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Role of ultrasound in acute and chronic pancreatitis and its comparison with CECT

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Abstract

Pancreatitis is inflammation of the pancreas and has been considered the most common pancreatic disease in adults and children. Ultrasound imaging is first investigation to be performed. Ultrasound can be helpful in monitoring the evolution of fluid collections and in guiding diagnostic and therapeutic interventions. CT is considered as the gold standard investigation for acute pancreatitis. CT is highly accurate and more sensitive than USG in diagnosing and demonstrating the extent. Imaging has a significant role in detecting parenchymal abnormalities in chronic pancreatitis and ductal system. This study was conducted to determine the value of ultrasound imaging in pancreatitis patients and comparison of USG findings with CECT findings. The present prospective cross sectional study was conducted in Department of Radiodiagnosis GMC Bhopal from 1st October 2021 to 31st October 2022 on a total of 100 patients presented with clinical history and signs and symptoms of pancreatitis in emergency department who were then referred in our department for USG and CT examination. The study included 100 patients whose age ranged from 11 to 70 years in which 68 were males and 32 patients were females. Of both the sexes and all age groups, males in 41 to 50 years formed the bulk of study i.e. 23 patients.. Acute pancreatitis was diagnosed in 80 patients, chronic pancreatitis in 20 patients and acute on chronic pancreatitis were found in 14 patients. Pleural effusion being the most common complication (42%) followed by ascites (34%). Because of non-invasiveness and lack of radiation hazard, Ultrasound is initial investigation of choice in evaluation of pancreatitis. CECT can better delineate margins and extent of the gland, necrosis, calcification and extra pancreatic

complications than USG. CT is 80-90% accurate in the detection of pancreatic necrosis.

Keywords: Pancreatitis, Ultrasound, Computed Tomography, Necrosis, CT Severity Index. Pseudocyst, Walled off Necrosis, Calcification, MPD Dilatation.

Introduction

The pancreas is a soft, finely lobulated, elongated, J or retort shaped retroperitoneal organ (except tail region) mixed exocrine and endocrine gland. The exocrine part secretes digestive enzymes while endocrine part secretes hormones. It is located oblique horizontally on posterior abdominal wall at the level of L1 and L2 lumbar vertebrae.[1] Inferior vena cava, suprarenal abdominal aorta, splenic vein and left adrenal gland lies anterior to it while stomach lies posterior to it and separated from it by the lesser sac. [2,3] Pancreatitis is defined as the inflammation of the pancreas and has been considered the most common pancreatic disease in adults and children. It can be acute or chronic. Common causes of acute pancreatitis in adults are cholelithiasis or alcohol consumption; whereas trauma, viral infections and systemic diseases account for the majority of cases in children. In adults, alcohol consumption is commonest cause in majority (80%) of cases of chronic pancreatitis in developed countries; whereas malnutrition is the most common cause worldwide.[4] Modalities for imaging pancreas are plain x-ray, ultrasound, ERCP, Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and MRCP. Laboratory investigations and radiological imaging helps in making accurate diagnosis. Ultrasound imaging is progressively achieving a key role in assessing pancreas. It can diagnose pancreatitis and exclude other causes of abdominal pain. USG is used in the diagnosis and assessment of organs. Ultrasound is frequently the first investigation to be performed; although it has little value in evaluating the entire pancreatic parenchyma. Ultrasound can be helpful in monitoring the evolution of fluid collections and in guiding diagnostic and therapeutic interventions. Among the various imaging modalities, CT offers higher sensitivity and accuracy and is considered as the gold standard in diagnosing acute pancreatitis as is sensitive in evaluating pancreatic necrosis and extra-pancreatic complications. Computed Tomography (CT) is highly accurate, and more sensitive than USG in both diagnosing as well as demonstrating the extent.[5] Imaging has a significant role in detecting parenchymal abnormalities in chronic pancreatitis and ductal as well and helps in differentiating early from advanced phases. This study was conducted to determine the value of ultrasound imaging in pancreatitis patients and comparison of USG findings with CECT findings.

Materials and Methods

The present prospective cross sectional study entitled "Role of Ultrasound in acute and chronic pancreatitis and its comparison with CECT" was conducted in Department of Radio diagnosis GMC Bhopal from 1st October 2021 to 31st October 2022 on a total of 100 patients presented with clinical history and signs and symptoms of pancreatitis in emergency department who were then referred for USG and CT examination to the Department of Radio diagnosis after obtaining informed written consent for the same.

