



Management of Acute Biliary Pancreatitis in Cholecystectomized Patients

Kolesistektomili Hastalarda Akut Biliyer Pankreatit Yönetimi

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ABSTRACT

Objective: We aimed to evaluate the patients who were hospitalized, followed up and treated in our clinic with the diagnosis of acute biliary pancreatitis (ABP) after cholecystectomy.

Methods: The electronic records of 18 patients with a history of cholecystectomy were reviewed retrospectively. The demographic findings of the patients, time passed after cholecystectomy, methods used in diagnosis, amylase levels, treatment choices, clinical follow-ups, mortality and morbidity rates, and length of hospital stay were evaluated. The Ranson criteria and Apache II score were used to determine the severity of pancreatitis.

Results: Thirteen (72.2%) were female and 5 (27.8%) were male. The mean age was 57.83±12.59 (34-77). The mean time elapsed after cholecystectomy was 72.11±38.12 (5-130) months. The mean diameter of the common bile duct (CBD) was measured as 12.39±2.30 (8-15) mm. The average level of amylase was 986.50±323.29 (350-1530) U/L. Fifteen (83.33%) patients had mild, and 3 (16.67%) patients had moderately severe acute biliary pancreatitis. Endoscopic sphincterotomy (ES) was performed on 16 patients during endoscopic retrograde cholangiopancreatography (ERCP). Two patients were operated due to failure of ERCP. Choledochotomy, transduodenal sphincteroplasty and The T-tube drainage were performed on 1 patient. The other patient underwent choledochotomy and choledochoduodenostomy. The average length of stay in hospital was 7.89±4.91 (5-25) days.

Conclusion: It should be kept in mind that ABP may develop months or even years after cholecystectomy. The standard treatment

ÖZ

Amaç: Bu çalışmada kolesistektomi sonrası akut biliyer pankreatit (ABP) tanısıyla kliniğimizde yatan, takip edilen ve tedavi edilen hastaların değerlendirilmesini amaçladık.

Yöntemler: Kolesistektomi öyküsü olan 18 hastanın kayıtları retrospektif olarak incelendi. Hastaların demografik bulguları, kolesistektomi sonrası geçen süre, tanıda kullanılan yöntemler, amilaz düzeyleri, tedavi seçenekleri, klinik takipler, mortalite ve morbidite oranları ve hastanede kalış süreleri değerlendirildi. Ranson kriterleri ve Apache II skoru, pankreatitin şiddetini belirlemek için kullanıldı.

Bulgular: Hastaların 13'ü (%72,2) kadın, 5'i (%27,8) erkekti. Ortalama yaş 57,83±12,59 (34-77) idi. Kolesistektomi sonrası geçen ortalama süre 72,11±38,12 (5-130) aydı. Ana safra kanalının (ASK) ortalama çapı 12,39±2,30 (8-15) mm olarak ölçüldü. Ortalama amilaz seviyesi 986,50±323,29 (350-1.530) U/L idi. On beş (%83,33) hastada hafif ve 3 (%16,67) hastada orta şiddetli akut biliyer pankreatit vardı. Endoskopik retrograd kolanjiyopankreatografi (ERCP) sırasında 16 hastaya endoskopik sfinkterotomi (ES) yapıldı. ERCP'nin başarısızlığı nedeniyle 2 hasta ameliyat edildi. Bir hastaya koledokotomi, transduodenal sfinkteroplasti ve T-tüp drenajı yapıldı. Diğer hastaya koledokotomi ve koledokoduodenostomi yapıldı. Hastanede ortalama kalış süresi 7,89±4,91 (5-25) gündü.

Sonuç: ABP'nin kolesistektomiden aylar, hatta yıllar sonra gelişebileceği unutulmamalıdır. Kolesistektomili hastalarda ASK

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for acute pancreatitis caused by CBD stones in patients with cholecystectomy are ERCP and ES. In patients with failed ERCP and ES, the CBD exploration should be performed surgically.

Keywords: Acute pancreatitis, cholecystectomized patients, endoscopic retrograde cholangiopancreatography

taşlarının neden olduğu akut pankreatit için standart tedavi ERCP ve ES'dir. ERCP ve ES'nin başarısız olduğu durumlarda, cerrahi olarak AKS koledok eksplorasyonu yapılmalıdır.

