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Gallstone Pancreatitis: Evaluation of the Common Bile Duct

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July 5, 2012

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Case Presentation

61yM with upper abdominal pain for several days radiating to back. Decreased appetite. Denied fever, chills, nausea, diarrhea, change in urine or stool color.

Case Presentation

- PMH: DM, HTN, HCV, CRF on HD, h/o CHF (EF 55% 2011), h/o Afib, h/o endocarditis
- PSH: exploratory laparotomy for trauma, renal transplant 12/2008, transplant nephrectomy for infection 1/2009, hip replacement
- SH: former smoker, drinker, drug user
- Meds: clonidine, nifedipine, pantoprazole, calcium, nephrocaps

Case Presentation

- T 98.3 HR 89 BP 174/95
- NAD
- No scleral icterus
- Heart regular
- Lungs clear
- Abdomen soft, tender upper abdomen

Case Presentation

- CBC 13.2/16/49/136
- BMP 141/6.6/99/29/24/9/93
- AST 45
- ALT 22
- Alkaline Phosphatase 81
- Total bilirubin 0.5
- Amylase 421
- Lipase 735
- Lactate Dehydrogenase not done
- PT13, PTT 33, INR 1.1

- EKG NSR

Case Presentation

- He refused CT scan and admission for pancreatitis

- Seen by primary care physician 2d later with persistent epigastric pain
- Admitted to medicine
- NPO, IVF
- US, CT

Case Presentation

- Surgery clinic visit
  - Admission for urgent EUS
  - If positive, then ERCP
  - If negative, then open cholecystectomy

Case Presentation

- EUS negative
- LFTs, amylase, lipase normal

- Open cholecystectomy performed
  - Significant adhesions in RUQ
  - Gallbladder adherent to duoudenum
  - Distortion of porta hepatis
  - Single large gallstone
  - No CBD dilation, no palpable CBD stones
  - JP drain placed

Case Presentation

- POD#3 diet advanced
- POD#4 JP removed and discharged

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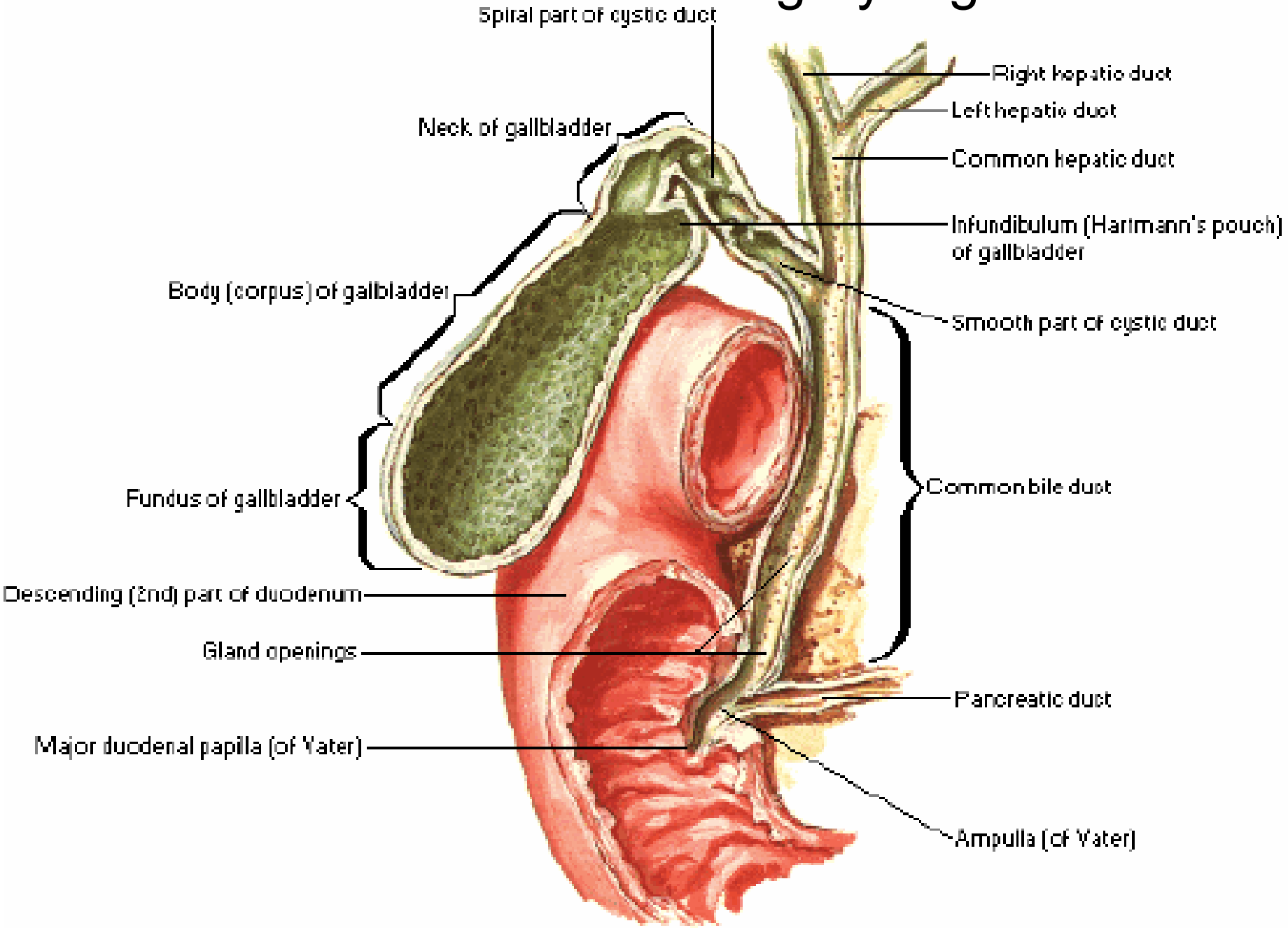
Overview