Diagnostic criteria

- Severe epigastric pain and tenderness
- Serum amylase/lipase ≥ 3 times the normal value.
- Imaging findings (USG and/or CT) suggesting acute pancreatitis.

Inclusion criteria

- Age: 10 to 50 years.
- Gender: Both

- Patients with complaints of abdominal pain or who are suspected or diagnosed of either pancreatitis based on clinical and laboratory findings with raised serum amylase & serum lipase.
- Already diagnosed cases of pancreatitis and referred to radiology department.
- Serum creatinine ≤ 1.5 mg/dl.

Exclusion criteria

- Patients not giving consent for the examination or study.
- Pregnant females
- Any previous pancreatic surgery.
- Elevated serum creatinine levels (>1.5 mg/dl)
- Congenital pancreatic lesion.
- Patients who are known case of neoplastic etiology.
- Patients having history of renal failure or insufficiency, allergic to iodinated contrast media.
- Patients less than ten years of age, trauma and post-operative patients.

Methodology-Questionnaire-Socio-demographic details entered in questionnaire. Laboratory investigation of serum amylase and lipase was done. Further ultrasound and CECT imaging was performed for every patient by the same examiner.

Trans abdominal USG- The abdomen was examined on the USG machine available in our department with a low frequency curvilinear transducer having a frequency range of 2-5 MHz.

CECT abdomen- All CT scans were performed CT scanner present in our department. All patients received 1000 ml of oral contrast material 45-60 minutes prior to study besides additional 200-250 ml of oral contrast was given just prior to scanning. The scanning was done in suspended expiration following hyperventilation. Dual phase CECT scan was performed using 1.5mg/kg of nonionic iodinated contrast media duly administered at a flow rate of 2.5ml/sec with pancreatic parenchymal phase at 40 sec and portovenous phase at 70 sec in adults whereas single portal venous phase performed in pediatric patients following non contrast scan.

Assessment of severity of acute pancreatitis on CT: The CTSI in acute pancreatitis devised by Balthazar et al 9 was used in this study. CTSI was created by combining the two prognostic indicators, grade and degree of acute pancreatitis. In grading system, patients with grades A-E of acute pancreatitis have been assigned zero to four points. Grade. In degree system, 0 point for no necrosis, 2 points for 30%, 4 points for 50% and 6 points for more than 50% of pancreatic necrosis. The Index was calculated by grade+ degree of necrosis points. Patients were divided into three categories: Mild (0-3 points), moderate (4-6 points) and severe (7-10 points).

(a) CTSI

Prognostic Indicator	Points
Normal pancreas	0
Diffuse or focal enlargement of the pancreas	1
Intrinsic pancreatic abnormalities with inflammatory changes in peri pancreatic fat	2
Single ill-defined collection or phlegm on	3
≥ 2 poorly defined collections or presence of air in or adjacent to the pancreas	4
Extent of pancreatic inflammation was assigned points from 0-4. The presence and extent of necrosis was classified into 4 categories and awarded points from 0-6.	

Necrosis	Points
None	0
</= 30%	2
30-50%	4

>/ =50%	6
Calculation of CTSI was by adding the above points in each case and the total score was then categorized as:	
Mild pancreatitis	CTSI Score 0-3
Moderate pancreatitis	CTSI Score 4-6
Severe pancreatitis	CTSI Score 7-10

(b) Modified CTSI

Prognostic indicator		Points
Pancreatic inflammation	Normal pancreas	0
	Intrinsic pancreatic abnormali¬ties ± inflamma¬tory changes in peripancreatic fat	2
	Pancreatic or peripancreatic fluid collection or necrotic peripancre¬atic fat	4
Pancreatic Necrosis	None	0
	<30%	2
	>30%	4
Extra pancreatic complications	One or more of the following: Ascites, pleural effusion, vascular complications, parenchymal complications, or gastroin-testinal tract involvement	2
The Modified mortele CTSI was calculated by summing these values and acute pancreatitis was then categorized as:		
Mild pancreatitis		MCTSI score 0-2
Moderate pancreatitis		MCTSI score 4-6
Severe pancreatitis		MCTSI score 8-10

Statistical analysis

Statistical analysis was done after collecting all necessary data and using proper statistical methods. Data was compiled using MS Excel and analyzed using IBM SPSS software version 20. Descriptive and inferential statistics was applied. Diagnostic accuracy, sensitivity, specificity, NPV and PPV for USG were calculated and expressed as percentage.

