

Persistent Symptoms After Laparoscopic Cholecystectomy: A Prospective Study At A Tertiary Care Centre

Pooja Jain, Sanjeev Agarwal, Rushi Daxini, Dhruv Jodhabhai Dodiya
Department Of General Surgery, Geetanjali Medical College And Hospital, Udaipur, India

Abstract

Background: Cholelithiasis is a common cause of morbidity with varying prevalence in India. Symptomatic cholelithiasis many a times leads to recurrent biliary colic due to transient cystic duct obstruction, requiring surgical intervention. Laparoscopic cholecystectomy is the gold standard of treatment but the symptom resolution may vary. The present study aimed to evaluate the incidence and nature of persistent symptoms after laparoscopic cholecystectomy and their association with clinical variables.

Material and Methods: The present study was a prospective observational study, conducted at Geetanjali Medical College and Hospital. A total of 100 patients undergoing laparoscopic cholecystectomy for calculous cholecystitis were enrolled using purposive consecutive sampling. Patients above 18 years with or without comorbidities were included, excluding complicated gallstone cases and malignancies. Preoperative clinical, demographic, and imaging data were collected. Patients were followed monthly for three months postoperatively to assess symptom progression. Histopathological examination was performed on all specimens.

Results: The majority of patients were middle aged females, with high BMI which is a known cause of gallstone disease. Predominant preoperative symptoms were right hypochondrial pain, nausea and vomiting. Intra operative findings included gallstones, wall thickening and adhesions. Histopathology confirmed chronic calculous cholecystitis in 89% of cases. Postoperative follow-up showed a significant reduction in gastrointestinal symptoms including pain, nausea, and bloating by three months, although a minority experienced persistent symptoms. Symptom improvement was statistically significant ($p < 0.05$).

Conclusion: Laparoscopic cholecystectomy is an effective and safe procedure resulting in significant symptom regression in patients with calculous cholecystitis. Early diagnosis, surgical intervention, and structured postoperative follow-up are crucial to optimize outcomes. Further research is needed to explore mechanisms behind persistent postoperative symptoms in a subset of patients.

Keywords: Laparoscopic cholecystectomy, Cholelithiasis, Postoperative symptoms, Chronic calculous cholecystitis, Gallbladder disease

Date of Submission: 12-10-2025

Date of Acceptance: 22-10-2025

I. Introduction:

Gallbladder disease is a major cause of morbidity and mortality worldwide. In India it affects large portion of the population, with incidence rates varying across different regions. Cholelithiasis is reported in approximately 2-29% of the population and is upto seven times more prevalent in the northern part of India. Symptomatic cholelithiasis remains a leading cause of inpatient admissions,¹ with about one-third of the patients diagnosed with gallstones developing symptomatic biliary colic. Biliary colic is characterized by acute visceral pain resulting from transient obstruction of the cystic duct by cholelithiasis or biliary sludge. This obstruction leads to increased intraluminal pressure and distension of the gallbladder wall, typically triggered postprandially due to cholecystokinin (CCK)-induced gallbladder contraction. The ensuing epigastric or right upper quadrant pain corresponds to visceral afferent nerve stimulation, primarily transmitted via spinal segments T8–T9. In most cases (>90%), recurrent symptomatic episodes occur within a decade of the initial presentation. Symptom resolution typically follows spontaneous dislodgement of the obstructive material, either into the common bile duct or retrograde into the gallbladder, relieving pressure and restoring bile flow.²

A wide range of diseases can disrupt the normal functioning of the gall bladder, causing clinical digestive complications. These include acute or chronic cholecystitis, biliary dyskinesia, symptomatic cholelithiasis, acalculous cholecystitis, gallbladder masses/polyps, and gallstone induced pancreatitis.³

Patients typically present with moderate to severe right upper quadrant pain lasting for minutes to hours, which may plateau and subside. Upto 60% report radiation of pain to the right scapula or back⁴. The pain is usually unaffected by change in position, vomiting, defecation or flatus. Laparoscopic cholecystectomy is now considered

the gold standard surgical intervention for symptomatic gallbladder disease. This minimally invasive procedure, performed under general anesthesia, involves the insufflation of carbon dioxide to establish pneumoperitoneum, creating a safe operative field for dissection and gallbladder removal. Compared to open surgery, laparoscopic cholecystectomy is associated with a 65% reduction in major complications, reduced postoperative wound infections, and faster recovery times, enabling earlier return to routine activities.⁵

