

# “Imaging Of Fluid Collections In Acute Pancreatitis In Accordance With Revised Atlanta Classification And It’s Impact On Patient’s Prognosis”

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## ABSTRACT-

Pancreatic fluid collections (PFCs) are seen in up to 50% of cases of acute pancreatitis. The Revised Atlanta classification categorized these collections on the basis of duration of disease and contents, whether liquid alone or a mixture of fluid and necrotic debris. Management of these different types of collections differs because of the variable quantity of debris; while patients with pseudocysts can be drained by straight-forward stent placement, walled-off necrosis requires multi-disciplinary approach. Differentiating these collections on the basis of clinical severity alone is not reliable, so imaging is primarily performed. CECT is the commonly used modality for the diagnosis and assessment of proportion of solid contents in PFCs; Magnetic resonance imaging (MRI) performs better than CT in characterization of pancreatic/ PFCs especially for quantification of solid debris and fat necrosis, and is an alternative in those situations where CT is contraindicated. Magnetic resonance cholangiopancreatography is highly sensitive for detecting pancreatic duct disruption and choledocholithiasis. Endoscopic ultrasound is an evolving technique with higher reproducibility for fluid-to-debris component estimation with the added advantage of being a single stage procedure for both diagnosis and management in the same sitting.

**Keywords:** Endoscopic ultrasound, Pancreatic fluid collections, Acute necrotic collections, Acute peripancreatic fluid collections, Pseudocysts, Walled-off necrosis

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## I. Introduction

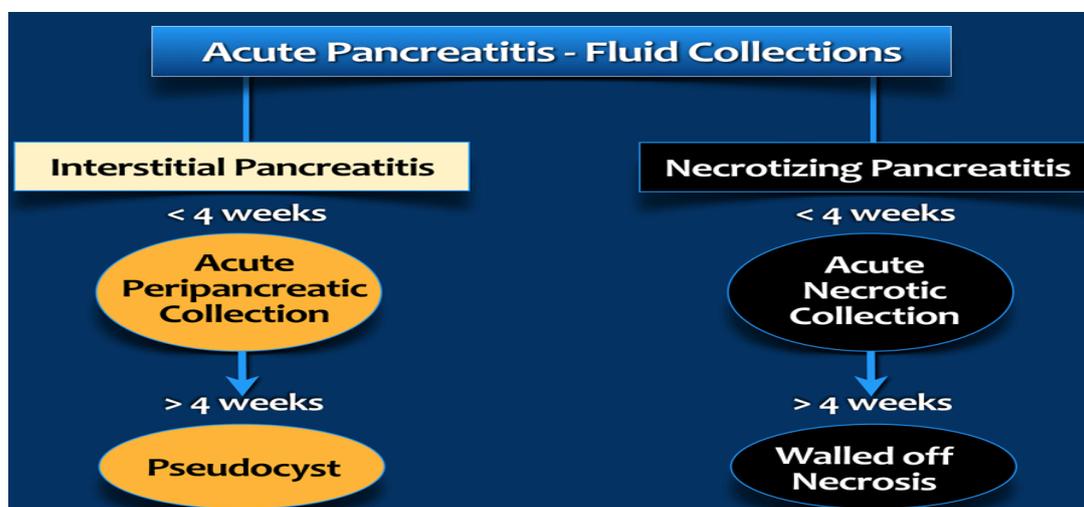
Acute pancreatitis is a common clinical condition of variable severity with some patients experiencing mild self-limiting pancreatic inflammation to pancreatic necrosis with life-threatening sequelae. <sup>(1)</sup> . An excessive systemic inflammatory response syndrome (SIRS) leading to multiorgan failure has been stated to be the primary cause of morbidity and mortality in this condition <sup>(1)</sup> . Severe acute pancreatitis tends to have a fulminant clinical course with recent diagnostic and therapeutic progress having remarkably decreased the mortality rate. It is important to evaluate the severity of pancreatitis at an early stage and initiate early treatment at a center with adequate facilities. This has been made possible by assessing severity with laboratory /clinical severity scores and contrast enhanced computed tomography findings <sup>(2)</sup> . Early assessment of patients with acute pancreatitis with contrast enhanced CT and grading the severity of pancreatitis based on CT findings has shown a good sensitivity in predicting outcomes with pancreatic necrosis being a specific indicator of morbidity and mortality <sup>(3)</sup> .

