Original article:

Study of decrepit state of USG in detecting pancreatic tumors with CT helping to solve the dilemma in our hospital

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ABSTRACT:

It is a not so easy to visualize pancreas completely in settings of routine abdominal sonography ; further in cases of pancreatic tumors this becomes even more cumbersome with high chances of error and missing the pathology. Although USG is economical , readily available ,non- invasive with no radiation hazards ;the major drawback for ultrasound is failure to properly and completely visualize the pancreas due to distended bowel loops and gaseous stomach. With introduction of contrast enhanced CT it becomes the preferred technique in the diagnosis of pathology, assessment of severity, staging and detection of the complication. It serves as a useful prognostic indicator of morbidity and mortality and can identify high risk patients. CT can detect complication early and image guided diagnostic and therapeutic procedures can be performed better. CT also provides the anatomic details to optimize surgical interventions. CT has definitive role in diagnosing, staging and predicting outcome for surgical procedure. CT is especially useful for following the course of disease during the development and study of new therapeutic regimens. Also in cases of unresectability CT proves far better imaging modality by providing the following information.

KEY WORDS: Pancreatic tumors, CT pancreas, Histopathology.

INTRODUCTION:

Ductal cell adenocarcinoma constitutes 80% of the neoplasm of pancreas and occurs most commonly in the head (65%). It is most common in older patients with higher incidence among men. Patients most frequently have weight loss, pain and jaundice but a variety of other symptoms related to metastatic spared can occur. Tumor may demonstrate one or combination of following diagnostic signs on CT scan. Masses of head of pancreas are usually obvious because their size with smooth contours or a lobulated appearance. Ratio of head and body remain constant at 1.45 +/-0.03.The ratio of head and body in carcinoma patient was 3.4 +/- 0.9. Most of ductal cell adenocarcinoma is isodense to hypodense on NCCT due to decreased vascularity of neoplasm as compared to normal gland.

The effect of contrast enhancement varies according to the method of contrast administration, enhancement bye generalized equilibration or by dynamic bolus injection added by mechanical injector. Pancreatic adenocarcinoma does not enhance on post contrast study and appear hypodense as compared to normal parenchyma. Dilatation of pancreatic duct occurs in patients in whom the duct is obstructed by neoplasm. In most of cases, ductal dilatation is smooth or beaded. Ductal dilatation is larger (avg–8.7 mm) compared to (6.7 mm) in patients with pancreatitis, the

ratio of duct to gland is greater than 0.5 is more likely tube present in carcinoma. Most pancreatic duct adenocarcinoma arises in head and hence obstruction of CBD is most common. Metastatic lymphadenopathy adjacent to supra pancreatic part of bile duct can also cause ductal obstruction. Dilated CBD with dilated pancreatic duct appear on CT as 'Double duct sign'.Pancreatic duct adenocarcinoma most commonly metastasizes to liver which appears low density within the enhanced liver. Direct extension into neighboring structures especially pre vascular and peri renal tissue is seen as encasement of one of arteries that supply the gland. Metastatic dissemination of pancreatic carcinoma occurs to regional lymph nodes. Local extension beyond the margin of tumor is seen in 68% of cases and involves the duodenum, stomach, left adrenal gland and root of mesentery. Pancreas is an unusual site of metastasis and is associated with wide spread metastatic disease. The cell types that may occur include breast , lung , colon , gastric , renal , pulmonary , ovarian and gall bladder tumor as well as hepatoma , melanoma , lymphoma , angiosarcoma and lymphosarcoma. The most frequent are lung and breast tumors and lymphoma.

MATERIALS AND METHOD :

During the period of May 2018 TO Jan 2019, 60 patients with suspected pancreatic disease are examined using MDCT scan as prime diagnostic modality at Geetanjali Medical College and Hospital. Each patient was studied in detail with relevant to clinical history, examination and laboratory investigation. ***USG was done in all patients prior to CT scan.*** Inclusion criteria***:*** Patient presented with epigastric pain; Laboratory findings suggestive of pancreatic pathology and USG finding with strong suspicion about pancreatic pathology.

SCANNING AND METHODS USED:

SCANNING WAS DONE WITH SIEMENS 64 SLICE MULTIDETECTOR CT SCAN MACHINE.