Although laparoscopic cholecystectomy has revolutionized the management of gallbladder disease by reducing the mortality rate, hospital stays but not all patients achieve complete symptom resolution. Studies report successful symptom relief in 70-95% of the cases, yet approximately 30% experience persistent symptoms post operatively.⁶ Common complications after laparoscopic cholecystectomy include excessive bleeding, risk of infections, and damage to surrounding organs or anatomical structures. A good number of patients also experience persistent gastrointestinal symptoms like abdominal pain, dyspepsia, bloating, and diarrhea despite technically successful surgery.⁷ Understanding the underlying mechanisms and developing effective management strategies for post-cholecystectomy syndrome (PCS) is critical for improving postoperative care and patient outcomes.⁸ This study aims to evaluate the incidence, nature and frequency of persistent symptoms in patients undergoing laparoscopic cholecystectomy for calculus cholecystitis. It also seeks to explore the association between persistent symptoms and various sociodemographic clinical variables.

II. Material And Methods

This prospective observational study was conducted over a period of 18 months (June 2023 to December 2024) in the Department of General Surgery, Geetanjali Medical College and Hospital. The study employed purposive consecutive sampling and included 100 patients under going laparoscopic cholecystectomy.

Study design: A prospective observational study.

Study duration: One and a half year.

Sampling technique: Purposive Consecutive sampling

Sample size: 100 patients

Inclusion criteria:

1. Patient who underwent elective laparoscopic cholecystectomy after proper assessment for calculous cholecystitis.
2. Patients aged from 18 years of either sex with or without comorbidities like diabetic or hypertensive are included in surgery.

Exclusion criteria:

1. Patient not willing to be a part of the study.
2. Pregnant females
3. Patients with prior diagnosis of carcinoma of gall bladder
4. Patients with complicated gallstone disease such as empyema of gallbladder, gallstone pancreatitis, obstructive jaundice, and septic complication. History of complicated symptomatic cholelithiasis (choolangitis, biliary pancreatitis, choledocholithiasis requiring endoscopic retrograde cholangiopancreatography)

Statistical Analysis: All the collected data was recorded in Microsoft Excel and analyzed. Categorical variables have been described as frequencies and percentages. Discrete variables have been described in terms of median and interquartile range. Continuous variables were summarized as mean and standard deviation and finally the appropriate statistical tests were applied for data analysis. p value <0.05 was considered statistically significant.

III. Results

The present observations were based on a cohort of 100 patients in which females represented majority of cases between the age of 45 and 60 years. The difference in this age bracket was also statistically significant (Table 1). The observation regarding Body Mass Index (BMI) represented majority of patients were female and were overweight. Ten female patients were obese while 2 male patients fell under this category with a statistically significant different (Table 2). Majority of patients had a history of acute cholecystitis, followed by smoking and alcohol consumption (Fig. 1). Physical findings prior to surgery were dominated by right hypochondrium tenderness, followed by palpable gallbladder mass (Table 3).

Table 1: Distribution of patients according to their gender and age groups

Age groups	Males	Percent (%)	Females	Percent (%)	Chi square value	p value
18 to 30 years	4	28.57%	10	71.42%	2.57	0.1
30 to 45 years	15	50%	15	50%	0	-
45 to 60 years	10	30.30%	23	69.69%	5.12	0.02*
>65 years	7	30.43%	16	69.56%	3.52	0.06
N = 100, p value was calculated using χ^2 , df=1, *p<0.05						

Table 2: Distribution of patients according to gender and BMI

BMI category	Criteria	Females	Males	Chi square value	p value
Underweight	Less than 18.5	1	0	1	0.31
Normal weight	18.5 to less than 25	20	14	1.05	0.3
Overweight	25 to less than 30	33	20	3.18	0.07
Obesity	30 or greater	10	2	5.33	0.02*
N = 100, p value was calculated using χ^2 , df=1, *p<0.05					

