Practical Approaches to Pancreatobiliary Disease Management

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Disclosures

- Consultant for Boston Scientific, Fujifilm Medical, Fractyl

Case 1

- 36yo female 12 weeks postpartum with mild intermittent RUQ pain since 3rd trimester who presented with severe RUQ pain.
  - Afebrile
  - ALT 742, AST 1073, T bili 2.9, Alk phos 150
  - WBC 9,000, normal lipase
  - US multiple gallstones, 6mm CBD, no intrahepatic duct dilation

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➢ Should pt undergo ERCP?

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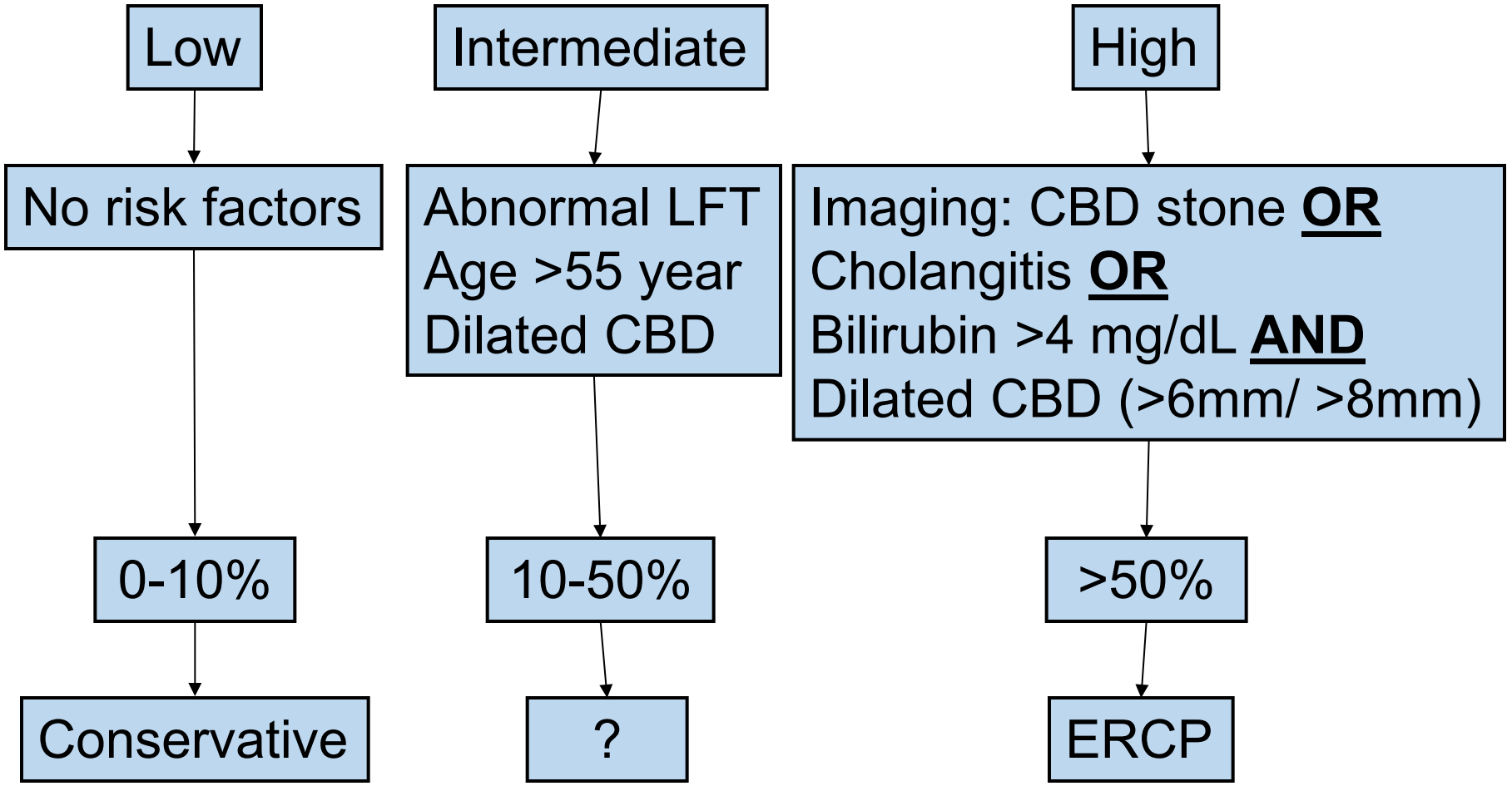
- Should pt undergo ERCP?
- What's the likelihood that the patient has a CBD stone?

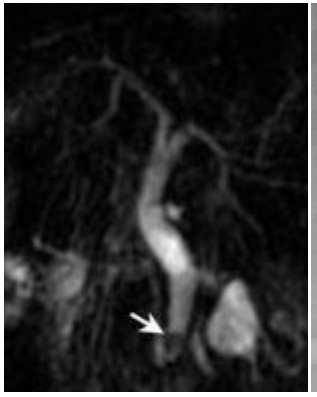
Risk of CBD Stone

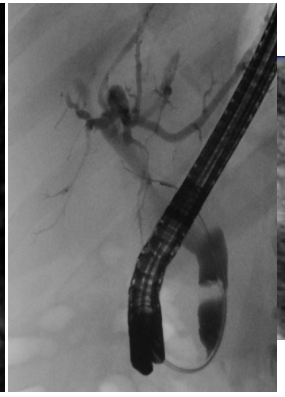


Buxbaum et al. GIE 2019.

Imaging CBD Stone

Test	Sensitivity	Specificity	NPV
US	20-55%	83%	**56%**
Helical CT	40-85%	88-92%	**78%**
MRCP (no gadolinium)	85-91%	93%	**92%**
EUS	93%	96%	**96%**
ERCP	72-90%	99%	-





Gurusamy KS et al. Cochrane 2015.

Approach to Intermediate Risk

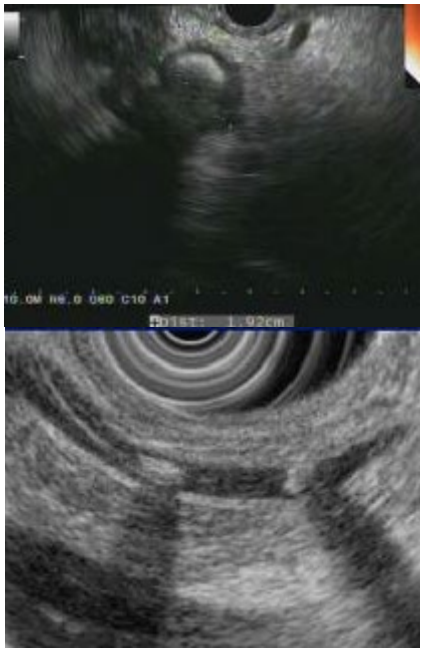
EUS or MRCP or Lap CCY with IOC

Karakan et al. GIE 2009; Napoleon et al. Endoscopy 2011.

Approach to Intermediate Risk

EUS or MRCP or Lap CCY with IOC

- **EUS and MRCP safer than ERCP**
- **46-60% more invasive tests avoided with EUS**
- **Limitations of MRCP:**
  - Lower sensitivity for small stones <6mm
  - 15-20% intrasphincteric CBD not seen on MRCP



Karakan et al. GIE 2009; Napoleon et al. Endoscopy 2011.

CBD Stones

- Labs: bilirubin || degree obstruction
  - Bilirubin usually 2-5, rarely >12
  - ALT/ AST can present in 1000s

