

ORIGINAL ARTICLE

Indications, Findings and Complications of Endoscopic Retrograde Cholangio-Pancreatography (ERCP); A Study Conducted on the Patients Admitted in a Tertiary Care Hospital

MUHAMMAD AYUB NAICH¹, SAGHEER HUSSAIN², ROMAIZA³, HINA ZAMIR⁴, ADEEL QAMAR⁵, FATIMA CHEEMA⁶

¹Assistant professor gastroenterology, Sir Ganga Ram Hospital Lahore

²Consultant gastroenterologist DHQ Hospital Sheikhupura

³Medical officer in Allama Iqbal Memorial Hospital Sialkot

⁴Assistant professor medicine Sir Ganga Ram Hospital Lahore

⁵Assistant professor gastroenterology Sahara Medical College Narowal

⁶Registrar Gastroenterology Sir Ganga Ram Hospital Lahore

Correspondence to: Muhammad Ayub Naich, Email: mnaich@hotmail.com

ABSTRACT

Objective: To highlight the significance of endoscopic retrograde cholangio-pancreatography, its indications, findings and complications.

Material and methods: This is a prospective study conducted on the patients admitted in the gastroenterology department of Sir Ganga Ram Hospital Lahore. Study period was of six months from July 2021 to December 2021. Main outcomes in this study were technical safety, indications of ERCP and complications. Study sample was calculated using WHO sample size formula.

Results: Total 200 cases were included in this study including 116 (58%) male and 84(42%) female. CBD cannulation was done in 184(92%) cases. CBD stone was found in 35(17.5%), CBD stricture in 44(22%) and CBD stricture with stone found in 17(8.5%) cases. 11(5.5%) cases developed acute pancreatitis out of which 2(01%) cases had severe pancreatitis with collection of fluid. One case (0.5%) had retroperitoneal perforation which was managed conservatively. 03(1.5%) cases had bleeding after the procedure and hemostasis achieved by re-scope with adrenal injection at the bleeding point.

Conclusion: ERCP procedure has a high success rate with minimum complications.

Keywords: ERCP, Findings, Complications, CBD stone, Pancreatitis

INTRODUCTION

Endoscopic retrograde cholangio-pancreatography (ERCP) is an advanced technically demanding procedure associated with some risks and complications.¹ It is done with combination of endoscope and x-ray images to examine pancreatic and biliary ducts with the capability of necessary intervention where needed.² It is a diagnostic as well as therapeutic procedure.³ It was first performed in 1968 as a diagnostic procedure, however later on it developed as a therapeutic procedure as well.⁴ According to a report about 0.5 million ERCP procedures are done annually in USA with the complication rate of 5%-10% and mortality rate 0.05-01%.⁵ Most common complication being post-operative pancreatitis, infection and bleeding. Infection occur due to combination of percutaneous and endoscopic procedures for insufficient biliary drainage, in jaundiced patients and in malignant strictures for placement of stents.^{6,7} According to a study conducted in seventeen hospitals stated that pancreatitis is a most common and critical complication after ERCP.⁸ These complications have been classified according to the criteria given in table-I.⁹ There are various factor associated with post-operative pancreatitis like age, gender and previous history of pancreatitis and other factors related to the procedure

include pancreatic sphincterotomy and precut sphincterotomy.¹⁰ The aim of this was to assess the outcomes of ERCP in our center comparing with the national and international survey data and to review evidence base modern ERCP practice.

METHODOLOGY

This is a prospective study conducted on 200 cases admitted in the gastroenterology department of Sir Ganga Ram Hospital Lahore. Ethical approval was taken from the ethical committee of the hospital. Informed written consent was taken from all the study cases. Patient history, examination findings procedure details and complications were recorded. Outcome variables include procedure success rate, its indications, complications and failure rate. Complications included anesthesia related like cardiovascular and pulmonary events, pancreatitis, perforation, infection, bleeding and mortality within 30 days post operatively. Data was collected on data sheets and analyzed using SPSS software version 20. Percentages were calculated for indications of procedure and modes of treatment given, mean and standard deviations were calculated for age and hospital stay

Table-1: Consensus criteria for ERCP complications

	Mild	Moderate	Severe
Bleeding	Clinical evidence of bleeding, Hemoglobin level drop	Blood transfusion: Four units or less, no intervention needed	Blood transfusion \geq 5 units or intervention needed
Perforation	Possible or very slight leakage of fluid or contrast dye, treated by fluids and suction for three days or less	Definite perforation treated medically for 4-10 days	Medical treatment given for more than 10 days or intervention needed
Pancreatitis	Clinical pancreatitis, Amylase at least three times more than upper normal limit after more than 24 hours of the procedure and patient requiring admission of 2-3 days	Patient requiring admission for 4-10 days	Admission required for more than 10 days
Infection	Fever $>38^{\circ}\text{C}$ at 24-48 h	Requiring hospital admission for more than 3 days	Septic shock or surgery

RESULTS

Study was conducted on 200 patients underwent ERCP in the gastroenterology department, Sir Gangaram Hospital Lahore. Out of them 116(58%) were male and 84(42%) were female. Range of ages of the patients was 18-75 years with mean age of 46.73 ± 5.8 years.

