

Clinical Study and Management of Calculous Cholecystitis in a Tertiary Care Hospital

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Abstract:

Background: Cholecystitis, a bacterial or chemical-induced inflammation of the gallbladder, is one of the most common biliary diseases. There are numerous pathological and clinical manifestations of it. Gallstone-related cholecystitis is the most prevalent kind, accounting for 90–95% of cases. The current study intends to examine the pathology of the removed gallbladder due to calculous cholecystitis, as well as the demographics and surgical morbidity of the local population admitted to the S.S. Institute of Medical Science and Research Centre Hospital in Davangere.

Methods: This was an observational study carried out over a period of two years, from September 2017 to October 2019, involving 50 cases presenting to the department of surgery with symptomatic gall stones, confirmed by imaging studies and admitted for further management. A detailed history and physical examination were carried out. The diagnosis was confirmed by ultrasound imaging. All patients were subjected to laparoscopic cholecystectomy. Details pertaining to intra-operative and post-operative complications, post-operative pain, and length of stay were recorded. The collected data were tabulated and descriptive analysis was carried out.

Results: Between the ages of 31 and 40, calculous cholecystitis had its highest incidence. The ratio of men to women is 1.5:1. A common initial symptom was pain in the right upper abdomen. Right hypochondric pain is the most prevalent, followed by epigastric discomfort. Additional symptoms include fever, jaundice, dyspepsia, and nausea and vomiting. The most typical symptom was discomfort in the right hypochondrium. Additional symptoms include icterus, fever, and Murphy's sign guarding. Upon analysis of the co-morbid diseases, it was discovered that 30% of patients with acute calculous cholecystitis and 12.5% of patients with chronic calculous cholecystitis were obese. Additionally, 10% of the study group had diabetes in ACC and 40% in CCC. HTN was shown to be a significant comorbidity in 47.5% of cases of CCC. Gall bladder wall thickening was observed in 80% (8) of the ACC group, while pericholecystic fluid was observed in 30% (3). There was no mass in any patient, and on ultrasonography, choledocholithiasis and cholelithiasis are present. In 35% (14) of the CCC group, the gall bladder wall got thicker, and in 17.5% (7), there was fluid around the gall bladder.

Conclusion: Calculus cholecystitis is still a disease that primarily affects women, usually in their third or fourth decade of life. A proper laparoscopic cholecystectomy can safely and successfully control the condition with few to no consequences. Predisposing factors would be identified through additional research, leading to an earlier intervention.

Keywords: Calculus Cholecystitis, Laparoscopic Cholecystectomy.

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Introduction

Cholecystitis, a bacterial or chemical-induced inflammation of the gallbladder, is one of the most common biliary diseases. There are numerous pathological and clinical manifestations of it. Gallstone-related cholecystitis is the most prevalent kind, accounting for 90–95% of cases.

There are a number of risk factors that contribute to calculous cholecystitis, the most significant of which are female gender, obesity, nutritional factors, and diabetes. Females are more likely than males to get cholecystitis; the ratio of females to males is 3:1 until around the age of 50, at which point it drops to roughly 1.5:1. There are regional

variations in its occurrence across the globe. Wani N.A. experience states that there are 4.4:1 females in India. Additionally, there are regional variations in the prevalence of cholecystitis across the Indian subcontinent. The northern areas get it almost seven times more frequently than the southern ones. [1]

The current study intends to examine the pathology of the removed gallbladder due to calculous cholecystitis, as well as the demographics and surgical morbidity of the local population admitted to the S.S. Institute of Medical Science and Research Centre Hospital in Davangere.

Materials & methods

This was an observational study carried out over a period of two years from September 2017 to October 2019 involving 50 cases presenting to the department of surgery with symptomatic gall stones, confirmed by imaging studies and admitted for further management at the S.S. Institute of Medical Science and Research Centre Davangere.

