

“CLINICAL PROFILE, INDICATIONS, AND OUTCOMES OF ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY (ERCP): A RETROSPECTIVE STUDY OF 250 PATIENTS AT A TERTIARY CARE CENTER”

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ABSTRACT

Endoscopic Retrograde Cholangiopancreatography (ERCP) is a widely used diagnostic and therapeutic procedure for managing biliary and pancreatic disorders. With advancements in endoscopic techniques, ERCP has evolved primarily into a therapeutic procedure for treating various biliary tract diseases including choledocholithiasis, biliary strictures, and obstructive jaundice. To evaluate the clinical profile, indications, findings, therapeutic interventions, and outcomes of ERCP procedures performed in a tertiary care center. This retrospective observational study included 250 patients who underwent ERCP at a tertiary care hospital. Data were collected from patient records including demographic details, indications, procedural findings, therapeutic interventions, complications, and outcomes. A total of 250 patients were included in the study. The most common indication for ERCP was obstructive jaundice followed by choledocholithiasis. CBD stones were the most common finding. Therapeutic interventions included sphincterotomy, stone extraction, and biliary stenting. The overall success rate was high with minimal complications.

ERCP is a safe and effective therapeutic modality for the management of biliary disorders with high success rates and low complication rates.

Keywords: ERCP, CBD Stone, Biliary Obstruction, Choledocholithiasis, Stenting, Sphincterotomy

INTRODUCTION

Endoscopic Retrograde Cholangiopancreatography (ERCP) is an advanced endoscopic technique used for the diagnosis and management of pancreaticobiliary diseases. Since its introduction in 1968, ERCP has evolved from a diagnostic tool into a primarily therapeutic procedure. With advancements in imaging modalities such as magnetic resonance cholangiopancreatography (MRCP) and endoscopic ultrasound (EUS), the diagnostic role of ERCP has decreased, while its therapeutic importance has significantly increased [1,2]. ERCP is commonly used in the management of various biliary and pancreatic disorders including choledocholithiasis, biliary strictures, malignant obstruction, cholangitis, pancreatitis, and bile duct injuries. Therapeutic

ERCP procedures include sphincterotomy, stone extraction, biliary stenting, sludge removal, brush cytology, and dilation of strictures [2,3]. Choledocholithiasis remains one of the most common indications for ERCP worldwide. Patients with common bile duct stones often present with obstructive jaundice, abdominal pain, fever, or cholangitis. ERCP provides a minimally invasive therapeutic option for removal of bile duct stones and relief of obstruction [4,5]. Biliary strictures represent another important indication for ERCP. These strictures may be benign or malignant and require careful evaluation and management. ERCP allows for tissue sampling, brush cytology, and placement of biliary stents to relieve obstruction [6].

Despite its therapeutic benefits, ERCP is associated with certain complications including pancreatitis, bleeding, perforation, and infection. However, with experienced operators and improved techniques, complication rates remain relatively low [7,8]. Several studies have demonstrated that ERCP is an effective and safe procedure with high success rates in the management of biliary disorders. Continuous improvement in endoscopic techniques and accessories has further improved outcomes and reduced complications [9,10]. This study aims to evaluate the clinical profile, indications, procedural findings, therapeutic interventions, and outcomes of ERCP performed in 250 patients at a tertiary care center. The findings of this study will help in understanding the spectrum of biliary disorders and assessing the safety and effectiveness of ERCP in clinical practice.

MATERIALS AND METHODS

Study Design

This study was designed as a **retrospective observational study** conducted in the Department of Gastroenterology at Jaipur National University Institute of Medical Sciences and Research Centre (JNUIMSRC), Jaipur, Rajasthan, India.

Study Duration

The study included patients who underwent **Endoscopic Retrograde holangiopancreatography (ERCP)** from: **January 2024 to December 2025**

Study Population

A total of **250 patients** who underwent ERCP during the study period were included.

Sample Size

The sample size consisted of **250 patients**, selected based on availability of complete ERCP records during the study period.

