

Outcome of Endoscopic Retrograde Cholangiopancreatography at a tertiary Centre in Western Nepal

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Abstract

Background: Endoscopic Retrograde Cholangiopancreatography (ERCP) is an endoscopic procedure for management of various pancreaticobiliary diseases. Successful outcome with minimal complications require an expertise and adequate resources in relevant indications. This study aims to explore the indications, technical success, outcome and complications of ERCP in our region.

Methods: This is a descriptive, hospital-based, prospective study conducted in the Department of Medicine, Pokhara Academy of Health Sciences, Pokhara, Nepal from March 2024 to February 2026 after an ethical clearance. Endoscopic Retrograde Cholangiopancreatography was performed under anesthesia with standard accessories recommended by trained gastroenterologists after evaluation of indications. Data was entered in Microsoft Excel 2024 and descriptive analysis was done on SPSS version 25.

Results: Successful ERCP was performed in 94% of indicated patients with choledocholithiasis as the commonest indication. Emergency procedure was performed among 68 cases (22%). Mean age of patients was 60.19±16.89 years with almost equal gender distribution. Common bile duct clearance was achieved in 58% cases at first attempt. Overall complications were observed among 8% of the procedure and pancreatitis was the commonest (4%) followed by bleeding (1.2%).

Conclusions: ERCP can be safely performed as minimally invasive procedure with comparable outcome and complications with expertise and adequate resources.

Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) is currently an advanced endoscopy procedure for management of pancreatobiliary disorders.¹ Ampulla of Vater cannulation was attempted as early as 1968² and development of endoscopic techniques with time has established ERCP as a therapeutic procedure. It is performed for choledocholithiasis, cholangitis, biliary and pancreatic strictures, biliary leaks and pancreatic duct stones under anesthesia.³ The procedure demands a highly trained manpower, appropriate patient selection and adequate resources for successful outcome.

ERCP can be performed safely as a minimally invasive procedure but is associated with adverse events in 6% to 15%.⁴ In population-based studies, successful cannulation at ERCP is achieved in >85% of cases worldwide.⁵ In Nepal, regular ERCP service is available in limited centers in capital city with variable indications and outcome. Paucity of data exists regarding the major indications, technique and outcome of ERCP in our region. In this study we have evaluated the common indications and outcome of procedure in resource limited settings.

Methods

This descriptive, cross sectional, hospital-based, prospective study was conducted in the Department of Medicine, Pokhara Academy of Health Sciences (PoAHS), Pokhara, Nepal from March 2024 to February 2026 after an ethical clearance. All patients were evaluated by physician/gastroenterologist for relevant indications of ERCP: obstructive jaundice due to choledocholithiasis, benign or malignant biliary and pancreatic strictures, cholangitis and biliary leaks with relevant investigations before enrollment. Patients with esophago-gastro-duodenal strictures precluding the duodenoscope reach up to ampulla, unsuccessful bile duct cannulation and incomplete procedure were excluded in study. Preanaesthetic checkup was

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done by anesthesiologist and was carried out under sedation after appropriate preparation as recommended. Patients were positioned on left lateral or prone position during procedure. Standard Pentax duodenoscope (Pentax Optivista) was used for the procedure. Cholangiogram was performed for all with diluted contrast (Diatrizoate Meglumine Sodium). Accessories like sphincterotome, needle knife, guidewires, balloon and baskets were used as per indication and preference of endoscopist. Plastic/metallic stents of varying sizes were used wherever needed. Occlusion cholangiogram was performed for visualization of clearance of calculi. Immediate or in hospital complications if any were recorded before discharge from hospital. Complication of procedure if any was managed according to current standard of care as recommended.

The demographic details, relevant indications, procedure details and complications were studied. Data were recorded in Microsoft excel 2024 and was analysed in Statistical Package for the Social Sciences (SPSS) version 25.

Results

Among 326 ERCP indicated for the procedure, 308 ERCPs (94.4%) were successfully performed during the study period. Mean age was 60.19±16.89 years and female comprised of 51%. Majority of the patients were from districts of Gandaki province: Kaski (45.5%), Tanahun (17.5%) followed by Syangja (11.7%). Twelve cases were from outside this province, among whom one is from neighboring country India. Sixty-eight cases (22%) were performed as an emergency procedure within 48 hours of hospital admission. One case was performed under general anesthesia while rest were performed under intravenous anesthesia. Native ampulla comprised of 63.6%. Commonest primary indication was choledocholithiasis (58.4%) followed by cholangitis due to various cause (19.8%) as shown in table 1.

Table 1: Indications of ERCP

Indications	N, %
Choledocholithiasis	180 (58.4%)
Cholangitis	61 (19.8%)
Benign biliary stricture	28 (9.0%)
Malignant biliary stricture	21 (6.8%)
Biliary leak	11 (3.5%)
Others (Mirizzi syndrome, choledochal cyst, Hydatid cyst)	7 (2.2%)
Total	308

Periampullary diverticula were noted among seventyeight cases (25.3%). Common bile duct (CBD) access was achieved by guidewire technique with sphincterotome in majority of cases (82.5%). CBD cannulation was unsuccessful in 8 cases by any technique used and were referred for surgical management. Inadvertent pancreatic duct (PD) cannulation was done among 43 cases (13.9%), followed by plastic stent placement in all to prevent post ERCP pancreatitis (PEP). However, two cases with PD stents developed mild PEP even after stent placement.

