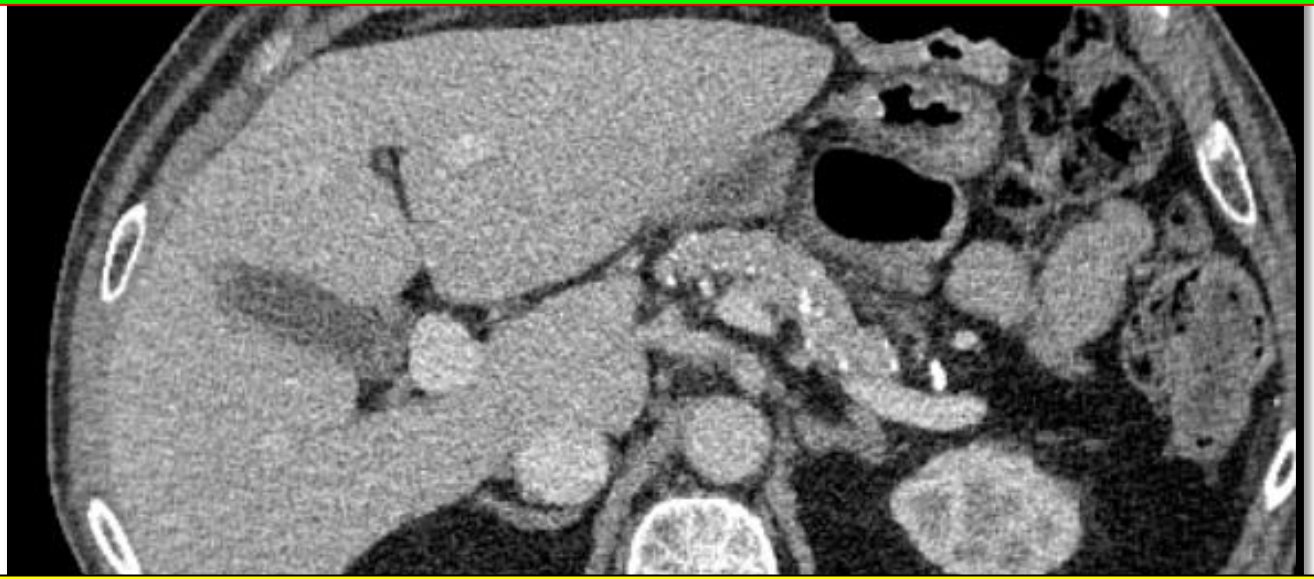
Epigastric Pain: the Pancreas



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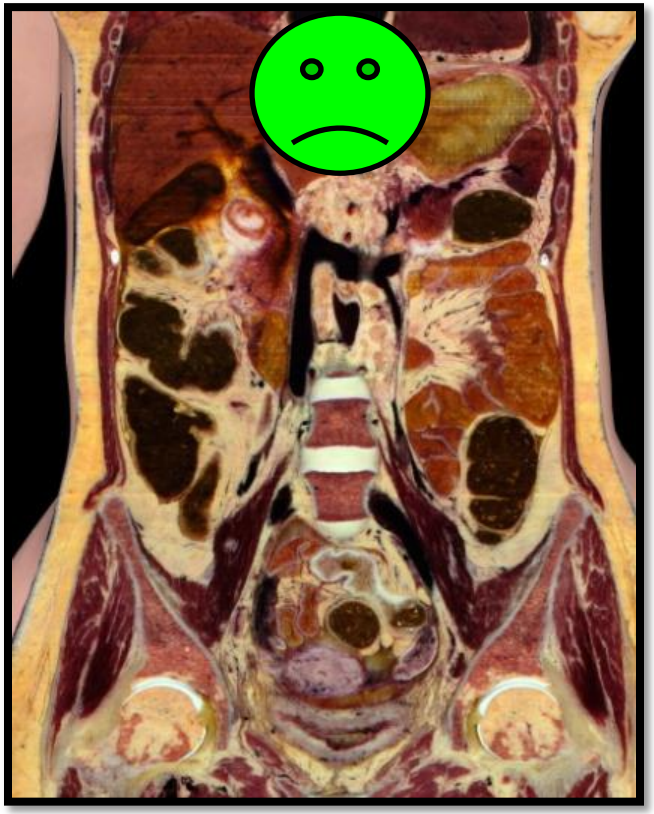
Epigastric Pain



