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Therapeutic Endoscopic Retrograde Cholangiopancreatography (ERCP): A Single Centre 5-Year Experience

Michael Tendean,[1] Toar D. B. Mambu,[1] Ferdinand Tjandra,[1] Billy Salem,[1] Jimmy Panelewen,[1] Everly Corputty[2]

[1]Division of Digestive Surgery, Department of Surgery, Medical Faculty, Universitas Sam Ratulangi – Prof. Dr. R. D. Kandou Hospital, Manado, Indonesia
[2]Department of Surgery, Medical Faculty, Universitas Sam Ratulangi, Prof. Dr. R. D. Kandou Hospital, Manado, Indonesia
Email: corputtycheverly@gmail.com
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Abstract: Endoscopic retrograde cholangiopancreatography (ERCP) and related procedures are established as necessary techniques in the diagnosis and treatment of biliopancreatic diseases. Caution is needed due to the high risk of complications that can be fatal. The main complications are pancreatitis, bleeding, perforation, biliary stents, and lithiasis treatment issues. This study aimed to evaluate the therapeutic ERCP at Prof. Dr. R. D. Kandou Hospital between 2017-2021. This was a retrospective study using patients' medical record data. The results obtained a total of 196 ERCP procedures performed at Prof. Dr. R. D. Kandou Hospital in that period. Variations of etiology, technical difficulties, and morbidities were recorded. The success rate of endoscopic stone extraction was 77.9 %, EPBD 10.71 %, and stenting for biliary drainage 97.3 %. Etiology varied from bile duct stone (74%); malignancies of the pancreas (8%), duodenum (2%), and periampullary (4%); Klatskin tumor (5.6%); and other malignancies (5%). Associated morbidities were melena 2%, pancreatitis 1%, and cholangitis 0.5%. In conclusion, endoscopic retrograde cholangiopancreatography is a reliable method for the diagnosis and treatment of hepatobiliary and pancreatic diseases, shown by the low incidence of morbidities and mortalities.
Keywords: endoscopic retrograde cholangiopancreatography; biliopancreatic diseases

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) was first introduced in 1968. Over the past 20 years, with the development of endoscopic technology, ERCP has been widely used in diagnostic procedures and management of biliary and pancreatic neoplasms, and post-operative management of biliary perioperative complications. With the continuous improvement of the technical level and suitable endoscopic enhancements the ERCP procedure has improved significantly. ERCP is one of the most technically demanding and highest risk procedures performed by a gastroenterologist. ERCP carries an overall risk of adverse events of 7% or less and a mortality rate less than 0,1 %. Post-ERCP complication rates vary widely depending on the complexity of the intervention and the individual case. It can cause recent complications such as bleeding, perforation, pancreatitis after ERCP, and late complications such as nipple stenosis, cholangitis, and recurrence of stones. The overall incidence of ERCP post-operative complications, reported by domestic and foreign studies is 4-9,8 %, including acute pancreatitis, bile duct infection, gastrointestinal bleeding, cholecystitis, intestinal perforation, as well as cardiovascular and cerebrovascular accidents.[1,2] Pancreatitis is the most common serious complication, with the incidence is around 3.5%. Other serious complication, such as perforation (0.1-0.6%), infection (cholangitis (1%) and cholecystitis (0.2-0.5%) may also occurred, but the incidence is low.[3-5]

Despite its associated morbidity and risk of mortality, ERCP is a reliable method in diagnosing and treating hepatobiliary and pancreatic diseases. The overall success rate of ERCP reported has ranged from 79.6% to 94.6%.[4,5] Although ERCP usually falls within the domain of gastroenterologists, it can be performed safely by trained surgeons. Therefore, we aimed to discuss the outcomes of 196 ERCP procedures achieved between 2017-2021 at Prof. Dr. R. D. Kandou Hospital, Manado, Indonesia,

METHODS

This was a retrospective study using medical records of the outcomes of 196 ERCP procedures achieved between 2017-2021 at Prof. Dr. R. D. Kandou Hospital, Manado, Indonesia.

RESULTS

There was a total of 196 patients with ERCPs included in the study. Among them, male patients were 104 and females 92. The mean age was 51,1 ± 12,3 years old, and the age range was 21 to 80 years (Table 1).

Table 1. Patients' characteristics

Patient characteristics	N = 196 (N, %)
Gender	
Male	104 (54)
Female	92 (46)
Age (years)	
<30	8 (4)
30 – 40	22 (11)
41 – 50	58 (30)
51 – 60	51 (26)
>60	57 (29)
Mean	51,9 ± 12,3

The most common indication for ERCP was bile duct stone in 146 patients (74%) meanwhile malignancy was found in 50 patients (26%). Among them, 16 patients had pancreatic malignancies, five patients had duodenum malignancies, eight patients had periampullary malignancies, 11 patients had Klatskin tumor, and 10 patients had other malignancies (Table 2).