Results and Discussion

In current study, the patients were examined by USG using curvilinear probe in transverse and longitudinal planes. All the patients were followed up for a CT scan examination who were diagnosed pancreatitis, in whom clinical examination, laboratory parameters and USG examination (Even if suboptimal) favored pancreatitis. The findings of present study are described as under:

Table 1: Various causes of pancreatitis

	Males(n= 68)		Females(n= 32)	
Causes	No. of cases	%	No. of cases	%
Gall Stones	10	10	25	25
Alcohol	48	48	0	-
Hypertriglyceridemia	5	5	1	1
Idiopathic	5	5	5	5
Drug induced	0	-	1	1
Total	68	68	32	32

Gall stones and alcohol consumption were found to be the most common etiological factors in adults. However, blunt abdominal trauma was most common cause in pediatric patients. The causes of acute pancreatitis are illustrated in Figure 1.

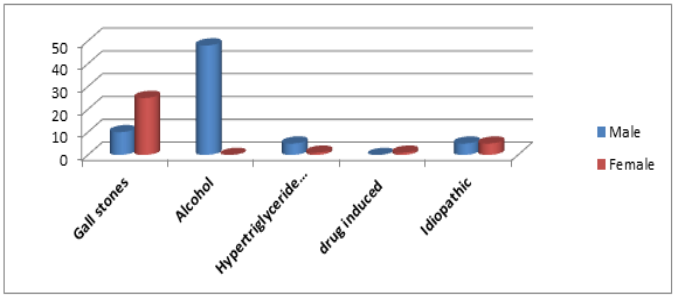


Figure 1: Various causes of pancreatitis

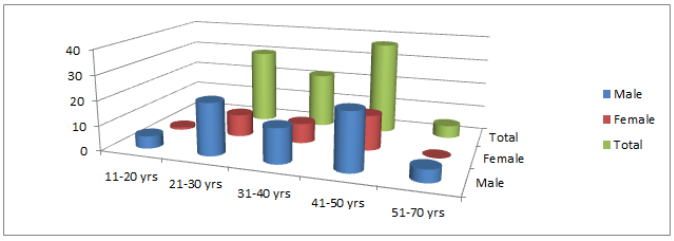
In our study, most common etiological factors were alcoholism (48%) and cholelithiasis (35%) followed by idiopathic (10%), hypertriglyceridemia (6%) and drug induced (1%) (Table1; Figure1).A prospective study was done by Silverstein et al on 102 patients to determine role of USG and CT scan in pancreatitis. Silverstein et al study had 57 patients with alcohol history and 6 with gall stones.[6] O'Connor et al study approximates 70% etiology of pancreatitis due to gall stones and alcohol.[7] Prospective study done by Raghuwanshi et al on 50 patients also found that cholelithiasis (42%) and alcoholism (38%) were the major causes of acute pancreatitis.[8]

Fisher et al. stated that hyperlipidemia was the third leading cause of acute pancreatitis after biliary and alcoholic causes.[9]

Table 2: Age and Sex distribution of pancreatitis

Age	Male	Female	Total
<20 years	5	1	6
21-30 years	21	9	30
31 -40 years	14	8	22
>41-50 years	23	14	37
>50 years	5	0	5
Total	68	32	100

Figure 2: Age and Sex distribution of pancreatitis



The present study comprised of 68 males and 32 females (Table 2). Of 100 patients, 6 were below 20 years, 30 between 21-30 years, 22 between 31-40 years, 37 between 41-50 years and 5 were above 50 years age (Figure 2). In our study, age range was 11-70 years, most patients were of age group 41 to 50 years, of being 37 (37%) patients, findings like that of Silverstein et al of 65 among 102 patients and Lenhard and Balthazar who reported the average age was 49 years, with male predominance. [6,10] Of both the sexes and all age groups, males in 41 to 50 years formed the bulk of study i.e. 23 patients. Our present study revealed males being more affected than females finding similar to like that of Ishtiaq et al of 33 males (82.5%) and 7 females (17.5%) among 40 patients [11] and Apodaca et al, who had 27% female and 73% male, [12] as well as with Bollen et al [13] and Block et al consisted of 61 (65.6%) males and 32 (34.4%) females with a male to female ratio of 2:1. [14]