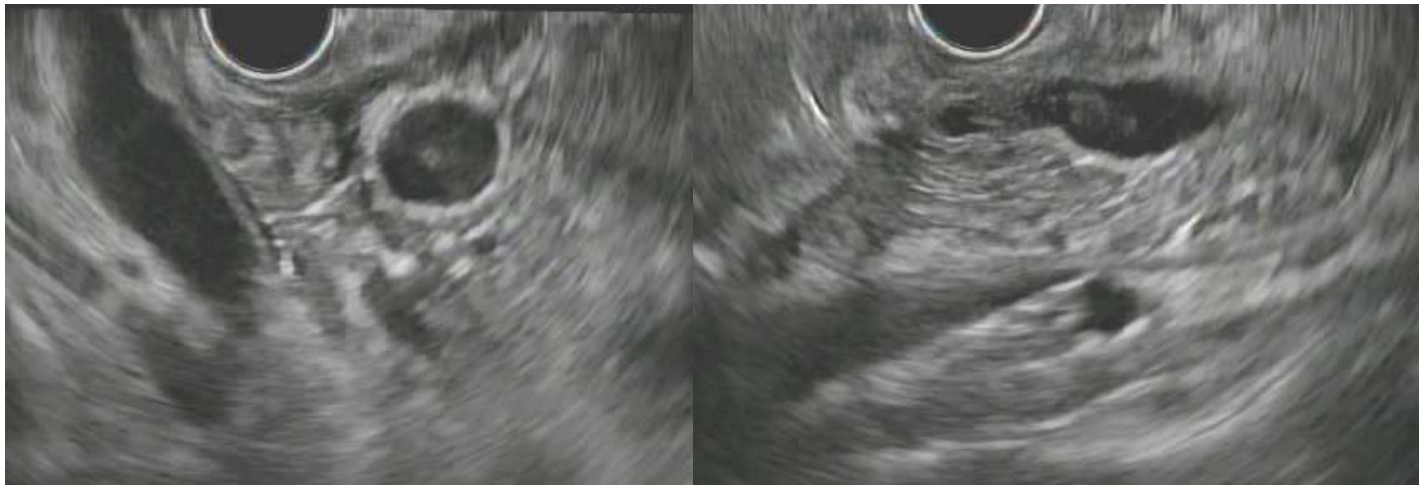
Case 1

- 36yo female with RUQ pain, total bilirubin 2.9, gallstones, CBD 6mm and no intrahepatic biliary ductal dilation.
- Intermediate risk for CBD stone
- Best next step: EUS or MRCP
- MRCP: gallstones, CBD 8mm, no choledocholithiasis

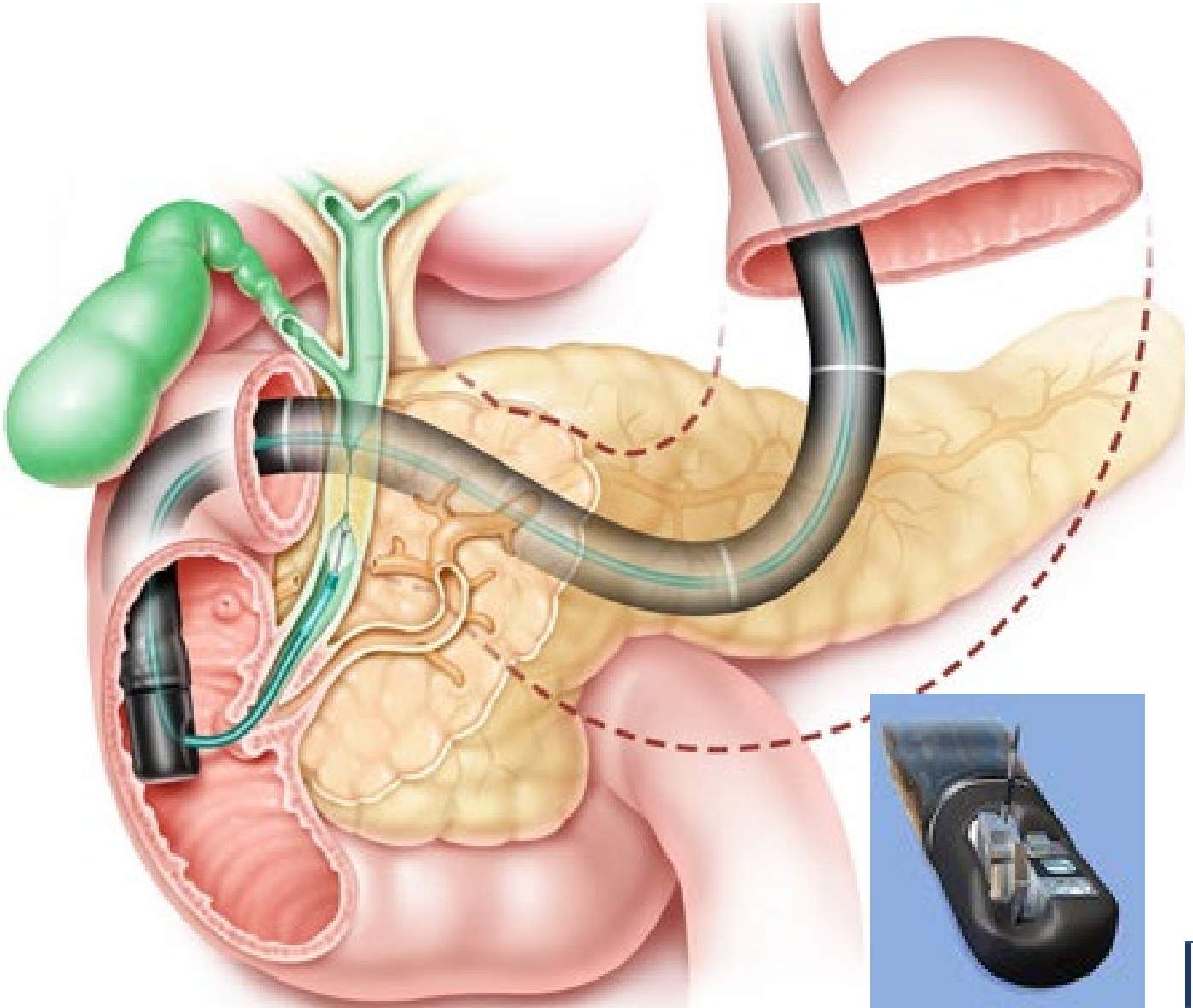
Case 1

- Ongoing intermittent RUQ pain after eating
- Total bilirubin continued to rise to 6.1
- Other LFTs lower (AP 179, ALT 393, AST 173)

EUS

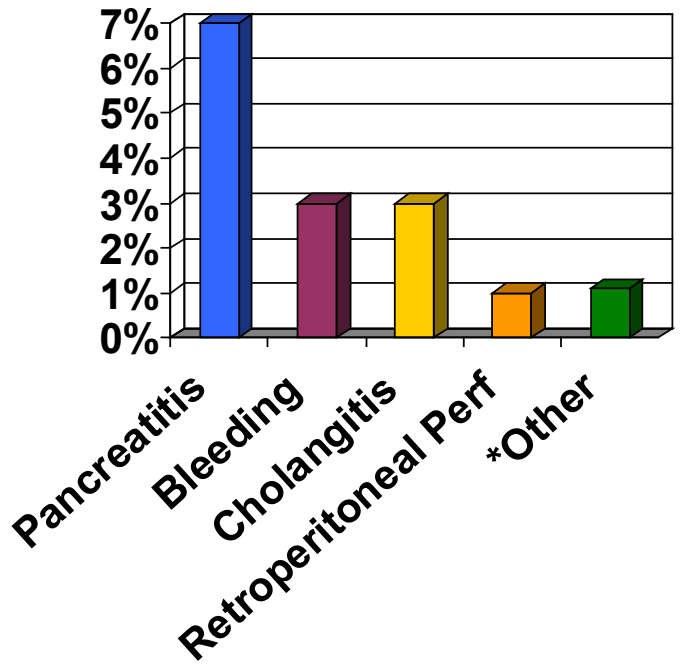


ERCP



ERCP Complications

- Overall morbidity 6.9%
- Mortality 0.33%



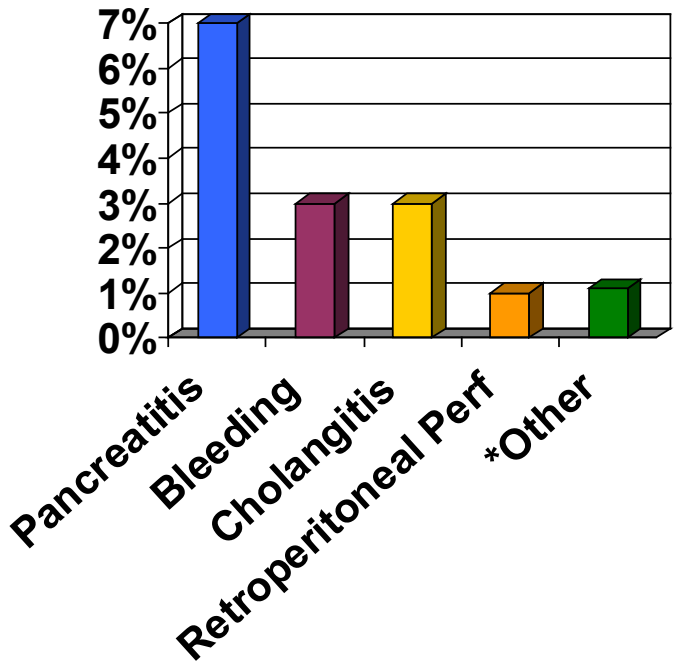
* MDRO/CRE infection

Luo et al. Lancet 2016.

ERCP Complications

- Overall morbidity 6.9%
- Mortality 0.33%

- Do not check amylase, lipase unless pain
- Rectal Indocin
- After sphincterotomy, hold anticoagulants ≥3 days, antiplatelets ≥7 days



* MDRO/CRE infection

Luo et al. Lancet 2016.

