Complex Cholecystitis

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Overview
Spectrum of Cholecystitis from cholelithiasis range from very mild symptoms of “indigestion” with minimal symptoms to patients presenting in “extremis” with sepsis and multi-organs system failure.

Excluded from this presentation biliary pancreatitis, gall bladder carcinoma and congenital biliary abnormalities.

Focus on complex Cholecystitis secondary to gallstones.

Complex Cholecystitis

Glasgow et al

Glasgow et al

Overview
Gallstone occur in approximately 10% of the US Population.
600,000 Cholecystectomies per year.
Biliary colic 56%
Acute Cholecystitis 36%
Acute Pancreatitis 4%
Gall bladder cancer 0.3%
Cholangitis 0.2%

Patients with gallstone complications have an average delay of 6 months from the ultrasound diagnosis of symptomatic gallstone to surgery.

Most patients with symptomatic gallstone disease will remain symptomatic. 1-3% / year will develop a serious complication.
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Signs and Symptoms of Severe Cholecystitis

1. “Murphy’s sign” inspiritional arrest on palpation of the right upper abdomen with an associated palpable mass.
2. Fever
3. Elevated WBC count
4. Elevated LFTs
5. Jaundice
6. Elevated lipase and amylase
7. Charcot’s triad—RUQ pain, fever with rigors, jaundice.

8. Reynolds’s Pentad—RUQ pain, fever, jaundice, also add hypotension and altered mental state (usually the patient is confused or agitated)

The common bacteria associated with this presentation is E. Coli.

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“Peek and Shriek gallbladders”

1. Gangrenous Cholecystitis
2. Emphysematous Cholecystitis
3. Empyema Cholecystitis

4. Porcelain Cholecystitis “calcified gallbladder “
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5. Gallstone Ileus

6. Mirizzi Syndrome external compression of the hepatic duct by the gallbladder.

The Tokyo Guidelines were established in 2007 to assess systematically the severity of acute Cholecystitis and to form a management scheme.

Hiroto, M. et al
Complex Cholecystitis

Tokyo Guidelines:
Grade 1 Mild Acute Cholecystitis – low risk surgery complication.
✓ Healthy patient
✓ No organ dysfunction, normal or only mildly elevated lab studies.
✓ Disease limited to the gall bladder.
✓ Mildly inflamed gall bladder by imaging studies

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Grade 2 Moderate Acute Cholecystitis – intermediate risk of surgery complication
✓ Healthy patient
✓ No organ dysfunction.
✓ May have fever, abdominal pain and a RUQ mass.
✓ May have elevated lab studies
✓ Severe inflammation of the gall bladder, can include abscess of gall bladder or liver.

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Grade 3 Severe Acute Cholecystitis – High risk of surgery complication
✓ Serious co-morbidity or extreme age > 80 years.
✓ Severe abdominal pain and mass.
✓ Organ dysfunction, renal failure (creat. > 2.0 mg/dl, hypoxia, liver failure with PT-INR > 1.5).

Hiroto, M et al.

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Grade 3 Acute Cholecystitis – High risk of surgical complication.
✓ Thrombocytopenia-platelet count < 100,000.
✓ Severe inflammation of the gall bladder, can include abscess of gall bladder or liver.
✓ Elevated lab studies, WBC and LFTs.
✓ Decreased consciousness.

Hiroto et al.
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**Imaging findings of acute Cholecystitis**

- Ultrasonography findings: Sonographic Murphy sign (tenderness elicited by pressing on the abdomen.
- The gallbladder with the ultrasound probe
  - Thickened gallbladder wall (>4mm; if the patient does not have chronic liver disease and/or ascites or right heart failure)
- Enlarged gallbladder (long axis diameter >8 cm, short axis diameter >4 cm)
  - Incarcerated gallstone, debris echo, pericholecystic fluid

**Magnetic resonance imaging (MRI) findings**

- Collection sonolucent layer in the gallbladder wall, striated intramural lucencies.

**Computed tomography (CT) findings**

- Thickened gallbladder wall.
- Pericholecystic fluid collection
- Enlarged gallbladder
- Linear high-density areas in the pericholecystic fat tissue.

**Conclusion**

Consider percutaneous cholecystomy tube for unstable patient.

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Based on the level of severity of the acute Cholecystitis the surgeon can plan appropriately management.

1. ICU Admission
2. Drainage or partial or complete gallbladder resection.
Surgery Tool Box:
1. Percutaneous Drainage.
2. Laparoscopic/Open Drainage
3. Subtotal cholecystectomy

Roux en Y Cholecysto-Choledocho-Jejunostomy described by Safioleas for Mirizzi Cholecystitis.
Safioleas et al. World J Gastroenterol 2006 September 14: 12(34): 5579-5581

Percutaneous Drainage
- Percutaneous or Transhepatic
- Can be done under ultrasound, fluoroscopic or CT guidance for critically ill patients.

Figure 2 Schematic representation of the described technique during laparotomy
(A, B) and Roux-en-Y cholecysto-choledocho-jejunostomy (C).
World J Gastroenterol 2006 September 14: 12(34): 5579-5581
Complex Cholecystitis

Study by J Li et al.

- 25 patients all critically ill or grade 3 acute Cholecystitis treated with percutaneous drainage using the Seldinger technique with ultrasound.
- 23 patients symptoms resolved in 1-6 days (median 2 days).
- 23 patients symptoms resolved in 1-6 days (median 2 days).

