

Clinical Profile and Treatment Outcome of Patients with Cholecystolithiasis

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Abstract

Background: Cholecystolithiasis is a significant surgical problem. Variation in clinical symptoms of cholecystolithiasis forms the disease more thought-provoking. We aimed to explore demographics, the clinical profile of patients, and treatment outcomes of patients with cholecystolithiasis. **Subjects and Methods:** This is a retrospective study of patients with cholecystolithiasis from January 2018 to June 2021. The patient's demographics, clinical profile, perioperative details, and treatment outcomes were analyzed. **Results:** A total of 304 patients (73 males) with cholecystolithiasis were included in the study. Median ages were 46 years (range: 19-71 years). Most of our patients 290 (95.6%) were symptomatic with the commonest symptom as upper abdominal pain. The conversion rate was 8.6%. Overall postoperative complications were found in 38 patients (12.2%). There was no mortality in this study. In logistic regression analysis, on multivariate analysis, out of the independent variables, sex (male), age (≥ 60 years), presence of comorbidity, and duration of surgery (≥ 2 hours), only the male gender was associated with an increased risk of postoperative complications (OR; 0.046, CI [0.018- 0.112], $P < 0.05$). **Conclusion:** Cholecystolithiasis is a common and significant surgical problem that usually presents with upper abdominal pain. Laparoscopic cholecystectomy is the standard care of treatment. Male gender is a risk factor for postoperative complications.

Keywords: Cholecystolithiasis; Clinical profile; treatment outcome.

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Introduction

Cholecystolithiasis is a significant surgical problem throughout the world. The incidence reported varies from 10-15% in the USA, 20% in the European adult population, and 4-15% in Asia.^[1] The formation of cholecystolithiasis is multifactorial that includes genetic, gender-specific, lifestyle, physical inactivity, obesity, and comorbidity-related factors. Known risk factors for cholecystolithiasis are four "F's": female, fat, forty, and fertile.^[2] Depending on their composition, gallstones are classified into cholesterol gallstones and bilirubin ('pigment') stones. Black pigment stones could be usually grown in obstructed and infected bile ducts and black pigment stones form due to chronic hemolysis.

The majority of patients (60-80%) with gallstones are asymptomatic and clinical symptoms vary from true biliary pain that radiates to the back and nonspecific abdominal complaints including dyspepsia with other symptoms such as nausea and vomiting.^[1]

Transabdominal ultrasonography is the gold standard for the

diagnosis of cholecystolithiasis. The benefit of ultrasonography is noninvasive, easily available, with high sensitivity and specificity (above 95%). Moreover, ultrasonography gives information on stone size, number, and anatomy of gallbladder and bile duct.^[3] Regarding treatment, laparoscopic cholecystectomy is the standard care of treatment for symptomatic cholecystolithiasis. We aimed to explore demographics, the clinical profile of patients, and treatment outcomes of patients with cholecystolithiasis in our setting.

Subjects and Methods

A retrospective cross-sectional review of surgical records was done for all patients who were admitted with cholecystolithiasis at the People's Dental College and Hospital, Kathmandu, Nepal, from January 2018 to June 2021. The study was approved by the Institutional Review Committee of People's Dental College and Hospital, Kathmandu, Nepal. In addition to that, all methods were performed per the relevant guidelines and regulations. The patient's demographics, clinical profile, risk factors, and

perioperative details were analyzed. Clinical evaluation, abdominal ultrasonography as well baseline investigations were used as a tool to assess all patients for surgery. In addition to that, some patients had been undergone magnetic resonance cholangiopancreatography (MRCP) and a few needful patients were evaluated with endoscopic retrograde cholangiopancreatography (ERCP) before cholecystectomy. The timing of laparoscopic cholecystectomy was fixed after the resolution of symptoms in those patients who presented with acute phase like acute cholecystitis.

During the operation, the standard four-port technique was applied for the procedure. Meanwhile, the open method was used to introduce a sub-umbilical cannula. In most of the cases, we positioned titanium clips for cystic duct and cystic artery ligation and we could not execute intraoperative cholangiography regularly. Besides, we only place a closed suction drain in some patients afforded to need. Moreover, all patients received perioperative prophylactic antibiotics before initiation of operation. Relevant operative findings and perioperative data were documented in each case.

An independent t-test was applied for all quantitative variables, while the Chi-square test was used for all categorical variables. Univariate and multivariate logistic regression were executed to identify independent predictors associated with complications of laparoscopic cholecystectomy. Statistical software SPSS version 25.0 (Statistical Package for the Social Sciences) was used for statistical analysis. A P value <0.005 was considered statistically significant.

