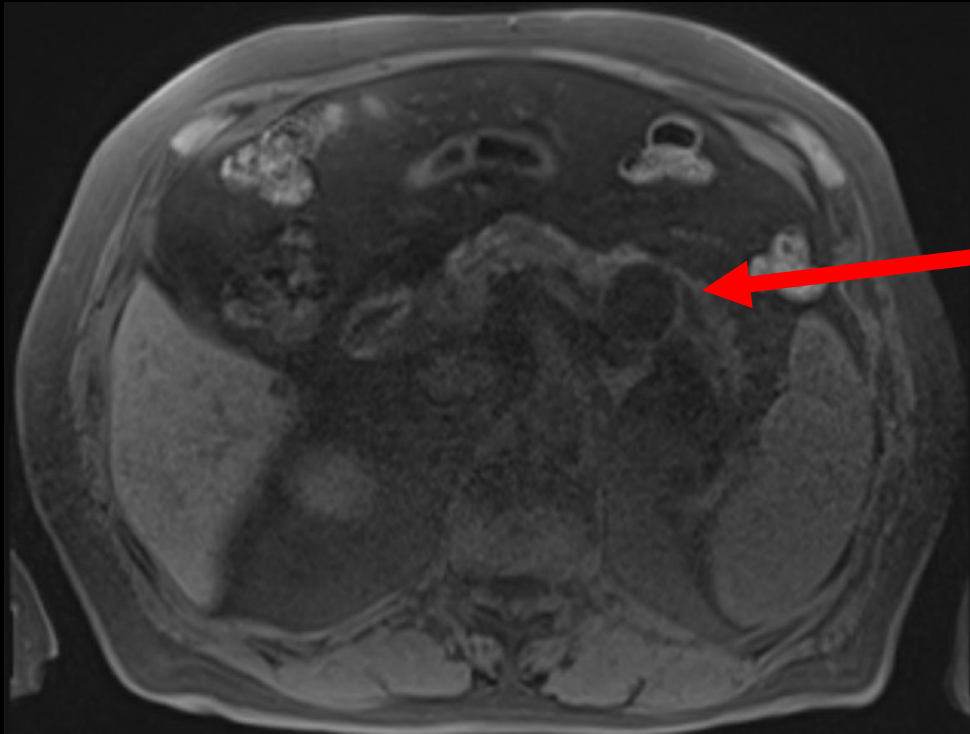


T1 Fat Sat



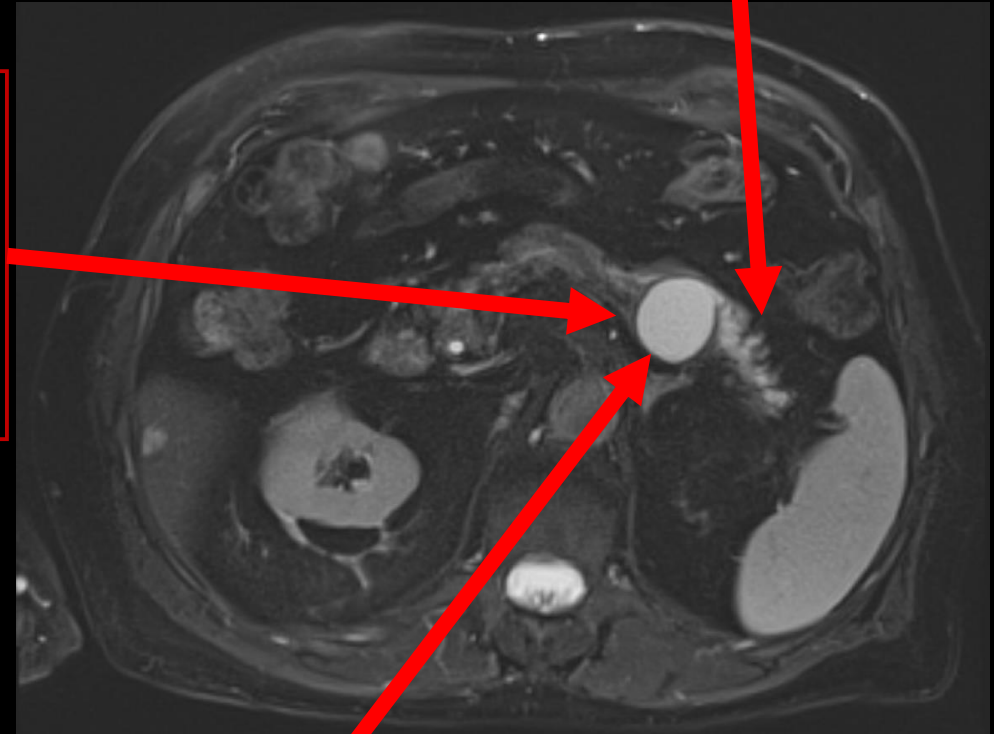
T2 Fat Sat

Non-contrast Axial MRI



T1 Fat Sat

- 3.1 cm lesion in pancreatic body
- T1 hypointense, T2 hyperintense → consistent with fluid → cystic

