Pancreatic Lesions

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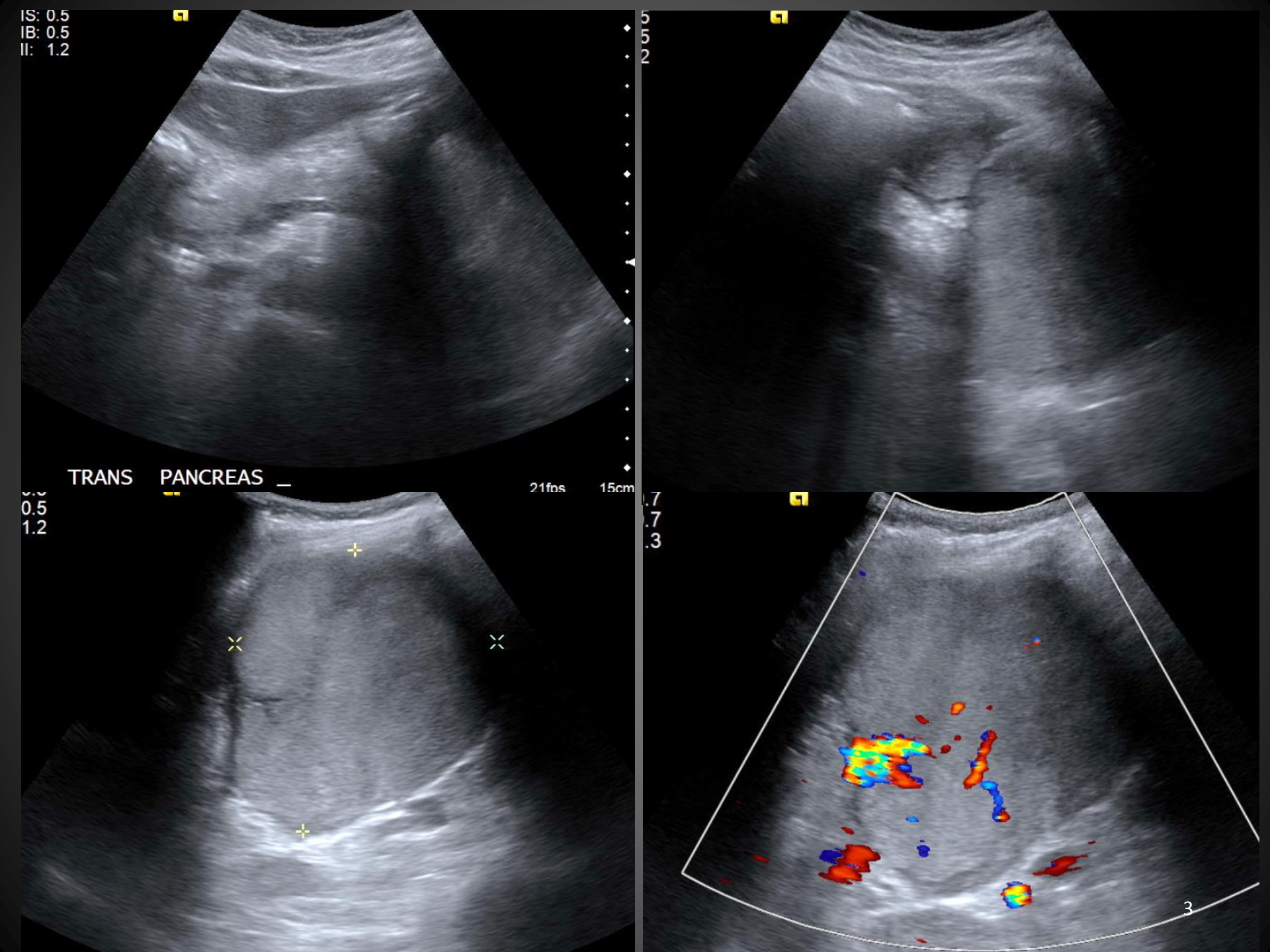
PollEv.com/Bdabiri525

75 year old female with abdominal pain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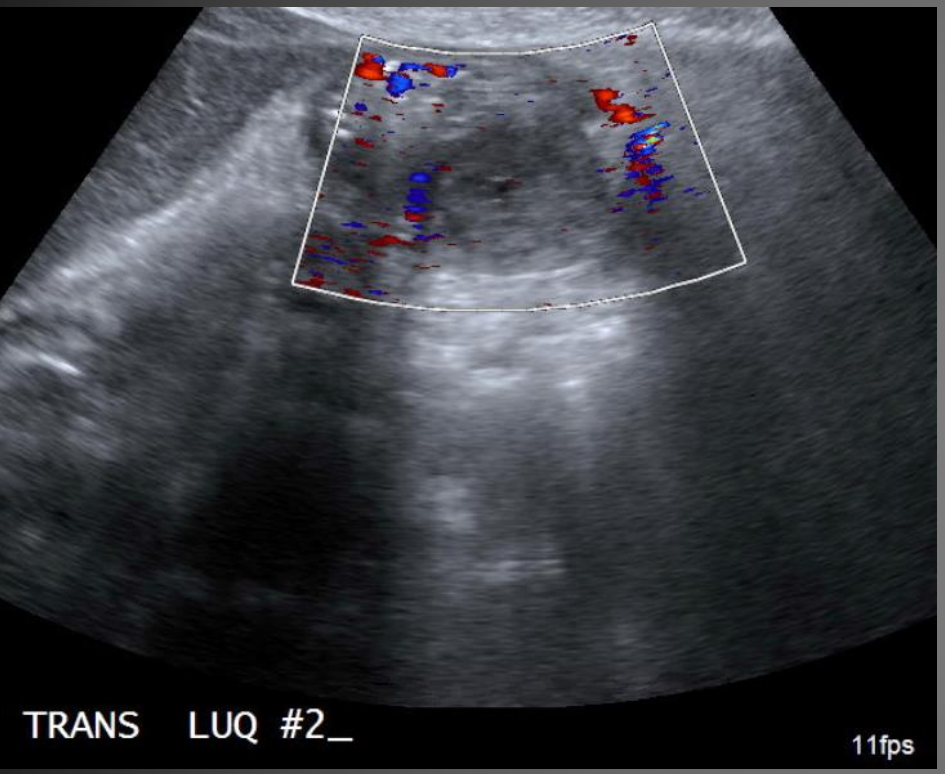
15cm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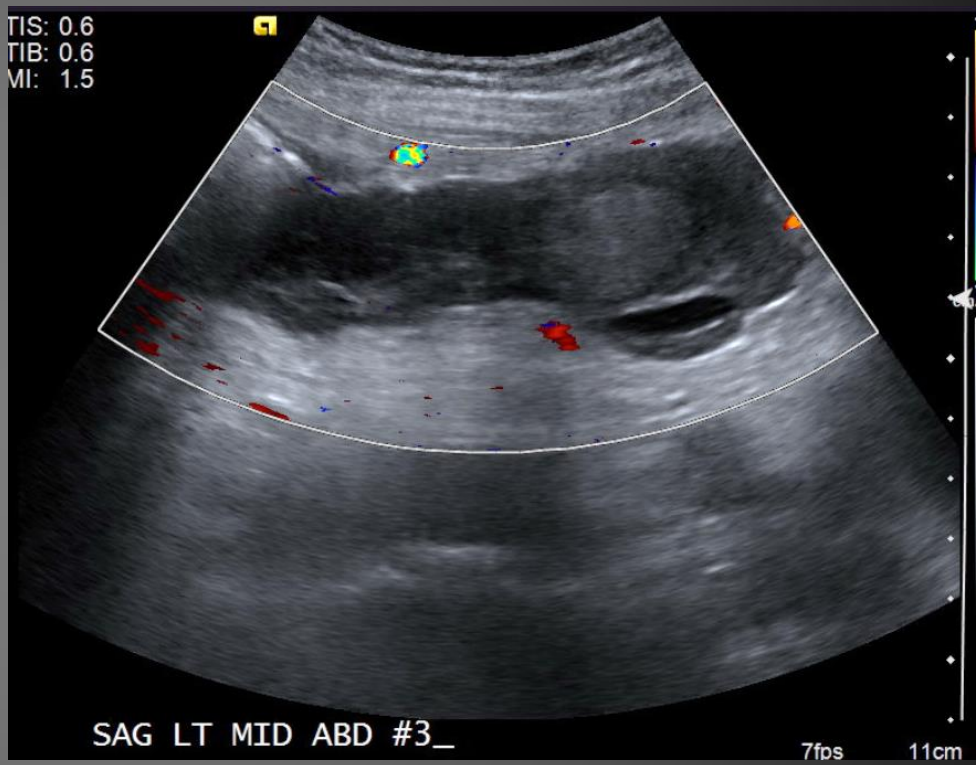
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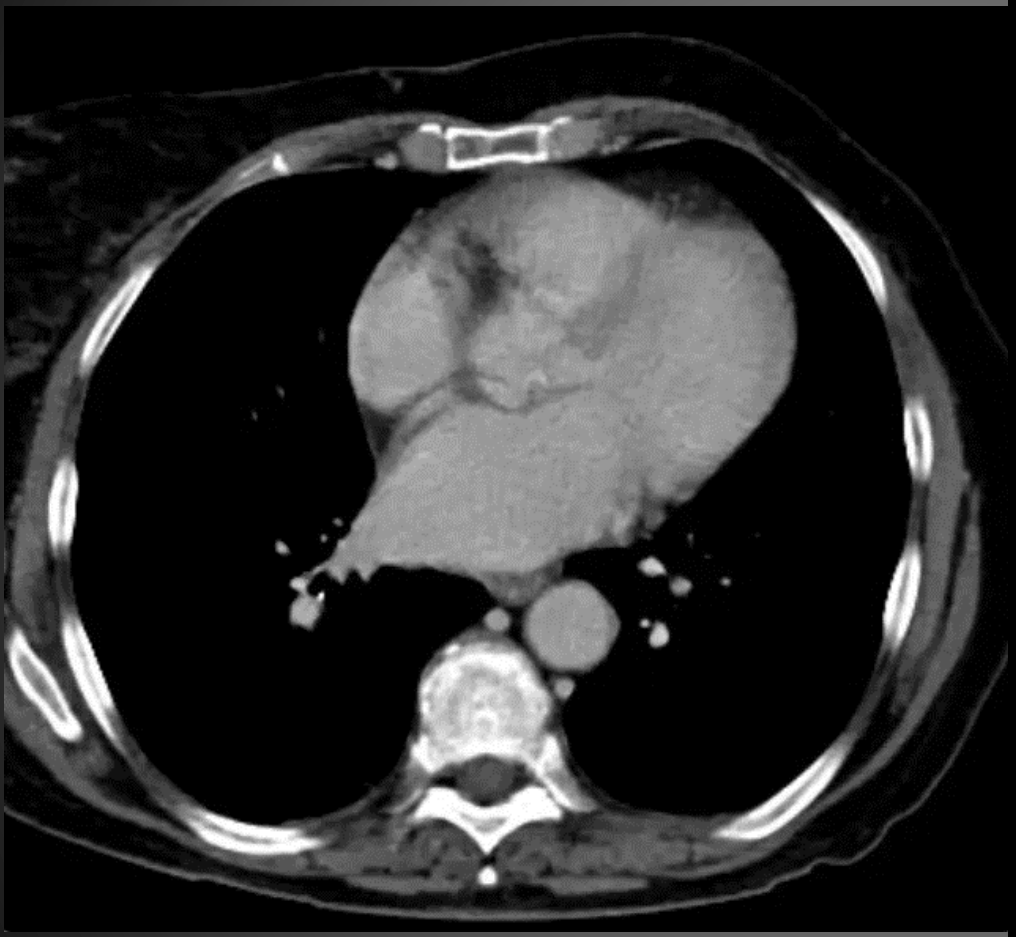

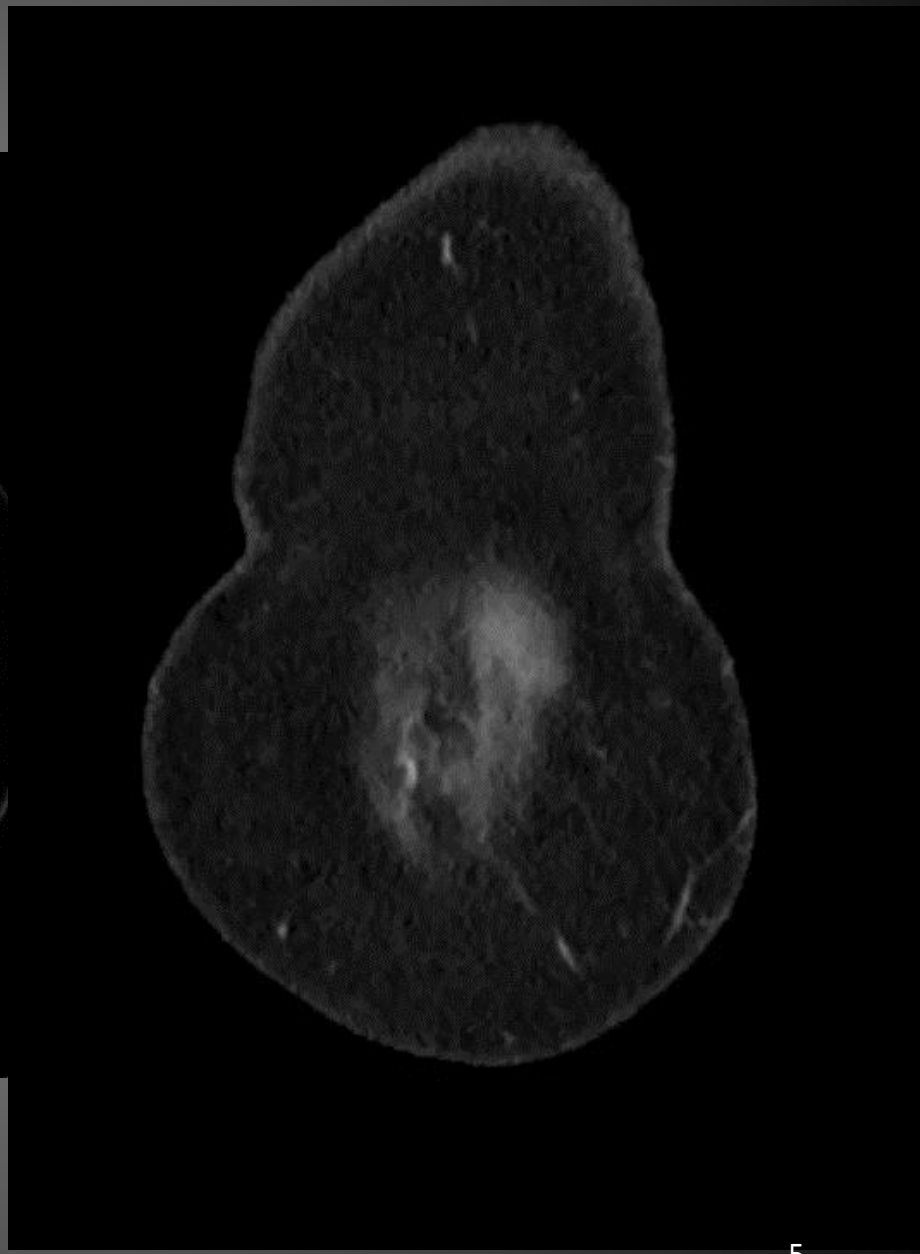

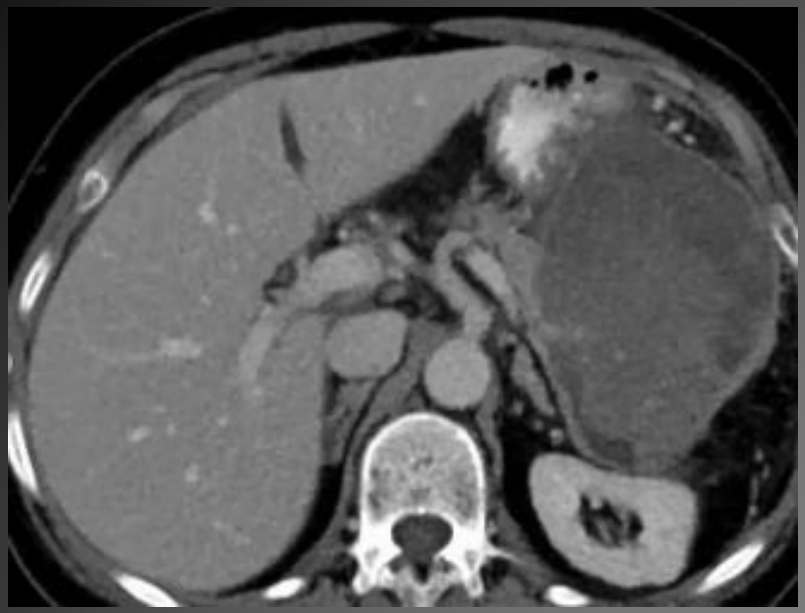

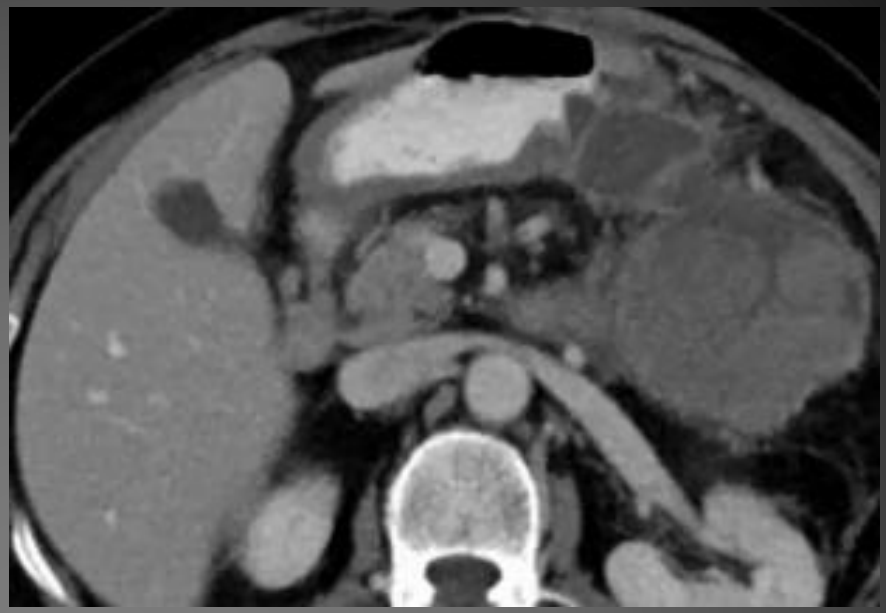

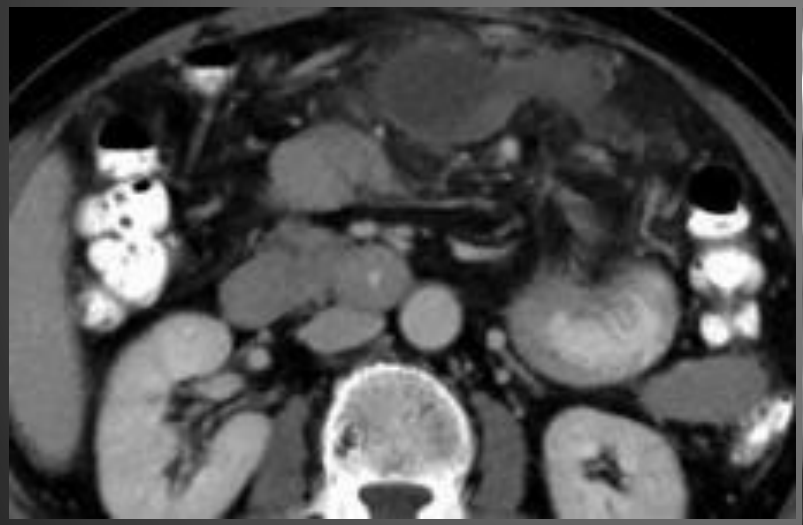

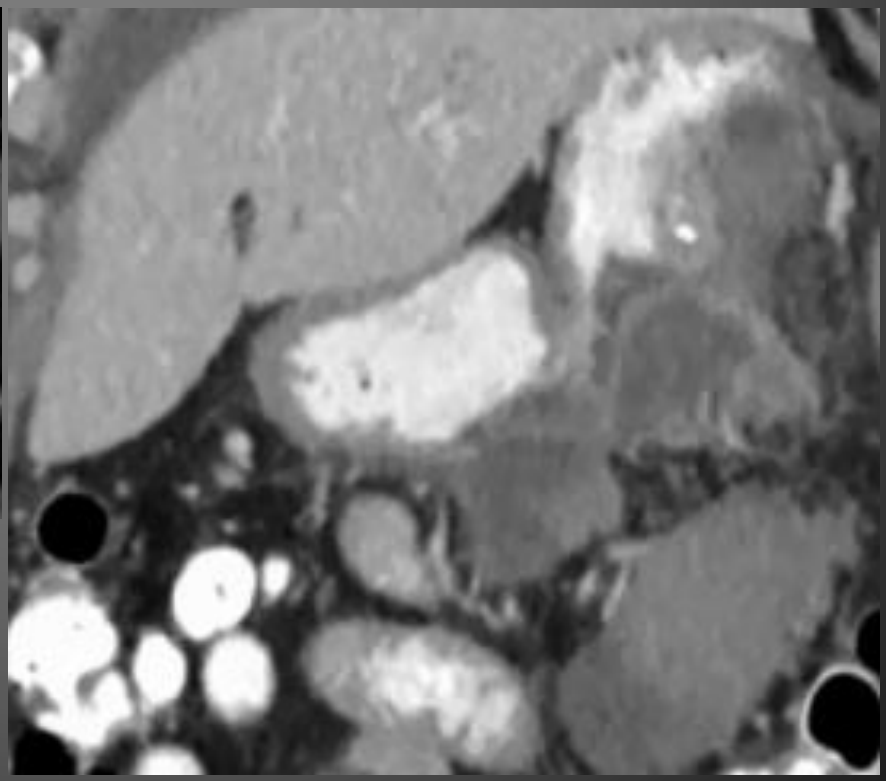

BS-15-20841:

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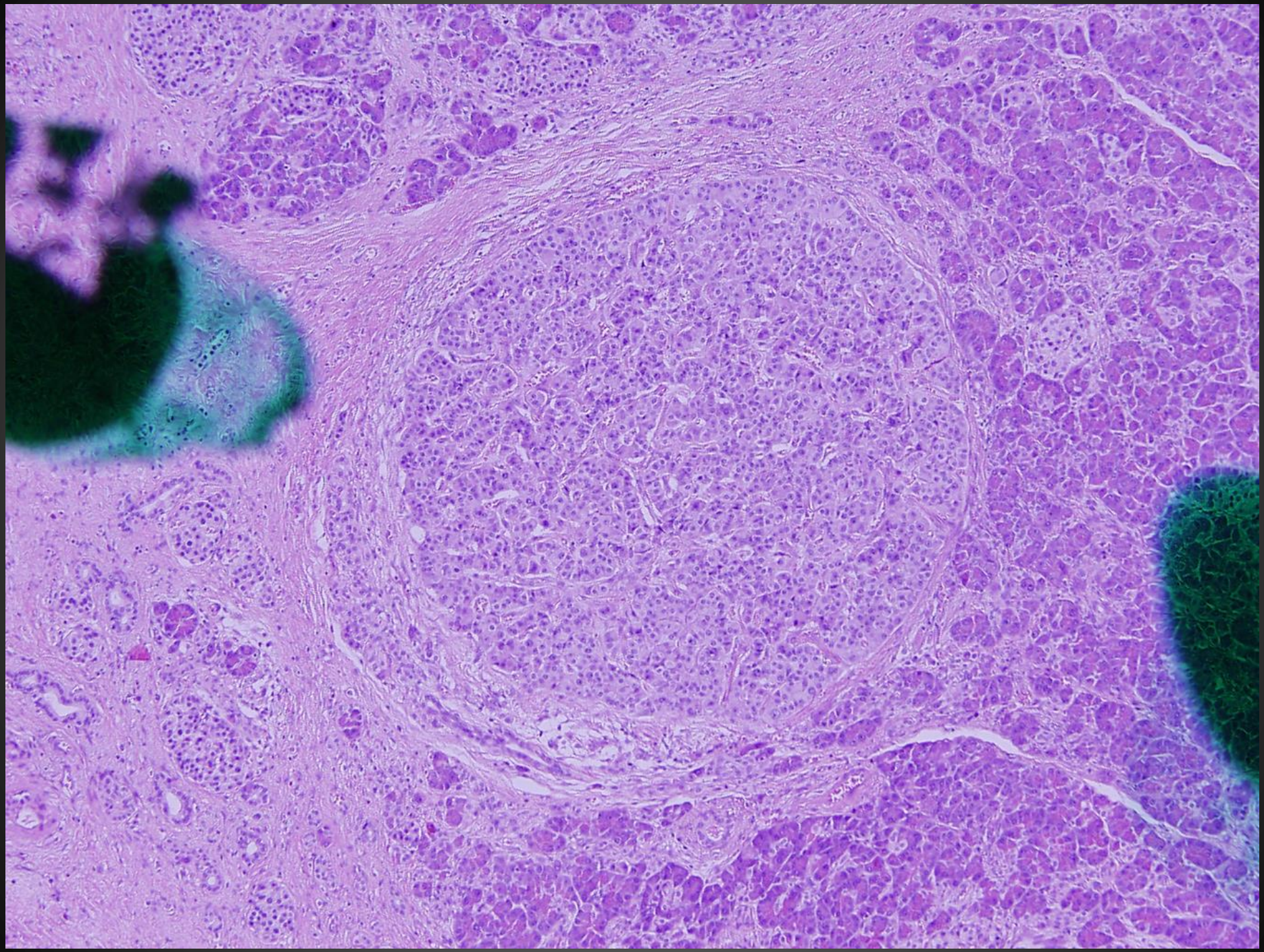
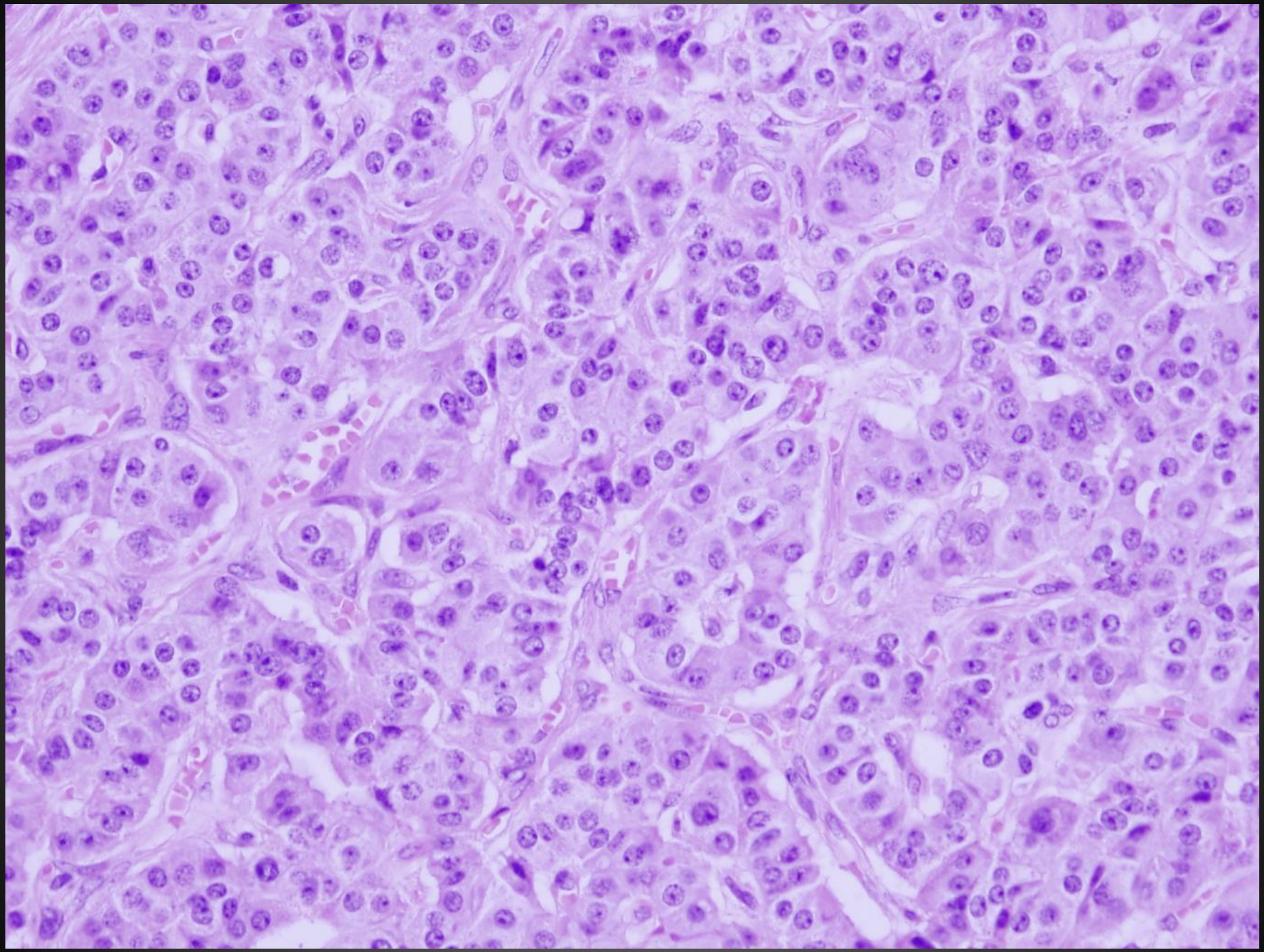
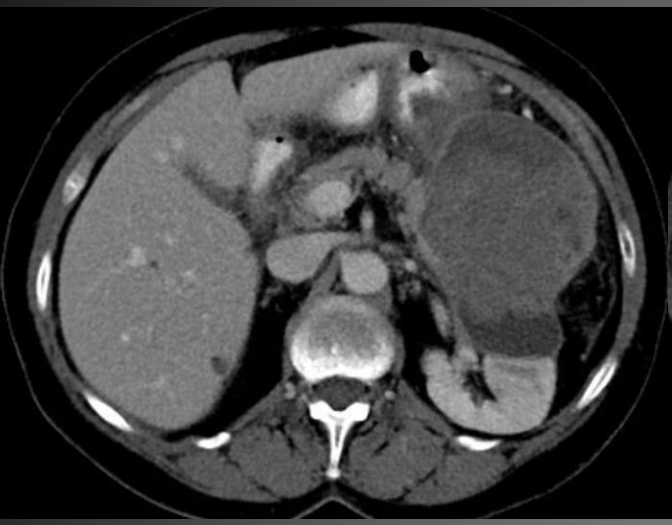
Acinar pancreatic carcinoma

