ORIGINAL ARTICLE

Outcome of Pancreatic Necrosectomy for Infected Pancreatic Necrosis in Terms of Perioperative Mortality

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ABSTRACT

Aim: To determine the outcome of pancreatic necrosectomy for infected pancreatic necrosis in terms of perioperative mortality at Shaikh Zayed Postgraduate Medical Institute.

Methods: This descriptive case series study was carried out in the Department of General Surgery at Shaikh Zayed Postgraduate Medical Institute, Lahore for six months. The Non-probability consecutive sampling technique was used to include patients. Informed consent was taken from all the patients. Basic information of all patients was recorded. The subject patients went through a clinical assessment to determine history of their previous illness. The level of their illness i.e. severity was examined usingRanson's score ≥ 3. Closed continuous lavage of the lesser sac and retroperitonium technique was used to operate all patients. Dead tissue was removed and necrotic tissue was unbridled, material of pus was cleared, surgical procedures like cholecystectomy and jejunostomy were carried out for enteral feeding in all cases. To clear debris and presence of amylase, drain system was used to close abdomen and continuous efflux was performed after operation until it was noted that effluent has become clear of above mentioned substances. Due to the sensitivity factor of necrotic tissue, antibiotic therapy was initiated after operation. Surgical records were obtained and subject patients were monitored for over 30 days after their surgery. All the gathered data was catalogued on a precisely designed research Performa. SPSS version 16 was used to analyze all the sample data.

Results: In this study total 50 cases were enrolled, the mean age of the patients was 44.18±8.57 years and the male to female ratio of the patients was 2.5:1. The mortality occurred in 13(26%) patients. sepsis was found in 6(12%) cases, multiple organ failure was noted in 4(8%) cases and hemorrhage was found in 3(6%) cases.

Conclusion: According to our study the mortality occurred in 26% patients after open surgery of infected pancreatic necrosis.

Keywords: Pancreatic Necrosis, Mortality, Outcome, Perioperative, Necrosectomy

INTRODUCTION

Acute pancreatitis can be defined as a sudden inflammation of pancreas that may further affect peri-pancreatic tissue and/or other organs of body. Annually 210,000 new acute pancreatitis cases arise in the United States. It is estimated to be the 3rd most prevalent gastrointestinal disease needing clinical treatment[1]. There are almost 17 new cases per 100,000 of acute pancreatic necrosis in USA. The mortality rate related to complications of acute pancreatitis is almost 2000 patients per annum[2]. Three characteristics indicate presence of acute pancreatitis: 1) Upper abdominal discomfort and pain, Amylase and lipase level increased up to 3 times of normal level, and characteristic abnormalities of pancreas in CT scan[3].

It has been noted that oedematous interstitial inflammation is also present in almost 85% of cases of acute pancreatitis in mild form which is self restricting and disappears in a short period. But it also observed in severe form in almost about 15-20 % patients[4].

Complexities involved are peripancreatic fluid collections, pancreatic and peri pancreatic necrosis, infected pancreatic necrosis, pseudo cyst, pancreatic abscess, pancreatic fistula, pancreatic ascities[5]. Pancreatic necrosis may also cause exocrine and endocrine insufficiency leading to chronic morbidity[6].

As the time passed, the standards for clinical prediction of severity acute pancreatitis have evolved gradually. The Ranson criteria, from 1974, and the Acute Physiology and Chronic Health Evaluation (APACHE) II system are bridling and almost 48 hours are needed after the initiation of acute pancreatitis to get a complete clinical score[1]. Ranson's signs ≥ 3, APACHE II score ≥ 8, C- reactive protein level > 150 mg/dl, complete failure of organ systems and characteristic of local complexities indicate severity of acute pancreatitis[7]. CT scan of retroperitoneal gas and positive cultures of necrotic fine needle aspirates are used frequently to diagnose pancreatic necrosis.

Primary treatment of severe necrotizing pancreatitis involve a stable management[4]. A research study held in Pakistan reports mortality rate of patients who were operated with surgery for infected pancreatic necrosis is 38.9%[8]. International research conducted in year of 2003 reports mortality rate with open surgery of pancreatitis was 47%[9] but contrary to that, it was reported that the mortality rate in 2007 was found to be 12%[10]. As reported by Bello B, the mortality rate was 20% in patients operated with open surgery for necrotic pancreatitis[11].