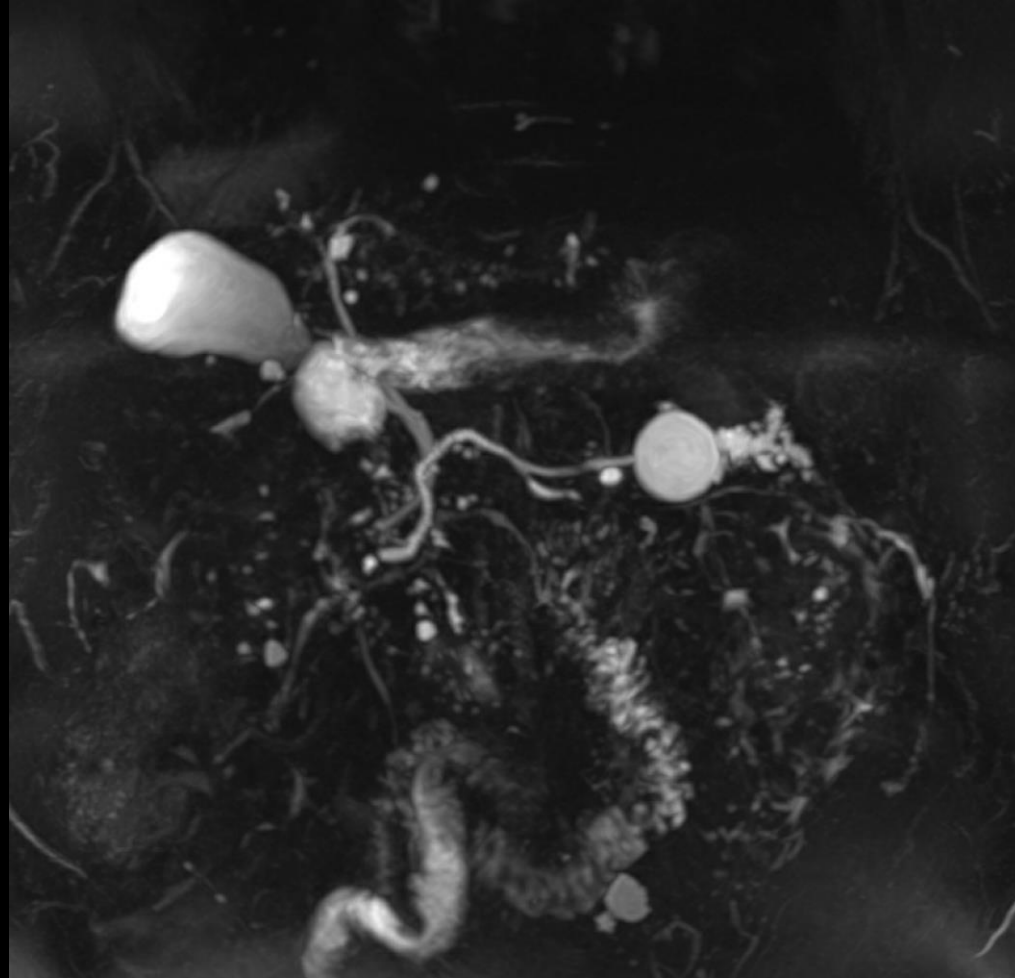


T2 Fat Sat

Atrophy of the pancreatic tail

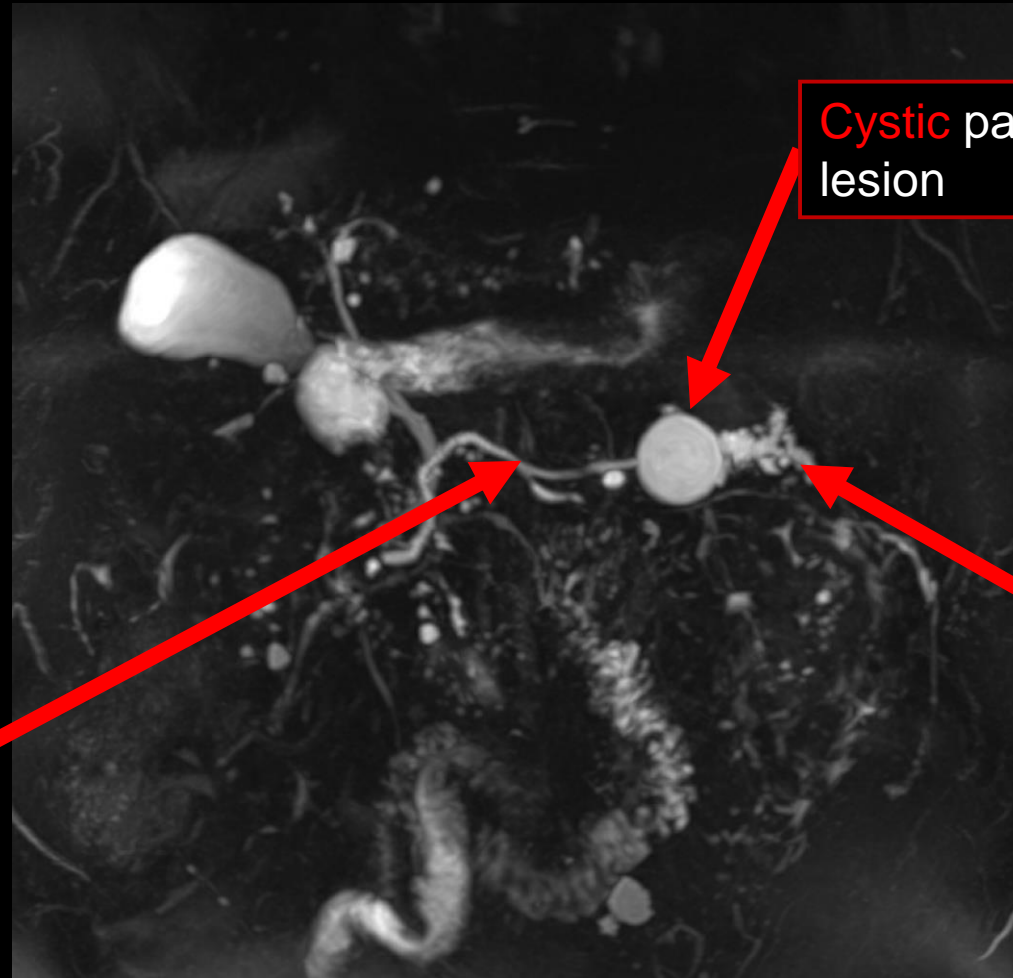
Signal does not drop out with fat suppression → No macroscopic/extracellular fat

Magnetic Resonance Cholangiopancreatography (MRCP)



3D Coronal T2 MRCP MIP

Magnetic Resonance Cholangiopancreatography (MRCP)



Cystic pancreatic lesion

Communicating with the dilated main pancreatic duct (up to 9 mm)

