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Comparison of the results of early, delayed and elective surgery in biliary pancreatitis

Biliyer pankreatitte erken cerrahi, geç cerrahi ve elektif cerrahinin karşılaştırılması

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Background/aims: *To evaluate the results of the patients who underwent surgery for biliary pancreatitis, with respect to timing of operation.* ***Methods:*** *192 Patients underwent surgery for biliary pancreatitis between January 1990 and December 1999. The patients were retrospectively separated into three groups: early surgery (within 72 hours after admission), delayed surgery (between 3 and 15 days after admission) and elective surgery (after 15 days).* ***Results:*** *There were 98 patients in the early surgery group, 46 in the delayed surgery group and 48 in the elective surgery group. The number of Hanson's criteria present was between 3 and 5 in 58.2% of the cases in the early surgery group and in 54.3% of the cases in the delayed surgery group, whereas 62.5% of the cases in the elective surgery group had 0-2. APACHE II score was in the 6-10 range in 43.9% of the cases in the early surgery group and in 39.1% of the cases in the delayed surgery group, whereas 66.7% of the cases in the elective surgery group had between 0 and 5. The most frequent operations in the early and delayed surgery groups was cholecystectomy, common bile duct exploration, and T-tube placement (60.2% and 69.6%, respectively), whereas it were laparoscopic cholecystectomy in the elective surgery group (66.7%). Pancreatitis-releated complication rates in the early, delayed and elective surgery groups were 20.4%, 17.4% and 8.3%, respectively. Mortality rates were 5.1% and 4.3% in the early and delayed surgery groups, respectively. There was no deaths in the elective surgery group.* ***Conclusion:*** *In biliary pancreatitis, surgery should not be considered as a primary option until the resolution of the pancreatic inflammation and its systemic effects. It should be employed only when the clinical picture does not ameliorate in spite of conservative treatment.*

Key words: Biliary pancreatitis, early surgery, delayed surgery, elective surgery

Amaç: *Biliyer pankreatit nedeniyle cerrahi geçiren hastaların sonuçlarını cerrahi tedavinin zamanlamasına göre değerlendirmek.* ***Yöntem:*** *Ocak 1990-Arahk 1999 tarihleri arasında Erciyes Üniversitesi, Genel Cerrahi Kliniğinde biliyerpankreatit nedeniyle 192 hasta operasyona alındı. Hastalar retrospektif olarak; erken (hastaneye başvurudan sonraki ilk 72 saatte), geç (3 ile 15 gün arasında) ve elektif (15 günden sonra) cerrahi uygulanan hastalar olmak üzere üç gruba ayrıldı.* ***Bulgular:*** *Erken cerrahi grubunda 98, geç cerrahi grubunda 46 ve elektif cerrahi grubunda 48 hasta bulunmakta idi. Erken ve geç cerrahi gruplardaki hastaların sırasıyla %58.2 ve %54.3'ünde Ranson değerleri 3 ile 5 arasında iken, elektif cerrahi grubundaki hastaların %62.5'inde O ile 2 arasında tespit edildi. APACHE II skorları erken cerrahi grubundaki hastaların %43.9'unda ve geç cerrahi gruplardaki hastaların %39.1'inde 6 ile 10 arasında iken, elektif cerrahi grubundaki hastaların %66.7'sinde O ile 5 arasında bulundu. En sık uygulanan cerrahi işlem erken ve geç cerrahi gruplarında kolesistektomi, koledok eksplorasyonu ve T-tüp yerleştirilmesi (sırasıyla %60.2 ve %69.6), elektif cerrahi grubunda ise laparokopik kolesistektomi idi (%66.7). Pankreatite bağlı komplikasyon oranları erken, geç ve elektif cerrahi grupları için sırasıyla %20.4, %17.4 ve %8.3 olarak tespit edildi. Mortalite oranları erken ve geç cerrahi grupları için sırasıyla %5.1 ve %4.3 iken elektif cerrahi grubunda hiçbir hasta kaybedilmedi. Sonuç: Biliyer pankreatitte pankreasdaki inflamasyon geçene ve pankreatitin sistemik etkileri düzelene kadar cerrahi düşünülmemesi, eğer klinik düzelme olmuyorsa acil cerrahiye başvurulması uygun yaklaşımdır.*

Anahtar kelimeler: Biliyer pankreatit, erken cerrahi, geç cerrahi, elektif cerrahi

