Hepato-Pancreato-Biliary Surgical Oncology: Cases and Pearls

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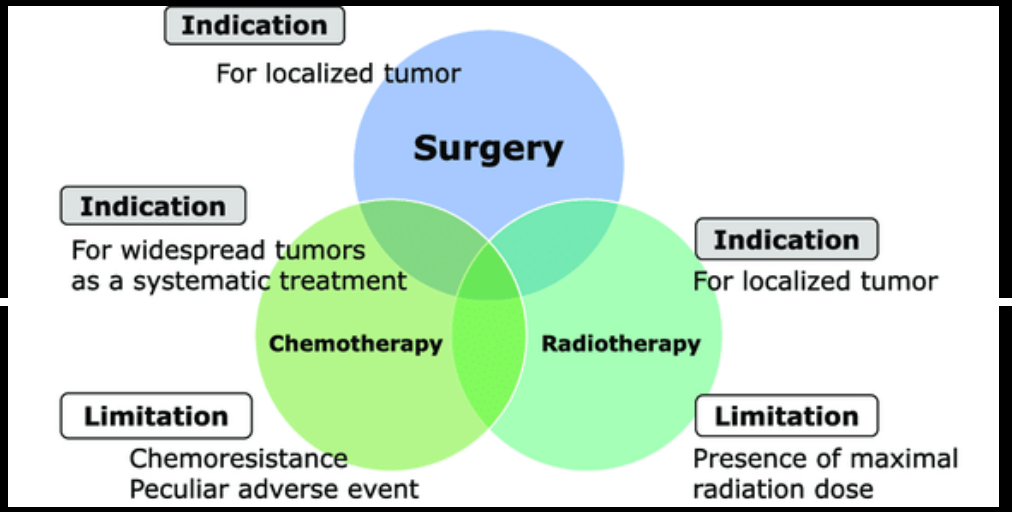
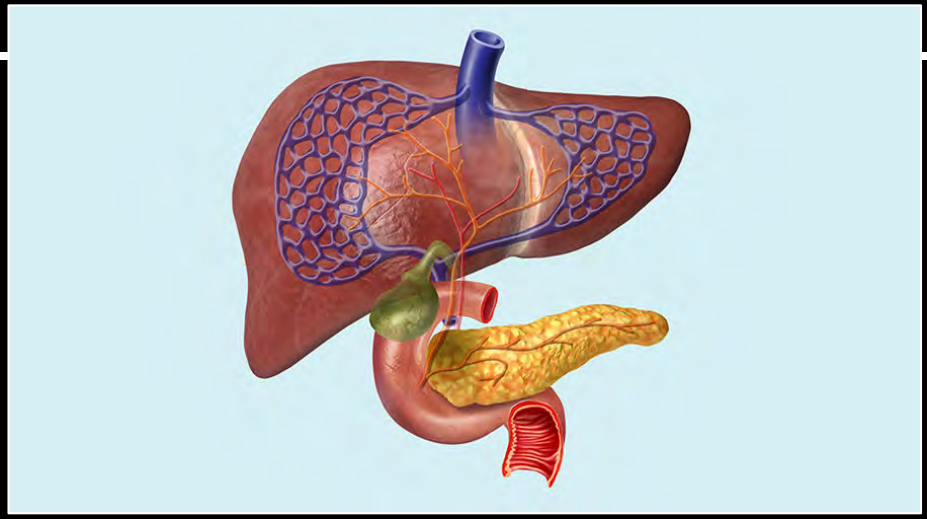


Outline/Objectives

- Think like a surgeon
- Case-based approach
- Medical pearls
- Cues to help you in practice

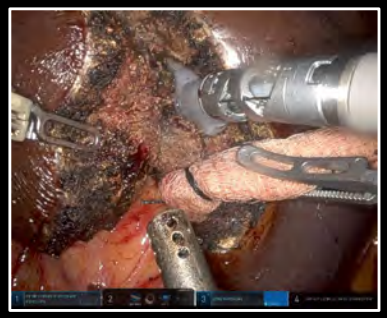
HPB Oncology

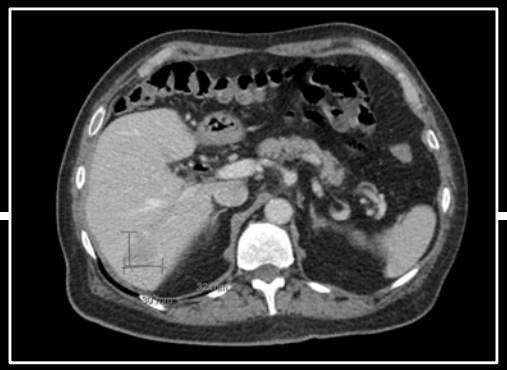


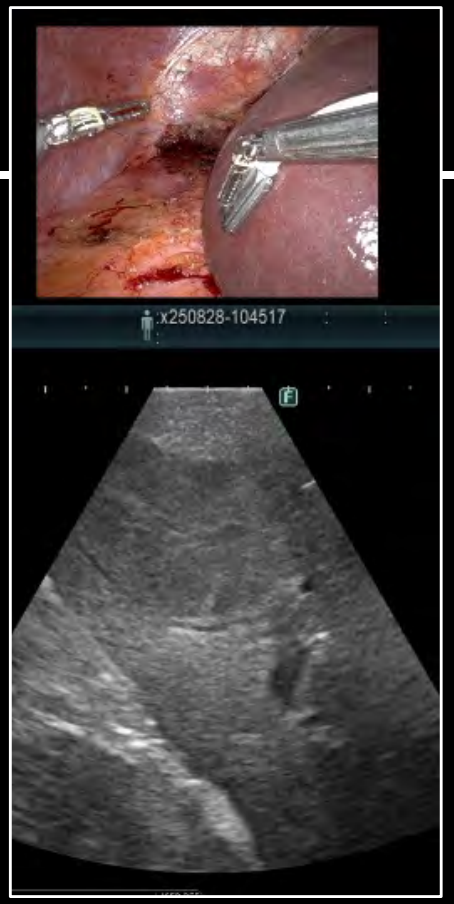
- Liver
  - Hepatocellular Carcinoma
  - Biliary tract cancer
  - Colorectal metastasis
- Pancreas
  - Pancreatic cancer
  - Pancreatic neuroendocrine tumor
  - IPMN
  - Other pancreatic malignancies
- Biliary (see BTC…)

Case #1

- 77m evaluated for UTI
- ‘Gangrenous cholecystitis’
- Liver mass
- Biopsy => HCC
- No history of liver disease
- Robotic liver resection







