

ORIGINAL RESEARCH

Medicine Science 2018;7(2):383-5

Endoscopic retrograde cholangiopancreatography results and reliability in experienced hands

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Received 15 November 2017; Accepted 26 January 2018
Available online 15.05.2018 with doi: 10.5455/medscience.2018.07.8791

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Abstract

Endoscopic retrograde cholangiopancreatography (ERCP) is an imaging modality that visualizes biliary tract and pancreatic ductus after giving contrast material by cannulation of ampulla Vateri via a duodenoscope. It has been used in the diagnosis and treatment of pancreatic ductus and biliary tract. This study included 204 patients. There was stone formation at ductus choledochus in 147 (72.06%), malignant biliary stricture in 28 (13.73%), benign biliary stricture in 8 (3.92%), periampullary tumor in 4 (1.96%), hydatid cyst communicating with ductus choledochus in 2 (0.98%), fasciola hepatica in 1 (0.49%), sclerosing cholangitis in 4 (1.96%), sphincter of Oddi dysfunction in 5 (2.45%) and postoperative bile leakage in 3 (1.47%) of the patients. The procedure couldn't be performed in 2(0.98%) patients due to anatomic difficulties. Stone retrieval with basket and/or balloon was performed in 115 (56.37%) patients while plastic stents was inserted to ductus choledochus in 87 (47.64%) and in pancreatic ductus in 5 (2.45%) patients. Mechanical lithotripsy was performed in 6 (2.94%) patients. Following ERCP, pancreatitis was developed in 3 (1.47%) patients, whereas sepsis in 2(0.98%) and bleeding in another 2 (0.98%) patients. ERCP remains to be an effective method in the diagnosis and treatment of biliary tract and pancreatic ductus in experienced hands.

Keywords: Endoscopic retrograde cholangiopancreatography, pancreaticobiliary diseases, complication

Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) is an imaging modality that visualizes biliary tract and pancreatic ducts after injecting a contrast medium by cannulation of ampulla of Vater via advancing a duodenoscope. While providing advantages in the diagnosis and treatment of pancreas and biliary tract disorders via a minimal invasive procedure, it also has the potential for more severe complications than other endoscopic methods [1, 2]. ERCP is mainly therapeutic intervention for biliary and/or pancreatic disease in recent years. Endoscopic ultrasonography and magnetic resonance cholangiopancreatography (MRCP) have been mainly applied for diagnosis [3]. It has been used in the diagnosis and treatment of pancreaticobiliary diseases since 1974 when it was first performed [4]. It has increasingly gained popularity over time[5]. We aimed to discuss results of ERCP in 204 patients in a retrospective manner.

Material and Method

The study included 204 patients who underwent therapeutic ERCP due to extrahepatic cholestasis at Turgut Ozal Medical Center of

Inonu University, between January 2016 and December 2016. We retrospectively reviewed the data regarding demographic characteristics, ERCP indications, interventions performed, number and success of interventions, mortality and morbidity. The diagnostic methods of extrahepatic cholestasis were defined by transabdominal ultrasonography or MRCP. ERCP interventions were applied by experienced authors. All patients were informed about interventions and related risks and written informed consent was obtained.

The ERCP was performed by using Olympus TJF-Q180V duodenoscope and Olympus ESG- 100 electrocautery. The instruments used for interventions included ERCP catheters, sphincterotomes, balloons, lithotripters, biopsy forceps and coagulation instruments. All patients were sedated by using midazolam and propofol. Hyoscine-N-butyl bromide was used as anti-peristaltic agent.

Results

There were 110 women and 94 men with a mean age of 68.03 years. Two or more interventions were performed in 48 patients. There was choledochal stone in 147(72.06%), malignant biliary stricture in 28(13.73%), benign biliary stricture in 8(3.92%), periampullary tumor in 4(1.96%), hydatid cyst communicating with ductus choledochus in 2(0.98%), fasciola hepatica in

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1(0.49%), sclerosing cholangitis in 4(1.96%), sphincter of Oddi dysfunction in 5(2.45%) and postoperative bile leakage in 3(1.47%) of the patients. The ERCP had failed in 2(0.98%) patients due to anatomical problems (Table 1). Selective cannulation of the common bile duct was performed in 162(79.41%) cases. The common bile duct cannulation was performed via an anterior incision in 25(12.26%) cases and previous sphincterotomy in 15(7.35%) cases. Of 25 cases with anterior incision, cannulation couldn't be performed at first attempt in 7 cases, which was then performed 2 days after first intervention. Papillae were observed within the diverticula in 10(4.9%) cases and all were cannulated using selective cannulation in the first attempt.

