

## ERCP IN A TERTIARY CARE HOSPITAL OF SOUTH-EASTERN BANGLADESH : A CLINICAL AUDIT

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### Abstract

**Background:** Endoscopic Retrograde Cholangio Pancreatography (ERCP) is an established modality, mainly to treat pancreatico-biliary diseases. There are no comprehensive data about ERCP procedure from south-eastern part of Bangladesh. The aim of this study was to review the indications, cannulation success rate and complications of ERCP performed in a tertiary care centre of south-eastern Bangladesh.

**Materials and methods:** In this retrospective cross-sectional study, 192 consecutive patients undergone ERCP between January 2015 to December 2019 were included to find out indications, success rate and complications of ERCP. Patients with any previous papillary intervention like papillotomy, sphincterotomy, stent placement, altered surgical anatomy were excluded. Data from computerized records of all of ERCP to a predesigned excel sheet were analyzed.

**Results:** Among 192 patients, male was 79(41.15%) and female 113(58.85%) mean age 43.88 years with age range of 18 to 85 years. Significantly higher proportion of male had malignant biliary etiology compared to female (39.24 versus 10.62%). Cannulation success rate was 95.52%. Most of the therapeutic procedure done by classical sphincterotomy (88.02%) whereas precut needed in 11.98% procedures. Complete stone extraction was possible in 77.68% cases irrespective of stone sizes but 93.33% case of <10 mm sized stone were extracted at first ERCP. ERCP adverse events developed in 9.37% (n=18) patients and post ERCP pancreatitis was more frequent (5.21%).

**Conclusions:** ERCP is a safe procedure though complication in our center was slightly higher than standard tertiary center. By proper selection of patients, using updated guidelines and accessories it can be done more safely onward.

**Key words:** Endoscopic Retrograde Cholangio-Pancreatography (ERCP); Sphincterotomy; Pancreatitis.

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### Introduction

Endoscopic Retrograde Cholangio Pancreatography (ERCP) is a demanding procedure used in the management of benign and malignant pancreatico-biliary diseases. ERCP is one of the most technically demanding and highest-risk procedure performed by gastroenterologist.<sup>1</sup> With the advent of newer diagnostic imaging (MRCP, EUS) the diagnostic role of ERCP is diminishing and ERCP is evolving into predominantly therapeutic procedure.<sup>2</sup> The most common indications of ERCP are removal of Common Bile Duct (CBD) stones and relieving bile duct obstruction by stent insertion.<sup>3</sup> The procedure usually begins with wire-guided deep cannulation of the biliary tract or through precut. However, there is a risk of unplanned events such as technical failure, complications. Main complication of the procedure is pancreatitis, cholangitis, hemorrhage and perforation of CBD or duodenum.<sup>4,5</sup> Adverse event rates ranges from 4-7% of procedures and mortality between 0.05 to 1%.<sup>5,6,8-10</sup> Pancreatitis is the most common serious complication related to ERCP. The incidence of post ERCP pancreatitis ranges from 1.6 to 15.7%, depending on patient selection.<sup>8, 11</sup> The rate of Post ERCP cholangitis is 1-5%.<sup>4,5</sup> A retrospective study on 314 ERCP in a tertiary care hospital in Odisha, India showed most common indication for ERCP was malignant obstructive jaundice (54%) and choledocholithiasis (43.6%) post ERCP complications developed in 8% patients with pancreatitis was the commonest.<sup>12</sup> The quality indicator of ERCP practice include adequate indications and low complication figure as well as success rate of cannulation.<sup>13</sup> From January 2015 to March 2020 many ERCP performed in Chittagong Medical College Hospital, a tertiary care hospital in south-eastern Bangladesh. In Bangladesh, there is no study evaluating indications and complications of ERCP. Our aim is to retrospectively investigate indications, success rates and complications of ERCP in a tertiary care hospital of south-eastern Bangladesh.

