

Endoscopic Retrograde Cholangiopancreatography (ERCP) profile of a tertiary care hospital in Peshawar: indications, procedures, and complications

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ABSTRACT

Introduction: Endoscopic Retrograde Cholangiopancreatography (ERCP), being a useful though technically demanding diagnostic and therapeutic procedure to evaluate and treat diseases of biliary and pancreatic ducts is dependent in large part for its success on the skill of the operator.

Objective: To determine the indications, procedures performed and success rate of ERCP at a tertiary care center of Peshawar.

Materials & Methods: A descriptive cross-sectional study was carried out at the Endoscopy Unit of Rehman Medical Institute (RMI) from January 2020 to April 2020 using universal sampling technique. All ERCP procedures done in the endoscopy unit from January 2019 to December 2019 were included in the study regardless of their age, gender, ethnicity or presenting complaints. Any ERCP that did not have complete data were excluded from the study. Data were collected in a structured Performa. Data were analyzed in Microsoft Excel for descriptive statistics.

Results: A total of 161 ERCP procedures were performed during the study duration, of which 84(52.2%) were in males while 77(47.82%) were in females; the mean age was 54.82 ± 15.83 years. Biliary Stent placement (51.6%) was the most commonly performed procedure followed by Biliary Stone extraction (22.4%). Failed ERCP accounted for 30(18.6%) cases. The main indication for ERCP was Obstructive Jaundice (65.8%) followed by Common Bile duct (CBD) stones (42.9%). The least common indication was Dilated Intrahepatic Duct (1.86%). Only 4 cases of minor bleeding were observed during the procedure which were controlled during the procedures. No major complications have been seen on follow-up.

Conclusion: Obstructive Jaundice is major contributor to ERCP's being performed. It is a relatively safe procedure in the hands of an experienced operator.

Keywords: Obstructive Jaundice; Retrograde Cholangiopancreatography; Gallstones; Pancreatic Duct.

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INTRODUCTION

Endoscopic Retrograde Cholangiopancreatography (ERCP) is a diagnostic as well as a therapeutic procedure combining endoscopy and fluoroscopy to evaluate as well as treat the diseases of biliary and pancreatic ducts.¹ ERCP is one of the most technically demanding and the highest risk procedures performed by gastrointestinal endoscopists.² The procedure requires adequate relaxation and amnesia for the patient while maintaining cardiorespiratory status of the patient.³ ERCP is considered as a gold standard because it has sensitivity of 95% and specificity of 100%. Invasive nature and time consumption are negative factors for ERCP and Percutaneous transhepatic cholangiography (PTC) compared to CT scan.⁴ Biliary endoscopic procedures have become the treatment of choice for management of postoperative complications and include balloon dilatation with or without insertion of one or more stents to calibrate the zone of stricture as well as sphincterotomy with or without biliary diversion (stent or nasobiliary drain).⁵ Other indications include obstructive jaundice, biliary or pancreatic ductal system disease treatment or tissue sampling, suspicion for pancreatic cancer, pancreatitis of unknown cause, manometry for Sphincter of Oddi, nasobiliary drainage, biliary stenting for strictures and leakage, drainage of pancreatic pseudocysts, and balloon dilation of the duodenal papilla and ductal strictures.⁶

Since its introduction in 1968, ERCP has become the most important technique for diagnosis and treatment of biliary and pancreatic diseases at the present time.⁷ ERCP was born initially as a diagnostic modality to assess diseases of the pancreaticobiliary system. With advancements in endoscope design, catheter, instrument developments, the use of Computed Tomography (CT) particularly Magnetic Resonance Cholangiopancreatography (MRCP) has eliminated a vast majority of diagnostic indications for ERCP, resulting in an increase in therapeutic ERCPs.^{8,9}

ERCP with biliary and/or pancreatic sphincterotomy has become the preferred therapeutic option for many pancreaticobiliary conditions.¹⁰ The advantages of ERCP over surgical treatment are all around archived, but when compared with other endoscopic techniques, ERCP conveys a higher potential for confusion that extend from insignificant episodes with brief goals to significant perilous emergencies, for example, serious pancreatitis.^{11,12} The complications can be secondary to biliary and pancreatic manipulation or related to endoscopy.¹³ Most patients tolerate ERCP without significant complications. Minor Complications are associated with anesthesia and occur in 5% to 7% of patients.¹⁴ Post-ERCP pancreatitis is seen most commonly, followed by cholangitis, duodenal hemorrhage, stent migration, and duodenal perforation.¹⁵ An increase in the serum amylase concentration is normal after endoscopic retrograde cholangiopancreatography (ERCP), happening in up to 75 percent of patients; in contrast, intense clinical pancreatitis (characterized as a clinical disorder of stomach torment and hyperamylasemia requiring hospitalization) is substantially less common.¹⁶

This study was carried out to determine the indications, procedures performed and the success rate of ERCP at a tertiary care hospital of Peshawar, Khyber Pakhtunkhwa, Pakistan, since it is one of the two centers offering this service.