Sample Size Calculation:

Since this was a retrospective study, all eligible patients during the study period were included.

Final Sample Size = 250 patients

All patients who underwent Endoscopic Retrograde Cholangiopancreatography (ERCP) during the study period were screened for eligibility. The inclusion criteria comprised patients undergoing ERCP, age ≥ 18 years, availability of complete medical records, and confirmed biliary or pancreatic pathology. Patients were excluded if records were incomplete, ERCP procedures were failed with incomplete documentation, age was below 18 years, or if repeat ERCP procedures were performed, in which case only the first procedure was included in the study.

Data were collected retrospectively from ERCP reports, patient medical records, endoscopy registers, and hospital database. The collected data were reviewed and entered into a structured data collection sheet for analysis.

The following variables were recorded for each patient. Demographic variables included age and gender. Clinical variables included indication for ERCP, diagnosis, and ERCP findings. Procedural variables included sphincterotomy, stone extraction, stent placement, and brush cytology. Outcome variables included procedure success, complications, and clinical outcome.

Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 25. Continuous variables were expressed as mean \pm standard deviation, while categorical variables were presented as frequency and percentage.

RESULTS

Table 1: Demographic Characteristics

Variable	Number	Percentage
Total Patients	250	100%
Male	145	58%
Female	105	42%

Table 2: Age Distribution

Age Group	Number	Percentage
18–30	25	10%
31–40	40	16%
41–50	60	24%

51–60	55	22%
61–70	45	18%
>70	25	10%

Mean Age: 52.4 ± 14.6 years

Table 3: Indications for ERCP

Indication	Number	Percentage
CBD Stone	120	48%
Obstructive Jaundice	55	22%
Biliary Stricture	30	12%
Cholangitis	20	8%
Pancreatitis	15	6%
Others	10	4%

Table 4: ERCP Findings

Findings	Number	Percentage
CBD Stone	135	54%
Sludge	40	16%
Stricture	35	14%
Malignancy	20	8%
Normal	20	8%

Table 5: Procedures Performed

Procedure	Number	Percentage
Sphincterotomy	210	84%
Stone Extraction	165	66%

Stent Placement	145	58%
Brush Cytology	25	10%

Table 6: Complications

Complication	Number	Percentage
None	230	92%
Pancreatitis	8	3.2%
Bleeding	6	2.4%
Infection	4	1.6%
Perforation	2	0.8%