Results

A total of 304 patients who were admitted with cholelithiasis during the study period comprised of 73 (24%) male patients and 231 (76 %) female patients. Median ages were 46 years (range 19-71). The patient's preoperative data were shown in [Table 1]. Most of our patients had symptoms of gallstone disease such as upper abdominal pain followed by dyspepsia, nausea, and vomiting as shown in [Table 2]. On physical examination, most of the patients had no significant findings.

Regarding the diagnosis, biliary colic due to gallstones was found in 172 patients (56.6%), acute cholecystitis was found in 8 patients (2.6%) and acute biliary pancreatitis was found in 11 (3.6 %) patients whereas mucocele was in 12 (3.9%), polyp in 6 (2%), cholesterosis was in 8 (2.6%) and empyema was noted in 10 patients (3.3%).

We perceived 8.6 % conversion to open surgery as shown in [Table 3]. The most common cause for conversion was a failure to adequately visualize Calot's triangle and the biliary tract anatomy. The mean operative time was an average of 60 (range: 40-130 min) as shown in [Table 3].

Regarding the outcome of laparoscopic cholecystectomy, a complication rate of 12.5 % was observed in the study. The most common complications were surgical site infections followed by lower respiratory tract infections [Table 3]. Although there was no bile duct injury noted in this study, 3 patients had minor bile leaks that were treated conservatively. Reoperation and ligation of the bleeding cystic artery were done for hemorrhage occurred in two

patients. There was no mortality observed in our series. The average length of hospital stay was an average of 5 (3-18 days) as shown in [Table 3].

In logistic regression analysis, on multivariate analysis, out of the independent variables, sex (male), age (≥ 60 years), presence of comorbidity, and duration of surgery (≥ 2 hours), only the male gender was associated with an increased risk of postoperative complications (OR; 0.046, CI [0.018- 0.112], P < 0.05) as shown in [Table 4].

Table 1: Preoperative data

Variable	Numbers (%) (n=304)
Age, (years)	46 (19-71)
Age, (years)	
<30	14 (4.6)
30-40	56 (18.4)
40-50	124 (40.8)
50-60	73 (24.0)
60-70	35 (11.5)
≥ 70	2 (0.7)
Age (years),	
≥ 60	37 (12.2)
<60	267 (87.8)
Sex	
Male	73 (24.0)
female	231 (76.0)
ASA¶	
I	236 (77.6)
II	64 (21.1)
III	4(1.3)
IV	0 (0)
Comorbidity ,%	32 (10.4)
Diabetes mellitus	12 (3.9)
Hypertension	10 (3.3)
Respiratory diseases	2 (0.7)
Renal disease	3 (1.0)
Neurological problems	2 (0.7)
Cardiovascular disease	3 (1.0)

¶ASA; American society of anesthesiology

Table 2: Clinical presentation of patients with cholelithiasis

Clinical symptoms and Signs	Numbers (%) N=304
Pain abdomen	233(76.6)
Dyspepsia	33(10.9)
Nausea	11(3.6)
Vomiting	4(1.3)
Fever	5 (1.6)
Jaundice	4(1.3)
Asymptomatic	14(4.6)

Table 3: Perioperative data

Variable	Numbers (%) (n=304)
Operative time (mins)	60 (40-130)
Operative time ≥ 120 (mins)	24 (7.9)
Conversion to open	26 (8.6)
Complications,%	38 (12.5)
LRTI♦	9(3.0)
UTI♣	4(1.3)
Hemorrhage	2 (0.7)
Bile leak	3(1.0)
DVT/PE#	1 (0.3)
SSI†	12 (4.0)
Superficial/Deep	10 (3.3)
Organ/space	2 (0.7)
Thrombophelbitis	7 (2.3)
Length of hospital stay (days)	5(3-18)

† LRTI; lower respiratory tract infection, ♣UTI; urinary tract infection, #DVT/PE; Deep vein thrombosis/Pulmonary embolism, †SSI; surgical site infection

Table 4: Association of variables with complications of laparoscopic cholecystectomy

Variables	Complications n=38 (12.5%)	Univariate analysis			Multivariate analysis		
		OR	CI	P value	OR	CI	P value
Sex (Male)	31 (10.2)	5.16	3.76-7.08	0.001*	0.046	0.018-0.112	0.001*
Age(≥60 years)	10 (3.03)	2.59	1.36-4.92	0.004*	0.401	0.145-1.08	0.078
Presence of comorbidity	8 (2.6)	2.24	1.09-4.60	0.031*	0.371	0.119-1.160	0.089
Operative time ≥ 2 hours	7 (2.3)	2.88	1.28-6.49	0.01*	0.486	0.154-1.537	0.486