Anahtar Sözcükler: Akut pankreatit, kolesistektomili hastalar, endoskopik retrograd kolanjiyopankreatografi

Introduction

Acute pancreatitis (AP) is an inflammatory disorder of the pancreas that is characterized by edema, and when severe, necrosis (1). Alcohol and gallstones are responsible for 80% of the etiology (2). While alcohol consumption is the most common cause of AP in developed western countries, gallstones are the most common cause in eastern society. The rate of incidence of gallbladder and common bile duct (CBD) stones in patients diagnosed as having AP changes between 30% and 70% (3). While men are more prone to the development of AP in the presence of gallbladder stones, it is more common in women (4). In acute biliary pancreatitis (ABP), laparoscopic or open cholecystectomy is performed to prevent pancreatitis recurrence. However, ABP may develop due to gallstones months or even years after surgery in patients who undergo cholecystectomy for non-pancreatitis causes (5-7). Approximately 10% to 18% of patients with cholecystectomy have also CBD stones (8). Endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic sphincterotomy (ES) are standard approaches used for treatment of patients with choledochal stones subsequent to cholecystectomy. However, some authors have reported that these techniques are unsuccessful approximately in 10% of the patients. When ERCP and ES fail, laparoscopic or open surgery and choledochal exploration is the approach of choice (9,10). In the literature, we determined that studies on ABP in cholecystectomized patients were rare. Thus, we aimed to evaluate the patients who were hospitalized, followed up and treated in our clinic with the diagnosis of ABP after cholecystectomy, and to share our clinical experience.

Methods

Patients diagnosed as having ABP in the University of Health Sciences Turkey Derince Training and Research Hospital between August 2010 and July 2020 were listed. The electronic records of 18 patients with a history of cholecystectomy from a total of 585 patients were reviewed retrospectively. The demographic findings of the patients, time passed after cholecystectomy, methods used in diagnosis, amylase levels, treatment choices, clinical follow-ups, mortality and morbidity rates, and length of hospital stay were evaluated. The Ranson criteria and Apache II score were used to determine the severity of pancreatitis. Patients who had a Ranson score ≥ 3 , an Apache II score ≥ 8 (48th hour), persistent organ failure (>48 hours) and local complications (pancreatic necrosis, pancreatic abscess, pseudocyst) were considered to have severe pancreatitis. However, patients with transient organ failure (<48 hours) were considered to have moderately severe pancreatitis. Patients with a Ranson score <3, an Apache II score <8 and without permanent organ failure and local complications

were considered to have mild pancreatitis. Stones in the CBD were detected by using magnetic resonance cholangiopancreatography (MRCP) in patients diagnosed as having pancreatitis and with signs of cholestasis. All patients underwent ERCP. ES was performed on 16 of the 18 patients during ERCP. Two patients were operated due to failure of ERCP. Patients with no evidence of cholestasis and who had no radiologically detected bile duct stones were excluded from the study. The study was approved by the Local Ethical Committee of University of Health Sciences Turkey Derince Training and Research Hospital, (protocol number: 2021/54-25.03.2021).

Statistical Analysis

The Statistical Package for the Social Sciences (IBM SPSS Statistics 23, software, IL-Chicago- USA) was used for data analyses. The frequency and percentage values of the demographic variables of the qualitative data in our study, and the mean \pm standard deviation of the age variable of the quantitative data were used in the descriptive statistics.

Results

Eighteen patients were examined (Table 1). Thirteen (72.2%) of the 18 patients were female and 5 (27.8%) were male. The mean age was 57.83 ± 12.59 (34-77). The mean time elapsed after cholecystectomy was 72.11 ± 38.12 (5-130) months. The rate of incidence of patients with cholecystectomy in the etiology of ABP was found to be 3.08%. Intravenous contrast-enhanced abdominal tomography (CT) was performed on all patients to evaluate the pancreas. CT was repeated 48 and 96 hours later when patients' clinical conditions had not changed. MRCP was performed on all patients to show the CBD diameter and the presence of stones. The mean diameter of the CBD was measured as 12.39 ± 2.30 (8-15) mm by MRCP. The average level of amylase was 986.50 ± 323.29 (350-1530) U/L. Fifteen (83.33%) patients had mild, and 3 (16.67%) patients had moderately severe ABP according to the Ranson's criteria and Apache II score. None of the patients had severe ABP. Patients with moderately severe ABP responded to medical therapy. None of the patients needed intensive care unit. All patients underwent endoscopic retrograde ERCP. ES was performed on 16 of the 18 patients during ERCP. Two patients were operated due to failure of ERCP. CBD exploration was performed on both patients surgically. Four to five stones were removed from the CBD in one patient. The transition from CBD to duodenum was controlled with dilators. Transduodenal sphincteroplasty was performed because there was stenosis in the Oddi sphincter. A T-tube was inserted into the CBD. T-tube cholangiography was executed on the 14th day. The T-tube was removed since no pathology was found in the

