

Evaluating Management Strategies for Common Bile Duct Stones in Female Patients at a Tertiary Care Hospital

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Abstract:

Introduction: Common bile duct (CBD) stone is a common issue in clinical practice, demanding swift diagnosis and treatment. Treatment options encompass open, endoscopic, and laparoscopic methods. CBD stones pose challenges for surgeons and gastroenterologists due to varying symptom severity. This study aimed to assess different treatment modalities for CBD stones in females and their effectiveness in terms of outcomes and complications.

Materials and Methods: We conducted a prospective study involving 89 patients. Data collected included detailed patient history (age, gender, admission date), chief and associated complaints, past medical history, general and systemic examinations (particularly abdominal), laboratory investigations (if conducted), and special investigations such as X-ray, ultrasound, CT scan, MRCP, and ERCP. Complications were meticulously evaluated and monitored post-treatment. Patients were followed up monthly for six months after discharge to track recurrent attacks or new complications.

Results: CBD stones predominantly affected females aged 55 to 64 years, presenting a range of symptoms from asymptomatic to severe complications like acute biliary pancreatitis and cholangitis. Pain, jaundice, and fever were common symptoms. Ultrasonography detected stones in about 40% of cases. ERCP was the primary extraction method, with open surgery used in failed cases. Open surgery showed slightly higher success rates than endoscopic procedures.

Conclusion: Open surgery demonstrated greater success compared to endoscopic procedures, particularly in cases with large stone burdens causing lower CBD obstruction. Proper patient categorization, pre-operative evaluation, and skilled medical staff are critical for optimal treatment decisions.

Keywords: Common Bile Duct Stone; ERCP; Jaundice; Pancreatitis, Females.

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Introduction

Over the past decade, there has been a significant shift in the management of bile duct stones, moving away from conventional open surgical procedures towards minimally invasive techniques such as laparoscopic cholecystectomy with CBD exploration and the use of MRCP for diagnostic purposes.

This evolution has transformed the management strategies for bile duct stones, with MRCP offering comprehensive diagnostic information without the risks associated with ERCP investigations, thereby reducing the diagnostic relevance of ERCP [1]. Despite the availability of multiple approaches for

managing CBD stones, the optimal approach remains a subject of debate. Our study focuses on evaluating different treatment modalities for bile duct stones and their efficacy. In hepatobiliary surgery, the presence of stones in the CBD, known as choledocholithiasis, is a common clinical scenario. Our approach includes considering the entire extrahepatic biliary tree as part of the CBD for management purposes [2].

Choledocholithiasis is found in 6–12% of patients with gallstones, with the incidence increasing with age, particularly in patients over 60 years old where up to 20–25% may have stones in the CBD.

Secondary stones, originating in the gallbladder and passing through the cystic duct, are the most common type, often influenced by the diameter of the cystic duct (>4 mm). Primary stones, developing de novo in the bile duct, are typically associated with bacterial infections, parasitic infestations, or various structural abnormalities like strictures, foreign bodies, or diverticula. Retained stones after cholecystectomy, usually within two years, are also a concern [3].

The objectives of our study are to explore different modalities and standardized protocols for managing bile duct stone diseases in female patients and to assess the efficacy of endoscopic versus open surgical management of CBD stones in terms of outcomes, morbidity, and mortality.

This study aimed to evaluate the effectiveness of oral versus intravenous magnesium administration in preventing postoperative hypomagnesemia among CABG patients and to assess oral supplementation's potential in averting arrhythmias. Notably, there is a paucity of literature comparing oral and intravenous administration routes in this context, making this investigation novel in its approach.

Material and Methods

A total of 89 females were included in the study. Data were gathered from patients with bile duct stones who sought medical attention at the outpatient department (OPD), inpatient department (IPD), or emergency department.

The study included all cases of clinically diagnosed bile duct calculi using radiological techniques, recurrent bile duct calculi cases, referred cases with diagnosed bile duct calculi to Peerless Hospital, and patients aged 14 years and above. Patients who underwent ERCP, laparoscopic, or open exploration for reasons other than CBD stones, those with choledocholithiasis managed elsewhere who presented for complication management, patients under 14 years old, those in critical condition upon presentation, and patients with both CBD stones and malignant periampullary growth were excluded from the study.

Patient data collection involved obtaining a comprehensive history, including demographic details (age, gender, date of admission), chief complaints, associated symptoms with their duration, past medical history (including chronic conditions or previous abdominal surgeries), general physical examination, systemic examination (especially focusing on the abdomen), laboratory tests (if conducted), and specialized investigations such as X-ray, ultrasound (USG), CT scan, magnetic resonance cholangiopancreatography (MRCP), and endoscopic retrograde cholangiopancreatography

(ERCP). Complications were carefully assessed, and ongoing complications were monitored. All patients were followed up for six months post-discharge, with monthly check-ups to monitor for recurrent episodes or the development of complications.