A detailed history and physical examination were carried out. The diagnosis was confirmed by ultrasound imaging. All patients were subjected to laparoscopic cholecystectomy. Details pertaining to intra-operative and post-operative complications, post-operative pain and length of stay were recorded. The collected data were tabulated and descriptive analysis was carried out.

Results

The oldest patient in this study was 84 years old, and the youngest patient had a higher prevalence of cholecystitis in the third decade. There were 20 (40%) male patients and 30 (60%) female patients. Males made up 20% of ACC patients, while females made up 80%. Of the CCC patients, 54% were female and 46% were male. There are 1.5 females for every male.

42.93 years old (SD 15.31) was the average age at presentation. Females were 43.5 (SD 14.1) years old on average. The average age of the men was 44.35 years (SD 12.35).

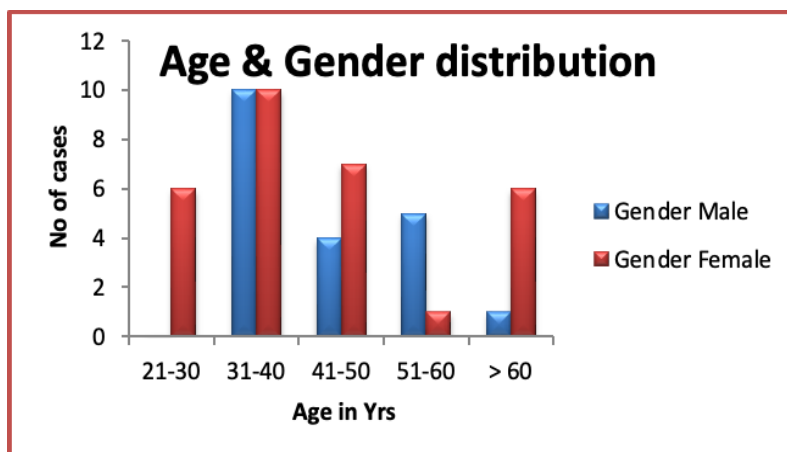


Figure 1: Incidence

Table 1: Clinical Presentation

Complaints	ACC		CCC	
	Number	Percentage	Number	Percentage
RUQ Pain	10	100	40.0	100
Epigastric pain	4	40	10	25
Fever	10	100	4.0	10
Vomiting	6	60	15.0	37.5
jaundice	0	0	3.0	7.5
dyspepsia	3	30	13.0	32.5

The most frequent presenting symptom in the ACC and CCC groups was pain. 100% of the patients in the ACC group had fever (100%), and all of them had right hypochondrial discomfort (10%). In 60% of instances, the epigastrium was the second most prevalent site of pain, after the right hypochondrium. Vomiting ranked as the second most frequent symptom (60%). Upper abdominal

dyspepsia was one of the other symptoms (34%). No patient had itching or jaundice.

Pain in the right upper abdomen affected 100% of the CCC group. In 25% of cases, the epigastrium was the second-most frequent source of discomfort after the right hypochondrium. Other symptoms included dyspepsia (32.5%), fever (10%), jaundice (7.5%), and vomiting (37.5%), in descending order.

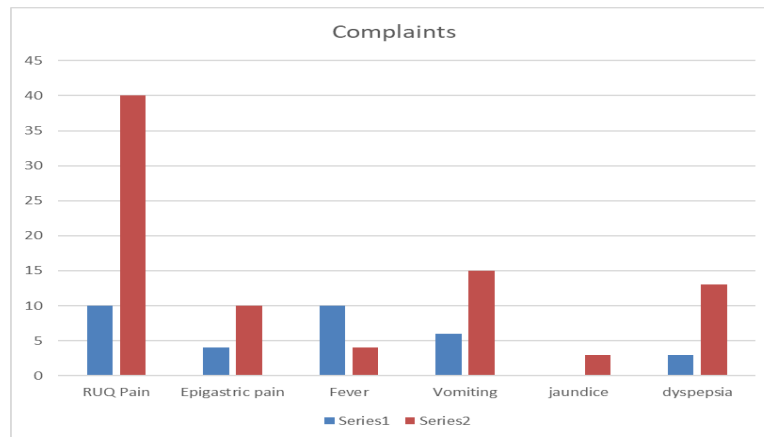


Figure 2: Clinical Presentation

In the current investigation, the right hypochondrium was painful for 48 patients. Six patients had the predominant symptom of guarding. Only one patient had a mass in the right hypochondrium, and three individuals had icterus. There were fourteen feverish patients.