Epigastric Pain

Gastro-duodenal

Pancreas

Honorable Mention:
Hepatobiliary
Vascular
Esophageal

Epigastric Pain

Gastro-duodenal

Gastritis
Ulcer
Neoplasm

Pancreas

Pancreatitis, acute
Pancreatitis, chronic
Neoplasm
(adenocarcinoma, neuroendocrine)

Epigastric Pain

Gastro-duodenal

Gastritis
Ulcer
Neoplasm

Pancreas

Pancreatitis, acute
Pancreatitis, chronic
Neoplasm
(adenocarcinoma, neuroendocrine)

What are the modifiers?

- Demographics/Risk Factors
- Clinical Presentation/Diagnostic Features
- Complications/Paraneoplastic syndromes
- Pathology

Epigastric Pain: Demographics/Risk Factors

Gastro-duodenal

Gastritis
Ulcer
Neoplasm

NSAIDs
H. pylori

Pancreas

Pancreatitis, acute
Pancreatitis, chronic
Neoplasm
(adenocarcinoma, neuroendocrine)

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Etoh, Stone,
Hypertriglyceridemia

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Etoh, Stone,
Hypertriglyceridemia

Pancreatitis, chronic

Neoplasm
AdenoCa
rine

Etoh: AST:ALT ratio (2:1); MCV ↑; GGTP ↑

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Etoh, Stone,
Hypertriglyceridemia

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Etoh: AST:ALT ratio (2:1); MCV ↑; GGTP ↑

Stone: symptoms after fatty meal

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Etoh, Stone,
Hypertriglyceridemia

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Etoh: AST:ALT ratio (2:1); MCV ↑; GGTP ↑

Stone: symptoms after fatty meal

Trigs > 1000 mg/dL: Which of the following would be the best initial rx?

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Etoh, Stone,
Hypertriglyceridemia

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Trigs > 1000: Which of the following would be the best initial rx?

Answer: Fibrates (clofibrate, fenofibrate, gemfibrozil)
MOA: upregulation of lipoprotein lipase; ↑ PPAR-α → ↓ VLDL (↑ HDL synthesis)

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Etoh, Cystic Fibrosis (CF)

Neoplasm
AdenoCa
Neuroendocrine

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Etoh, Cystic Fibrosis (CF)

Neoplasm
AdenoCa
Neuroendocrine

Etoh: repeated hospitalizations for abdominal pain

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Etoh, Cystic Fibrosis (CF)

Neoplasm
AdenoCa
Neuroendocrine

Etoh: repeated hospitalizations for abdominal pain

CF: Fat-soluble vitamin deficiency (steatorrhea)
- A – night vision (nyctalopia), skin dryness
- D – bone fragility fractures, hypocalcemia
- E – hemolysis, neuromuscular
- K – stigmata of ↑ PT/PTT: bruising/bleeding

Epigastric Pain: Demographics/Risk Factors

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

AdenoCa: Tobacco, Chronic Pancreatitis
Neuroendocrine (Gastrinoma, Insulinoma): FH MEN 1 (PTH, Pituitary)

Epigastric Pain

Gastro-duodenal

Gastritis
Ulcer
Neoplasm

Pancreas

Pancreatitis, acute
Pancreatitis, chronic
Neoplasm
(adenocarcinoma, neuroendocrine)

What are the modifiers?

- Demographics/Risk Factors
- Clinical Presentation/Diagnostic Features
- Complications/Paraneoplastic syndromes
- Pathology

Epigastric Pain: Clinical Presentation/Diagnostic Features

Gastro-duodenal	Pancreas
Gastritis Ulcer Neoplasm	Pancreatitis, acute Pancreatitis, chronic Neoplasm (adenocarcinoma, neuroendocrine)

- Bleeding (overt/IDA)
- EGD
- Microbiologic characteristics of H pylori

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pain → back

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pain → back

Lab: ↑ Amylase, Lipase

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Test	Result
Lipase	> 600 U/L

Test	Result
Amylase	1322 U/L

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pain → back

Lab: ↑ Amylase, Lipase

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Scoring Systems (Ranson's): used to predict severity and complications; these are NOT diagnostic features