INTRODUCTION

Acute pancreatitis is a well-recognized complication of cholelithiasis which develops in approximately 8 of patients with gallstones (1). The clinical course of acute pancreatitis is usually self-limited and relatively benign. However, adverse outcomes can occur and a mortality approaching 9% has been reported (2). Overall, the prognosis ofbiliary pancreatitis appears to be worse when gallstone impaction in the papilla persists, or when cleared it recurs. For this reason, it is generally accepted that the excess morbidity associated with biliary pancreatitis can be best controlled by

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removing the gallbladder and clearing any residual calculi from the biliary system. Although this intervention is generally accepted, there continues to be disagreement regarding the timing of surgery. Those who support emergency intervention believe that the progression of pancreatitis can be interrupted by the prompt relief of obstruction at the ampulla of Vater (3, 4). Others recommend delaying surgery until the acute attack has subsided and then performing cholecystectomy during the same hospitalization (5-7). Not surprisingly, a selective approach that incorporates both viewpoints has gradually evolved (8). The main objective of the selective approach is to apply conservative treatment until the resolution of symptoms and to perform surgery during the first hospitalization. However, if resolution is not achieved with conservative treatment, urgent surgery is reserved for patients. Routine use of the selective approach has been reported to decrease morbidity due to biliary pancreatitis and symptomatic recurrences (8, 9). In this study, we summarized the results of the patients who underwent surgery for biliary pancreatitis, with respect to the timing of the operation.

MATERIALS AND METHODS

The records of the patients who were treated for acute pancreatitis between January 1990 and December 1999 at the Erciyes University School of Medicine were retrospectively evaluated. During this period, 192 patients underwent surgery for biliary pancreatitis. Of the 192 patients, early surgery (within 72 hours after admission) was performed in 98 patients (51%), delayed surgery (between 3 days and 15 days after admission) in 46 (24%) and elective surgery (after 15 days) in 48 (25%). The following data were collected from the records: age, gender, laboratory findings, Ranson's criteria, Acute Physiology and Chronic Health Evaluation (APACHE) II score, organ failure, operations performed, intensive care unit (ICU) and hospital stay, pancreatitis-related complications and mortality. APACHE II scores were assessed at the initial admission for acute pancreatitis.

Statistical Analysis: Student's t test was used for statistical treatment of continuous variables and chi-square analysis was applied to all discrete variables. Statistical significance was defined as $p<0.05$. Where appropriate, each value was expressed as mean ± SEM.

RESULTS

The characteristics of the study population are given in Table 1. Biliary pancreatitis was diagnosed more commonly in women than men (ratio, 1.7:1), and the total group had a mean age of 52 years (range, 20 to 88 years). There was no significant difference between the study groups regarding age and sex. The number of Ranson's criteria present was between 3 and 5 in 58.2 % of the cases in the early surgery group and in 54.3% of the cases in the delayed surgery group, whereas 62.5% of the cases in the elective surgery group had 0-2. APACHE II score was in the 6-10 range in 43 cases (43.9%) in the early surgery group and in 39.1% of the cases in the delayed surgery group, whereas 32 cases (66.7%) in the elective surgery group had scores between 0 and 5. The APACHE score was >16 in 17.3% of the cases in the early surgery group and in 8.7% of the cases in the delayed surgery group. In the early surgery group, nine patients (9.2%) had two organ failures and three (3.1%) had multiple organ failure (MOF). In the delayed surgery group, three patients (6.5%) had two organ failures. MOF was not diagnosed in the delayed and elective surgery groups.

The most frequent operation in the early and delayed surgery groups was open cholecystectomy,

Table 1. Characteristics and prognostic scores of the patients

	Early surgery group (n=98)	Delayed surgery group (n=46)	Elective surgery group (n=48)
Age (years)	51.4 ± 4.7	52.2 ± 3.7	54.1 ± 5.2
Sex (female/male)	55/43	32/14	33/15
Ranson's criteria			
0-2	35 (35.7)	18 (39.2)*	30 (62.5)
3-5	57 (58.2)	25 (54.3)	17 (35.4)
≥ 6	6 (6.1)	3 (6.5)	1 (2.1)†
APACHE II score			
0-5	25 (25.5)	12 (26.1)*	32 (66.7)
6-10	43 (43.9)	18 (39.1)	14 (29.2)
11-15	13 (13.3)	12 (26.1)	2 (4.1)†
≥ 16	17 (17.3)	4 (8.7)	-
Organ failure			
One	25 (25.5)	12 (26.1)	8 (16.7)¶
Two	9 (9.2)	3 (6.5)	-
Multiple	3 (3.1)	-	-

