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Research Article

Is Endoscopic Retrograde Cholangiopancreatography Safe in Elder patients?-A Single Center Experience

Serkan Ademoglu,[1] Zeliha Ademoglu,[2] Sezgin Yilmaz,[3] Yuksel Arikan[4]

[1]Department of General Surgery, Edirne Sultan I. Murat State Hospital, Edirne, Turkey
[2]Department of Romatology, Trakya University Faculty of Medicine, Edirne, Turkey
[3]Department of General Surgery, Afyonkarahisar Health Sciences University Faculty of Medicine, Afyon, Turkey
[4]Department of General Surgery, Parkhayat Afyon Hospital, Afyon, Turkey

Abstract

Objectives: The endoscopic retrograde cholongiopancreatography (ERCP) process is canulization of papilla vateri radiolologically and imaging bilier tructs and pancreas duct by a lateral endoscope. ERCP process has some severe complications. In this study, we aimed to assess the safety of ERCP in elderly patients.

Methods: This is a prospective study. Patients who performed ERCP in Afyon Kocatepe University Training and Research Hospital were included in order to determine the frequency of complications after ERCP and defining the risk factors and determiners for each complication.

Results: A total of 60 patients (29 female and 31male) were included. The median age was 57.3. The most frequent ERCP indication was choledocholithiasis (60%). In 15% of patients were observed after ERCP. The major complication was cholangitis (8.3%). Pancreatitis (5%) were detected to be seen in subsequent frequency. All complications were observed to be increasing with sphincteratomy.

Conclusion: Endoscopic retrograde cholangiopancreatography is a safe and effective technique in elderly patients but endoscopists should be more careful about complications in elderly patients.

Keywords: Efficacy, elderly patients, endoscopic retrograde cholangiopancreatography, safety

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Endoscopic procedures are used in all age groups to evaluate and treat the gastrointestinal tract and pancreaticobiliary system. All endoscopic procedure techniques can be used in elderly patients, but since the complications that may occur in these patients will be more severe, the endoscopist should be more careful when planning endoscopy for these patients. Therefore, the clinician should evaluate the diagnostic and therapeutic benefit of the recommended endoscopic procedure in patients whose poor prognosis is expected or whose general condition is poor.[1] Frequency of concomitant diseases and age-related problems can complicate the interventional procedures for diagnosis and treatment in elderly patients. Diseases affecting the gallbladder and biliary tract and choledocholithiasis are more common in the older age group. Endoscopic retrograde cholangiopancreatography (ERCP) is frequently used in these patients, especially since pathologies such as pancreatic cancer and biliary tract tumors are more common in elderly patients.[2] In addition to complications such as bleeding from the sphincterotomy due to ERCP procedure, post-ERCP pancreatitis, complications such as hypoxia, hypotension and arrhythmia may be observed in patients.

Address for correspondence: Serkan Ademoglu, MD. Edirne Sultan I. Murat Devlet Hastanesi, Genel Cerrahi Klinigi, Edirne, Turkey
Phone: +90 505 751 61 25 **E-mail:** serkan0187@hotmail.com

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Therapeutic ERCP can eliminate the need for emergency biliary tract surgery in elderly patients. However, there are a limited number of studies on the effectiveness and reliability of ERCP procedure in elderly patients.[3] In our study, we evaluated the effectiveness, reliability, and procedure success rates of the ERCP procedure in elderly patients.

Methods

In the ERCP Unit of General Surgery Department of Afyon Kocatepe University Faculty of Medicine, a total of 60 patients including 30 patients over 65 years old and 30 patients under 65 years old were evaluated prospectively. The ethics committee of Dumlupinar University of Medicine provided the ethics committee approval for this study (21.07.2016.2015-KAEK-86/09/176). Patients' demographic (age, gender, occupation, whether they use cigarettes and alcohol, operations they have undergone, whether ERCP has been previously applied), laboratory (white blood cell, hemoglobin, Hemotocrit, Platelet, AST, ALT, ALP, GGT, Total Bilurubin, CRP, LDH, Glucose, Amylase, Lipase, Ure, Creatinine) and treatment data were obtained from the hospital data processing database and endoscopic data from the endoscopy laboratory records. ERCP procedures were performed to investigate pathologies such as choledocholithiasis and other biliary obstructions, pancreatic cancer and biliary tract tumors, especially for both diagnostic and therapeutic purposes. On the other hand, patients under 18 years of age, pregnant women, mentally deficient, those with contrast allergy, previous sphincterotomies, cases with Billroth 2 gastrectomy, bulb cancer, active pancreatitis within 30 days before the procedure, active pancreatitis, idiopathic pancreatitis, pancreatic neoplasm or chronic obstructive pancreatitis were not included in the study.