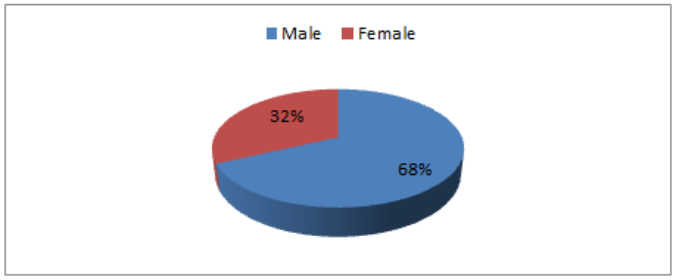


Figure 3: Chart showing sex distribution of pancreatitis

Table 3: Various symptoms in both types of pancreatitis

Clinical Finding or symptom	Types of Pancreatitis		
	Acute Pancreatitis	Chronic Pancreatitis	Total
Abdominal Pain	53	30	83
Fever	32	20	52
Vomiting	40	21	61
Weight Loss	10	8	18

Our study shows that pain in abdomen (83%) is most common clinical complaint in both types of pancreatitis which is comparable to the study done by Laharwal et al on 50 patients where epigastric pain was observed in all patients and nausea with vomiting in 76% of study population.[15] Vomiting (61%) is second most common complaint in present study followed by fever (52%) and least common is weight loss (18%) (Table 3).

Table 4: Laboratory examination findings in both types of pancreatitis

	Serum amylase (U/L)		Serum lipase (U/L)	
	Increased	Normal or Decreased	Increased	Normal or Decreased
Acute pancreatitis	54	11	38	6
Chronic pancreatitis	18	0	18	0
Total	72	11	56	6

In our study, amylase level more than 210 U/l in 54 (54%) patients and less than or equal to 210 U/l was seen in 5 (5%) patients of acute pancreatitis, whereas lipase level more than 180 U/l in 38 (38%) patients and less than or equal to 180 U/l in 10 (10%) patients of acute pancreatitis (Table 4). There were 5 patients who showed normal levels of amylase and lipase. Moreover, 5 (5%) patients showed increased lipase level with normal serum amylase level, and in only 1 (1%) patient there was increased level of serum amylase with normal serum lipase. This agrees with Gomez et al as they found the majority of their patients (113 patients, 97%) had raised levels of both amylase and lipase. [16] In present study raised serum amylase is commonly associated with acute pancreatitis than chronic pancreatitis, with normal serum amylase is found in 5 patients of acute on chronic pancreatitis (5%) whereas raised serum lipase is associated with chronic pancreatitis.

Table 5: Various Imaging findings on CT in pancreatitis

Findings on USG	No. of Cases
Obscured/ Non visualization of pancreas	20
Normal looking pancreas	14
Bulky & edematous pancreas(Acute phase)	18
Peri-pancreatic fluid collection in acute pancreatitis	10
Pseudocyst formation in acute pancreatitis	14
Chronic pancreatitis with calcification	14
Peri-pancreatic fluid collection in Chronic pancreatitis	4
Pseudocyst formation in Chronic pancreatitis	4
Acute on Chronic pancreatitis	2
Total	100

Table 6: Various Imaging findings on CT in pancreatitis

CT Findings	No. of Cases
Acute interstitial pancreatitis(edematous)	26
Acute necrotizing pancreatitis	10
Pseudocyst formation in acute pancreatitis	22
Other systemic complications in acute pancreatitis	8
Chronic pancreatitis with calcification	16
Pseudocyst formation in Chronic pancreatitis	4
Acute on Chronic pancreatitis	14
Total	100

Acute interstitial edematous pancreatitis was noted in 26 (26%) patients and acute necrotizing pancreatitis with or without peripancreatic necrotic fluid was noted in 10 (10%) patients (Table 6). Based on CT findings, Grading of acute pancreatitis was done into five grades (A, B, C, D, and E). In our study, acute pancreatitis according to CT grading scale showed the following: grade A included one (1%) patient, grade B included six (6%) patients, grade C included 42 (42%) patients, grade D Included 21 (21%) patients, and grade E included 30 (30%) patients. The CT showed sensitivity of 99.1% and

specificity of 100% with positive predictive value of 100% and negative predictive value of 97% in the diagnosis of acute pancreatitis. Out of total 100 patients, 80 were diagnosed as patients of acute pancreatitis while diagnosis of chronic pancreatitis was made in only 20 patients. Acute on chronic pancreatitis were found in 14 patients.