MATERIALS & METHODS

This was a descriptive cross-section study carried out at the Endoscopy Unit of Rehman Medical Institute (RMI) from January 2020 to April 2020 using universal sampling technique. All ERCP procedures done in the endoscopy unit from January 2019 to December 2019 were included in the study regardless of their age, gender, ethnicity or presenting complains. Any ERCP that did not have complete data were excluded from the study.

All the ERCP procedures were performed by an experienced endoscopist and the complications, if any, were handled either during the procedure or post procedure in the hospital. A Therapeutic Pentax Duodenoscope ED-3490TK was used during the procedures. A few Rendezvous procedures were also performed with the help of an experienced Interventional Radiologist. A predesigned Performa was made and used for data collection.

All the procedures were performed under sedation, mainly using Midazolam, an antiemetic, and an analgesic. Pre-requisites for the procedure included identification of patient, indications for ERCP, Liver function tests, INR in last 24 hours, Blood Pressure and oxygen saturations, comorbidities like Coronary artery disease, Lung Parenchymal diseases, Diabetes, and allergies to medication. During the procedure, cannulation was attempted using Guide wire cannulation /Sphincterotome led cannulation, Double Wire technique, Pancreatic Stent Guided technique, Precut and Papillotomy in patients with bile duct enlargement or with clinical or radiological suspicion of gallstones in the common bile duct (CBD). The standard procedures for stone removal were adopted, such as Dormia basket, Balloon extraction or mechanical Lithotripsy. Prior to each procedure, a formal written consent was obtained from the patients. Post procedure notes were written for each patient,

which included analgesia and post procedure antibiotic cover if the patient was not on antibiotics before the procedure.

After collection, data were entered into Microsoft Excel and analyzed using pivot tables for descriptive statistics.

RESULTS

A total of 161 ERCPs were carried out during the study duration. Out of the 161 ERCPs, 84(52.2%) were in males while 77(47.82%) were in females, the male to female ratio being 1.09:1. The mean age of all patients was 54.82 ± 15.83 years. For males, the mean age was 58.93 ± 16.71 years however, the average age for females undergoing ERCP was relatively lower (50.38 ± 14.08 years). Table 1 shows the characteristics.

Table 1: Characteristics of study population

Characteristics	Result
Age (years)	
Mean \pm SD	54.82 \pm 15.83
Range	19 - 95
Gender f (%)	
Female	77 (47.82)
Male	84 (52.2)
Successful Procedures	131 (81.4)

Out of these 161 procedures, bile duct cannulation was achieved completely in 103 (64.0%) and selective cannulation was done in 33 (20.5%) of the procedures; 22(13.7%) procedures did not have cannulation attempted while 03(1.9%) bile duct cannulations failed. The Pancreatic duct was cannulated in 39 (24.2%) procedures only. Midazolam was used in most procedures as an anesthetic (156, 96.9%). Only 01(0.62%) procedure was done under general anaesthesia while 02(1.24%) were done using Xylocaine spray. Nalbuphine (HCl) and Dimenhydrinate were used in combination with Midazolam in 53(32.9%) while Drotaverine was used in the remaining procedures. Procedures performed are shown in the table 2. The Biliary Stent placement (51.6%) was the most commonly performed procedure followed by Biliary Stone extraction (22.4%). Failed ERCP accounted for 30(18.6%) cases. Only one pancreatic stent placement was performed. Two Rendezvous procedures were also performed.

Table 2: Procedures done during ERCP

Procedures	f (%)
Biliary Stone Extraction	36 (22.4)
Sphincterotomy	26 (16.1)
Biliary Stent Placement	83 (51.6)
Biliary Stent Removal	04 (02.5)
RHD Stenting	02 (01.2)
Sphincteroplasty	03 (01.9)
Failed ERCP	30 (18.6)
Pancreatic Stent Placement	01 (0.6)
Balloon Trawl	17 (10.6)
Stricture Dilatation	12 (07.5)
Biliary Stent Exchange	04 (02.5)

Table 3 shows the indications for ERCP. The main indication for ERCP was Obstructive Jaundice (65.8%) followed by Common Bile duct (CBD) stones (42.9%). The least common

indication being Dilated Intrahepatic Duct (1.86%). All the others are in the following order CBD stricture (15.5%), Biliary Leak Post-cholecystectomy (10.6%), Ampullary lesion (8.1%), Carcinoma Head of Pancreas (6.8%), Cholangitis (6.8%), Pancreatitis (3.7%), Cholangiocarcinoma and Dilated CBD (3.1%).

