


# Evaluation of Patients with Exploratory Laparotomy for Acute Abdomen with Intraoperative Finding of Acute Pancreatitis

Bashar Akram Abed(DGS,CABS)<sup>1</sup>, Duraid Jameel Kareem (DGS,CABS)<sup>2</sup>, Nazar Saleh Ibrahim  (FIBMS)<sup>3</sup>  
<sup>1,2,3</sup> General surgeon, Department of Surgery, Baquba Teaching Hospital, Diyala, Iraq

## Abstract

### OPEN ACCESS

**Correspondence Address:** Bashar Akram Abed  
General surgeon, Department of Surgery, Baquba Teaching Hospital ,Diyala , Iraq

**Email:** [dr\\_basharakram1976@yahoo.com](mailto:dr_basharakram1976@yahoo.com)  
**Copyright:** ©Authors, 2021, College of Medicine, University of Diyala. This is an open access article under the CC BY 4.0 license(<http://creativecommons.org/licenses/by/4.0/>)  
**Website:** <https://djm.uodiyala.edu.iq/index.php/djm>

**Received:** 18 September 2021  
**Accepted:** 31 October 2021  
**Published:** 25 April 2022

**Background:** Acute pancreatitis (AP) is one of the main causes of acute abdomen that requires hospitalization and multidisciplinary management. The spectrum of the disease is wide with variable presentations that mimic the clinical features of other acute illnesses. Occasionally the diagnosis of AP is only made at laparotomy, especially when there is doubt in the preoperative diagnosis.

**Objective:** To evaluate the findings during exploratory laparotomy for patients with acute abdomen and were diagnosed as cases of AP intraoperatively, and to determine the postoperative outcome during the follow up period for these patients.

**Patients and Methods:** A retrospective study performed at the Department of General Surgery- Baquba Teaching Hospital- Diyala- Iraq, from January 2011 to December 2020. Thirty-three patients (16 male and 17 female) were included, all patients had history of acute abdomen with unknown cause preoperatively, in spite of doing the available preoperative investigations, and were found to have acute pancreatitis intraoperatively. A standardized data collection form was completed and analyzed for each patient.

**Results:** The patients' ages ranged from 8 to 75 years with a mean age of 40.2 years. The majority of the patients were found to have pancreatic oedema (66.67%), followed by hemorrhagic pancreatitis (15.15%), pancreatic necrosis (12.12%) and pancreatic tumours that presented as acute pancreatitis (6.06%). During the follow up period 13 patients (39.39%) recovered with no complications while 20 patients (60.6%) developed one or more complication mainly surgical site infections in 18.18% of patients, pancreatic pseudocyst (15.15%), death (15.15%), ascites (9.1%), chronic pancreatitis (6.1%), pleural effusion (6.1%), while ileus, ARDS, DIC and acute renal failure occurred in (3%) for each.

**Conclusion:** AP is an important cause of acute abdomen that is associated with severe mortality and morbidity and a high index of suspicion is needed to avoid the frequent misdiagnosis. Despite of rapid advances in the diagnostic strategy, still exploratory laparotomy is indicated in some cases to reach a sound diagnosis although such intervention is undesirable and might increase the postoperative morbidity and mortality.

**Keywords:** acute abdomen, acute pancreatitis, explorative laparotomy, postoperative complications.

## Introduction

Acute pancreatitis (AP) is one of the main causes of acute abdomen and one of the most common gastrointestinal disorders requiring acute hospitalization and multidisciplinary management worldwide [1,2] with reported annual incidence of 10-80 cases per 100000 persons in different countries based on environmental features and lifestyle [2-5]. The disease may occur at any age, though it is rare in childhood [2, 6].

AP has various aetiologies, most frequent biliary and alcoholic [1, 5, 7-9], that lead to early activation of digestive enzymes inside acinar cells, with varying compromising of the gland itself, nearby tissues and other organs [2], the spectrum of the disease is wide and according to the recent revised Atlanta classification [10, 11] there is a mild form (interstitial edematous pancreatitis) without organ failure, local or system complications, and usually self-limiting (accounting for 80-85% of cases), moderately severe AP (local complications without persistent organ failure), and severe AP that is associated with development of persistent organ failure. A fourth class of severity, critical AP, is described in the determinant-based classification [10,12] when both infected necrosis and persistent organ failure are present together. The disease is potentially life threatening with mortality rate of about 10-30% for severe cases [7, 13-16].