Two hundred fifteen cases (69.8%) demonstrated filling defects suggestive of calculi on cholangiogram examination, 63.2% of these were larger calculi (>10mm, measured in approximation with duodenoscope diameter). Choledocholithiasis alone

comprised of 175 cases (81.3%), others being hepatolithiasis alone and intrahepatic and bile duct combined. Calculi were retrieved by balloon trawls alone in 104 patients and balloon plus basket was used in 20 patients in first ERCP attempt for CBD clearance. Spontaneous passage of small CBD stones was noted in 23 cases from diagnosis to ERCP. Successful clearance was achieved at first ERCP attempt in 124 patients (57.6%). Eight patients were referred for choledocholithotomy due to unsuccessful clearance despite multiple ERCP attempts. Three patients underwent cholangioscopy with laser treatment for complete removal.

Biliary strictures were noted among sixtyfour (20.7%) of ERCP cases and classified as primary benign (64%) or malignant stricture (36%) after relevant clinical, laboratory and imaging studies (Table 2). Fifteen stricture patients presented with cholangitis. Fully covered metallic stent was deployed in 2 benign strictures of chronic pancreatitis and partially covered metallic stents in 14 malignant strictures among the affording patients. Stenting was unsuccessful in two malignant strictures due to multiple stricture sites and long length.

Table 2: Biliary Stricture

Stricture type	Number (%)	Stenting		
		Plastic Stents	Metal Stents	Stenting Unsuccessful
Benign stricture	41 (64.0%)	39	2	0
Malignant stricture	23 (35.9%)	7	14	2
Total	64	46	16	2

Complications were noted among 25 ERCP cases (8.1%) and pancreatitis (14 patients, 4.5%) was the commonest complication followed by bleeding (4 patients, 1.2%) and post ERCP cholangitis (3 patients, 0.9%). One patient died immediately after the procedure and one diabetic patient developed myocardial infarction during the procedure.

Table 3: Complications of ERCP

Complications		Number of complications	Total (N, %)
Pancreatitis (PEP) ⁶	mild	13	14 (4.5%)
	moderate	1	
	severe	0	
Bleeding	major (requiring transfusion and endotherapy)	1	4 (1.2%)
	minor bleeding	3	
Post ERCP cholangitis		3	3 (0.9%)
Intestinal perforation		2	2 (0.6%)
Myocardial infarction		1	1 (0.3%)
Death		1	1 (0.3%)
Total		25	25 (8.1%)

Discussion

The availability of ERCP service in this region of country has helped for the standard management of pancreaticobiliary diseases saving the time and minimizing the cost. Providing this highly advanced medical service at resource limited setting is a challenge and quality assurance is the major issue at beginning of service. Cholangitis and biliary leaks after cholecystectomy were provided as emergency service which is a notable achievement at resource limited government facility. We performed emergency ERCP in 68 cases, which is of utmost need, having morbidity benefits in terms of organ failure, reintervention, hospital stay and possible mortality benefits.^{7,8}

Both genders benefitted from procedure in almost equal frequency at our centre. The age range varied from 14 years to 93 years highlighting the presence of indications for ERCP in varied ages. Most patients were from the district where service is available and twelve patients other than Gandaki province highlighting the possible development of referral center in future for ERCP procedure. Choledocholithiasis was the commonest indication similar to other studies in different part of country.^{9,10} Ampulla could not be reached in 10 patients due to unfavourable anatomy for duodenoscope to pass through, which can be addressed during case selection by performing esophagogastroduodenoscopy prior sedation, and common bile duct access could not be done among eight patients due to difficult cannulation requiring surgical intervention. In four cases, percutaneous Rendezvous technique was applied for CBD access and further therapeutic interventions, which can be a noble method in failed standard cannulation to relieve the obstruction.¹¹

CBD could be cleared of stones in almost 57.6% cases at first attempt which is comparable to others reported from Nepal (59%) and lower than other countries (82%).^{12,13} This might be due to high number of large calculi and greater percentage of cholangitis patients limiting the therapeutic interventions in our study. Use of needle knife for CBD cannulation among 11.4% cases requires technical improvement in use of safe methods like sphincterotomy. Characteristics of biliary strictures on cholangiogram and long-term prognosis was not well defined in our study and use of metallic stents for all advanced malignant strictures would have greater benefit.

The complications observed in our study is similar to national and international literature with reports of overall complication rates ranged from 9.4% to 15.9%, most common being PEP (3.8-17.2%), cholangitis (0.5-9.7%), bleeding (1-2%), perforation (0.08%-0.6%), with procedure-related mortality of 0.26% to 1.0%.^{14,15} The complications can be minimized with standard techniques in experienced hands, definitive indications, use of recommended pre procedure prophylaxis measures, standard sphincterotomy technique and use of pancreatic stent.^{6,9,16}

Failure of clearance of CBD calculi in higher frequency in first attempt, inability to practice standard pre-ERCP prophylactic measures, long term follow-up of calculi recurrence, unknown outcome of biliary strictures, minimal data on pancreatic calculi management are limitation of our procedure and study.

Conclusion

Though invasive ERCP can be safely performed in our settings with comparable outcome and complications. Application of standard procedure recommendations can minimize complications.

Conflict of Interest: None

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