After ERCP, Now What?

All should have CCY unless contraindicated

- ESGE recommends CCY within 2 weeks of ERCP
- 5-40% recurrent biliary symptoms after ERCP
- Median 3 months after ERCP
- 2/3 abdominal pain

Byrne et al. Surg Endosc 2009; Boerma et al. Lancet 2002; Lau et al. Gastro 2006; Williams et al. Gut 2017; Manes G et al. Endoscopy 2019

Case 2

- 79yo male with CAD, DM, ESRD on HD admitted with nausea, vomiting, atypical chest discomfort and SOB. No abdominal pain. Physician daughter notes pt's mental status far from baseline.
- Temp 97.5, HR 100s, BP 151/67
- Alert and oriented x1
- ALT 103, AST 68, T bili 5.4, Alk phos 355.
- WBC 11.8
- Chest CT: negative for PE, trace right pleural effusion
- Abd CT: diffuse intra and extrahepatic biliary ductal dilation up to 24mm s/p CCY

➢What is the likely diagnosis?

Cholangitis

- Diagnosis
  - Charcot's triad (present in 22%): RUQ pain, fever, jaundice
  - Reynold's pentad: Charcot's + ΔMS, hypotension
  - Tokyo guidelines: Fever or elevated/depressed WBC + abnormal LFTs + abnormal imaging (biliary dilation or cause of cholangitis seen)
    - 92% sensitivity, 78% specificity

Tokyo Guidelines for Acute Cholangitis 2018 ☆

Part A: Systemic Inflammation

- ☐ Fever and/or shaking chills
  >38°C/100.4°F
- ☑ Laboratory data: evidence of inflammatory response
  WBC <4 or >10 x1,000/μL and/or CRP ≥1 mg/dL

Part B: Cholestasis

- ☑ Jaundice
  Total bilirubin ≥2 mg/dL
- ☑ Laboratory data: abnormal liver enzymes
  ALP, γGTP, AST, ALT levels >1.5 x STD

Part C: Imaging

- ☑ Biliary dilatation

Diagnostic Result

Definite	Grade I
Diagnosis of acute cholangitis	Mild acute cholangitis Recommendation: antibiotics and general supportive care; consider biliary drainage if no response to initial treatment

Tokyo Guidelines for Acute Cholangitis 2018 ☆

Provides diagnostic criteria and severity grading for acute cholangitis.

Grading

- [ ] **Cardiovascular dysfunction**
  Hypotension requiring dopamine ≥5 μg/kg per min or any dose of norepinephrine
- [x] **Neurological dysfunction**
  Disturbance of consciousness
- [ ] **Respiratory dysfunction**
  PaO_2/FiO_2 ratio <300
- [ ] **Renal dysfunction**
  Oliguria or creatinine >2.0 mg/dL
- [ ] **Hepatic dysfunction**
  PT-INR >1.5
- [ ] **Hematological dysfunction**
  Platelet count <100,000/mm^3
- [ ] **Abnormal WBC count**
  >12,000/mm^3 or <4,000/mm^3
- [ ] **High fever**
  ≥39°C/102.2°F
- [x] **Age ≥75 years**
- [x] **Hyperbilirubinemia**
  Total bilirubin ≥5 mg/dL
- [ ] **Hypoalbuminemia**
  <0.7 x upper limit of normal

Diagnostic Result

Definite

Diagnosis of acute cholangitis

Grade III

Severe acute cholangitis

Recommendation: initial treatment with antibiotics, urgent biliary drainage, appropriate respiratory/circulatory management

Cholangitis Management

- Initial management:
  - IVF
  - IV antibiotics (cover GNR and enterococcus)
    - Ampicillin + gentamicin or fluoroquinolone ± metronidazole
- 80% respond
- Eventually biliary drainage necessary
- Percutaneous drain:
  - Failed ERCP
  - Post-surgical anatomy
  - Patient unstable and ERCP not available

Timing of ERCP

- *Mild, grade 1*: responds to antibiotics — *Elective*
- *Moderate, grade 2*: not responding but stable — *24-72h*
- *Severe, grade 3*: organ dysfunction — *<24h*

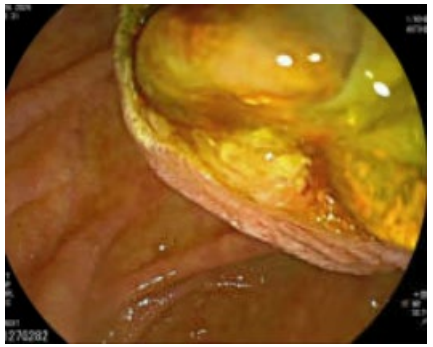
Transfer patient ASAP where ERCP available

Lee J. Nature Reviews GI and Hep 2009; Khashab M et al. Clin Gastro Hep 2012; Manes G et al. Endoscopy 2019; Mukai S et al. Dig Endo 2022

Case 2

- 79yo male with SOB, atypical chest pain, vomiting, fever, elevated WBC, LFTs, dilated CBD.
- IV vancomycin and piperacillin/tazobactam initiated
- Blood cultures 4/4 GNR
- Urgent ERCP in PM





Case 3

- 53yo obese female admitted with severe epigastric pain which began last nite. Temp 98.3.
  - Amylase 1000, lipase 2658
  - ALT 100, AST 89, T bili 2, Alk phos 69.
  - WBC 10

- What is the likely diagnosis?

Epidemiology of Acute Pancreatitis

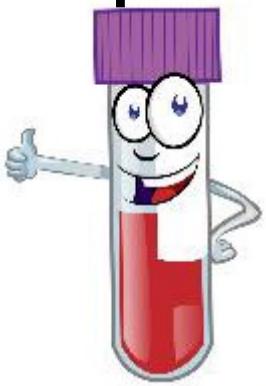
- One of top GI reasons for hospitalization in US
- >275,000 admissions annually
- $ 2.6 billion
- Incidence rising

Approach to Acute Pancreatitis

- Establish diagnosis
- Determine etiology
- Assess severity
- Treat with (moderately) aggressive IVF
- Reassess patient frequently especially during initial 24 hours of admission
- Early nutrition- use the gut!
- Refer to pancreas center for:
  - Idiopathic pancreatitis
  - Severe pancreatitis

Diagnosis of Acute Pancreatitis

2 of 3 criteria: Revised Atlanta



Single best imaging?

Banks et al. Gut 2013.

Diagnosis of Acute Pancreatitis

When is abdominal CT helpful?

Diagnosis of Acute Pancreatitis

When is abdominal CT helpful?

- Diagnosis unclear
- Not improving after 48-72 h
- Signs of severe pancreatitis
- Signs of local complications

Etiology of Acute Pancreatitis

Gallstone 40-70%

Alcohol 30% (at least 50g/d)

RCT 8% v. 21% ($p<0.05$) recurrent pancreatitis over 2 yrs for two 30-min counseling (inpt + 6m later) v. 1 inpt

Crockett SD et al. Gastro 2018.

Etiology of Acute Pancreatitis

Smoking

	RR non-gallstone pancreatitis
Current smoking	1.8
≥ 20 pack-year	2.3
≥ 20 pack-year + ≥ 400g/ month alcohol (~1 glass wine/day)	4.1

- Current smoking > former > never

Azodi et al. Gut 2012; Aune et al. Pancreatology 2019.