Table 7: Morphology of acute pancreatitis according to Revised Atlanta classification

CT Findings	No. of Cases
Acute peripancreatic collection	20
Acute necrotic collection	10
Pseudocyst of Pancreas	22
Walled off necrosis	8

In the present study, majority of the study population presented with acute peripancreatic collection (26%) followed by acute necrotic collection (10%)(Table 7). Studies done by Laharwal et al, Raghuwanshi et al have reported peripancreatic collection to be the most common presenting feature with an incidence of 88% and 72% respectively in their study population. [15, 8] In our study, complications were pseudocyst in 22 (22%) patients, infected fluid in none of patient. Our results agree with Bharwani et al who found in their study that pseudocysts occur as a complication of pancreatitis in 10–20% of patients.[17]

Table 8: Balthazar CTSI score of acute pancreatitis

Severity	Score	No. of cases	%
Mild	0-3	32	40%
Moderate	4-6	22	27.5%
Severe	7-10	26	32.5%
Total		80	100%

Table 9: Modified Mortele CTSI score of acute pancreatitis

Severity	Score	No. of cases	%
Mild	0-2	18	22.5%
Moderate	4-6	28	35%
Severe	8-10	34	42.5%
Total		100	100%

Table 10: Comparison of grading in acute pancreatitis according to Balthazar CTSI score and Modified CTSI score

Disease Grading	CTSI Grade (Balthazar)	Modified Mortele CTSI Grade
Mild Pancreatitis	40%	22.5%
Moderate Pancreatitis	27.5%	35%
Severe Pancreatitis	32.5%	42.5%

Of 80 patients of acute pancreatitis in the study, 32 (40%) had mild pancreatitis (CTSI within range of 1-3), 22 (27.5%) had moderate pancreatitis (CTSI range of 4-6), and 26 (32.5%) patients had severe acute pancreatitis (CTSI range of 7-10). Pancreatic necrosis was detected in 10 patients (Table 8).

Table 11: Comparison of imaging findings on USG and CT in acute pancreatitis

Imaging modality			USG		CT Scan	
Findings			No. of Cases	%	No. of cases	%
Pancreatic inflammation	Normal pancreas		14	14	3	3
	Pancreatic enlargement		10	10	23	23
	Pancreatic inflammation with spread in Peripancreatic Fat		6	6	38	38
	Single pocket of peri pancreatic fluid collection fluid		10	10	16	16
	>/= 2 pocket of peri pancreatic fluid collection fluid		16	16	20	20
Pancreatic Necrosis	None		-	-	90	90
	<30%		2	2	5	5
	30-50%		2	2	3	3
	>50%		2	2	2	2
Extra pancreatic complications	Ascites		34	34	34	34
	Pleural effusion	Unilateral	28	28	28	28
		Bilateral	14	14	14	14
	Infection		-	-	-	-
	GIT	Inflammatory thickening of the bowel wall	4	6	6	6
		Intramural fluid collection	-	-	-	-
	Vascular complication	Venous thrombosis	8	8	8	8
		Arterial hemorrhage	-	-	-	-
		Pseudoaneurysm	-	-	-	-
	Abnormal solid organ	Infarction	-		-	
		Hemorrhage	-	-	-	-
		Subcapsular collection	8	8	8	8