### Materials and methods

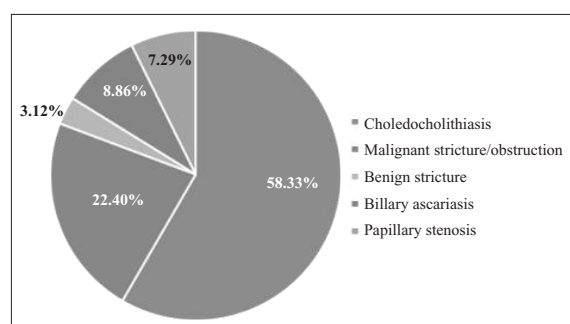
Total 235 patients were admitted/referred for ERCP to Department of Gastroenterology, Chittagong Medical College Hospital from January 2015 to December 2019. Among them 5 patients had history of gastrojejunostomy, 3 had gastric outlet obstruction, 4 had unstable vitals and 12 patients refused to give consent for ERCP were excluded. Two hundred eleven patients who underwent ERCP procedure, 10 patients had previous history of papillary intervention and in 9 patients cannulation failed were also excluded. So total 192 completed ERCP included in this single centre, retrospective cross-sectional study. ERCP indication and findings, cannulation technique, devices used during the procedure, performance of sphincterotomy, complications that were recorded and entered into the database, used for this study. All procedure was performed by experienced gastroenterologists with Olympus duodenoscope. A primary method of entering the bile duct was to use sphincterotome or to cannulate over guide wire that inserted in to Common Bile Duct (CBD). When necessary a precut sphincterotomy was performed with a needle knife. Duodenal peristalsis during procedure was reduced by I.V hyoscine butylbromide. All ERCP procedure was anesthesiologist- assisted with I.V propofolused for sedation. Prophylactic antibiotic (Ceftriaxone) was infused at the endoscopic decision in patient with cholangitis, incomplete stone removal or failure to drain biliary system. Those with incomplete or failure to remove stone, a pigtail plastic stent was placed in CBD. Complete blood count and serum amylase done in all symptomatic patient after ERCP. All patients were followed up in our center for at least 24 hours after procedure. Complications of ERCP were defined as any adverse events related to ERCP procedure that required more than one-night hospitalization. Pancreatitis was defined as the presence of abdominal pain at 24 hours after procedure with at least 3-fold elevation of serum amylase. Cholangitis was defined as an elevation of body temperature to  $>38^{\circ}\text{C}$  for more than 48 hours. Hemorrhage was defined as mild where there was a decrease in hemoglobin level but no transfusion needed, moderate when transfusion requirement  $<4$  units and severe when  $>5$  units transfusion or intervention required. In case

of more than one complication, only clinically relevant one was considered for the purpose of study. Categorical variables were analyzed using Chi-square test, while continuous variable were expressed by means and percentage.

The study protocol was approved by the Ethical Review Committee of Chittagong Medical College, Chattogram.

### Results

Out of 235 admitted and referred patients for ERCP during January 2015 to December 2019, 192 patients were included in this study. Among them female were 113 and male 79. Age range was 18-85 with mean age of 43.88 years.



**Fig 1 :** Pie chart showing etiologies of ERCP.

Out of 192 cases, 149(77.60%) cases were of benign etiology and 43(22.40%) were malignant. Cholelithiasis was the commonest indications for ERCP.

**Table I :** Gender variation of the biliary diseases in the study.

Etiology	Male Number (Percentage)	Female Number (Percentage)	p value
Cholelithiasis	39(49.37)	73(64.60)	0.052
Malignant biliary obstruction	31(39.24)	12(10.62)	$<0.001$
Benign stricture	1(1.27)	5(4.42)	0.414
Biliary ascariasis	4(5.06)	13(11.50)	0.198
Papillary stenosis	4(5.06)	10(8.85)	0.477

Data were expressed as frequency (Percentage) p value were obtained from Chi-square test.

Significantly higher proportion of male had malignant biliary etiology compared to female (39.24 versus 10.62%,  $p=<0.001$ ). Cholelithiasis was present in higher proportion in female than male but the difference was not statistically significant.

There was no sex variation in terms of other biliary etiologies like benign stricture, biliary ascariasis and papillary stenosis (Table I).

Cannulation success rate was 95.52%. Biliary access done by conventional papillotomy in 169 cases (88.02%) whereas 23(11.98%) patient needed needle knife papillotomy to enter biliary tree, most of which (n=12) was malignant causes.

**Table II :** Profiles of ERCP due to Choledocholithiasis.

Characteristics	Number	Percentage
Stone size (mm):		
<10	30	28.79
10-20	62	55.36
>20	20	17.85
Extraction devices:		
Balloon	54	48.21
Basket	10	8.93
Balloon and Basket	31	27.68
Mechanical lithotripter	17	15.18
Stone extraction:		
Complete	87	77.68
Incomplete	15	13.39
Failed	10	8.93

Most of the biliary stones were sized 10-20 mm (n=62, 55.36%). Seventy-nine patients had multiple whereas 33 had single stone. Stones was completely extracted in 77.68% (n=87) of the cases with standard accessories like basket, balloon and mechanical lithotripter (Table II).

**Table III :** ERCP profile of malignant etiology.

Characteristics	Number	Percentage
Etiology:		
Carcinoma head of pancreas	8	18.61
Cholangiocarcinoma	15	34.88
Ampullary carcinoma	15	34.88
Carcinoma gallbladder	5	11.63
Stricture location:		
Common bile duct		
Proximal	9	20.93
Mid	5	11.63
Distal	25	58.14
Common hepatic duct	4	9.30

Most common indications for ERCP in malignant cases was palliative intent. Ampullary carcinoma and cholangio carcinoma (Both 34.88%) were the most frequent etiology among malignant causes and distal CBD (58.14%) was the commonest site of stricture (Table III).

**Table IV :** Complications of ERCP.

Adverse events	Number	Percentage
Pancreatitis	10	5.2
Cholangitis	5	2.6
Hemorrhage	2	1.04
Perforation	1	.52

Though 10 patients (5.2%) developed pancreatitis, all of which was mild and treated conservatively in ward. Five patients who developed cholangitis managed with I.V antibiotics. Post sphincterotomy hemorrhage in two patients was mild and perforation in one patient in CBD, probably guidewire induced-managed conservatively.