Table 2. Indications for ERCP

Indications for ERCP	N (%)
Bile duct stone	146 (74)
Malignancies	
Pancreas	16 (8)
Duodenum	5 (2)
Periampulary	8 (4)
Klatskin tumor	11 (5,6)
Other malignancies	10 (5)

Common bile duct (CBD) stone retrieval was successful in 102 patients at the initial attempts. Meanwhile, there was a failure in the stone extraction in 29 patients, and 21 patients had EPBD performed on them successfully. In malignancies, 72 patients had successful ERCP procedure using stenting for biliary drainage, while two patients failed. This ERCP procedure in the form of stent removal was performed on two patients (Table 3). Complications that occurred post-ERCP in 196 patients were melena (2%), pancreatitis (1%), and cholangitis (0.5%) (Table 4).

Table 3. Types of therapeutic ERCP procedures

Types of therapeutic ERCP procedures	n (%)
Stone extraction	
Success	102 (77.9%)
Failure	29 (22.1)
Endoscopic papillary baloon dilatation (EPBD)	21 (10.71)
Stenting for biliary drainage (malignancy)	
Success	72 (97.3)
Failure	2 (2.7)
Stent removal	10 (5.1)

Table 4. Post operative complications

Post operative complications	n (%)
Mortality	4 (2)
Morbidity	
Melena	5 (2)
Pancreatitis	2 (1)
Cholangitis	1 (0,5)

DISCUSSION

Endoscopic retrograde cholangiopancreatography (ERCP) is a combined endoscopic and fluoroscopic procedure in which an upper endoscope is led into a second part of the duodenum, making it possible to pass other tools via the major duodenal papilla into the biliary and pancreatic ducts. Contrast material may be injected into these ducts, allowing for radiologic visualization and therapeutic interventions when indicated. This ERCP initially started as a diagnostic procedure through cannulation of the pancreatic and biliary ducts but has evolved over the years to a predominantly therapeutic tool. Difficult biliary cannulation is proposed to be defined as cannulation attempts duration of more than 5 minutes, more than five cannulation attempts, or at least two pancreatic guidewire passages. Direct visualization of the ducts is done through cholangiopancreatoscopy.[7-10]

Endoscopic retrograde cholangiopancreatography (ERCP) has evolved from a primarily diagnostic to therapeutic procedure in hepatobiliary and pancreatic diseases. This ERCP can provide direct visualization and clear images of the hepatobiliary and pancreatic ducts.[1,2] Most

commonly, ERCPs are likely primary performed for choledocholithiasis with or without cholangitis.[1] Its similar to the results of this study where the most common indications for ERCP were bile duct stones in 74%. However, improvements in technology and technique have allowed for management of pancreatic duct stones, benign and malignant strictures, as well as bile and pancreatic leaks. Similar to the results of this study where the indications for ERCP were bile duct stones in146 cases (74%) and other malignancies in 50 cases (26%). In this study, we found a higher rate of bile duct stone (choledocholithiasis) as the indication for ERCP (74%) than the previous research.[10,11]

In this study the morbidities included melena 2%, pancreatitis 1%, and cholangitis 0,5% with a mortality rate of 2 %. Advanced age is generally considered an important factor, but multivariate analyses do not support it. The underlying disease and operation are the most important factors. In this study the mean age was 51.1 years, and the age range was 21 to 80 years.

Endoscopic retrograde cholangiopancreatography is a safe and efficacious therapeutic procedure. Therapeutic procedures were carried out in accordance with the appropriate indication. Successful therapeutic procedures in this study were stone extraction in 102 patients (77,9%), Endoscopic Papillary Balloon Dilatation (EPBD) in 21 patients (10,71%), stenting for biliary drainage in malignancy in 72 patients (97,3%), and stent removal in 10 patients (5,1%). ERCP helps to diagnose, and when combined with ES and/or biliary stenting to manage, residual choledochal stones, Endoscopic Papillary Balloon Dilatation (EPBD) and stenting for biliary drainage,[11-13] which is compatible with our practice such as stone extraction, EPBD and stenting for biliary drainage in malignancy. According to recent research, this study performed a much more successful rate of CBD stone retrieval.[14]

ERCP is however associated with complications like bleeding, pancreatitis, cholangitis and cholecystitis.[14,15] The latter is the most concerning of all complications, with and estimated incidence ranging from 0,09-1,67% and mortality up to 8%. In this study the mortality rate was 2 %. The overall complication rate in this study was 3,5%. The most common post-ERCP complication in this study was melena in 5 patients (2%), followed by pancreatitis (1%) and cholangitis (0,5%). Similar to the recent research, melena developed 14 days after ERCP for biliary obstruction, requiring blood transfusion and transfer to the ICU.[16] The most common and serious complication of ERCP is Pancreatitis (PEP).[13] This is similarly to the published literature which showed pancreatitis as the most frequent post-ERCP complication than cholangitis.[10,14] In this study, cholangitis was less due to adequate per and post procedure control of infection.

Advanced age is generally considered an important factor, but multivariate analyzes do not support it. The underlying disease and operation are the most important factors. In this study the mean age was 51.1 years, and the age range was 21 to 80 years.

CONCLUSION

Endoscopic retrograde cholangiopancreatography is a reliable method for diagnostic and treated hepatobiliary and pancreatic diseases, which is shown by the low incidence of morbidities and mortalities in our center. The indications and complications in our center are similar to those reported in other centers.

Conflict of interest

The authors affirm no conflict of interest in this study.

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