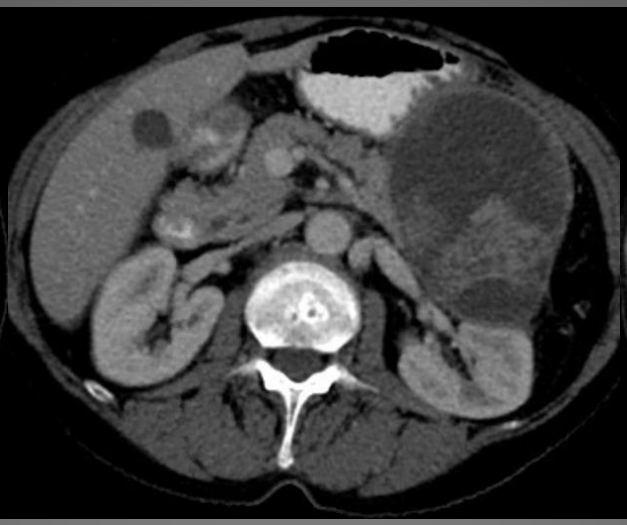




Treatment Course



5/2014



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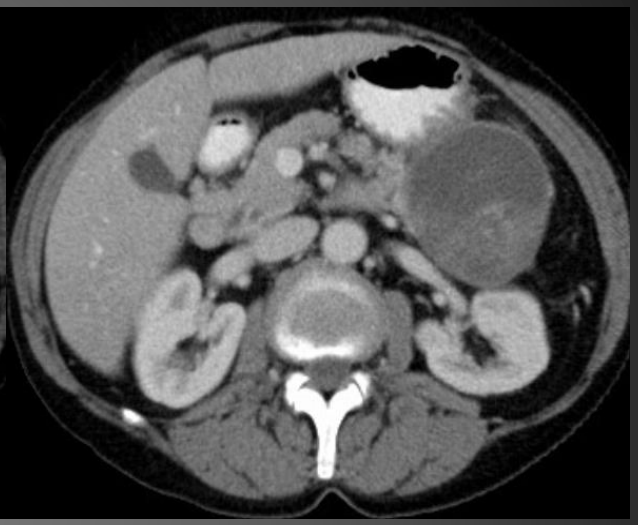

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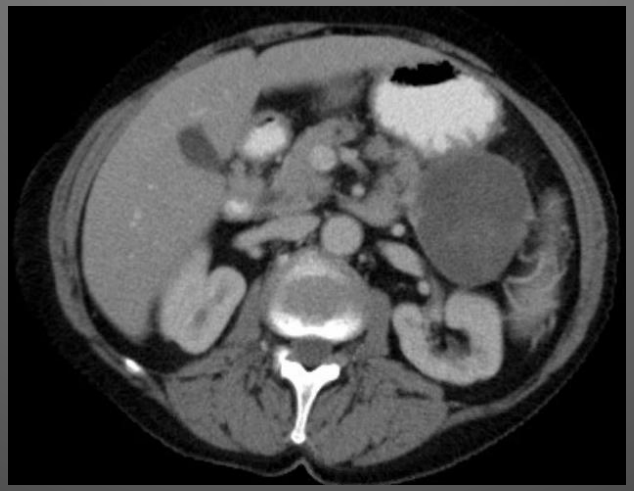
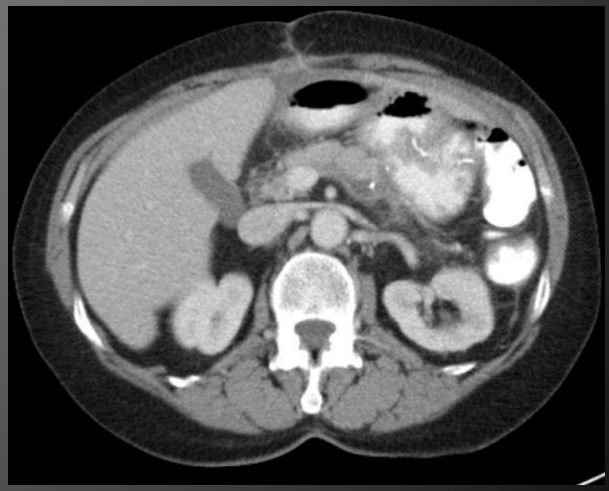
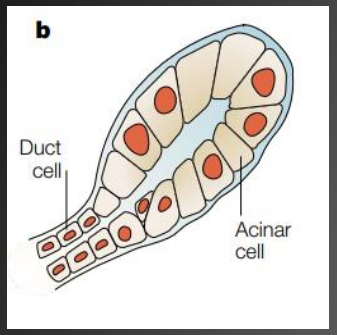


1/2015



5/2015 s/p Resection

Acinar Cell Carcinoma



Nature Reviews, 2002

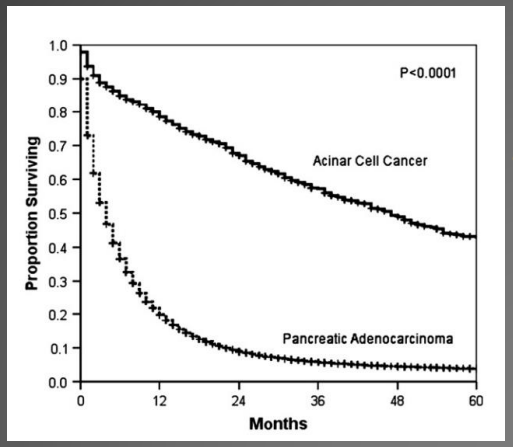


Table 1. Baseline Patient Characteristics

No. of patients	39
Age, years	
Median	60
Range	15-87
Sex, male/female	31/8
Race, white/nonwhite	32/7
Size of lesion, >10 cm/<10 cm*	9/21
Metastases at presentation, n (%)	
Yes	19 (49)
No	20 (51)
Tumor location,† n (%)	
Head	17 (53)
Body and/or tail	15 (47)

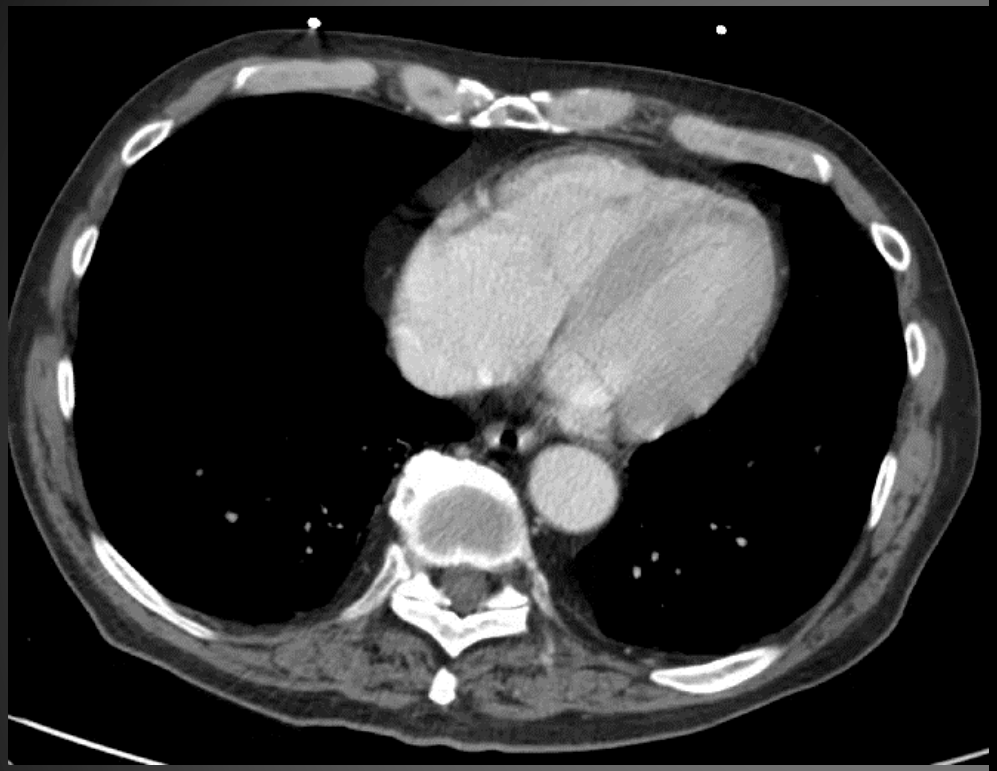
- **Origin**
  - Acinar cells makeup the majority of the pancreatic parenchyma but represent 1% of pancreatic neoplasms
- **Epidemiology and Survival**
  - More common in men
  - 5th-7th Decade
  - Active tumors secrete pancreatic enzymes that can cause systemic fat necrosis and arthritis – jaundice is rare
  - Better survival than pancreatic adenocarcinoma but worse than pancreatic neuroendocrine tumor
- **CT**
  - Large (avg 6.0 x 5.3 cm), circumscribed mass with solid and cystic components and large areas of necrosis; may be found throughout the pancreas
  - Capsule can enhance and tumor is locally aggressive (typically no lymphadenopathy)
  - No ductal dilation
- **MR**
  - Depending on degree of cystic and necrotic components, mixed T1 and T2 signal intensity
  - Homogenous enhancement that is less than surrounding pancreatic parenchyma

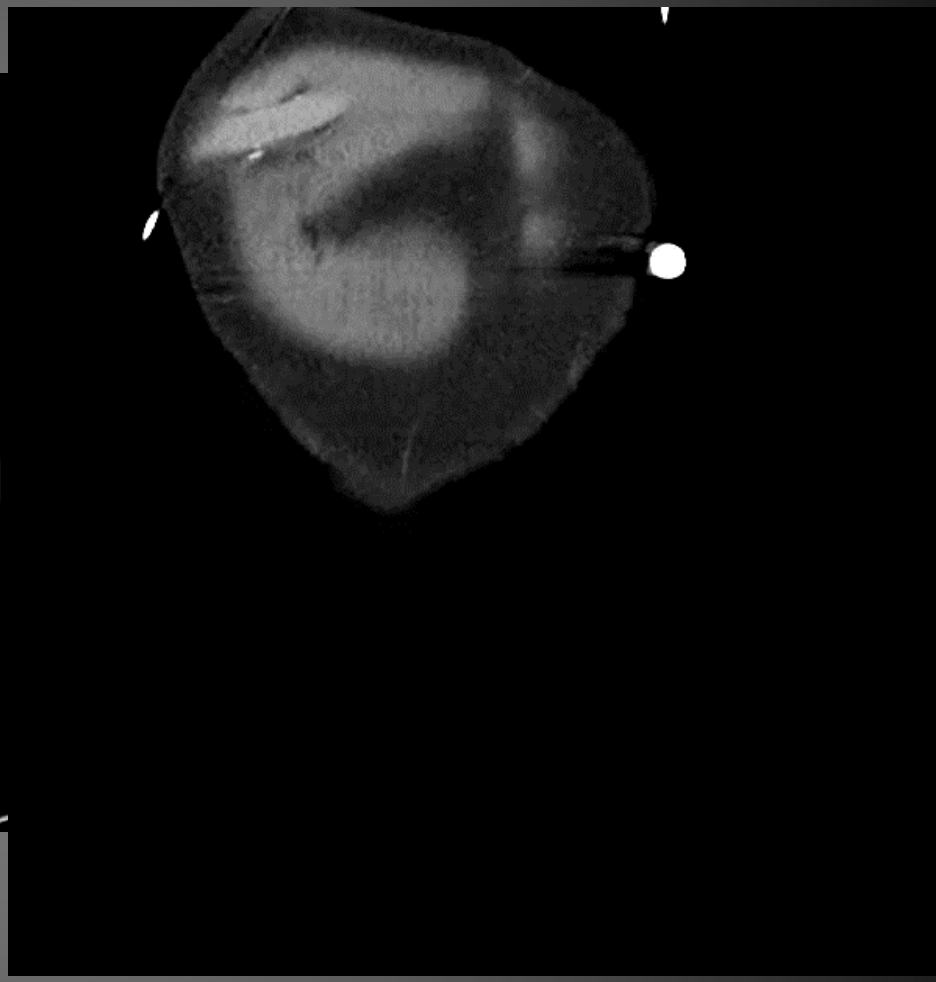
Tatli et al, AJR 2005
Holen et al, JCO, 2002
Wisnoski et al, Surgery, 2008

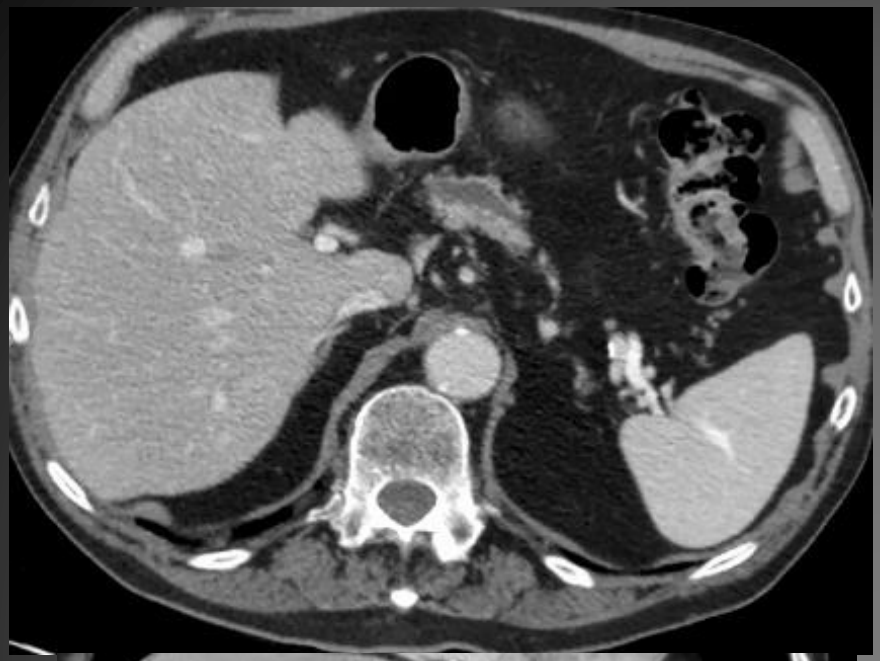
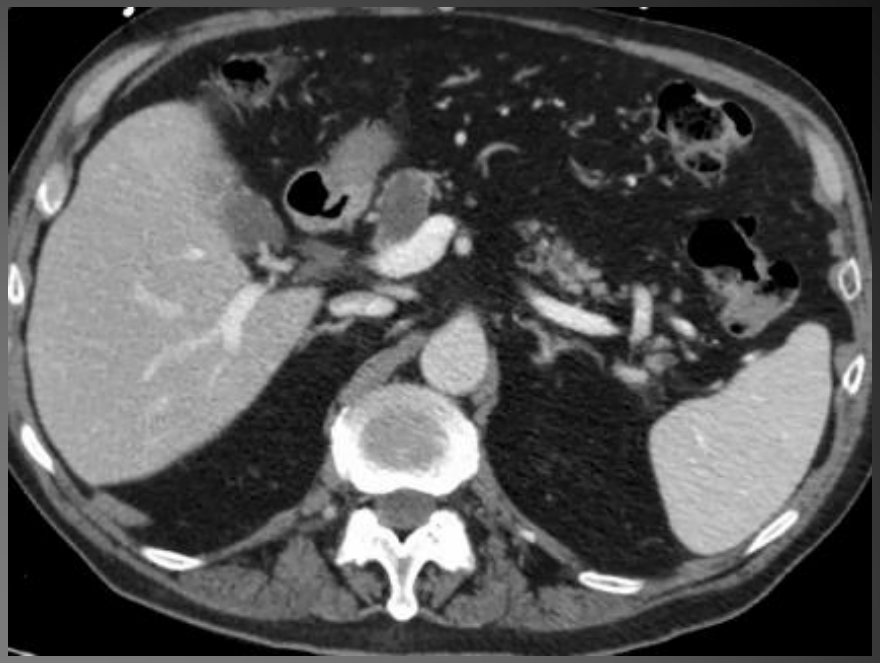
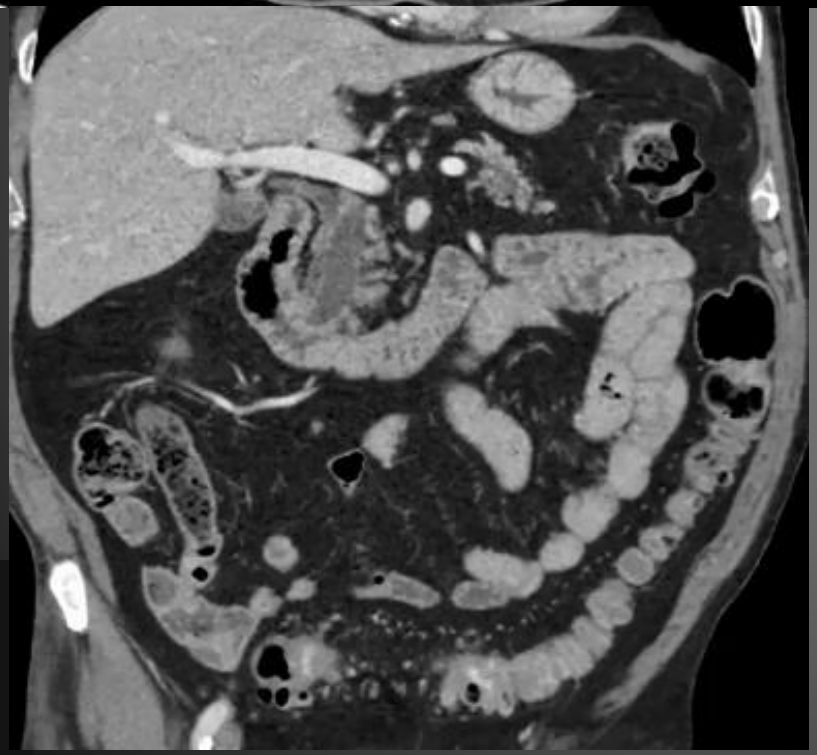
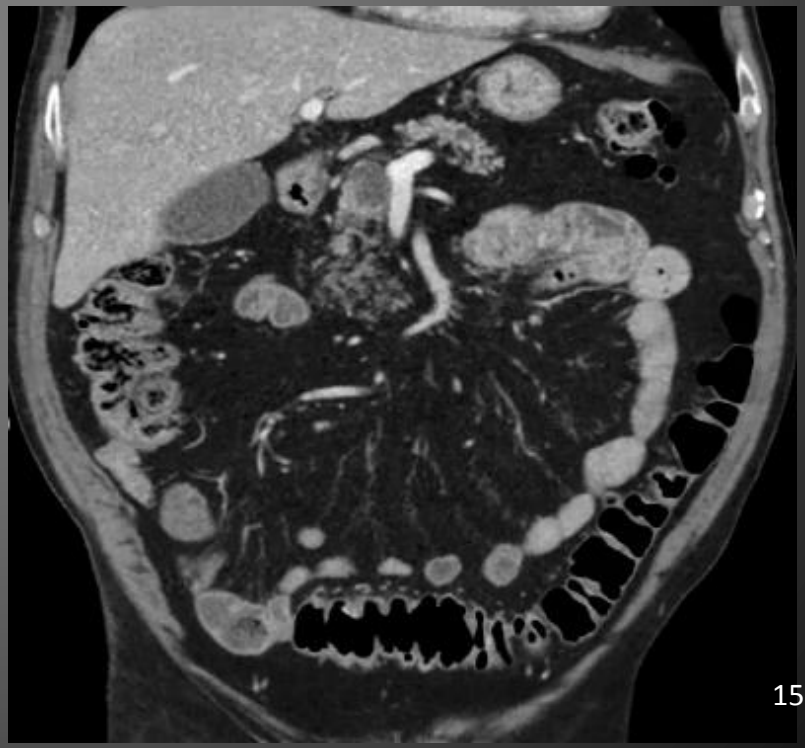
Acinar Cell Carcinoma

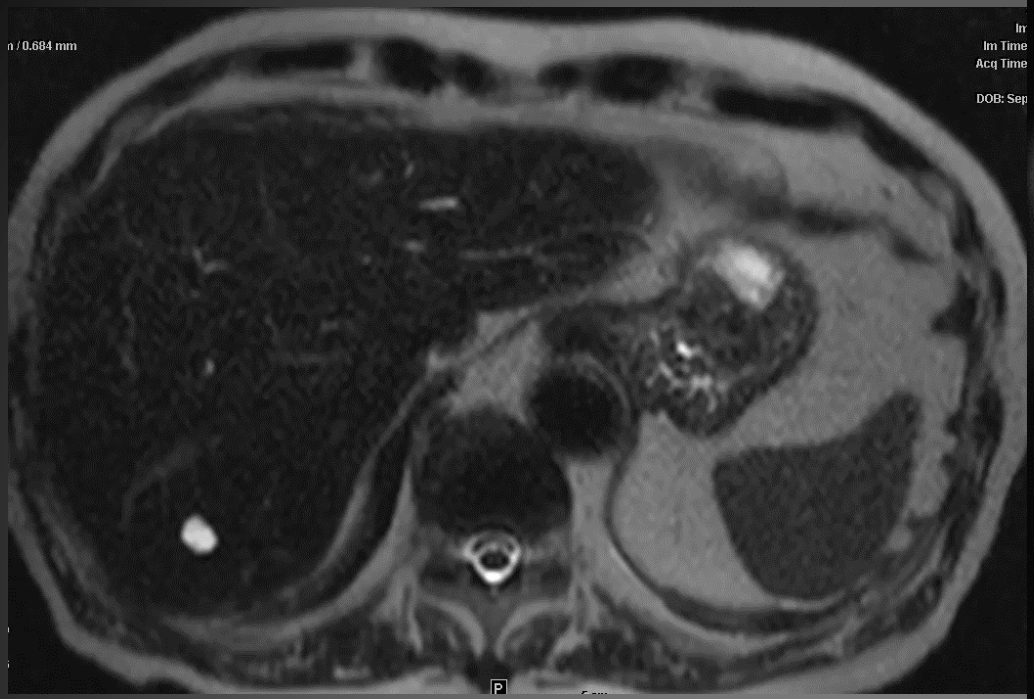
- **Differential**
  - Pancreatic adenocarcinoma – typically smaller and without cystic component. Less locally aggressive
  - Neuroendocrine tumor – more vascular involvement and increased enhancement
  - Solid pseudopapillary tumor – similar appearance but more often in young women. Hemorrhage more common.
  - Pancreatoblastoma – similar appearance but more often in infants and children
  - Mucinous Cystadenoma: Not locally aggressive. More cystic component. Typically in body/tail. Occur in middle-aged women.