The diagnosis of AP requires 2 of 3 features: 1) severe, constant upper abdominal pain usually of sudden onset that radiates to the back; 2) elevation of serum amylase and / or lipase to greater than three folds of normal upper limit and 3) characteristic findings on imaging [1, 2, 9, 17]. Still, because of the

variable presentation and similarity of the clinical features of AP to a number of other acute illnesses, even an experienced clinician can be mistaken [18].

While this is not desirable, occasionally the diagnosis of AP is only made at laparotomy, especially when there is doubt in preoperative diagnosis and a perforated or a gangrenous viscus can not be excluded [8, 9, 19-21].

The aim of this study was to evaluate the findings during exploratory laparotomy for patients with acute abdomen and were diagnosed as cases of AP intraoperatively, and determine the postoperative outcome during the follow-up period for these patients

## Patients and Methods

A retrospective study performed at the Department of General Surgery- Baquba Teaching Hospital- Diyala- Iraq, from January 2011 to December 2020. The medical records of patients who had emergency exploratory laparotomy were reviewed. The excluded patients were those with a history of trauma and those with preoperatively known causes of acute abdomen as AP, visceral perforations, vascular occlusions or bowel obstruction. Only 33 patients (16 male and 17 female) were included in our study, all these patients had history of acute abdomen with unknown cause preoperatively, in spite of doing the available preoperative hematological and biochemical investigations and imaging, and were found to have AP intraoperatively. The diagnosis of AP was done intraoperatively by one or more of the findings suggesting the diagnosis as a localized or generalized collection of fluid, which could be blood-

stained, omental or mesenteric fat necrosis or pancreatic edema or necrosis. Samples of fluids and involved tissues were taken for histopathology confirmation.

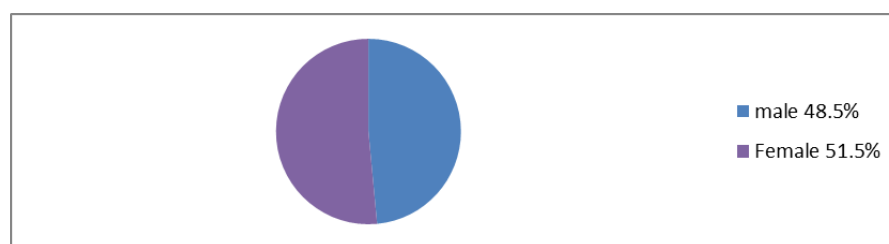
A standardized data collection form was completed for each patient, including demographic data, patients' presentation and duration of symptoms, medical, surgical, drug, family and social history, operative findings, postoperative hospital stay, outcome and histopathology results.

### Statistical analysis

Results and outcomes of all patients included in this study were collected on a specific questionnaire and an Excel Microsoft 2010 program was used for data analysis.

### Results

In this study, 33 patients were included, 16 male (48.5 %) and 17 female (51.5%), as shown in Figure(1).



**Figure (1):** patients' distribution according to the gender

The patients' ages ranged from 8 to 75 years, with the majority in the 4<sup>th</sup> and the 5<sup>th</sup>

decade, and a mean age of 40.2 years as shown in Table (1).

**Table (1):** Distribution of patients according to the age

Age (years)	-10	11-20	21-30	31-40	41-50	51-60	61-70	71-	Total
No. of patients	1	4	2	9	10	3	2	2	33
%	3%	12.1%	6.1%	27.3%	30.3%	9.1%	6.1%	6.1%	

All patients presented with abdominal pain, which was generalized and vague in 20 patients and mainly epigastric in 13 patients. 22 patients had nausea and vomiting while

fever was observed in 20. The duration of symptoms ranged from 1 to 7 days with a mean of 4.5 days. Table 2 shows the patients' symptoms.

**Table (2):** The patients' symptoms

Symptoms	No. of patients (%)
generalized and vague pain	20 (60.6%)
Epigastric pain	13 (39.4)
Nausea and vomiting	22 (66.7%)
Fever	20 (60.6%)

Hematological and biochemical investigations were done to all the patients as complete blood count, blood sugar level, blood urea and serum creatinine and the

findings were non-specific. Serum lipase and amylase were not done to all patients as these investigations were not available in the emergency unit all the time. Preoperative

abdominal ultrasound was done for 21 patients, while preoperative CT scan was done for 4 patients only as shown in Table(3).