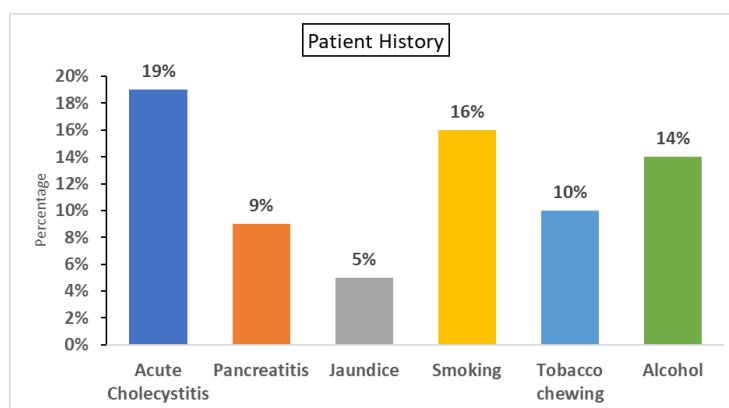


Fig. 1: Bar graphs representing patient history

Table 3: Distribution of physical findings

	Yes	Percent (%)	Chi square value	p value
Right hypochondrium tenderness	65	89.04%	9	0.0027**
GB palpable/ GB mass	8	10.95%	70.56	0.0001**
Others	0	0%	100	0.0001**
Total	73	100%	-	-

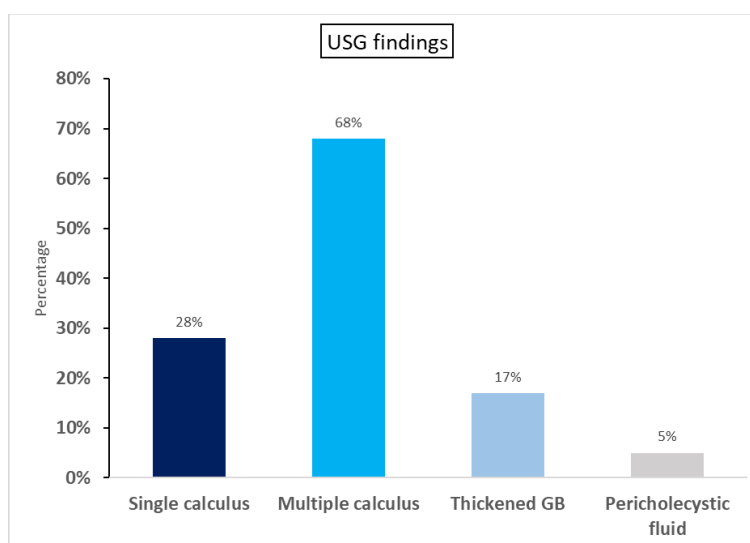


Fig. 2: Bar graphs representing USG findings

The preoperative evaluation indicated major symptoms as right hypochondriac pain and meals were the most common aggravating factor. Many patients experienced pain for a longer time while some experienced for a week. Around 21% cases had pain radiating to back. Other common manifestations included nausea, bloating, dyspepsia, heartburn and vomiting (Table 4).

Histopathological examination revealed that the majority of patients (89%) were diagnosed with chronic calculous cholecystitis, indicating a prolonged inflammatory process associated with gallstone formation. A smaller subset (3%) presented with chronic calculous cholecystitis accompanied by mucocoele, characterized by mucus accumulation due to cystic duct obstruction. Acute on chronic calculous cholecystitis was observed in 4% of the patients. Additionally, 1% of patients were found to have empyema of the gallbladder, a serious complication involving pus accumulation. These findings emphasize that chronic calculous pathology dominates the clinical spectrum, while acute and severe presentations are comparatively less frequent (Fig. 4).

Post operative symptoms highlighted a significant reduction in almost all symptoms over a 3 month period of follow up. Symptoms such as bloating constipation, diarrhea, heartburn, nausea, pain, vomiting declined significantly after the procedure (Table 5).

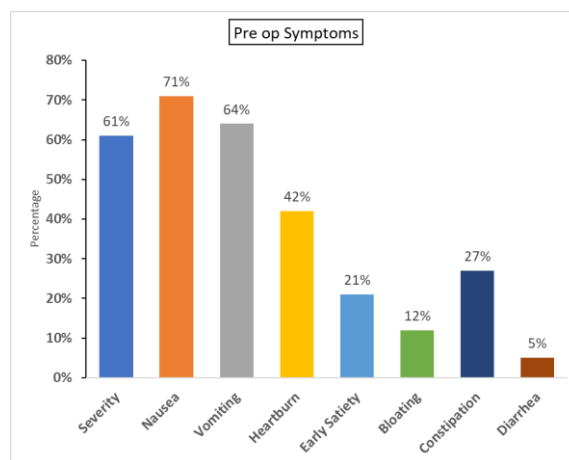


Fig. 3: Bar graphs representing Pre operative symptoms in patients

Table 4: Pre operative pain site, pain duration, radiation of pain and aggravation