CT severity index has proved to be useful in assessing the severity of acute pancreatitis, it takes into account changes in pancreatic morphology, peripancreatic changes and extent of pancreatic necrosis and score ranges from 0 to 10 . In 2004 , modified CT severity index was introduced to overcome the potential limitations of CTSI and it incorporates extrapancreatic complications in the assessment simplifies the evaluation of the

extent of pancreatic parenchymal necrosis (none,  $\leq 30\%$ , or  $> 30\%$ ) and peripancreatic inflammation (presence or absence of peripancreatic fluid)<sup>(4)</sup>

Revision of the Atlanta classification of acute pancreatitis by international web based consensus provides clarity to classify acute pancreatitis using easily identified clinical and radiological criteria. The revisions have proposed two distinct phases of acute pancreatitis consisting of early (first week) phase in which clinical parameters are important for treatment planning and are determined by systemic inflammatory response syndrome and a late phase ( after first week )where morphological CT criteria are combined with clinical criteria . Grading of severity has been done based on organ failure and local/systemic complications as mild acute pancreatitis, moderately severe acute pancreatitis and sever acute pancreatitis.

Fluid collections have been given a special importance in the revision with a distinct classification into four types of fluid collections depending on content, degree of encapsulation and time. This involves classification into acute peripancreatic fluid collection of less than four weeks duration which evolve into pseudocysts after four weeks and acute necrotic collection ( parenchymal or extrapancreatic ) which evolve into walled off necrosis after four weeks . It also recognizes that clear distinction of the above entities may be difficult in certain cases with only CECT and the collection may be indeterminate and may require other modalities in addition. There is also specific mention of infected necrosis with infection being suspected by patients clinical course or presence of gas on imaging and confirmation by aspiration <sup>(5)</sup>.



#### **AIMS AND OBJECTIVES-**

- 1.To classify the fluid collections in acute pancreatitis in accordance with 2012 revised Atlanta classification .
- 2.To assess what influence this classification of fluid collections has on patients clinical course and outcome .

#### **II. Materials And Methods**

A prospective study to assess the fluid collections developing during the course of acute pancreatitis. This study has been performed for 15 months in Department of Radiodiagnosis ,GEMS & Hospital ,Srikakulam, Andhra Pradesh.

#### **Inclusion criteria:**

1. All patients with clinically suspected acute pancreatitis.
2. CECT showing fluid collections in conjunction with changes of acute pancreatitis.

#### **Exclusion criteria:**

1. Patients who do not give consent.
2. Patients with acute pancreatitis in whom CT contrast cannot be given ( foreg .history of allergy to contrast ,elevated creatine when dialysis cannot be done )

#### **STUDY PROTOCOL:**

- 1.CT TECHNIQUE :The study shall be done on 16slice multidetector CT , Plain CT abdomen, IV non-ionic contrast 350mg of iodine at the rate of 3-4ml/sec with triphasic study of abdomen

### III. Results

**Table 1:** Type of collection

Type of collection	Numbers	Percentage
Pseudocyst	24	49
Won	25	51
Total	49	100

In the present study Pancreatitis resulted in formation of Pseudocyst in 51% and Walled off necrosis in 49% of total study population

**Table 2:** Modified CT Severity Index

MTCSI	NUMBERS	PERCENTAGE
Mild [0-2]	0	0
Moderate [4-6]	15	31
Severe [8-10]	34	69
TOTAL	49	100

In this present study 31% of study population had moderate of pancreatitis and 69% had severe pancreatitis

**Table 3:**Types of Collection vs Organ failure

TYPE OF COLLECTION	ORGAN FAILURE		TOTAL
	YES	NO	
PSEUDOCYST	2[8.3%]	22[91.7%]	24
WON	14[56%]	11[44%]	25
TOTAL	16[32.7%]	33[67.3%]	49

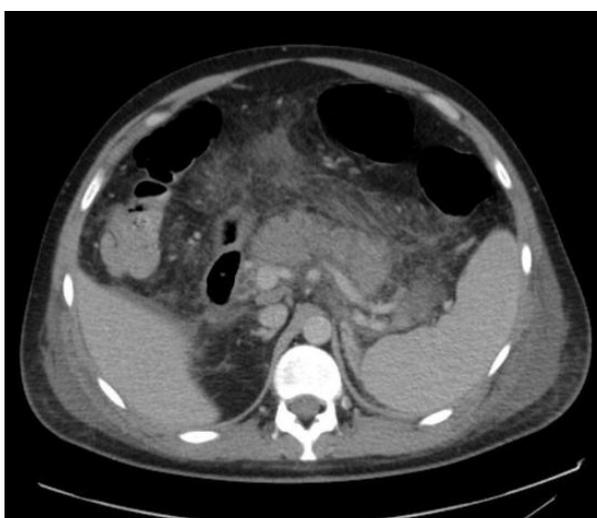
In the present study significant statistical correlation was seen in between the organ failure and walled off necrosis