**Table (3):** Preoperative imaging findings in our patients

Imaging	Findings	No. of patients
Abdominal ultrasound	Free fluid in peritoneal cavity	13
	No pathological findings	7
	Dilated bowel loops	1
Abdominal CT scan	No pathological findings	3
	Free fluid in peritoneal cavity	1

Explorative laparotomy was done on all patients and AP was suggested intraoperatively. Table (4) shows the gross pathological findings in this study. The majority had pancreatic oedema in 22/33 (66.67%), followed by hemorrhagic

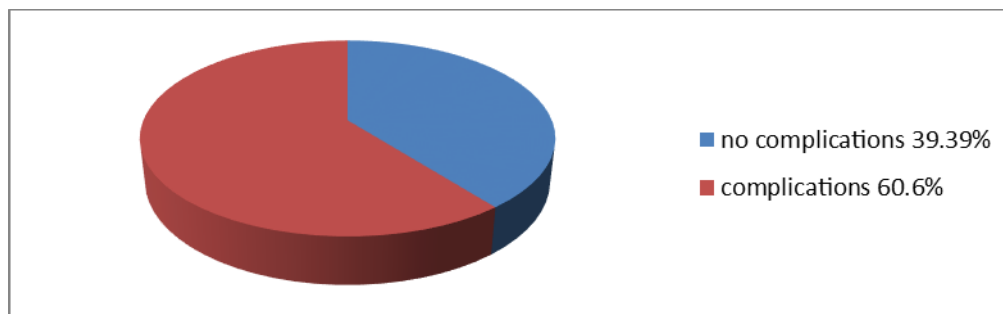
pancreatitis in 5/33 (15.15% of patients). While pancreatic necrosis was seen in 4/33 patients (12.12%) and 2 (6.06%) patients had pancreatic tumours that presented as acute pancreatitis.

**Table (4):** The gross pathological findings intraoperatively

Finding	No.	%
Pancreatic oedema	22	66.67 %
Hemorrhagic pancreatitis	5	15.15 %
Necrosis	4	12.12 %
Tumour	2	6.06 %

The postoperative hospital stay ranged between 12 – 18 days with a mean of 14.6 days. During the follow-up period, which was for 6 months for the majority of patients, 13 patients (39.39%) recovered with no

complications while 20 patients (60.6%) developed one or more complications. Figure (2) shows the percentage of patients who developed complications postoperatively.



**Figure (2):** The percentage of patients who developed complications postoperatively

Among those who had complications, 6 patients (18.18%) had surgical site infections, 5 patients (15.15%) developed pancreatic pseudocyst, death occurred in 5 patients

(15.15%), ascites occurred in 3 patients (9.1%), chronic pancreatitis developed in 2 patients (6.1%), pleural effusion developed in 2 patients (6.1%), while ileus, ARDS, DIC

and acute renal failure occurred in one patient (3%) for each complication. Table (5) shows

the number and percentage of patients who had postoperative complications in this study.

**Table (5):** the number and percentage of the patients who had postoperative complications

Complication	No. of patients	%
Surgical site infections	6	18.18%
Pancreatic pseudocyst	5	15.15%
Death	5	15.15%
Ascites	3	9.1%
Chronic pancreatitis	2	6.1%
Pleural effusion	2	6.1%
Ileus	1	3%
ARDS	1	3%
DIC	1	3%
Acute renal failure	1	3%

### Discussion

AP is one of the main causes of acute abdomen worldwide that occurs in both genders and at any age [1, 2, 6]. In this study 33 patients were included, 16 male (48.5 %) and 17 female (51.5%) and these findings are in accordance with the studies of Nesvaderani M [22] who found that 49.4 % of patients were male and 50.4% were female, the study of Haroon ur Rashid [3] in which 60.9 % were female and 39.1% were male and Maryam Nesvaderani [16] in whom AP had an equal distribution between males and females with a median age at 50 (range 16-95 years). While Alkareemy [1], found that 60 % of patients were male and 40% were female. The patients' age ranged from 8 to 75 years with a mean age of 40.2 years in our study, while the median age at which the disease occurred was 50 (range 16- 95 years) in the study of Maryam Nesvaderani [16] and in the study of Alkareemy [1] the mean age of the patients was 50.96 years.

Pancreatitis is quite a large spectrum disease ranging from mild to severe and critical presentation [3, 7, 10-16] and even as cases of acute abdomen with unexplained

cause and because of the danger of misdiagnosing pancreatitis, awareness of unusual presentation is paramount [17, 23].