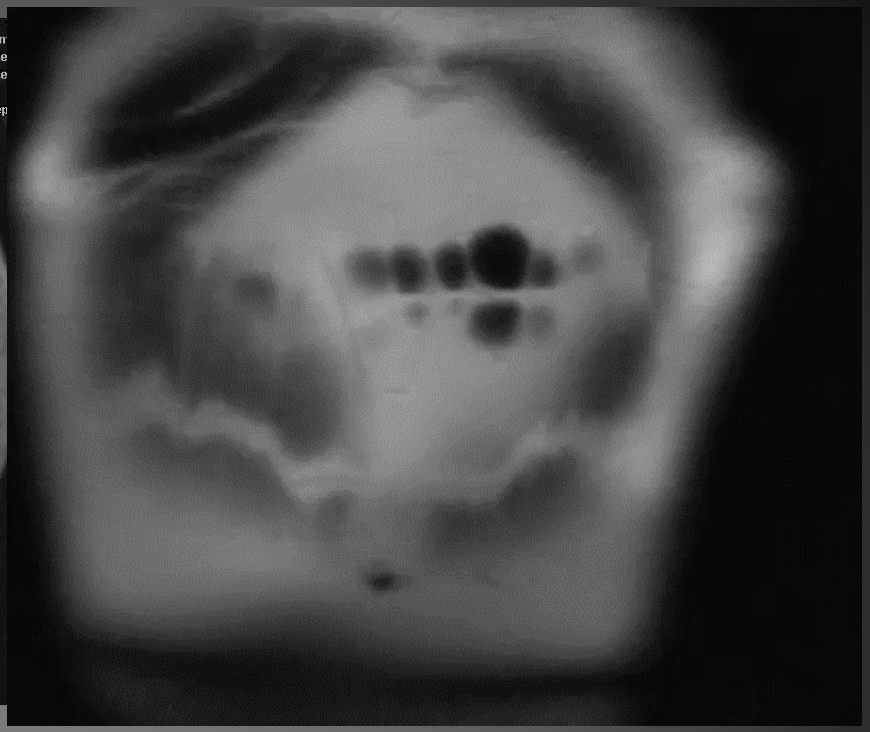
75 year old male with bright red blood per rectum

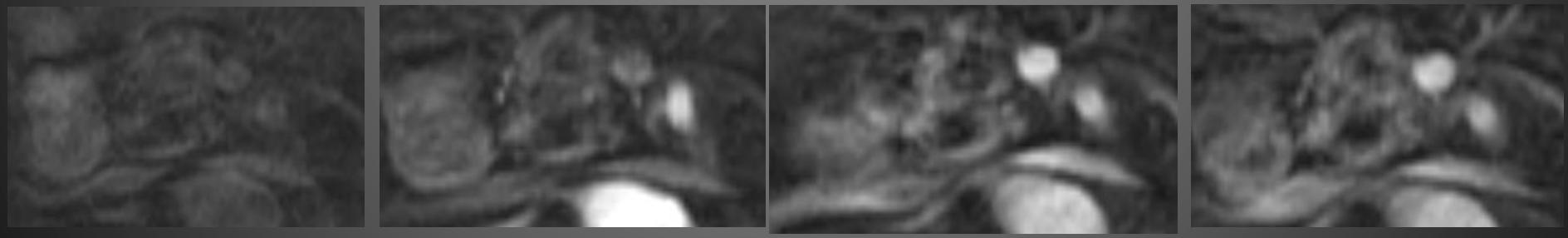




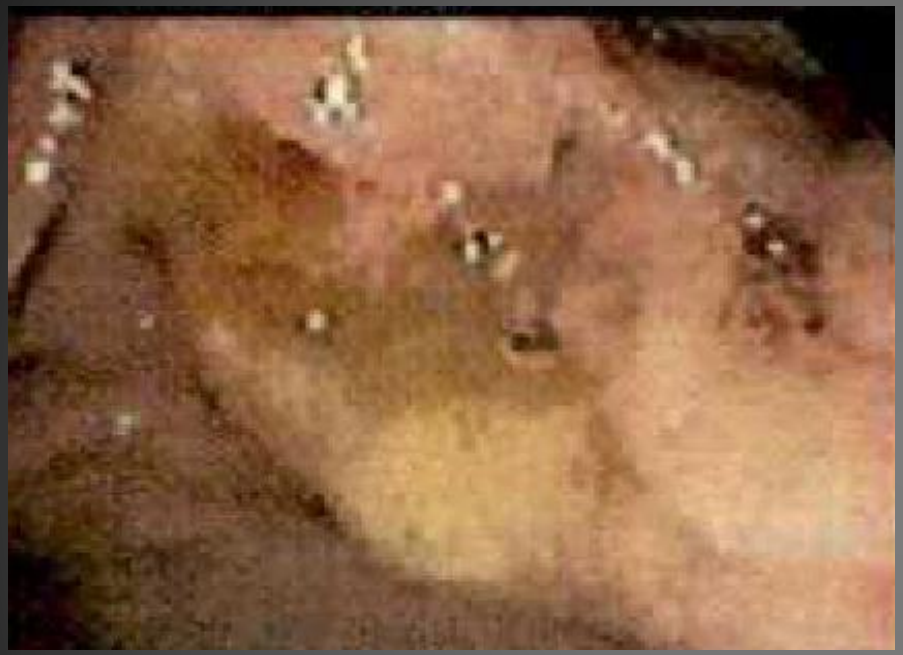


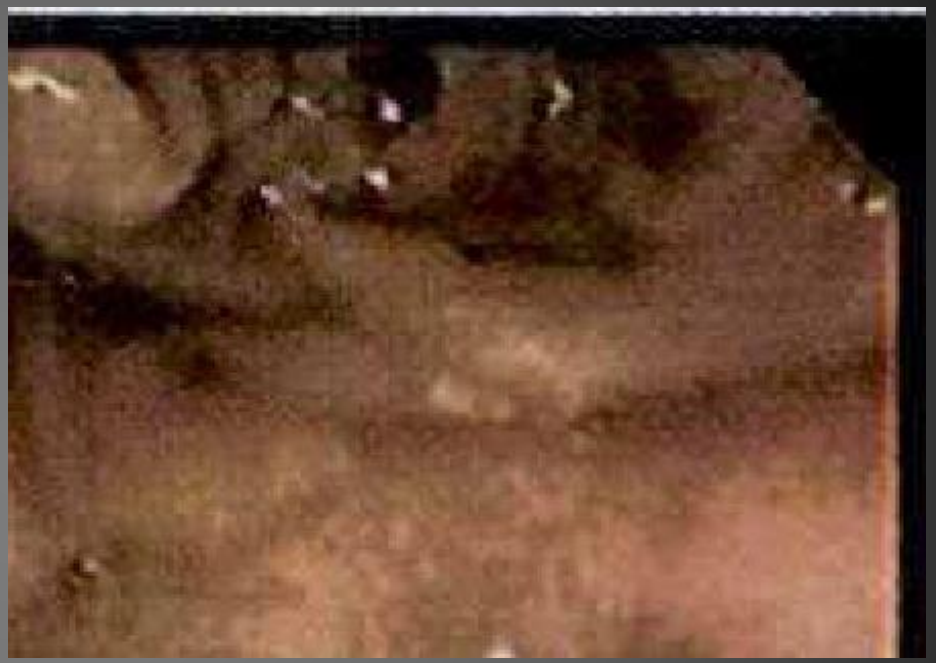


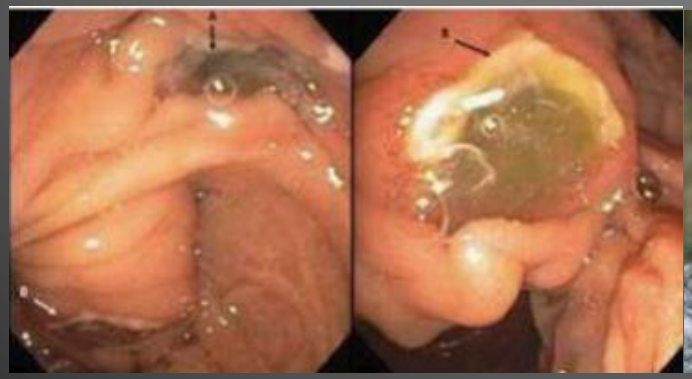


T1 FS Pre

Endoscopy







SlideShare, Atit Ghoda

BS-17-33135

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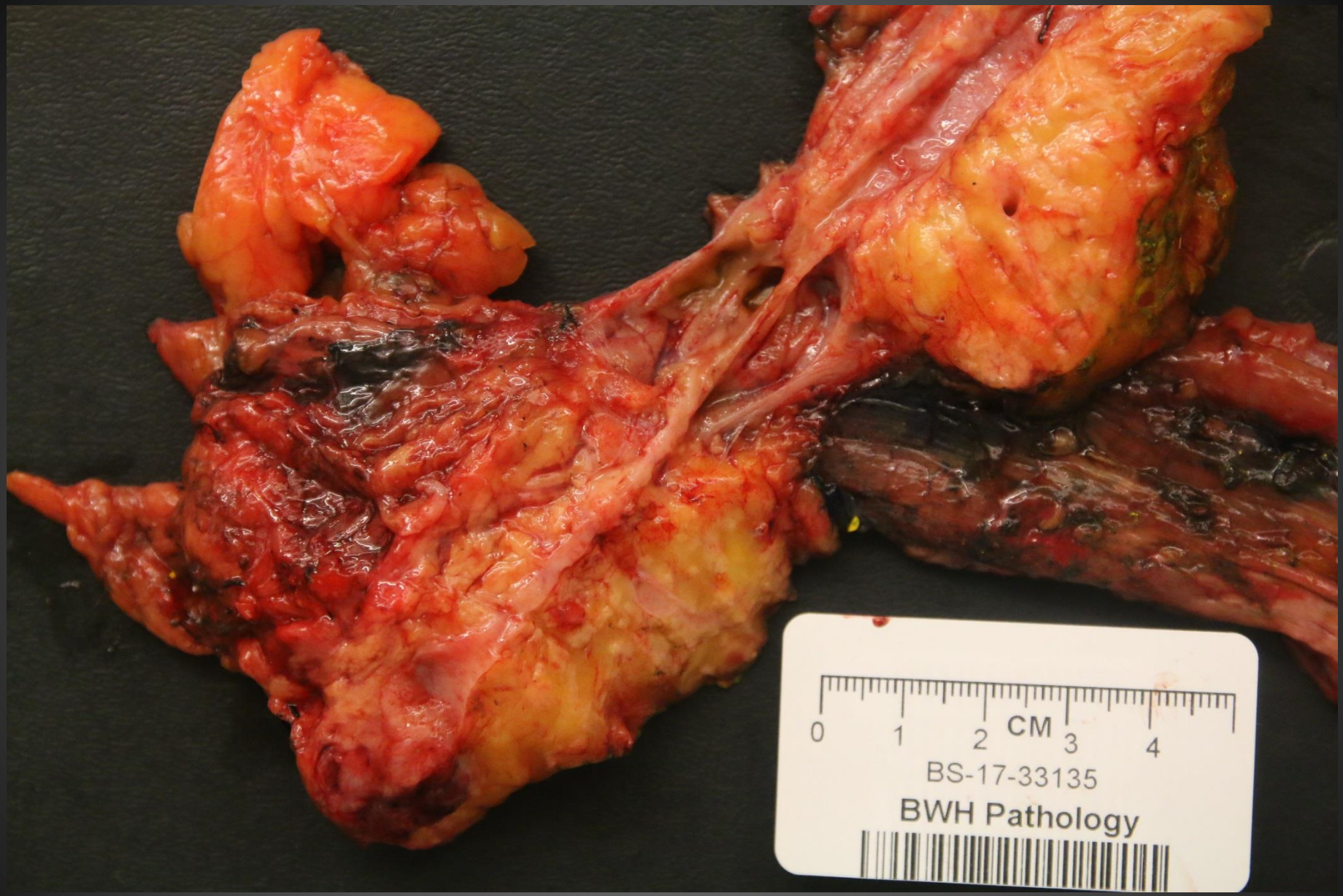
INTRADUCTAL PAPILLARY MUCINOUS NEOPLASM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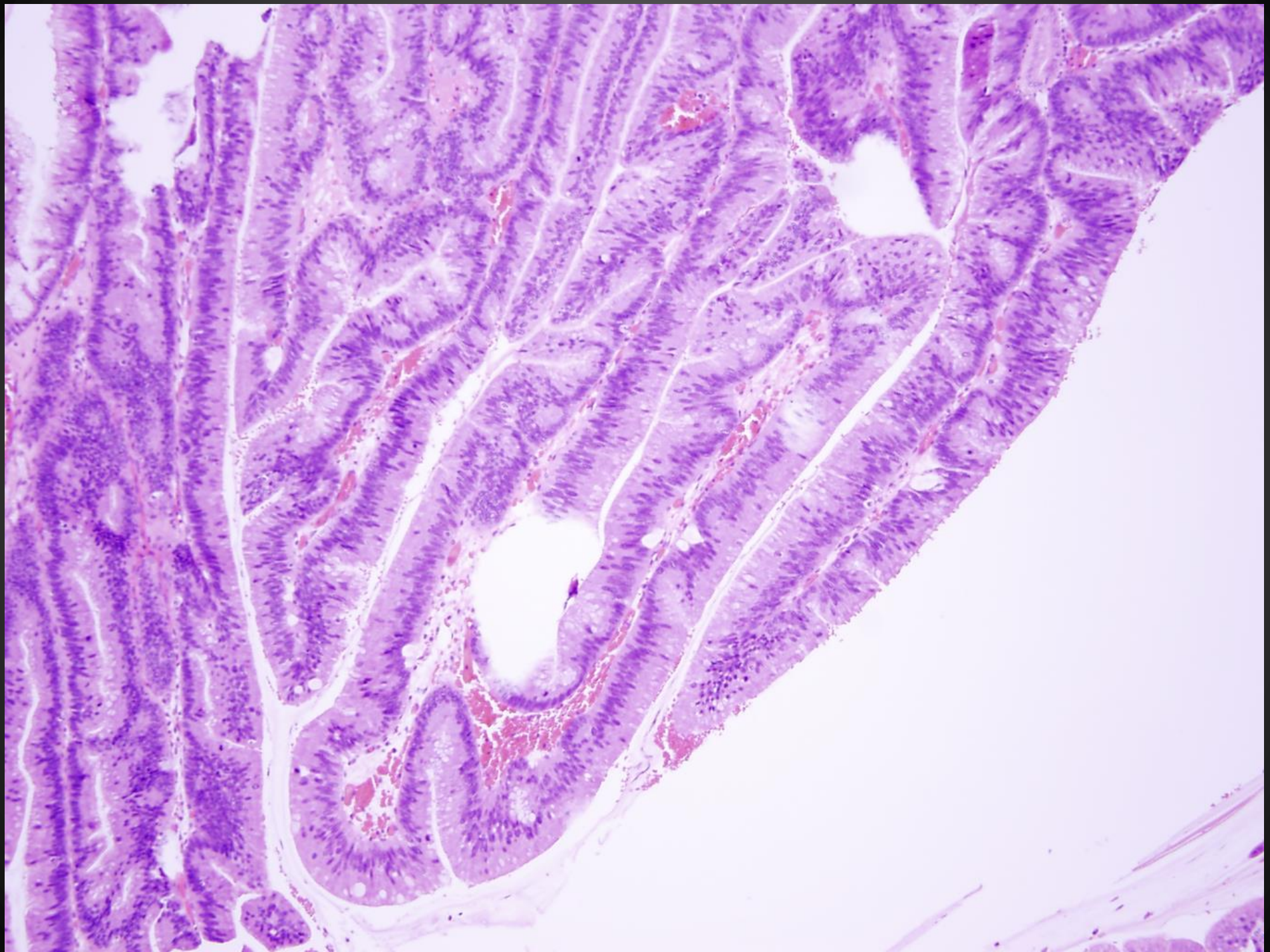
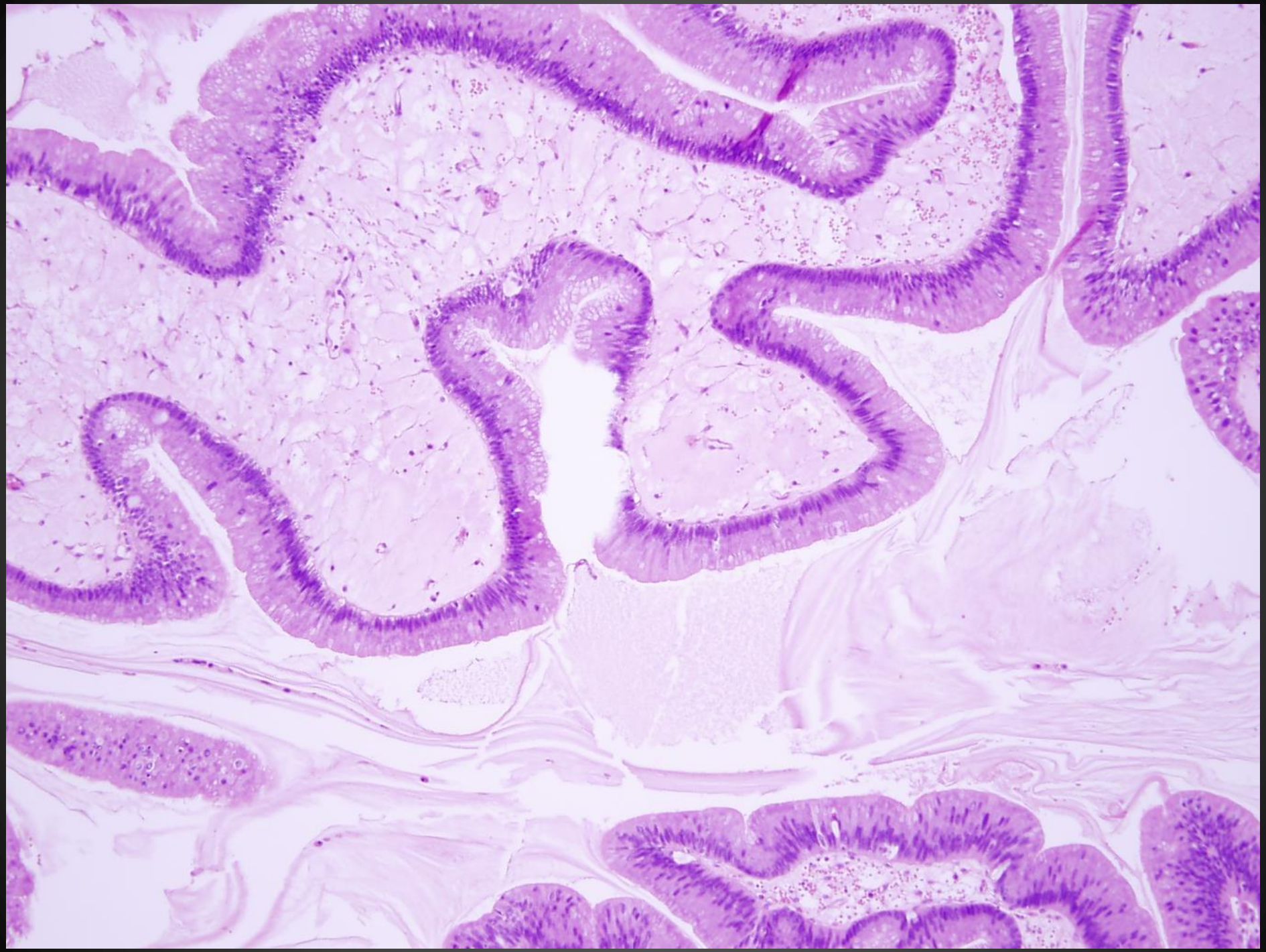
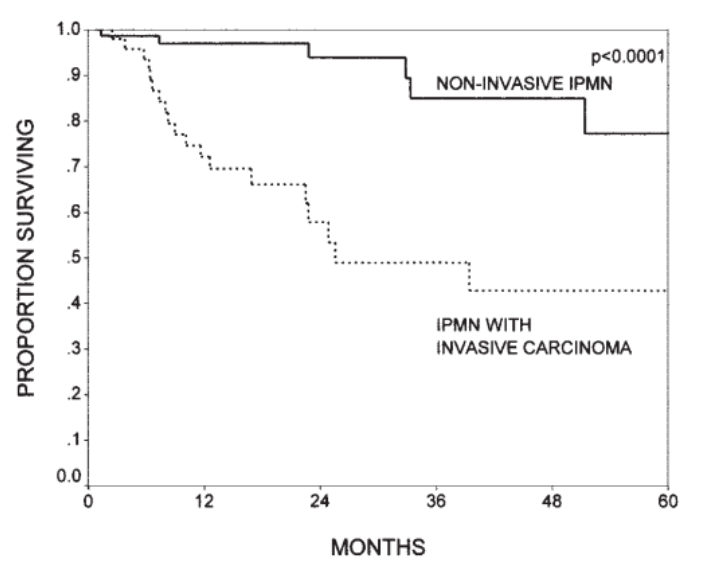
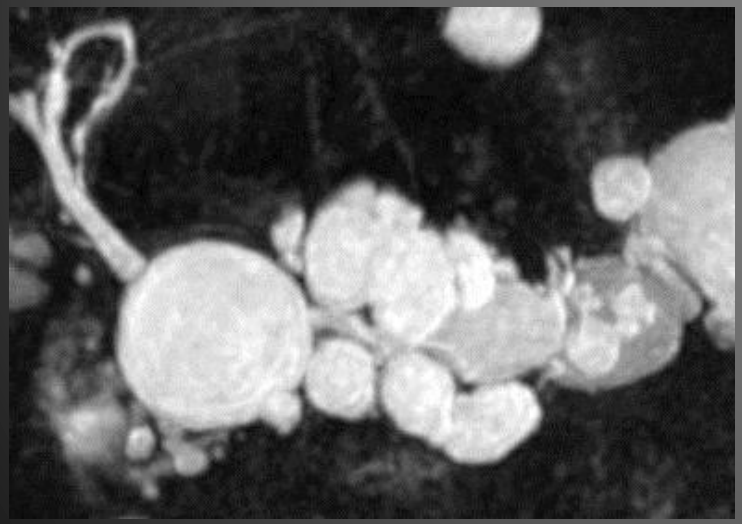
BS-17-33135
BWH Pathology





Intraductal Papillary Mucinous Neoplasm





- **Origin**
  - Epithelial cells within the main pancreatic duct or side branches
- **Epidemiology and Survival**
  - Male predominance in 6-7th decade
  - Incidental cysts are seen in up to 3% undergoing CT
- **CT**
  - Branch duct: cluster of small cysts with lobulated margins. More often in the uncinate process. Main duct is normal.
  - Main Duct – focal or segmental dilation of the main duct. This can lead to atrophy of the pancreas
  - Mixed type
  - Worrisome features: wall thickening with enhancement; >1cm connection to main duct for branch type; cyst> 3cm; main duct >6mm; nodules>3mm (consider mucin globule)
- **MR**
  - Side branch hyperintense on T2 and hypointense on T1
  - "grape-like" cluster of cysts
  - Better to assess for communication with main duct
  - Worrisome if nodules are enhancing
  - Some evidence for restriction of diffusion in malignant IPMNs

Pedrosa et al, WJGS, 2010
Kawamoto et al, Radiographics 2005
Oagawa et al, Radiology, 2008
Sohn et al, Anals of Surgery, 2004

Intraductal Papillary Mucinous Neoplasm

A: MPD

CT Finding	Benign Tumors ($n = 26$)*	Malignant Tumors ($n = 35$)†	*P* Value‡
Maximum diameter ≥ 6.0 mm	9 (35)	32 (91)	<.001§
Mural nodule ≥ 5.4 mm	1 (4)	10 (29)	.034
Presence of septum	1 (4)	5 (14)	.206

B: Cystic Lesion Originating from Branch Duct

CT Finding	Benign Tumors ($n = 22$)*	Malignant Tumors ($n = 27$)†	*P* Value‡
Multilocular type	20 (91)	26 (96)	.813
Overall size ≥ 29.1 mm	11 (50)	20 (74)	.254
Mural nodule ≥ 3.6 mm	9 (41)	23 (85)	.018
Presence of wall thickness	13 (59)	22 (81)	.317

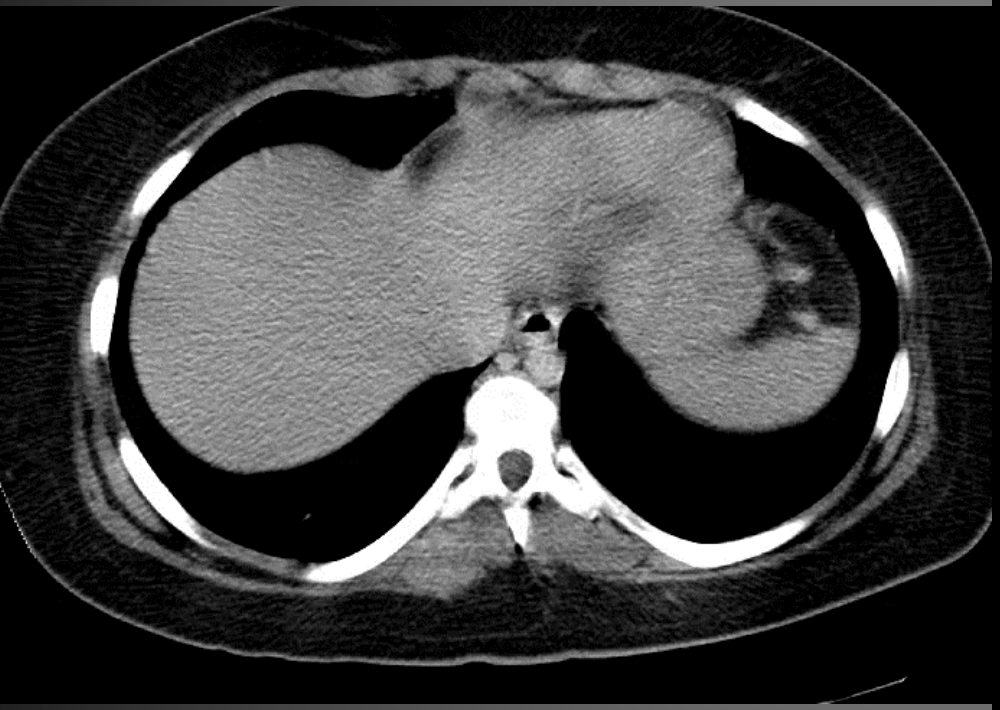
→ ***There is considerable overlap between benign and malignant features***