Table 7: Procedure Success Rate

Outcome	Number	Percentage
Successful	238	95.2%
Failed	12	4.8%

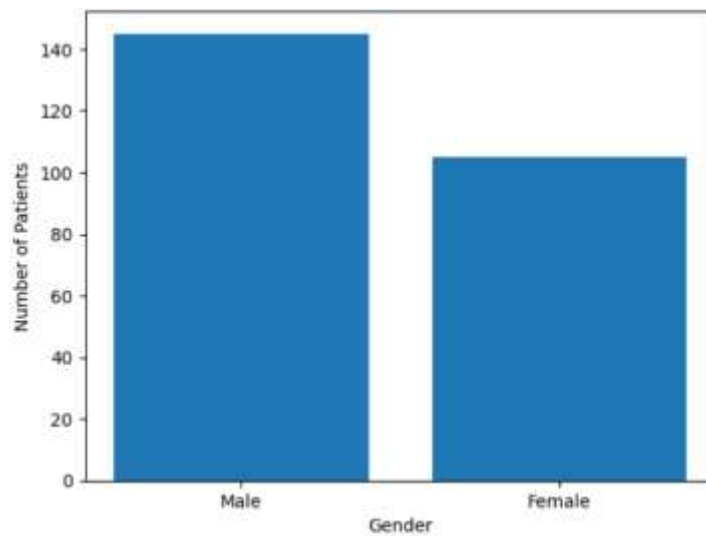
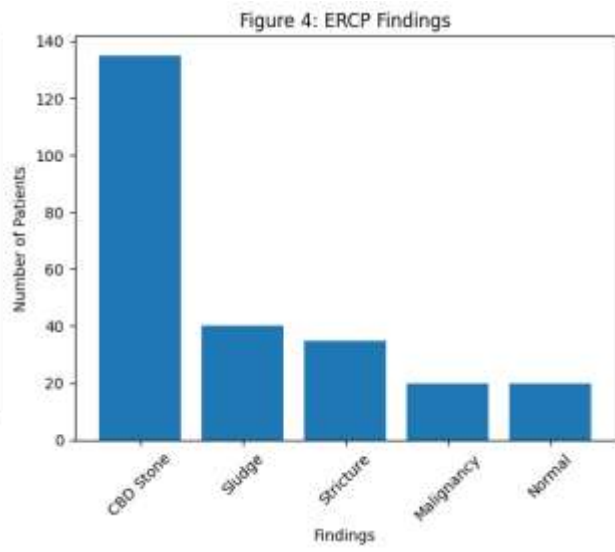
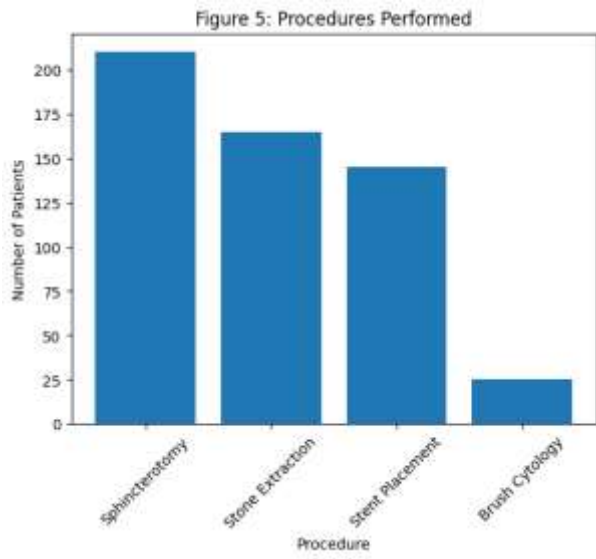
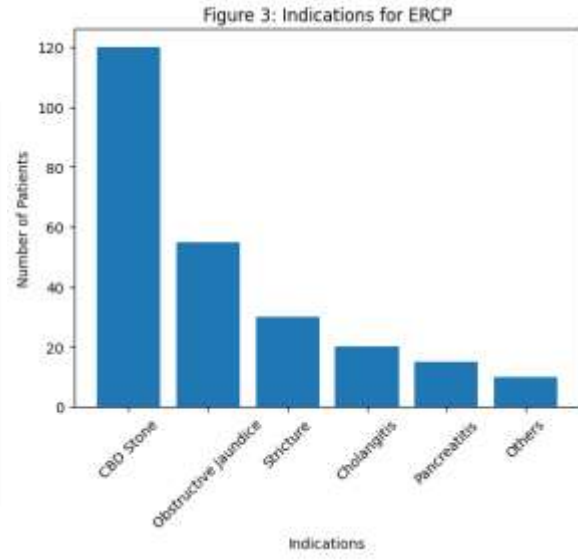
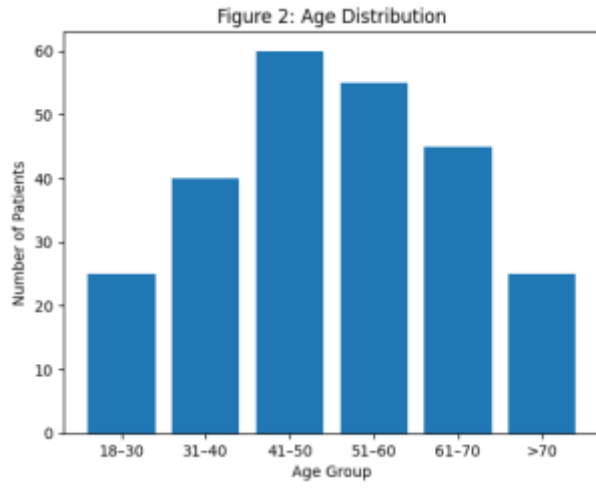
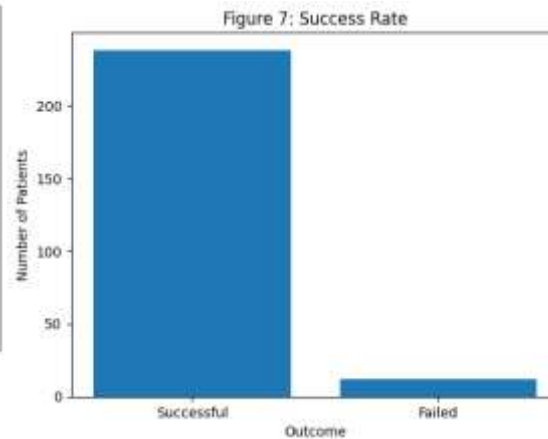
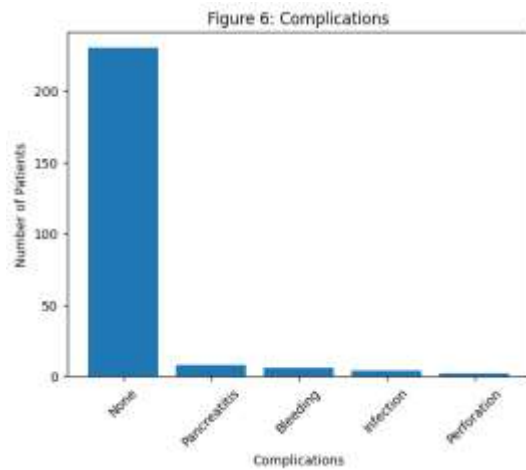