Volumetric data from diaphragm to rectum were acquired with pitch kept usually 1 with contiguous 1 mm slices with axial, coronal and sagittal reconstruction.Images were acquired after oral water soluble contrast or oral water. Intravenous iodinated contrast agent, volume of 80-100ml injected at 3 ml/sec with a 30 and 70s data acquisition delay to visualize the pancreas in both the arterial and portal venous phase of enhancement. In patients, suspected of having liver metastasis on other investigation, triple phase scanning was done after administration of intravenous contrast.

RESULTS:

TABLE 1) AGE WISE DISTRIBUTION

Age group	**No. of male**	**No. of female**	**Total**
<1=10	0	O	0
11-20	4	1	5[8.30 %]
21-30	9	0	9[15.00%]
31-40	4	2	6[10.00 %]
41-50	10	O	10[16.66%]
51-60	12	8	20[33.33%]
61-70	4	3	7[11.66%]
>/=71	2	1	3[5.00%]
TOTAL	**45**	**15**	**60**

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Pancreatic lesion were more common in 4rd to 6th decade of life consist of 30 cases[50.00%] of which more than half of cases [33.33%] were from 51 to 60 years of age group.

TABLE –2 PANCREATIC PATHOLOGY

Sr. NO.	Type of lesion	No. of cases	PERCENTAGE
1	Acute pancreatitis	24	40.00
2	Pancreatic mass	11	18.33
3	Acute pancreatitis with Pseudo cyst	5	08.33
4	Trauma	5	08.33
5	Chronic pancreatitis	4	06.66
6	Acute on chronic pancreatitis	4	06.66
7	Other [cyst with RCC, metastasis, polycystic disease]	4	06.66
8	Chronic pancreatitis with Pseudo cyst	2	03.33
9	Pseudo cyst	1	01.66
	TOTAL	**60**	

In this study of 60 cases, acute pancreatitis was most common pathology consist of 24 cases [40.00 %]
Second most common pathology of pancreas was pancreatic malignancy, consist of 11 cases [18.33 %], followed by acute pancreatitis with pseudo cyst with 5 cases [08.33%]

TABLE – 3 CLINICAL PRESENTATIONS

Symptoms	No. of cases	Percentages
Abdominal pain	57	95.00
Vomiting	37	61.66
Abdominal distension	14	23.30
Weight loss	11	18.33
Jaundice	2	03.33

Most common clinical presentation in patient with pancreatic pathology was abdominal pain [95.00 %] followed by vomiting [61.66%] and abdominal distension [23.30%].

TABLE-4 SITE OF MALIGNANCY IN PANCREAS

SITE	No. of cases	Percentages
Head	5	45.45
Body	4	36.36
Tail	2	09.09

Out of 11 cases, 5 cases had malignancy in head region [45.45 %], 4 cases had in body region [36.36 %] and 2 cases had in tail region [09.09%].

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TABLE- 5 CT FEATURES IN PANCREATIC HEAD CARCINOMA

CT feature		**No. of cases**	**Percentages**
Density	Hyperdense	-	0
	Hypodense	5	100.00
Dilated MPD		5	100.00
Dilated CBD		4	60.00
Post contrast enhancement		5	100.00
Invasion of other organs		1	20.00

All of the pancreatic mass appeared hypodense on NCCT and showed post contrast enhancement(4 cases showed mild enhancement) and dilated MPD, CBD [60.OO %] found dilated in most of cases and invasion of other organs found in 1 case[20.00%].

TABLE- 6 CT FEATURES IN PANCREATIC BODY CARCINOMA

CT feature		**No. of cases**	**Percentages**
Density	Hyperdense	-	00.00
	Hypodense	4	100.00
Post contrast enhancement		4	100.00
Invasion of other organs		4	100.00
Dilated MPD		4	100.00
Dilated CBD		-	00.00

All 4 [100.00%] cases were hypodense on CT, showed post contrast enhancement and show dilated MPD. Due to delayed clinical presentation, distal metastasis was found in all cases.

TABLE-7CT FEATURES IN PANCREATIC TAIL CARCINOMA

CT feature		**No. of cases**	**Percentages**
Density	Hyperdense	-	00.00
	Hypodense	2	100.00
Post contrast enhancement		2	100.00
Invasion of other organs		1	50.00
Dilated MPD		0	00.00
Dilated CBD		-	00.00

All 2 [100.00%] cases were hypodense on CT and showed mild post contrast enhancement and invasion of other organ found in 1 case..

