



BILIARY ABNORMALITIES IN POST CHOLECYSTECTOMY SCENARIO: A TERTIARY CARE EXPERIENCE

Medical Gastroenterology

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ABSTRACT

Background and Objectives: Persistent or recurrent biliary symptoms may occur after cholecystectomy because of retained or recurrent calculi, strictures, congenital abnormalities, or malignancy. This study aimed to characterize biliary abnormalities detected by endoscopic retrograde cholangiopancreatography (ERCP) at least six months after cholecystectomy. **Materials and Methods:** This retrospective descriptive study was conducted in the Department of Gastroenterology, Gandhi Medical College and Hospital, Secunderabad. Medical records of eligible post-cholecystectomy patients who underwent ERCP between January 2019 and April 2026 were reviewed. **Results:** A total of 115 patients were included, with a mean age of 51.01 ± 14.00 years; 66 (57.39%) were male. Laparoscopic cholecystectomy had been performed in 98 (85.22%) patients. Cholangitis was the most common indication for ERCP, occurring in 86 (74.78%). Biliary calculi were detected in 78 (67.83%) patients, including solitary stones in 46 (40.00%) and multiple stones in 32 (27.83%). Biliary strictures were identified in 30 (26.09%) patients; 28 (93.33%) were benign, and 18 (60.00%) were distally located. **Conclusion:** Post-cholecystectomy patients undergoing ERCP demonstrated a broad spectrum of biliary abnormalities, predominantly choledocholithiasis and benign strictures. ERCP had a high diagnostic yield in this selected population and additionally identified uncommon congenital and malignant conditions.

KEYWORDS

Cholecystectomy; Choledocholithiasis; Biliary stricture; Endoscopic retrograde cholangiopancreatography

INTRODUCTION

Cholecystectomy is the definitive surgical treatment for symptomatic gallstone disease and ranks among the most widely performed abdominal procedures worldwide. Laparoscopic cholecystectomy has largely superseded open surgery due to decreased postoperative pain, shortened hospital stay, accelerated convalescence, and favorable cosmetic outcomes (Konstantakis et al., 2021; Kumar & Reddy, 2021). Nonetheless, gallbladder removal does not invariably relieve abdominal symptoms. Approximately 10% to 19.8% of patients experience persistent, recurrent, or newly emerging gastrointestinal and biliary symptoms, collectively termed post-cholecystectomy syndrome (Bunkar et al., 2017).

Post-cholecystectomy symptoms arise from biliary and extra-biliary pathologies (Muhammad et al., 2021). Biliary etiologies include retained or recurrent choledocholithiasis, benign or ischemic strictures, cystic duct remnant calculi, sphincter of Oddi dysfunction, congenital malformations, and occult pancreaticobiliary malignancies. Clinically significant retained ductal calculi can present months to years after index surgery despite normal preoperative imaging (Lee et al., 2016). Distinguishing retained from recurrent stones remains challenging without intraoperative cholangiographic records (Cox et al., 2015). Concurrently, postoperative biliary strictures secondary to mechanical or thermal injury can provoke progressive hepatic compromise (Kabir et al., 2025). Furthermore, underlying malignancies may masquerade as uncomplicated biliary colic during index surgery and manifest only on delayed follow-up (Goto et al., 2024).

While early post-cholecystectomy complications like acute bile leaks are well documented, data detailing delayed cholangiographic abnormalities in tertiary healthcare centres in India remain limited (Ibáñez-García et al., 2025; Patel et al., 2020). Therefore, this study aimed to characterize the profile and frequency of biliary abnormalities detected by endoscopic retrograde cholangiopancreatography (ERCP) in patients presenting at least six months following cholecystectomy.

MATERIALS AND METHODS

Study Design and Setting

This retrospective descriptive study was conducted in the Department of Gastroenterology, Gandhi Medical College and Hospital, Secunderabad, Telangana, India. Records of post-cholecystectomy patients undergoing ERCP between January 2019 and April 2026 were reviewed. Ethical clearance was secured from the Institutional Ethics Committee.

Study Population and Eligibility Criteria

Consecutive patients aged 10–99 years who had undergone ERCP at least six months after laparoscopic, open, or subtotal cholecystectomy were screened. Patients undergoing ERCP within six months of surgery, individuals under 10 years of age, those with concurrent major abdominal surgeries, or those with incomplete medical records were excluded. A total of 115 consecutive eligible patients were enrolled.