Table-2: Classification of study cases into various age groups

Age (Years)	Number of patients
<20	09 (4.5%)
20-30	15 (7.5%)
31-40	22 (11%)
41-50	36 (18%)
51-60	50 (25%)
>60	68 (34%)

Most common finding during ERCP was CBD stone in 54(27%) cases, followed by CBD stricture in 40(20%) and both stone and stricture were found in 23(11.5%) cases. Less common findings include Ampullary growth (6%), choledochal cyst (4.5%), PD stones (3.5%), post cholecystectomy CBD clipped (2.5%) and displaced PD stent in (1.5%) cases.

Table-3: Frequency of endoscopic findings

Endoscopic findings	Percentages
CBD stone	54(27%)
CBD stricture	40(20%)
CBD stone with stricture	23 (11.5%)
Large stone	18 (9%)
Ampullary growth	15(6%)
Post cholecystectomy CBD leakage	09 (4.5%)
Choledochal Cyst	09 (4.5%)
PD stones	07 (3.5%)
Post cholecystectomy CBD clipped	05 (2.5%)
Displaced PD stent	03(1.5%)

One case (0.5%) had retroperitoneal perforation which was managed conservatively. 03(1.5%) cases had bleeding after the procedure and hemostasis achieved by re-scope with adrenal injection at the bleeding point. 11(5.5%) cases developed acute pancreatitis out of which 2(01%) cases had severe pancreatitis with collection of fluid. They were admitted in the hospital for few days and discharged after conservative management. Common bile duct cannulation was done in 183(91.5%) cases. Out of them 126(63%) cases had CBD cannulation directly. Total 17(8.5%) cases were failed and most of them having duodenum infiltrated with tumor. Sphincteroplasty was done in 09(4.5%) cases for extraction of large stones.

DISCUSSION

In this study most of the procedures were successful (91.5%). Biliary disease were the most common indication for ERCP. First commonest indication was CBD stone (27%). These patients presented with biliary colic, obstructive jaundice and uncommonly with cholangitis. Second common indication was CBD stricture (20%). Both benign and malignant strictures were found in study cases. Most common malignancy found during endoscopy was pancreatic cancer and second common malignancy was cholangiocarcinoma. Less common indications of ERCP included ampullary growth and post cholecystectomy CBD leakage or clipped CBD. Many studies have reported various risk factors of ERCP complications like extensive pancreatic or biliary manipulation with therapeutic ERCP and lengthy duration of procedure causing post endoscopic pancreatitis (PEP) rate upto 30%.¹¹⁻¹³ Overall this procedure was safe with minimum complications which were managed conservatively. Most of the cases were discharged same day after the procedure. Commonest complaint after the procedure was bloating and mild to moderate abdominal pain. Cause of failure of this procedure in few cases was underlying malignancy involving duodenum and periampullary area. Previous literature has stated risk factors of post ERCP complications as young age, female gender, Sphincter of Oddi dysfunction and previous history of pancreatitis, decompensated cirrhosis, difficult CBD cannulation, failed biliary drainage, percutaneous biliary intervention and contrast injection into pancreatic duct.¹⁴⁻¹⁷ Severe bleeding after ERCP was reported in 1.5% cases in our study. This was comparable to previous data showing frequency of bleeding as 0.1%-0.5%.¹⁸ Other studies have reported perforation of bile duct, pancreatic duct or duodenum in <1% cases undergoing ERCP.¹⁹⁻²²

CONCLUSION

ERCP is a safe procedure carried out as a day care procedure after which patient can be discharged same day. Its success rate in our study is above 90%. It is a very effective way of treating the disease of patients, their pain and misery. According to our study most common indication of ERCP is biliary colic due to CBD

stones. There are few complications associated with this procedure, however these are mild and usually can be managed conservatively.