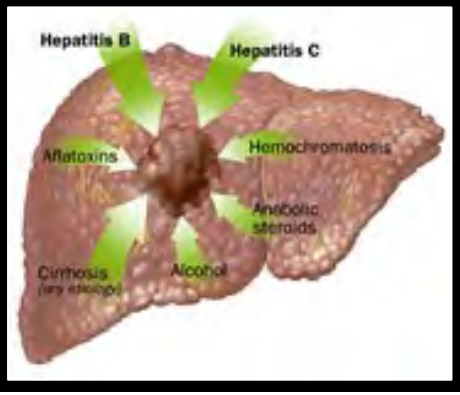
Hepatocellular Carcinoma

- Cirrhotic (more common) or sporadic
- Hep B/C and EtOH cirrhotics are susceptible, but biology different
- Therapy
  - Resection (if possible) – may need medical optimization
  - Liver-directed (TACE, TARE, Ablation)
  - Transplant (best for cirrhotics!) – strict selection criteria (Milan/UCSF)
  - Systemic

    Sorafenib – old school, limited benefit

    Atezo/Bev – new, much more impressive benefit[1]

    Other biologics



1. Finn, RS et al. *NEJM* 2020.

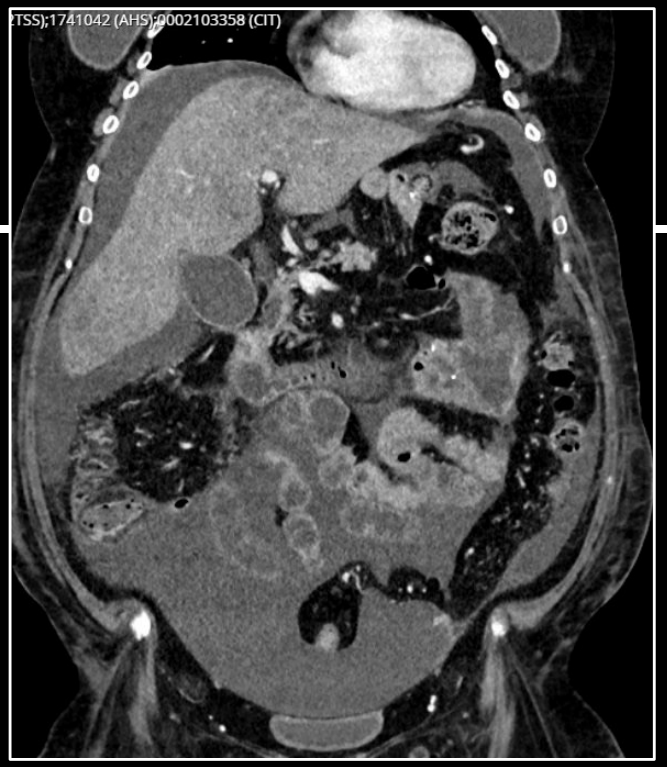
Li-RADS

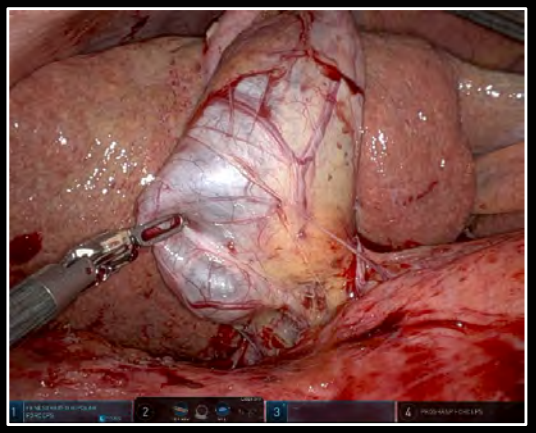
- Radiologic scoring system for risk of liver lesion
- Applies only in cirrhotic pts
- Requires multiphase imaging
- Assess size, growth, washout, pseudocapsule, vascular involvement
- LR 1 => Definitely benign. No biopy, no observation.
- LR 2 => Probably benign, but should observe.
- LR 3 => Could be malignant, could biopsy vs. resect.
- LR 4 => Probably malignant, treat if reasonable, bx if not
- LR 5 => Definitely malignant, treat without biopsy

https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Reporting-and-Data-Systems/LI-RADS

Case #2

- 51F with EtOH Cirrhosis
- SBP, gallbladder thickening
- Tbili 2.6, Cr 1.4, INR 1.1
- MELD 13, CP-A
- PLT 260





Surgery in Cirrhotics

- MELD score for mortality risk
- INR – often a reflection of liver fx, not coagulopathy
- TEG – functional coagulation assay
- PLT – drops due to portal HTN / splenomegaly
- Optimization – diuretics, EtOH cessation
- Indication/Risk

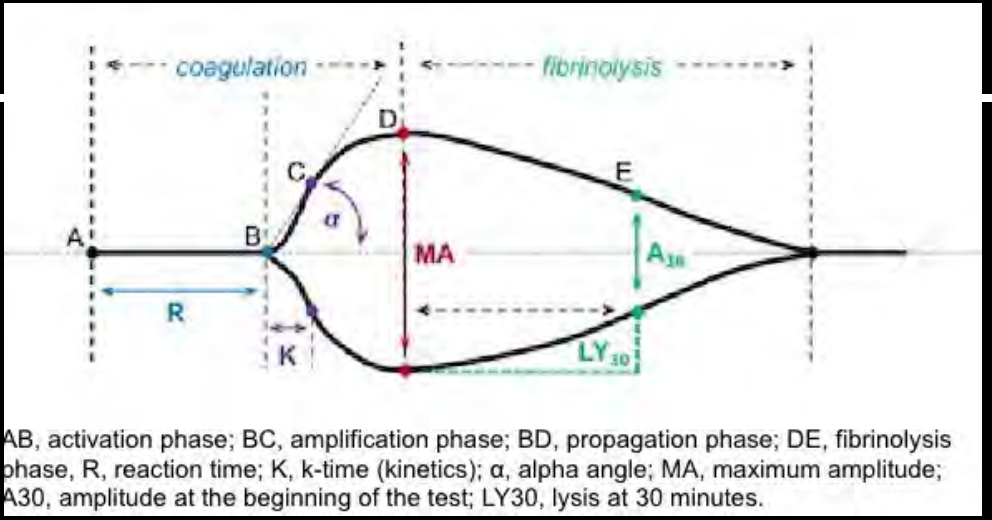
MELD Score

- Goes from 8-40
- Basic version: Cr, bili, INR
- More recently, Na, Albumin
- Allows triage for transplant wait list
- Useful to understand perioperative mortality risk
- MELD 40 - >70% 3 month all-cause mortality

Kamath PS et al., *Hepatology* 2001.