CBD lumen, and free passage was observed into the duodenum. A 10-mm stone that was impacted in the Oddi sphincter was removed from the other patient. Due to Oddi sphincter fibrosis, the duodenum could not be passed with CBD dilators, hence choledocoduodenostomy was performed. In our series, the

failure rate of ERCP was found to be 11.11%. CBD stones were removed in all patients when ERCP was successful. There was no mortality. The average length of stay in hospital was 7.89±4.91 (5-25) days. Demographic features for each patient are shown in Table 2.

Table 1. Demographic features (n=18)

Age (mean ± std)	
For all patients	57.83±12.59 (34-77)
Male	67.20±8.43 (55-77)
Female	54.23±12.25 (34-70)
Sex (n)	
Male	5 (27.8%)
Female	13 (72.2%)
Severity of AP	
Mild	15 (83.33%)
Moderately severe	3 (16.67%)
Severe	0 (0%)
The mean diameter of the CBD (mm)	12.39±2.30 (8-15)
The average level of amylase (U/L)	986.50±323.29 (350-1,530)
The mean time elapsed after cholecystectomy (months)	72.11 ± 38.12 (5-130)
The average length of stay in hospital (days)	7.89 ± 4.91 (5-25)
Mortality (n)	0 (0%)
Morbidity (n)	0 (0%)
Treatment method (n)	
ERCP + ES	16 (88.9%)
Exploration of CBD + TDS + T-tube drainage	1 (5.6%)
Exploration of CBD +Choledocoduodenostomy	1 (5.6%)
AP: Acute pancreatitis, CBD: Common bile duct, ERCP: Endoscopic retrograde cholangiopancreatography, ES: Endoscopic sphincterotomy, TDS: Transduodenal sphincteroplasty	

Discussion

The most common causes of AP, which is considered inflammation of the pancreas, are chronic alcohol use and gallstones/sludge. They appear as the etiological causes in 80% of all patients with AP (1,2). AP caused by gallstones is called ABP. Approximately 10-20% of patients with stones in the gallbladder have stones in the CBD at the same time (11,12). Gallstones in the CBD can be primary or secondary stones. Primary stones are very rare, therefore more of the stones detected in the CBD are secondary gallstones that are poured from the gallbladder. In order to be called a primary choledochal stone, it must occur at least 2 years after cholecystectomy (13). The rate of gallstones in the CBD is 3-18.5% after cholecystectomy (14-16). CBD stones can remain asymptomatic for a long time. However, they may cause symptomatic ABP in some patients months or even years after cholecystectomy (5). Manuel-Vázquez et al. (17) reported that 6% of patients who were rehospitalized within 90 days after cholecystectomy hospitalized due to AP. There are few publications on the rate of developing AP in patients with cholecystectomy. Gloor et al. (6) reported that the rate of cholecystectomized patients was 10% in patients diagnosed as having ABP in their series of 278 patients. There are also publications on the literature reporting that ABP can occur in patients with cholecystectomy without gallstones. Panara et al. (18) reported that an endoclip migrating from the cystic duct to the bile duct caused AP in a patient who had recurrent AP attacks, 15 and 19 months after cholecystectomy.

Contrast-enhanced abdominal tomography is the gold standard in the diagnosis and treatment plan of ABP. Anatomical condition of the pancreas and local complications such as abscess and necrosis can be easily detected by using tomography (1).

Table 2. Demographic features of each patient

Patients	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Sex	F	F	M	M	F	F	F	F	F	F	M	F	M	M	F	F	F	F
Age	60	45	70	77	65	53	39	45	48	69	71	70	55	63	34	46	68	63
Time after cholecystectomy (months)	5	130	120	96	29	120	60	36	72	84	84	72	60	120	6	48	96	60
Diameter of the CBD (mm)	15	14	15	13	8	12	13	10	14	12	10	15	14	13	9	15	12	9
Level of amylase (U/L)	1145	1055	950	1190	450	985	632	1255	1530	350	735	1464	1215	690	1080	945	856	1230
Treatment method	1*	1*	1*	3***	1*	1*	1*	1*	1*	1*	2**	1*	1*	1*	1*	1*	1*	1*
Length of stay in hospital (days)	6	7	7	15	5	5	7	10	5	5	25	7	8	5	6	7	5	7

