

Assessment Of Role Of Computed Tomography In Evaluation Of Pancreatic Pathologies

Amanpreet Kaur¹, Arvinder Singh², Harsimrat Singh Waraich³

¹Assistant Professor, Department of Radiodiagnosis, GMC Amritsar, Punjab, India;

²Professor, Department of Radiodiagnosis, GMC Amritsar, Punjab, India;

³Assistant Professor, Department of Pharmacology, GMC Amritsar, Punjab, India

³Email: harsimrat@gmail.com

ABSTRACT

Background: Computerized tomography has been a revolutionary advance in the field of diagnostics. The present study was conducted to assess role of computed tomography in evaluation of pancreatic pathologies.

Materials & Methods: 100 patients with pancreatic pathologies were subjected to Philips Ingenuity CT Scanner (128 slices) for the acquisition of the CT scan images. In all patients, clinical presentation and CT scan findings were recorded.

Results: Age group of 41-50 years (26 %). 21 patients presented in 51-60 years. 18 patients (18%) presented in both 21-30 years and 31-40 years age group each. 9 patients (9%) in 61-70 years age group, 3 patients (3%) in 71-80 years age group, and 2 patients (2%) in 0-10years and 11-20 years age group each. 1 patient (1%) in 81-90 age group. 1 case (1%) was of congenital abnormality (Annular pancreas), 61 cases (61%) were of inflammatory pathologies, 27 cases (27%) were of non inflammatory mass lesions (tumors), 7 cases (7%) were of trauma and 4 cases (4%) were of miscellaneous pathologies.

Conclusion: CT is highly accurate for determining the nature and extent of pancreatic lesions and plays a valuable role in assessing patients with inflammatory/non inflammatory lesions of pancreas, pancreatic trauma and pancreatic tumours.

Key words: CT, Pancreatic lesions, inflammatory lesions

1. INTRODUCTION

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.¹ 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..²

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.³

Common pancreatic anomalies are pancreas divisum, annular pancreas, uneven pancreatic lipomatosis, acute pancreatitis, chronic pancreatitis, groove pancreatitis and pancreatic

tuberculosis etc.⁴ 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.⁵ The present study was conducted to assess role of computed tomography in evaluation of pancreatic pathologies.

2. MATERIALS & METHODS

The present study was conducted among 100 patients with pancreatic pathologies reported to the department. The duration of the study was 1 year. Inclusion criteria comprised of all suspected cases of pancreatic lesions of either gender. Exclusion criteria were pregnant women. All were informed regarding the study and their consent was obtained.

Data such as name, age, gender etc. was recorded. All were subjected to Philips Ingenuity CT Scanner (128 slices) for the acquisition of the CT scan images. In all patients, clinical presentation, pancreatic pathology and CT scan findings 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.

3. RESULTS

Table I Age distribution in patients

Age (in years)	Number	Percentage
0-10	2	2%
11-20	2	2%
21-30	18	18%
31-40	18	18%
41-50	26	26%
51-60	21	21%
61-70	3	3%
71-80	3	3%
81-90	1	1%

Table I shows that out of 100 patients included in this study maximum number of patients were between the age group of 41-50 years (26 %). 21 patients presented in 51-60 years. 18 patients (18%) presented in both 21-30 years and 31-40 years age group each. 9 patients (9%) in 61-70 years age group, 3 patients (3%) in 71-80 years age group, and 2 patients (2%) in 0-10years and 11-20 years age group each. 1 patient (1%) in 81-90 age group.

Table II Distribution of pancreatic pathologies

Pancreatic Pathology	No.	Percentage (%)
Congenital	1	1%
Inflammatory pathologies	61	61%
Non inflammatory mass lesions (Tumors)	27	27%
Trauma	7	7%
Miscellaneous	4	4%

Table II, graph I shows that 1 case (1%) was of congenital abnormality (Annular pancreas), 61 cases (61%) were of inflammatory pathologies, 27 cases (27%) were of non inflammatory mass lesions (tumors), 7 cases (7%) were of trauma and 4 cases (4%) were of miscellaneous pathologies.