Normal diameter main pancreatic duct proximal to lesion

3D Coronal T2 MRCP MIP

High-risk on imaging ¹

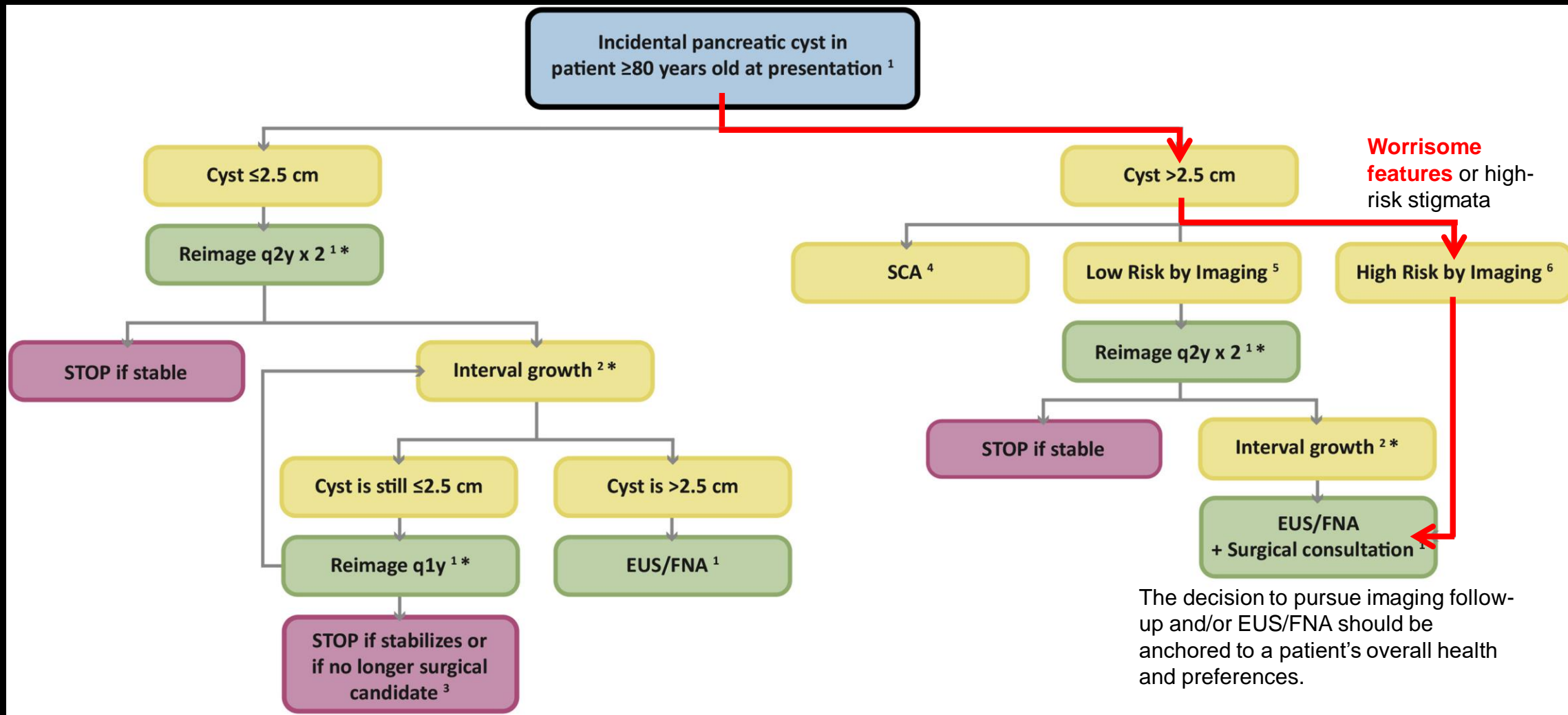
“Worrisome features”

- Cyst ≥ 3 cm
- Thickened/enhancing cyst wall
- Nonenhancing mural nodule
- Main pancreatic duct caliber ≥ 7 mm

“High-risk stigmata”

- Obstructive jaundice with cyst in head of pancreas
- Enhancing solid component within cyst
- Main pancreatic duct caliber ≥ 10 mm in absence of obstruction