*p<0.05 versus early and elective surgery groups
†p<0.01 versus early and delayed surgery groups
¶p<0.05 versus early and delayed surgery groups

Table 2. Details of operations in patients with biliary pancreatitis. Data are expressed as number (%) of patients

	Early surgery group (n=98)	Delayed surgery group (n=46)	Elective surgery group (n=48)
Laparoscopic cholecystectomy	-	2 (4.3)	32 (66.7)*
Open cholecystectomy	19 (19.4)	9 (19.6)	8 (16.6)
Open cholecystectomy and t-tube placement	59 (60.2)	32 (69.6)	6 (12.5)*
Cholecystectomy and sphincteroplasty	20 (20.4)†	3 (6.5)	2 (4.1)

*p<0.01 versus early and delayed surgery groups
†p<0.01 versus delayed and elective surgery groups

common bile duct exploration, and t-tube placement (60.2% and 69.6%, respectively), whereas it was laparoscopic cholecystectomy in the elective surgery group (66.7%) (Table 2). Cholecystectomy and sphincteroplasty were performed in 20 patients in the emergency surgery group (20.4%), in three patients in the delayed surgery group (6.5%) and in two patients in the elective surgery group (4.2%). Endoscopic retrograte cholangiopan Ereatograpy (ERCP) was performed in 17 cases (8.9%): Four patients in the delayed surgery group and 13 in the elective surgery group. Four of these patients (23.5%) had no stones in the common bile duct. Endoscopic stone extraction was achieved in nine of the other 13 cases (69.2%). Intraoperative cholangiography was performed in all of the open-era patients and in 11 (32.4%) of the patients who underwent laparoscopic cholecystectomy.

Pancreatic abscess developed in 3 patients in the early surgery group (3.1%) and in two patients in the delayed surgery group (4.3%); percutaneous drainage was performed in all cases. Pancreatic fistula developed in two patients in the early surgery group (2%) and in one patient in the elective surgery group (2.1%); these fistulae closed spontaneously after an average period of 20.7 days (range; 17-26 days). The most frequent complication-pseudocyst formation-occurred in 14 patients: nine patients in the emergency surgery group (9.2%), three patients in the delayed surgery group (6.5%) and two patients (4.2%) in the elective surgery group. Pancreatitis-releated complication rates in the early, delayed and elective surgery groups were 20.4%, 17.4% and 8.3%, respectively. Overall mortality was 5.1% and 4.3% in the early and delayed surgery groups, respectively; there was no death in the elective surgery group. The mean intensive care and hospital stay periods were 10.2/16.9, 7.6/21.2 and 5.1/22.3 days, respectively (Table 3).

Table 3. Morbidity, mortality, intensive care and hospital stay. Data are expressed as number (%), or mean ±SEM.

	Early surgery group (n=98)	Delayed surgery group (n=46)	Elective surgery group (n=48)
Morbidity	20 (20.4)*	8 (17.4)	4 (8.3)
Mortality	5 (5.1)	2 (4.3)	-
Intensive care stay (days)	10.2 ±0.8	7.6 ± 1.8	5.1 ± 0.3
Hospital stay (days)	16.9 ± 2.1	21.2 ± 1.7	22.3 ± 1.9

* p<0.01 versus delayed and elective surgery groups

DISCUSSION

Acute pancreatitis is characterized by acute abdominal pain, elevated pancreatic enzyme levels in the blood and increased excretion of these enzymes in the urine. Biliary pancreatitis is caused by the migration of biliary calculi or impaction of a stone at the ampulla of Vater. In most patients, the diagnosis can be made with acceptable accuracy by clinical, radiological and laboratory findings. Many authors consider the constellation of abdominal pain, nausea, elevated amylase levels and radiologically confirmed biliary calculi adequate for the diagnosis of acute biliary pancreatitis (5,8). Still, the variability in the course of the disease complicates the diagnosis, and laparotomy may be required to rule out an extrapancreatic condition in 5% of the cases (10). The multiple biochemical parameters and/or investigations, which are performed to assess the course of the disease and evaluate the severity of pancreatitis, have prognostic significance. Although many modifications have been proposed, the original Ranson's criteria is still widely used. In a study on the relationship between Ranson's criteria and mortality in acute pancreatitis, mortality was 2% in the presence of 0-2 signs , 15% with 3-4 signs, 40% with 5-6 signs and 100% with 7-8 signs (11). APACHE II scoring system has also been widely used in acute pancreatitis. Wilson et al, in the analysis of 160 patients, have reported

