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ORIGINAL ARTICLE

Assessment of pancreatic pathologies with CT scan

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ABSTRACT:

Background: To assess pancreatic pathologies with CT scan**. Methodology:** 112 patients diagnosed with pancreatic pathologies were subjected to CT scan of the abdomen was performed using Toshiba CT Scanner (128 slices) machine for the acquisition of the CT scan images. **Results:** Out of 112 patients, males were 70 (62.5%) and females were 42 (37.5%). Grade B had 6 (5.3%), grade C had 12 (10.7%), grade D had 24 (21.4 %) and grade E had 70 (62.5%) patients. A significant difference was found (P< 0.05). In 12 (10.7%) patients, CT severity index was 0 – 3, in 48 (42.8%) 4-6 and in 52 (46.4%) patients CT severity index was between 7 – 10. A significant difference was found (P< 0.05). Pancreatic pathologies were inflammatory in 67 (59.8%), non- inflammatory in 23 (20.5%), congenital in 4 (3.5%), trauma in 10 (8.9%) and miscellaneous lesions in 8 (7.4%) cases. A significant difference was found (P< 0.05). All the cases showed ill-defined margins. Pancreas was shrunken in 100% cases. Ascites was noted in 42% patient. Necrosis was seen in15% patients. Calcification was present in all 10% cases. Main pancreatic duct was dilated in 13% cases. Enlarged lymph nodes were seen in 13% cases and vascular complications was seen in 7% patients. A significant difference was found (P< 0.05). Out of the 10 cases of pancreatic trauma, six (6) cases were of grade 2 and four (4) cases were of grade 4. Other miscellaneous lesions observed were pancreatic cyst in 4, pancreatico- duodenal fistula and fatty replacement of pancreas each in 2 cases. **Conclusion:** CT is a good modality for pancreatic pathologies and considered to be best option when other investigations fail to detect the pancreatic lesions. CT demonstrates better soft tissue information. The attenuation difference between various soft tissue structures helps in knowing the nature of the lesion.

Key words: CT, Pancreatic pathologies, pancreatico- duodenal fistula

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INTRODUCTION

The pancreas was one of the last organs in abdomen to receive attention of anatomist, physiologist and surgeons. Pancreas is divided into head, uncinate process, body and tail from right to left.[1] The long axis of body and tail of pancreas is in an oblique orientation, extending from hilum of spleen to the midline of body, where the pancreas lies anterior to the portal vein. The uncinate process, the inferior most portions of the head of the pancreas is triangular or wedge shaped and lies just posterior to superior mesenteric artery and vein.[2]

Computerized tomography has been a revolutionary advance in the field of diagnostics. The fundamental concept in computerized tomography is that the internal structure of an object can be reconstructed from multiple projections of the object and thus it portrays anatomical details with excellent clarity.[3] Unlike, ultrasound the image quality is not hampered by intervening bowel gas, bone or fat. Computerized tomography can provide adequate information about the composition, morphology and relationship to adjacent structures.[4] On CT, pancreas is best visualised with triphasic (Artery, post venous and superior venous phases) contrast enhanced computed tomography scan with three dimensional triplane (axial, coronal and sagittal) reconstruction. Pancreas lies obliquely. All parts of pancreas are not at the same transverse level and are not seen in one section (cut) of computed tomography scan. Head is lower at L2 level, body is at L1 level and tail is at T12 level.[5]The present study was conducted to assess pancreatic pathologies with CT.

METHODOLOGY

A sum total of one hundred twelve adult patients diagnosed with pancreatic pathologies of both genders were enrolled in this prospective, observational study. They were included in the study after they agreed to participate in the study and gave their written consent. Ethical approval from institutional ethical and review committee was obtained.

Demographic data such as name, age, gender etc. was recorded. Systemic examination was carried out. CT scan of the abdomen was performed using Toshiba CT Scanner (128 slices) machine for the acquisition of the CT scan images. CT findings of pancreas were recorded. CT severity index was calculated by combining the peripancreatic inflammation and degree of necrosis. For the calculation of CT severity index, on a scale of 1 to 10, patients were assigned points as A = 0, B = 1, C = 2, D = 3, E = 4. To this 2, 4 or 6 points are added if CT showed < 30%, 30 – 50% or > 50% necrosis respectively. On the basis of

CT severity index patients were divided into three categories i.e. mild (0 – 3), moderate (4 – 6) and severe (7 – 10). Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 112		
Gender	**Males**	**Females**
Number	70 (62.5%)	42 (37.5%)

Out of 112 patients, males were 70(62.5%) and females were 42 (37.5%) (Table I).