ERCP Process

The procedures were performed by endoscopists with similar experience and having at least about 1000 ERCP cases each year. Approval was obtained by signing detailed informed consent from all patients.

Patients were operated on the left side position as standardized technique. Blood pressures, heart rates and oxygen saturations were continuously monitored with an automatic pulse oximeter. Standard video duodenoscopes with side view (Olympus, Tokyo, Japan) with 4.2 mm accessory channel caps were used for ERCP operations.

Post ERCP monitoring, pancreatitis-like pain or hyperamylasemia or both control 4-6 hours after the procedure, control of hyperamylasemia 24 hours after the procedure, and if the patient was not 5 times higher than normal was discharged. On the other hand, resistant altitudes at 24-hour amylase levels were reevaluated at 48 hours of the enzymatic profile. If complications occurred in the patient, hospitalization was extended until these resolved.

Statistical Analysis

While evaluating the study data, besides descriptive statistical methods (Mean, Standard deviation), Student t test in independent univariate analysis of measurement data; Chi-Square test was used for the analysis of independent univariate qualitative data. A logistic regression model was used to determine the multivariate relationship between dependent and independent risk factors. The results were evaluated within the 95% confidence interval and the significance level was $p<0.05$.

Results

A total of 60 patients were evaluated, including 30 patients over 65 years old and 30 patients under 65 years old. Demographic and clinical characteristics data of the patients are shown in Table 1. The patients were between 18 and 92 years old and the mean age was 57.3 years. The most common comorbid disease in patients was found as Type 2 diabetes mellitus. Neoplasia (endometrium and pancreas adenocarcinoma) was additionally present in 2 patients over 65 years of age. Clinically, the most common symptom was pain in both groups. While the symptoms of fever, pain, and jaundice among the infectious symptoms were higher

Table 1. Demograhic and clinical characteristic of the study subjects

	<65 age (n=30)	≥65 yaş (n=30)	p
Gender, n (%)			
Female	13 (43.3)	16 (53.3)	
Male	17 (56.7)	14 (46.7)	>0.05
ALT (mean±SD)	141.23±143.06	128.45±116.87	>0.05
AST (mean±SD)	92.24±104.34	103.13±114.45	>0.05
ALP (mean±SD)	784.17±744.89	921.23±751.79	>0.05
Total Bilirubin (mean±SD)	5.81±8.10	10.02±12.23	<0.05
Clinic, n (%)			
Pain	9 (30)	8 (26.7)	>0.05
Jaundice	6 (20)	7 (23.3)	>0.05
Pain+Jaundice	8 (26.6)	7 (23.3)	>0.05
Pain+Fire+Jaundice	4 (13.4)	6 (20)	>0.05
Fatigue, Tiredness, Vomiting, Back pain	3 (10)	2 (6.7)	<0.05

ALT: Alanin aminotransferaz; AST: Aspartat aminotransferaz; ALP: Alkalen fosfataz.

in the group under 65 years of age, we found that only the symptom of jaundice suggesting malignancy was higher in the group over 65 years of age.

The most common ERCP indications in patients are shown in Table 2. Accordingly, 36 patients (60%) had obstructive jaundice and/or high serum bilirubin level; The presence of high serum cholestatic enzyme (AST, ALT, GGT, ALP) levels in 19 (31.6%) was not accompanied by obstructive jaundice, and 21 (35%) were choledochal stone. Only 1 patient had choledocholithiasis with biliary tract malignancy.

Additional therapeutic endoscopic procedures were performed in 55 (91.6%) of the patients. The most common applications were endoscopic sphincterotomy in 29 patients (48.3%) and balloon application in 36 (60%). The most used therapeutic procedure in patients over 65 years of age was balloon use (Table 3).

The most common complication after ERCP was infectious complications (cholangitis) in 5 (8.3%) patients. Infectious complications were higher in the group under 65 years of age. Mortality was seen only in 1 patient in the age group above 65 years. (respiratory failure due to sedoanalgesia) (Table 4).

Table 2. ERCP Indications

Indication	Number	Percent	≥65 age	<65 age
Choledocholithiasis	36	60		
Choledocholithiasis and mechanical icter	7		3	4
Choledocholithiasis and dilated choledochal	15		6	9
Choledocholithiasis, mechanical icterus and dilated choledochal	8		3	5
Choledocholithiasis and malignancy	1		1	-
Choledocholithiasis and stent replacement	1		1	-
Choledocholithiasis only	4		2	2
Malignancy	6	10		
Malignancy only	1		1	-
Malignancy and icter	2		1	1
Malignancy and pancreatitis	1		-	1
Malignancy and choledocholithiasis	1		-	1
Malignancy and stent change	1		1	-
Pancreatitis	7	11.6		
Biliary pancreatitis	4		1	3
Chronic pancreatitis	1		-	1
Pancreatitis and malignancy	1		1	-
Pancreatitis and liver cyst hydatid	1		-	1
Biliary fistula	7	11.6		
After cholecystectomy	4		1	3
After liver hydatid cyst surgery	2		-	2
Fistula and malignancy	1		1	-
Others	6	10		
Ikter of unknown cause and/or dilated choledochal	5		2	3
Before liver cyst hydatid surgery	1		-	1