In our study, on CT examination pancreas looked normal in three (3%) patients, and pancreatic enlargement was seen in 23 (23%) patients (Table 11). Silverstein et al found enlargement of the pancreas in 68% of the cases as

in this study. [6] Similar findings also concluded in a study by Irshad Ahmad Banday et al.[18] Pancreatic inflammation with/ without peripancreatic fat stranding was seen in 38 (38%) patients. Peripancreatic inflammatory changes were the most common CT findings seen in acute pancreatitis. Mendez et al. found that out of 32 patients, 28 (87.5%) exhibited extra-pancreatic spread of the inflammatory process.[19] Infected necrosis occurred in 10 cases (10%) in this study. Silverstein et al. and Mendez et al. have also reported an incidence of infected necrosis in 10.5% and 3% respectively.[6,19] Single peripancreatic fluid collection was seen in 16 (16%) patients. There were 20 (20%) patients who showed more than or equal to two fluid collections. Extra-pancreatic complications included pleural effusion on CT scan in 42 (42%) patients, ascites in 34 (34%) patients, vascular complications i.e., venous thrombosis which was found to be the most common vascular complication in eight (8%) patients, GIT involvement in six (6%) patients and extra-pancreatic parenchymal complications were found in 8 (8%) patients. Pleural effusion being the most common complication (42%) followed by ascites (34%) (Table 11). This is in comparison with the studies done by Raghuwanshi et al and Wongnai Anchalee et al where similar findings of pleural effusion and ascites were found to be the most common extra-pancreatic complications. [8,20] Study done by Banday et al on 50 patients stated that ascites (36%) was the second most common extrapancreatic complication followed by GI involvement (26%).[18] Similar incidence was also reported by Balthazar et al.[21]

Table 12: Comparison of imaging findings on USG and CT in complications of chronic pancreatitis

Findings in Chronic pancreatitis	No. of cases in USG	No. of cases in CECT
Double duct sign	4	8
Duct penetrating Sign	0	6
Dilated MPD	12	14
Pancreatic parenchymal calcification	14	14
Diffuse atrophy of pancreas	8	11
Mass formation	0	0
Groove pancreatitis	0	1
Acute on chronic pancreatitis	2	14
Vascular complication	0	1
Portal hypertension	0	1
Pseudo aneurysm	0	0
Ascites	7	7
Fistula formation	0	1
GIT complication	0	2

Dilated main pancreatic duct was found to be in association with calcification in pancreatic parenchyma. However, in chronic pancreatitis diffuse gland atrophy was slightly less common. Vascular complications, groove pancreatitis, portal hypertension, fistula and pseudo aneurysm were found to be the least complications of chronic pancreatitis on CT. Calcification in pancreatic parenchyma was notice in 14 patients (85%); dilated main pancreatic duct was noticed in 14 patients (85%); diffuse gland atrophy was

noticed in 11 patients (70%) and mass formation was noticed in none of the patient (Table 12). Dilated main pancreatic duct associated with calcification in pancreatic parenchyma was found in chronic pancreatitis. Pancreatic ductal dilatation with a beaded appearance is a unique characteristic in chronic pancreatitis.[22,23] CT showed a sensitivity of 100% for common bile duct dilation, whereas regarding the GB stones detection, CT sensitivity is 8.18%. The study by Matar showed similar percentages in his sample.[24]

Table 13: Comparison of imaging findings on USG and CT in chronic pancreatitis

Findings on CECT		Parenchymal abnormality in CECT			MPD dilatation in CECT			Parenchymal calcification in CECT		
		Present	Absent	Total	Present	Absent	Total	Present	Absent	Total
Findings on USG										
Parenchymal abnormality in USG	Present	38	12	50	-	-	-	-	-	-
	Absent	36	14	50	-	-	-	-	-	-
	Total	74	26	100	-	-	-	-	-	-
MPD dilatation in USG	Present	-	-	-	12	3	15	-	-	-
	Absent	-	-	-	10	75	85	-	-	-
	Total	-	-	-	22	78	100	-	-	-
Parenchymal calcification in USG	Present	-	-	-	-	-	-	24	0	24
	Absent	-	-	-	-	-	-	14	62	76
	Total	-	-	-	-	-	-	38	62	100

In present study, USG determine abnormal parenchymal echotexture in 38(38%) patients and CT determined abnormal parenchymal attenuation of 74(74%) patients which proves that CT had better role in evaluating parenchyma of the gland in comparison of USG. USG determined dilated MPD of 12(12%) patients and CT determined dilated MPD of 22 (22%) patients which proves that CT had better role in evaluating MPD of the gland in comparison of USG. USG determined calcification of 24(24%) patients and CT determined calcification of 38(38%) patients which proves that CT had a better role in evaluating calcification of the gland in comparison of USG (Table13).