	Trait	Number of patients	Percent (%)	Chi square value	p value
Pain site	Right hypochondriac	68	68%	12.96	0.0003**
	Generalised	32	32%		
Pain duration	<1 week	43	43%	12.140	0.002**
	1 to 4 weeks	17	17%		
	4 to 8 weeks	40	40%		
Radiation of pain	To Back	21	21%	33.64	0.0001**
Aggravation	By meal	67	67%	51.4	<0.01**

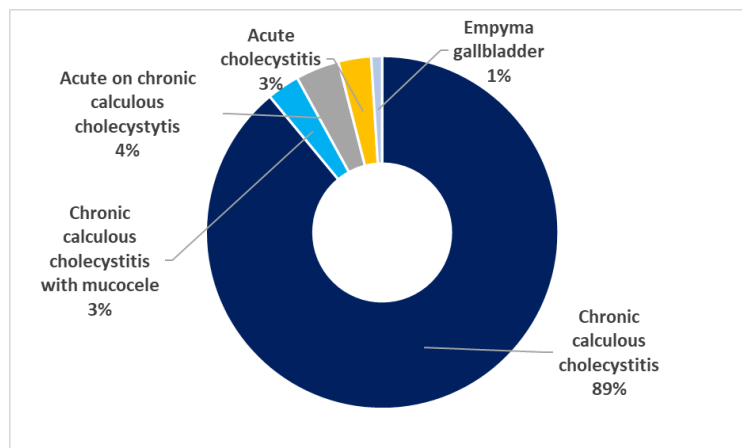


Fig. 4: Pie chart representing Histopathological evaluation report

Table 5: Comparison of pre operative and post operative symptoms

Symptoms present	Pre operative	Post op 1st month	Post op 2nd month	Post 3rd month
Bloating	12	4	3	0
Constipation	27	6	3	1
Diarrhea	5	3	1	1
Early Satiety	21	5	3	2
Heartburn	42	4	2	0
Nausea	71	5	2	0
Pain	61	9	4	1
Vomiting	64	4	3	1

IV. Discussion

Gallbladder disease, particularly cholelithiasis and its complications, continues to represent a significant health burden both globally and within the Indian population. Despite laparoscopic cholecystectomy being widely recognized as the gold standard for the management of symptomatic gallstone disease, not all patients experience complete symptomatic relief post-surgery. This study aimed to evaluate the persistence of symptoms following laparoscopic cholecystectomy in patients diagnosed with calculous cholecystitis and to explore potential associations between these symptoms and various sociodemographic and clinical variables.

The prospective study highlights the trajectory of post operative symptoms in patients with calculus cholecystitis undergoing laparoscopic cholecystectomy with a particular emphasis on symptoms related to gastrointestinal. It was observed that a significant reduction was observed in most of the symptoms 3 months after the procedure. A small subset of patients continued to experience some residual complaints with fewer symptoms.

The patients in present study comprised largely or middle aged females, consistent with known epidemiology of gall stones and also exhibited a predominance of overweight or obese individuals which is a recognized risk profile for cholelithiasis. Khan et al., 2018⁹ reported 60% patients were overweight and 15% obese in their study with a positive correlation with cholelithiasis. Similar results were also published by Rani and Mehta, 2021¹⁰ and Bhattacharya et al., 2020.¹¹

Postoperative follow ups exhibited a high rate of symptom reduction related to biliary colic, heartburn and pain. Although some symptoms such as bloating, dyspepsia, diarrhea and constipation still persisted but in a very low frequency of patients. These observations align with the previously published literature which confirms that persistent abdominal pains, altered bowel habit etc can be continued in 1/3rd of the patients. BMI or other comorbidities have also emerged as significant predictors in determining post operative outcomes. Similar results were published by Patel et al. (2022)¹², Sharma et al. (2020)¹³ and Rao et al. (2021)¹⁴.

Histopathological analysis from the present study revealed that the most common diagnosis was chronic calculous cholecystitis, found in 89% of patients. This high prevalence suggests a long-standing inflammatory process linked to gallstone formation as the primary underlying condition in gallbladder disease.

In the current study, patients were closely monitored for gastrointestinal symptoms at baseline and at monthly intervals following cholecystectomy, up to three months postoperatively. The data revealed a clear and statistically significant reduction in the prevalence of all recorded symptoms, indicating the effectiveness of the surgical intervention. Many other previously published studies such as Kapoor et al. (2020)¹⁵, Sharma et al. (2019)¹⁶ and Patel & Singh (2021)¹⁷ also reported significant reduction in symptoms such as nausea, vomiting, pain, dyspepsia, bloating, heartburn etc. after the patients have undergone laparoscopic cholecystectomy.