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

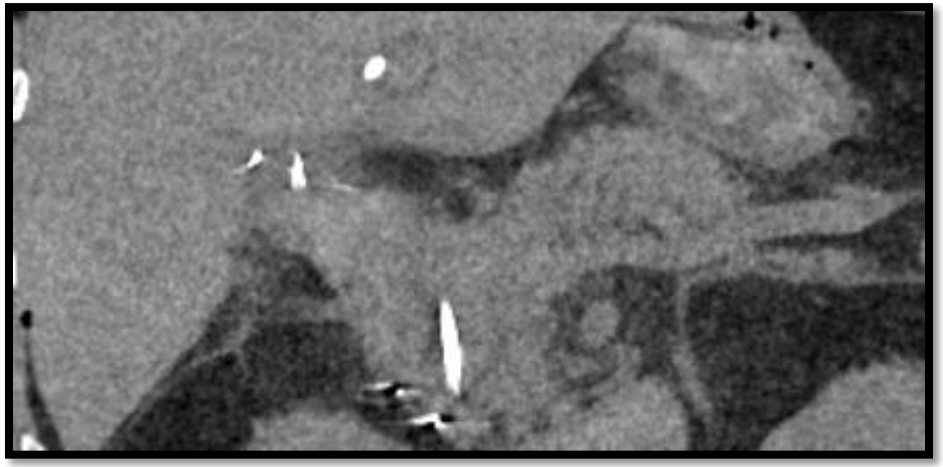
Pain → back

Lab: ↑ Amylase, Lipase

Imaging: CT, U/S

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine



Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

h/o pain → steatorrhea

Neoplasm
AdenoCa
Neuroendocrine

CF: Fat-soluble vitamin deficiency (steatorrhea)

A – night vision (nyctalopia), skin dryness
D – bone fragility fractures, hypocalcemia
E – hemolysis, neuromuscular
K – stigmata of ↑ PT/PTT: bruising/bleeding

A – Retinol, Carotene
D – 25-(OH)VitD
E - α-tocopherol
K – ↑ PT/PTT
B-12 level (tryptase → R-protein)
Fecal fat (qualitative → quantitative)
- Sudan stain (black or red)