Table 3: Indications for ERCP

Indications	f (%)
Obstructive Jaundice	106 (65.8)
Ca Head of Pancreas	11 (06.8)
Biliary Leak Post-cholecystectomy	17 (10.6)
CBD Stones	69 (42.9)
Pancreatitis	06 (03.7)
CBD Stricture	25 (15.5)
Dilated IHD	03 (01.9)
Gall Bladder Stones	07 (04.3)
Cholangiocarcinoma	05 (03.1)
Dilated CBD	05 (03.1)
Ampullary Lesion	13 (8.1)
Cholangitis	11 (6.8)

Complications that commonly occur post-ERCP include pancreatitis, perforations or bleeding. In this study, only 4 cases of minor bleeding were observed during the procedure which were controlled during the procedures. No major complications have been seen on follow-up.

DISCUSSION

Most of the procedures in our setup were successful (81.4%). Out of the 161 ERCPs that were performed, 84(52.2%) were males while 77(47.82%) were females. In a study conducted at the Military Hospital of Rawalpindi in 2015, a total of 469 patients underwent ERCP. Out of them 251(53%) were males while 218 (46%) were female.¹⁷ In a 4-years ERCP Profile done in Fatima Memorial Hospital Lahore, a similar male to female ratio was noted.¹ Females, especially before menopause, are more likely to have gallstone disease. Men are almost half as likely as women to form stones however the men begin to catch up following menopause in women.²²

For Gall Bladder Cancer, the female gender shows dominance over men around the world, particularly in Northern India, Pakistan, and in American Indian females. Women are affected two to six times more often than men.²² Mean age in our setup including both males and females was 54.82 ± 15.83 years, while the mean age in the study conducted at Fatima Memorial Hospital Lahore was 53.49 ± 15.86 years, almost in line with

our study.¹ The incidence of gallstones rises with age, rising dramatically after age 40 to become four to ten times more common in older people.²¹ Gallbladder cancer rates, in general, increment with age. In a study at Memorial Sloan-Kettering Cancer Hospital and Research Center, New York, USA, the median age of 435 gallbladder cancer patients was 67 years.²²

Biliary diseases were the most common indications with Obstructive jaundice (65.8%), CBD stones (42.9%) and Common Bile Duct stricture (15.5%) coming out on top. In a study of Outpatient therapeutic ERCP of 262 cases, suspected or documented choledocholithiasis was the most common indication for ERCP (50%), followed by malignant obstruction in 77 (29%), type I sphincter of Oddi dysfunction in (14%).¹⁹ In a retrospective analysis of ERCP Procedures in a Finnish Community Hospital where 1207 procedures were performed, the most common indication or work-up diagnosis of 825 ERCPs with intact papilla were as follows; Common Bile Duct stone (32.2%), Malignancy of the hepatobiliary tree (20.9%), Bile duct obstruction or jaundice without accurate diagnosis (20.8%).²⁰ These are not in line with the findings in our study.

Overall, our procedures were successful without any major complications during the procedure or on follow-up. We did however observe 4 cases of minor bleed which were controlled during the procedures. In a study conducted in 2015 in Rawalpindi, 21 cases (4.4%) had developed acute pancreatitis, 3 cases (0.6%) had retroperitoneal perforation, 4 cases (0.8%) had significant post procedure bleed.¹⁷ In a systematic survey of prospective studies which included 21 studies between a time period of January 1977 to May 2006 and consequently 16,855 ERCP cases were included, a total of 1,154(6.85%) patients experienced post-ERCP pancreatitis, bleeding, perforation and/or infection. The most common of these were post-ERCP Pancreatitis 585(3.47%) while 242(1.44%) post-ERCP cholecystitis or cholangitis were the second most common complications.¹¹ Pancreatitis is the most well-known and dreaded inconvenience of ERCP, happening in up to 30-40% of high-hazard patients. In a study published from Karachi, Sindh, Pakistan², it was determined that age lower than 60 years, the female gender, precut papillotomy, pancreatic duct contrast injections and biliary sphincterotomy were factors frequently causing post-ERCP pancreatitis.

CONCLUSION

ERCP is most commonly performed for Obstructive Jaundice in a tertiary care setting, and is a relatively safe procedure in the hands of an experienced operator.

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