Despite the availability of multiple guidelines, there are still challenges in the management of cases of AP (24, 25), but the initial treatment remains primarily medical with intensive organ support [2]. Although, the indications for surgery are heavily debated upon and depend on the experience and preference of the interdisciplinary team [20], still exploratory laparotomy may be needed especially when there is doubt in preoperative diagnosis and a perforated or a gangrenous viscus can not be excluded [8, 9, 19-21]. Early surgery might cause further significant morbidity and mortality in these severely ill patients, often with multiorgan failure [2, 4, 20, 21]. In our patients surgical intervention was done due to lack of proper preoperative diagnosis as our patients presented with non-specific acute abdomen or a perforated or a gangrenous viscus could not be excluded due to shortage of investigations or lack of CT scan imaging in emergency setting as these modalities increase the accuracy of preoperative



diagnosis that may avoid unnecessary laparotomy.

Postoperatively 39.39% of our patients recovered smoothly with no postoperative complications, while Haroon ur Rashid [3] found that 67.7 % of the patients had no significant morbidity.

Postoperative complications were observed in 60.6% of our patients, and some of them had developed more than one complication. This incident is in accordance with the study of Karakayali FY [2] who found that surgery for AP is a morbid procedure associated with complications in 34% to 95% of patient, while Maryam Nesvaderani [16] found that the morbidity rate was 8% only, which is significantly lower than our results.

The most common postoperative complication in our study was surgical site infection in 18.18% of patients, while pancreatic pseudocyst occurred in 15.15% of cases, ascites in 9.1%, chronic pancreatitis and pleural effusion in 6.1% for each and ileus, ARDS, DIC and acute renal failure occurred in 3% of patients for each complication. Karakayali FY [2] reported that pancreatic pseudocyst incidence ranged from 5% to 16 % and was higher in patients with underlying chronic pancreatitis. Haroon ur Rashid [3] found that 14.9% developed pleural effusion, 13 % had ascites, 6.8% developed pancreatic pseudocyst and acute renal failure. Multiple organ failure and shock occurred in 1.2 % of cases for each complication.

In this study, the postoperative mortality rate was 15.15%. This figure approximated the study of Karakayali FY [2] who reported mortality rate of 11% to 39%, while our result was much higher than that reported by

Maryam Nesvaderani [16] (1% mortality rate) and Haroon ur Rashid [3] who found that the mortality rate was 3.7%.

These differences in postoperative morbidity and mortality could be explained partially by the underlying cause of AP, the patients' comorbidities and the level of postoperative care.

In this study, the postoperative hospital stay ranged between 12 – 18 days with a mean of 14.6 days, while the median length of stay for the patients in the study of Maryam Nesvaderani [16] was 4 days (range 1-106).

## Conclusions

AP is an important cause of acute abdomen that is associated with severe mortality and morbidity and a high index of suspicion is needed to avoid the frequent misdiagnosis. Despite of rapid advances in the diagnostic strategy, still exploratory laparotomy is indicated in some cases to reach a sound diagnosis although such intervention is undesirable and might increase postoperative morbidity and mortality.

## Recommendations

For any patient with suspected AP or non-specific acute abdomen, serum amylase and lipase should be done with the possible need to do abdominal CT scan to exclude AP and avoid unnecessary laparotomy. The necessary tests such as serum amylase and lipase and imaging modality such as abdominal US and CT scan should be available in the emergency units.

**Source of funding:** The research was funded by ourselves and there is no other funding cover this study or manuscript preparation and publication.

**Ethical clearance:** The project for this study was taken from the College of Medicine/ University of Diyala ethical committee.

**Conflict of interest:** Nil

**References**

[1]Alkareemy EAR, Ahmed LAW, El-Masry MA, Habib HA, Mustafa MH. Etiology, clinical characteristics, and outcomes of acute pancreatitis in patients at Assiut University Hospital. *Egypt J Intern Med* 2020; 32:24. [PMID] [CrossRef].

[2]Karakayali FY. Surgical and interventional management of complications caused by acute pancreatitis. *World J Gastroenterol* 2014; 20(37): 13412-13423. [PMID] [CrossRef]

[3]Haroon ur Rashid , Ihtasham Muhammad Ch, Ahmad Raza, Muhammad Asghar, Hamid Rasheed Goreja , Saba Maqsood. Experience of managing acute pancreatitis in a surgical unit of a tertiary care hospital. *Journal of Rawalpindi Medical College*2019; 23(3): 159-163.

[4]Simon P Young, Jonathan P Thompson. Severe acute pancreatitis. *Continuing Education in Anaesthesia, Critical Care & Pain* 2008; 8 (4):125-28.