OR: odds ratio, CI: confidence interval, * P: value is significant if < 0.05

Discussion

The incidence of gallstones is ten times more in people aged 40 and more. This is due to a waning in the activity of the rate-limiting enzyme for bile acid synthesis (cholesterol 7 α -hydroxylase) as this enzymatic activity decreases, and biliary cholesterol synthesis increases, the aged individual has more cholesterol saturation and decreasing mobility of gallbladder emptying. In addition, it is also supposed that with increasing age there is long-term exposure to risk factors irrespective of the individual factors and thus more incidence of stone in an aged person. Female gender is one of the most salient risk factors for gallstone disease may be due to higher estrogen levels, multiparity, or ingestion of estrogen-based oral contraceptives.^[2,4] This study also observed the incidence of cholecystolithiasis is more in the age group 40-50 years and female gender compared to other age groups and male gender, respectively.

The majority of patients (60-80%) with gallstones are asymptomatic and most stones are incidentally found during regular abdominal ultrasonography. Only 10% and 20% of asymptomatic patients will eventually become symptomatic within 5 and 20 years of diagnosis, respectively. Therefore, the risk of developing symptoms with gallstones is low (2 to 2.6% per year).^[3]

The majority of our patients 290 (95.4%) who visited the hospital were symptomatic and only 14 patients (4.6%) had incidental findings of cholecystolithiasis. It may be because of delayed seeking of health services due to lack of health education, inaccessibility of health facilities, and remote geographical location. However, some studies in the literature have mentioned that most of the patients are asymptomatic in the case of cholecystolithiasis. Interestingly, due to the easy availability, noninvasiveness, and cheapness of ultrasound, the incidental finding of cholecystolithiasis are increasing these days.

Upper abdominal pain was the main symptom among the symptomatic patients, similar to other studies.^[5] The pain abdomen is commonly related with biliary colic, which is defined as episodic attacks of pain in the right upper abdominal quadrant or epigastrium, which may be with radiation of the pain to the right back or shoulder, moderate to severe in intensity, steady, and peaking within one hour of onset. Biliary colic gradually resolves and can last up to 5 to 6 hours, It can also cause nonspecific abdominal symptoms, such as epigastric pain and intolerance to fried or fatty foods characterized by nausea, bloating, and flatulence.^[6] Some patients may not only present with a feeling of fullness, inability to eat fatty food, and chronic diarrhea but also with complications such as acute cholecystitis, acute cholangitis (Charcot's triad of fever, jaundice, and abdominal pain), and gallstone pancreatitis.^[7] In our study, biliary colic due to gallstone was found in 172 patients (56.6%), acute

cholecystitis was found in 8 patients (2.6%) and acute biliary pancreatitis was found in 11 (3.6 %) patients whereas mucocele was in 12 (3.9%), polyp in 6 (2%), cholesterosis was in 8 (2.6%) and empyema was noted in 10 patients (3.3%). Ultrasound (US) is the most reliable, easily available, and simplest method for the diagnosis of cholecystolithiasis.^[8] Therefore, our all patients were evaluated with abdominal ultrasonography and baseline investigations required for surgery.

Regarding the treatment, the prime choice of surgery in this study population was laparoscopic cholecystectomy, which is considered as the gold standard method of treatment. We reported the mean operative time of 60 (range: 40-130) minutes in our study is comparable to that in other studies.^[9] Our conversion rate of 8.6 % which is also in agreement with the literature.^[10] The overall complications (12.5%) were found in this study which is concordant with the numbers reported in the literature.^[11] The surgical site infection was the commonest complication that we encountered in our study, which is similar to other studies.^[12] Bile leak was found in 3 patients (1%), that is, from presumed aberrant ducts in the liver bed of the gall bladder according to reported in the studies.^[13]

We also evaluated different factors that affect postoperative outcomes. Male gender is an independent risk factor for postoperative complications which is similar to reported by studies.^[14] We did not find any correlation between the age of the patient more than 60 years, presence of comorbidity and operative time of more than 2 hours, and the postoperative complications rendered to the association have been mentioned in the literature.^[15]

We also acknowledge the limitations of our study as being a retrospective and single-centered design. Therefore, further, properly designed prospective studies are recommended to endorse our findings.

Conclusion

Cholecystolithiasis is a common and significant surgical problem that usually presents with upper abdominal pain. Laparoscopic cholecystectomy is the standard care of treatment. Male gender is a risk factor for postoperative complications.

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