that none of the patients with scores below 10 died (12). Contrast-enhanced computerized tomography (CT) is used to obtain objective information on the extent of the inflammatory process and the degree of pancreatic necrosis (13). These prognostic scores reflect the course of the patient and the response to medical treatment, and also provide clues for determining the timing of surgery. In this study, the severity of the disease was assessed by Hanson's criteria and APACHE II scoring system. The early surgery group rated worst and the elective surgery group rated best. The need for mechanical ventilation: nutritional support and intensive care treatment correlated with these results.

There are five general indications for surgery in biliary pancreatitis; diagnosis, treatment of pancreatitis, treatment of specific complications, amelioration of ongoing pancreatitis, and prevention of recurrence of pancreatitis. According to the general consensus, the increased morbidity due to biliary pancreatitis can be best controlled by cholecystectomy and removal of the stones in the bile duct (10,14,15). If common bile duct stones are detected, these should be removed, and stones impacted in the ampulla should be extracted. Urgent removal of common bile duct stones has been advocated in patients with acute pancreatitis, although confusion and controversy still surround the optimal management of acute biliary pancreatitis. Acosta et al. published the first report on early surgery (3). In this study, 86 patients with acute pancreatitis were treated nonoperatively, and the mortality was 16% and the mean hospital stay was 25 days. In contrast, in the 46 cases undergoing cholecystectomy, common bile duct exploration, and transduodenal sphincteroplasty, the mortality was 2% and the mean hospital stay was 13 days. In contrast, Ranson et al. reported that early surgery causes a dramatic increase in mortality (6). In a controlled, randomized study on early surgery and nonoperative approach, Stone et al. found mortality rates of 2.8% and 0%, respectively (4). Kelly et al. have reported that early surgery in the first 48 hours in acute biliary pancreatitis decreases the mortality and complication rates from 15.1% and 30.1%, respectively, to 2.4% and 5.1% (7). Performing delayed cholecystectomy six weeks later, after the resolution of pancreatitis with conservative treatment, seems to be a logical approach. Delayed cholecystectomy may usually be performed safely because inflammation regresses. Another advantage of the delayed operation is that cholecystectomy may be performed laparoscopically. Ön the other hand, it must be kept in mind that delayed cholecystectomy is associated with a 20-23% rate of recurrent pancreatitis (10,16). In this study, early surgery was performed in 98 patients (51%), delayed surgery in 46 (24%) and elective surgery in 48 (25%). Pancreatitis-related complication rates in the early, delayed and elective surgery groups were 20.4%, 17.4% and 8.3%, respectively. Mortality was 5.1% and 4.3% in the early and delayed surgery groups, respectively; there was no death in the elective surgery group.

Recently, endoscopic sphincterotomy (ES) has gained wide acceptance as a treatment for common bile duct stones. Presently it is used in most patients with bile duct stones and also in patients with gallstone pancreatitis (17-20). Liu et al. reported that in patients with clinically diagnosed biliary pancreatitis, emergency and early ERCP was successful in 95% of the cases. Choledocholithiasis was diagnosed in 69%, and ES was performed in all with a morbidity of 3% (21). Another advantage of ERCP and ES is the possibility of early laparoscopic cholecystectomy. After an average period of severi days following clearance of common bile duct stones by ERCP, laparoscopic cholecystectomy may be performed successfully in 70-80% of the cases (17,20,22). However, ERCP should be performed when the possibility of Choledocholithiasis is high because unnecessary ERCP increases the cost and prolongs hospital stay. Moreover, ERCP itself may precipitate pancreatitis. Some authors argue that combination of selective ERCP and laparoscopic cholecystectomy is an effective treatment for biliary pancreatitis, but concur that the number of preoperative ERCP examinations should be decreased (18), In our study, ERCP was performed in 17 patients; stones were detected in 13 patients, and endoscopic extraction was possible in nine patients (69.2%).

In conclusion, the published results and our retrospective analysis show that in biliary pancreatitis, surgery should not be considered as a primary option until the resolution of the pancreatic inflammation and its systemic effects. It should be employed urgently if the clinical picture does not ameliorate in spite of conservative treatment. Early ERCP and ES are beneficial in cases in whom Choledocholithiasis is strongly suspected.

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