Discussion

The frequency of endoscopic examination increases in elderly patients due to the increase in the average life expectancy. Differences in disease prevalence, concomitant systemic diseases, frequency of complications that may arise, reveal the need for more careful evaluation of endoscopic procedures in the elderly. In our study, we concluded that ERCP procedure is an effective and reliable procedure in elderly patients, but more care should be taken in elderly patients than patients under 65 years of age in terms of complications related to the procedure and anesthesia.

Table 3. Therapeutic Procedures Used in ERCP

Technical	Number	Percent	≥65 age	<65 age
Standard biliary sphincterotomy	29	48.3	13	16
Basket usage	27	45	12	15
Balloon usage	36	60	16	20
Use of pre-cut	5	8.3	2	3
Mechanical lithotripter usage	4	6.6	2	2
Biliary stent placement	8	13.3	5	3

Table 4. Complications After ERCP

	≥65 age n (%)	<65 age n (%)
Infectious Complications*	2 (6.6)	3 (10)
Pancreatitis	1 (3.3)	2 (6.6)
Death	1 (3.3)	-
Total	4 (13.3)	5 (16.6)

*Cholangitis, bacteremia and sepsis.

Geriatrics units, which deal with the general health problems and diseases of people aged 65 and over, started to be established with the aging of the world population and the emergence of the unique diseases and treatments of the elderly population.[4,5] ERCP is considered to be effective and safe for the treatment and diagnosis of hepatopancreatobiliary diseases in the elderly. However, the number of reports on this subject consists of small and small group studies. Retrospective and prospective studies on this subject generally include ERCP data in the elderly. Very few studies compare ERCP data in young and old patients. In the study conducted by Ashton et al.,[6] the age ranges were taken as 75-100 and this study was conducted retrospectively. In this study, 101 patients were evaluated and the cannulation rate was found to be 99%. In the patients over 75 years old in the study, the early period after the procedure was found to be complications as 4 cholangitis, 1 pancreatitis and 1 perforation. In our series, complications after the procedure 65 years and older were found to be 2 infectious, 1 pancreatitis and 1 mortality. On the other hand, in a study in which 403 cases were performed by Sugiyama et al.,[7] where only 70-year-old patients were evaluated, the ERCP procedure, which was retrospective, success rate was reported to be 98.5%. early complications 1 mortality, 9 pancreatitis, 7 bleeding, 5 cholangitis, 3 cholecystitis, 1 basket compression and a liver failure were observed. Similarly, in the study conducted by Mitchell et al.,[8] 90 years old and older were taken and retrospectively examined, 121 patients were evaluated, cannulation success was determined as 91.3%, 3 bleeding, 4 mortality were observed, and pancreatitis was not observed. In the study of Ashton et al.,[6] atypical presentations were found more in elderly patients. Sugiyama et al.[7] determined the presentation of choledocholithiasis as 20% in patients aged 70-89. In the study conducted by Ashton et al.,[6] they found that the rate of pancreatitis after pre-cut papillotomy was higher in elderly patients compared to other studies and stated that it can be applied in appropriate patients with the risk of pancreatitis with the experience of the endoscopist. In our study, the cannulation success rate was specified as 98.4%; no bleeding, basket compression, perforation and liver failure were observed.

In the presence of gallstones, the probability of finding stones in the bile duct is up to 10-15%.[9–11] Despite the discussion in the field of diagnosis, emergency ERCP and endoscopic sphincterotomy (ES) is the most important treatment option in cases of acute suppurative occlusive cholangitis due to stone. ERCP and ES appear to be significantly effective in detecting and removing choledochal stones after surgery as well as before laparoscopic cholecystectomy.[11] In our study, the rate of choledocholithiasis in the presence of gallstones was 12%. In our study, sphincterotomy was performed successfully in 29 (48.3%) and stenting in 8 (13.3%) patients. ERCP is also used in the diagnosis and treatment of many hepatobiliary diseases such as liver malignancies, hydatid disease, alveolar echinococci, fasioliasis, hemobilia, bilioma. In our study, ERCP was applied to 1 (1.6%) biliary tract hydatid liver patient and biliary stent was placed in the procedure.

