ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 02 | February - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

SPECTRUM OF FINDINGS IN CONTRAST ENHANCED CT IN THE EVALUATION OF ACUTE PANCREATITIS

Radio-Diagnosis

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ABSTRACT

INTRODUCTION: Acute pancreatitis is an acute inflammatory disease of the pancreas characterized by autodigestion of the pancreatic parenchyma due to inappropriate intracellular activation of proteolytic pancreatic enzymes. The inflammatory process may be limited to the pancreas or can spread to surrounding tissues and the remote organs with resultant multiorgan failure or occasional death. Imaging with contrast-enhanced CT plays a vital role in the diagnosing, staging and evaluation of associated complications

AIM: To study the Spectrum of findings in CECT evaluation of Acute pancreatitis.

MATERIAL AND METHODS: 30 Subjects with CECT scan study of the abdomen carried out before and after injection of IV contrast medium by using on 128 slice SIEMENS SOMATOM Perspective CT scanner machine with patient in supine position were identified retrospectively with the diagnosis of acute pancreatitis in last 2 years presenting in emergency department fulfilling the following criteria:

1) Patients with history of acute abdominal pain clinically strongly suggestive of acute pancreatitis with at least three-fold increase in the serum amylase, lipase levels;

3) Characteristic imaging findings of acute pancreatitis.

RESULTS: According to Revised Atlanta Classification, acute interstitial pancreatitis was the most common(approx. 63.3 % of cases) morphological form. Pancreatic parenchyma was involved diffusely in about 73 % of cases, focal involvement was relatively less 36%. Grading of acute pancreatitis was done based on Modified CT severity index, in which mild pancreatitis was the most common finding. Moderate pancreatitis was seen in 23 % cases and severe pancreatitis in 30% of cases. Complications of acute pancreatitis were seen involving pancreas itself and tissue surrounding the pancreas. Most common pancreatic complication was peri-pancreatic fluid collection (56%) followed by peri-pancreatic necrotic collection. Pseudocyst formation was complication of interstitial pancreatitis (0.6%) and walled necrosis was complication of acute necrotic pancreatitis(1%).

Most common extra-pancreatic complications was pleural effusion (40%) followed by ascites.

Vascular complications included portal vein or splenic thrombosis with or without resultant splenic/liver infarcts.

ABBREVIATIONS: US-ultrasonography, CT-computed tomography, CECT- contrast enhanced computed tomography, MRI- magnetic resonance imaging,

KEYWORDS

Acute Pancreatitis, Interstitial Pancreatitis, Necrotizing Pancreatitis, Modified Ct Severity Score, Revised Atlanta Classification.

INTRODUCTION

Acute pancreatitis is an acute inflammatory disease of the pancreas characterized by autodigestion of the pancreatic parenchyma due to inappropriate intracellular activation of proteolytic pancreatic enzymes. The inflammatory process may be limited to the pancreas or can spread to surrounding tissues and the remote organs with resultant multiorgan failure or occasional death [1]. In patients with acute pancreatitis, Ultrasound (US) is the first-line imaging modality for the initial of the diagnosis of the disease and to find out the cause. But ultrasound has its own limitations in evaluation of its extent. Imaging with contrast-enhanced CT plays a vital role in the diagnosing, staging and evaluation of associated complications. Magnetic resonance imaging (MRI) has important role in the diagnosis of acute pancreatitis in patients with iodine allergies.

AIMS AND OBJECTIVES:

To study the Spectrum of findings in CECT evaluation of Acute pancreatitis.

MATERIALS AND METHODS:

30 Subjects with CECT scan study of the abdomen carried out before and after injection of IV contrast medium by using on 128 slice SIEMENS SOMATOM Perspective CT scanner machine with patient in supine position were identified retrospectively with the diagnosis of acute pancreatitis in last 2 years presenting in emergency department fulfilling the following criteria:

1) Patients with history of acute abdominal pain clinically strongly suggestive of acute pancreatitis with at least three-fold increase in the serum amylase, lipase levels;
3) Characteristic imaging findings of acute pancreatitis.

RESULTS:

According to Revised Atlanta Classification, acute interstitial pancreatitis was the most common(approx. 63.3 % of cases) morphological form. Pancreatic parenchyma was involved diffusely in about 73 % of cases, focal involvement was relatively less 36%.

Morphological classification according to Revised Atlanta Classification:

Serial no.	Morphological type	No. of cases	%of cases
1.	Acute interstitial pancreatitis	19	63.3%
2.	Acute necrotizing pancreatitis	11	36.6%

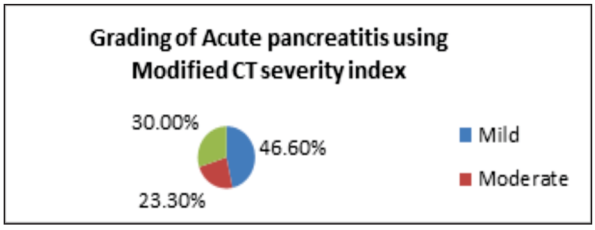
Involvement of pancreatic parenchyma:

Serial no.	Morphological type	No. of cases	% of cases
1.	Focal pancreatitis	8	26.6%
2.	Diffuse pancreatitis	22	73.3%

Grading of acute pancreatitis was done based on Modified CT severity index, in which mild pancreatitis was the most common finding. Moderate pancreatitis was seen in 23 % cases and severe pancreatitis in 30% of cases.