Table 2: Comorbid Conditions

		TYPE			
		ACC		CCC	
		Count	Column N %	Count	Column N %
Obesity	No	7	70	31	77.5
	Yes	3	30	9	12.5
DM	No	9	90	24	60
	Yes	1	10	16	40
HTN	No	10	100	21	52.5
	Yes	0	0	19	47.5
Other	Bronchial Asthma	1	100	0	0
	Hypothyroid	0	0	3	100

After the co-morbid conditions were examined, it was discovered that obesity affected 30% of patients with acute calculous cholecystitis and 12.5% of patients with chronic calculous cholecystitis. Additionally, 10% of the study group had diabetes in ACC and 40% in CCC. The presence of HTN in 47.5% of patients with CCC was another noteworthy comorbidity.

Table 3: Ultrasound Imaging

Imaging Findings	ACC		CCC	
	Number of Cases	% of Cases	Number of Cases	% of Cases
Stone in a Gall Bladder	10	100	40	100
TG	8	80	14	35
PCF	3	30	7	17.5
Bile Duct Stones	0	0	3	7.5
Mass	0	0	0	0

The primary investigation was an abdominal ultrasound. In both groups, all 50 patients developed gall bladder stones. Gall bladder wall thickening was observed in 80% (8) of the ACC group, while pericholecystic fluid was observed in 30% (3). On ultrasound, none of the patients showed cholelithiasis or choledocholithiasis.

In 35% (14) of the CCC group, the gall bladder wall got thicker, and in 17.5% (7), there was fluid around the gall bladder. Three instances, or 7.5%,

had choledocholithiasis in addition to cholelithiasis. There was no mass seen on ultrasonography.

Type of Surgery

Each and every patient was treated with a laparoscopic cholecystectomy. One patient had an open cholecystectomy following a laparoscopic procedure.

The standard treatment plan for acute calculous cholecystitis is to first reduce inflammation and

then, six weeks later, do an interval cholecystectomy.

In 49 individuals (98%) a laparoscopic cholecystectomy was performed. Due to strong adhesions and challenging calots triangle dissection, 1 (2%) patient's lap procedure was changed to an open cholecystectomy. The right subcostal incision made by Kocher was employed.

In three cases, there were common bile duct stones. In all three cases, ERCP effectively removed the CBD stone, and the patient subsequently underwent an elective laparoscopic cholecystectomy.

The occurrence of adhesions in 26 (52%) of the patients, bile leaks in 4 patients (8%) and stone

spills in 2 (4%) of the LC patients were the main intraoperative problems noted. Patient 1 in the lap converted to open had extensive adhesion. In neither group was there a single case of CBD injury or surrounding organ damage.

Post-Op Complications

There were not many post-operative problems. A patient underwent laparoscopic conversion to an open case and had a prolonged bile leak, which was treated conservatively. In both groups, there were no cases of wound infection, retained stones, or post-operative bleeding. Death occurred in both groups.

Table 4: Histopathology Findings

Histopathology Report	No. of Cases	%
Acute cholecystitis	3	6%
Acute on chronic cholecystitis	7	14%
Chronic cholecystitis	40	80%
Gangrenous gall bladder	0	0%

39 patients, or 78% of the total, in this study had chronic cholecystitis. Three patients (6%), who had acute cholecystitis, and seven patients (14%), who had chronic cholecystitis, had acute gallbladder symptoms. Our investigation yielded no cancer cases.