TEG/ROTEM

- Functional, POC, real-time coagulation assay
- Measures force vs. time
- Allows directed-correction of underlying coagulopathy
- Use of TEG in Cirrhotics reduces blood product utilization[1]



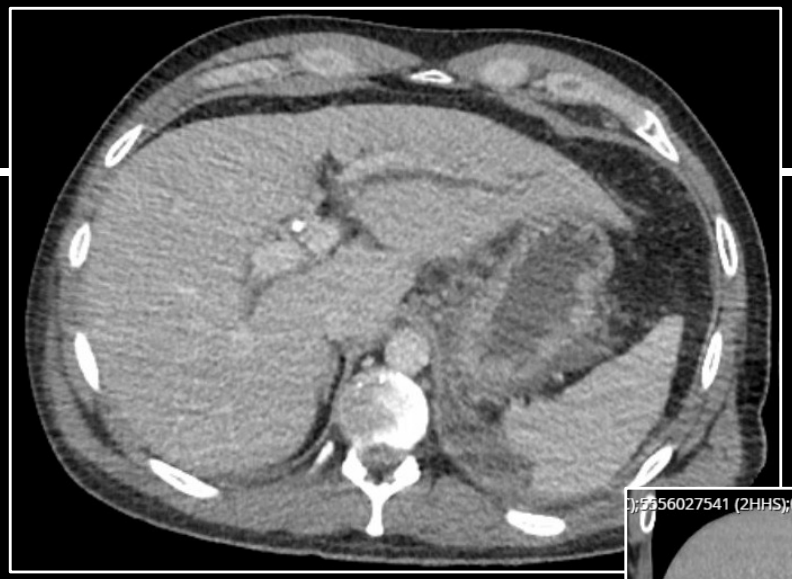
AB, activation phase; BC, amplification phase; BD, propagation phase; DE, fibrinolysis phase, R, reaction time; K, k-time (kinetics); α, alpha angle; MA, maximum amplitude; A30, amplitude at the beginning of the test; LY30, lysis at 30 minutes.

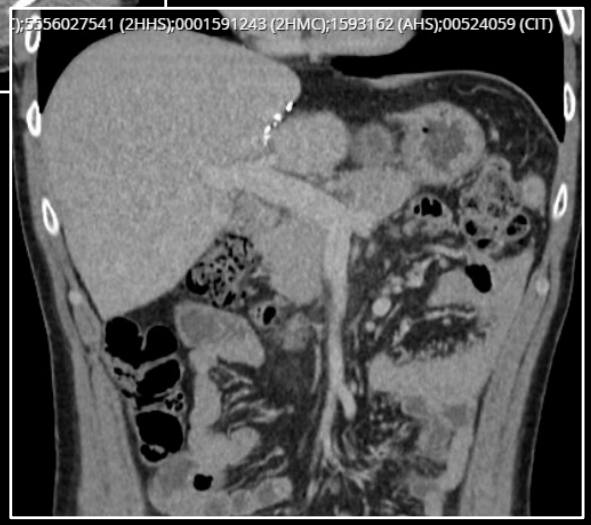
TEG	ROTEM	Description	Normal	Abnormality: Cause	Treatment
Reaction Time (R value)	Clotting Time (CT)	Time till initiation of fibrin clot formation	5 - 10 min	↑ R value: ↓ factors	FFP protamine
K value	Clot Formation Time (CFT)	Time to achieve 20 mm clot on assay representing thrombin-platelet interaction	1 - 5 min	↑ K/CFT value: ↓ fibrinogen	Cryoprecipitate Fibrinogen
α-angle	α-angle	Rate at which fibrin cross-linking occurs	45 - 75°	↓ α angle: ↓ fibrinogen	Cryoprecipitate Fibrinogen
Maximum Amplitude (MA)	Maximum Clot Firmness (MCF)	Maximum strength of clot	50 - 75 mm	↓ MA/MCF: ↓ platelet count and/or function	Platelets DDAVP
LY-30	Clot Lysis (CL)	Degradation of clot 30 minutes after MA/MCF	0 - 10%	↑ LY-30/CL: ↑ clot breakdown	TXA Amicar

1. De Pietri, L et al., *Hepatology* 2016.

Case #3

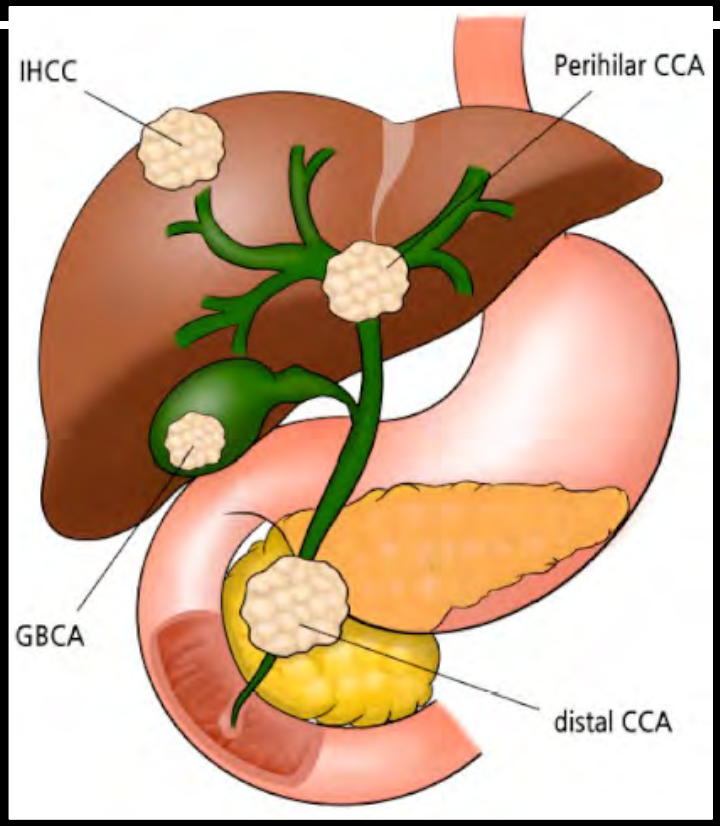
- 36M with biliary obstruction
- Right PTBD
- Perihilar mass + stricture
- L Triseg, bile duct resection, RNY HJ
- 2 yrs out