[5]Bradley EL, Dexter ND. Management of severe Acute pancreatitis. *A Surgical Odyssey. Ann Surg* 2010; 251: 6–17. [PMID] [CrossRef]

[6]Ibrahim MM, Gabr K, Abdulrazik M, Fahmy H, El-Booq Y. Acute pancreatitis in children: an experience with 50 cases. *Annals of Pediatrics Surgery* 2011, 7:72–75.

[7]Leppäniemi A, Tolonen M, Tarasconi A, Segovia-Lohse H, Gamberini E, Kirkpatrick AW, Ball CG, Parry N, Sartelli M, Wolbrink D, van Goor H, Baiocchi G, Ansaloni L, Biffi

W, Coccolini F, Di Saverio S, Kluger Y, Moore E, Catena F. 2019 WSES guidelines for the management of severe acute pancreatitis. *World J Emerg Surg.* 2019;14:27.[PMID] [CrossRef]

[8]Assi AN, Al Saaedi FG, Kadeem MK. Explorative laparotomy versus conservative management in acute pancreatitis. *Thi-Qar Medical Journal (TQMJ)* 2011; 5(1): 12-17.

[9]Beyer G, Simon P, Mayerle J, Lerch MM. Mistakes in the management of acute pancreatitis and how to avoid them. *UEG Education* 2016; 16: 27–30.

[10] Vege SS, DiMagno MJ, Forsmark CE, Martel M, Barkun AN. Initial Medical Treatment of Acute Pancreatitis: American Gastroenterological Association Institute Technical Review. *Gastroenterology.* 2018;154(4):1103-1139. [PMID] [CrossRef]

[11]Banks PA, Bollen TL, Dervenis C. Classification of acute pancreatitis—2012: revision of the Atlanta classification and definitions by international consensus. *Gut* 2013; 62:102–111. [PMID] [CrossRef]

[12]Dellinger EP, Forsmark CE, Layer P. Determinantbased classification of acute pancreatitis severity: an international multidisciplinary consultation. *Ann Surg* 2012; 256:875–880. [PMID] [CrossRef]

[13]Kapoor S, Singh D, Chander R. To study the utility of Modified Glasgow Score and CT Severity Score in acute pancreatitis-a clinical study. *J Adv Med Dent Sci Res* 2018; 6:114–117.

[14]Wei AL, Guo Q, Wang MJ, Hu WM, Zhang ZD. Early complications after interventions in patients with acute pancreatitis. *World J Gastroenterol.* 2016 Mar 7;22(9):2828-2836. [PMID] [CrossRef]

- [15]Alberts C, Alsfasser G. Severe Acute Pancreatitis - How Conservative Can We Be? *Visc Med.* 2018;34(6):432-434. [PMID] [CrossRef]
- [16]Nesvaderani M, Eslick GD, Vagg D, Faraj S, Cox MR. Epidemiology, aetiology and outcomes of acute pancreatitis: A retrospective cohort study. *Int J Surg.* 2015;23(Pt A):68-74. [PMID][CrossRef]
- [17]Omar Nadhem, Omar Salh. Acute Pancreatitis: An Atypical Presentation. *Case Rep Gastroenterol* 2017; 11:359–63.
- [18] C D Johnson, M G Besselink, R Carter. Acute pancreatitis. *BMJ* 2014; 349:g4859 doi: 10.1136/bmj.g4859.
- [19]Alfred Cuschieri, Abdool Rahim Moossa. Disorders of the pancreas. In: Alfred Cuschieri, George B Hanna, eds. *Essential Surgical Practice Higher Surgical Training in General Surgery.* 5<sup>th</sup> ed. Boca Raton, FL: CRC Press; 2015.
- [20]Satyajit Bhattacharya. The Pancreas. In: NS Williams, PR O’Connell, AW McCaskie, eds. *Bailey and Love’s Short Practice of Surgery.* 27th ed. Boca Raton, FL: CRC Press; 2018.
- [21]Navadgi S, Pandanaboyana S, Windsor JA. Surgery for Acute Pancreatitis. *Indian J Surg.* 2015;77(5):446-52. [PMID] [CrossRef].
- [22]Nesvaderani M, Eslick GD, Vagg D, Faraj S, Cox MR. Epidemiology, etiology and outcomes of acute pancreatitis: a retrospective cohort study. *Int J Surg* 2015; 23:68–74. [PMID] [CrossRef]
- [23]Zafar W, Chaucer B, Davalos F, Nfonoyim J: Scrotal swelling and normal lipase, a rare presentation of acute pancreatitis. *Am J Emerg Med* 2016; 34:763. [PMID] [CrossRef]
- [24]Greenberg J A, Hsu J, Bawazeer M, Marshall J, Friedrich J O, Nathens A, Coburn N, May GR, Pearsall E, McLeod RS. Clinical practice guideline: management of acute pancreatitis. *Canadian Journal of Surgery.* 2016; 59(2):128-140. [PMID] [CrossRef]
- [25] J Werner, S Feuerbach, W Uhl, M W Bu’chler. Management of acute pancreatitis: from surgery to interventional intensive care. *Gut* 2005; 54:426–436. [PMID] [CrossRef].