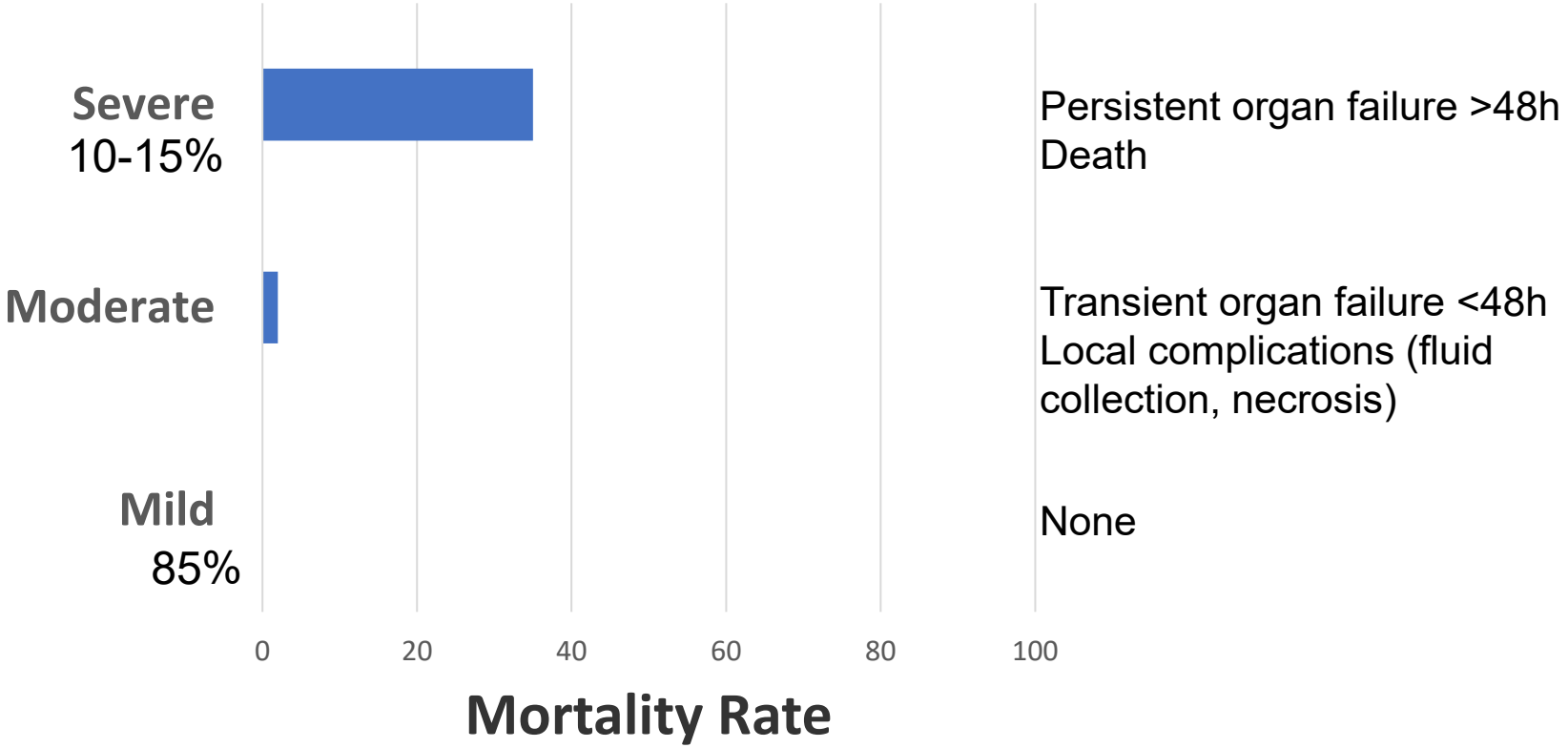
Etiology of Acute Pancreatitis

- Metabolic
  - Triglyceride >1000 mg/dL, but likely lower even >500
  - Hypercalcemia
- Structural
  - Mass, cyst (IPMN), pancreas divisum, annular pancreas, choledochal cyst, SOD
- Autoimmune (IgG4)
- Genetic/ Hereditary (mutations in PRSS1, SPINK1, CTRC, CFTR)
- ERCP
- Drug (6-MP, azathioprine, ACE-I, diuretics, ddI, valproic acid, cocaine, marijuana)
- Infection (e.g., EBV, CMV, hepatitis B, hepatitis C, HIV, ascariasis in developing countries)
- Rheumatologic disease (lupus, RA)
- Trauma
- Acute flare-up of chronic pancreatitis

Etiology Acute Pancreatitis

- Initial work-up
  - History: alcohol, smoking, ERCP, surgery, trauma, medications, history of autoimmune disorders, family history of pancreatitis
  - Labs: LFT, Ca, triglyceride (at presentation)
  - US

Severity Correlates with Mortality



Sternby et al. Annals Surgery 2019; Banks et al. Gut 2013; Van Dijk et al. Gut 2017.

Defining Organ Failure: Modified Marshall Score

- ≥2 in any system = organ failure

Organ	Score 0	1	2	3	4
Respiratory (PaO2/FiO2)	>400	301-400	201-300	101-200	≤101
Renal Cr	<1.4	1.4-1.8	1.9-3.6	3.6-4.9	>4.9
Cardiac (SBP)	>90	<90, fluid responsive	<90, not fluid responsive	<90, pH<7.3	<90, pH<7.2

Supplemental O2 (L)	Estimating FiO2%
Room air	21
2	25
4	30
6-8	40
9-10	50

Koutroumapkis E, et al. AJG 2015.

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9-10	50

Predictors of Organ Failure:

- Admit Hct ≥44
- Rising BUN 1st 24 hrs

Koutroumapkis E, et al. AJG 2015.

Predictor of Mortality in Acute Pancreatitis

- Ranson, Glasgow, APACHE, BISAP

Risk Factors	Odds Ratio	
• BUN ≥20mg/dL admission	4.6	BAD
• Rise BUN ≥ 2 mg/dL in 24h	4.3	BAD

Wu et al. Arch Int Med 2011.

Additional Risk Factors of Severe Acute Pancreatitis

- Age >55
- Obesity (BMI >30 kg/m^2)
- Altered mental status
- SIRS
- Pleural effusions and/or pulmonary infiltrates

Tenner et al. Am J Gastroenterol 2024

Nonsevere Acute Pancreatitis

Harmless acute pancreatitis score (HAPS):

- Normal Hct
- Normal Creatinine
- No abdominal guarding and/or rebound

99% PPV for predicting who won't develop complications due to AP

Papachristou et al. Am J Gastro 2010.

Case 3

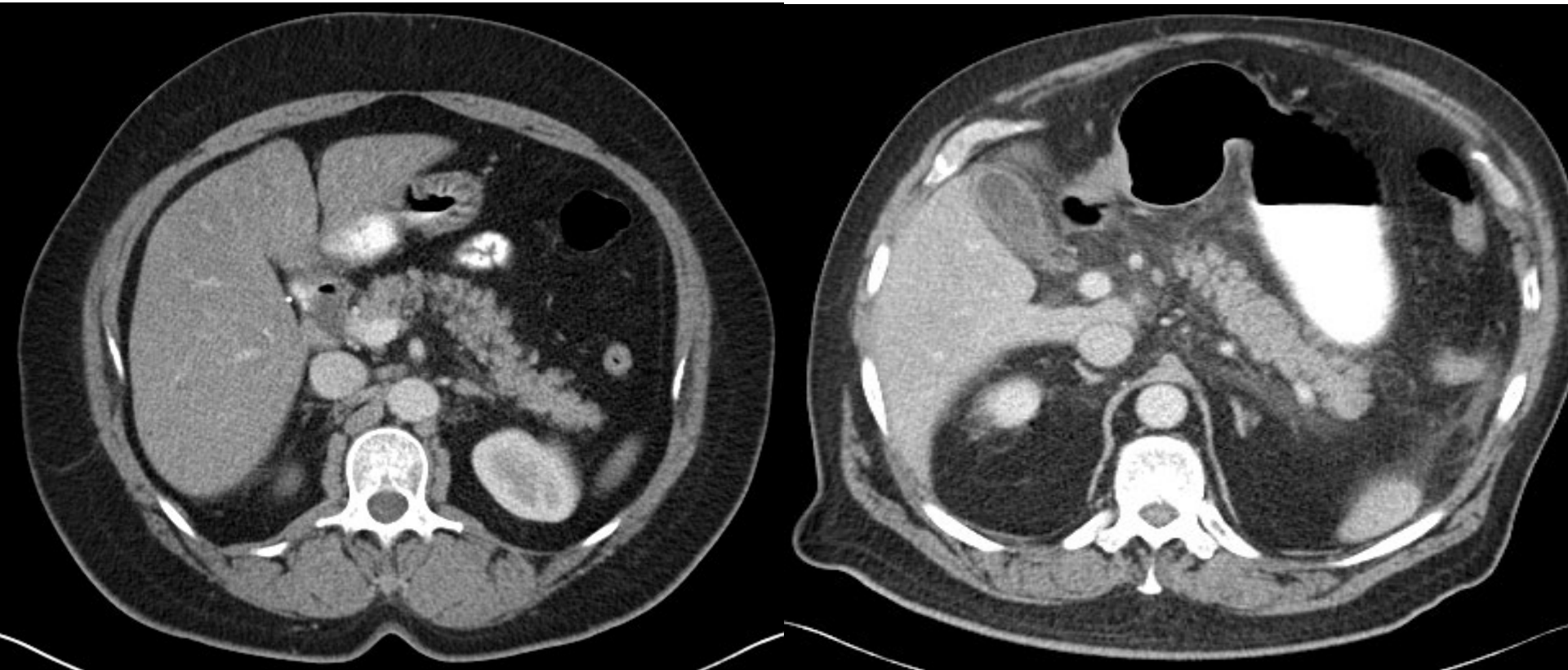
- 53yo female admitted with pancreatitis, elevated LFTs, on room air.
  - BUN 12, Creatinine 0.6
  - Hct 35
- Mild pancreatitis
- Low risk of mortality