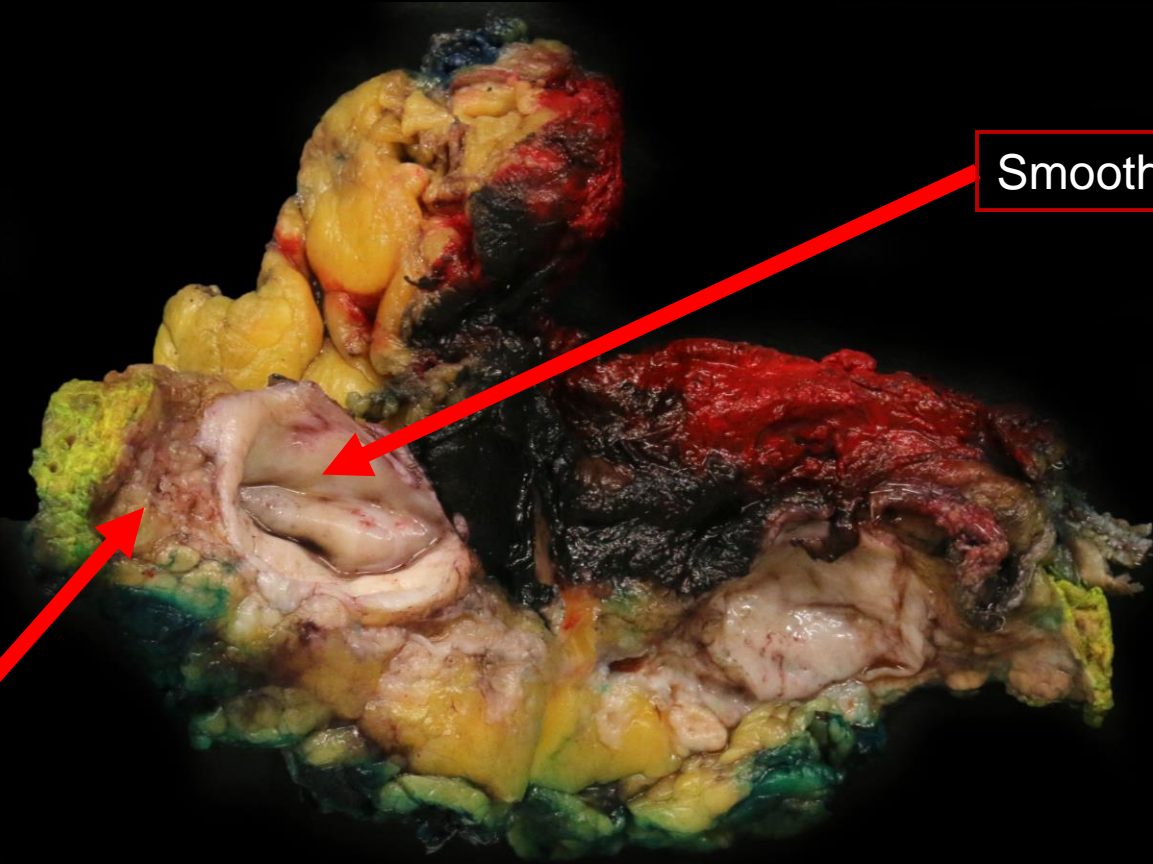
ACR Incidental Findings Committee ¹



Surgical Management

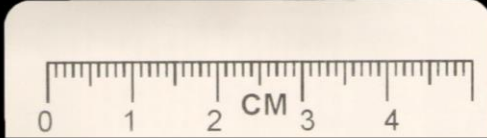
- Given dramatic increase in cyst size in <1 year, team and patient decided surgery would be reasonable option given the risk of occult malignancy or a high-grade premalignant tumor
- Patient underwent **robotic distal pancreatectomy and splenectomy**