CBD: Common bile duct, F: Female, M: Male,
1*: Endoscopic retrograde cholangiopancreatography + endoscopic sphincterotomy
2*: Exploration of common bile duct + transduodenal sphincteroplasty + T-tube drainage
3*: Exploration of common bile duct + choledocoduodenostomy

However, the development of necrosis takes time, so it is not desired on the first day (6). It provides important information to differentiate edematous pancreatitis from necrotizing pancreatitis. In cases with necrosis of more than 50% of the pancreas and in which they do not recover clinically, fine needle aspiration biopsy and culture can be taken by using tomography, and antibiotic treatment can be arranged according to the culture result (19). MRCP is used to detect stones in the CBD. Also, the width of the CBD can be measured with MRCP. The development rate of ABP increases in patients whose width of the CBD is over 10 mm (5-7). The mean CBD diameter in our study was 12.39 ± 2.30 , and it was consistent with the literature. Although duodenal diverticulum was an important factor in ABP etiology after cholecystectomy (5-7), no duodenal diverticulum was detected in any patient in our study.

While 80% of patients with AP have mild edematous pancreatitis, 20% of patients have necrotizing pancreatitis accompanied by multiple organ failure. Mortality rate in edematous AP is less than 1%. However, in necrotizing pancreatitis, this rate rises to 20-40% and even over 50% in critical patients (1,18). Supportive therapy such as stopping oral intake and starting fluid replacement in the edematous form is usually sufficient. However, patients with severe pancreatitis and multiorgan failure should be followed up in the intensive care unit (20). In our study, 15 of 18 patients had mild AP and 3 had moderately severe AP according to the Ranson's criteria. All patients, including those with moderately severe pancreatitis, were followed up in the normal clinic room and did not require intensive care.

The ERCP and ES are standard treatments accepted by most centers for treatment of ABP after cholecystectomy (21,22). The failure rates of ERCP and ES are around 10-18% in recent studies (5,7). In our study, this rate was found to be 11.11%. ERCP and ES were successful on 16 of the 18 patients, but they failed on 2 patients. Open or laparoscopic exploration of the CBD should be performed if ERCP and ES fail. In order to increase the reliability of the ERCP procedure, it is necessary to determine the risk factors for ERCP complications very well. In the study of Atamanalp et al. (23) on 3,136 patients, 2,965 (94.5%) of 3,136 patients were successfully cannulated, 465 (14.8%) anterior incisions were made, and no successful procedure was done in 171 (5.5%). In the study of Ciftci and Anuk (7), gallstones and biliary sand were found in CBD of 36 patients upon ERCP, but not observed in the remaining 8 patients. ES was performed and material was extracted in 32 of 36 patients, but stone extraction was unsuccessful in 4 patients; 3 patients underwent open surgery with CBD exploration and 1 patient died. We did an exploration of CBD with the open surgical method on 2 patients who failed to respond to the ERCP. We added transduodenal sphincteroplasty and T-Tube placement to the procedure in one patient, and we performed choledocoduodenostomy in the other. Another purpose of doing ERCP in ABP is to remove obstruction by cannulation of the pancreatic duct and to provide drainage of pancreatic secretion (24). This drainage helps to reduce the pressure inside the pancreatic duct. In patients with severe necrotic pancreatitis and

developing pancreatic fistula, ERCP is again used for stenting of the pancreatic canal. Although serious complications can be seen with ERCP, performing ERCP in the appropriate indication and early recognition of the complications are the most important steps in preventing morbidity and mortality (25-27).

Conclusion

It should be kept in mind that ABP may develop months or years after cholecystectomy. The standard treatment for AP caused by CBD stones in patients with cholecystectomy are ERCP and ES. In patients with failed ERCP and ES, CBD exploration should be performed surgically, and transduodenal sphincteroplasty plus T-Tube drainage or choledocoduodenostomy/choledocojejunostomy should be added to the procedure.

Ethics

Ethics Committee Approval: The study was approved by the Local Ethical Committee of University of Health Sciences Turkey Derince Training and Research Hospital, (protocol number: 2021/54-25.03.2021).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer review: Externally peer reviewed.

Author Contributions

Concept: A.Ç., Design: A.Ç., M.A.G., M.T.K., Supervision: M.T.K, Funding: A.Ç., M.A.G., Materials: A.Ç., M.A.G., Data Collection and/or Processing: A.Ç., M.A.G., Analysis and/or Interpretation: M.A.G., M.T.K., Literature Review: A.Ç., M.T.K., Writer: A.Ç., M.T.K.

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