Epigastric Pain: Clinical Presentation/Diagnostic Features

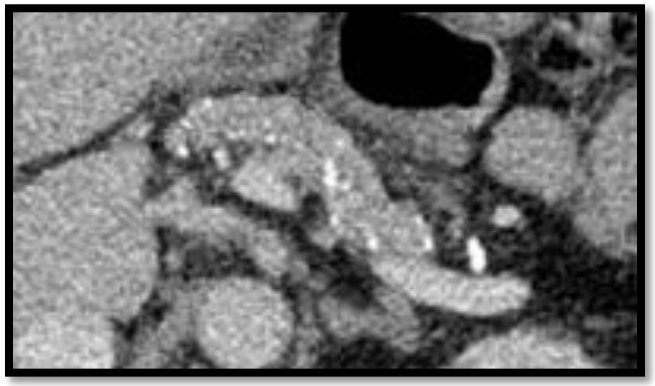
Pancreas

Pancreatitis, acute

Pancreatitis, chronic

h/o pain → steatorrhea

Imaging: AXR, CT



Neoplasm
AdenoCa
Neuroendocrine

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

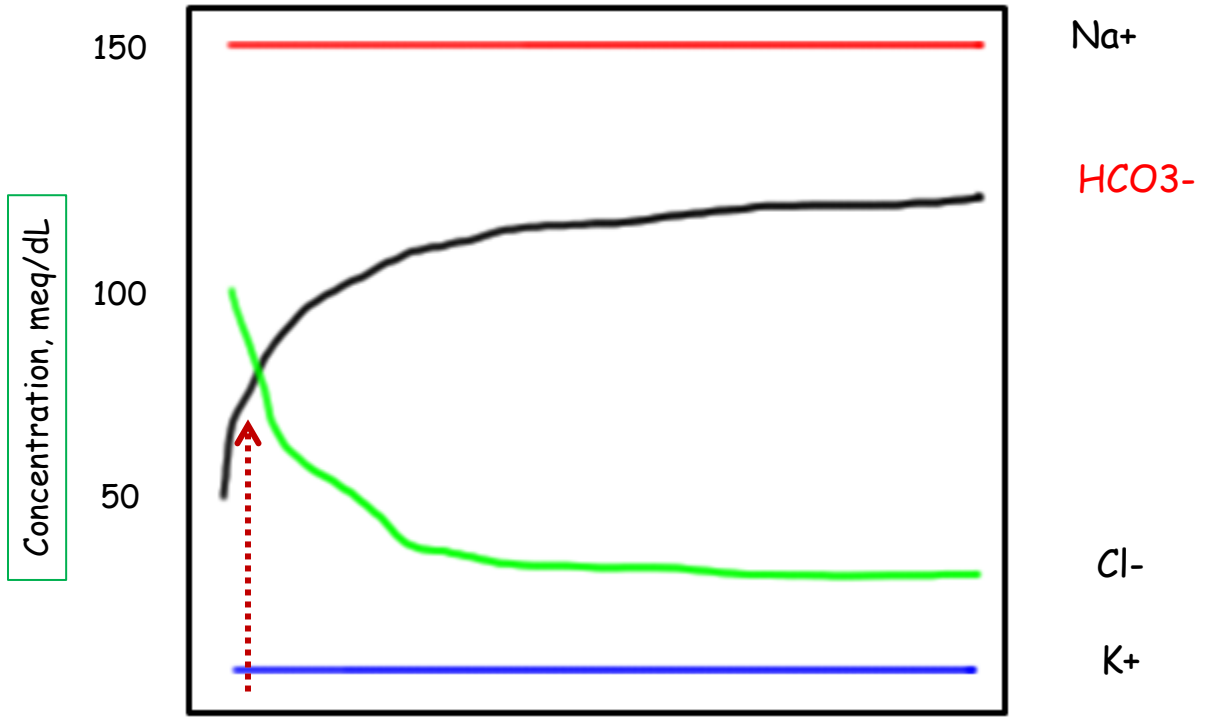
h/o pain → steatorrhea

Imaging: AXR, CT

Neoplasm
AdenoCa
Neuroendocrine

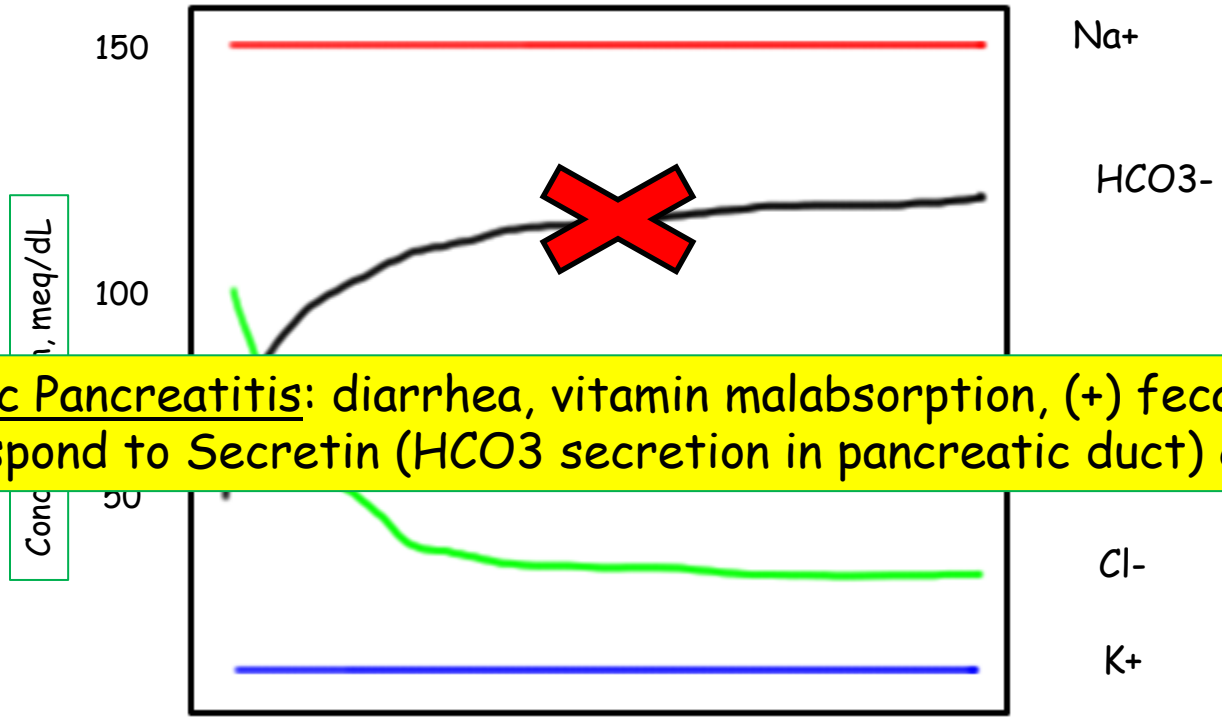
Provocative Test: Secretin Stimulation Test