Gross Pathology – Distal pancreatectomy

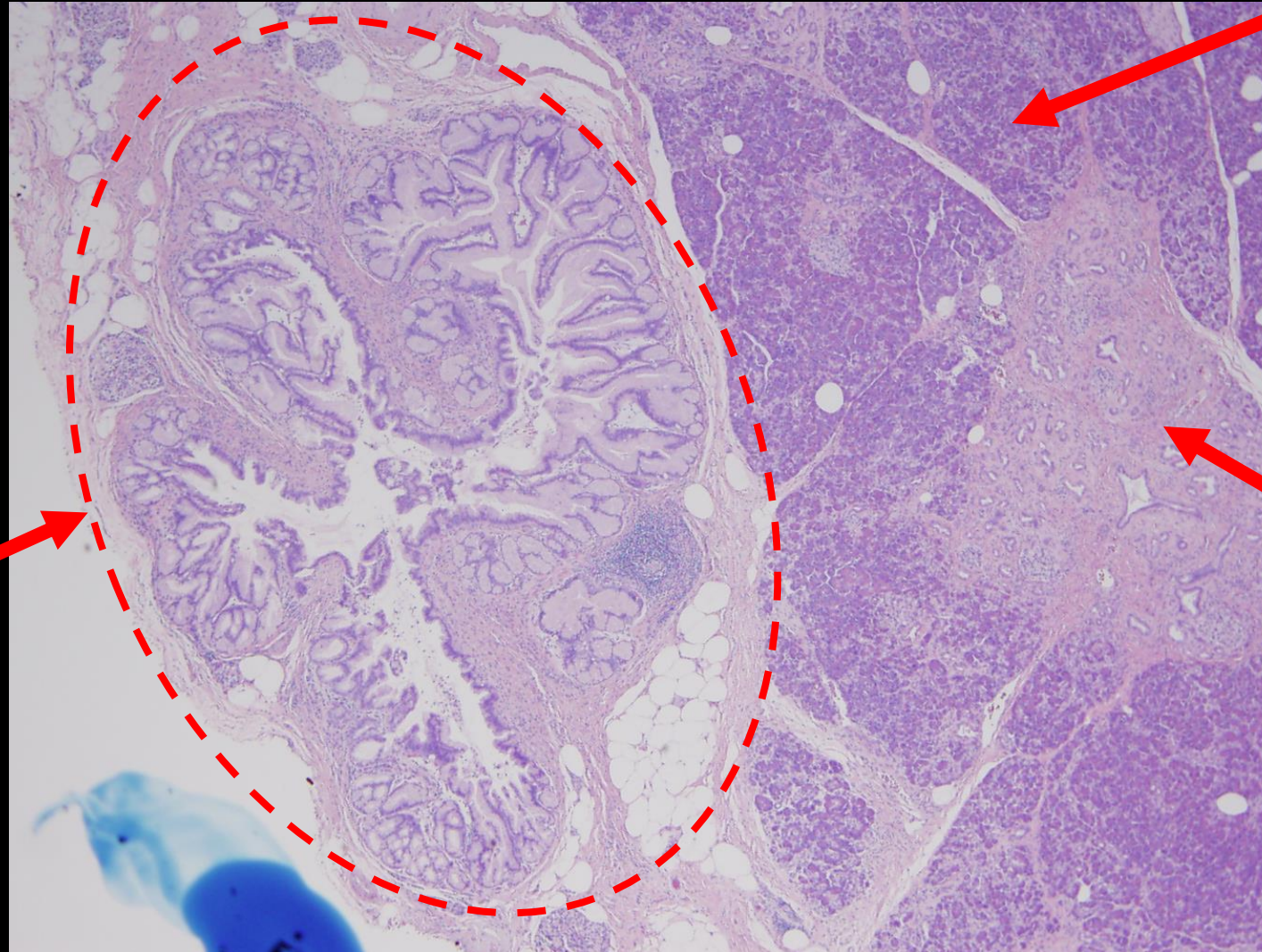


Smooth-lined cyst

Normal pancreatic parenchyma



Histopathology

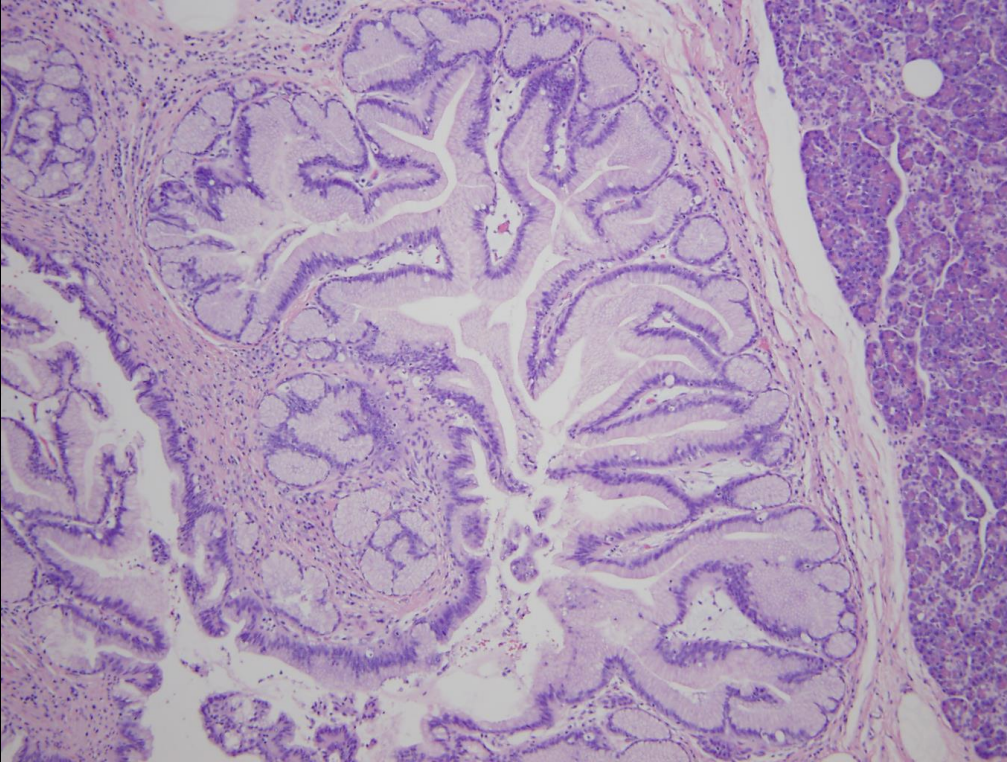