Terminology

	Interstitial edematous	Necrotizing
Acute collection	Acute peripancreatic fluid collection (20-40%)	Acute necrotic collection (90-100%)
Mature collection	Pseudocyst (10% of APFC)	Walled off pancreatic necrosis (WON, ~50% ANPFC)
Sterile or infected	Infected pseudocyst	Infected necrosis

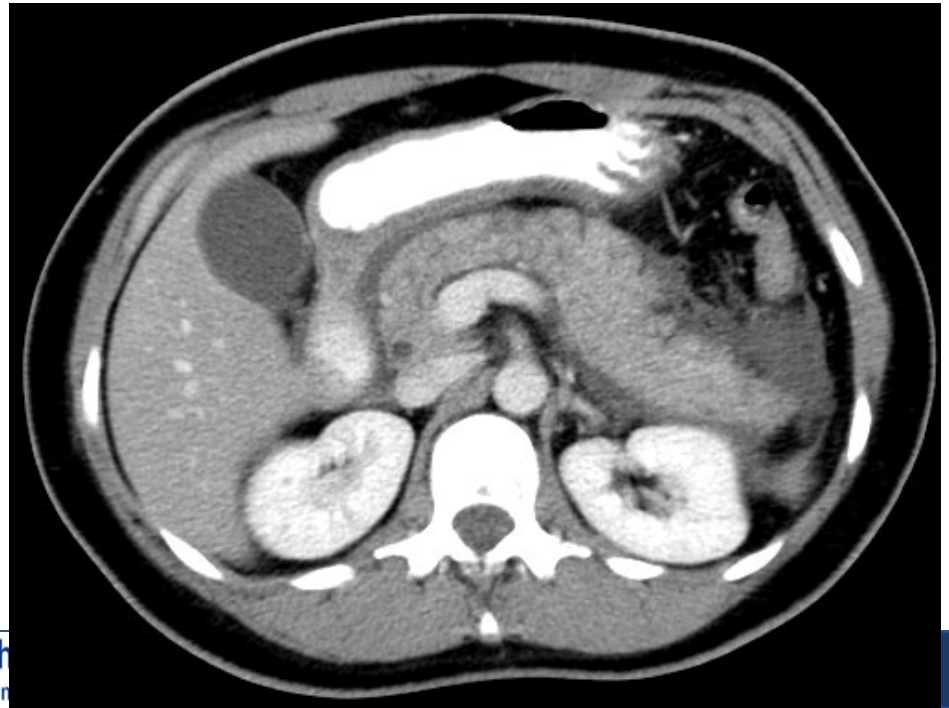
Terminology

- Interstitial pancreatitis



Terminology

- Acute peripancreatic fluid collection ~<4 weeks old



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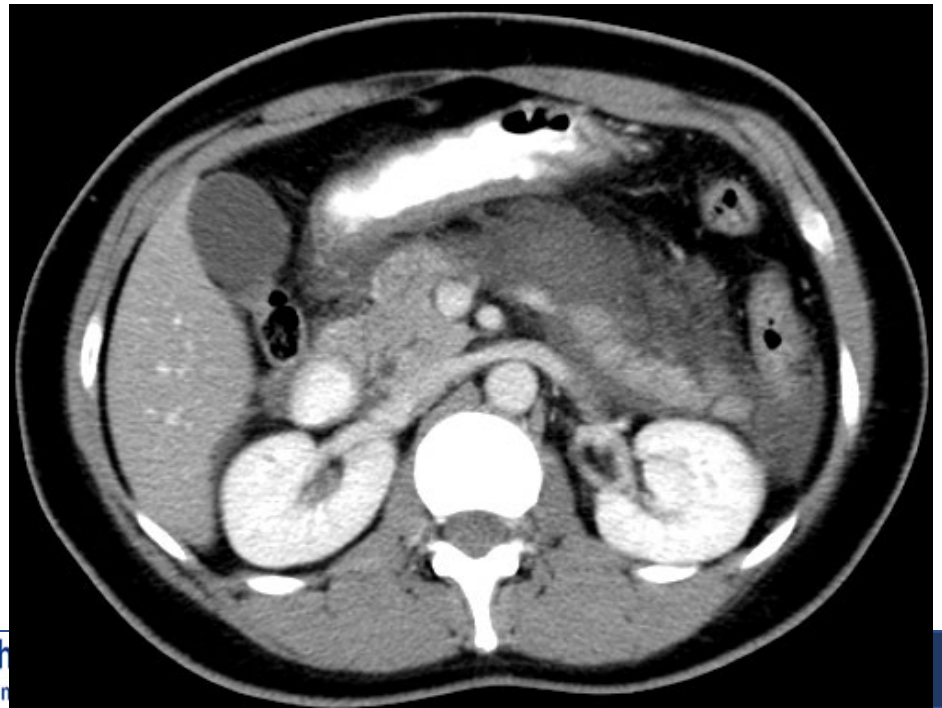

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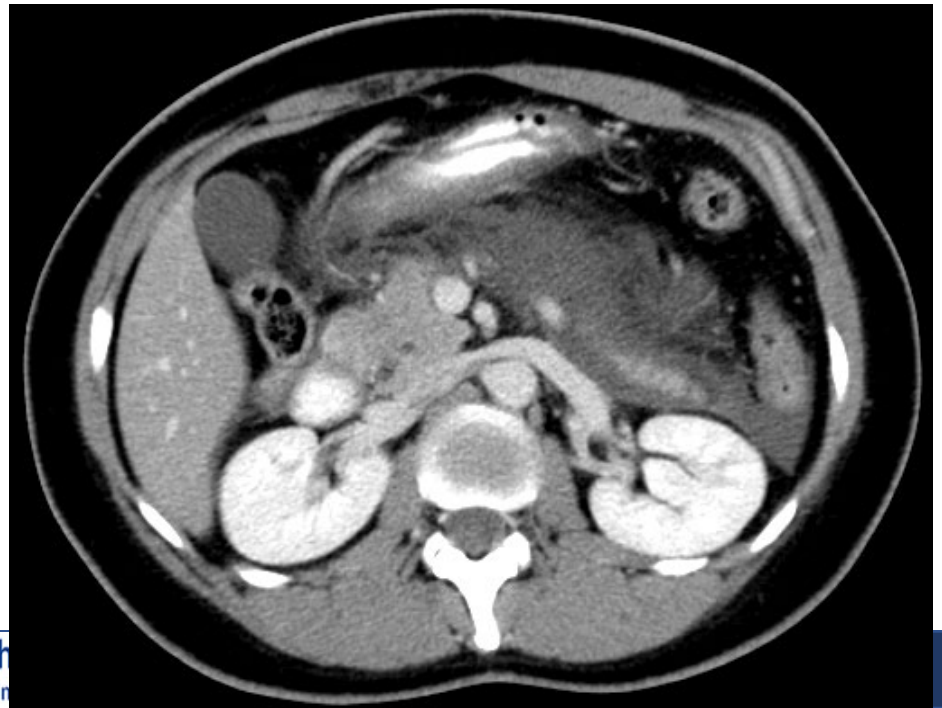
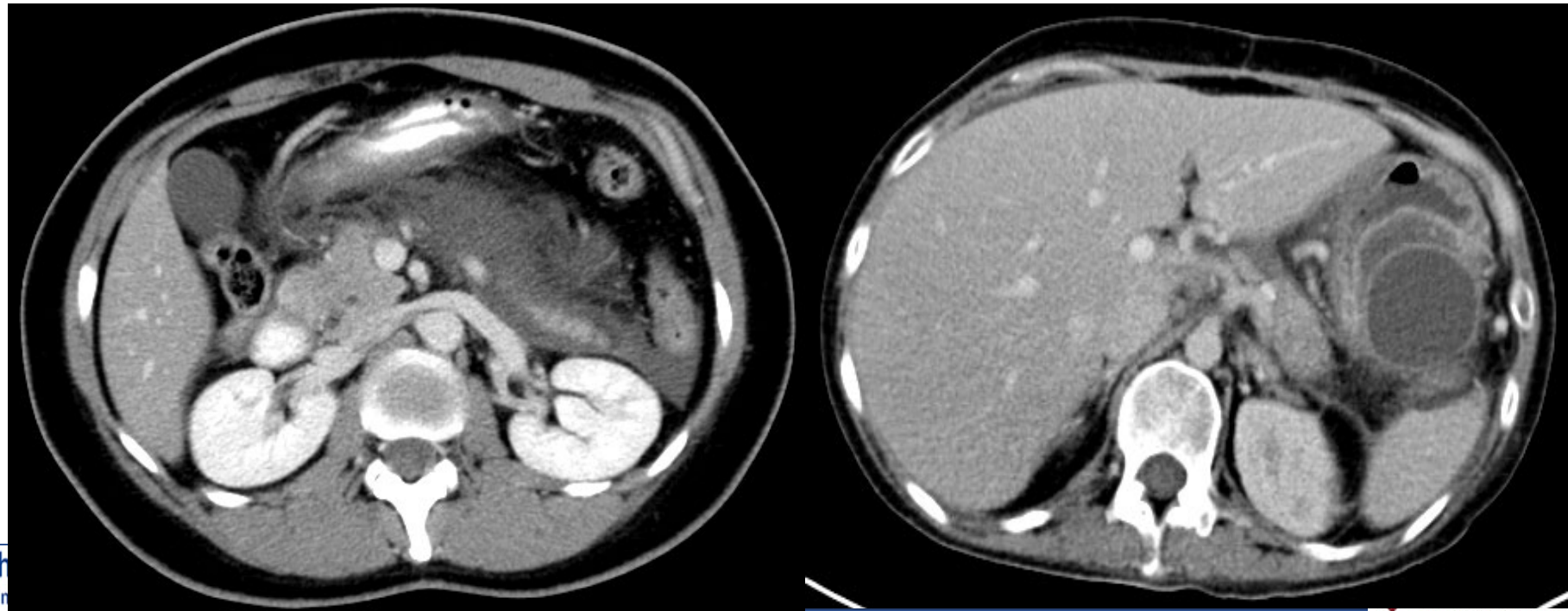