Table II Acute pancreatitis based on balthazar grade

Grade	Number (%)	P value
A	0	0.01
B	6 (5.3%)	
C	12 (10.7%)	
D	24 (21.4 %)	
E	70 (62.5%)	

Balthazar's grade B had 6 (5.3%), grade C had 12 (10.7%), grade D had 24 (21.4 %) and grade E had 70 (62.5%) patients. A significant difference was found (P< 0.05) (Table II).

Table III Assessment of CT severity index

CTSI	Number	P value
0 – 3	12 (10.7%)	0.05
4 – 6	48 (42.8%)	
7 – 10	52 (46.4%)	

In 12 (10.7%) patients, CT severity index was 0 – 3, in 48 (42.8%) 4-6 and in 52 (46.4%) patients CT severity index was between 7 – 10. A significant difference was found (P< 0.05) (Table III).

Table IV Assessment of pancreatic pathologies

Lesions	Number (%)	P value
Inflammatory	67 (59.8%)	0.02
Non- inflammatory	23 (20.5%)	
Congenital	4 (3.5%)	
Trauma	10 (8.9%)	
Miscellaneous	8 (7.4%)	

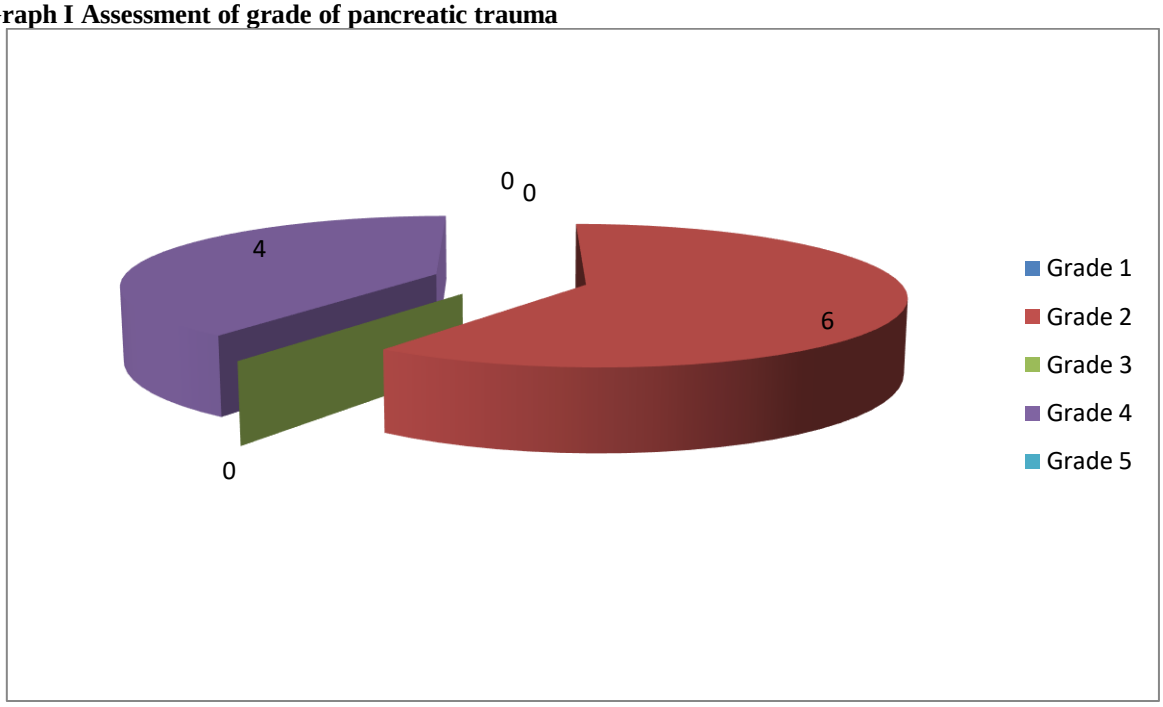
Pancreatic pathologies were inflammatory in 67 (59.8%), non- inflammatory in 23 (20.5%), congenital in 4 (3.5%), trauma in 10 (8.9%) and miscellaneous lesions in 8 (7.4%) cases. A significant difference was found (P< 0.05) (Table IV).

