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ORIGINAL ARTICLE

Indications, Complications and Outcomes of Patients Undergoing Endoscopic Retrograde Cholangio Pancreatography at Rawal Institute of Health Sciences, Islamabad

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Abstract

Objective: We aimed to explore indications, complications, and outcome of endoscopic retrograde cholangiopancreatography (ERCP) procedure in a tertiary care hospital.

Methodology: This retrospective study was conducted between July 2021 & December 2021 in the Department of Gastroenterology & Hepatology, Rawal Institute of Health Sciences, Islamabad. All the adult patients, male and female, undergoing ERCP procedure due to any indication were included in this study.

Results: The study was conducted on 900 patients and their mean age was 45±25 years. 567 (63%) females and 333 (37%) were males. Choledocholithiasis was most common indication (610, 68%) followed by malignant obstruction (115, 12.7%). The total rate of complication was 9% (81 patients). Acute pancreatitis most common complication (54, 6%). Overall success rate was 83.55%.

Conclusion: ERCP is considered safe and effective. Success rate and indications, as well as mortality and morbidity are acceptable.

Key words: Endoscopic retrograde cholangiopancreatography

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Introduction

Malignant and benign biliary and pancreatic diseases are treated using endoscopic retrograde cholangiopancreatography (ERCP). This process is associated with technical complexities and risk of life threatening complications. ERCP is commonly indicated for management of perioperative biliary complications, relieving obstruction in bile duct by inserting stent in malignant and benign strictures and removal of common bile duct stones([1]). Now endoscopic ultrasound or non-invasive magnetic resonance imaging has replaced diagnostic procedures. Though ERCP is significant therapeutic tool for pancreatic and biliary disease, it has serious risk of complications.[2] Mortality rate is 0.1-0.5% and complications may occur in about 10% patients.[3] Common complications include perforation, infection, bleeding and pancreatitis. Most common is pancreatitis, its incidence rate is 1-7% with maximum of 25% in high risks subjects. Mostly it is mild to moderate but may develop into severe pancreatitis in some cases resulting in need for surgical or endoscopic procedures.[4] Bleeding in the process mostly results from endoscopic sphincterotomy. Mechanical trauma to fresh sphincterotomy site or ampulla during balloon extraction of stones may also result in bleeding.[5] On the basis of cotton consensus criteria, bleeding is divided into mild, moderate and severe.[6] 70% of the cases are mild, severe bleeding occurs in 1 in 1000 sphincterotomy.[7] Perforation during ERCP results because of intraductal guidewire manipulation, duodenoscope related trauma and sphincterotomy.

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Rate of perforations is 0.3% -0.6%.[8] Mortality rate due to ERCP is 0.33 %.[9] The aim of this study is evaluate complications, outcomes and indications of endoscopic retrograde cholangiopancreatography (ERCP) procedure in a tertiary care hospital.

Material and Methods

A retrospective study was conducted from July 2021 to December 2021 in the Department of Gastroenterology & Hepatology, Rawal Institute of Health Sciences, Islamabad. The study included patients undergoing ERCP, those with partial CBD clearance and those with 1 month follow up. Pre, intra and post ERCP data of all the included patients was collected. Patients with unstable vitals, previous gastrojejunostomy, gastric outlet obstruction, ascites, low platelet and coagulopathy and those taking anti coagulants and antiplatelet were excluded from the study. Conscious sedation with pentazocine and midazolam was performed. Blood pressure, heart rate and arterial oxygen were monitored. Demographic data, clinical history, blood tests, technical procedures, procedural details, procedural findings and post-ERCP complications were recorded. Successful ERCP was defined as: passage of stents in benign and malignant stricture and relief of jaundice, CBD clearance in CBD worm and choledocholithiasis. Complications were defined as: adverse effect associated with ERCP procedure requiring more than a night hospital stay. Degree of required intervention and length of hospital stay determined severity of complications. Serve complications required > 10 days of hospital stay, invasive radiological or surgical interventions or lead to death. ERCP associated pancreatitis was defined as: three times increase in serum amylase above normal and onset or increase in abdominal pain.[9] Cholangitis was defined as body temperature ≥38 degree Celsius for greater than 48 hours post procedure. Cholecystitis was defined as signs of gall bladder inflammation including fever, Murphy's sign, pain or tenderness in right upper abdominal quadrant and radiographic findings.[10] Sedation related and other events like bradycardia, hypoxia and hypotension were considered ERCP complications. Data regarding presence of periampullary diverticulum, type of papilla, method of CBD cannulation, inadvertent PD cannulation and CBD diameter was collected.

Categorical variables were represented as percentage and frequencies and continuous variables were represented as range and median. Statistical comparison including indications, demographics, associated comorbidity and prior cholecystectomy was done between patients with and without post ERCP complications. P value < 0.05 was considered statistically significant.