Terminology

- Acute peripancreatic fluid collection ~<4 weeks old
- Pseudocyst: walled fluid ~>4 wks after attack

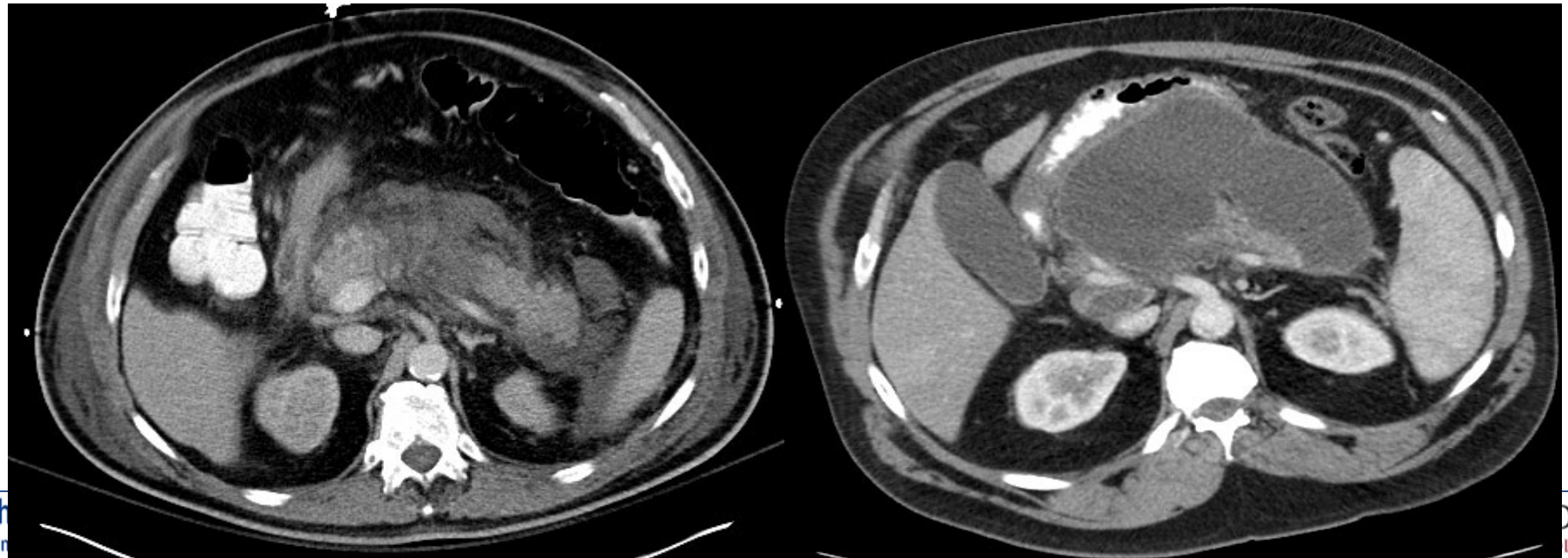


Terminology

- Necrotizing pancreatitis
  - Acute necrotic collection ~<4 weeks

Terminology

- Necrotizing pancreatitis
  - Acute necrotic collection ~<4 weeks
  - Walled-off pancreatic necrosis ~>4 weeks after attack



Initial Management

IVF

- **What type?**

  LR: decreases SIRS and severity

- **How much?**

  Goal directed IVF

Initial Management

- Randomized mild acute pancreatitis

  20ml/kg bolus, 3ml/kg/hr v. 10ml/kg bolus if hypovolemic, 1.5ml/kg/hr

- Goal directed at 12 to 24h:
  - Hypovolemic: repeat bolus
  - Normovolemic: 1.5ml/kg/hr
  - Volume overload: decrease or stop infusion

	Aggressive IVF	Moderate IVF	P value
Mod to severe pancreatitis	22%	17%	NS
Fluid overload	21%	6%	0.004

Initial Management

IVF

- Goal: decrease BUN
- Reassess patient q6-12h
- Recheck key labs (BUN, Hct) in 6-12h and adjust IVF accordingly

Tenner et al. Am J Gastro 2024.

Case 3

- 53yo female with diabetes admitted gallstone pancreatitis.
- Admission labs:
  - BUN 12, Creatinine 0.6
  - Hct 35
- 12 hours after admission:
  - BUN 20, Creatinine 0.7
  - Hct 39
- Next step?

Case 3

- Bolus 1 liter LR as pt hypovolemic
- Recheck Hct, BUN/Cr in 6 hours, adjust IVF PRN
- Repeat Hct 35, BUN 14, Creatinine 0.7

Pain

- Try non-opioids first
  - NSAID, tramadol- no worse than opioids
  - Then opioids if needed

Machicado et al. Curr Op Gastro 2019.

Nutrition: Start within 24hrs

Early oral or enteral feed 24-48h

Need for intervention for necrosis

Trend towards decreased infection and organ failure

- Do not need to start with clear liquids (low fat, normal fat, soft or normal)
- NGT > TPN
- Fluid collections or elevated pancreatic enzymes not contraindication to nutrition

Tenner et al. Am J Gastro 2024; Bakker OJ et al. NEJM 2014; Crockett SD et al. Gastro 2018.

Antibiotics

- **<u>Do not give prophylactic antibiotics</u>**
- Cholangitis, infected necrosis, infected pseudocyst, patient decompensating: *YES*
- If concern for infection, consider CT-guided aspiration before antibiotics (if possible)
- However, unclear whether CT-guided aspiration necessary and alters management

Abdominal Compartment Syndrome

- Abdominal compartment syndrome (ACS) = intraabdominal pressure >20 mmHg + new onset organ dysfunction
- In acute pancreatitis, 49% mortality with ACS
- Measure in severe pancreatitis with organ failure, persistent SIRS, or APACHE II ≥8; tense, distended abdomen

Van Brunschot S et al. Pancreas 2014.

Abdominal Compartment Syndrome

- Bladder pressure with bladder catheter
- NGT/rectal tube
- Optimize sedation and analgesia
- Consider muscle relaxants
- Diuretics
- Early enteral nutrition
- Percutaneous drainage of fluid
- Surgical decompression when IAH>25mmHg
- Neostigmine IM 1mg q12h; if no BM at 12h, q8h; if no BM at 24h, q6h x7 days or IAP <12mmHg

Trikudanathyan et al. Pancreatology 2014; He et al. Crit Care 2022

CCY Timing in Mild Gallstone Pancreatitis

- When should patients undergo CCY after mild acute gallstone pancreatitis?