- Anatomy
- Natural History of CBD Stones
- Initial Evaluation
- Diagnostic Modalities

- Evaluation of CBD in Symptomatic Cholelithiasis
- Evaluation of CBD in Gallstone Pancreatitis



Natural History of Choledocholithiasis

- Unpredictable
- May appear in five ways
  - Without symptoms
  - Biliary colic
  - Jaundice
  - Cholangitis
  - Pancreatitis
- Last four may appear in all possible combinations

Reference	Total Cases of Gallstones	Exploration of Common Duct (%)	Exploration Yielding Stones (%)	Overall Incidence of Common Duct Stones (%)
McSherry & Glenn, 1980	8791	15.5	60	9.5
Hampson et al, 1981	2889	15	51	8
Doyle et al, 1982	4000	22	52.5	11.5
Lygidakis, 1983	3710	11.5	80	9.5
Coelho et al, 1984	908	21	72	15
Ganey et al, 1986	1024	26	36	9.5
DenBesten & Berci, 1986	983	24.5	81	20
Girard, 2000	10,471	11	75	8
Total	*32,776*	*15*	*63*	*9.5*

Initial Evaluation

- History and Physical
- Serum chemistries
  - ALT
  - AST
  - GGT
  - Alkaline phosphatase
  - Total bilirubin
- Transabdominal RUQ US

Imaging Modalities

- US
  - 40-60% sensitivity
- CT
  - 65-88% sensitivity, 73-97% specificity
  - May exclude other diagnoses
- MRCP
  - 85-92% sensitivity, 93-97% specificity
  - Low sensitivity for small stones

Endoscopic Modalities

- EUS
  - Sensitivity 89-94%, specificity 94-95%
  - High sensitivity for smaller stones
  - Complications rare (0.1-0.3%)

- ERCP
  - Sensitivity 89-93%, specificity 100%
  - Risks include pancreatitis (1.3-6.7%), infection (0.6-5.0%), hemorrhage(0.3-2.0%), perforation (0.1-1.1%)

Endoscopic Modalities

- EUS-directed ERCP
  - EUS has a lower failure rate
  - EUS has a lower complication rate
  - Detects stones in 27-40% of cases
  - Avoid ERCP in 60-73% of cases