Normal pancreatic parenchyma

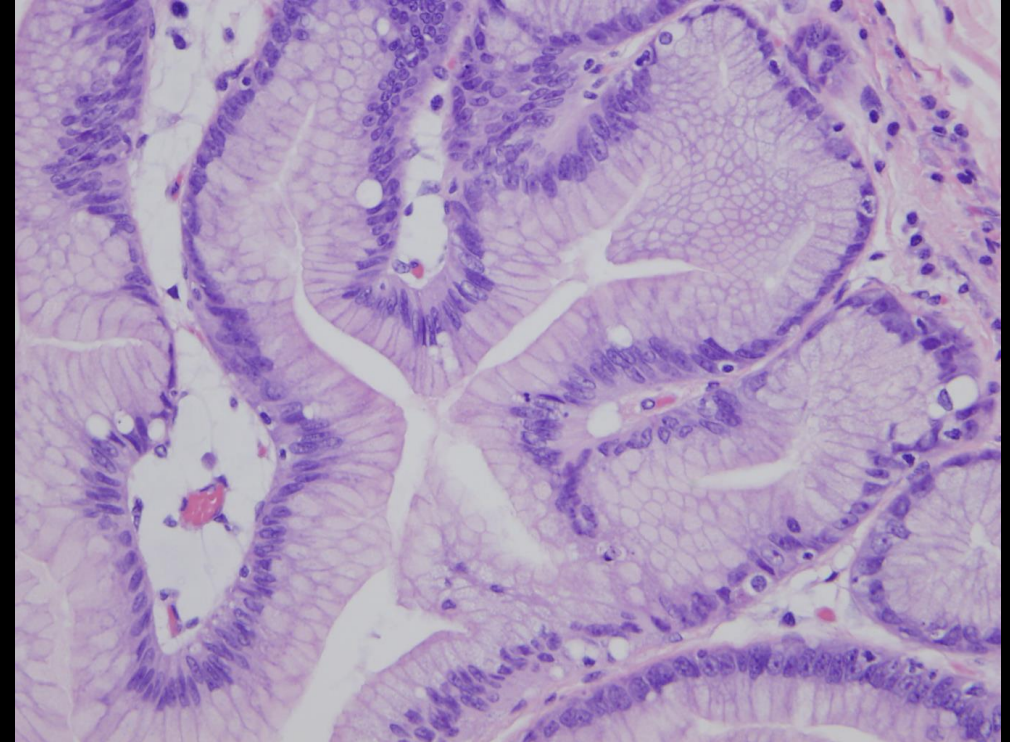
Pancreatic duct enlarged and filled with lesion demonstrating **papillary** architecture