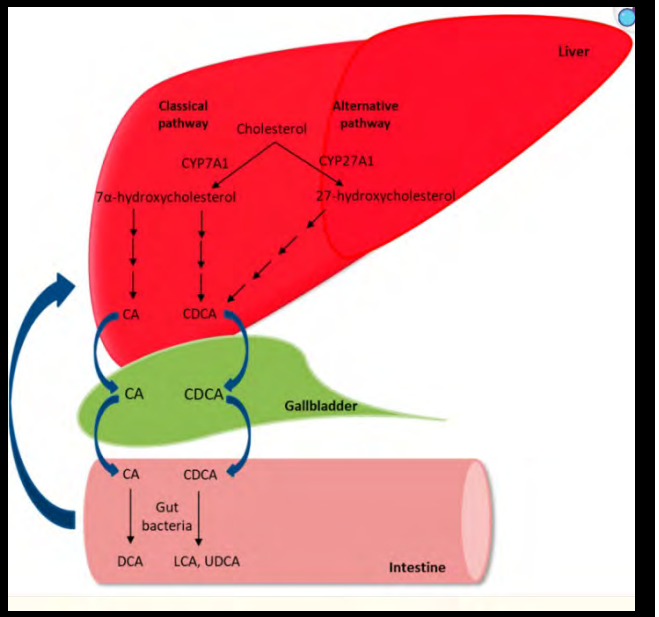
Biliary Tract Cancer

- Catch all term includes cholangiocarcinoma, gallbladder cancer
  - Intrahepatic, Perihilar, Distal/Mid-Duct
- Biology quite different from site-to-site
- Systemic therapy outcomes poor (ABC-02)
- Resection when possible
  - Intrahepatic – hepatectomy
  - Perihilar – hepatectomy, bile duct resection, lymphadenectomy OR transplant
  - Distal / Mid-Duct – bile duct resection +/- Whipple
- PSC linkage



Nutrition

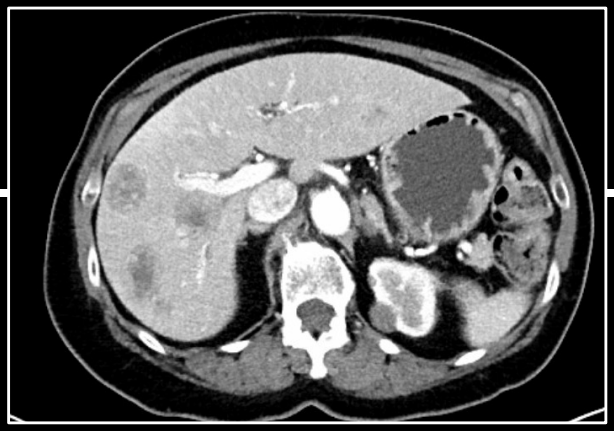
- Vitamin K – fat soluble vitamin
  - Absorbtion impaired in biliary obstruction
  - Often deficient in cholestatic liver disease
  - Replenishment associated with improved outcomes
  - INR often a marker of underlying nutrition status, not coagulopathy
- Cachexia/Sarcopenia – assess on exam
- Nutrition support
  - RD Consultation
  - Supplemental nutrition – TF/TPN

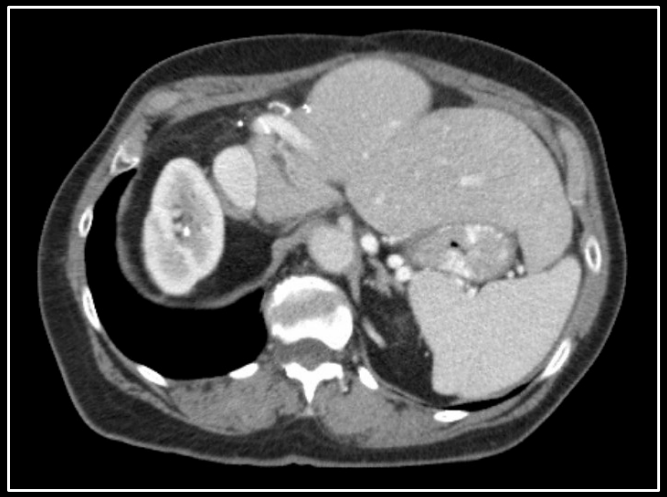


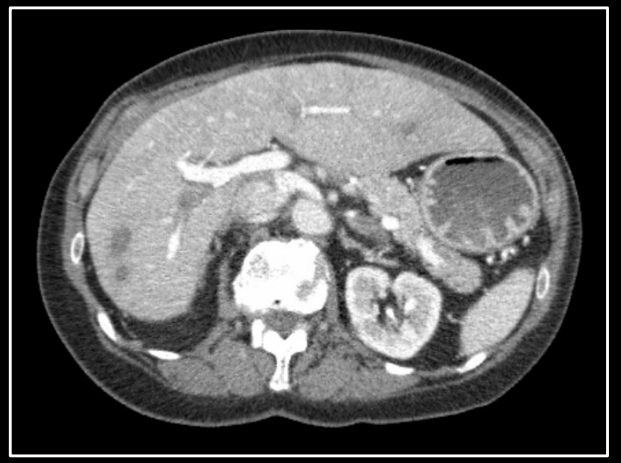
Sultana, H. et al. *Nutrients.* 2021.

Case #5

- 69F Smoker
- Left Colon Ca (pT4aN1aM1)
- 9 cycles FOLFOX+ Panitumumab
- ALPPS
- 2-yrs disease free