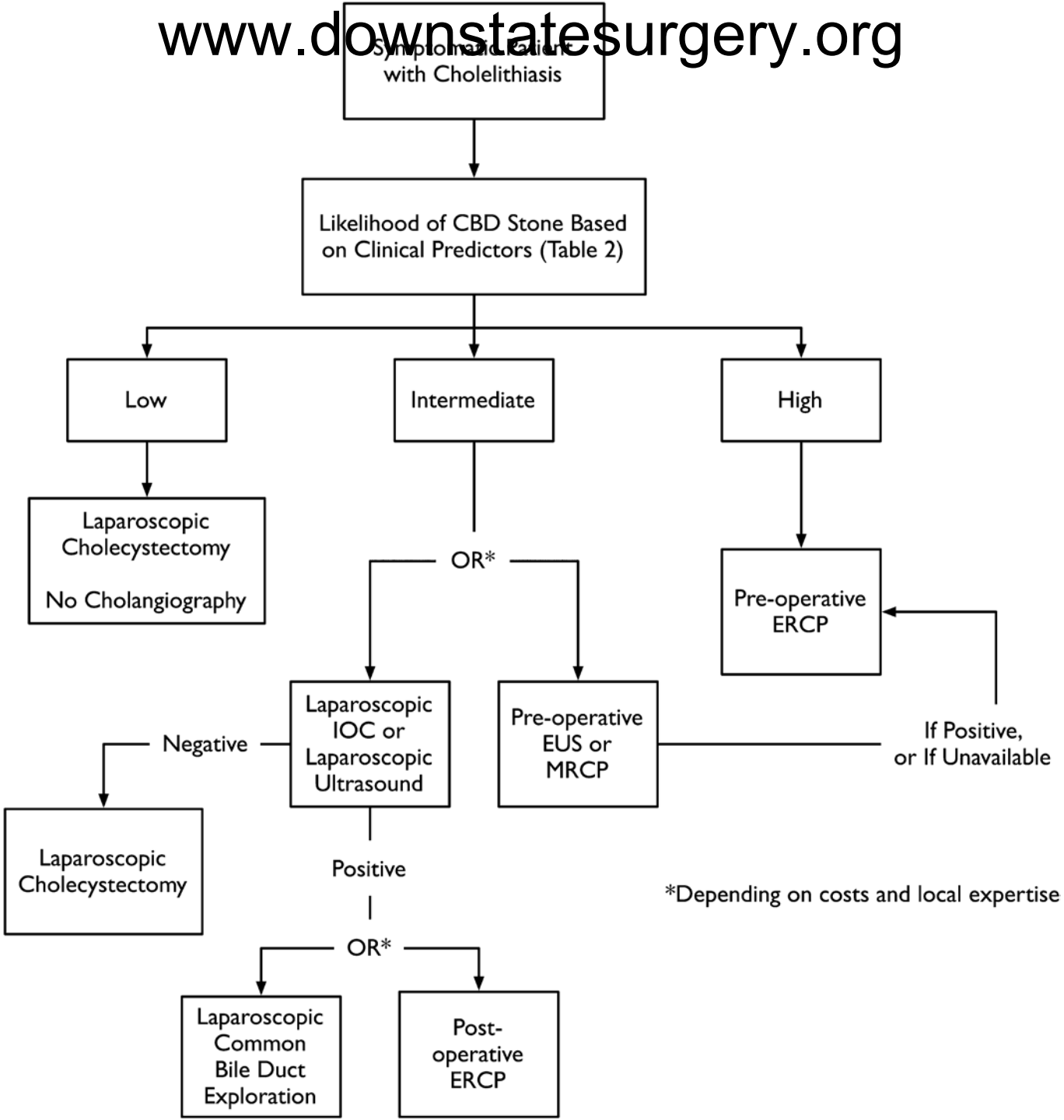
Operative Modalities

- Intraoperative US
  - Sensitivity 71-100%, specificity 96-100%
  - Successfully completed 88-100% of patients
- Intraoperative Cholangiography
  - Sensitivity 88-100%, specificity 59-100%
  - Successfully completed 88-100% of patients

Approach to CBD Stones in Symptomatic Cholelithiasis

TABLE 2. Unadjusted strategy for likelihood of choledocholithiasis in patients with symptomatic cholelithiasis based on clinical predictors