Since ERCP complications are frequently seen within the first 4-6 hours, it is considered a safe approach to perform ERCP for diagnostic purposes as an outpatient procedure. In our study, complications after ERCP were detected in 15% of cases. The most common complication was infectious with 8.3%, and the second most common pancreatitis was 5%. Acute cholangitis occurs in 0.4-1.8% of patients undergoing ERCP, and this rate is higher in patients with incomplete bile obstruction and in whom adequate bile drainage cannot be achieved. In our study, the most common complication was cholangitis (5%), and in patients without dilated biliary tract and obstruction, the incidence of cholangitis was significantly reduced, especially in patients over 65 years of age. Infectious complications and pancreatitis were more common in the group under 65 years of age. The reason for the prevalence of these in the young group is due to the occurrence of patients with Oddi dysfunction(OD) and sphincterotomy. In many publications reporting short-term complications, the rate of complications is reported between 5 and 15.9%, regardless of whether sphincterotomy or not. It is more difficult to reach patients and their records in retrospective studies conducted to determine the complications after ERCP in the outpatient and admitting centers. The main causes of cannulation failure in ERCP; papillae, biliary tract or obstruction due to tumor of the duodenum, narrowing of the papilla due to inflammation, papilla localization anomalies (inside or around the diverticulum). Although it has its own complications and the most common cause of perforation is sphincterotomy, it is known that pre-cut sphincterotomy performed in papillae that are not fully occluded or with stenosis increases the cannulation success. In our study, 1 (1.6%) patient had failed cannulation. In our study, when all of the complications were evaluated with patient demographic information; It was observed that the sex and age of the patients did not make any significant difference. The presence of cholangitis, cholecystitis, pancreatitis and cholecystectomy, and the diagnosis obtained after ERCP procedure did not make any significant difference in the development of complications.

One of the most common complications after ERCP is acute pancreatitis, which is seen at a rate of 0.9-4.4% and is more common in female patients.[12] In our study, the second

most common complication after ERCP was pancreatitis and was seen in 3 (5%) patients. However, there was no statistically significant difference in diagnosis and therapeutic ERCP procedures for pancreatitis development. Those who developed pancreatitis after ERCP; While pancreatitis associated with ERCP developed in 2 (6.6%) cases aged 65 and above, pancreatitis was detected in 1 (3.3%) case below 65 years of age. It was seen that therapeutic and diagnostic applications did not affect the development of pancreatitis, but the use of baskets and biliary sphincterotomy from therapeutic applications significantly increased the development of pancreatitis after ERCP. In the evaluation for all the complications in our study; It was observed that diagnostic and therapeutic ERCP applications did not make a statistically significant difference, however, it was determined that 88.9% of the cases with complications were therapeutic and 11.1% of them were ERCP for diagnostic purposes only. On the other hand, cholecystitis (3.3%) was detected in 2 patients after ERCP. In univariate analysis, the risk of cholecystitis after ERCP was increased in sphincterotomy applications. However, we found that the patient's cholecystitis and cholangitis history did not statistically pose any risk and the use of prophylactic antibiotics did not reduce the incidence.

As in young patients, different effects can be seen in elderly patients with sedative agents. Elderly patients are more prone to hypoxia, hypotension and arrhythmia. While premedication problems such as sedation intolerance, arrhythmia and cardio-respiratory arrest are seen in 0.5-1% of cases with ERCP, systemic air embolism is known as a rare complication.[13] In our study, mortality occurred in 1 patient (1.6%) from the age group over 65, due to hypoxia due to sedation intolerance. ERCP related mortality rate has been reported with an average of 0.4% and up to 1%.

The first study in the literature on this subject was done by MacMahon et al.[14] In the 65-94 age group. In this prospective study, the success of the procedure was 92% in 50 patients who underwent ERCP. In these cases, early complications related to the procedure were not observed. In our study, prospective operation was found to be 98.4% in 60 patients prospectively.

There are some limitations in our study. Especially considering the low number of patients and the incidences stated in the literature, larger sample size could be achieved with power analysis. In the geriatric patient population, we did not have data on performance score scales in which fragile patients were evaluated. Although we have major limitations regarding our study, the consistency of our data with the literature and prospective studies regarding this issue reveal the importance of our study.

As a result, ERCP procedure is as important as the young patients in the diagnosis and treatment of elderly patients due to the increase in biliary tract and pancreatic cancer with age and surgical intervention in these patients showing high mortality and morbidity. Despite the risk of morbidity and mortality, ERCP can be used reliably in the elderly when performed in experienced hands, used in the diagnosis and treatment of hepatobiliary and pancreatic diseases.

Disclosures

Ethics Committee Approval: The study protocol was approved by Dumlupinar University Clinical Research Ethics Committee with 21/07/2016 dated and 2016/9-23 numbered decision.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Concept – S.A.; Design – Z.A.; Supervision – S.Y.; Materials – S.A., Y.A., S.Y.; Data collection &/or processing – S.A., Z.A.; Analysis and/or interpretation – Y.A.; Literature search – S.A., Z.A.; Writing – S.A.; Critical review – Y.A.

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