Results

Table 1 presents the age distribution of females with CBD stones. A total of 89 female patients were included in the study. The age groups were categorized as follows: 15–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years, 65–74 years, and >75 years. The highest number of patients was in the 55–64 years age group (23.6%), followed by the 35–44 years age group (21.35%) and the 65–74 years age group (17.98%). The lowest number of patients was in the >75 years age group (5.62%).

Table 2 outlines the distribution of symptomatic and asymptomatic females with CBD stones. Out of the 89 female patients included in the study, 69 (77.53%) presented with symptoms related to CBD stones, while 20 (22.47%) were asymptomatic.

Figure 1 illustrates the distribution of symptoms in females with CBD stones. The symptoms considered in this analysis were pain, jaundice, and fever. Out of the total 89 female patients, 69 (77.53%) experienced pain related to CBD stones, while 20 (22.47%) did not report pain. Jaundice was present in 47 (52.81%) patients and absent in 42 (47.19%) patients. Fever was reported by 34 (38.2%) patients, with 55 (61.8%) patients not exhibiting fever symptoms.

Table 3 presents the levels of conjugated bilirubin in the study population of females with CBD stones. This distribution indicates a varied range of conjugated bilirubin levels among female patients with CBD stones. A substantial proportion of patients (37.08%) had elevated levels of conjugated bilirubin (>5 mg/dL), highlighting the impact of CBD stones on liver function and the need for close monitoring and appropriate management of these patients.

Table 4 presents the treatment outcomes in females with CBD stones, categorized into two main interventions: Endoscopic Retrograde Cholangiopancreatography (ERCP) and Open CBD exploration with stone removal. This data underscores the effectiveness of ERCP as a primary intervention for managing CBD stones in female patients, with a high success rate in stone removal and stenting. However, a small percentage experienced treatment failure, highlighting the need for alternative strategies such as open CBD exploration in select cases. Overall, these findings provide valuable insights into the treatment landscape and outcomes for CBD stones in female

patients. Table 5 presents the complications associated with ERCP among female patients with CBD stones. These findings demonstrate that the majority of female patients undergoing ERCP for CBD stones did not encounter any complications. However, a small percentage experienced

complications such as pancreatitis, hemorrhage, and cholangitis. These data underscore the importance of careful monitoring and management of patients undergoing ERCP, particularly in assessing and mitigating the risk of potential complications.

Table 1: Age distribution in females with CBD stones

Age groups	n	%
15–24 years	4	4.49
25–34 years	10	11.24
35–44 years	19	21.35
45–54 years	14	15.73
55–64 years	21	23.6
65–74 years	16	17.98
>75 years	5	5.62
Total	89	100