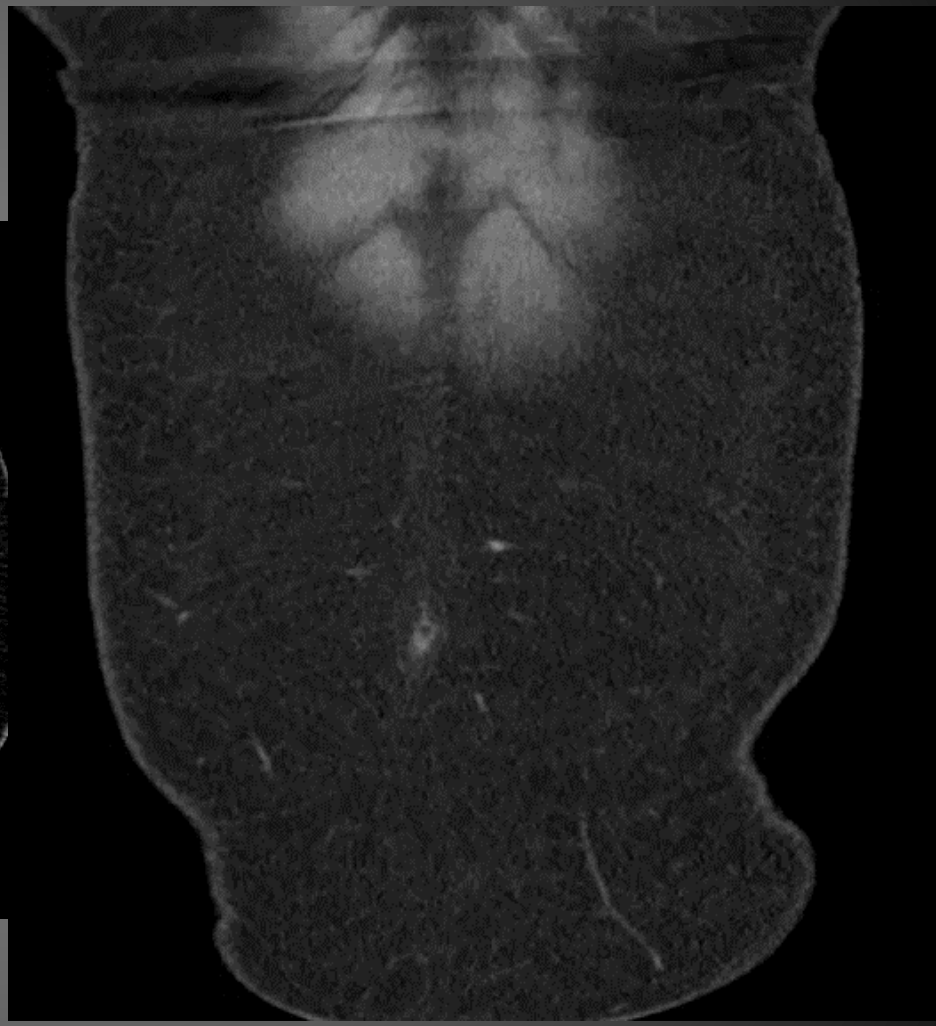
Pedrosa et al, WJGS, 2010
Kawamoto et al, Radiographics 2005
Oagawa et al, Radiology, 2008
Sohn et al, Anals of Surgery, 2004

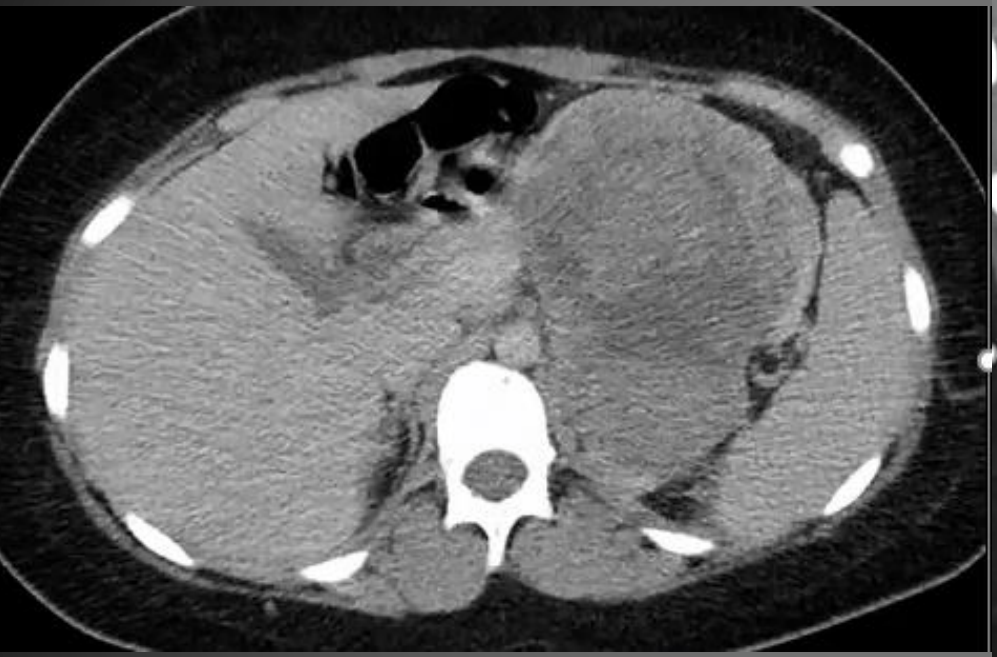
Intraductal Papillary Mucinous Neoplasm

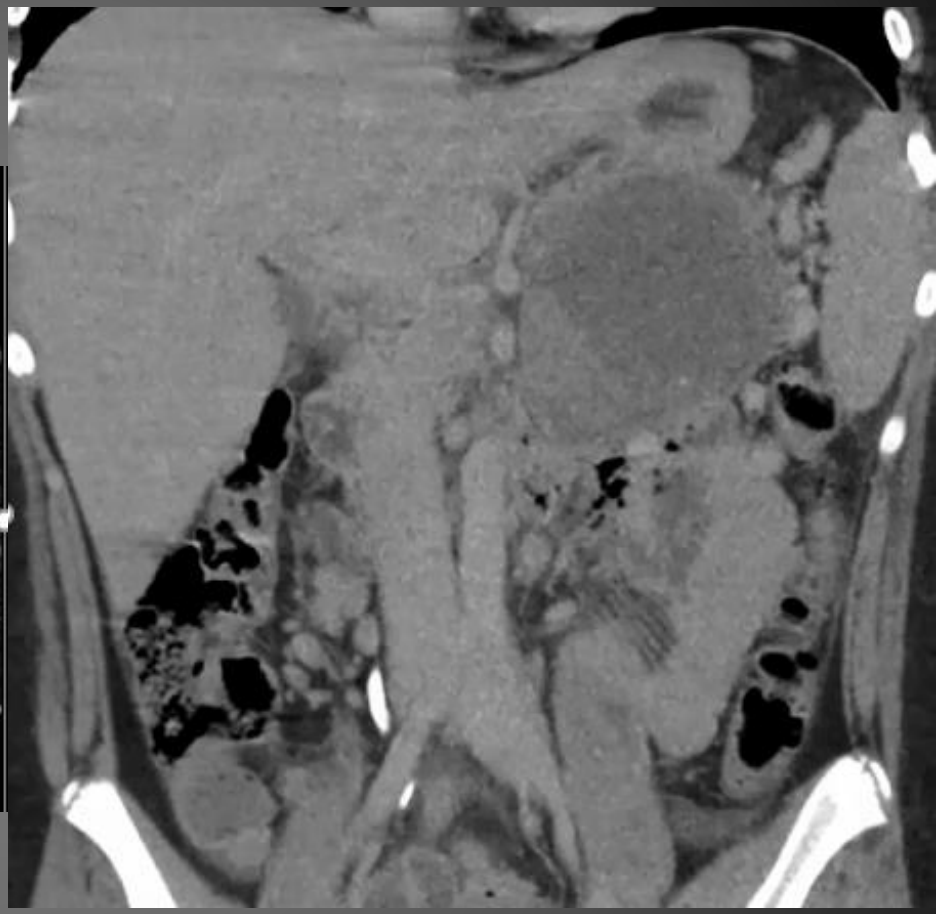
- **Differential**
  - Chronic Pancreatitis: will typically demonstrate more calcifications and parenchymal atrophy
  - Pancreatic Adenocarcinoma: Ductal dilatation will have more abrupt cutoff, however, a small lesion may be identical with IPMN
  - Pseudocyst: Typically no communication with main duct and there will be history of pancreatitis
  - Mucinous Cystadenoma: Cyst will have a thicker wall and will be in body/tail. Patients are typically middle-aged women. Will also lack main duct communication
  - Serous Cystadenoma: microcysts will be more sponge-like. No communication with main duct

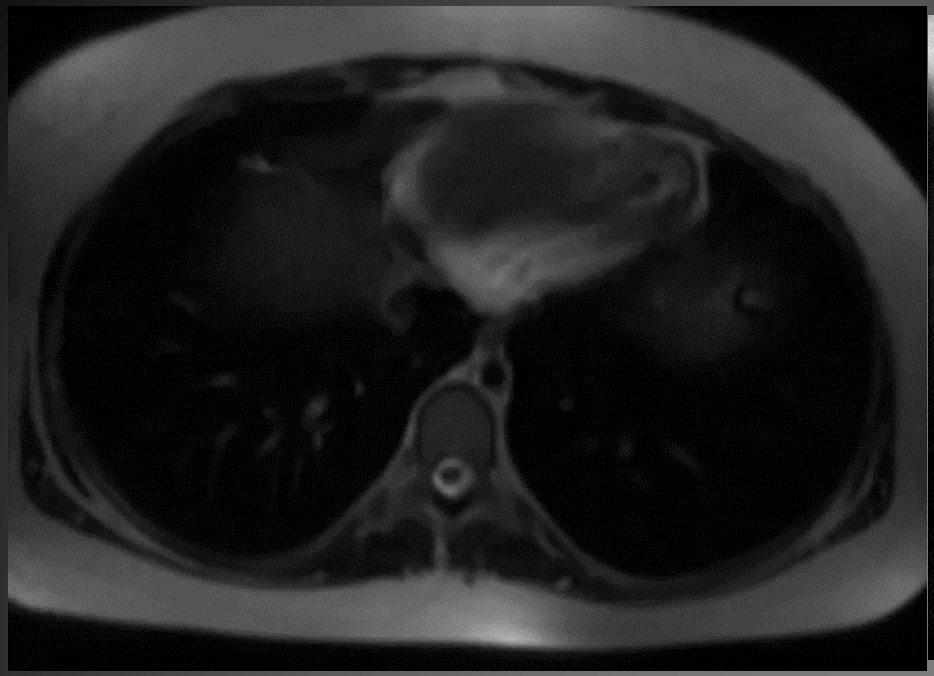
14 year old female with abdominal pain

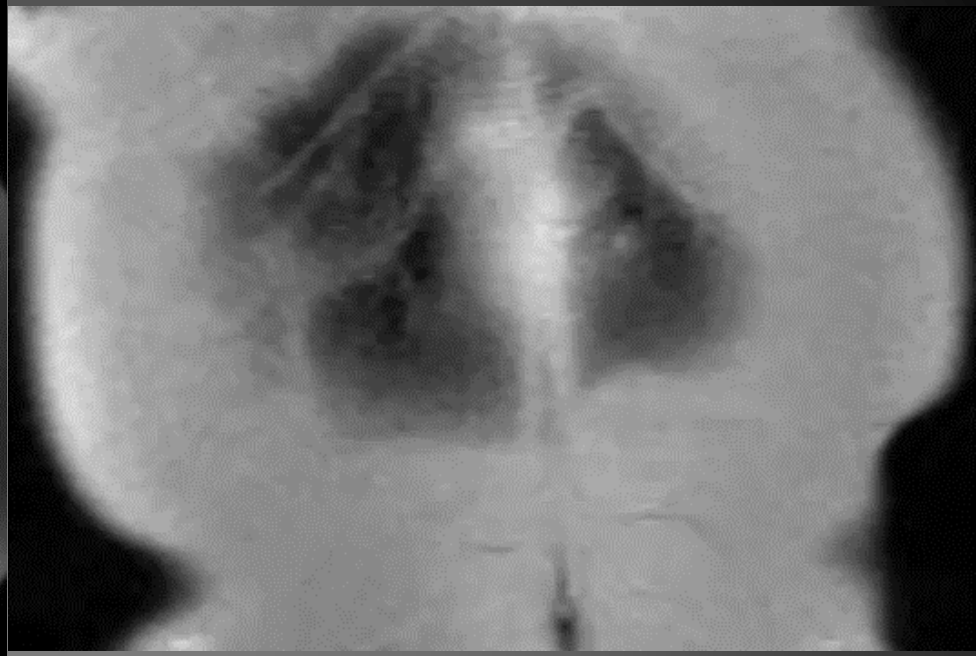


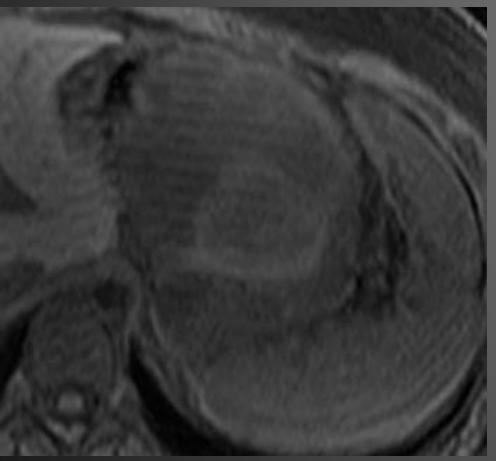


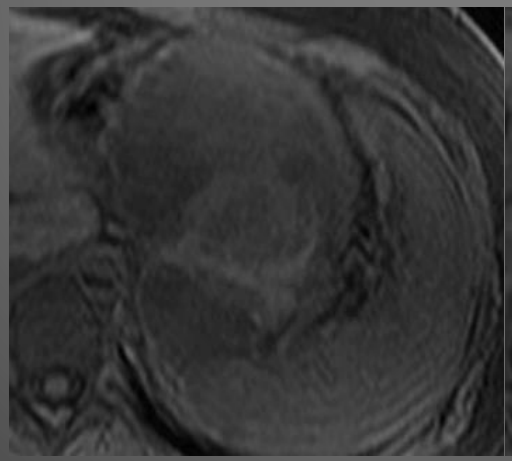


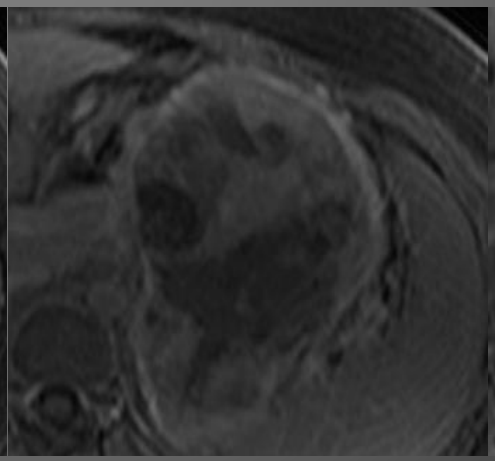


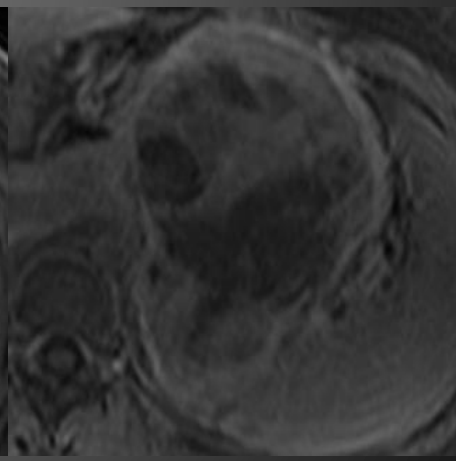












T1 FS Pre

BS-17-40902

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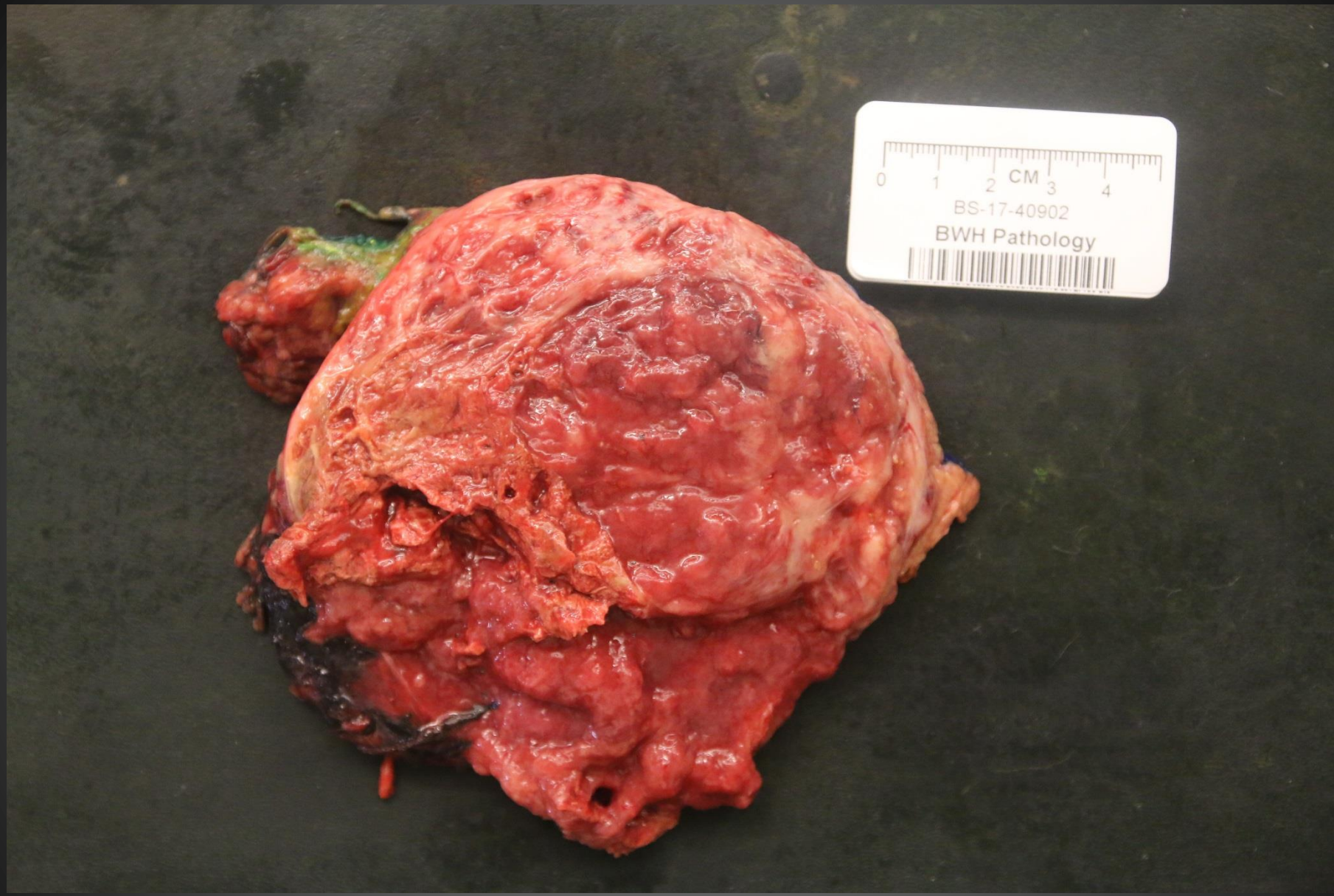
SOLID PSEUDOPAPILLARY TUMOR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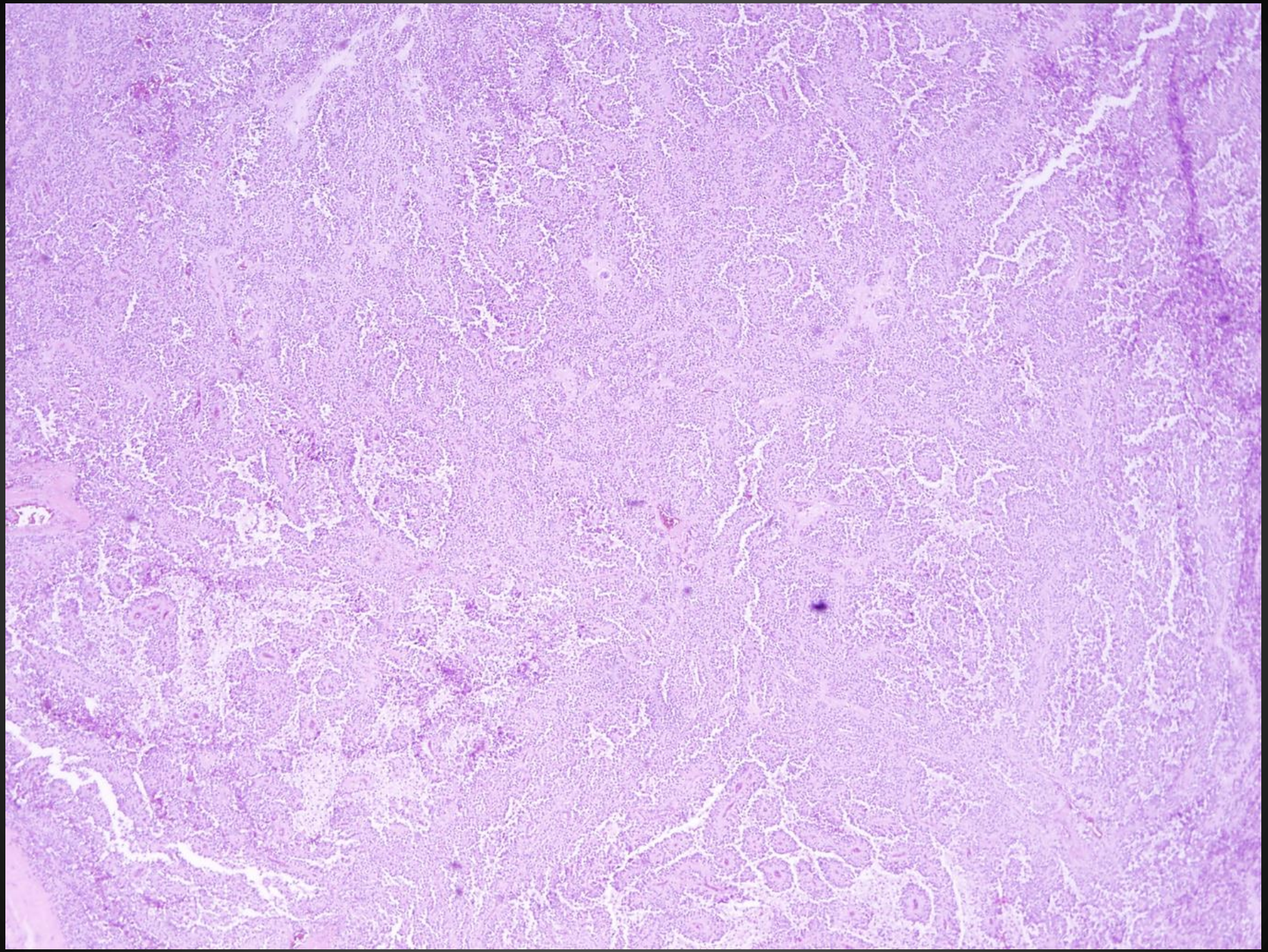
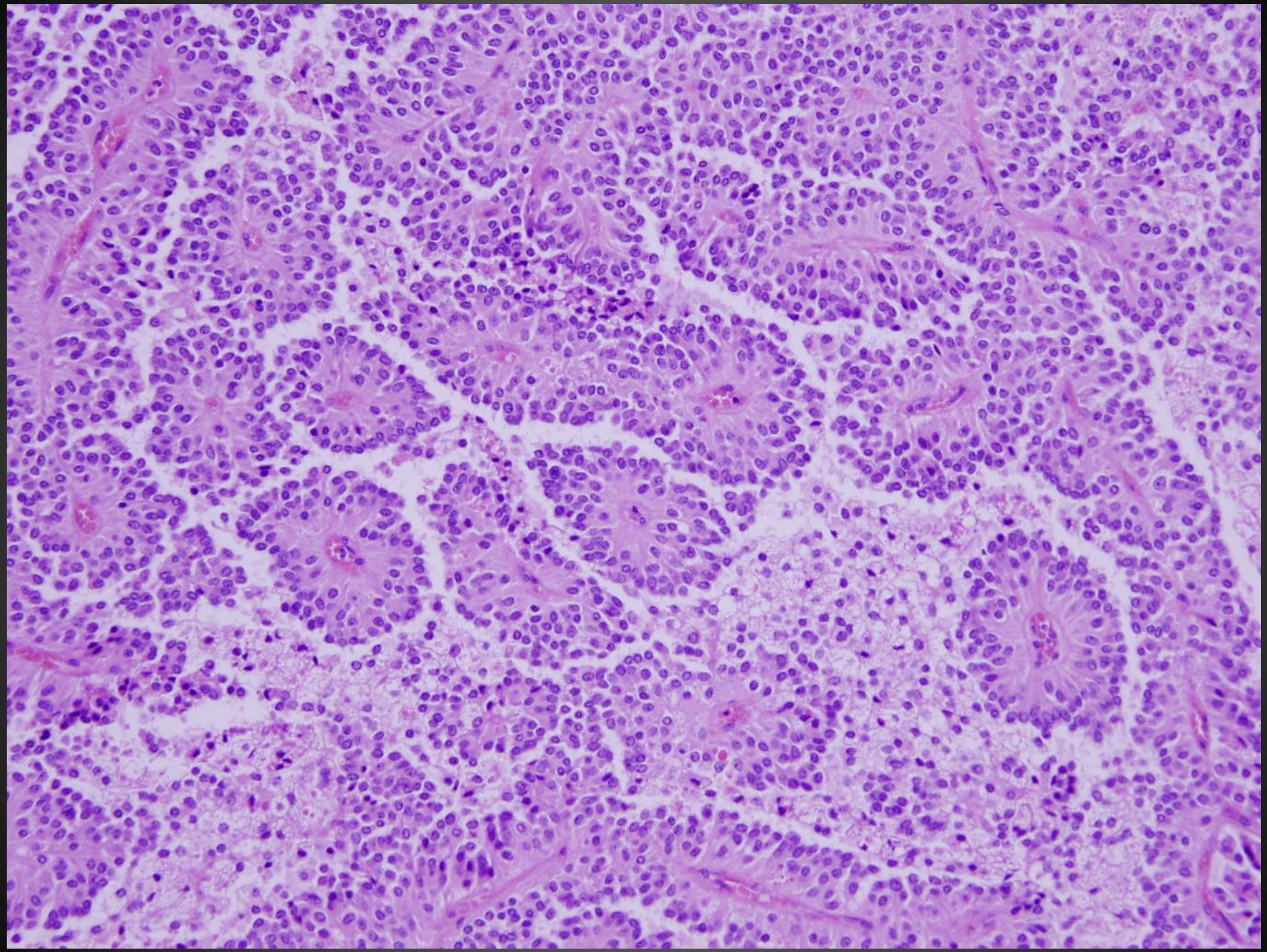
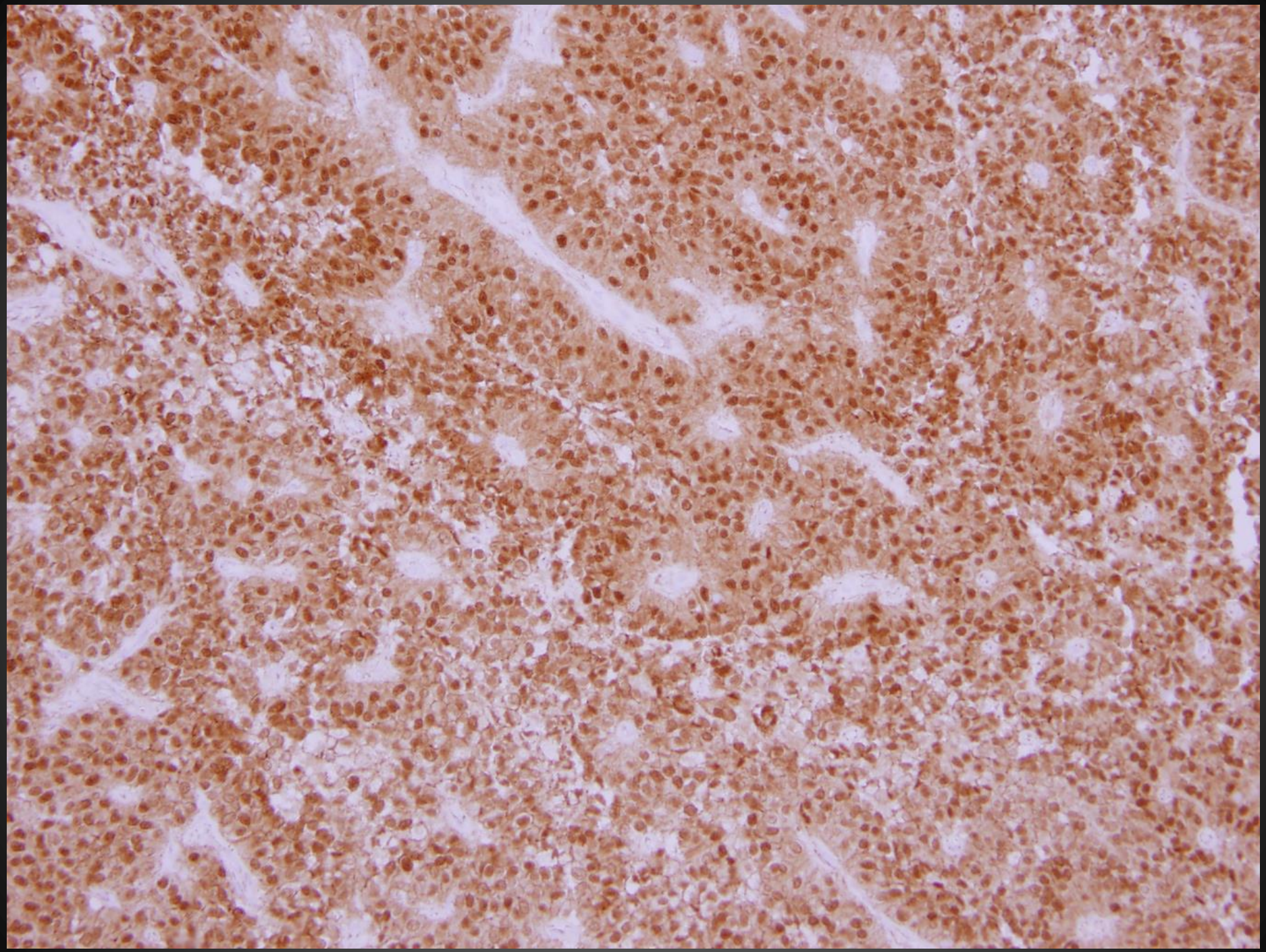
BS-17-40902
BWH Pathology