Stone retrieval with basket and/or balloon was performed in 115(56.37%) patients while plastic stents was inserted to ductus choledochus in 87(47.64%) and to pancreatic ductus in 5(2.45%) patients. Mechanical lithotripsy was performed in 6(2.94%) patients. Pancreatitis had developed in 3(1.47%) patients following ERCP. Sepsis had developed in 2(0.98%) patients who recovered with antibiotic. The bleeding that developed in another 2(0.98%) patients, was treated with coagulation during intervention (Table 2). SPSS version 22.0 was used for all analyses.

Table 1. ERCP diagnoses of patients participating in the study

Diagnoses	n	%
Choledochal stone	147	72.06
Malign biliary stricture	28	13.73
Benign biliary stricture	8	3.92
Periampullary tumor	4	1.96
Hydatid cyst	2	0.98
Fasciole hepatica	1	0.49
Primer sclerosing cholangitis	4	1.96
Postoperative bile leakage	3	1.47
Oddi dysfunction	5	2.45
Failed ERCP	2	0.98

Table 2. ERCP complications of patients participating in the study

Complications	(n)	(%)
Pancreatitis	3	(1.48)
Bleeding	2	(0.99)
Sepsis	2	(0.99)
Perforation	0	0

Discussion

The ERCP is used for therapeutic interventions such as stone extraction from biliary tract, tissue sampling from the biliary tract or pancreas, and pancreatoscopy or cholangiography [6].

Although magnetic resonance cholangiopancreatography (MRCP), endoscopic ultrasound (EUS), ERCP and computed tomography cholangiopancreatography (CTCP) are being used in the diagnosis of stone disease in the biliary tract, only ERCP is used in the treatment of these stones [7]. The success rate of extraction of choledochal stones varies from 80% to 97% [8]. In our cases, small stones were extracted in the first session while biliary stent was inserted in case of large or multiple stones. Stone was extracted by ERCP in all cases (except 2 cases) in which

biliary stent was inserted.

The ERCP is used in several interventions such as endoscopic sphincterotomy, stent insertion for management of malignant and benign biliary stricture, stone extraction from biliary tract and biopsy [9]. Learning curve requires at least 180 procedures for experience in diagnosis and treatment [10, 11]. The success rate is 90-95% with experienced operators [12]. Complication rates are lower in operators performing more than 40 procedures annually [13] or at least one procedure weekly [14] when compared to those performing less procedures. In our study, the procedure was performed successfully in all cases except 2 cases with anatomical issues.

Pancreatitis (1-7%), hemorrhage (.72-2%), perforation (0.3-0.6%), cholangitis (<1%) and cholecystitis (0.2-0.5%) can be seen following ERCP [15]. The ERCP complications don't only include specific complications such as perforation, bleeding, cholangitis and pancreatitis but also cardiopulmonary complications such as arrhythmia, hypoventilation and aspiration [16, 17]. Death related to ERCP is rarely seen (<0.5%) and is mainly associated with non-specific causes such as cardiopulmonary complications [18]. In our population, pancreatitis had developed in 3 cases, while bleeding in 2 and sepsis in another 2 cases and all were completely recovered. These findings are in agreement with the literature.

Periampullary diverticula, ampulla tumors or strictures are the causes for failure in ERCP [19]. The papilla was within the diverticula in 10 patients while there was periampullary tumor in 4 patients. Common bile duct cannulation was achieved in all 14 cases.

Choledochal stone is removed by Dormia basket or balloon following endoscopic sphincterotomy; however, this procedure may fail in approximately 15% of the patients. Stone>1.5 cm, number of stone>3, presence of periampullary diverticula, impaction of stone and narrow biliary duct distal for stone make stone extraction more challenging. Mechanical lithotripters are used when standard technique is failed [20]. Endobiliary stent can be inserted for biliary decompression if all interventions are failed. This may allow shrinking of stone and extraction of stone by standard techniques in subsequent sessions [21]. In our study, The stent was inserted into the common bile duct in case of large, multiple or impacted stones which couldn't be removed in the first session and stones were removed in all except 2 cases in subsequent sessions.

Cholangiocarcinoma is a tumor arising from intra- and extra-hepatic biliary tract, which is more commonly seen in men at 50-70 years of age. The tumors involving the main hepatic bifurcation are termed as Klatskin tumors. ERCP is the most common method used in the diagnosis and palliative treatment of these tumors [22]. But, unfortunately ERCP is not very effective for treatment due to stricture of due to perihilar cholangiocarcinoma [23]. In our study population, stricture secondary to cholangiocarcinoma was observed in 28 cases and plastic stent was inserted to allow drainage.

Conclusion

In conclusion, ERCP is an effective method in the diagnosis and

treatment of biliary tract and pancreatic duct disorders and is less invasive and more reliable compared to surgery. However, there are serious complications, including death. It has high success rates with experienced operators. It would be more appropriate to perform ERCP by a single clinic in a center in order to increase experience; thus, success.

Competing interests

The authors declare that they have no competing interest.

Financial Disclosure

The financial support for this study was provided by the investigators themselves.

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