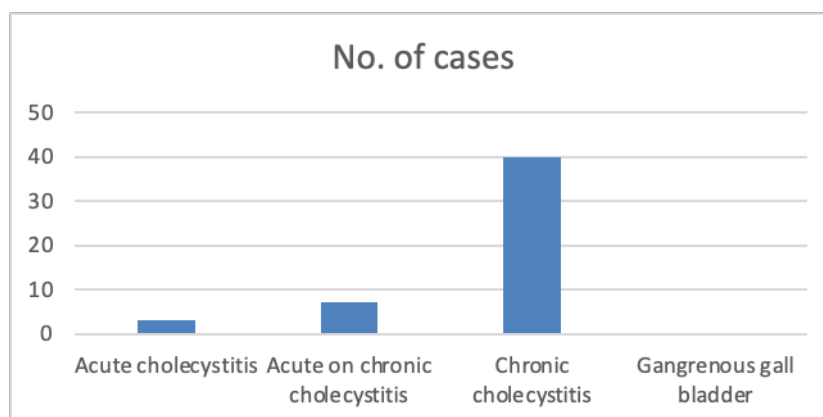


Figure 3: Histopathology Findings

Discussion

In almost 90% of cases, cholelithiasis coexists with acute cholecystitis. It usually happens in a patient who already has chronic cholecystitis, but it can also happen on its own. The most common cause is an impinging gallstone that blocks the cystic duct in Hartmann's pouch. Up to the age of fifty, the prevalence of acute calculous cholecystitis in women is three times higher than in males; after that, it is roughly 1.5 times higher in women. Since roughly 30–60% of patients with acute cholecystitis have sterile bile or gallbladder wall cultures, the infection of the bile is comparatively less significant at this early stage.

The term "cholecystitis" should only be used to refer to gallbladders containing gallstones with

varying degrees of inflammation, from mild mucosal or submucosal to gross transmural fibrosis leading to a contracted fibrous encasement of the biliary calculi. The most common cause of chronic cholecystitis (> 90%) is chronic gall bladder inflammation.

Incidence

According to our research, the third and fourth decades were the most often affected age groups by ACC, with the third decade having the highest incidence. ACC was more prevalent in the fourth and fifth decades, according to Sangma MMB et al. [2] The third and fourth decades in the CCC group were the most often afflicted, with the third decade having the highest prevalence. This showed a strong correlation with research by Rajendra G.C.

and Rakesh B.H. [3] which found that the fourth decade has the highest prevalence.

Out of the 50 patients in the current study, 30 (or 60%) were female and the remaining 20 (or 40%) were male. There was a noticeable female majority in both groups. There were two male and eight female patients in the ACC group. A similar gender preponderance favouring females was observed in a study by Sangma MMB et al. In the CCC group, there were 22 more female patients than male patients (18 total). In the Rakesh B.H., Rajendra G.C. investigation, similar sex preponderance females were identified. The male-to-female ratio was 1:1.2. [3]

The occurrence of cholecystitis varies throughout the world, according to Wani NA [4] experience. In India, the ratio of males to females is 4.4:1. However, symptomatic cholelithiasis is more severe in men, as indicated by more severe disease at surgery, higher conversion rates, and higher postoperative mortality rates, according to the findings of a study conducted by Russel JC et al. [5]

Clinical Manifestations

The literature suggests that two-thirds of gallstones may not cause any symptoms. Gallstones affect 10–20% of the population in most western nations, and 50–70% of those with the condition are asymptomatic when they are first diagnosed. The typical course of asymptomatic gallstone disease is benign, and only a small percentage of cases advance from asymptomatic to symptomatic (10–25%). [6]