Results

The study was conducted on 900 patients undergoing ERCP procedure. Mean age of the patients was 45±25 years. 567 (63%) females and 333 (37%) males were included in the study. Choledocholithiasis was most common indication for ERCP (610, 68%), second was malignant obstruction (115, 12.7%). In malignant obstructions, periampullary carcinoma was the most common distal biliary obstruction and carcinoma GB among hilar obstruction. Indications of the procedure are listed in Table I.

Table I: Indication of ERCP

Indications	No. of patients,%
Lymphoma/portal metastatic nodes	1(0.1%)
PSC/RPC	2 (0.2%)
Choledochal cyst	3 (0.3%)
Biliary ascariasis	21 (2.3%)
Post-operative biliary stricture	15 (1.6%)
Post-operative biliary leak	18 (2%)
Chronic pancreatitis with BBS	38 (4.2%)
Cholangiocarcinoma	60 (6.6%)
Carcinoma of head of pancreatitis	17 (1.9%)
Periampullary carcinoma	60 (6.6%)
Carcinoma GB	55 (6.15%)
Choledocholithiasis	610 (67.7%)

Absolute CBD clearance of stone was achieved in 702 (78%) cases in first attempt. In 60 cases complete extraction could not be achieved in initial attempt. In 40 out of 60 cases second attempt resulted in complete retrieval, rest were referred for surgery. The total rate of complication was 9% (81 patients). Acute pancreatitis most common complication (54, 6%), it was mild in majority of the cases. 1 patient had both acute pancreatitis and bleeding.

Cholangitis developed in 5 patients, it was severe in 2 cases requiring repeat ERCP. Others responded to IV fluids and antibiotics. 8 patients had bleeding,

of which 1 had severe bleeding leading to death. 2 patients had perforations, of which one required surgery. Sedation related complications (drop of saturation) occurred in 5 patients. Comparison of patients with and without complications show age, comorbidity and pre cut access were not associated with increase in rate of complications.

Table II: Success rate of ERCP			
Total	**Successful outcome %**		
Choledocholithiasis	610	519	85%
Bile leak	18	17	94.4%
Biliary ascariasis	21	21	100%

Table III: Rate of Complications associated with ERCP	
Complications	**No of patients,%**
Sedation related	5 (0.5%)
Acute cholecystitis	1 (0.1%)
Perforation	2 (0.2%)
Cholangitis	5 (0.5%)
Bleeding	8 (0.8%)
Mild	4
Moderate	3
Severe	1
Pancreatitis	54 (6%)
Mild	48
Moderate	10
Severe	2
Total	81 (9%)

Discussion

Various pancreatobiliary disorders are managed using ERCP. The procedure is generally effective and safe has some associated complications. In current study, 900 patients who underwent ERCP were reviewed. The success rate of the procedure varies between 87% to 95% in high volume centers and 77% to 81 % in low volume centers.[11] In this study, success rate was 83.55%, this was in line with previous studies. The success rate in malignant and benign diseases were 76% and 86.1% respectively. The success rate in distal biliary stricture was more than in hilar stricture. In current study, most common indication was choledocholithiasis. Among other indications were choledochal cyst, CBD worm, benign biliary stricture of chronic pancreatitis, post-operative biliary injury. Pancreatobiliary malignancies and pre-operative drainage was managed through biliary stenting. In cases were CBD stones were not cleared in first attempt, ERCP was repeated after 4-8 weeks of the first attempt and complete clearance was achieved in 68% cases. In our study, the total rate of complication was 9% .An earlier study reported mortality rate and complication rate of ERCP to be between 0.2%-0.88% and 6%-14% respectively.[12] One of the most severe complication is post ERCP pancreatitis.[13] A meta-analysis showed that overall incidence of post ERCP pancreatitis (PEP) was 9.8%, and in high risk patients incidence was 14.8%.[13] PEP was mild in majority cases, mortality rate was 0.8%. In our study PEP occurred in 6% patients, these findings were in line with result of previous studies. Mild and moderate cases were treated conservatively, severe cases were treated through radiological drainage. A meta-analysis showed rate of ERCP associated bleeding to be 1.3%, 70% cases were mild.[14] In our study, bleeding occurred in 0.8% patients, only 1 patient had severe bleeding resulting in the death. A study showed that of 2437 subjects, 2 % had bleeding of 2 cases were severe leading to death.[15] In our study, 5 patients had cholangitis, these results were comparable with previous studies.[16] Rate of incidence of perforation ranges from 0.1%-0.6%.[17] In our study it occurred in 0.2% cases Anesthesia complications or cardiopulmonary events ranged from hypotension and transient hypoxia to pulmonary embolism, cardiac arrest, myocardial infarction and respiratory failure. Sedation related events did not result in any mortality. The major limitation of our study is retrospective method of data collection. Procedure was repeated multiple times in few patients causing excessive financial burden.