Solid Pseudopapillary Tumor

	All years	1961-1999	2000-2012
Pathologic Stage			
Number of studies, n	89	19	70
Total number of patients in studies, n	1,523	72	1,451
Vascular Involvement, n (%)	70 (4.6)	7 (9.7)	63 (4.3)
Lymph node metastases, n (%)	24 (1.6)	3 (4.2)	21 (1.4)
Distant spread, n (%)	118 (7.7)	19 (26.4)	99 (6.8)
Outcomes			
Number of studies, n	320	104	216
Total number of patients in studies, n	2,158	269	1,889
Total number of patients with follow-up, n (%)	1,952(90.5)	254 (94.4)	1,698 (89.9)
Follow-up, months (± S.D.)	36.1 (± 32.8)	27.4 (± 24.1)	40.1 (± 35.4)
Disease-free, n (%)	1,866 (95.6)	242(95.3)	1,624 (95.6)
Recurrence, n (%)	86 (4.4)	12 (4.7)	74 (4.4)
Time to recurrence, months (± S.D.)	50.5 (± 44.6)	47.9 (± 46.5)	51.1 (± 44.6)
Death due to SPN, n (%)	29 (1.5)	5 (1.9)	24 (1.3)

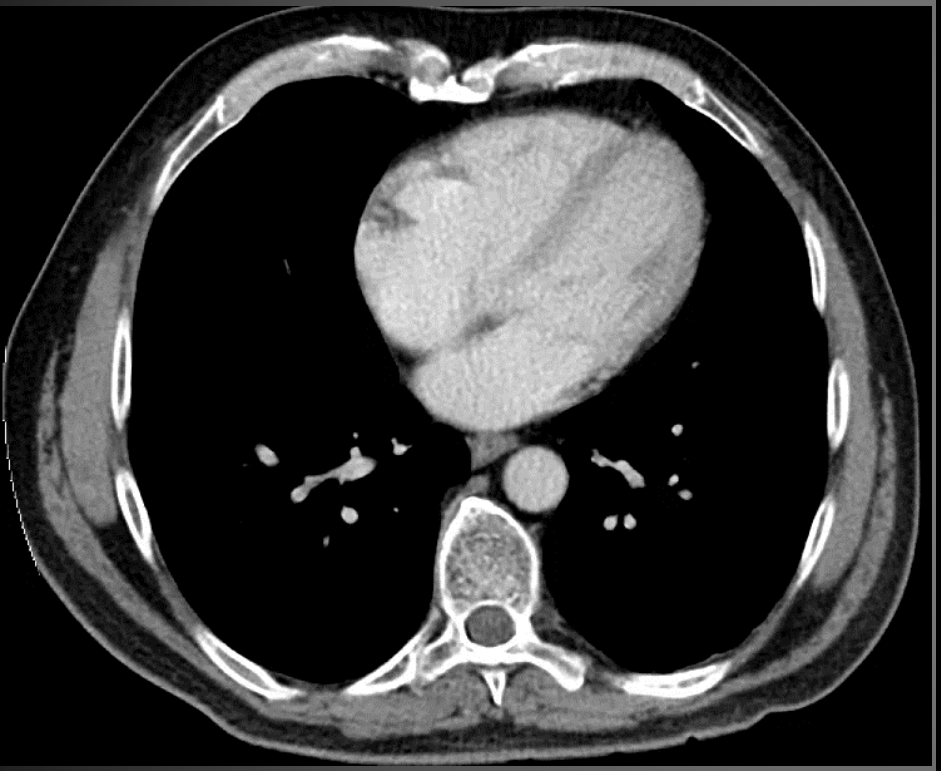
- **Origin**
  - Thought to be from genital-ridge epithelium that persists in the pancreas during organogenesis
- **Epidemiology and Survival**
  - Young, non-Caucasian women in 2-3rd decade
  - 1-2% of exocrine pancreatic tumors
  - Excellent prognosis; resection indicated if there is mass effect
  - Low grade malignant potential
- **CT**
  - Large (~10cm), well-circumscribed, mixed solid and cystic tumor with necrosis/hemorrhage
  - Typically in tail
- **MR**
  - Capsule and solid components are T1 hypointense with hemorrhage that is T1 hyperintense
  - T2 hyperintnse cystic/necrotic component
  - Early peripheral enhancement with progressive fill in

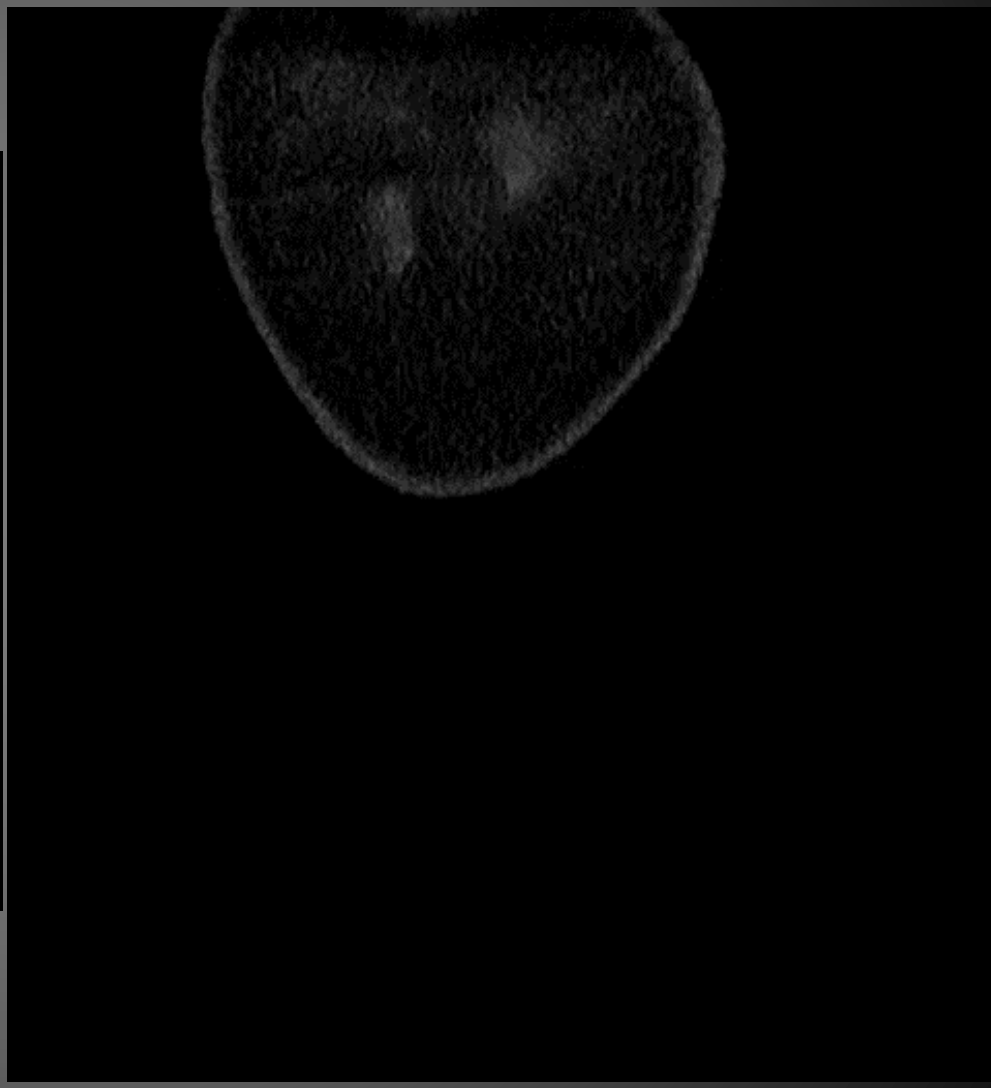
Coleman et al, Radiographics 2003
Chae et al, JCAT 2014
Law et al, Pancreas, 2014

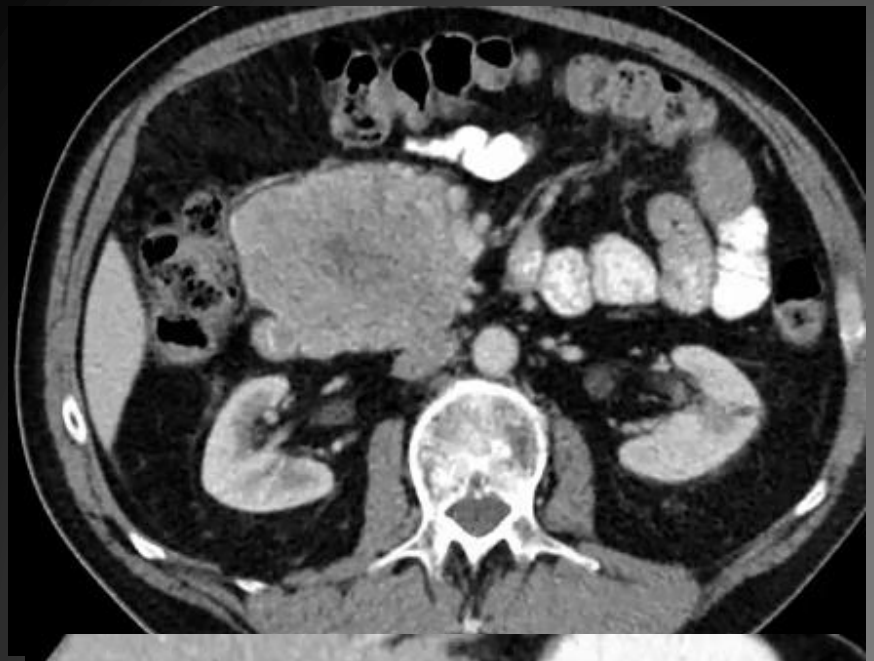
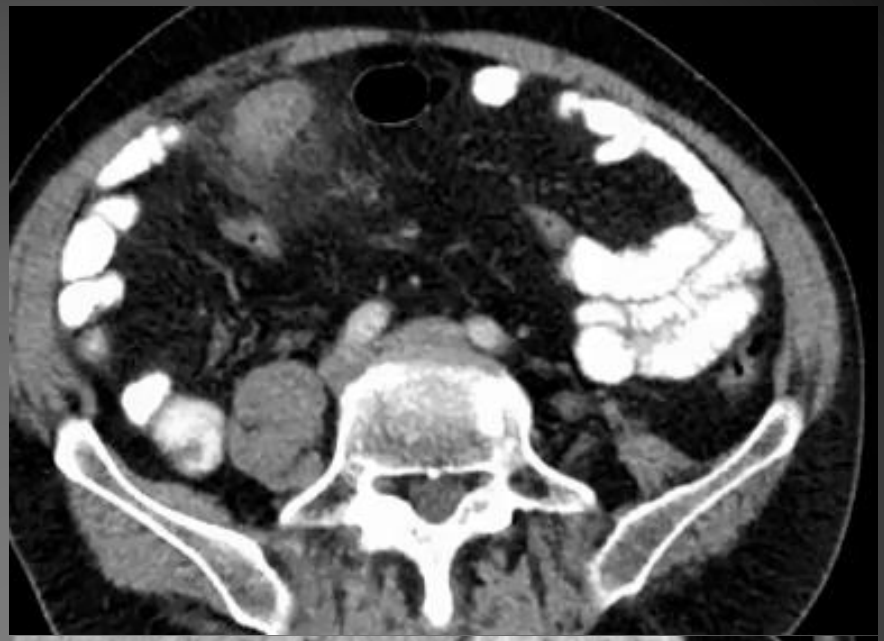
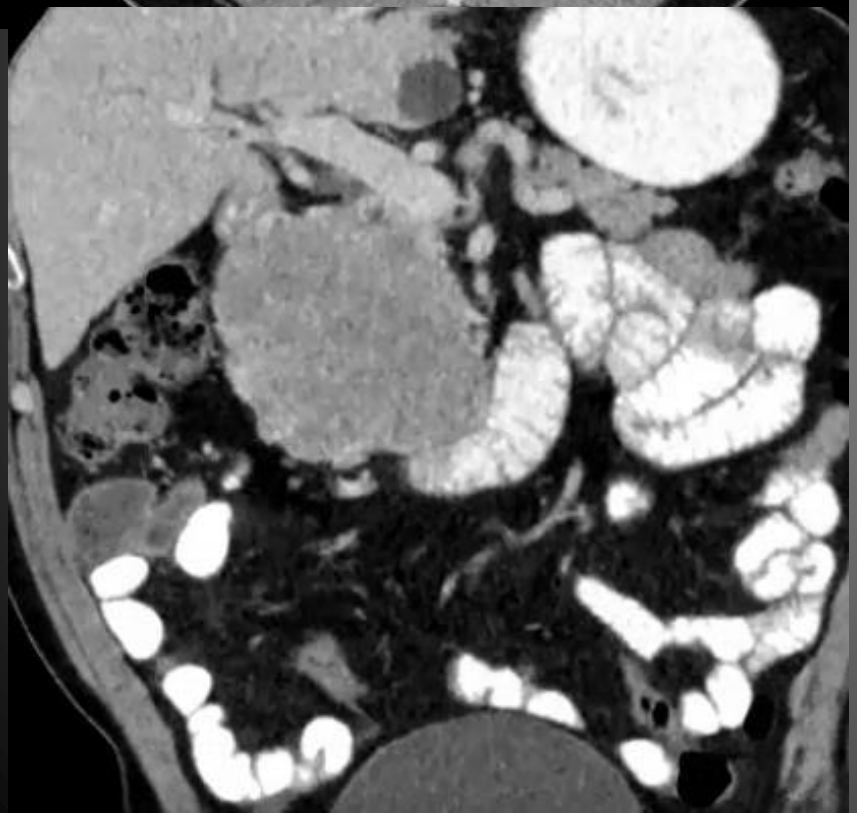
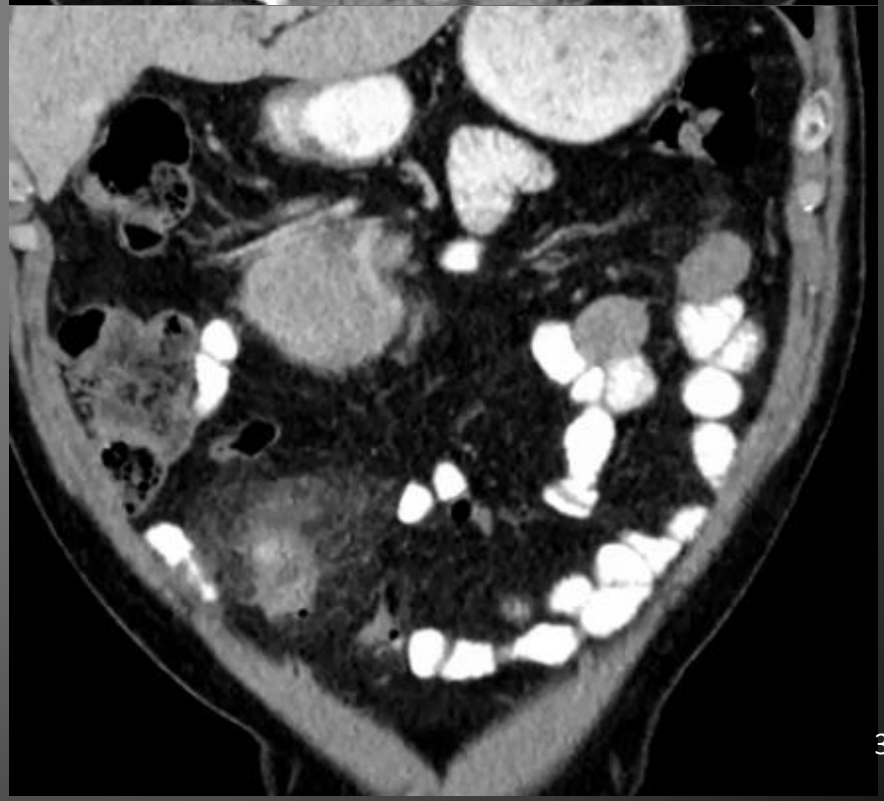
Solid Pseudopapillary Tumor

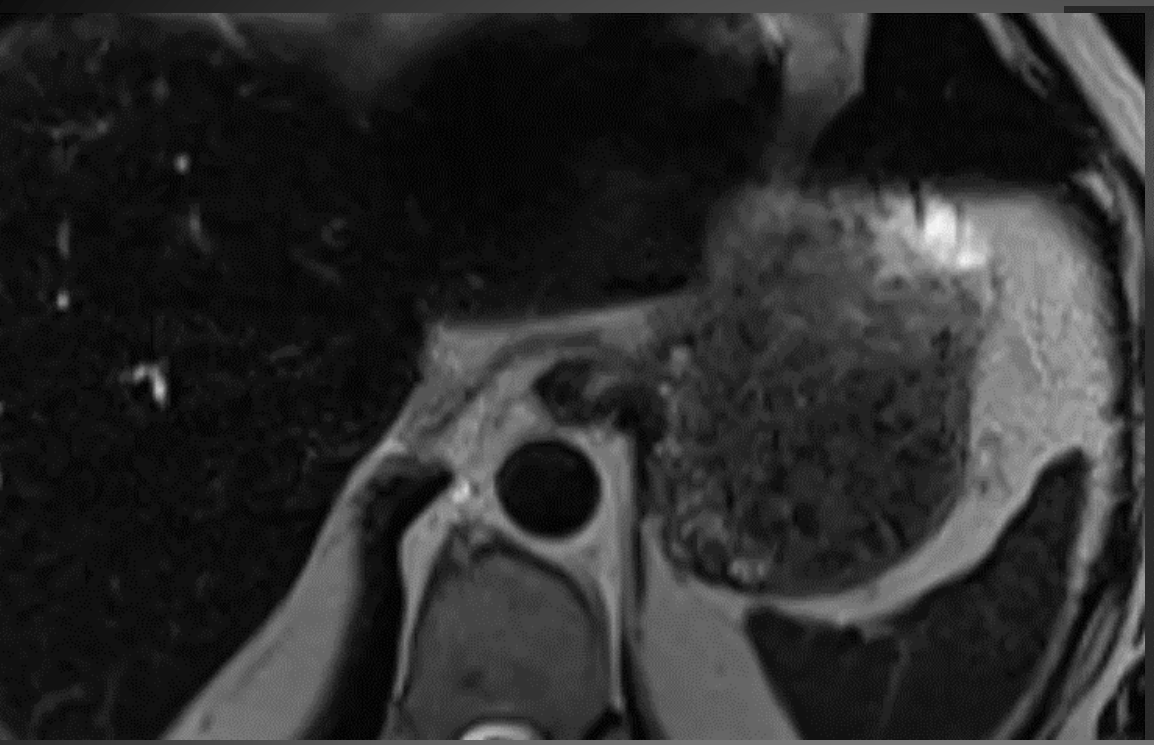
- **Differential**
  - **Mucinous Cystadenoma: Similar appearance and location in tail, however, hemorrhage is not seen. More often in middle-aged women.**
  - **Serous Cystadenoma: Innumerable cysts are present and there is no large solid component. More common in elderly females**
  - **Neuroendocrine Tumor: Will be more hypervascular but hemorrhage is less common**
  - **Pancreatic Adenocarcinoma: cystic component is less likely. Pancreactic duct dilation is often seen and less likely to have hemorrhagic component**