Certain patients could show up with vague symptoms. Stones can cause pancreatitis, biliary colic, obstructive jaundice, and acute or chronic cholecystitis. According to William et al., the primary sign of gallstone disease is biliary discomfort. He also verified that pain can be felt by the gallbladder itself in the absence of stones and that 77% of patients experience relief from this pain following a cholecystectomy. [7]

The most frequent presenting symptom in the ACC and CCC groups was pain. In the ACC group, 100% of the patients had fever and 100% had right hypochondrial discomfort upon presentation. The right hypochondrium was the most often reported site of pain, with the epigastrium coming in second in 40% of instances. Vomiting ranked as the second most frequent symptom (60%). Upper abdominal dyspepsia was one of the other symptoms (34%). Not a single patient had jaundice or itching. Sangma MMB et al, study [2] reported similar presentations.

The main complaint of chronic cholecystitis is discomfort, which is sometimes misdiagnosed as biliary colic. In cases of uncomplicated biliary

colic, fever and jaundice are less frequent, and nausea and vomiting may accompany the pain in 60–70% of cases. Bloating and dyspepsia may also occur in less than 50% of cases. [8,9] Patients with chronic cholecystitis typically present physically normal, especially if they are pain-free. Mild pain in the right upper quadrant may be experienced during a biliary colic episode.

All of the patients in the CCC group had abdominal pain, with 10 of them (or 25%) reporting epigastric pain. Of the patients, 30 (75%) experienced colicky discomfort, whereas the remaining 10 patients (25%) experienced dull aching pain. In most of the 32 patients, the pain was radiating to the back; in 8 individuals, it was to the shoulder. The next most common symptoms, which affected 15 individuals (37.5%), were nausea and vomiting. Thirteen patients (32.5%) had flatulent dyspepsia. Following a cholecystectomy, these patients had relief from their dyspepsia. Ten patients (four) developed fever. A biliary blockage-induced cholangitis caused the fever in 3 (7.5%) of the patients. The fever was mild in intensity. Three individuals, or 8% of the total, reported having yellowish urine and eyes.

The most prevalent symptom in the ACC and CCC groups was tenderness in the right hypochondrium. In the ACC group, 100% of the patients had right hypochondrial soreness. In 10% of cases, the patient had a preset fever, and in 50%, there was guarding. The gall bladders of none of the patients are palpable. These outcomes were similar to those of the study conducted by Sangma MMB et al.^[2]

Tenderness was detected in 97.5% of the CCC group, which was higher than in the study by Rajendra G.C. and Rakesh B.H. [3] Icterus was seen in 7.5% of cases, which was consistent with the study. 2.5% was the preset gauding value. Mass was not sensed in any group. These outcomes were similar to those of the study conducted by Rajendra G.C. and Rakesh B.H.

Management

The presence of pericholecystic fluid and gallbladder wall thickening are radiographic indicators of acute cholecystitis. In both groups, all 50 patients developed gall bladder stones. Gall bladder wall thickening was observed in 80% (8) of the ACC group, while pericholecystic fluid was observed in 30% (3). On ultrasound, none of the patients showed cholelithiasis or choledocholithiasis. In 35% (14) of the CCC group, the gall bladder wall got thicker, and in 17.5% (7), there was fluid around the gall bladder. Three instances, or 7.5%, had choledocholithiasis in addition to cholelithiasis. There was no mass seen on ultrasonography. Aside from very small stones, the limitations of ultrasonography in stone detection include the challenge of determining the

size and quantity of stones as well as whether or not they are calcified. [10]

The best course of treatment for acute cholecystitis is currently thought to be an urgent laparoscopic cholecystectomy. According to Gui PH et al.'s experience, cholecystectomy improved symptoms when compared to a control group of the same size, indicating that surgery is still the recommended course of treatment for symptomatic gallstones. [11] Acute cholecystitis was considered a relative contraindication at the time LC was introduced, but as experience has grown, laparoscopy has emerged as the method of choice. Randomised controlled trials have shown that individuals undergoing laparoscopic cholecystectomy had reduced rates of morbidity, shorter hospital stays, and a quicker return to work. Acute cholecystitis has been associated with increased conversion rates-up to 30%-although more recent research has shown lower rates-between 11 and 21%.