Hong Kong Med J Vol 10 No 6 December 2004

Complex Cholecystitis

J. Li et al.

- 2 patients failed with gangrenous gallbladders and perforation.
- 5 mortalities, all were older than 80 years old
- 3 died of pneumonia, one of sepsis with liver abscess, and one with metastatic cancer.

Hong Kong Med J Vol 10 No 6 December 2004

Complex Cholecystitis

Percutaneous Drainage

Morse et al. noted in their study 13 patients had their tubes removed before definitive surgery and all had recurrence of their symptoms of acute Cholecystitis.

Am Surg Jul 76(7) 2010

Complex Cholecystitis

Donkal et al.

- 122 patient treated with percutaneous drainage.
- CT guidance best imaging tool 93.3% success compared to fluoroscopy 62.5% and ultrasound 46.1%.
- 2 death within 30 days for a mortality of 1.6%

World J Radiol 2010 September 28; 2(9): 358-367
Complex Cholecystitis

Percutaneous Drainage

Von Sonneberg et al. reported similar results in 104 patients. Mortality rate of 2.2%. Surgery 1990:107

Indications for percutaneous drainage unstable or septic patient that will not tolerate surgery. Will allow time to stabilize the patient to eventually undergo surgery.

Complex Cholecystitis

Intra-operative management of the complex gallbladder that are deemed unresectable.

1. Laparoscopic/Open drainage tube Cholecystomy.
2. Laparoscopic/Open subtotal Cholecystectomy.
4. If available consult with a more experienced surgeon.

Michalowski et al.

Laparoscopic Subtotal Cholecystectomy on 29 patients with grade 3 acute Cholecystitis. Results:

- 2 patient the cystic duct could not be isolated.
- Posterior wall of gallbladder left intact.
- 4 Complications, one wound infection, 3 bile leak.
- One death from MI.
- Median hospital stay was 5 days.

British J of Surgery Jul:85 1998

Laparoscopic percutaneous drainage

Empyema acute Cholecystitis
Complex Cholecystitis

Sememisina (Denmark) argues for LSC for grade 3 acute Cholecystitis to allow fewer conversion to open procedures, shorter hospitalizations, minimal complications and mortality rate. Need Randomized trials.

Ji, W et al. Advocate for LCA as an alternative to converting to open procedure.

Hepatobiliary Pancreatic Disease 2006

Complex Cholecystitis

Nakajima J. et al compared outcomes of Laparoscopic Cholecystectomy (LC) vs. Laparoscopic Subtotal Cholecystectomy (LSC) for grade 3 acute Cholecystitis.

LC N=643  LCS N=583

Compared bile duct injuries, conversion to open Cholecystectomy, blood loss, mean op time, morbidity and mortality.

Surgery today 2009

Complex Cholecystitis

Results:
- Bile duct injuries 1.6% vs. 0.3% P=0.04
- Conversion to open 2.2% vs. 0.3% p=0.046
- mean op time 119 min vs. 71 min p<0.001
- Mean blood loss 53.4 ml vs. 12.9 ml p=0.001

No difference in morbidity or mortality in the two groups.

Surgery today 2009

Complex Cholecystitis

Soleimaniet et al. Review their data on 73 patients with grade 3 acute Cholecystitis comparing open vs. LSC.

Conclusion LSC is preferable to conversion to open Cholecystectomy, but more study is needed.

American J Surg Vol 73 2007
**Complex Cholecystitis**

Gallstone Ileus
- Result of adhesions between the inflamed gallbladder and adjacent part of the GI tract.
- Subsequently large stone cause pressure necrosis resulting in a Cholecysto-enteric fistula. The stone can travel into the gut and cause a mechanical obstruction.
- Common sites for the fistula Duodenum, stomach, and colon (Bouveret’s syndrome).

First described in 1654 by Erasmus Bartholin.
- More common in women, average age 70 years.
- Mortality 12-27% compared to 7-10% mortality from a mechanical SBO from adhesion. Stone impacted at ileo-cecal valve.
- Mortality related to co-morbid problems associated with the elderly.
- 50% will have a previous history of biliary disease.

Approximately 50% diagnosed on a plain abdominal film.
- Rigler’s Triad
  1. Pneumbilia
  2. Ectopic stone identified in the GI tract
  3. Mechanical SBO
- Other useful imaging studies are abdominal ultrasound and CT scan.

Controversy to treat in one stage with Cholecystectomy and repair of the fistula or enterolithotomy only.
- Ravikumar, R et al. reviewed 27 retrospective papers on gall stone ileus.
- Concluded one stage procedure for young and healthy patient. Enterolithotomy for elderly and/or for critically ill patients.

Ann R Coll Surg May 2012
Dr. Carter’s Little Pearls

• Problem 1: patient is obese, fatty omentum and T-colon obscure seeing the infundibulum
  • Solution: place 5th port, 11mm, in right mid-abdomen at level of camera port, and put in EndoPaddle to push colon down.
  •

• Problem 2: severe inflammation of HD ligament, need a top down approach.
  • Solution: dissect window behind GB at mid-body. Then divide GB in half. Leave retractor on fundus for exposure, then do top-down approach of lower half of GB until it funnels down.

• Problem 3: patient septic, Coagulopathic, in acute renal failure, etc. high risk for operation.
  • Solution: place Cholecystostomy tube, do the GB 6 weeks later.
  •

• Problem 4: perforated GB with hepatic abscess
  • Solution: IR drain in GB or abscess, either one. Add antibiotic and interval Cholecystectomy in 6 weeks.