Graph I Distribution of pancreatic pathologies

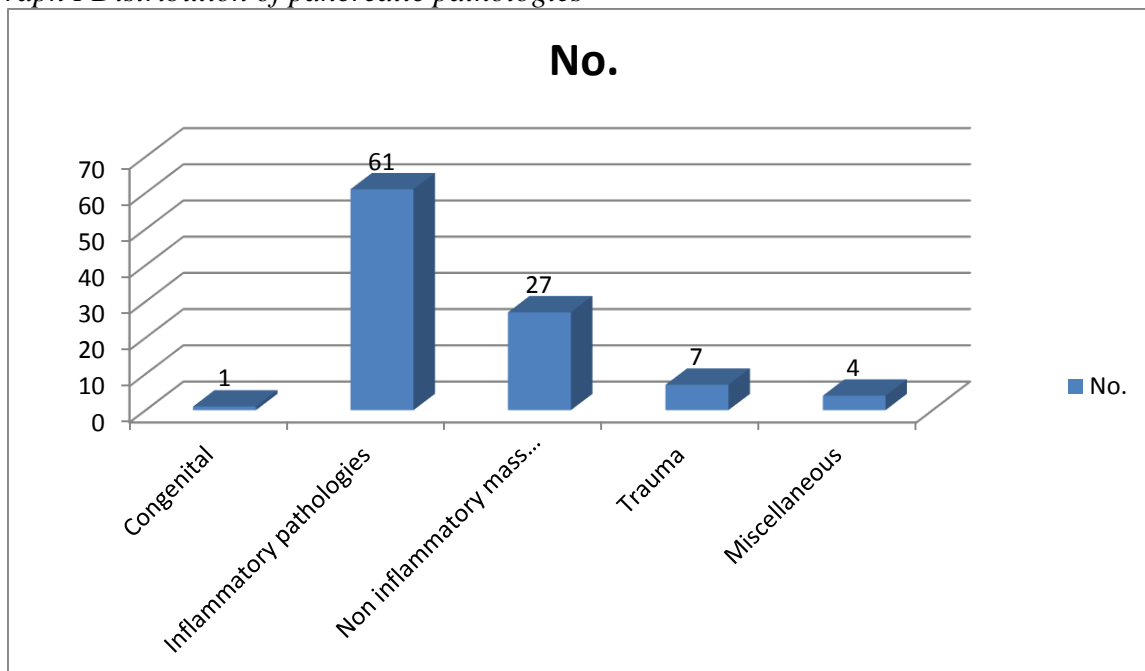


TABLE III CT features of acute pancreatitis

CT features	Number	Percentage
Size of pancreas		
Enlarged	48	100%
Shrunken	0	0%
Margins		
well defined	0	0%
Ill defined	48	100%
Attenuation		
Hypodense	48	100%
Hyperdense	0	0%
Necrosis	11	22.9%
Calcification	0	0

Table III shows that In all 48 cases (100%) of acute pancreatitis pancreas was enlarged and irregular in outline and pancreatic parenchyma was hypodense in attenuation. 11 cases (22.9%) showed necrosis and calcification was absent in all cases of acute pancreatitis.

Table IV CT severity index

Number of patients	CTSI	% age
7	0 – 3	14.5%

11	4 – 6	22.9%
30	7 – 10	62.5%

Table IV shows that in 7 patients (14.5%) CT severity index was 0 - 3 and in 11 patients (22.9%) it was 4 – 6. In 30 patients CT severity index was 7 – 10 (62.5%).

4. DISCUSSION

Computed tomography (CT) is a rapid, easily performed and safe diagnostic imaging technique that provides valuable information about a wide spectrum of pancreatic disorders. CT is highly accurate for determining the nature and extent of pancreatic masses and plays a valuable role in assessing patients with pancreatic trauma, pancreatitis and its complications.⁶ Since its clinical introduction in the 1970s, computed tomography (CT) has revolutionized the imaging work- up of patients in the emergency department. CT is now considered to be one of the most valued tools in the diagnostic work- up of trauma patients and patients with non-traumatic emergency conditions.⁷ CT is a rapid, easily performed and safe, diagnostic imaging technique and has a great impact on the diagnostic evaluation of patients with pancreatic pathologies. It provides valuable information about a wide spectrum of pathologies involving the pancreas, and is highly accurate in determining the part of pancreas involved, extent and characterization of the mass.⁸

The present series consists of 100 patients who were having pancreatic pathologies on CT. The present study has been conducted on patients admitted in the wards or visiting the outdoor of Guru Nanak Dev Hospital (GNDH), Bebe Nanaki Center for Mother and Child Health and Civil Hospital, Amritsar who came to get their CT done in the department of Radiodiagnosis and Imaging, GNDH, Amritsar. 100 patients who fulfilled the inclusion criteria were included in the study.

It was observed that among these 100 cases, 69 were males and 31 females. The majority of patients were in the age group of 20- 60 years. This is in comparison to study by Bathazar et al⁹ in which the average age was 24 years and 75% were male patients. 96% of the patients had pain abdomen as a presenting symptom. Almost 30% of the total cases presented with vomiting and jaundice. Around one- fourth of the total cases presented with complain of weight loss and history of abdominal trauma (blunt). This is in comparison with the study done by Dawoud M F et al.¹⁰

Out of all the 100 pancreatic lesions noted, one patient (1%) presented with Annular pancreas. 61 patients (61%) presented with inflammatory pancreatic pathologies. 27 patients (27%) presented with Non inflammatory mass lesions (tumours) of the pancreas. 7 patients (7%) presented with traumatic lesions of the pancreas and 4 patients (4%) presented with miscellaneous pathologies. Inflammatory pancreatic pathologies were the commonest pathologies followed by tumour lesions of the pancreas. Our study corresponds with the study done by Bergin et al¹¹ who showed that pancreatic inflammatory pathologies are the commonest lesion.

Out of 100 cases of pancreatic pathologies, one case presented with annular pancreas. Pancreatic tissue was seen encircling the second part of duodenum. No calcification/necrosis/lymphadenopathy was seen in the pancreas. The CT features are in comparison with the study done by Choi B I et al.¹² Annular pancreas was an incidental finding and would have missed if CT was not done.

Among the 61 cases of inflammatory pancreatic pathologies, acute pancreatitis was diagnosed in 48 cases (78.6%), 9 cases (14.7%) were of acute on chronic pancreatitis and 4 cases (6.5%) were of chronic pancreatitis. This is in comparison with the study done by Faragalla et al.¹³

In our study, in 7 patients (14.5%) CT severity index was 0 - 3 and in 11 patients (22.9%) it was 4 – 6. In 30 patients CT severity index was 7 – 10 (62.5%). CT of acute pancreatitis showed, bulky pancreas with irregular contour with multiple intrapancreatic hypodense areas (area of pancreatic necrosis) were seen. There were thickening and blurring of peripancreatic fat planes, also multiple fluid collections were seen in the lesser sac, so our study is in accordance with Elmas N¹⁴ who 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.

5. CONCLUSION

Authors found that CT is highly accurate for determining the nature and extent of pancreatic lesions and plays a valuable role in assessing patients with inflammatory/non inflammatory lesions of pancreas, pancreatic trauma and pancreatic tumours.

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