The purpose of our research study is solely to determine the mortality rate in patients that carry out open surgery for pancreatic necrosectomy. There is still some controversy in the studies published previously. Furthermore, only one local study has been carried out so far in Pakistan. This study was conducted to determine the frequency of mortality and to generate current results for our population. If high mortality is noted surgeons could be guided to search for an alternative method to deal with acute pancreatitis.

The objective of the study was to determine the outcome of pancreatic necrosectomy for infected pancreatic necrosis in terms of perioperative mortality at Shaikh Zayed Postgraduate Medical Institute.

MATERIAL AND METHOD

This descriptive case series study was carried out in the Department of General Surgery at Shaikh Zayed Postgraduate Medical Institute, Lahore during a period of six months after approval of synopsis. Sample size of 50 cases is calculated with 95% confidence level, 12% margin of error with expected mortality rate of open necrosectomy i.e., 20%. Non-probability consecutive sampling technique was used.

Inclusion criteria:

- Age 20 to 70 years
- Both sexes.
- Proven pancreatic necrosis detected on CECT (Contrast Enhanced Computed Tomography), which is evident by non-enhancement of pancreas and retroperitoneal gas.
- The severity of disease is evaluated according to Ranson's score ≥ 3.

Exclusion Criteria:

- Patients with sterile pancreatic necrosis responding to conservative management

Data Collection Procedure: After the approval from Ethical Committee of the Hospital, written informed consent was taken from 50 patients, who fulfilled inclusion criteria was admitted in the department of General Surgery through Out-Patient, accident and emergency at ShaikhZayed Postgraduate Medical Institute, Lahore. Basic information of all patients was recorded. The subject patients went through a clinical assessment to determine history of their previous illness. The level of their illness i.e. severity was examined using Ranson's score ≥ 3. Closed continuous lavage of the lesser sac and retroperitonium technique was used to operate all patients. Dead tissue was removed and necrotic tissue was unbridled, material of pus was cleared, surgical procedures like cholecystectomy and jejunostomy were carried out for enteral feeding in all cases. To clear debris and presence of amylase, drain system was used to close abdomen and continuous efflux was performed after operation until it was noted that effluent has become clear of above mentioned substances. Due to the sensitivity factor of necrotic tissue, antibiotic therapy was initiated after operation. Surgical records were obtained and subject patients were monitored for over 30 days after their surgery. All the gathered data was catalogued on a precisely designed research Performa. SPSS version 16 was used to analyze all the sample data.

Operational Definition

Mortality: Death of the patient within 30 days of the surgical procedure.

Infected Pancreatic Necrosis: It refers to the bacterial or fungal contamination within the necrotic pancreatic tissue which is evident on CT scan by non enhancement of pancreas and retroperitoneal gas.

Data analysis Procedure: All the data was entered and processed in SPSS version 16. Quantitative variables like age, were presented by using mean±S.D. Qualitative variables like sex, and mortality were recorded and processed by using frequencies and percentages. Data was stratified for age, gender, post-operative sepsis, multiple organ failure and hemorrhage. Post stratification chi square test was applied at p-value <0.05 as significant.

RESULTS

In this present study total 50 cases were enrolled. The mean age of the patients was 44.18±8.57 years with minimum and maximum ages of 22-65 years respectively. In this study 72% patients were males and 28% patients were females. The male to female ratio of the patients was 2.5:1. The study results showed that the mortality occurred in 13(26%) patients and it was not occurred in 37(74%) patients. The study results showed that the sepsis was found in 6(12%) cases and it was not found in 44(88%) cases.In our study the multiple organ failure was noted in 4(8%) cases and it was not noted in 46(92%) cases. In this study the hemorrhage was found in 3

(6%)cases and it was not found in 94% cases. The study results showed that the mortality occurred in 13 cases, in which 3 cases had age below 40 years and 10 had age above 40 years, sepsis was found in 6 cases in which 1 cases had age below 40 and 5 had above 40 years, multiple organ failure was found in 4 cases and hemorrhage was noted in 3 cases in which all the 3 cases had age below 40 years. Statistically there is insignificant difference was found between the mortality, sepsis, multiple organ failure and hemorrhage with age. i.e., p-value=0.320, 0.387, 1.000, 1.000 respectively. The study results showed that the mortality occurred in 13 cases, in which 10 cases were males and 3 were females, sepsis was found in 6 cases in which 4 cases were males and 2 were females, multiple organ failure was found in 4 cases and hemorrhage was noted in 3 cases in which all the 3 cases were males. Statistically there is insignificant difference was found between the mortality, sepsis, multiple organ failure and hemorrhage with sex. i.e., p-value=0.734, 1.000, 1.000, 0.550 respectively.