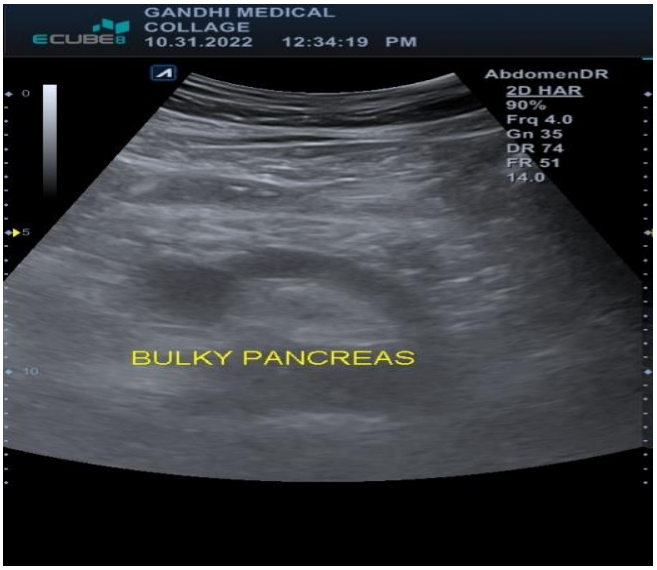


Figure 4: Ultrasound shows bulky pancreas with hypoechoic pancreatic parenchyma due to edema.

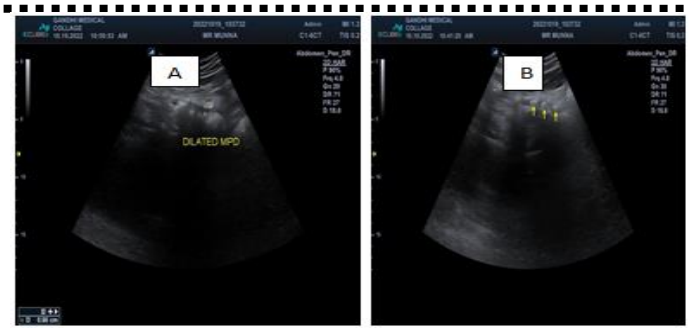


Figure 5: Ultrasound shows multiple tiny calcifications (arrows in B) in pancreas with dilated main pancreatic duct (arrow in A).

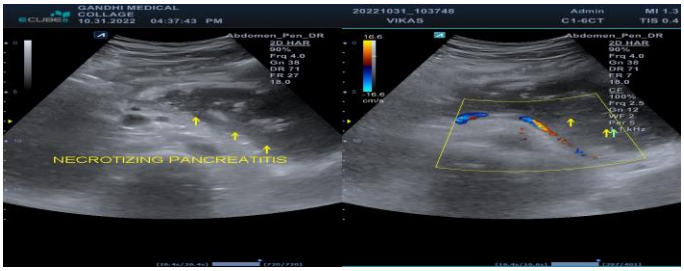


Figure 6: Ultrasound shows a focal ill-defined hypoechoic collection with internal debris in pancreatic neck and body region.

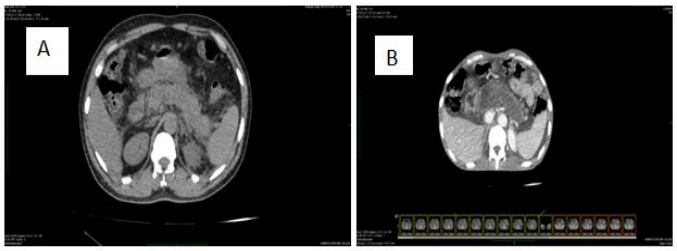


Figure 7: CT axial images show (A) Bulky pancreas with fuzzy margins and peri pancreatic fat stranding. (B) Contrast enhanced CT shows bulky and hypoattenuating (edematous) non enhancing pancreas.