Conflict of interest: No
Source of funding: No

REFERENCES

- Kim SH, Chung W, Kim YJ. Clinical Impact of Common Bile Duct (CBD) Angulation on the Recurrence of CBD Stone: A Meta-Analysis and Review. *Gut & Liver*. 2019 Nov 2;13.
- Benzie AL, Sucandy I, Spence J, Ross S, Rosemurgy A. Robotic choledochoduodenostomy for benign distal common bile duct stricture: how we do it. *Journal of Robotic Surgery*. 2019 Dec;13(6):713-6.
- Khaskheli AM. Endoscopic Removal of Longest CBD Stone. *MAR Case Reports*.;3.
- Ahirwar SL. Study on 60 cases of common bile duct stone, there different modality of management and its inference. *International Surgery Journal*. 2020 Aug 27;7(9):2960-4.
- Debnath P, Roy A, Singh V. Approach to Biliary Obstruction and Evaluation of Biliary Stricture. *InClinical Rounds in Hepatology 2022* (pp. 169-176). Springer, Singapore.
- Mohapatra S, Broder A. Role of ERCP in the Older Adults. *Geriatric Gastroenterology*. 2019;1:20.
- Archibugi L, Mariani A, Capurso G, Traini M, Petrone MC, Rossi G et al. Needle-knife fistulotomy vs. standard biliary sphincterotomy for choledocholithiasis: common bile duct stone recurrence and complication rate. *Endoscopy International Open*. 2019 Dec;7(12):E1733-41.
- Gerges C, Beyna T, Tang RS, Bahin F, Lau JY, van Geenen E et al. Digital single-operator peroral cholangioscopy-guided biopsy sampling versus ERCP-guided brushing for indeterminate biliary strictures: a prospective, randomized, multicenter trial (with video). *Gastrointestinal endoscopy*. 2020 May 1;91(5):1105-13.
- Nepalia S, Upadhyay S, Rajender A, Bhargava R, Nepalia S. Comparative Study of MRCP and ERCP in Extra Hepatic Biliary Obstruction.
- Upadhyay S, Bhargava R, Rajender A, Singh G, Nepalia S. Clinical Profile of Extrahepatic Biliary Obstruction Cases Undergoing ERCP at an Indian Tertiary Care Centre. *J Med Sci Clin Res*. 2019;7(5):872-77.
- Upadhyay S, Bhargava R, Rajender A, Singh G, Nepalia S. Clinical Profile of Extrahepatic Biliary Obstruction Cases Undergoing ERCP at an Indian Tertiary Care Centre. *J Med Sci Clin Res*. 2019;7(5):872-77.
- Zheng L, Wang X, Tao Q, Liang S, Wang B, Luo H et al. Different pattern of risk factors for post-ERCP pancreatitis in patients with biliary stricture. *Scandinavian Journal of Gastroenterology*. 2018 May 4;53(5):604-10.
- Wu L, Jia G, Hu Y, Zhu L, Wang S. A rare case of duodenal diaphragm in an adult during ERCP treatment for choledocholithiasis. *BMC surgery*. 2020 Dec;20(1):1-4.
- Dai T, Qiu S, Qian J. Risk Factors for Recurrent Common Bile Duct Stones After Endoscopic Retrograde Cholangiopancreatography. *Indian Journal of Surgery*. 2022 Apr 7:1-7.
- Kazmi SK, Khan RS, Alam L, Saeed F. A Year of Endoscopic Retrograde Cholangiopancreatography (ERCP) At a Glimpse. Indications, Interventions, Complications. *PAFMJ*. 2022 May 1;72(2):555-9.
- Ali F, Aamir N, Hassan MK, Khan HU, Khan D. Comparison of MRCP and ERCP findings: A retrospective secondary data analysis. *Journal of the Pakistan Medical Association*. 2022 Apr 1;72(2):284-6.
- Maryam S, Amer K, Wajeeha A. over view of role of ercp in hepatobiliary problems and encountered complications in a tertiary care hospital in kpk province. *pafmj*. 2019 oct 23;69(5):1094-97.
- Johnson KD, Perisetti A, Tharian B, Thandassery R, Jamidar P, Goyal H et al. Endoscopic retrograde cholangiopancreatography-related complications and their management strategies: a "scoping" literature review. *Digestive Diseases and Sciences*. 2020 Feb;65(2):361-75.
- Liu QY, Gugig R, Troendle DM, Bittou S, Patel N, Vitale DS et al. The roles of endoscopic ultrasound and endoscopic retrograde cholangiopancreatography in the evaluation and treatment of chronic pancreatitis in children: a position paper from the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition Pancreas Committee. *Journal of pediatric gastroenterology and nutrition*. 2020 May 1;70(5):681-93.
- Aden MD, Deng T, Yuting L. Incident of Post ERCP Complications: Meta-analysis and Systematic Review. *Archives of Internal Medicine Research*. 2020;3(3):168-77.
- Mohammad Ms, Ayman Hi, Atiyya Am. Management of Post Endoscopic Retrograde Cholangiopancreatography (ERCP) Complications. *The Medical Journal of Cairo University*. 2019 Dec 1;87(December):4537-44.
- Kamal, A., Akshintala, V.S., Talukdar, R., Goenka, M.K., Kochhar, R et al, Lakhtakia, S., 2019. A randomized trial of topical epinephrine and rectal indomethacin for preventing post-endoscopic retrograde cholangiopancreatography pancreatitis in high-risk patients. *Official journal of the American College of Gastroenterology| ACG*, 114(2), pp.339-347.