Composition of Pancreatic Fluid



Secretin → Pancreatic HCO_3^- secretion
(S-cells of duodenum in response acidic chyme)

Composition of Pancreatic Fluid



Chronic Pancreatitis: diarrhea, vitamin malabsorption, (+) fecal fat
Failure to respond to Secretin (HCO3 secretion in pancreatic duct) confirms dx

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

AdenoCa:
Symptoms: Weight loss, (obstructive) jaundice ('acholic' stool)
Imaging (U/S, CT, MRI, ERCP, EUS): Pancreatic mass, (dilated ducts)
Labs: Φ

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

AdenoCa:
Symptoms: Weight loss, (obstructive) jaundice
Imaging (U/S, CT, MRI, ERCP/EUS): Pancreatic mass, (dilated ducts)
Labs: Φ
Labs: CA19-9 (serial assessment of established disease)

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Neuroendocrine: FH MEN 1 (Pancreas, PTH, Pituitary)

Gastrinoma: atypical ulcers (multiple, non-D1, refractory), diarrhea

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Neuroendocrine: FH MEN 1 (Pancreas, PTH, Pituitary)

Gastrinoma: atypical ulcers (multiple, non-D1, refractory), diarrhea

Labs: ↑ Gastrin (off PPI; Secretin stimulation → increases gastrin)

Imaging: Pancreatic mass (not gastric)

Test	Result
Gastrin, Serum	135 pg/mL

→

Test	Result
Gastrin, Serum	496 pg/mL

Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

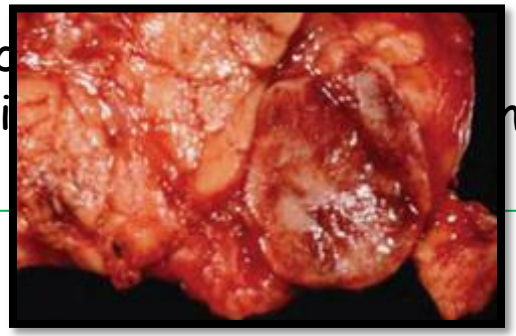
Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Neuroendocrine: FH MEN 1 (Pancreas, PTH, Pituitary)

Gastrinoma: atypical ulcers (multiple, non-D1, refrac
Labs: ↑ Gastrin (off PPI; Secretin stimulati n)
Imaging: Pancreatic mass (not gastric)



Epigastric Pain: Clinical Presentation/Diagnostic Features

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

Neuroendocrine: FH MEN 1 (Pancreas, PTH, Pituitary)

Gastrinoma: atypical ulcers (multiple, non-D1, refractory), diarrhea, ↑ gastrin
Insulinoma: hypoglycemia, elevated C-peptide
PTH: hyperCa^{+2}/low phosphate, stones, subperiosteal bone lesions
Pituitary: mass effect, s/s prolactinoma

Epigastric Pain

Gastro-duodenal

Gastritis
Ulcer
Neoplasm

Pancreas

Pancreatitis, acute
Pancreatitis, chronic
Neoplasm
(adenocarcinoma, neuroendocrine)

What are the modifiers?

- Demographics/Risk Factors
- Clinical Presentation/Diagnostic Features
- Complications/Paraneoplastic syndromes
- Pathology

Epigastric Pain: Complications/Paraneoplastic/Pathology

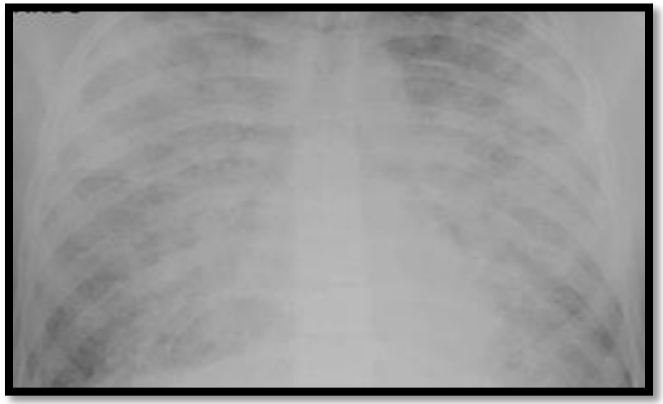
Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

ARDS/SIRS



Patient presents after Etoh binge with amylase of 500 U/L. 2 days later he is SOB and CXR obtained. Lung biopsy would reveal?