**Table 3:** Types of Collection vs OUTCOME

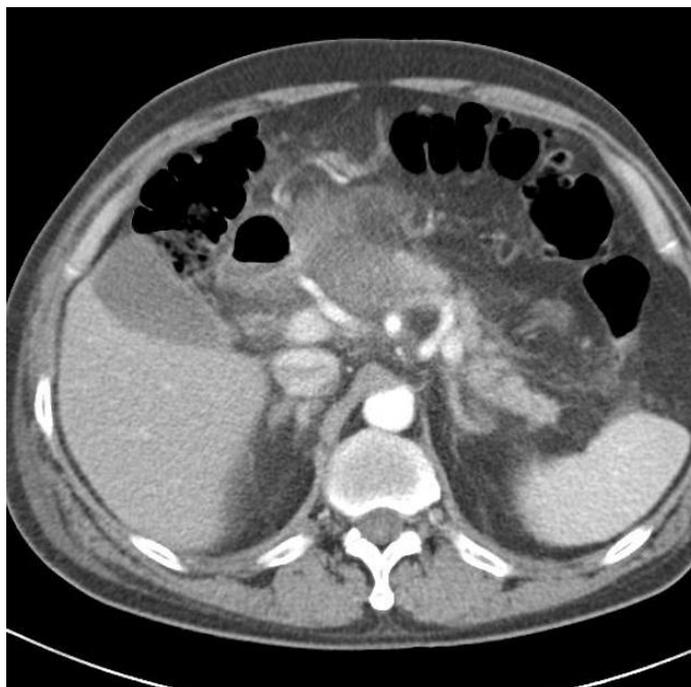
TYPE OF COLLECTION	OUTCOME		TOTAL
	YES	NO	
PSEUDOCYST	24[100 %]	0[0%]	24
WON	14[56%]	11[44%]	25
TOTAL	38[77.6%]	11[22.4%]	49

In this present study significant correlation was seen between the walled off necrosis and outcome

**Case1 :**Acute pancreatitis .the pancreas appears bulky swollen but does enhance uniformly and there is significant edema and peripancreatic fluid.Free fluid is seen tracking into pelvis.



**Case 2:** Bulky pancreas with marked retroperitoneal fat stranding . Lack of enhancement in head ,neck and proximal body are consistent with necrosis.



**Case 3:** A well defined rounded cystic lesion is seen occupying the pancreatic head.No enhancement of its wall and the pancreatic tissue and SMV stretched around the lesion.



#### **IV. Discussion**

In our prospective study of 49 cases of acute pancreatitis, determined on the basis of history, serum amylase levels and a CECT of the abdomen, the presence and size of peripancreatic fluid was evaluated in an early CT and the course of the peripancreatic fluid collection if any was followed up and was compared to the outcome parameters, in terms of presence of organ failure, presence of infection, duration of hospital & ICU stays and condition at discharge.

In our present study there is significant correlation between the walled off necrosis and the severity of the pancreatitis which was in concordance with the study by **Issenmanet al** which states that the pancreatic necrosis is associated with significant predictive value of the severity of acute pancreatitis.

**Balthazaretal** stated that the severity of pancreatitis occurs in 20%-30% of all patients with acute pancreatitis and is characterized by a protracted clinical course, multiorgan failure, and pancreatic necrosis. However in our study it was 69%

The walled off necrosis yielded statistically significant correlations with parameters such as presence of organ failure and outcome.

Of these, the highest correlation was of walled off necrosis which was found in patients with organ failure with 56% as compared to 8% in pseudocyst with a

p value of < 0.001 significance. Our study result was in concordance with the results showed by **Meyrignacet al** about high correlation of extrapancreatic volume with outcome and provided higher predictive values.

These findings suggest that estimation of type of collection with CECT, in the acute stages of onset of symptoms is crucial in the management and clinical course of the disease. The results were in concordance with the study by Balthazar et al who stated that early CT examination of patients with acute pancreatitis is a useful prognostic indicator of morbidity and mortality.

## V. Conclusion

Based on the CECT findings interpreted with revised Atlanta classification the present study showed 49% of the study population had pseudocyst and 51% of study population had walled off necrosis. Statistically significant correlation was found between walled off necrosis and the length of hospital and ICU stay, organ failure and outcome while no association was found between the size of the collection and the management of the peripancreatic collections.

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