**تقييم مرضى حالات البطن الحاد المشخصين كحالات التهاب البنكرياس الحاد أثناء العملية**د.بشار أكرم عبد<sup>١</sup>، د.دريد جميل كريم<sup>٢</sup>، د.نزار صالح إبراهيم<sup>٣</sup>**المخلص**

**خلفية الدراسة:** يعتبر التهاب البنكرياس الحاد من الأسباب الرئيسية لحالات البطن الحاد التي تحتاج إلى عناية طبية خاصة من قبل فريق طبي متكامل مع دخول المريض إلى المستشفى. يمتاز هذا المرض بأعراض متشعبة مشابهة لأمراض أخرى مما يصعب من التشخيص المبكر وأحيانا لا يتم التشخيص إلا أثناء عملية فتح بطن استكشافي.

**اهداف الدراسة:** لتقييم ووصف ما تم إيجاده أثناء عملية فتح البطن الاستكشافي ومعرفة المضاعفات المحتملة جراء مثل هذا التداخل.

**المرضى والطرائق:** أجريت الدراسة بأثر رجعي في قسم الجراحة - مستشفى بعقوبة التعليمي - ديالى - العراق للفترة من كانون الثاني ٢٠١١ إلى كانون الأول ٢٠٢٠ حيث تم اختيار ٣٣ مريض (١٦ ذكر و ١٧ أنثى) من حالات البطن الحاد غير معروفة الأسباب (بالرغم من إجراء التحاليل و الفحوصات المتوفرة في ردهات الطوارئ) وتم تأكيد إصابتهم بالتهاب البنكرياس أثناء العملية.

**النتائج:** تراوح أعمار المرضى ما بين ٨ إلى ٧٥ عام و بمعدل ٤٠،٢ سنة. أظهرت الدراسة بأن غالبية المرضى الذين تم تشخيصهم أثناء العملية كان لديهم وذمة في البنكرياس (٦٦،٦٧%) تلاها التهاب البنكرياس ألنزفي (١٥،١٥%) ، نخر البنكرياس (١٢،١٢%) أو ورم البنكرياس (٦،٠٦%). في فترة المتابعة، ١٣ مريضا (٣٩%، ٣٩) تعافوا بدون أي مضاعفات. بينما ٢٠ مريض (٦٠،٦%) حصلت لهم واحد أو أكثر من مضاعفات التهاب البنكرياس كالتهاب الجرح (١٨،١٨%) ، تكيس كاذب في البنكرياس (١٥،١٥%) ، وفاة (١٥،١٥%)، استسقاء اليريتون (٩،١%) ، التهاب البنكرياس المزمن (٦،١%) و استسقاء الصدر (٦،١%).

**الاستنتاجات:** يعد التهاب البنكرياس الحاد من الأسباب المهمة لحالات البطن الحاد والتي تكون مصحوبة بمضاعفات متعددة وخطيرة ومن ضمنها الوفاة وعليه يجب الحذر من خطورة عدم التشخيص وبالرغم من التطور والتقدم في وسائل التشخيص المبكر فان بعض الحالات يتم التشخيص أثناء عملية فتح البطن الاستكشافي والتي تكون مصحوبة بمضاعفات خطيرة و نسب عالية من الوفاة بعد التداخل الجراحي .

**الكلمات المفتاحية:** حالات البطن الحاد، التهاب البنكرياس الحاد، عملية فتح البطن الاستكشافي، مضاعفات ما بعد العملية

البريد الإلكتروني: [dr\\_basharakram1976@yahoo.com](mailto:dr_basharakram1976@yahoo.com)

تاريخ استلام البحث: ١٨ ايلول ٢٠٢١

تاريخ قبول البحث: ٣١ تشرين الاول ٢٠٢١

٣،٢،١ مستشفى بعقوبة التعليمي - ديالى - العراق