Table 2: Distribution of symptomatic vs asymptomatic females with CBD stones

Symptoms	n	%
Symptomatic	69	77.53
Asymptomatic	20	22.47
Total	89	100

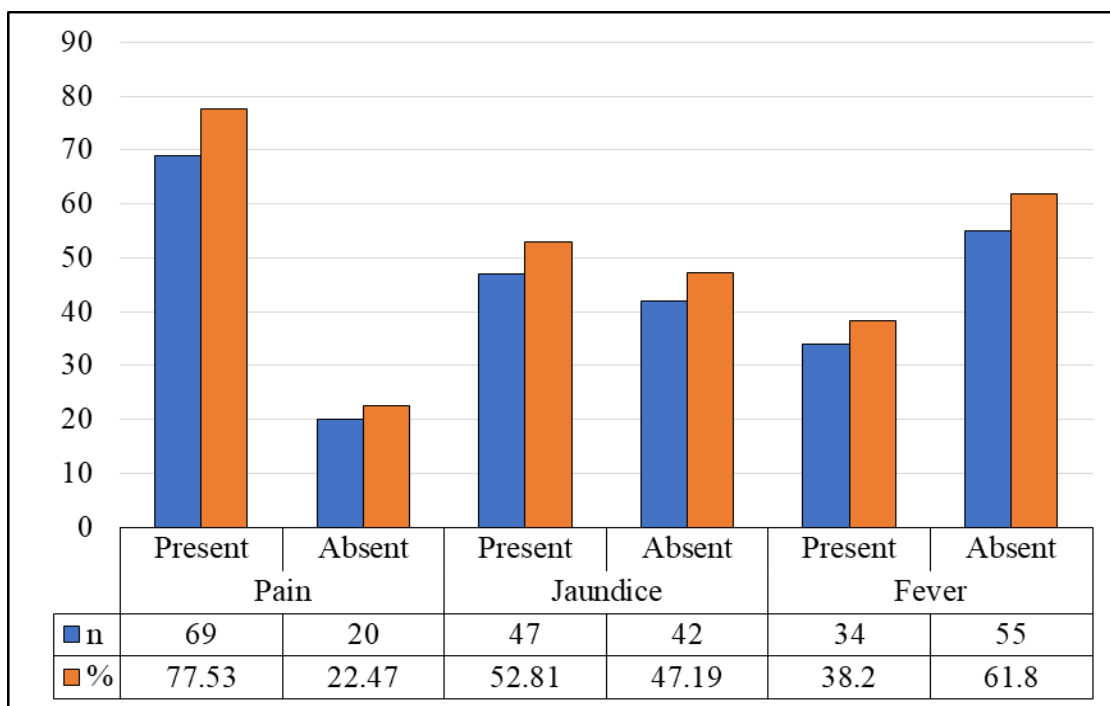


Figure 1: Distribution of symptoms in females with CBD stones

Table 3: Levels of Conjugated Bilirubin in study population

Conjugated Bilirubin	n	%
0.3–1.0 mg/dL	18	20.22
1.1–3.0 mg/dL	29	32.58
3.1–5.0 mg/dL	9	10.11
>5 mg/dL	33	37.08
Total	89	100

Table 4: Treatment outcomes in females with CBD stones

Treatment outcomes	n	%
ERCP		
Success (Stone removal + stenting)	76	85.39
Only stenting	4	4.49
Failure	9	10.11
Open CBD exploration and stone removal		
Success	8	8.99
Failure	1	1.12

Table 5: ERCP complications among females with CBD stones

Complication	n	%
No complication	81	91.01
Pancreatitis	4	4.49
Hemorrhage	3	3.37
Cholangitis	1	1.12
Total	89	100

Discussion

In our investigation, the age range of the subjects spanned from 15 to 85 years, with a mean age of 51 years. The majority of cases fell within the 55 to 64 years age bracket. This is somewhat older than what Girard observed, who reported the highest incidence in the 50–59 years age group (20.1%) [4]. notably, our study population exhibited an average age that was 5 years higher. Among the patients, about 22% were either asymptomatic or presented with mild dyspeptic symptoms, discovered incidentally during routine assessments.

The remaining patients experienced symptoms, with pain being the most prevalent, while jaundice and fever were also present in significant numbers. Signs indicative of cholangitis, such as abdominal pain, fever, and jaundice (known as Charcot's triad), were observed in about 32% cases. The criteria for choledochoduodenostomy in our research aligned with those outlined by Blumgart and colleagues [5,6]. Additionally, Andriulli et al., Enochsson et al., and others reported a post-ERCP pancreatitis incidence of approximately 3.5% [7-9].

Comparing our findings to previous research, we noted a similar incidence of jaundice, albeit lower rates of pain and fever in our cohort [9]. The diagnosis of CBD stones was confirmed through transabdominal ultrasound (USG) and magnetic resonance cholangiopancreatography (MRCP), with endoscopic retrograde cholangiopancreatography (ERCP) performed for therapeutic purposes. ERCP was successful (i.e., complete stone extraction and stent placement) in about 85% cases, with remaining cases requiring biliary stenting post-incomplete stone extraction. However, in about 10% cases, ERCP failed due to the presence of multiple large impacted stones near the distal bile ducts.

Our study demonstrated a higher ERCP success rate compared to previous findings [10]. For cases where ERCP failed, open CBD exploration was performed, resulting in complete stone clearance in most cases. Choledochoduodenostomy was chosen over choledochojejunostomy due to its safety, simplicity, and physiological benefits [11]. Intraoperative cholangiography was omitted as all cases were confirmed preoperatively, and post-procedure bile duct status was assessed using a choledochoscope or flexible cystoscope. The majority of patients did not experience complications post-ERCP, with pancreatitis being the most common. Management of complications was conservative, with all cases recovering successfully. At discharge, all patients were advised to follow-up regularly. The study reported a high cure rate, with retained stones and biliary stricture. Further investigations are warranted to validate these findings, considering the limitations of this single-institution study.

Conclusion

In all cases of choledocholithiasis, attempts were made to use ERCP for stone extraction, achieving a success rate of more than 80%. However, challenges arose with multiple large stones and impacted stones, leading to limitations in the endoscopic procedure's effectiveness. Complications such as pancreatitis, cholangitis, and hemorrhage were observed but were mostly managed conservatively. Open CBD exploration was reserved for cases where endoscopic methods failed, showing a slightly higher success rate compared to endoscopic procedures. Importantly, there were no mortalities associated with open surgery. These findings highlight the importance of carefully selecting the appropriate intervention based on individual patient characteristics and the complexity of the bile duct stone presentation.

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