Grading of severity of Acute pancreatitis using Modified CT severity index:

Severity	Score	No. of cases	% of cases
Mild	0-2	14	46.6%
Moderate	4-6	7	23.3%
severe	8-10	9	30.0%



Complications of acute pancreatitis were seen involving pancreas itself and tissue surrounding the pancreas. Most common pancreatic complication was peri-pancreatic fluid collection (56%) followed by peri-pancreatic necrotic collection. Pseudocyst formation was

complication of interstitial pancreatitis (0.6%) and walled necrosis was complication of acute necrotic pancreatitis(1%).

Most common extra-pancreatic complications was pleural effusion (40%) followed by ascites.

Vascular complications included portal vein or splenic thrombosis with or without resultant splenic/liver infarcts.

Complications of Acute Pancreatitis:

Complications	No. of cases	% of cases
Pancreatic Complication:		
Acute peri-pancreatic collection	17	56.6%
Acute necrotic collection	10	33.3%
Pseudocyst	2	0.6%
Walled off necrosis	3	1.0%
Extra-pancreatic Complication:		
Ascites	11	36.6%
Pleural effusion	12	40.0%
Solid organ infarction	2	0.6%
Vascular complications: 1. Portal vein thrombosis 2.Splenic vein thrombosis	5 3	1.6% 1.0%
Inflammation of intestine 1.Thickening of bowel wall	3 2	1.0% 0.6%
2.Paralytic illeus		

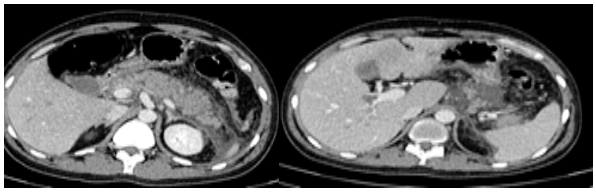


Fig 1a **Fig 1b**

Figure1a. Figure 1.a Axial section of abdomen in 30 year old male patient in venous phase showing diffusely bulky and heterogeneous pancreas with peripancreatic fat stranding.

Mild collections seen in peri-pancreatic region with mild thickening of Gerota's and lateral conal fascia seen on the left.

Figure 1b. Axial section of abdomen of same patient in venous phase showing partial thrombosis of portal vein in the form of patchy absent contrast opacification in main portal vein, near origin of right.

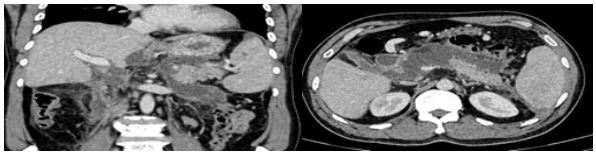


Fig 2a **Fig 2b**

Figure 2a . Axial section of abdomen in 32 year old male patient in venous phase showing

Figure2b. Axial section of abdomen in same patient venous phase showing hypodense filling defect noted in splenic vein consistent with splenic vein thrombosis with hypodense splenic infarct in upper pole of spleen.

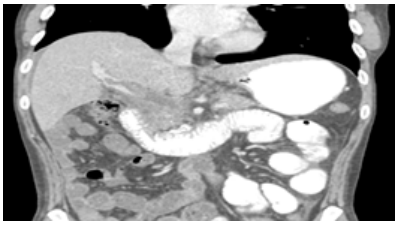


Figure 2c.

Figure2c. Axial section of abdomen in same patient venous phase showing hypodense filling defect noted in portal vein consistent with portal vein thrombosis.

Figure3. Axial section of abdomen in 41 year old male patient on venous phase showing a well defined loculated collection within the body of pancreas consistent with pancreatic pseudocyst.

DISCUSSION:

The study group consisted of 20 male and 10 female patients with a male: female sex ratio of 2:1 In a prospective study by Block et al., consisted of 61 (65.6%) males and 32 (34.4%) females with a male to female ratio of 2:1 [7].

Contrast-enhanced CT is the diagnostic modality of choice for the diagnosis and staging of acute pancreatitis [2]. The pancreas appears bulky and heterogenousy enhanced in acute interstitial pancreatitis and show central lnon-enhancing areas of necrosis on post contrast study in necrotic pancreatitis. Peripancreatic fluid collections consisting of exudate, fat tissue necrosis/hemorrhage [3].

Organized peripancreatic fluid collection having a fibrous wall occurring 4 weeks after the onset of symptoms is known as "pseudocyst" [4].

Nonenhancement of all or part of the pancreas is termed s"necrosis" [5] Pancreatic necrosis develops between 24 -48 hours after the onset of acute pancreatitis, therefore CT within the first 12 hours may be falsely reassuring [6].

Majority of the cases were categorized as mild pancreatitis according revised Atlanta classification. Acute interstitial pancreatitis was most common finding (approx. 63.3 % of cases) in this study.

The most common complication in this study was pleural effusion seen in 12 cases (40%). Balthazar et al., also found left pleural effusion as most common abnormality (43% of the cases) which is similar to the present study [8].

CONCLUSION:

Contrast enhanced CT is excellent diagnostic modality diagnosing the pancreatic necrosis and depict local complications as well as grading of severity of acute pancreatitis.

Modified CT severity index makes the score easier to calculate and also reduces the inter-observer variation in grading.

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