Table V Assessment of CT features in chronic pancreatitis

Parameters	CT features	Percentage	P value
Size of pancreas	Enlarged	0%	0.00
	Shrunken	100%	
Margins	Well defined	0%	0.00
	Ill defined	100%	
Others	Ascites	42%	0.051
	Necrosis	15%	
	Calcification	10%	
	Main pancreatic duct dilated	13%	
	Lymphadenopathy	13%	
	Vascular complication	7%	

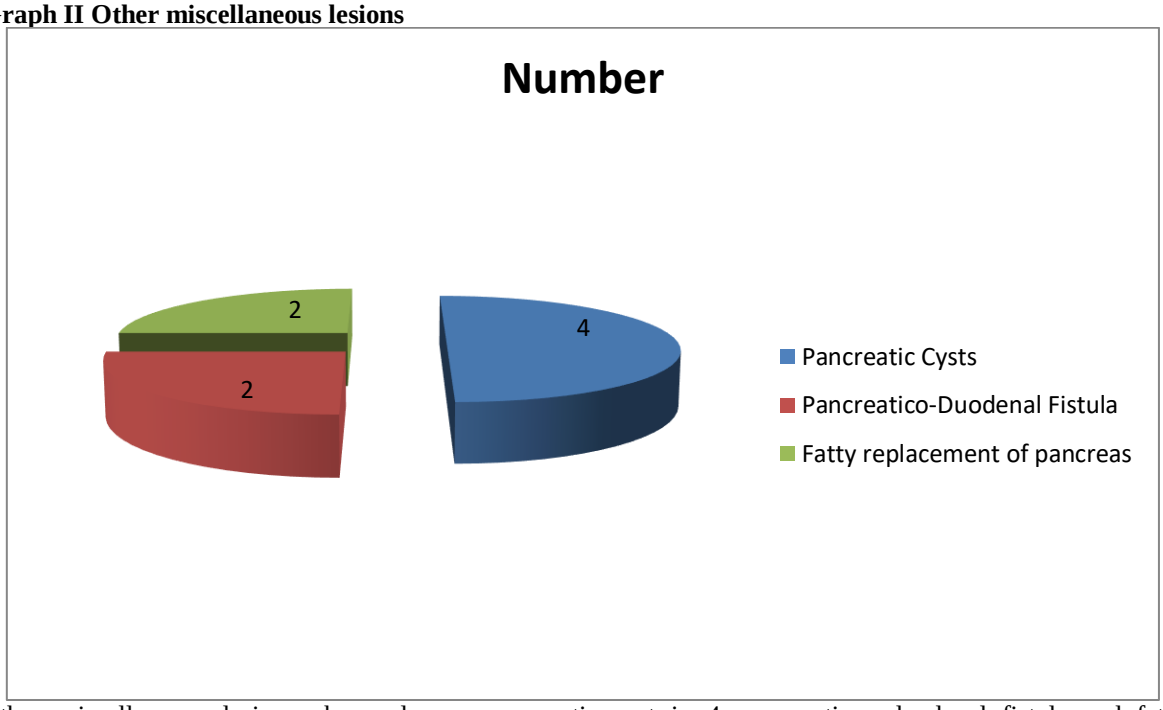
All the cases showed ill-defined margins. Pancreas was shrunken in 100% cases. Ascites was noted in 42% patient. Necrosis was seen in15% patients. Calcification was present in all 10% cases. Main pancreatic duct was dilated in 13% cases. Enlarged lymph nodes were seen in 13% cases and vascular complications was seen in 7% patients. A significant difference was found (P< 0.05) (Table V).

Graph I Assessment of grade of pancreatic trauma



Out of the 10 cases of pancreatic trauma, six (6) cases were of grade 2 and four (4) cases were of grade 4 (Graph I).