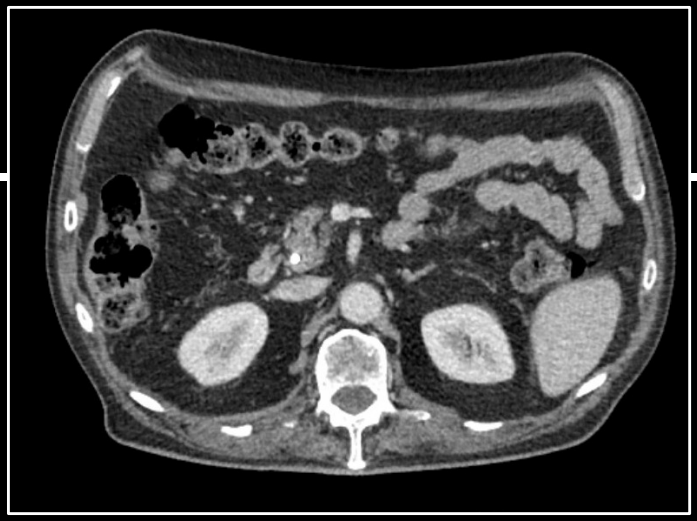


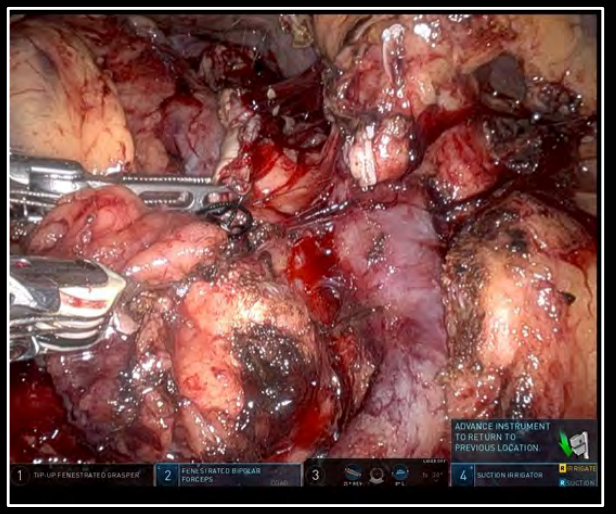
Colorectal metastasis

- Stage IV disease, but relatively indolent biology compared to most HPB malignancies (eg CCA, PDAC)
- Good systemic control options (FOLFOX +/- biologic, dependent on mutational status)
- Resection if possible to remove all disease
- Unresectable – systemic therapy vs. liver-directed
  - Hepatic Artery Infusion Pump
  - Ablation (not ideal)
  - Transplant (protocol only, highly selective)

Case #6

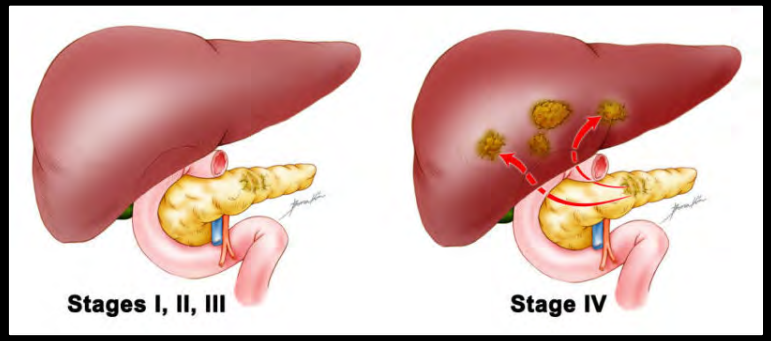
- 81M Obstructive jaundice
- Weight loss
- EGD/ERC periampullary mass ‘adenocarcinoma with neuroendocrine features’
- pT1cN0 adenocarcinoma
- Margins negative





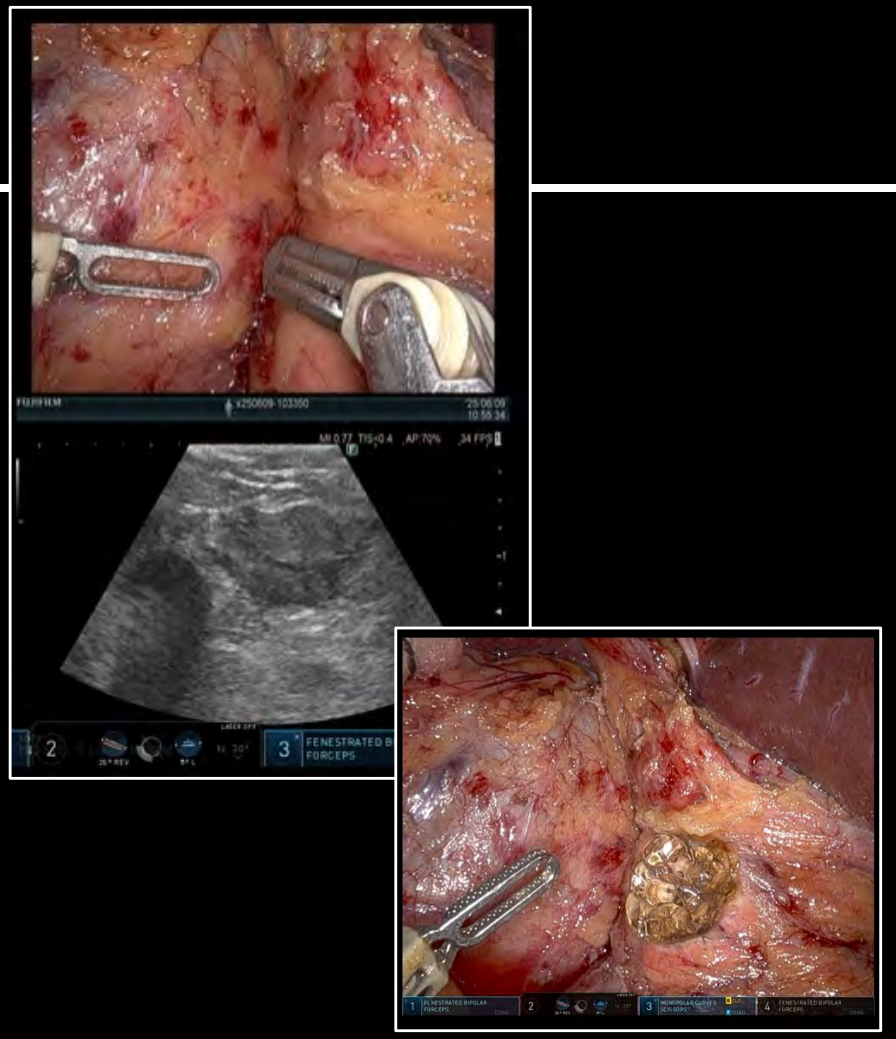
Pancreatic Cancer

- Biologically aggressive, propensity for early metastatic spread
- Chemotherapy will prolong survival in 100% of patients
- Surgery is only potential cure with possibility of long-term survival
- 75% of patients will be either locally advanced or unresectable at presentation
- Resection outcomes are all about **patient selection**
  - Anatomy
  - Biology
  - Condition