BEFORE DISCHARGE

	Interval cholecystectomy (n=136)	Same-admission cholecystectomy (n=128)	Risk ratio (95% CI)	p value
Primary endpoint				
Mortality or readmission for gallstone-related complications	23 (17%)	6 (5%)	0·28 (0·12–0·66)	0·002
Secondary endpoints				
Readmission for gallstone-related complications				
Recurrent pancreatitis	12 (9%)	3 (2%)	0·27 (0·08–0·92)	0·03
Cholecystitis	2 (2%)	0		0·50
Choledocholithiasis needing ERCP	2 (2%)	1 (1%)	0·53 (0·05–5·79)	1·00
Gallstone colic	7 (5%)	2 (2%)	0·30 (0·06–1·43)	0·17
Mortality	0	1 (1%)		0·48
Patients reporting colics during waiting period*	62 (51%)	3 (3%)	0·06 (0·02–0·19)	<0·0001

- In non-surgical pts, ERCP with sphincterotomy

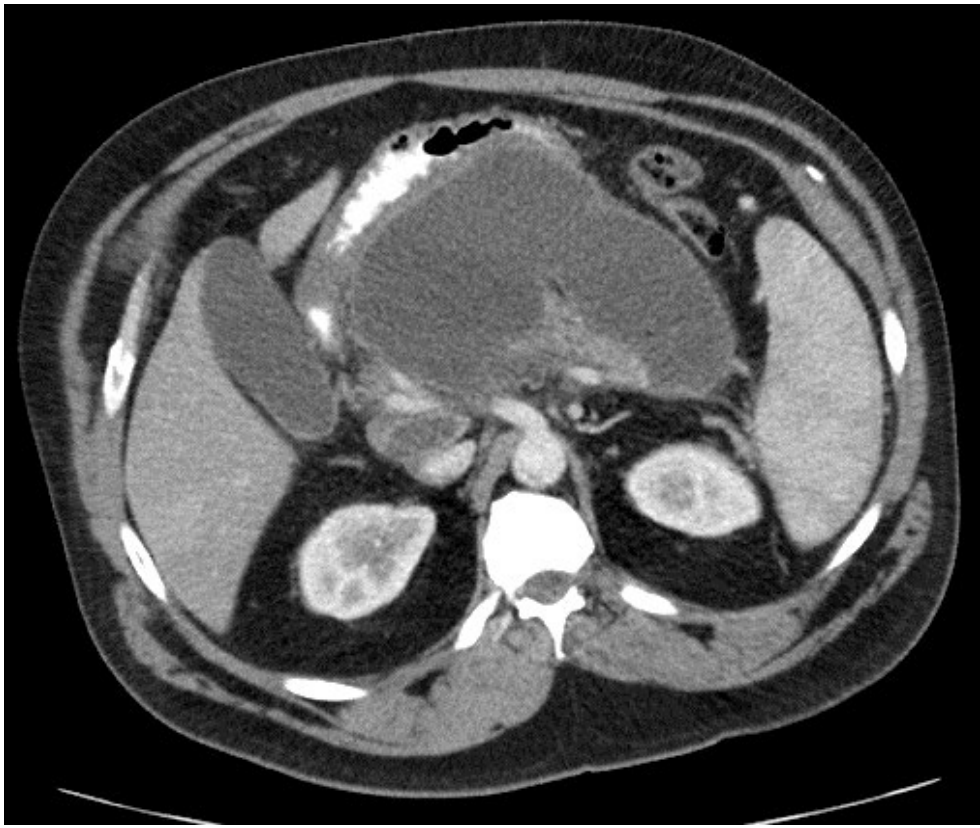
Role of ERCP in Acute Gallstone Pancreatitis

- ERCP within 72hrs
  - ✓Cholangitis
  - ✓CBD stone
  - ✓Post-operative CBD stone removal
- Not indicated for severe gallstone pancreatitis
  - ✓Urgent ERCP within 24 hrs did not reduce complications or mortality compared with conservative management

Schepers NJ et al. Lancet 2020.

Case 4

- 54yo male necrotizing gallstone pancreatitis 5 weeks ago, transiently intubated now on floor with abdominal pain and unable to eat.

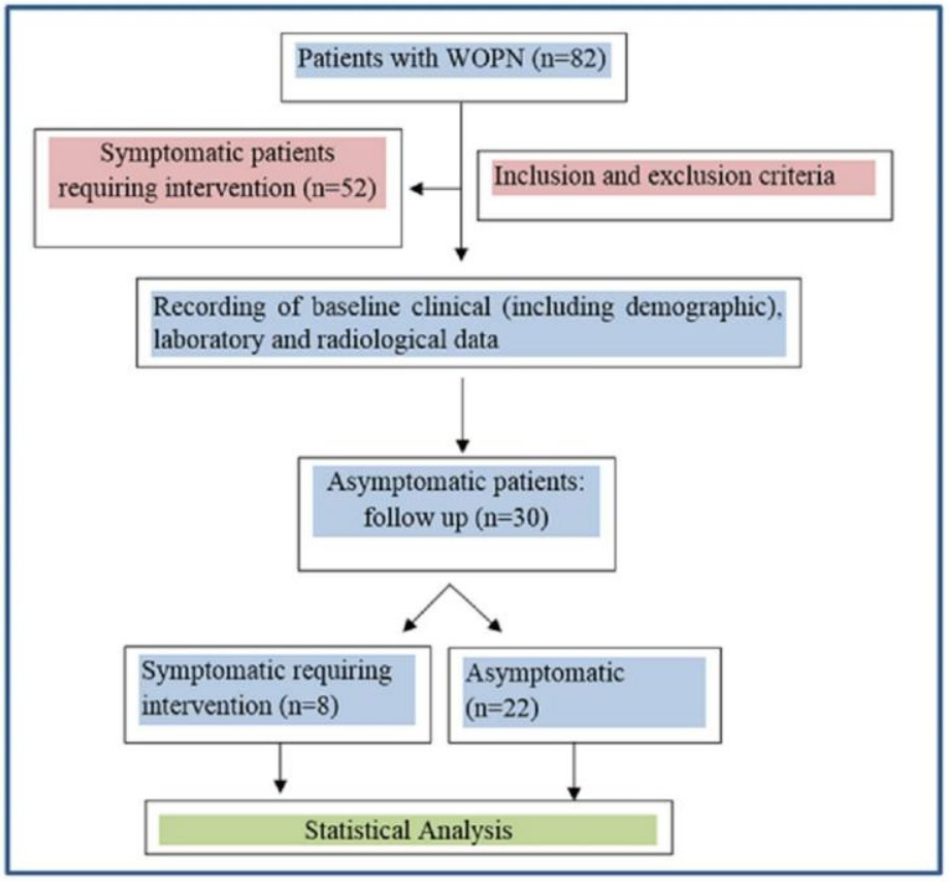


Approach to WON

- What are the management options?
  - Surgical necrosectomy
  - Radiologic percutaneous drain
  - Endoscopic necrosectomy
- Transfer patient to center with above expertise

Conservative Management WON

Prospective observational



27%
Within 1.5 months from onset
No surgery or mortality

64% smaller 7.6cm to 5.1cm
Rest no change

Kumar M et al. Cureus 2023.

Endoscopic vs. Surgical Management of WON

RCT

Table 3 Meta-analysis of all outcomes (*ITT* intention to treat, *mITT* modified intention to treat)

Endo **Surgery**

Mortality ITT

Study or Subgroup	Endoscopy Events	Total	Surgery Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Bakker 2012	1	10	4	12	14.8%	0.22 [0.02, 2.42]	2012
van Brunschot 2018	9	51	6	47	61.2%	1.46 [0.48, 4.48]	2018
Bang 2019	3	34	2	34	24.0%	1.55 [0.24, 9.91]	2019
Total (95% CI)		**95**		**93**	**100.0%**	**1.12 [0.44, 2.85]**	
Total events	13		12				

Heterogeneity: $Tau^2 = 0.04$; $Chi^2 = 2.11$, df = 2 (P = 0.35); $I^2 = 5\%$
Test for overall effect: Z = 0.25 (P = 0.81)

Odds Ratio M-H, Random, 95% CI
0.01 0.1 1 10 100
Favours Endoscopy Favours Surgery

New onset multiple organ failure ITT

Study or Subgroup	Endoscopy Events	Total	Surgery Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Bakker 2012	0	10	5	12	14.1%	0.06 [0.00, 1.36]	2012
van Brunschot 2018	2	51	6	47	47.9%	0.28 [0.05, 1.46]	2018
Bang 2019	2	34	3	34	38.0%	0.65 [0.10, 4.13]	2019
Total (95% CI)		**95**		**93**	**100.0%**	**0.31 [0.10, 0.98]**	
Total events	4		14				

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.67$, df = 2 (P = 0.43); $I^2 = 0\%$
Test for overall effect: Z = 1.99 (P = 0.05)

Odds Ratio M-H, Random, 95% CI
0.005 0.1 1 10 200
Favours Endoscopy Favours Surgery

Perforation of visceral organs Enterocutaneous fistulae ITT

Study or Subgroup	Endoscopy Events	Total	Surgery Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Bakker 2012	0	10	2	12	12.1%	0.20 [0.01, 4.69]	2012
van Brunschot 2018	4	51	8	47	74.2%	0.41 [0.12, 1.48]	2018
Bang 2019	0	34	4	34	13.7%	0.10 [0.01, 1.90]	2019
Total (95% CI)		**95**		**93**	**100.0%**	**0.31 [0.10, 0.93]**	
Total events	4		14				