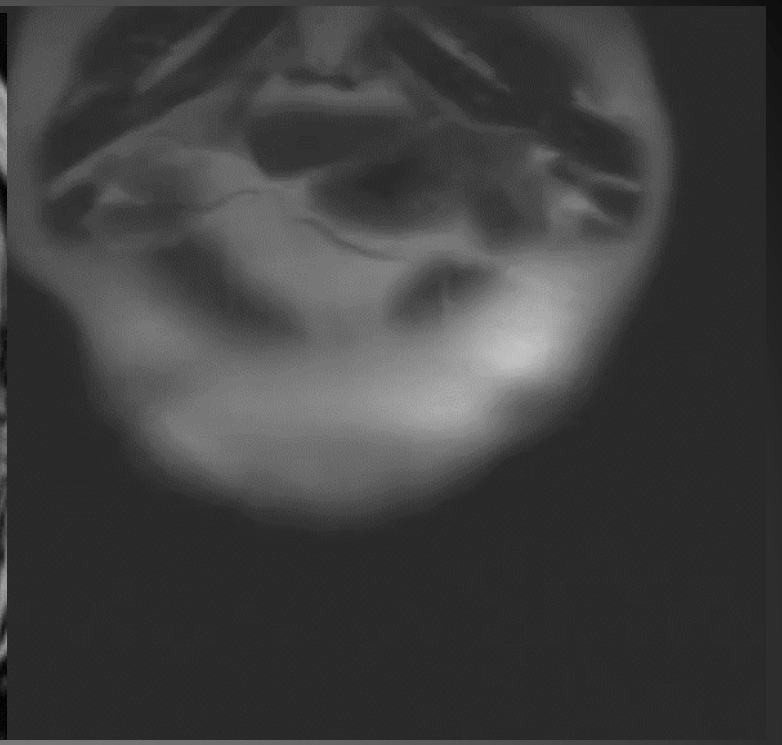
68 year old male with abdominal pain

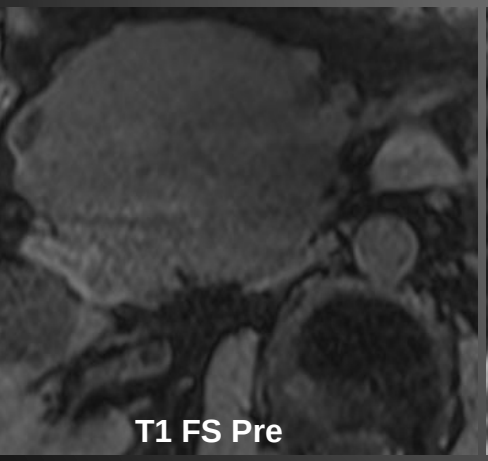


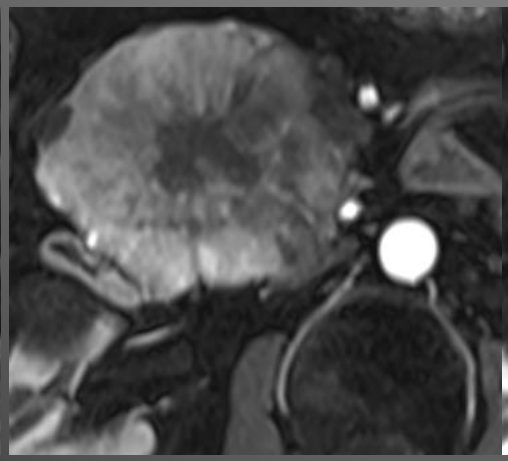


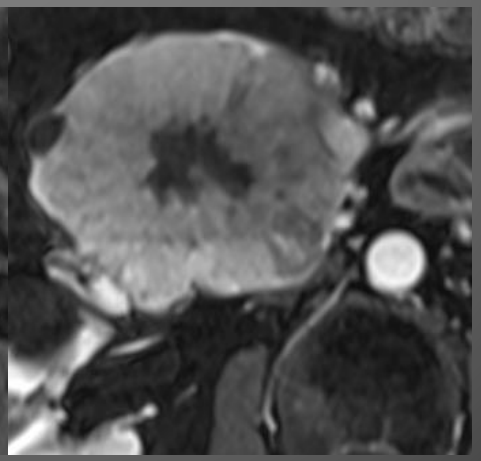





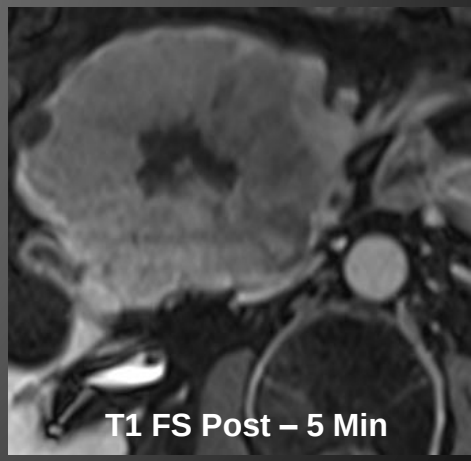












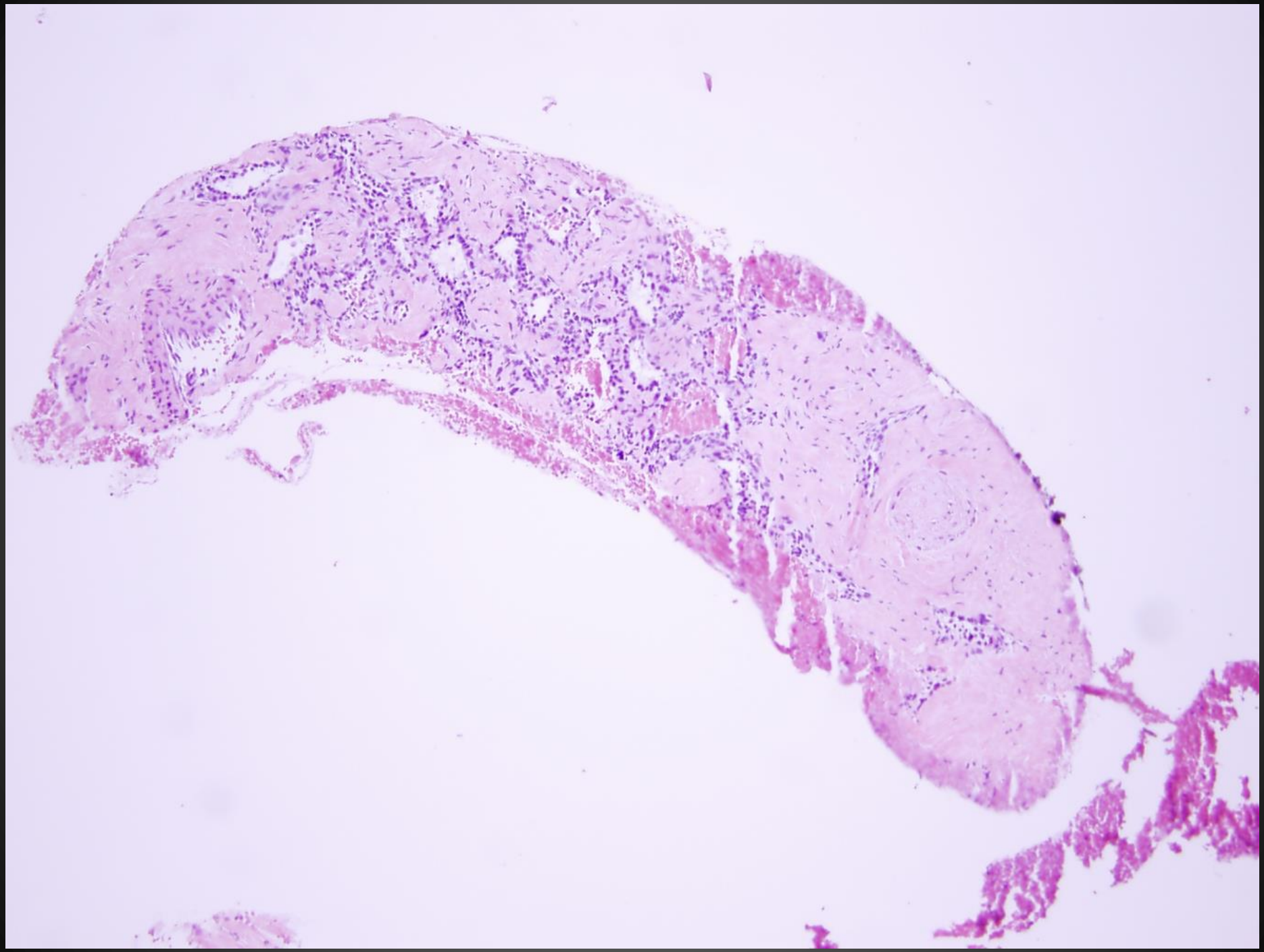
T1 FS Pre

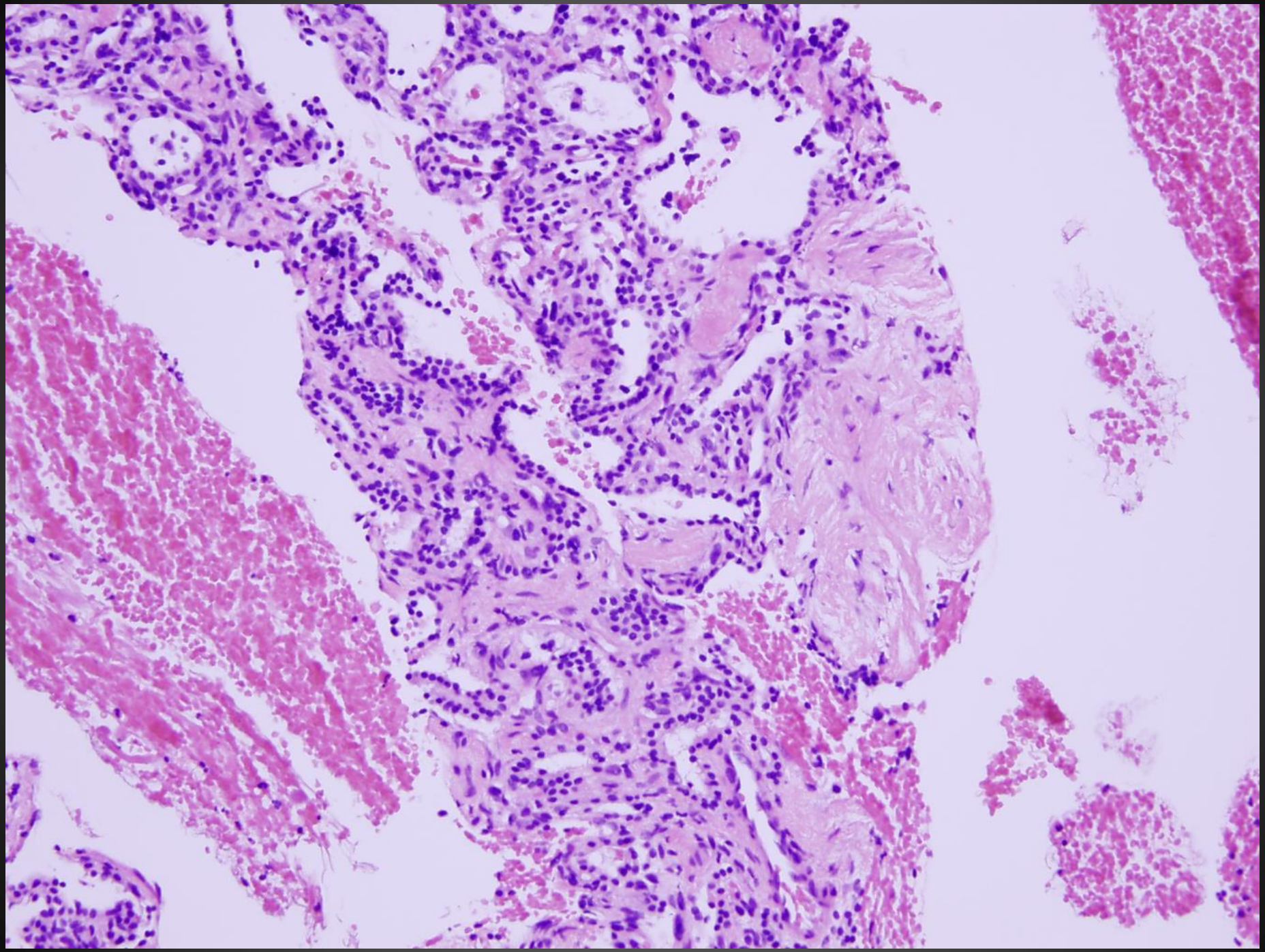
T1 FS Post – 5 Min

BS-17-50005

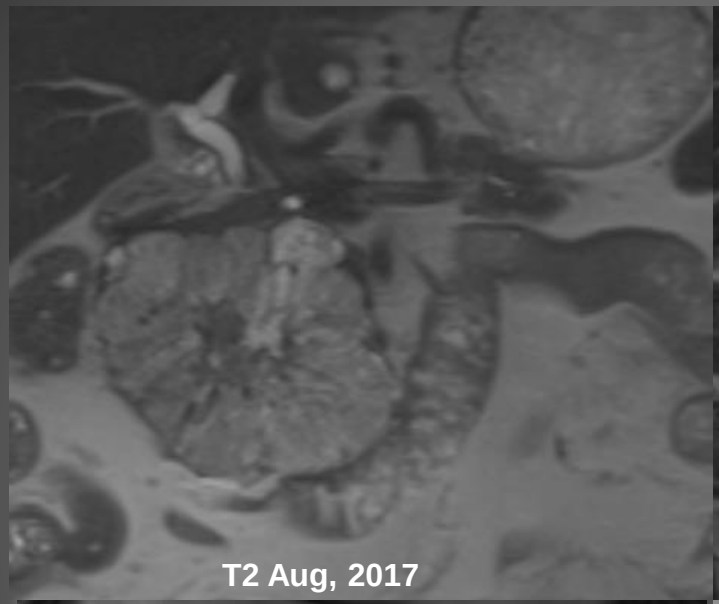
MRN 30234132

SEROUS CYSTADENOMA

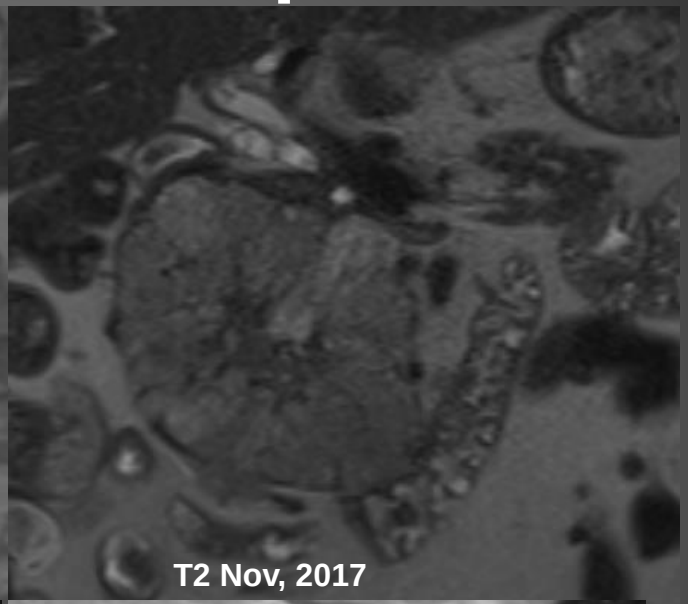




Serous Cystadenoma
6 month follow up

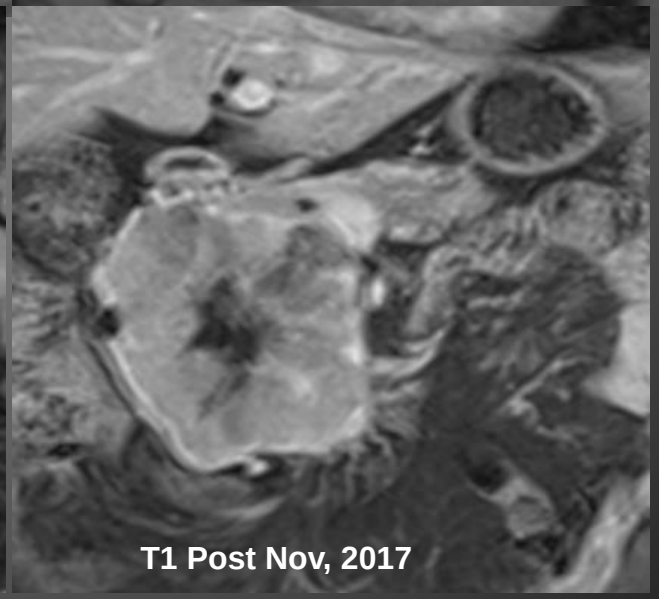


T2 Aug, 2017



T2 Nov, 2017

T1 Post Aug, 2017



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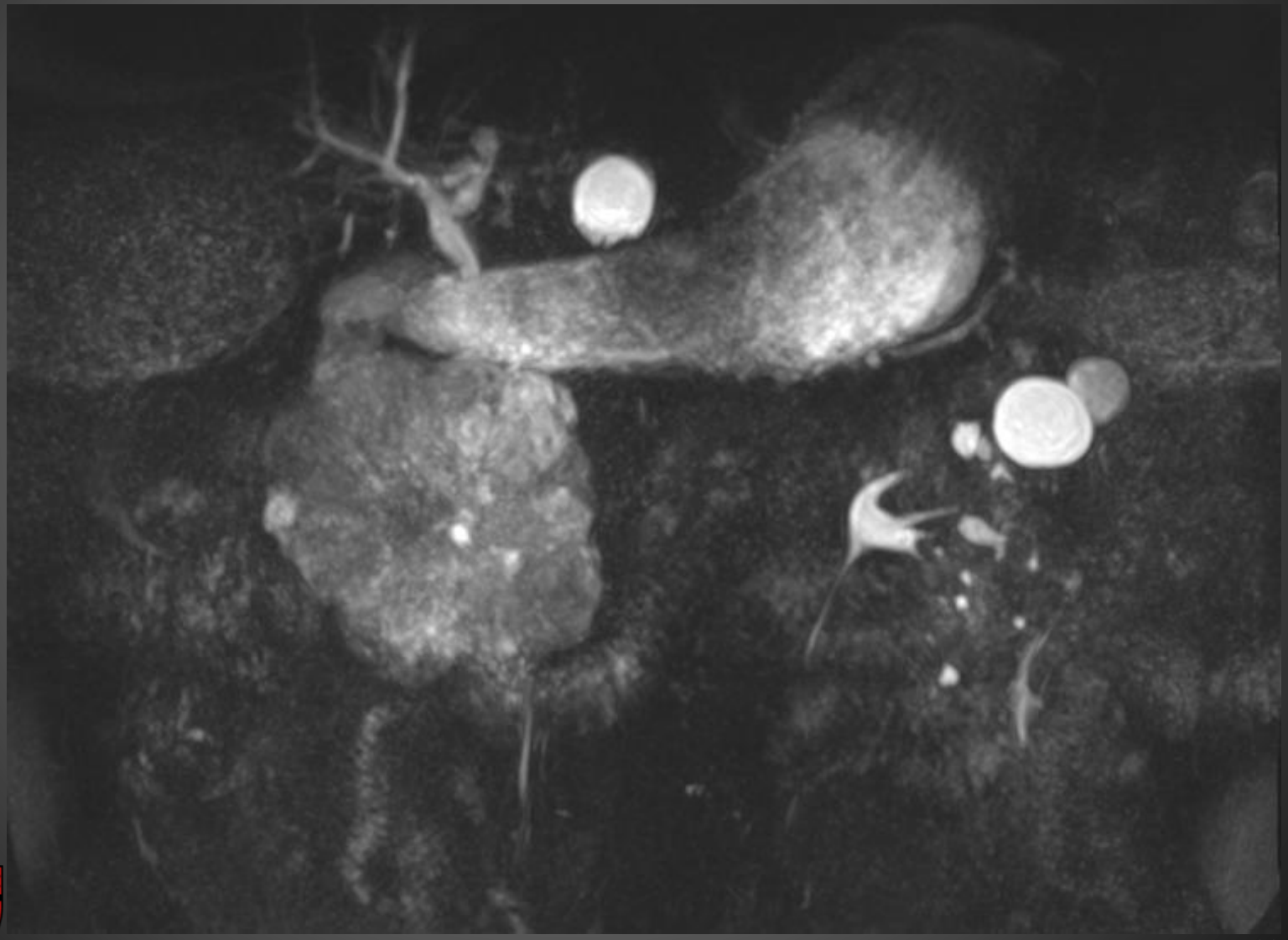
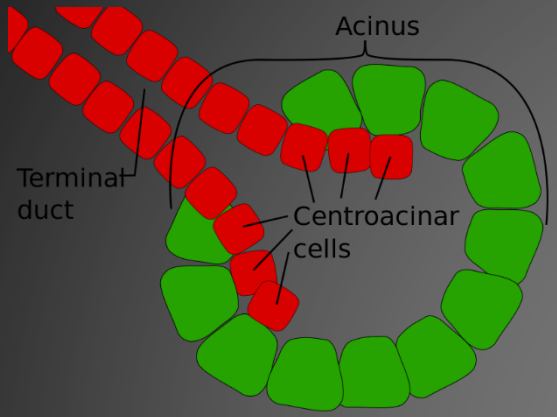
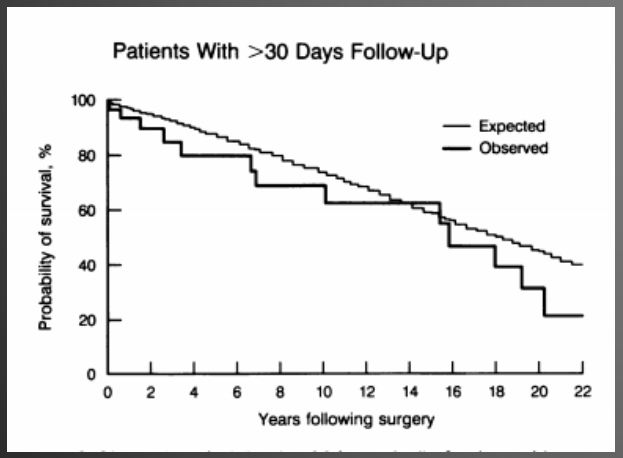


Serous Cystadenoma



Mikael Häggström - Basic histology



Pyke et al, 1992

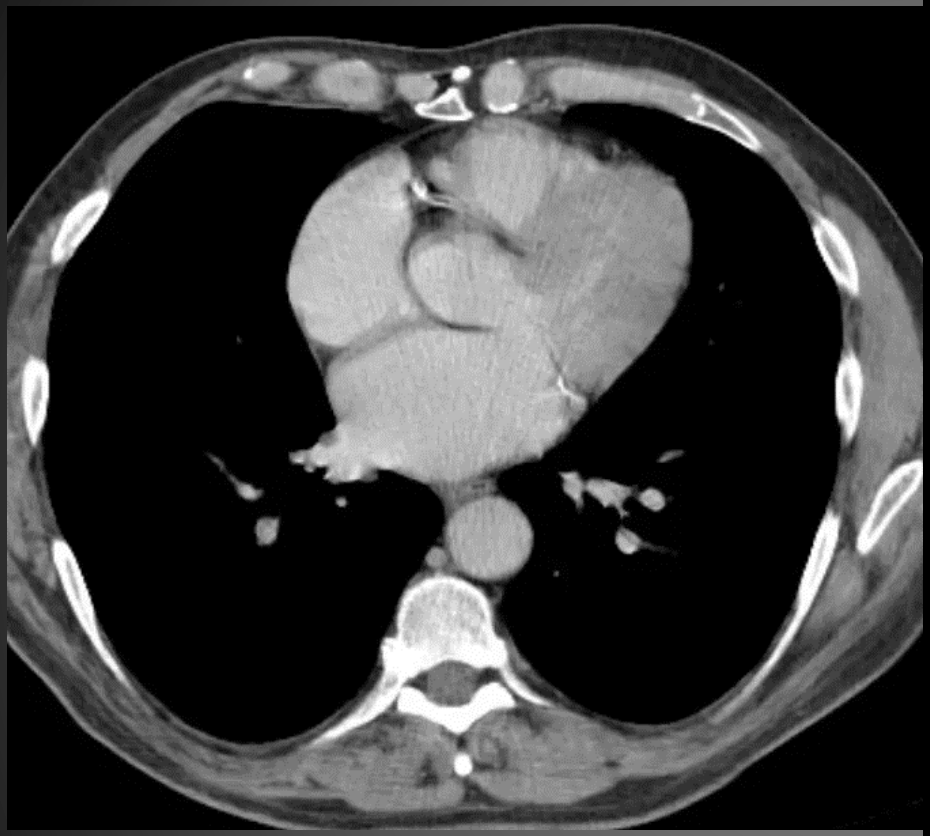
- **Origin**
  - Cuboidal, glycogen rich epithelial cells in the centroacinar portion of the duct system
- **Epidemiology and Survival**
  - Cystic tumors represent 10% of all pancreatic cysts and 1% of pancreatic neoplasms
  - Typically occur in women in 7th decade of life
  - Typically benign – resected if there is mass effect
- **CT**
  - Honeycomb appearance with cluster > 6 cysts that are < 1cm
  - Lobular contour with absence of wall enhancement. +/- calcifications
  - 30% are seen in the head of the pancreas
  - Macrocystic/Unilocular variations are also seen with cyst > 2cm
- **MR**
  - Central scar that is both T1 and T2 hypointense; Cysts are T2 hyperintense
  - Post contrast imaging shows enhancement of the septa
  - No communication with duct system
  - Hemorrhage is rare

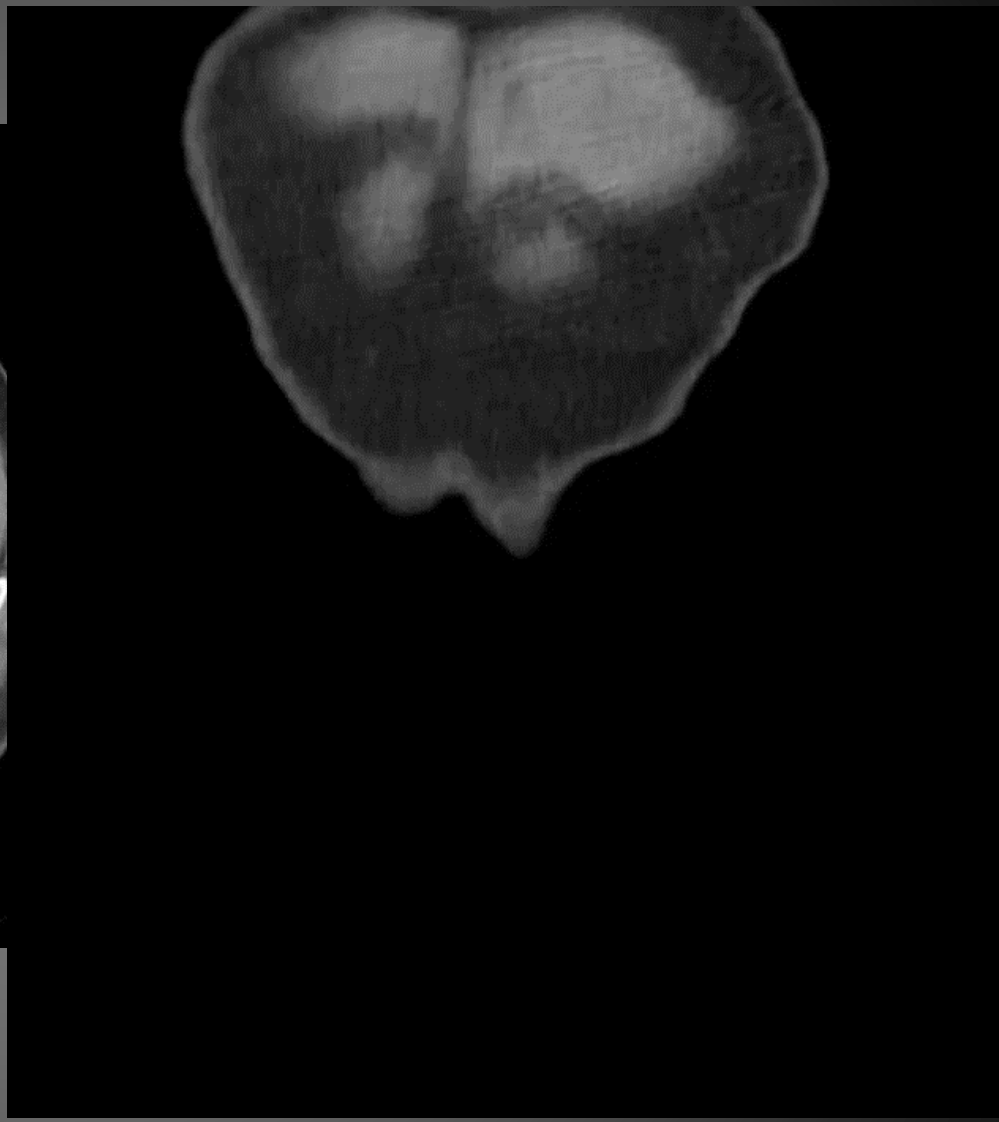
Tseng et al, Annals of Surgery, 2005
Adsay et al, JGS, 2008
Cohen-Scali, Radiology 2003
Pyke et al, Annals of Surgery, 1992

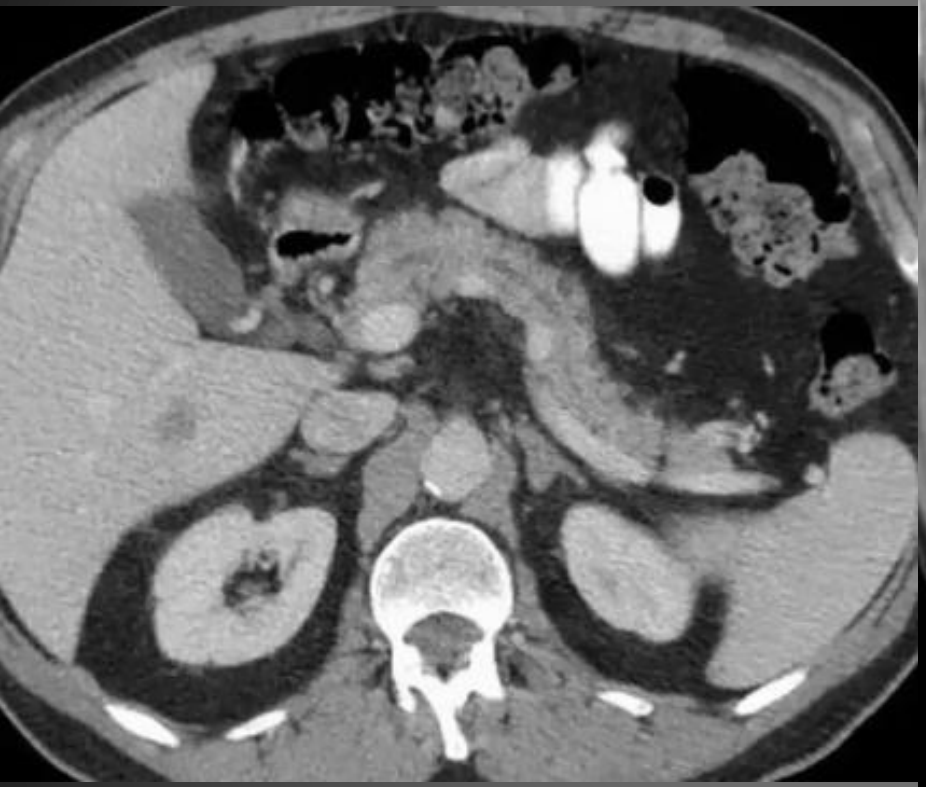
Serous Cystadenoma

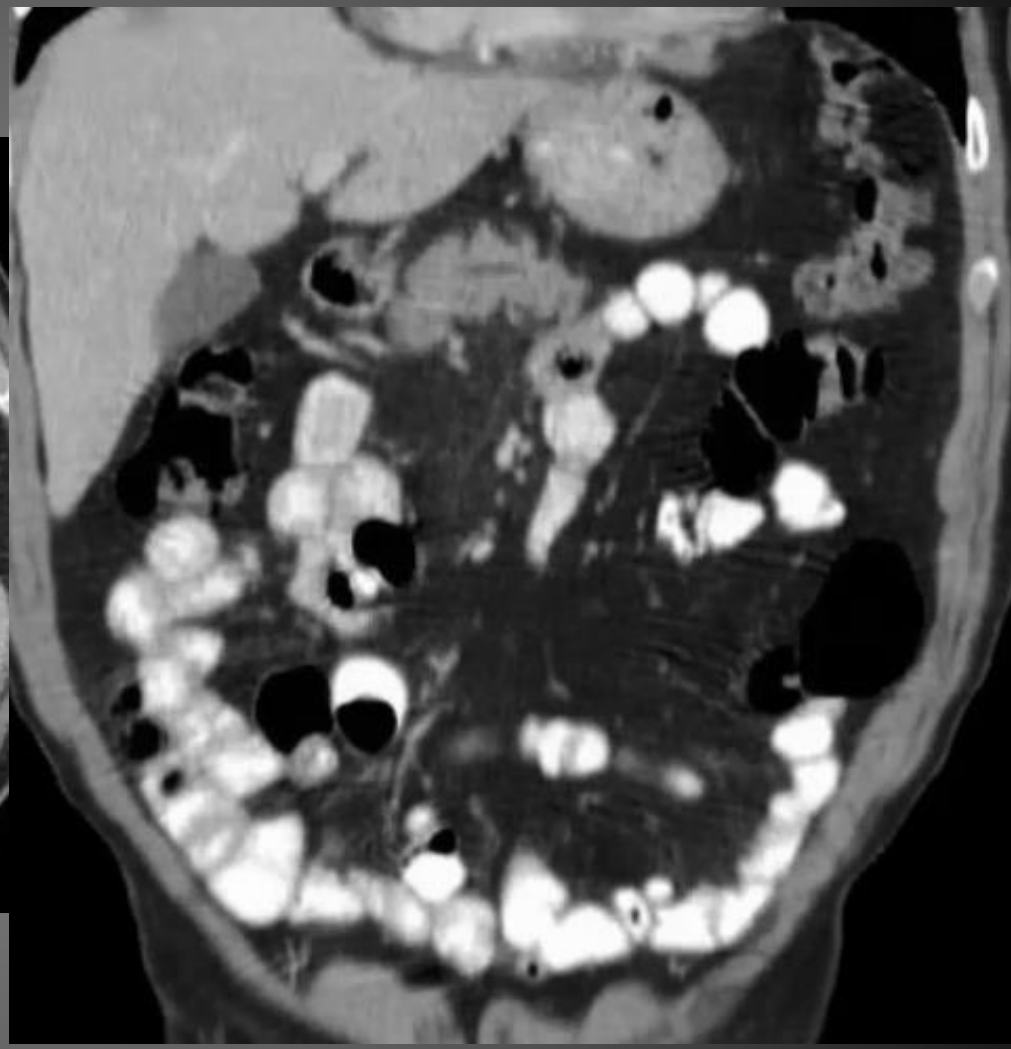
- **Differential**
  - Pancreatic Pseudocyst: Shows a more well defined capsule and is usually unilocular and lacks septations. History of pancreatitis is typically present.
  - Mucinous Cystadenoma: May appear identical to the macrocystic form of serous cystadenoma although wall may be thicker. Internal solid components are also more common. Typically in tail of pancreas.
  - IPMN: communication with the pancreatic duct and ductal dilation is key. Typically occurs in elderly men.
  - Cystic Neuroendocrine Tumor: More hypervascular; cystic type exhibits hemorrhage
  - Pancreatic Adenocarcinoma: Cystic components are rare and there is ductal dilatation. Calcifications are rare.