Every patient in our study had a laparoscopic cholecystectomy. Due to dense adhesion and challenges in dissecting the Calot's triangle, a single patient had their laparoscopic procedure changed to an open procedure.

The most serious side effect that can occur from surgery is harm to the bile duct. In 0.1% to 0.2% of cases involving open cholecystectomy, this happens. It should be quickly identified and treated during surgery. [12] The term "postcholecystectomy syndrome" describes the continuation of biliary tract-related symptoms following cholecystectomy. Post-cholecystectomy syndromes have a widely variable reported incidence that is correlated with the length of follow-up. Women outnumber men in this population, especially in the 40-50 age range. For every patient experiencing continued or recurrent symptoms following a cholecystectomy, a thorough assessment and study of the biliary tract, including an ERCP, are recommended. [8]

The current study's primary intraoperative problems were adhesion in 26 (52%) of the patients, bile leak in 4 patients (8%) and stone spillage in 2 (4%) of the LC patients. Patient 1 in the lap converted to open had extensive adhesion. In neither group was there a single case of neighbouring organ damage or CBD harm. In either group, there was no mortality.

The LC group in the current study had a considerably lower VAS score (Grade 2 (median) for LC and Grade 3 (median) for OC). For LC patients, the median pain duration was 3 days; for OC patients, it was 8 days. The length of time patients used analgesics: median 4 days for LC patients and 10 days for OC patients (n = 1). Patients in the laparoscopic group experienced much less pain and analgesic usage for shorter

periods of time. This resulted from LC's smaller incision size. Similar findings have also been found in other investigations. [13,14]

The brief hospital stay and quick recovery are the two best things about LC. The LC group's median length of stay in the hospital was 7.5 days, whereas the OC group's was 12 days. It was determined that the difference was statistically significant ($p < 0.01$). Several more series also corroborated this. [15] In LC cases, as opposed to OC cases, it took less time to resume regular work.

Chan et al. compared 371 LC vs. 100 OC in a prospective research comparing LC with conventional methods. A single observer evaluated the post-operative result subjectively using the VAS, while the parenteral analgesic administered was evaluated objectively. Patients undergoing LC were found to have mobilised earlier and had a shorter mean post-operative stay (3.5 days v/s 5.9 days, $p < 0.01$), and they required significantly less analgesia (467 mg v/s 223.9 mg mean pethidine dose, $p < 0.01$).

In a prospective study, Kum et al. [16] compared the pain thresholds of 28 patients who had LC and 11 individuals who had OC. With the use of the VAS, an impartial observer assessed the degree of pain. On the day of the procedure (mean VAS score 3.8 compared to 7.7) and the first postoperative day (mean VAS score 2.8 versus 6.2, $p < 0.05$), patients who had LC experienced noticeably less discomfort. Analgesia was needed for every patient in the OC group, but only 53.6% of the LC patients needed it ($p < 0.05$).

In Hardy's [17] evaluation of LC versus OC, which involved 108 patients in each group, the mean operating room duration was reported to be 131 +/- 3.7 minutes for OC and 164 +/- 4.7 minutes for LC. 4.5% was the conversion rate. For OC and LC, the average length of hospital stay was 6.5 +/- 0.3 days and 2 +/- 0.2 days, respectively. The LC group experienced far less analgesia, both in terms of duration and amount. After LC, patients recovered far more quickly ($p < 0.01$) in the first eight weeks following surgery.

Conclusion

Calculus cholecystitis is still a disease that primarily affects women, usually in their third or fourth decade of life. A prompt laparoscopic cholecystectomy can safely and successfully control the condition with few to no consequences. Predisposing factors would be identified through additional research, leading to an earlier intervention.

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