Epigastric Pain: Complications/Paraneoplastic/Pathology

Pancreas

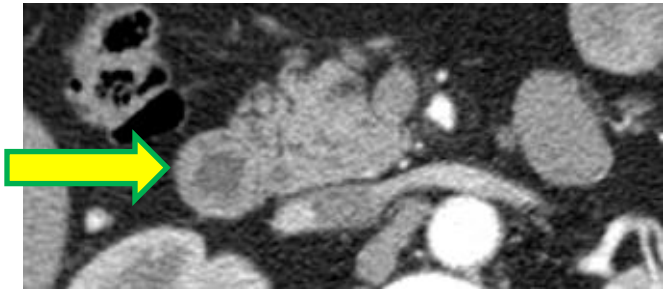
Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

ARDS/SIRS
Fat Necrosis: dystrophic calcification ('white chalky deposits')
Pseudocyst: granulation tissue and fibrosis; NO epithelial lining

Granulation Tissue



Epigastric Pain: Complications/Paraneoplastic/Pathology

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

<u>Neoplasm</u>
AdenoCa
Neuroendocrine

Exocrine dysfunction: Rx enzyme replacement
Endocrine dysfunction: Diabetes

Epigastric Pain: Complications/Paraneoplastic/Pathology

Pancreas

Pancreatitis, acute

Pancreatitis, chronic

<u>Neoplasm</u>
AdenoCa
Neuroendocrine

Exocrine dysfunction
Endocrine dysfunction: Diabetes
AdenoCa: weak association

Patient with s/s chronic pancreatitis is at risk of developing which of the following?