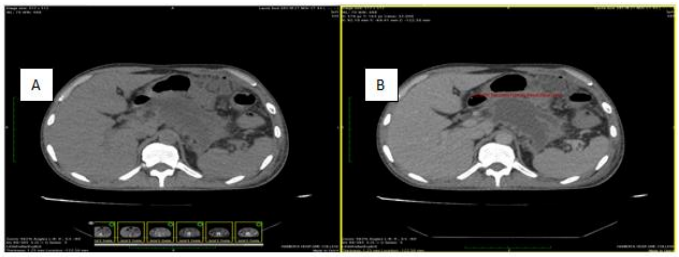


Figure 8: CT Axial image shows ANC in unenhanced phase (A), parenchymal phase (B) phase. ANC, acute necrotic collections

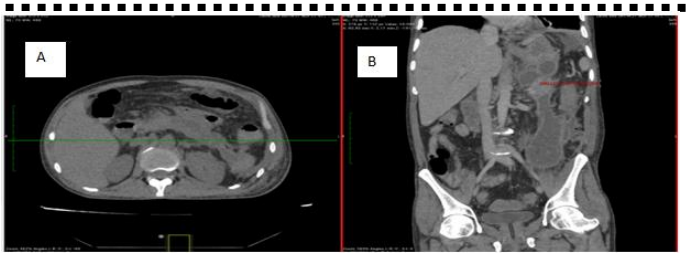


Figure 9: CT axial (A) unenhanced and Coronal (B) parenchymal phase shows walled off pancreatic necrosis.

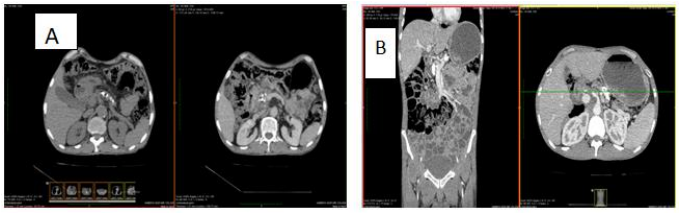


Figure 10: CT unenhanced and enhanced axial (A) shows diffuse atrophy of pancreas with multiple calcific foci in parenchyma and Coronal (B) parenchymal phase shows coarse calcification within pancreatic head and body region.

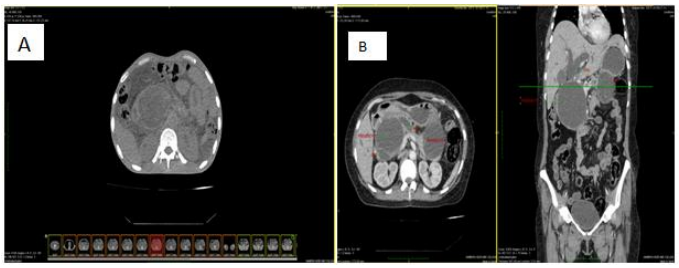


Figure 11: CT unenhanced axial (A) shows a pseudo-pancreatic cyst in pancreatic head region and (B) axial and coronal enhanced parenchymal phase shows a pseudo-pancreatic cyst in pancreatic head and tail region with cyst in head region causing compression over second part of duodenum resulting in dilatation of both CBD and MPD giving double duct sign.

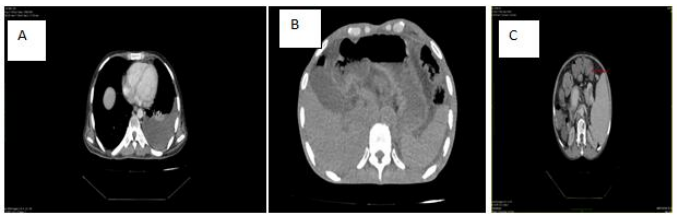


Figure 12: CT enhanced phase axial (A) shows left sided pleural effusion, (B) axial unenhanced phase minimal

peri-splenic fluid collection (ascites) and (C) axial portal phase shows a hypodense filling defect (thrombus) in splenic vein.

Conclusion

Because of non-invasiveness and lack of radiation hazard, Ultrasound is initial investigation of choice in evaluation of pancreatitis. Ultrasound can detect presence of inflammation and characterize the size, shape and echo texture of the gland, but because of retroperitoneal location, it is difficult to easily evaluate pancreas. CECT scan can better delineate margins and extent of the gland. It can better determine the size, parenchyma, necrosis, calcification and extra pancreatic complications associated with pancreatitis than USG. Of all the available imaging modalities, only CT scan can reliably detect the pancreatic necrosis. CT is 80-90% accurate in the detection of pancreatic necrosis. In acute pancreatitis, imaging plays an important role in the diagnosis and staging. Prognosis of acute pancreatitis can be depicted by computed tomography severity index. CT is superior to USG for better evaluation of pancreatic parenchyma, adjacent areas of the pancreas to determine the pathological process of pancreas and surrounding extent and involvement.

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