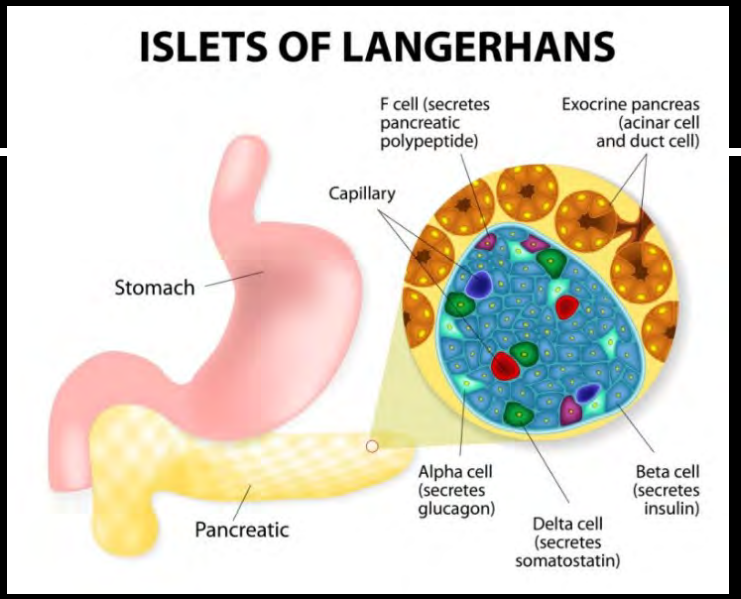
Case #7

- 38M truck driver
- Passed out driving
- Found to be hypoglycemic
- Exhaustive workup
- 7mm pancreatic head nodule
- Robotic enucleation



Whipple's Triad

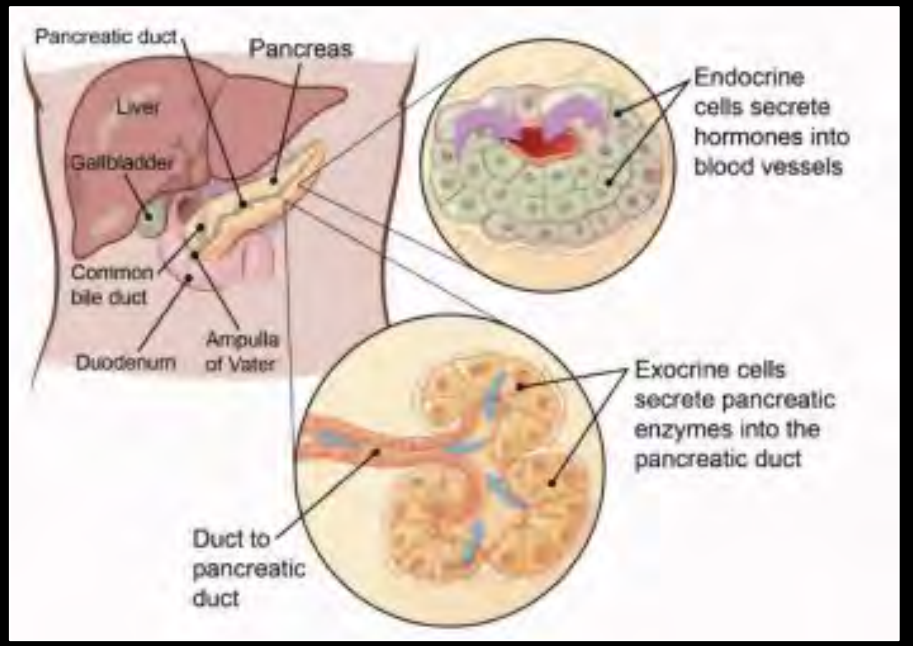
- Hypoglycemia
- Causes Symptoms
- Resolves with sugar



- Pathognomonic for insulinoma

Pancreatic Neuroendocrine Tumor (PNET)

- Tumor of endocrine pancreas, relatively rare
- Relatively indolent
- 90% non functional, but functional can secrete hormones
  - Insulin
  - Gastrin
  - Glucagon
  - VIP
  - Somatostatin
- Tend to spread to liver
- Carcinoid syndrome +/- carcinoid heart disease
- Debulking can ‘reset the clock’ but almost always will come back
- Systemic therapy aimed at symptom control and suppression of progression

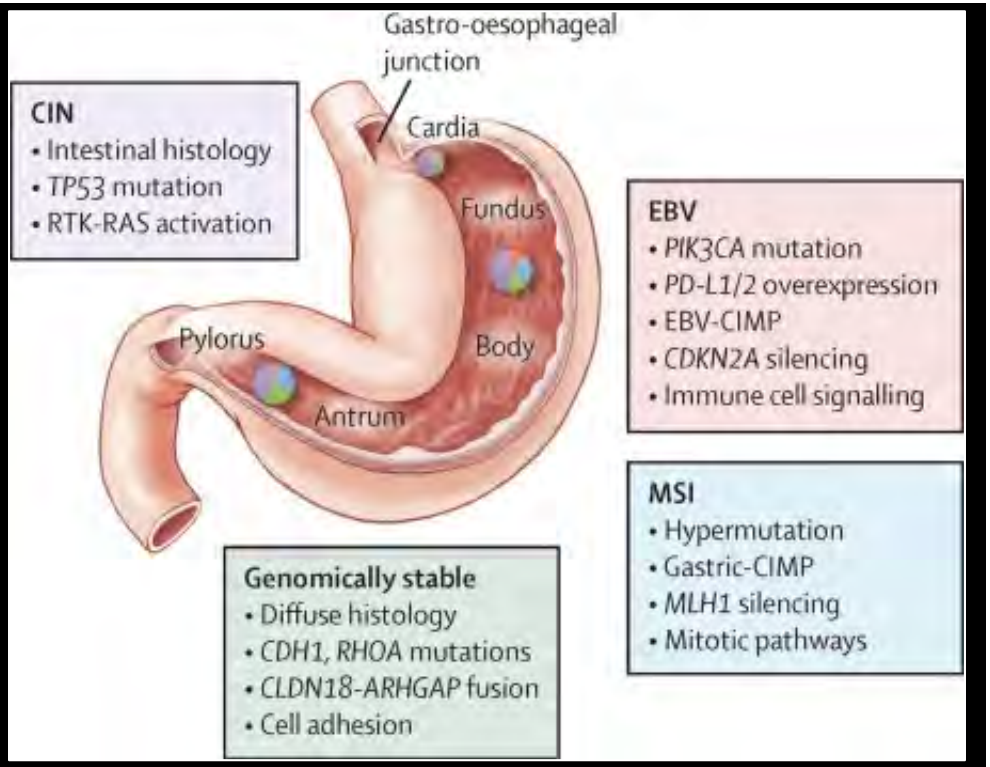


Case #8

- 50F hx breast ca
- Genetic testing
- CDH1 Mutation
  - Autosomal Dominant
  - 100% lifetime risk of gastric Ca
- Robotic prophylactic total gastrectomy

Gastric Cancer

- Biologically aggressive, high chance of peritoneal metastatic spread
- A/W smoking, drinking, acid hypersecretion, ulcers
- Can obstruct gastric outlet, create severe malnutrition
- T2+ N1+ => Perio-operative chemo (FLOT)
- Intestinal vs. Diffuse type (Linitis Plastica)
- Resection with big margins ~15cm historically
- D2 lymphadenectomy
- 4 Genomic subtypes, different genetics, response to therapy