Data Collection and Study Variables

Demographic details, surgical history, clinical presentation, indication for ERCP, and cholangiographic findings were extracted using a standardized data extraction template. Ductal calculi were categorized by number (solitary or multiple) and anatomical location (proximal, mid, or distal common bile duct [CBD], common hepatic duct [CHD], cystic duct remnant, or diffuse). Strictures were categorized by site (distal CBD, CHD, or hilum) and etiology (benign or malignant). Congenital abnormalities and normal cholangiograms were documented.

Statistical Analysis

Data were entered in Microsoft Excel and analyzed using IBM SPSS Statistics (Version 32.0). Continuous variables are presented as mean $\pm$ standard deviation (SD), and categorical variables are expressed as absolute frequencies (n) and percentages (%).

RESULTS

1. Age and Sex Distribution of Study Population

A total of 115 post-cholecystectomy patients who underwent ERCP at least six months after surgery were included. The mean age was 51.01 ± 14.00 years. Most patients were aged 41–60 years (50, 43.48%), followed by 21–40 years (29, 25.22%), >60 years (27, 23.48%), and ≤ 20 years (9, 7.83%).

There were 66 male patients (57.39%) and 49 female patients (42.61%), giving a male-to-female ratio of approximately 1.35:1 (Table 1).

Table 1. Sex distribution and Age distribution of the study population (N = 115)

Sex	n	%
Male	66	57.39
Female	49	42.61
Total	115	100.00
Age group (years)	n	%
≤ 20	9	7.83

21–40	29	25.22
41–60	50	43.48
>60	27	23.48
Total	115	100.00

2. Type of Cholecystectomy

laparoscopic cholecystectomy was the most frequently performed procedure, reported in 98 (85.22%) patients. open cholecystectomy had been performed in 13 (11.30%) patients, subtotal cholecystectomy in three (2.61%), and laparoscopic cholecystectomy converted to open surgery in one (0.87%) (Table 2).

Table 2. Type of Cholecystectomy Performed (n = 115)

Type of cholecystectomy	n	%
Laparoscopic cholecystectomy	98	85.22
Open cholecystectomy	13	11.30
Subtotal cholecystectomy	3	2.61
Laparoscopic converted to open	1	0.87
Total	115	100.00

3. Clinical Presentation at the Time Of Ercp

Abdominal pain was the most frequently recorded symptom and was present in 40 (34.78%) patients. Fever and jaundice were each reported in 30 (26.09%) patients, while weight loss was documented in six (5.22%). Some patients experienced more than one symptom; therefore, the sum of symptom frequencies exceeded the total sample size.

Cholangitis was the most common indication for ERCP and was documented in 86 (74.78%) patients. ERCP was also undertaken in patients without symptoms when clinically relevant abnormalities had been identified on preceding imaging (Table 3).

Table 3. Clinical Presentation at the time of ERCP (N= 115)

Clinical presentation	n	%
Fever	30	26.09
Abdominal pain	40	34.78
Jaundice	30	26.09
Weight loss	6	5.22
Asymptomatic	25	21.74

4. ERCP Cholangiographic findings

An abnormal cholangiogram was identified in 112 (97.39%) patients, while only three (2.61%) had a normal biliary system. Biliary calculi were the most frequent abnormality and were detected in 78 (67.83%) patients. Solitary calculi were identified in 46 (40.00%) patients, whereas multiple calculi were present in 32 (27.83%).

Among the 78 patients with biliary calculi, the anatomical site was unspecified in 26 (33.33%). Documented locations included the middle bile duct in 11 (14.10%), proximal bile duct in 10 (12.82%), distal bile duct in seven (8.97%), the entire biliary tree in five (6.41%), and the common hepatic duct in three (3.85%). Calculi involving the cystic duct remnant were identified in two (2.56%) patients. Mirizzi syndrome was also documented in two (2.56%) patients (Table 4).

Biliary strictures were identified in 30 (26.09%) patients. Of these, 18 (60.00%) were located in the distal bile duct, eight (26.67%) in the common hepatic duct, and four (13.33%) at the hepatic hilum. Twenty-eight strictures (93.33%) were benign, while two (6.67%) were malignant. Coexisting biliary calculi and strictures were documented in six (5.22%) patients (Table 4).

A type I choledochal cyst was identified in three (2.61%) patients, while pancreas divisum was detected in one (0.87%). Thus, congenital anomalies were observed in four (3.48%) patients (Table 4).