Conclusion

ERCP is considered safe and effective procedure if performed by experienced Endoscopist. Success rate and indications as well as mortality and morbidity are acceptable.

References

1. Alberca-de-las-Parras F, Lopez-Picazo J, Pérez-Romero S, Sanchez-del-Rio A, Judez-Gutierrez J, León-Molina J. Quality indicators for endoscopic retrograde cholangiopancreatography. The procedure of endoscopic retrograde cholangiopancreatography. Rev Esp Enferm Dig. 2018;110(10):658-66.
2. Choudhury BN, Deka UJ, Baruah BJ, Bhattachayya M, Sarma P, Debroy P. Indications, outcomes and complications of therapeutic endoscopic retrograde cholangiopancreatography procedures in a tertiary

care centre in North East India. Int J Res Med Sci. 2020;8:2606-11.
3. Heinemann M, Tafrishi B, Pischke S, Fischer L, Rösch T, Lohse AW, et al. Endoscopic retrograde cholangiography and percutaneous transhepatic cholangiodrainage in biliary strictures after liver transplantation: Long-term outcome predictors and influence on patient survival. Liver International. 2019;39(6):1155-64.
4. Gadour E, Musharaf M, Hafeez S, Shafiq Y, Agu D. PTU-1 Impact of the first COVID-19 wave on ERCP performance in a single UK endoscopy unit. BMJ Publishing Group; 2021.
5. Rustagi T, Jamidar PA. Endoscopic Retrograde Cholangiopancreatography–Related Adverse Events: General Overview. Gastrointestinal Endoscopy Clinics. 2015;25(1):97-106.
6. Erbil OA. How long does it take to be an ERCP expert? Laparoscopic Endoscopic Surgical Science. 2021;28(3):148-57.
7. Leerhøy B, Elmunzer BJ. How to Avoid Post–Endoscopic Retrograde Cholangiopancreatography Pancreatitis. Gastrointestinal Endoscopy Clinics. 2018;28(4):439-54.
8. Kim SH, Bang S, Lee K-Y, Park SW, Park JY, Lee HS, et al. Comparison of high flow nasal oxygen and conventional nasal cannula during gastrointestinal endoscopic sedation in the prone position: a randomized trial. Canadian Journal of Anesthesia/Journal canadien d'anesthésie. 2021;68(4):460-6.
9. 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.
10. Yokoe M, Hata J, Takada T, Strasberg SM, Asbun HJ, Wakabayashi G, et al. Tokyo Guidelines 2018: diagnostic criteria and severity grading of acute cholecystitis (with videos). Journal of Hepato-biliary-pancreatic Sciences. 2018;25(1):41-54.
11. Coté GA, Imler TD, Xu H, Teal E, French DD, Imperiale TF, et al. Lower provider volume is associated with higher failure rates for endoscopic retrograde cholangiopancreatography. Medical care. 2013;51(12).
12. Kwak N, Yeoun D, Arroyo-Mercado F, Mubarak G, Cheung D, Vignesh S. Outcomes and risk factors for ERCP-related complications in a predominantly black urban population. BMJ Open Gastroenterology. 2020;7(1):e000462.
13. Kochar B, Akshintala VS, Afghani E, Elmunzer BJ, Kim KJ, Lennon AM, et al. Incidence, severity, and mortality of post-ERCP pancreatitis: a systematic review by using randomized, controlled trials. Gastrointestinal endoscopy. 2015;81(1):143-9. e9.
14. Kang X, Guo X, Chen Z, Zhou Z, Luo H, Lu Y, et al. The Incidence and Severity of Post-ERCP Pancreatitis in Patients Receiving Standard Administration of NSAIDs: a Systematic Review and Meta-analysis. Journal of Gastrointestinal Surgery. 2022:1-10.
15. Facciorusso A, Crinò SF, Tacelli M, Antonini F, Fantin A, Barresi L. Chronic use of statins and risk of post-endoscopic retrograde cholangiopancreatography pancreatitis: a systematic review and meta-analysis. Expert Review of Gastroenterology & Hepatology. 2021;15(2):195-202.
16. Goyal H, Sachdeva S, Sherazi SAA, Gupta S, Perisetti A, Ali A, et al. Early prediction of post-ERCP pancreatitis by post-procedure amylase and lipase levels: A systematic review and meta-analysis. Endoscopy international open. 2022;10(07):E952-E70.
17. Alomari M, Al Momani L, Alomari A, Khazaaleh S, Hitawala AA, Khasawneh A, et al. The Incidence of Endoscopic Retrograde Cholangiopancreatography-Related Complications in Patients With Liver Transplant: A Meta-Analysis and Systematic Review. Gastroenterology Research. 2021;14(5):259.