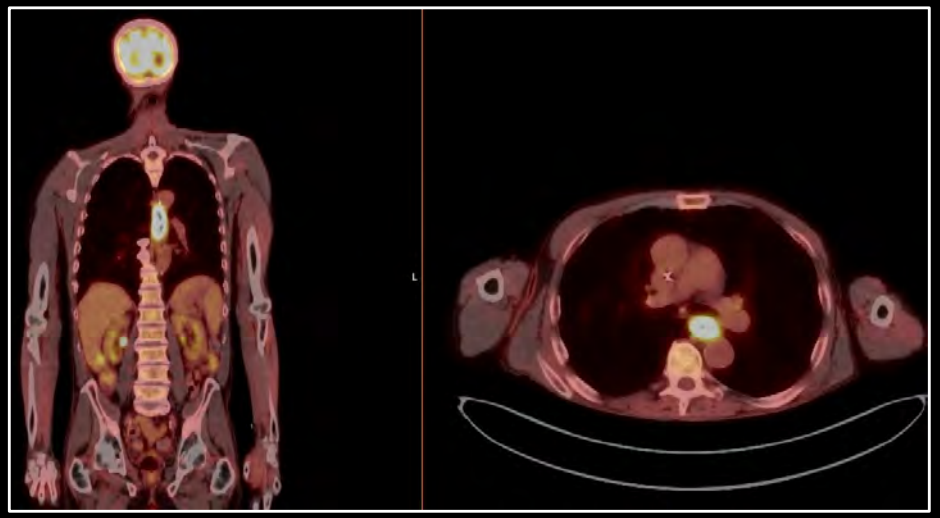


Genetic Evaluation/Counseling

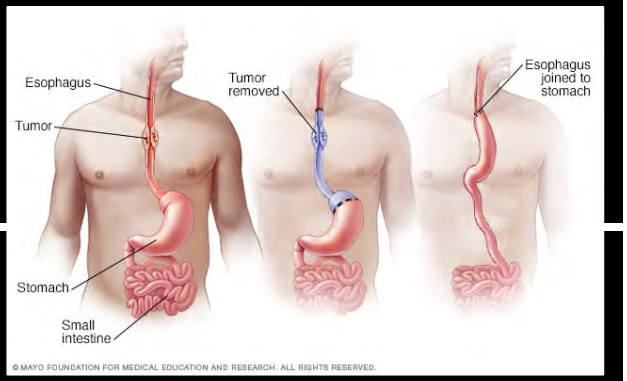
- Indicated for all cancer pts
- Significant genetic-associated risk
  - BRCA => Breast/Ovarian
  - CDH1 => Stomach
  - FAP/Lynch => Colon
- Prophylactic risk-reduction surgery
- Genetic screening/counseling/testing referral

Case #9

- 70M smoker with dysphagia
- 50 lbf weight loss
- EGD => occlusive mid-esophageal mass
- EUS => cT3N1 Squamous carcinoma, 28-34cm
- Neoadjuvant combined-modality
- Robotic McKeown (3-field) esophagectomy
- Anastomotic leak, managed with endo-vac
- ypT1aN0 (near-complete response)



Esophageal Cancer



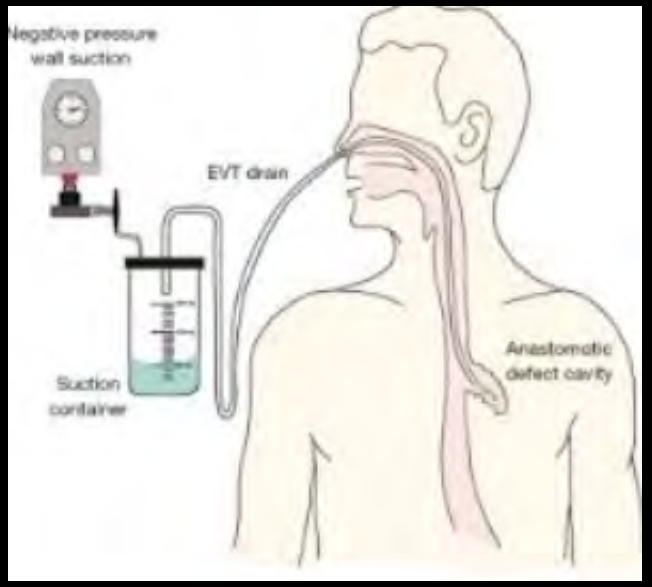
- Adenocarcinoma (reflux)
- Squamous carcinoma (smoking/drinking)
- Resection strategy depends on location (mid, distal, GEJ)
  - Ivor-lewis
  - Transhiatal
- Combined abdominothoracic surgical approach
- Neoadjuvant carboplatin/paclitaxel + radiation
- Will need jejunal feeding access in case of anastomotic leak (high risk)

Nutrition support

- Dietitian evaluation
- Weight loss assessment
- Physical exam – temporal wasting, sarcopenia
- Micronutrient/macronutrient deficiency – lab tests
- Plan for nutrition support at beginning of treatment

Salvage after anastomotic leak

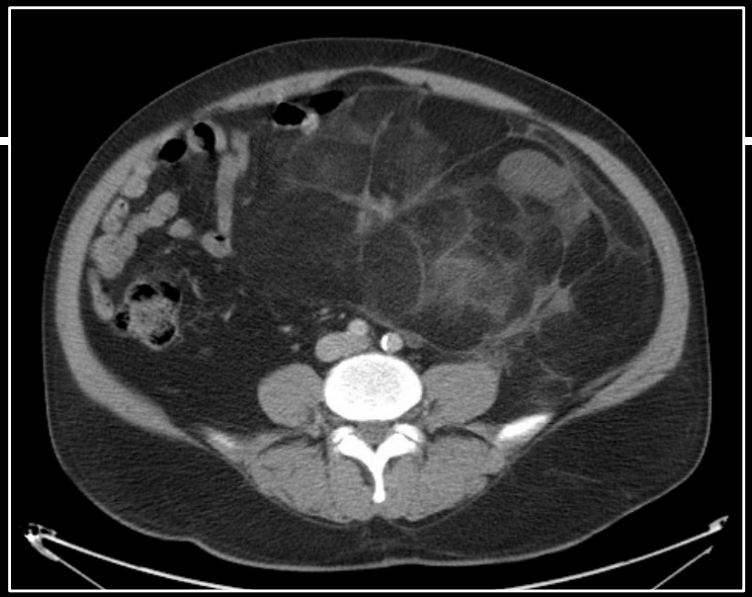
- Esophageal anastomotic leak associated with high mortality (>50%)
- Endo-vac salvage therapy has demonstrated strong ability to salvage with good outcomes (5x decrease in mortality)