This progressive improvement in symptomatology not only confirms the therapeutic efficacy of cholecystectomy but also suggests that postoperative gastrointestinal disturbances are typically transient and self-limiting. These outcomes align with previously published literature, further reinforcing the role of surgery in resolving gallstone-associated symptoms. From a clinical perspective, the results underscore the importance of a thorough preoperative counselling along with long term management to improve recovery and quality of life.

V. Conclusions

This study highlights that gallstone disease predominantly affects middle-aged females, with obesity and female gender emerging as significant risk factors. Most patients presented with chronic symptoms such as right hypochondrial pain, nausea, and vomiting, which were strongly correlated with ultrasound and intraoperative findings like multiple gallstones, gallbladder wall thickening, and adhesions. Histopathological examination confirmed chronic calculous cholecystitis as the most prevalent diagnosis. Laparoscopic cholecystectomy not only proved to be a safe and effective treatment but also resulted in significant postoperative symptom regression by the third month. These findings underscore the importance of early diagnosis and intervention to prevent complications and ensure favorable outcomes. The study also emphasizes the role of structured follow-up and patient education in managing post-cholecystectomy expectations. Further research is warranted to explore factors contributing to persistent postoperative symptoms in a minority of patients.

References

- [1]. Pinto A, Reginelli A, Cagini L, Coppolino F, Stabile Ianora AA, Bracale R, Et Al. Accuracy Of Ultrasonography In The Diagnosis Of Acute Calculous Cholecystitis: Review Of The Literature. *Crit Ultrasound J*. 2013 Jul;5(1):S11.
- [2]. Roy DK, Sheikh R. A Systematic Review And Meta-Analysis Of The Outcomes Of Laparoscopic Cholecystectomy Compared To The Open Procedure In Patients With Gallbladder Disease. *Avicenna J Med*. 2024 Feb;14(1):3–21.
- [3]. Hassler KR, Collins JT, Philip K, Jones MW. Laparoscopic Cholecystectomy [Internet]. 2025. Available From: [Http://Www.Ncbi.Nlm.Nih.Gov/Books/NBK448145/](http://www.ncbi.nlm.nih.gov/books/NBK448145/)
- [4]. Bodvall B, Overgaard B. Computer Analysis Of Postcholecystectomy Biliary Tract Symptoms. *Surg Gynecol Obstet*. 1967 Apr;124(4):723–32.
- [5]. Bates T, Ebbs SR, Harrison M, A'Hern RP. Influence Of Cholecystectomy On Symptoms. *Br J Surg*. 1991 Aug;78(8):964–7.
- [6]. Khan A, Sharma V, Bansal M. Body Mass Index And Gallstone Disease: A Study From North India. *International Surgery Journal*. 2018;5(4):1300–4.
- [7]. Rani M, Mehta N. The Role Of Obesity In Gallstone Disease: A Clinical Observational Study. *Asian J Med Sci*. 2021;12(8):42–6.
- [8]. Bhattacharya D, Singh R, Ghosh S. Association Of BMI And Gallstone Disease In Eastern India: A Hospital-Based Study. *Journal Of Clinical And Diagnostic Research*. 2020;14(2):OC10–3.
- [9]. Patel RJ, Shah PM, Mehta AK. Prospective Study On Symptom Relief Following Laparoscopic Gallbladder Surgery. *International Journal Of Surgery And Health Sciences*. 2022;6(1):15–20.
- [10]. Sharma A, Mishra R, Jain P. Assessment Of Symptom Resolution In Post-Cholecystectomy Patients. *Asian J Surg*. 2020;43(6):985–90.
- [11]. Rao N, Gupta D, Singh A. Longitudinal Evaluation Of GI Symptoms After Cholecystectomy. *Indian Journal Of Gastroenterology*. 2021;38(4).
- [12]. Kapoor A, Gupta N, Mehta P. Symptom Relief And Quality Of Life After Laparoscopic Cholecystectomy: A Prospective Observational Study. *J Minim Access Surg*. 2020;16(4):351–7.
- [13]. Sharma V, Bansal A, Yadav R. Assessment Of Gastrointestinal Symptoms Before And After Cholecystectomy. *International Journal Of Surgery And Medicine*. 2019;5(2):43–7.
- [14]. Patel M, Singh D. Post-Cholecystectomy Syndrome: Incidence And Management In Rural Population. *Indian Journal Of Surgery*. 2021;83(1):55–60.