Paucity of acinar cells → **Chronic pancreatitis**

Histopathology



- Varied architecture ranging from flat to papillae
- **No evidence of invasion**



- **Mucous-producing columnar epithelial cells** with varied degrees of dysplasia
- Epithelial cells show variable differentiation and can be subclassified into: intestinal, gastric and pancreaticobiliary subtypes

Final Dx:

Intraductal Papillary Mucinous Neoplasm (IPMN)

low grade → adenoma

mixed type → involving the main duct and branch ducts

Case Discussion: Pancreatic Cysts²

- Pancreatic cysts detected in >2% of patients undergoing abdominal CT or MRI for unrelated reasons (frequency increases with age)
 - Risk of malignancy is low (0.01%) → in subset resected, risk is 15%
- Pancreatic cystic neoplasms - Risk of malignancy:
 - Increased risk if:
 - Cyst size > 3 cm
 - Solid component
 - Dilated pancreatic duct
 - Mod/high risk: mucinous cystic, solid pseudopapillary, some IPMNs (esp. main-duct IPMNs)
 - Very low risk: serous cystic

Case Discussion: IPMN

- Most common pancreatic cystic neoplasm (20-50%)⁴
- Malignant transformation^{5,6}
 - Orderly progression: benign neoplasm → invasive carcinoma (takes 5-6 years)
 - Risk of carcinoma in situ or invasive carcinoma in:
 - Main-duct IPMN = ~60%
 - Branch-duct IPMN = ~5%
- IPMN management:⁷
 - High-grade dysplasia or invasive carcinoma → surgical resection + adjuvant therapy
 - Symptomatic or concerning features → surgical resection
 - May undergo further evaluation with endoscopic ultrasound and FNA if less concerning or not a surgical candidate
 - < 5 mm w/o concerning features or most branch-duct type → surveillance (MRCP or CT in 1-2 years)

References:

1. Megibow, A.J., Baker, M.E., Morgan, D.E., Kamel, I.R., Sahani, D.V., Newman, E., Brugge, W.R., Berland, L.L., and Pandharipande, P.V. (2017). Management of Incidental Pancreatic Cysts: A White Paper of the ACR Incidental Findings Committee. *Journal of the American College of Radiology* 14, 911–923.
2. Khalid, A and McGrath, K. “Pancreatic cystic neoplasms: Clinical manifestations, diagnosis, and management.” *UpToDate*.
3. Chen, F.-M., Ni, J.-M., Zhang, Z.-Y., Zhang, L., Li, B., and Jiang, C.-J. (2016). Presurgical Evaluation of Pancreatic Cancer: A Comprehensive Imaging Comparison of CT Versus MRI. *American Journal of Roentgenology* 206, 526–535.
4. Sheth, SG et al. “Intraductal papillary mucinous neoplasm: pathophysiology and clinical manifestations.” *UpToDate*.
5. Sohn, TA et al. “Intraductal papillary mucinous neoplasms of the pancreas: and updated experience.” *Ann Surg.* 2004;239(6):788
6. Salvia R, et al. “Main-duct intraductal papillary mucinous neoplasms of the pancreas: clinical predictors of malignancy and long-term survival following resection.” *Ann Surg.* 2004;239(5):678.
7. Sheth, SG et al. “Intraductal papillary mucinous neoplasm of the pancreas (IPMN): Evaluation and management.” *UpToDate*.