Table 1: Descriptive statistics of age (years)

Age (years)	n	50
	Mean	44.18
	SD	8.57
	Minimum	22
	Maximum	65

Table 2: Frequency distribution of outcome

		Frequency	%age
Mortality	Yes	13	26.0
	No	37	74.0
Sepsis	Yes	6	12.0
	No	44	88.0
Multiple organ failure	Yes	4	8.0
	No	46	92.0
Hemorrhage	Yes	12	6
	No	38	94

DISCUSSION

Necrotizing pancreatitis is a frequent cause of morbidities and mortalities. The indications and timing for its surgical management are controversial issues. Acute pancreatitis is considered as mild and cures without any complications. But necrotic pancreatitis is a different case and is found to be in 10–20% of acute pancreatitis patients.[12] Among those patient of necrotic pancreatitis, 40%-70% of patients with necrotising pancreatitis have infected necrosis, which definitely worsens the treatment[13]. Surgical necrosectomy through laparotomy is considered as the “gold standard” therapy of symptomatic acute pancreatic necrosis, in spite of its postoperative mortality frequency of 20–40% and morbidity rate of 78%[14,15].

In our research study the average age of the patients was 44.18±8.57 years and male to female ratio was 2.5:1. According to our study the mortality occurred in 13(26%) patients and it was not occurred in 37(74%) patients. Some of the studies are discussed here showing the same frequency of mortality as in our study.

One study demonstrated that average Ranson's score of 5, indicating a mortality rate of 40%. Furthermore, APACHE II scores of (8.9±5.6) also indicated pancreatic disease[16].

HW Harris et al[17] showed mortality rate observed in their study was only 14% in spite the severity level of pancreatitis, as shown by various test scores. Current literature suggests a low mortality rate of 14%.

A study by Abdul Rehman Alvi et al revealed that the overall mortality rate was 9/47(19.7%), in infected Acute Necrotic Pancreatitis cases and also in postoperative patients mortality was 7/18 (38.9%). The patients that underwent early pancreatic necrosectomy had increased duration of hospitalization. Furthermore complications were more severe and there was statistically significant increase in in-hospital mortality[8]. International research conducted in year of 2003 reports mortality rate with open surgery of pancreatitis was 47%[9]but contrary to that, it was reported that the mortality rate in 2007 was found to be 12%[10]. As reported by Bello B, the mortality rate was 20% in patients operated with open surgery for necrotic pancreatitis.[11] Early surgery for pancreatitis is shown to be related with increased morbidity and mortality rate in other studies[18,19].

The comparison of early necrosectomy (within 72 hours from the initiation of acute pancreatitis) with a late necrosectomy (after 12 days of AP) was only randomised trial that was terminated before completion because of a high mortality rate in late necrosectomy group (58% vs. 27%)[20]. Moreover, Besselink et al[21]. Found that low mortality rate of 8% in necrosectomy done at least 30 days since the initiation of pancreatitis. The largest series of study data of endoscopic necrosectomy was reported by a German group from the multicentre trial GEPARD[22] Out of ninety-three patients with acute pancreatitis, endoscopic necrosectomy was successful in 80% of the patients. Overall mortality rate and morbidity rate was 7.5% and 26%, respectively.

Beger and associates[23] reported a mortality rate for patients with necrotizing pancreatitis of 37%, and in the study by Mier and co-workers, almost half of the patients with necrotizing pancreatitis died during the study period (47%)[20].

Based on these studies it was believed by many researchers that it contributes to a very high mortality rates .[24, 25]C Fernández-del Castillo et al[26] concluded in their study that the unbridling of pancreatic necrosis after closed packing and efflux is associated with a low mortality rate and reduced rates of complications and second surgical procedures. HG Beger et al[27] described in their study that Hospital mortality rate was 8·4 per cent. Necrosectomy and continuous postoperative lavage can achieve high survival rates in patients with necrotizing pancreatitis.

CONCLUSION

As per our research study the mortality happened in 26% cases after open surgery for infected pancreatic necrosis. Thus after this research study we finally proof that is a local evidence and now on the premise of this information, we are presently ready to suggest that some surgical changes ought to be done or some different strategies ought to be embraced to additionally decrease the rate of intraoperative mortality in such critical cases.

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