Epigastric Pain: Complications/Paraneoplastic/Pathology

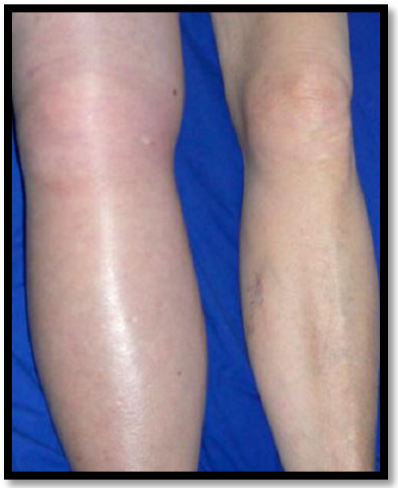
Pancreas

Pancreatitis, acute

Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

AdenoCa: Migratory Thrombophlebitis



Epigastric Pain: Complications/Paraneoplastic/Pathology

Pancreas

Pancreatitis, acute

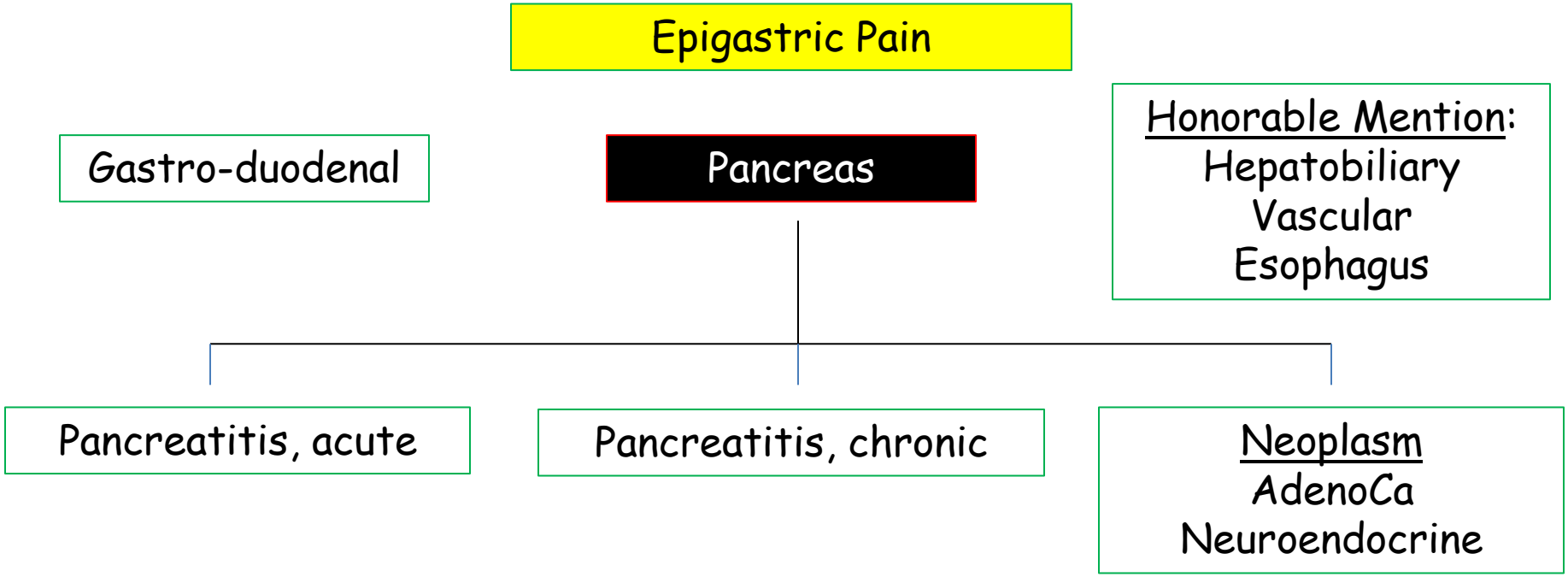
Pancreatitis, chronic

Neoplasm
AdenoCa
Neuroendocrine

AdenoCa: Migratory Thrombophlebitis

Other malignancies that will be presented with hypercoagulability:

- Polycythemia vera (Budd-Chiari, Portal Vein Thrombosis)
- Renal cell carcinoma (Renal Vein Thrombosis)



This is how USMLE uses modifiers to get you to the promised land?

- Demographics/Risk Factors
- Clinical Presentation/Diagnostic Features
- Complications/Paraneoplastic syndromes
- Pathology

the Index Cards

Me: Take Less Notes, Not More…

Student: What is the material I need to know???

Acute Pancreatitis

- Demographics/Risk Factors
  - Etoh, Stone, Hypertriglyceridemia
- Clinical Presentation/Diagnostic Features
  - Epigastric pain radiating to back
  - Data:
    - Lab: ↑ Amylase/Lipase
    - Imaging: CT/US
- Complications/Pathology
  - ARDS/SIRS: organ failure
  - Fat necrosis (with calcifications: 'chalky deposits')
  - Pseudocyst: no epithelial lining (granulation tissue)

Chronic Pancreatitis

- Demographics/Risk Factors
  - Etoh, Cystic Fibrosis
- Clinical Presentation/Diagnostic Features
  - h/o recurrent epigastric pain → steatorrhea
  - Data:
    - Lab: Manifestations of Fat-Soluble Vitamin Deficiency
      - (+) fecal fat
    - Imaging: AXR/CT – calcifications
    - Provocative Testing: Secretin Stimulation (failure of $HCO3^-$)
- Complications/Pathology
  - Endocrine failure: Diabetes
  - Exocrine failure: Rx with pancreatic enzymes

Pancreas, Neoplasm

- Demographics/Risk Factors
  - AdenoCa: Tobacco, Chronic Pancreatitis
  - Neuroendocrine: FH MEN-1
- Clinical Presentation/Diagnostic Features
  - AdenoCa: wt loss, obstructive jaundice (acholic stool)
    - Imaging: Multimodality (U/S, CT, MRI, ERCP)
    - Labs: serial assessment CA19-9 (not diagnostic test)
  - Neuroendocrine: atypical ulcers (gastrinoma), hypoglycemia (insulinoma)
    - Labs: Gastrin, C-peptide (MEN-1: PTH, Pituitary)
      - Provocative Test: Secretin Stimulation
    - Imaging: CT
- Complications/Pathology
  - AdenoCa: Migratory Thrombophlebitis

Epigastric Pain: the Pancreas

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