Predictors of choledocholithiasis[13,14,29,31,32]	
Very strong	
CBD stone on transabdominal US	
Clinical ascending cholangitis	
Bilirubin >4 mg/dL	
Strong	
Dilated CBD on US (>6 mm with gallbladder in situ)	
Bilirubin level 1.8-4 mg/dL	
Moderate	
Abnormal liver biochemical test other than bilirubin	
Age older than 55 y	
Clinical gallstone pancreatitis	
Assigning a likelihood of choledocholithiasis based on clinical predictors[12-14,28,29,31,32]	
Presence of any very strong predictor	High
Presence of both strong predictors	High
No predictors present	Low
All other patients	Intermediate



Approach to CBD Stones in Gallstone Pancreatitis

Gallstone Pancreatitis (GSP)

- Gallstones most common cause of acute pancreatitis in western world, 35-50%
- Frequently caused by small silent stones
- Probable mechanism transient obstruction leading to intracellular proenzyme activation
- Gallstones recovered in stool of 85% of patients with GSP compared to 10% of patients with symptomatic cholelithiasis

Approach to CBD Stones in Mild GSP

- Controversial
- Most stones will pass, 90-95%

- May rely on US and LFTs only
- May image preoperatively with MRCP or EUS
- May image intraoperatively with US or IOC

Approach to CBD Stones in Severe GSP

- Controversial
- One RCT comparing early ERCP versus conservative management found no benefit in morbidity and mortality
- Failure to respond to aggressive resuscitation in 24h with SIRS, persistent pain, or elevated bilirubin → urgent ERCP

Approach to CBD Stones in GSP and Jaundice

- Controversial
- Two RCT comparing early ERCP versus conservative management were conflicting in their outcomes
- Moderate persistent elevation total bilirubin (>3.0mg/dL)→ ERCP/EUS
- Mild transient elevation total bilirubin → MRCP
  - If MRCP positive, then ERCP
  - If ERCP fails (5%), then CBD exploration

Approach to CBD Stones in GSP and Cholangitis

- NOT controversial
- 3 RCT comparing early ERCP versus conservative management
- Urgent ERCP to decompress CBD regardless of severity of pancreatitis

EUS and Gallstone Pancreatitis

- Sensitivity 85-100%, Specificity 85-100%
- Lower failure rate than ERCP
- Avoids ERCP in 31-74%
- Lower morbidity
- More cost effective

- Strategy based on EUS before ERCP may be effective alternative

Summary

- Mild GSP → consider MRCP, EUS or IOC
- Severe GSP → consider urgent ERCP
- Persistent elevated bilirubin → EUS/ERCP
- Mild transient elevated bilirubin → MRCP
- Cholangitis → ERCP

Question #1

Which of the following has the the highest sensitivity for detecting small stones in CBD?

- Transabdominal US
- CT
- MRCP
- Endoscopic US

Question #2

On the Ranson Scale, how many points are awarded to a 61yM with gallstone pancreatitis and the following labs: WBC 13, Glucose 93, LDH 60, AST 45?

- 0
- 1
- 2
- 3
- 4

TABLE 1 -- Comparison of clinical and laboratory data used for Ranson criteria of severity in both biliary and nonbiliary acute pancreatitis

	Biliary Pancreatitis	Nonbiliary Pancreatitis
Admission		
Age	>70	>55
WBC (mm^3)	>18,000	>16,000
Serum glucose (mg/dL)	>220	>200
Serum LDH (U/L)	>400	>350
Serum AST (U/L)	>250	>250
Within 48 Hours		
Hematocrit fall (%)	>10	>10
BUN increase (mg/dL)	>2	>5
Serum calcium (mg/dL)	<8	<8
PaO_2 (mm Hg)	—	<60
Base deficit (mEq/L)	>6	>4
Fluid sequestration (L)	>4	>6

Question #3

- You are consulted for 64yM on medical service with gallstone pancreatitis HD#5. Ranson score 2. Currently pain free and tolerating regular diet. Normal amylase and lipase. Total bilirubin stable 2.5mg/dL. US shows gallstones and CBD 4mm. What do you want to do?

References

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- Cameron's Current Surgical Therapy, 10th ed.
- Blumgart's Surgery of the Liver, Biliary Tract and Pancreas, 4th ed.
- Role of Endoscopy in the Evaluation of Suspected Choledocholithiasis. Gastrointestinal Endoscopy. 71(1), 2010.
- Systematic Review of EUS versus ERCP. British Journal of Surgery. 96, 2009.