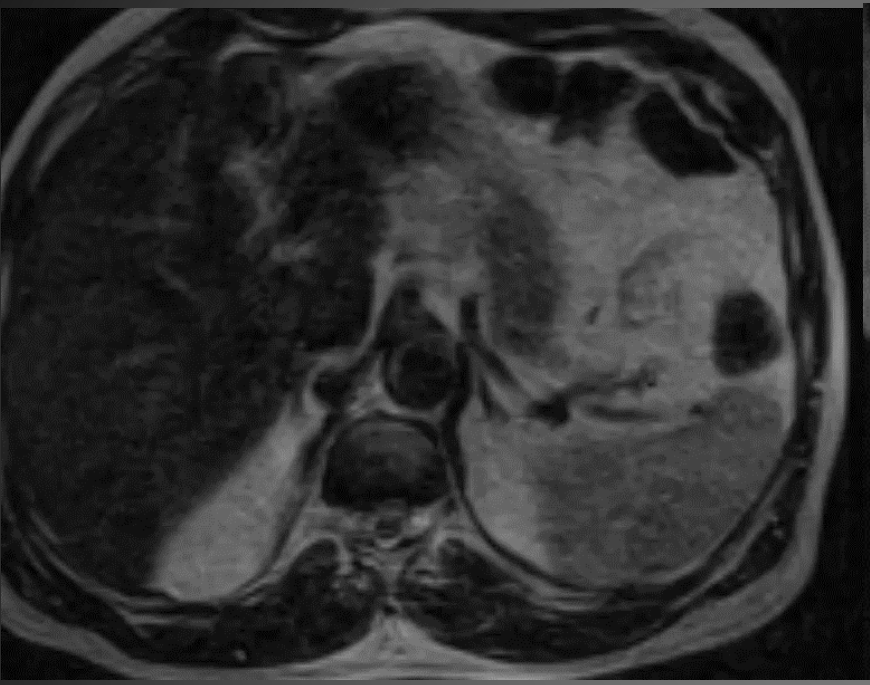
71 year old male on surveillance

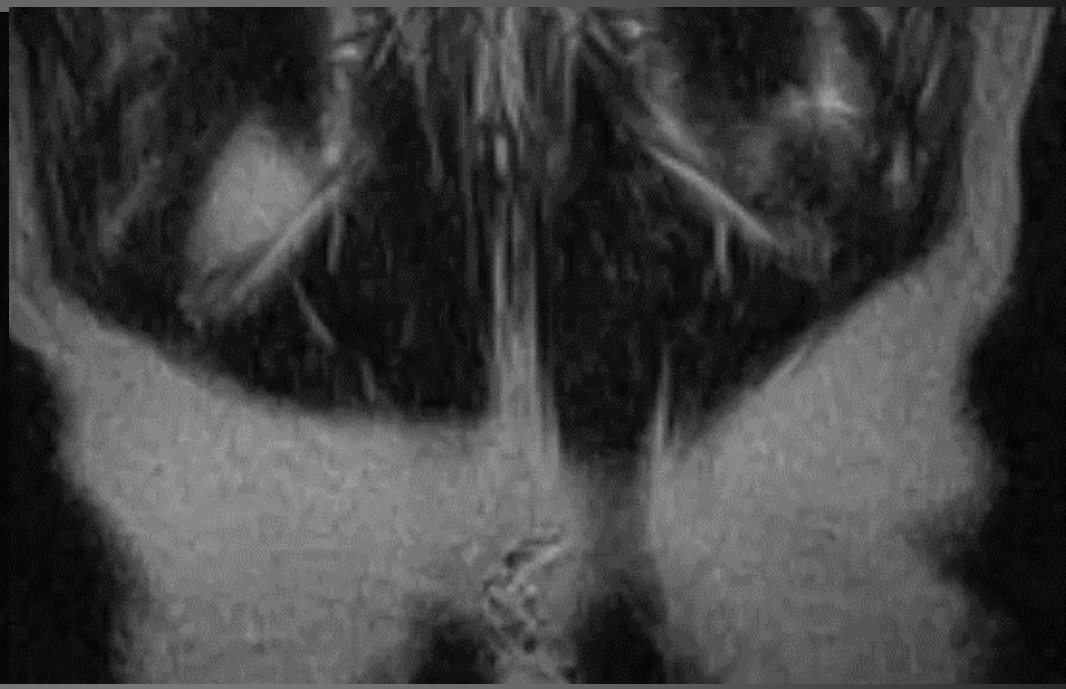


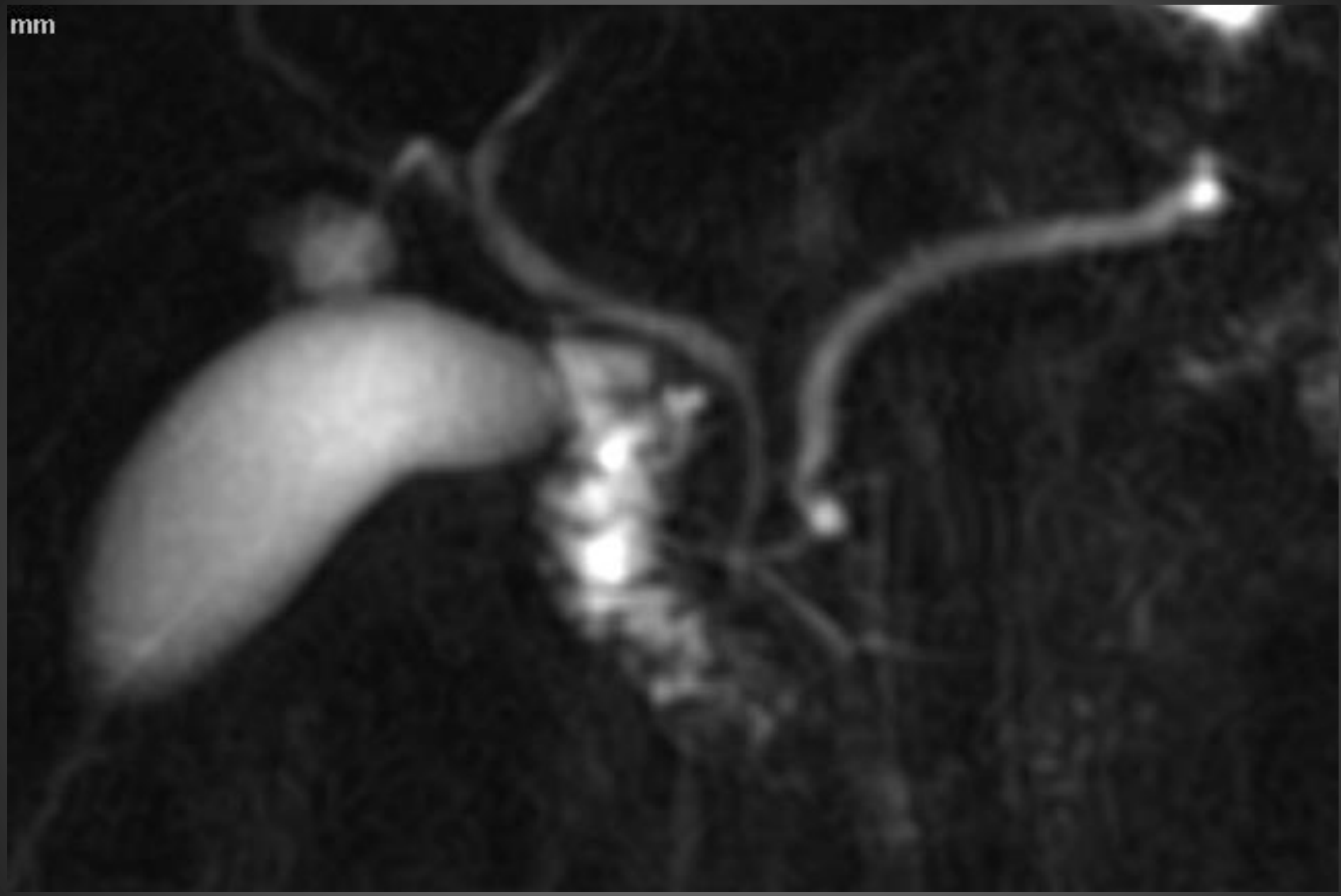








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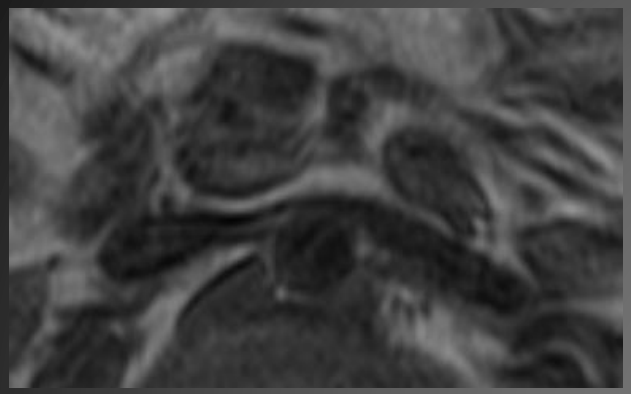

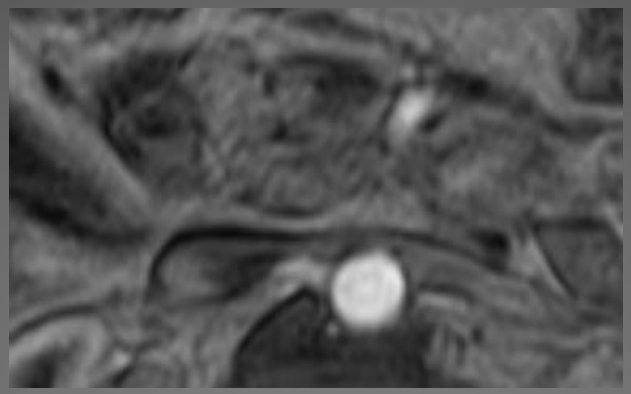

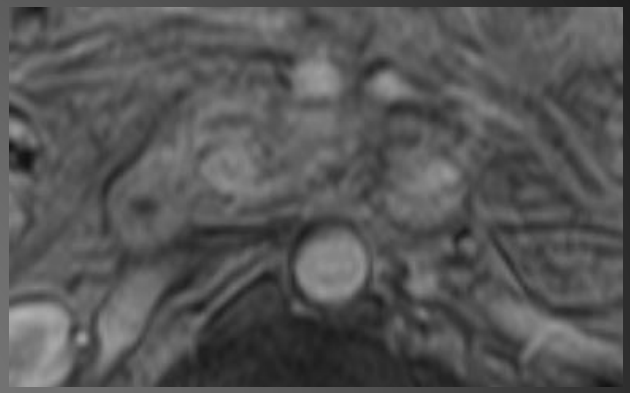

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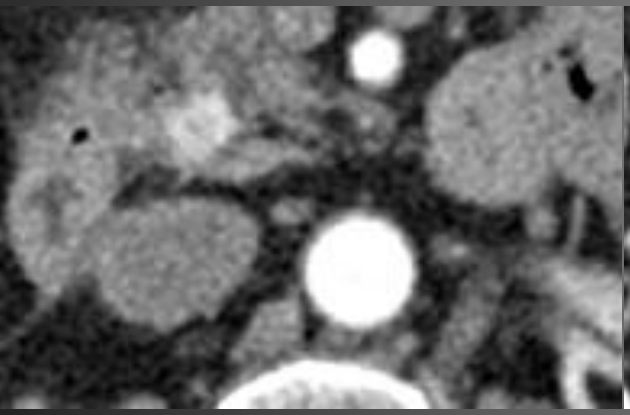

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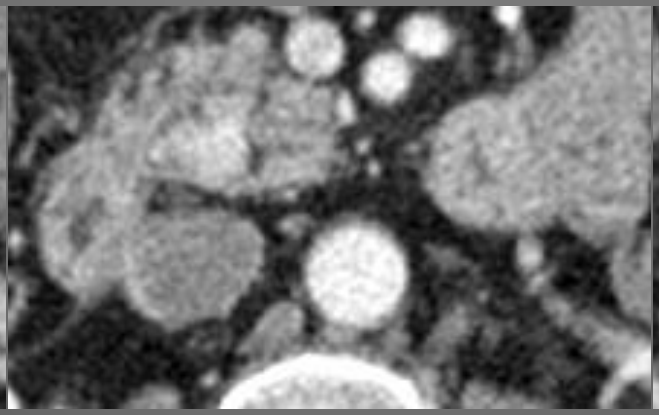

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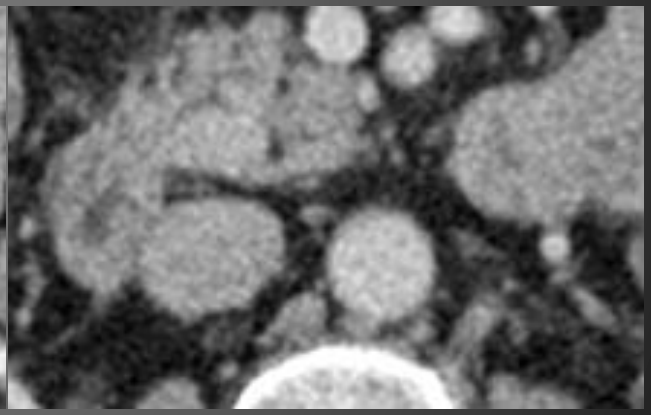
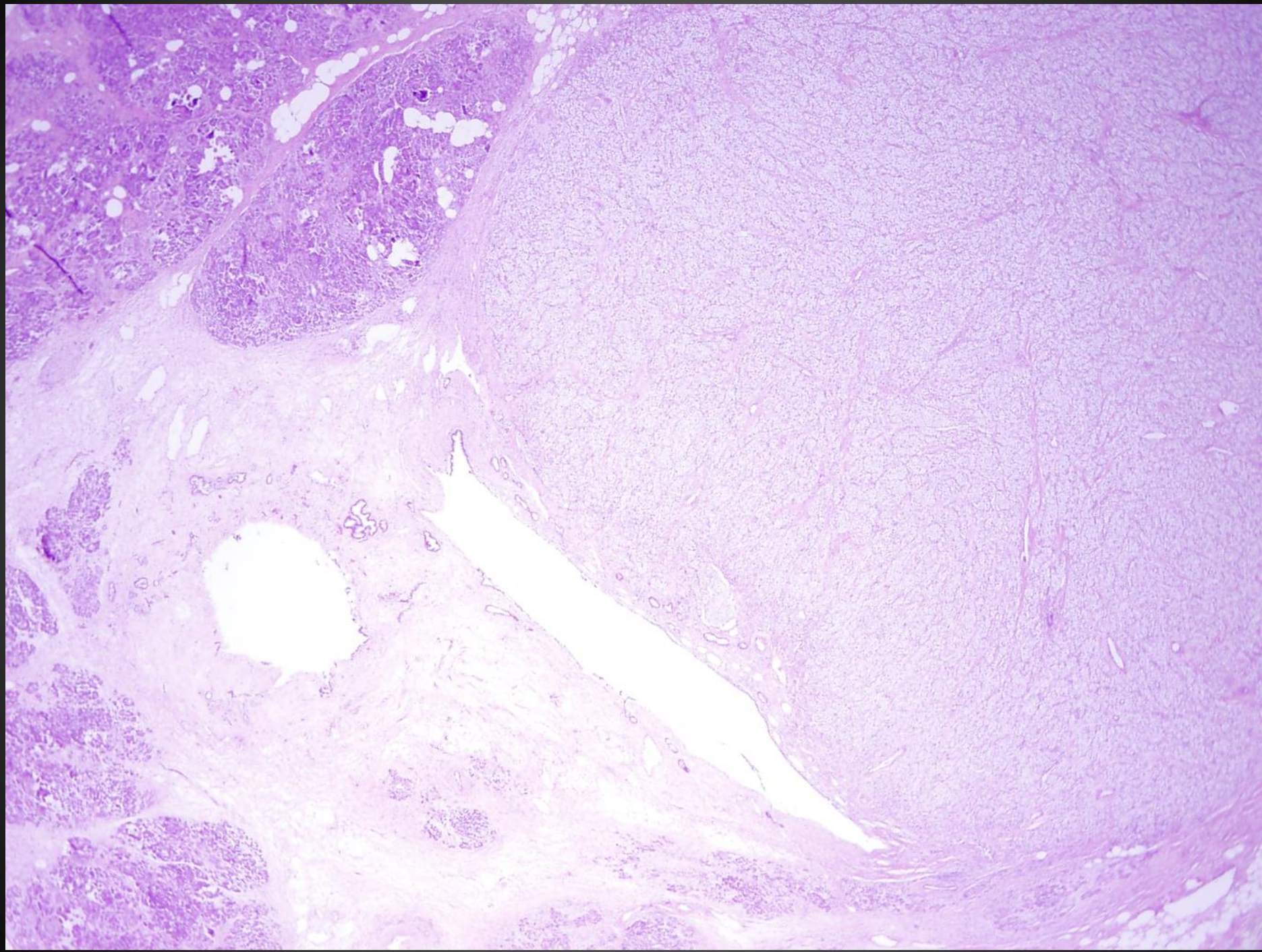


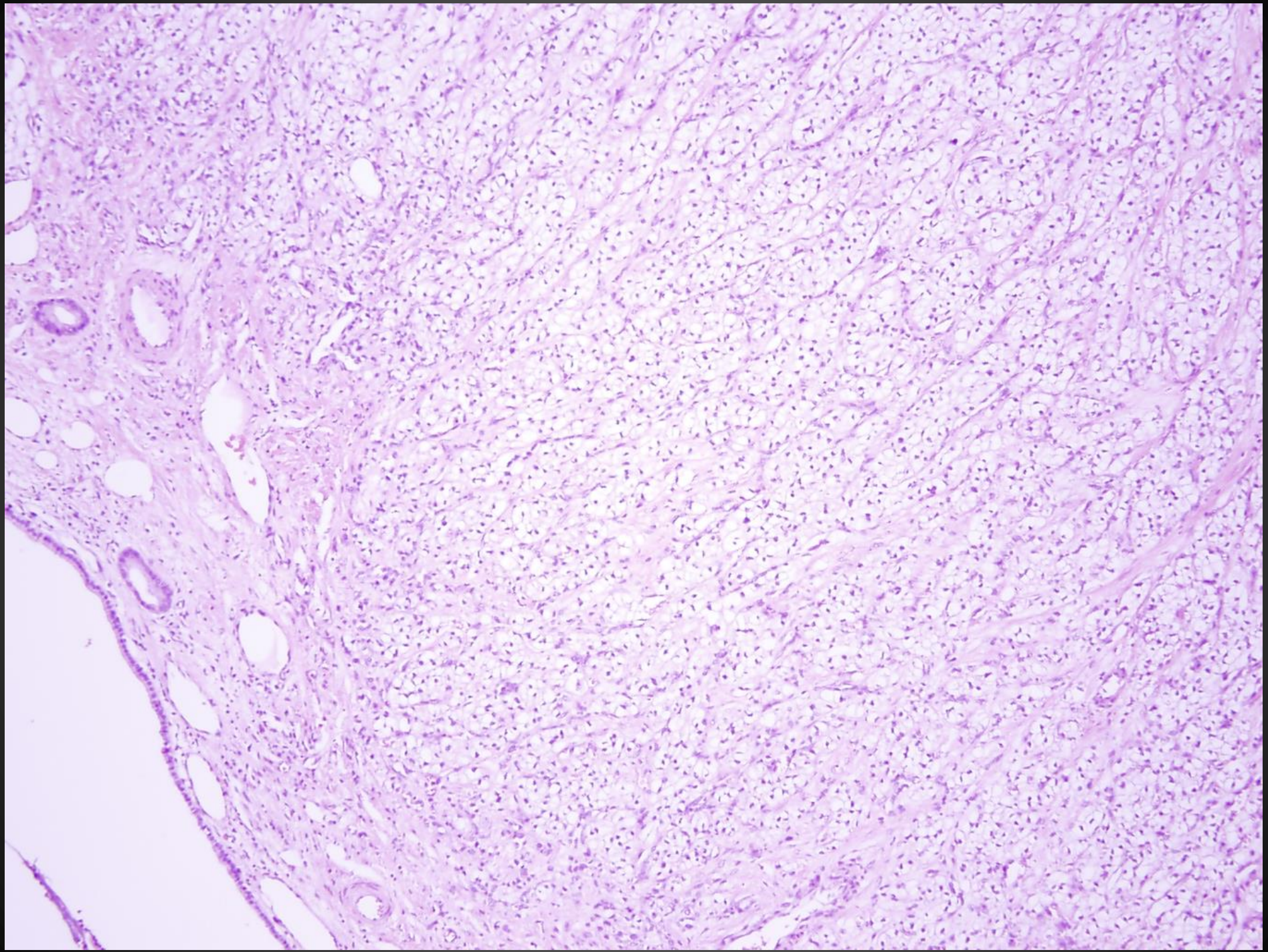
70s

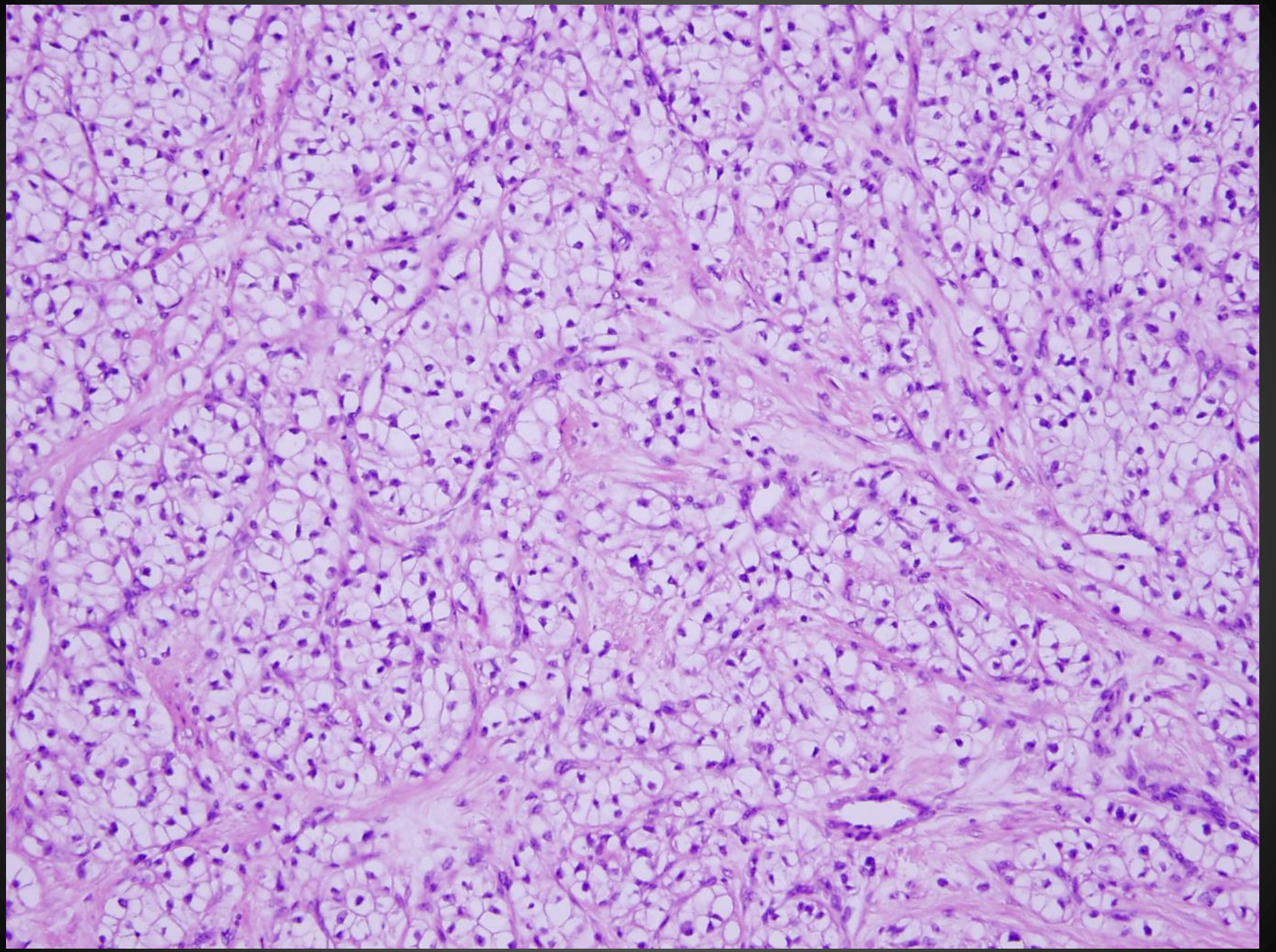
BS-15-23666

23412331

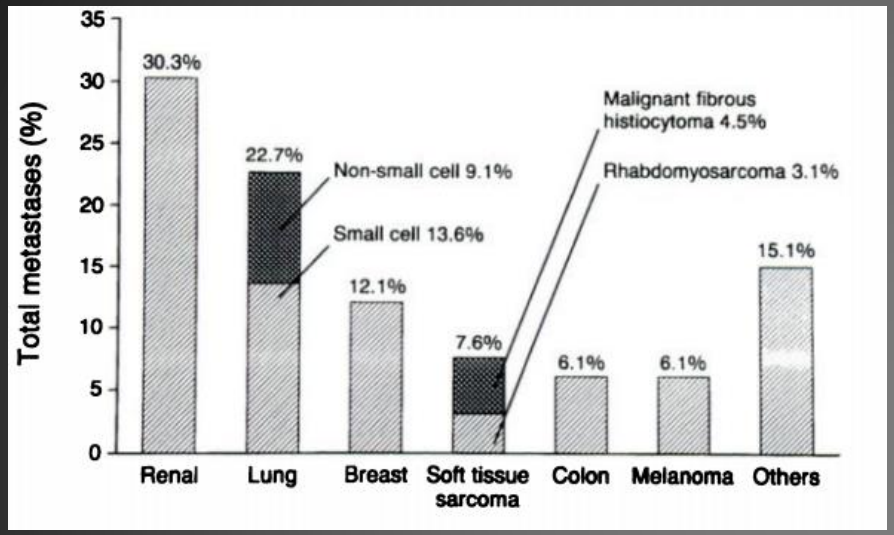
METASTATIC RENAL CELL CARCINOMA, clear cell type.