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.88$, df = 2 (P = 0.64); $I^2 = 0\%$
Test for overall effect: Z = 2.08 (P = 0.04)

Odds Ratio M-H, Random, 95% CI
0.001 0.1 1 10 1000
Favours Endoscopy Favours Surgery

Pancreatic fistulae ITT

Study or Subgroup	Experimental Events	Total	Control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Bakker 2012	1	10	7	12	25.3%	0.08 [0.01, 0.84]	2012
van Brunschot 2018	2	42	13	41	57.8%	0.11 [0.02, 0.52]	2018
Bang 2019	0	34	8	34	16.9%	0.05 [0.00, 0.82]	2019
Total (95% CI)		**86**		**87**	**100.0%**	**0.09 [0.03, 0.28]**	
Total events	3		28				

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.28$, df = 2 (P = 0.87); $I^2 = 0\%$
Test for overall effect: Z = 4.04 (P < 0.0001)

Odds Ratio M-H, Random, 95% CI
0.002 0.1 1 10 500
Favours [experimental] Favours [control]

Hospital stay mITT

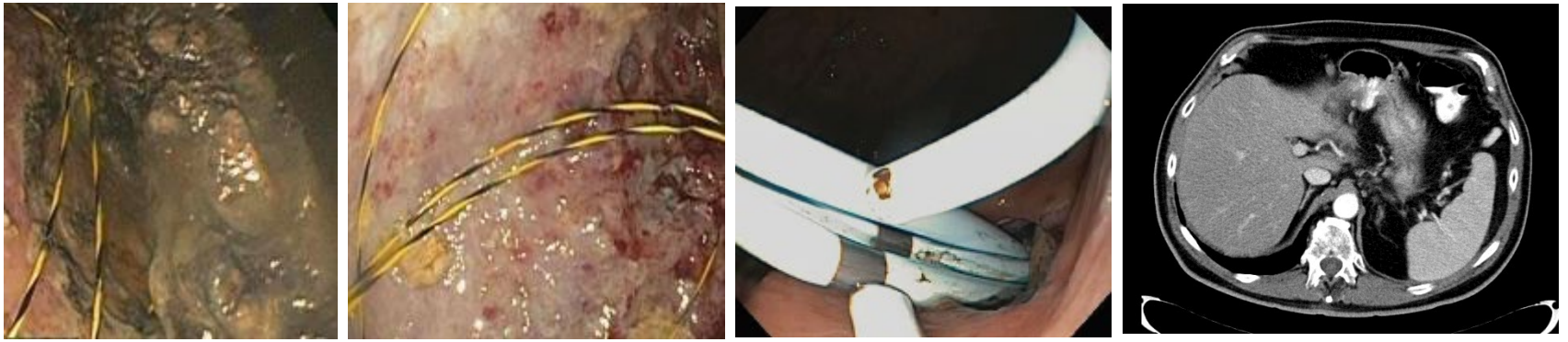
Study or Subgroup	Endoscopy Mean	SD	Total	Surgery Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI	Year
Bakker 2012	45	42.2	9	36	42.2	6	2.3%	9.00 [-34.59, 52.59]	2012
van Brunschot 2018	53	47	51	69	38	47	15.5%	-16.00 [-32.86, 0.86]	2018
Bang 2019	16.5	12.2	34	23.3	17.5	32	82.2%	-6.80 [-14.12, 0.52]	2019
Total (95% CI)			**94**			**85**	**100.0%**	**-7.86 [-14.49, -1.22]**	

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.55$, df = 2 (P = 0.46); $I^2 = 0\%$
Test for overall effect: Z = 2.32 (P = 0.02)

Mean Difference IV, Random, 95% CI
-50 -25 0 25 50
Endoscopy Surgery

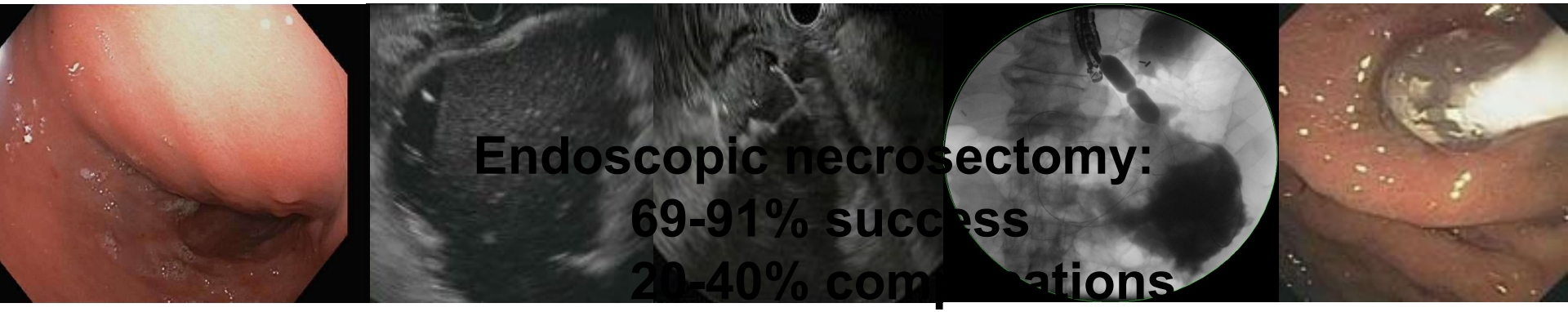
Haney CM et al. Surg Endo 2020

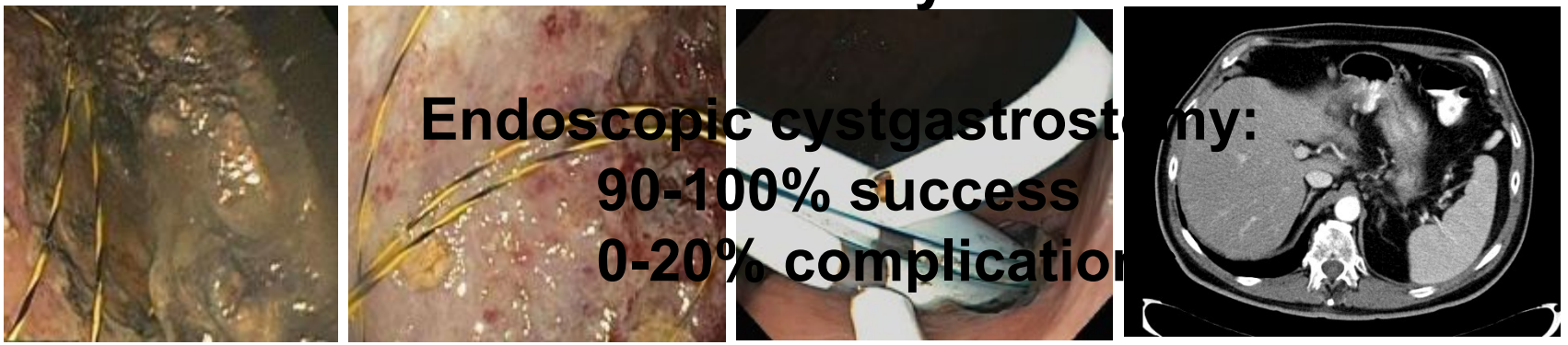
Endoscopic Necrosectomy



Thompson CC et al. Pancreatology 2016.

Endoscopic Necrosectomy





Thompson CC et al. Pancreatology 2016.

Pancreatic Necrosis/ Pseudocyst

- Decision points:
  - **Symptoms** present?
  - Necrosis/ fluid **collection mature**? (≥4 weeks)
- No symptoms: no intervention, but should be followed in pancreas center
- Symptomatic sterile or infected necrosis:
  - **Endoscopic necrosectomy (>4 wks with wall)**
  - **Radiologic percutaneous drain (<4 wks)**
  - Surgical necrosectomy
- Infected necrosis: conservative management with antibiotics until wall matures reasonable

Take Home Points

- CBD stones: intermediate probability, EUS, MRCP, IOC
- CCY after ERCP for CBD stone
- Emergent ERCP (<24h) for severe cholangitis (Tokyo)
- Early ERCP (<72h) in acute gallstone pancreatitis: cholangitis or retained CBD stone
- In acute pancreatitis, determine etiology (gallstone, Etoh, smoking)
- Moderate IVF LR in 1st 24h

Take Home Points

- Recheck BUN, Hct within 1st 24h and tailor fluids
- Start solid PO/ enteral feed within 24-48h
- Use antibiotics sparingly in acute pancreatitis
- Monitor bladder pressure in severe pancreatitis
- CCY before discharge in mild gallstone pancreatitis
- Multidisciplinary approach with referral to pancreas center for severe or idiopathic pancreatitis

Thank you from Boston!