Duodenal diverticula were found in 6 cases, choledocho-duodenal fistula in 5 cases and round worm in CBD found in 2 cases of choledocholithiasis.

## Discussion

ERCP is an indispensable procedure in the management of various pancreaticobiliary disease. In this study most common indication for ERCP was choledocholithiasis (58.33%) followed by malignant biliary obstruction (22.44%). Most common indications for ERCP were choledocholithiasis 49%, pancreaticobiliary tumour 20.6% in a prospective study by Kafaf A et al in a tertiary care centre of Tehran, Iran.<sup>14</sup> In a study by Coelho-Prabhu et al in Olmsted county, Minnesota showed Choledocholithiasis 46.6% and malignant biliary obstruction 13.5% almost similar to our study.

Significantly higher proportion of male had malignant biliary etiology compared to female (39.24 versus 10.62%,  $p < 0.001$ ). Panda CR et al found malignant biliary etiology in male was 50.6% and in female was 49.4% in a tertiary care centre of Odisha, India, not consistent with our findings.<sup>15</sup>

In 2015, an ASGE-ACG joint task force revised the practice guideline initially proposed in 2006. The updated performance aim was, deep cannulation > 90% of intact papilla's, removal of stone sized up to 10 mm >90%, perforation <.2% and bleeding <1% without any goal for Post ERCP Pancreatitis (PEP) precut and infective complications.<sup>16</sup> On the other hand, WEO's statement acknowledged cannulation rate of over 90-95%, PEP 1-7% without goal for other complications.<sup>17</sup> In a retrospective study by Borges et al in a tertiary Brazilian center, of 211 ERCP, deep cannulation

rate was 89.6%, precut was needed in 16.6% with 75.4% ductal clearance in single session and 8% technical failure.<sup>18</sup> In our study, ductal clearance in single session was 77.68%, <10 mm stone extraction rate was 93.33%, deep cannulation rates were 95.52% that is similar to these studies. Precut sphincterotomy was 11.92%, lower than Brazilian study.

In a study by Panda CR et al found, carcinoma of gallbladder 25.4%. Cholangiocarcinoma 13.6%, periampullary carcinoma 7.6% and carcinoma head of pancreas 4.1%.<sup>12</sup> In our series, we found both Cholangiocarcinoma and periampullary carcinoma 34.88% followed by carcinoma head of pancreas (18.61%) carcinoma of gallbladder (11.63%).

We performed ERCP for 17 cases of biliary ascariasis relatively common parasitic infestation in Indian subcontinent. We found 14 cases with dilated CBD, CHD with tight papilla and no pathology inside biliary tree, labeled as organic papillary stenosis as sphincter of Oddi manometry not available here. This seems to be unusually high as an etiological indication for ERCP.

The frequent adverse effect arising from ERCP is post ERCP pancreatitis, followed by cholangitis and bleeding. In a systematic review of 21 survey of ERCP including 16855 patients, adverse events were 6.85% with PEP, infection and bleeding were 3.5%, 1.4%, 1.3% respectively.<sup>5</sup> In a retrospective study by Siiki A et al, Pancreatitis developed in 1.9%, Cholangitis 2.2%, bleeding 1.9%, perforation 1%.<sup>3</sup> Over all early complication found in this study was 9.37% which is a bit higher than above systematic review but lower than Borges AC et al (Early complications was 16.6%) and Vandervoort et al (Overall complication was 11.2%).<sup>19</sup> PEP in this study was 5.21%, slightly higher than this survey and Siiki A et al. Cholangitis and bleeding in this study was almost similar to above studies but perforation is lower than Siiki A et al.<sup>3</sup>

A beat higher rate of complications in our study was probably related to patient selection, repeated cannulation attempt, late precut and fails to follow giving routine indomethacin per rectally before ERCP procedure.

### Limitations

Limitations of this study was it is a single centre retrospective study with a small sample size. Height and weight of patient, procedure time, papillary morphology, number of cannulation attempt, ERCP difficulty grading were not included in study as not recorded in data sheet. Future multicenter prospective study including larger sample with all these factors needed to support the findings.

### Conclusion

ERCP is a highly effective procedure for treating biliary-pancreatic pathology. Our procedural performance is almost similar to standard center. Though overall adverse events and post ERCP pancreatitis is slightly high in our center but bleeding and cholangitis is similar to standard.

### Recommendation

By implementing modern practical guideline, we can minimize our adverse events related to ERCP to make it a safer procedure for our patients. Future multicenter prospective study including larger sample with all those factors that not recorded, needed to support the findings.

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### Contribution of authors

EUA- Conception, design, manuscript writing, acquisition, interpretation of data & final approval.  
BP- Acquisition of data, critical revision & final approval.  
BD- Acquisition of data, data analysis, drafting & final approval.  
MNM- Design, acquisition of data, interpretation of data, critical revision & final approval.  
SMAH- Acquisition of data, interpretation data & final approval.

### Disclosure

All the authors declared no competing interest.

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