RCC Metastasis To Pancreas



Klein et al

- **Differential**
  - If hypervascular, neuroendocrine tumors should be considered
  - For hypovascular lesions, pancreatic adenocarcinoma is an important differential
  - History is key; biopsy is often necessary

- **Origin**
  - RCC most common, followed by lung, breast, soft tissue sarcoma, colon, and melanoma
- **Epidemiology and Survival**
  - Metastasis to the pancreas account for 2-5% of all pancreatic neoplasms
  - Interval to metastasis is typically ~3 years, however, RCC may take 6-12 years
  - Survival outcomes better than pancreatic adenocarcinoma. 80% of those with RCC metastasis won't have other organ involvement
- **CT**
  - Solitary lesion that is well marginated in 50-70% of cases
  - Larger lesions will have ringed enhancement
  - RCC metastasis will be hypervascular; others are hypodense
- **MR**
  - Typically hypointense on T1 and isointense to hyperintense on T2
  - Enhancement pattern will follow that of the primary

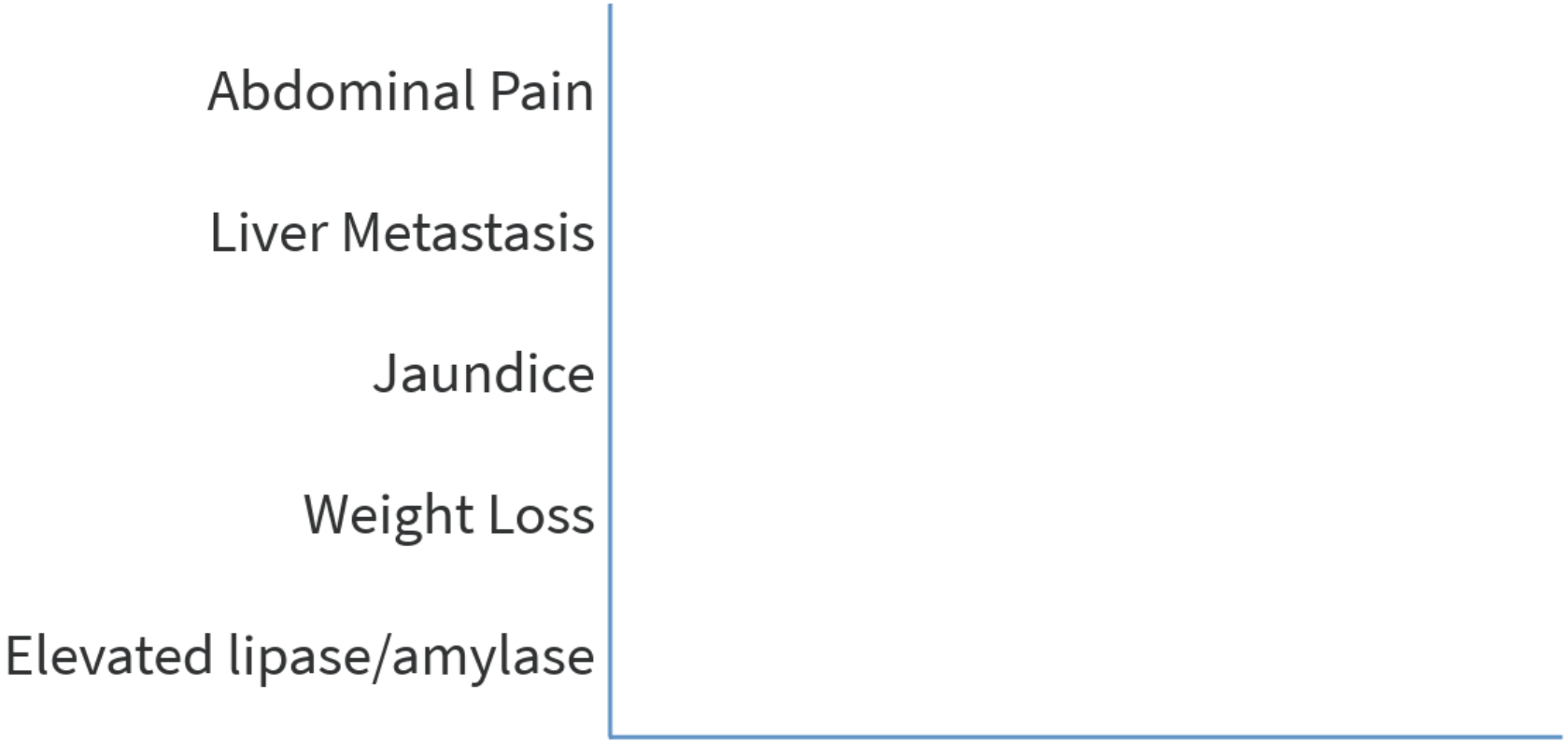
Low et al, Radiographics, 2011
Klein et al, Radiographics 1998

	Origin	Demographics	CT	MR
Acinar Cell Carcinoma	Acinar cells of ducts	Men > Women 5-7th decade	Large with solid and cystic components. Capsulated. Locally aggressive	Mixed T1 and T2 depending on degree of cyst/necrosis. Homogenous enhancement
IPMN	Epithelial cells within ducts	Men >> Women 6-7th decade	Branch- cluster of cysts Main – Focal or segmental dilation. Worrisome if cyst > 3cm or MDP > 6mm	Cysts are hyper T2. Nodules are T1&T2 hypointense. Worrisome if there is nodular enhancement
Solid Pseudopapillary Tumor	Genital-ridge epithelium	Women >> Men 2-3rd decade	Large, well circumscribed mixed solid and cystic. +Hemorrhage	Capsule/Solid component T1 hypo. Hemorrhage T1 hyper. Early peripheral enhancement
Serous Cystadenoma	Centroacinar epithelium	Women > Men 7th decade	Honeycomb with cluster of cysts<1cm Lobular contour Macrocystic/Unilocular Variant	Central scar T1&T2 hypo. Septa enhance. Hemorrhage is rare
Metastasis	RCC>lung> breast>sarcoma> colon> melanoma	~3 year interval to metastasis. RCC may take 6-12 years	Solitary lesion that is well marginated. RCC metastasis will be hypervascular.	Typically hypo T1 and iso-hyper T2. Enhancement will follow primary

The presentation of acinar cell carcinoma of the pancreas commonly includes all of the following EXCEPT:

When poll is active, respond at **PollEv.com/bdabiri525**

Text **BDABIRI525** to **37607** once to join



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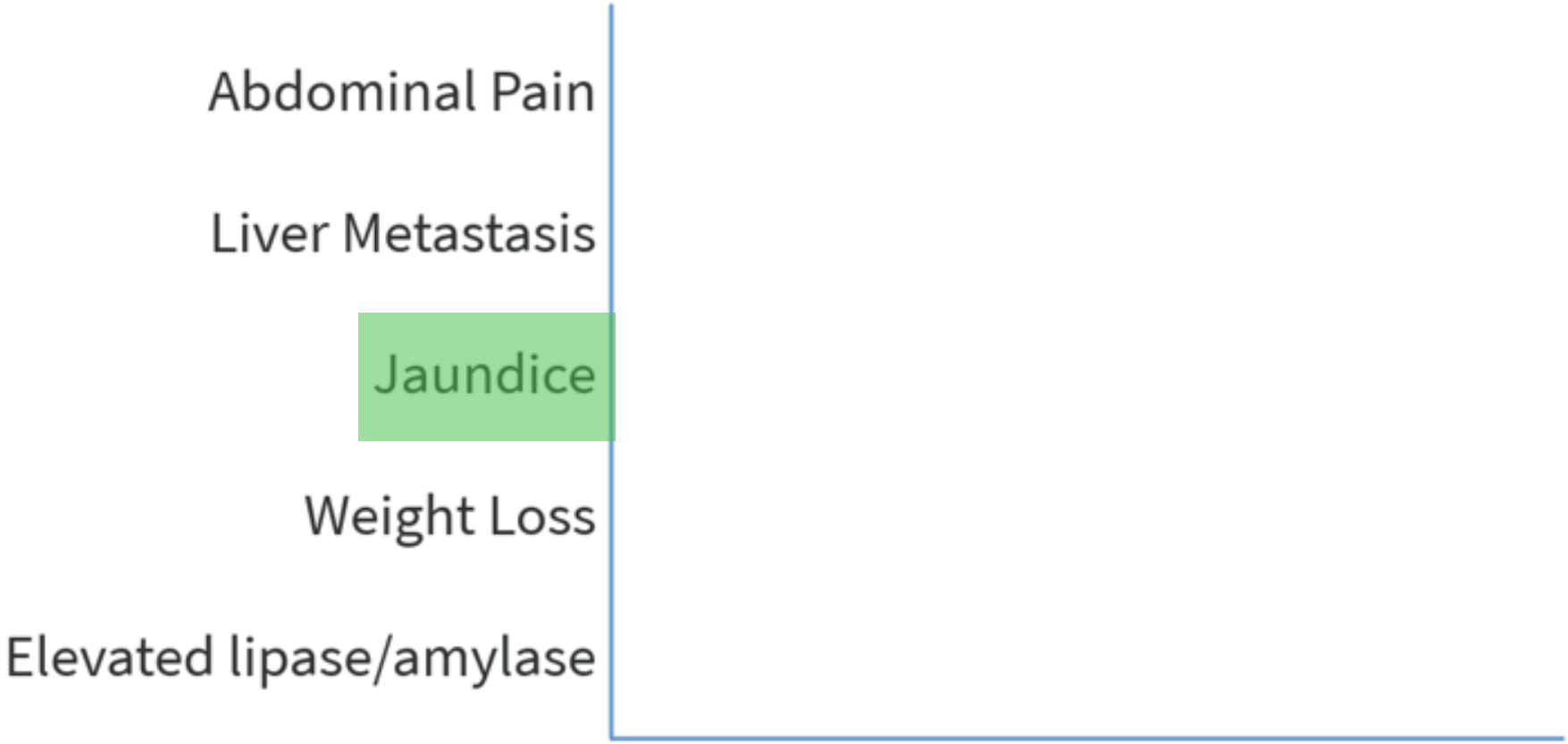

Ductal dilation in IPMN is caused by what mechanism?

Mass effect from neoplastic tissue obstructs outflow pancreatic duct

Mucin production causes dilation of the duct

Multifocal microcalcifications cause obstruction of the pancreatic duct

Relative atrophy of the pancreatic parenchyma creates ductal dilation

There is overstimulation of pancreatic exocrine function

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15% of Solid Pseudopapillary Tumors may undergo malignant transformation. Malignancy in SPT is most often associated with

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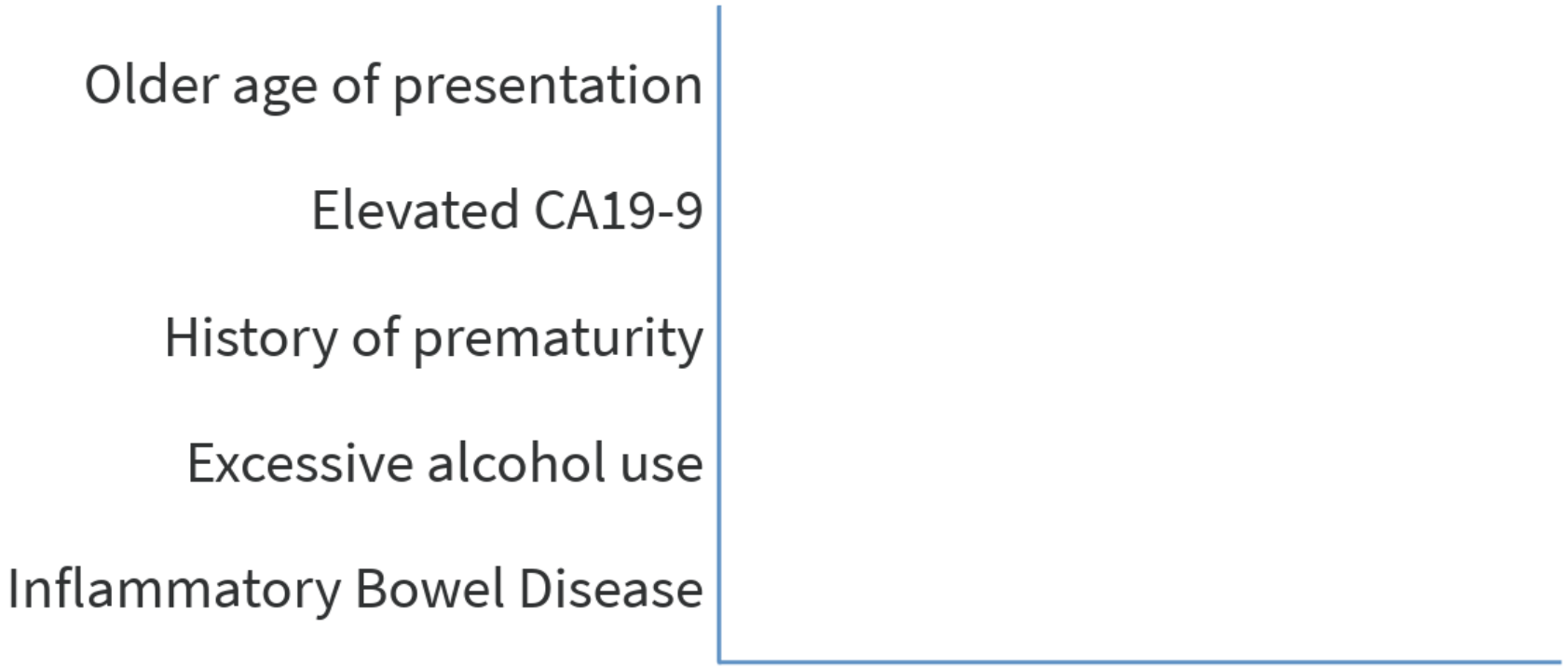

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- Older age of presentation
- Elevated CA19-9
- History of prematurity
- Excessive alcohol use
- Inflammatory Bowel Disease

Which of the following is associated with Von Hippel–Lindau disease?

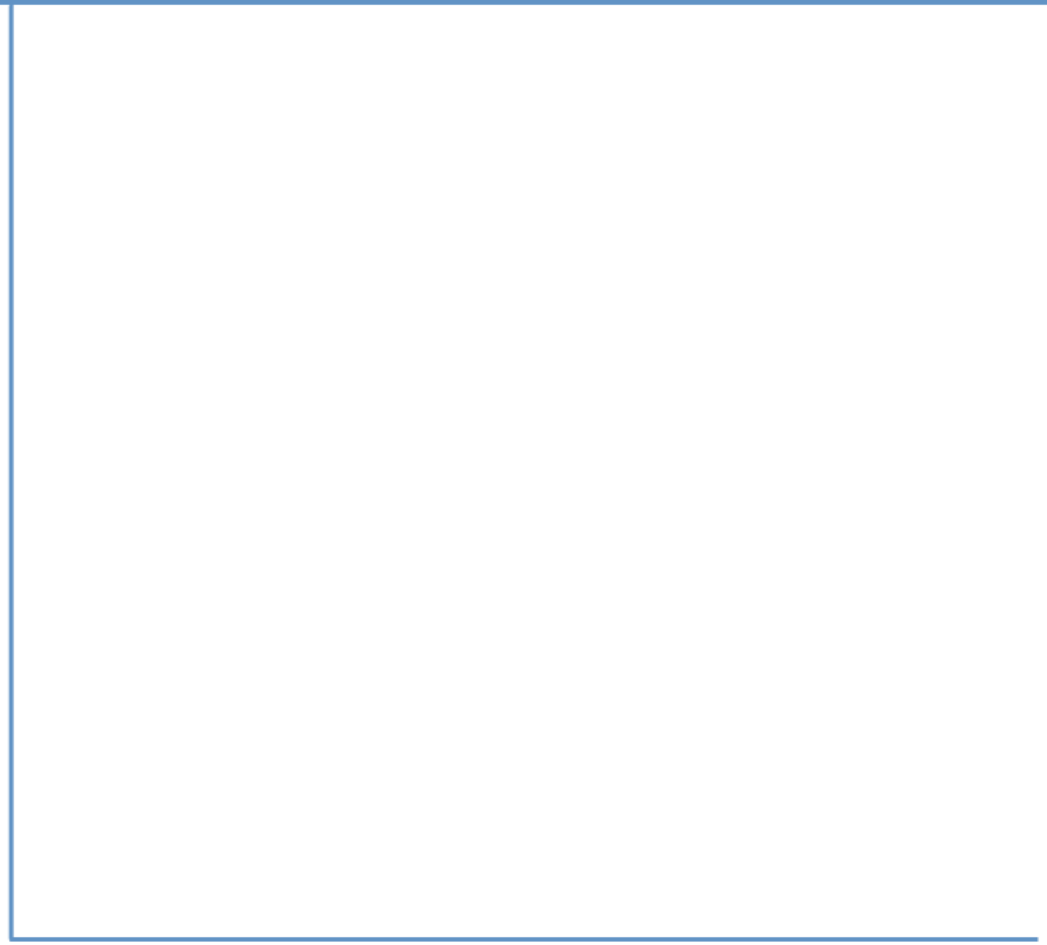
IPMN

Mucinous Cystadenoma

Acinar Cell Carcinoma

Solid Pseudopapillary Tumor

Serous Cystadenoma



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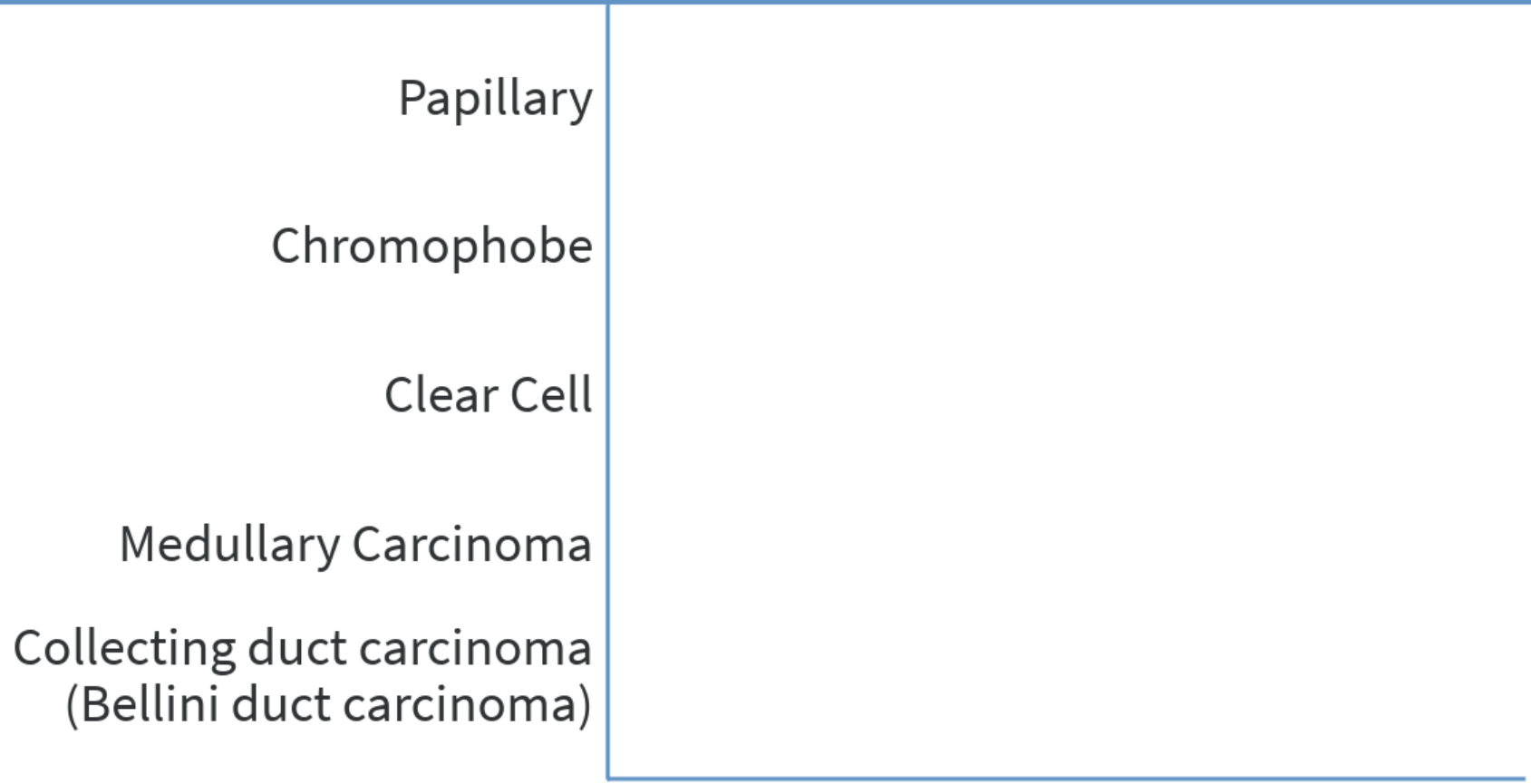
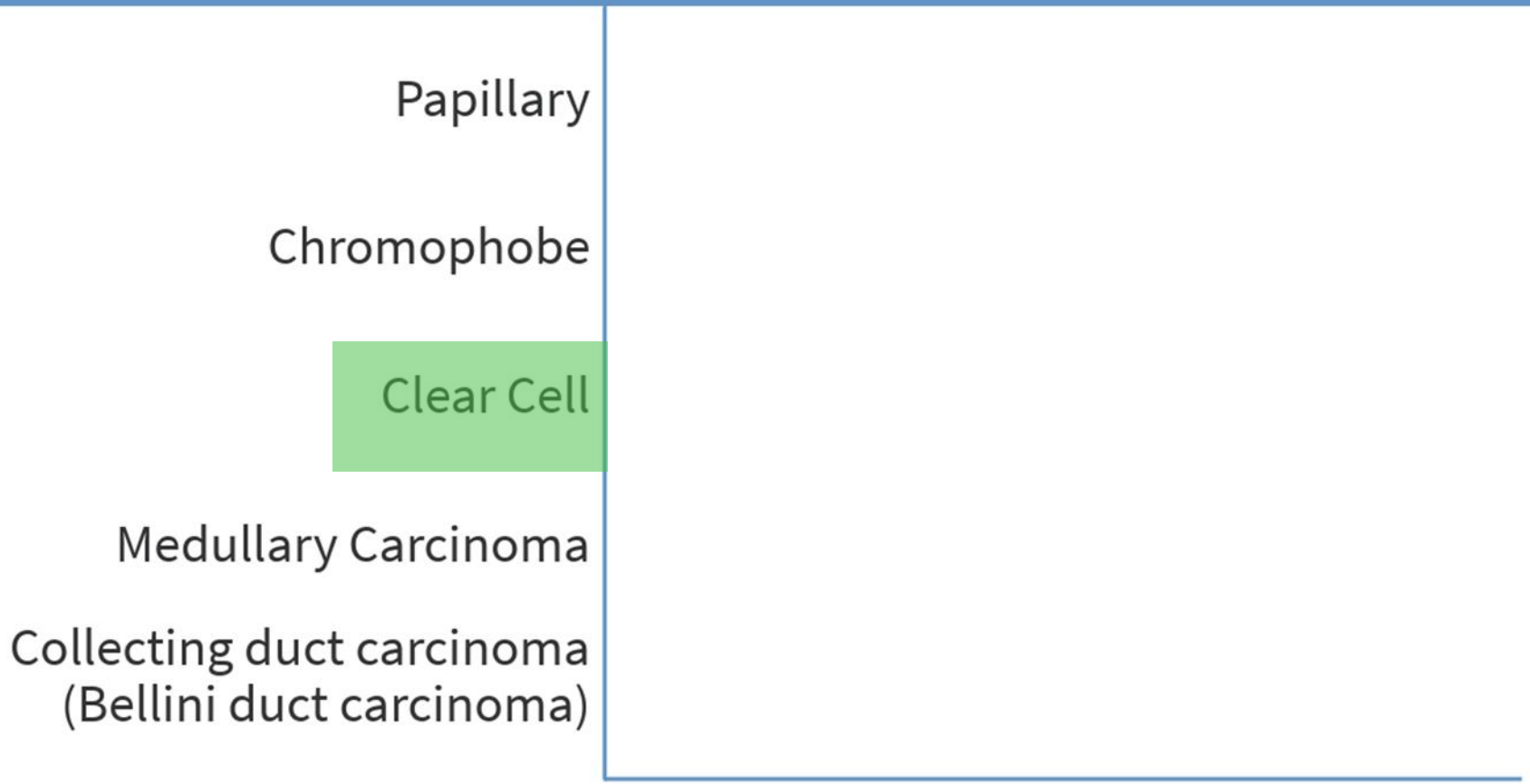
Solid Pseudopapillary Tumor

Serous Cystadenoma

RCC accounts for the majority of metastatic lesions to the pancreas. Which subtype of RCC is most likely to metastasize to the pancreas?



RCC accounts for the majority of metastatic lesions to the pancreas. Which subtype of RCC is most likely to metastasize to the pancreas?




Questions?

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