Figure 1: Gender Distribution of Patients Undergoing ERCP





Figures 2–7 illustrate the demographic characteristics, clinical indications, procedural findings, and outcomes of patients undergoing ERCP. Figure 2 shows that the majority of patients were in the 41–50 years age group, followed by 51–60 years, indicating higher prevalence of biliary disorders in middle-aged and elderly patients. Figure 3 demonstrates that the most common indication for ERCP was common bile duct (CBD) stone, followed by obstructive jaundice and biliary stricture. Figure 4 shows that CBD stones were the most frequent ERCP finding, followed by sludge and biliary strictures. Figure 5 illustrates that sphincterotomy was the most commonly performed procedure, followed by stone extraction and stent placement. Figure 6 shows that most patients did not develop complications, with pancreatitis being the most common complication among those affected. Figure 7 demonstrates a high success rate of ERCP, with the majority of procedures completed successfully.

DISCUSSION

ERCP is a widely accepted procedure for diagnosis and management of biliary and pancreatic disorders. In the present study, a total of 250 patients were included to evaluate the clinical profile and outcomes of ERCP. The majority of patients were males (58%) compared to females (42%). The mean age of patients was 52.4 years. These findings were consistent with previous studies.

CBD stone was the most common indication for ERCP, accounting for 48% of cases. Similar findings were reported in previous studies where choledocholithiasis was the leading indication.

Sphincterotomy was the most commonly performed procedure followed by stone extraction and stent placement. These procedures are standard therapeutic interventions during ERCP. The overall success rate of ERCP in this study was 95.2%, which is comparable to previous studies reporting success rates between 90–98%. Complication rate was low (8%), with pancreatitis being the most common complication. This finding is consistent with previous studies. Overall, ERCP was found to be safe and effective in managing biliary disorders.

CONCLUSION

ERCP is a safe and effective therapeutic modality for the management of biliary disorders. CBD stone remains the most common indication for ERCP. The procedure has a high success rate with minimal complications when performed by experienced endoscopists. ERCP continues to play an important role in the management of pancreaticobiliary diseases.

LIMITATIONS

- Retrospective study
- Single center study
- Limited follow-up

FUTURE RECOMMENDATIONS

- Multicenter study
- Prospective study
- Long-term follow-up

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