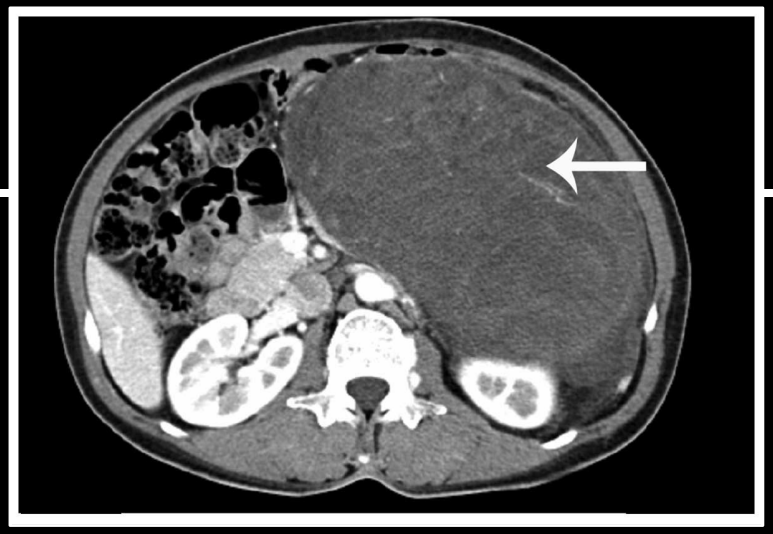
Papadakos SP et al., J Clin Med 2024.

Case #10

- 64M complains of early satiety, increased abdominal girth
- CT 22cm fatty mass
- Resection => Low-grade liposarcoma
- Iliac vein resection/reconstruction
- Local recurrence => re-resection



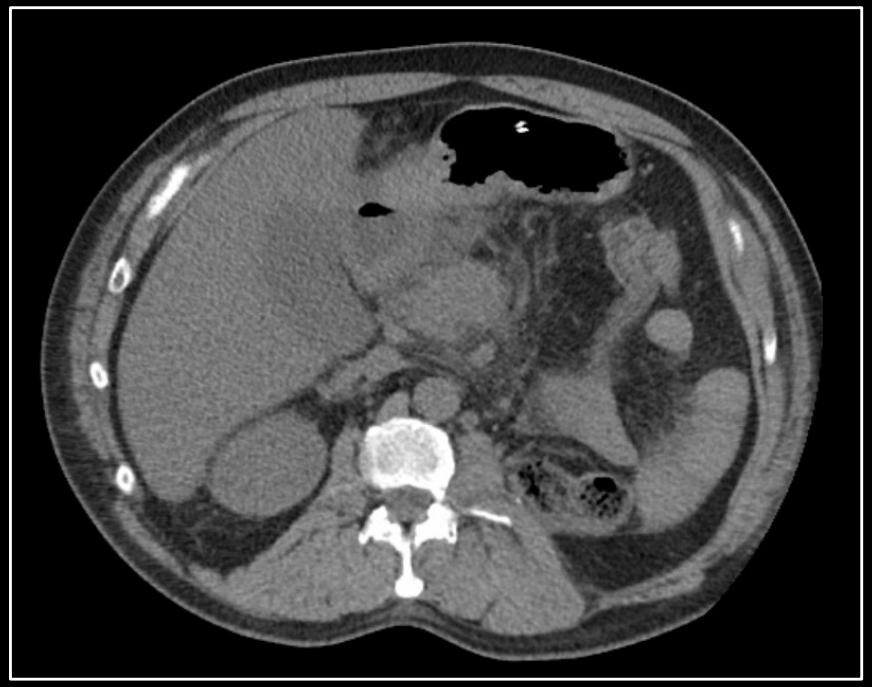
Sarcoma



- Outcome highly dependent on histology
  - Liposarc – relatively indolent
  - Leiomyosarc – less indolent
  - Pleomorphic – aggressive
- Operation also histology dependent
  - Liposarc – can be really big, may require nephrectomy
  - Leiomyosarc – can originate from cava or other smooth muscle site (bowel)
  - Pleomorphic – can be anywhere
- Systemic therapy options not good
- Radiosensitive in some cases
- Extremity – may require orthopedic oncology evaluation

Case #11

- 65M hx bladder/rcc s/p left nephrectomy
- Abdominal pain, nausea, vomiting
- Complete Gastric outlet obstruction
- Request gastric bypass (palliative loop GJ)



Pancreatitis

- Acute/Chronic
- Causes
  - #1 Biliary
  - #2 EtOH
- Treatment
  - Medical/supportive
  - Drainage (prefer endoscopic)
  - Surgery (rare in modern era)
  - Risk-reduction cholecystectomy
- **NO ROLE FOR ANTIBIOTICS IN UNINFECTED PANCREATITIS**

Leppaniemi, A et al., *World J Emerg Surg* 2019.

Antibiotic stewardship

- Empiric therapy should not be continued in absence of evidence of infection
- Real morbidity from inappropriate antibiotics
  - Resistant bugs (ESBL, VRE)
  - C. diff

Palliative Surgery

- Relief of malignant obstruction
  - Gastric outlet
  - Colonic or small bowel
  - Biliary
- Relief of inflammatory process
  - Cholecystitis in pt with metastatic PDAC
- Focused on quality of life
  - Pain relief
  - Allow pt to eat

Multidisciplinary care

- Collaborative care among subspecialists diagnosing and treating complex cancer cases
  - Medical Oncology
  - Surgery
  - Radiation oncology
  - Gastroenterology
  - Interventional / Diagnostic Radiology
  - Pathology
  - Palliative care
- Every case: Name, Stage, Treat
- Treatment discussions revolve around:
  - Which therapies to give, when, and in what sequence?
  - Recognition of and concordance with established guidelines (NCCN, AJCC)
  - Genetic evaluations where appropriate
  - Utilization of clinical trials where available
  - Utilization of targeted therapy based on tumor genetics when possible

Limitations of Surgical Cancer Care

- Surgery is **local** therapy
- Surgery cannot defeat **biology**
- Surgery has major **risks/side** effects for patients
- Not every patient is in **condition** to tolerate surgery

- Our role: deciding **who** is likely to **benefit** from surgery, offer it to **all those who are potentially appropriate**, and **compassionately convey** to patients who are felt not to be appropriate the **rationale** for that recommendation.

Thank you / Questions

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