Table 4. ERCP Cholangiographic findings (N = 115)

Finding	n	%
Biliary calculi	Solitary biliary calculus	46 40.00
	Multiple biliary calculi	32 27.83
Stone location (among patients with calculi; n = 78)	Common hepatic duct	3 3.85
	Proximal common bile duct	10 12.82
	Mid common bile duct	11 14.10
	Distal common bile duct	7 8.97
	Entire biliary tree	5 6.41
	Level not specified	26 33.33
	Cystic duct remnant	2 2.56
	Mirizzi syndrome	2 2.56

Biliary strictures	Any biliary stricture	30 26.09
Stricture location (among patients with strictures; n = 30)	Distal common bile duct	18 60.00
	Hilar region	4 13.33
	Common hepatic duct	8 26.67
Stricture type (among patients with strictures; n = 30)	Benign stricture	28 93.33
	Malignant stricture	2 6.67
	Coexisting calculus and stricture	6 5.22
Congenital anomalies	Type I choledochal cyst	3 2.61
	Pancreas divisum	1 0.87
Malignant lesions	Periampullary carcinoma	1 0.87
	Distal cholangiocarcinoma	1 0.87
	Hilar cholangiocarcinoma	1 0.87
Normal cholangiogram	Normal biliary system	3 2.61

5. Indications for Ercp

Among the 115 post-cholecystectomy patients evaluated, the most common indication for ERCP was cholangitis, which was present in 86 (74.78%) patients. Biliary stones were identified in 21 (18.26%) patients, while biliary strictures were detected in 8 (6.95%) patients (Table 5).

Table 5. Indications for ERCP (N = 115)

Indication	n	%
Cholangitis	86	74.78
Incidental stones on imaging in an asymptomatic patient	21	18.26
Incidental stricture on imaging in an asymptomatic patient	8	6.96

DISCUSSION

In this tertiary-care series of 115 patients undergoing ERCP at least six months after cholecystectomy, delayed presentations were characterized predominantly by infectious complications and ductal lithiasis. Laparoscopic cholecystectomy was the primary index procedure (85.22%), consistent with contemporary surgical patterns. Cholangitis represented the most common indication (74.78%), underscoring that late biliary complications frequently manifest as frank sepsis rather than vague upper abdominal discomfort.

Choledocholithiasis was identified in 67.83% of subjects. This frequency is higher than the 45.8% reported by Ibáñez-García et al. (2025) and 36.7% reported by Abd Elrazik (2019), and substantially higher than the 9% noted by Patel et al. (2020), who evaluated unselected post-cholecystectomy abdominal pain. Stones identified at delayed intervals may reflect retained stones missed during initial surgery or de novo recurrent calculi formed due to altered bile composition or biliary stasis (Cox et al., 2015; Lee et al., 2016).

Biliary strictures were present in 26.09% of cases, primarily affecting the distal common bile duct (60.00%). While this rate closely parallels the 24.7% documented by Ibáñez-García et al. (2025), it exceeds rates observed in early postoperative cohorts, which tend to focus on direct operative transections or major duct leaks (Konstantakis et al., 2021). The coexistence of calculi and strictures in 5.22% reflects secondary lithiasis promoted by biliary stasis.

Malignant lesions were identified in 2.61% of patients. Although uncommon, delayed manifestation of cholangiocarcinoma or periampullary carcinoma highlights that persistent obstructive jaundice or constitutional weight loss should not be assumed to be purely benign postoperative sequelae (Goto et al., 2024). Normal cholangiograms were observed in only 2.61% of patients, confirming high diagnostic yield in targeted clinical settings. Nevertheless, due to inherent procedural risks, ERCP must be guided by non-invasive modalities such as MRCP and endoscopic ultrasound and reserved primarily for therapeutic indications (Kabir et al., 2025; Thiruvengadam et al., 2024).

LIMITATIONS

Limitations include the retrospective single-centre design, referral bias, and the lack of primary surgical details, which precluded distinguishing retained from recurrent lithiasis. Longitudinal outcomes following endoscopic therapy were also not available.

CONCLUSION

Patients undergoing ERCP at least six months after cholecystectomy exhibit a wide spectrum of biliary pathomorphology, predominantly choledocholithiasis and benign distal strictures. The diagnostic yield of ERCP is exceptionally high in this population; however, non-invasive imaging should remain the initial investigative approach to tailor endoscopic intervention specifically to therapeutic candidates.

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