Acute Gangrenous Cholecystitis: An Institutional Review

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INTRODUCTION

Annually, 200,000 acute cholecystitis (AC) cases are diagnosed in the US.[1] Gangrenous cholecystitis (GC), resulting in ischemic necrosis of the gallbladder, occurs in 2-20% of AC.[2] Mortality rates for GC range anywhere from 15% to 50%. GC is often associated with a delay in diagnosis, leading to increased complications and mortality.[3]

We present the characteristics, treatment and outcomes of patients admitted to our institution with GC.

METHODS

- Retrospective chart review of adult patients with GC between October 2012 - December 2022
- Inclusion criteria: GC confirmed by pathology
- Exclusion criteria: AC without GC confirmed by pathology
- Data collection consisted of patient demographics, clinical presentation, laboratory values, imaging studies, treatment modality, operative findings, and outcomes.

RESULTS

- A total of 5,746 patients underwent surgery for AC between 2012 - 2022
  - Laparoscopic Cholecystectomy (LC): *n* = 5,336
  - Robotic Surgery: *n* = 329
  - Open Cholecystectomy (OC): *n* = 81
- A total of 67 patients (0.01%) were diagnosed as having GC
  - Average age was 56 (SD=16.5) ; 64% were male.
  - Hispanic (37%) and Asian (28%) ethnicity most common
- Comorbidities present included:
  - Hypertension (48%)
  - Obesity (BMI > 30) (36%)
  - Diabetes (33%)
- Physical assessment:
  - 64% presented with right upper quadrant pain
  - 46% with epigastric pain
- CT imaging findings for GC included:
  - Gallbladder distention (43%), fat stranding (22%), and perforation (3%)
- Surgical management was laparoscopic cholecystectomy (LC; 75%), laparoscopic converted-to-open cholecystectomy (LC-O; 19%) and open cholecystectomy (OC; 3%)
- Complications included bile leak (7%), wound infection (4%), hematoma (3%), and wound dehiscence (1%)
- Overall mortality rate was 1.4%

RESULTS

Table 1. Descriptive statistics for the sample

	SAMPLE (N=67)
DEMOGRAPHICS	
AGE (SD)	55.81 (16.55)
HISPANIC	37%
ASIAN	28%
MALE	64%
COMORBIDITIES	
HYPERTENSION	48%
BMI >= 30	36%
DIABETES	33%
CT FINDINGS	
GALLBLADDER DISTENSION	43%
FAT STRANDING	22%
PERFORATION	3%
OUTCOMES	
MORTALITY	1.4%

Figure 1. Treatment Modalities.

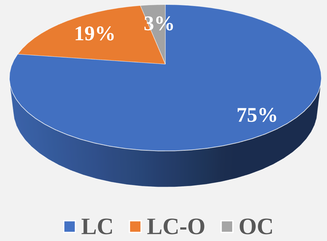
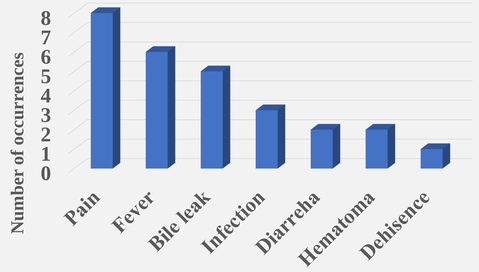


Figure 2. Complications



DISCUSSION

• Those with GC were significantly more likely to be over 45 and male.[4,5]

• Ultrasound and CT signs suggest the presence of gangrenous cholecystitis through decreased focal wall perfusion on Color Doppler, irregular gall bladder mucosal outline, gall bladder wall thickening, gas within the gall bladder, and pericholecystic collections.[6]

• HIDA may demonstrate what is known as the "hot sign," a peripherally enhanced rim with an encompassing tracer-deficient gallbladder.[6]

• Patients with GC experience increased length of stay (LOS) and complication rates,[7,8] including increased bile leak, hemorrhage, surgical site infections, intra-abdominal abscesses, and a 30-day mortality rate of 1.2%. However, properly timed treatment in specialized units may lower adverse outcomes.[9]

• Yacoub et al produced a scoring system stratifying groups into low, intermediate, or high probability of having GC. Variables included age, HR, male gender, WBC > 13,000, and US observed GBWT. Points were assigned as 1 for age > 45, HR > 90, and GWBT > 4.5 mm; 1.5 for WBC > 13,000; and 2 for male gender. Sum totals were interpreted as 0 - 2 (low probability = 13%), 2 - 4.5 (intermediate = 33%), and > 4.5 (high = 87%). Overall score could possibly help determine which patients may need prompt cholecystectomy.[10]

• GC occurring in COVID-19 patients is believed to be multifactorial: these include increased risk of developing vascular microthrombi, biliary stasis, gallbladder distention, SIRS, immunosuppression, opportunistic infections, antiretroviral induction of a hypercoaguable state, and ischemia to the gallbladder.[11]

CONCLUSION

Gangrenous cholecystitis is a serious complication of gallbladder disease. It is often associated with delayed diagnosis, which translates into higher rate of complications and mortality. A high index of suspicion based on appropriate assessment of key factors such as age, gender, certain co-morbid conditions, specific lab values and imaging findings can lead to timely surgical intervention and decreased complications and mortality.

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