Graph II Other miscellaneous lesions



Other miscellaneous lesions observed were pancreatic cyst in 4, pancreatico- duodenal fistula and fatty replacement of pancreas each in 2 cases (Graph II).

DISCUSSION

The pancreas was first described in the "Talmud" and depicted as "finger of liver" between 200 B.C. and 200 A.D. Pancreas is located in the anterior pararenal space of the retro peritoneum just anterior to the perirenal (gerota') fascia and posterior to the parietal peritoneum.[6] Pancreas appears triangular in shape in cut section with superior, inferior and anterior border as well as antero-superior, antero-inferior and posterior surfaces.Computed tomography (CT) is frequently used to evaluate the pancreas and has a major role in the evaluation of pancreatitis, trauma, and tumors.[7] Although ultrasound (US) is often the procedure of choice for initial evaluation of the nontraumatized pancreas, sonographic evaluation of pancreatic size, con- figuration, and echogenicity may

not be reliable in differentiating normal from abnormal, especially in pancreatitis.[8]The present study was conducted to assess pancreatic pathologies with CT.

Our results showed that out of 112 patients, males were 70 (62.5%) and females were 42 (37.5%). Grade B had 6 (5.3%), grade C had 12 (10.7%), grade D had 24 (21.4 %) and grade E had 70 (62.5%) patients. King LR et al[9] found that approximately one-half of pediatric patients with acute pancreatitis have extrapancreatic fluid collections, whereas less than 10% have fluid collections within the pancreatic pamenchyma. In children, extrapancreatic fluid collections associated with acute pancreatitis are most commonly found in the anterior pamarenal space (71 % of cases) and lesser sac (57% of cases). These fluid collections tend to be extensive, but most resolve spontaneously.

Our results demonstrated that in 12 (10.7%) patients, CT severity index was 0 – 3, in 48 (42.8%) 4-6 and in 52 (46.4%) patients CT severity index was between 7 – 10. It was found that pancreatic pathologies were inflammatory in 67 (59.8%), non- inflammatory in 23 (20.5%), congenital in 4 (3.5%), trauma in 10 (8.9%) and miscellaneous lesions in 8 (7.4%) cases. We observed that all the cases showed ill-defined margins. Pancreas was shrunken in 100% cases. Ascites was noted in 42% patient. Necrosis was seen in15% patients. Calcification was present in all 10% cases. Main pancreatic duct was dilated in 13% cases. Enlarged lymph nodes were seen in 13% cases and vascular complications was seen in 7% patients. Elmas N[10] showed that CT findings in acute pancreatitis were diffuse hypertrophy of the gland, peripancreatic fatty planes shows increased density with mild thickening of adjacent fatty planes and acute fluid collections as well as well-defined areas of low attenuation were seen within the peripancreatic areas and The most common spaces involved are the anterior pararenal space and the lesser sac.

We found that out of the 10 cases of pancreatic trauma, six (6) cases were of grade 2 and four (4) cases were of grade 4. Other miscellaneous lesions observed were pancreatic cyst in 4, pancreatico-duodenal fistula and fatty replacement of pancreas each in 2 cases. Arcovitz[11] suggested that pancreatic injury after blunt abdominal trauma is uncommon in children, occurring in less than 10% of cases. However, trauma is one of the most common causes of acute pancreatitis in children. CT performed with intravenous contrast material is superior to US in detection of traumatic panceatitis; the diagnostic sensitivity is reported to be as high as 85% for initial CT scans and 90% for CT scans obtained throughout the course of hospitalization. The initial CT study is also more sensitive and specific than measurement of the initial serum amylase level in detecting pancreas.

Mendez et al[12] reported incidence of pleural effusion in 30% patients. Faragalla S A[13] and Siegelman SS[14]who showed that the most common site for pseudopancreatic cyst is anterior to the body and tail of the pancreas extending to lesser sac and are typically located in the pancreas and the immediate per pancreatic region, omental bursa, gastro splenic recess etc.

CONCLUSION

CT is a good modality for pancreatic pathologies and considered to be best option when other investigations fail to detect the pancreatic lesions. CT demonstrates better soft tissue information. The attenuation difference between various soft tissue structures helps in knowing the nature of the lesion.

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