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FOLLOW UP

Type of lesion	**Conservative**	**Operation**	**Expired**	**Follow-up not available**	**Total**
Acute pancreatitis	23	1	-	-	24
Pancreatic mass	0	4	4	3	11
Acute pancreatitis with Pseudo cyst	4	-	1	-	5
Trauma	3	-	2	-	5
Chronic pancreatitis	2	2	-	-	4
Acute on chronic pancreatitis	4	-	-	-	4
Other [cyst with RCC, metastasis, polycystic disease]	2	1	1		4
Chronic pancreatitis with Pseudo cyst	-	2	-	-	2
Pseudo cyst	1	-	-	-	1
TOTAL	**39**	**10**	**8**	**3**	**60**

4 operated case of pancreatic mass were confirmed on histopathological examination.

Out of 60 patient of different pancreatic pathology, 39 patients [65.00%] were kept conservatively, in 10 patients [16.66 %] operation was done and 8 patients [13.33%] expired.

In remaining 3 patients [5.00%] follow up was not available.

DISUCSSION:

In this study 60 cases of suspected pancreatic lesions were studied by CT scan as a prime modality. Correlation of CT diagnosis was done with usg features, laboratory investigations and histopathological examination reports whenever possible, a follow up done about the outcome of patients after treatment. Pancreatic etiology was found in wide range of age groups. i.e. from 1 to 70 years with maximum incidence in 4rd to 6th decade[50.00%]. among this age groups , maximum incidence was found in age group of 51 to 60 years [33.33%] Pancreatic lesions were more common in males [75.00%] than females [25.00%].

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Commonest presenting symptoms were abdominal pain [95.00%] and vomiting [61.66%]. Among pancreatic pathology in descending order, acute pancreatitis was most common pathology comprising 24 cases [40.00%] .Pancreatic malignancy consist of 11 cases [18.33Clinically suspected patients were underwent prior laboratory investigations and USG examination. As USG has got many advantages like easy availability, cost effectiveness, non invasive, no radiation hazards and can be repeated as when required, it was done in every case before a ct scan.

Out of 11 cases of pancreatic mass, 5 cases (45.45%) were found in head region, 4cases (36.36%) in body and 1 case (09.09%) in tail region. Among pancreatic malignancy, adenocarcinoma was most common and it was most commonly found in head region. In Clark study majority (60%) of pancreatic carcinoma occur in the head, whereas 20% and 10% occur in the body and tail, respectively (11).

On CECT examination, all 5 cases of head mass were hypo dense and showed dilated MPD which were most common finding followed by dilated CBD (60.00%). Pancreatic carcinoma is a hypo vascular mass so it does not enhance at all or show a mild enhancement on post contrast study. In this study only 4 cases showed mild post contrast enhancement. Distant metastasis was found in 1 case (20%) in liver.

Out of 4 cases of body mass, all were hypo dense on NCCT. Distant metastasis and dilated MPD were found in all 4 cases and CBD was not dilated in any case of body mass. Liver metastasis was found in all 4 cases and lung metastasis in 2 cases.Out of 2 cases of tail mass, all were hypo dense on NCCT and showed mild enhancement. Dilated MPD and CBD were not dilated in any case of tail mass. Distant metastasis was found in 1 case in liver.

Study by McNulty et al shows sensitivity of MDCT for detection of pancreatic carcinoma is 96 % (35).Out of 5 cases of pancreatic head mass, 3 cases were managed by operation, 1 patient was expired and in 1 case follow up was not available. All 3 operated cases were confirmed as adenocarcinoma of head of pancreas, a most common malignancy on histopathological examination.

Out of 4 cases of pancreatic body mass, 3 patients expired and in 1 case follow up was not available. Out of 2 cases of tail mass, 1 patient was operated and confirmed as adenocarcinoma on histopathology examination and in 1 case follow up was not available. Patients with pancreatic head mass were presented earlier than pancreatic body and tail mass with signs and symptoms of obstructive jaundice due to obstruction of MPD and CBD. That is why in this study, the patient with pancreatic body and tail mass were presented late with distant metastasis.

CONCLUSION:

In this study 60 cases of pancreatic lesions are studied by MDCT scan as an imaging modality. Pancreatic lesions were more common in males [75.00%] than females [25.00%]. They were most common in age group of 51 to 60MDCT findings were confirmed on histopathological examination reports whenever possible, a follow up done about the outcome of patients after treatment.MDCT was able to categorize all pancreatic lesions in inflammatory and neoplastic condition and evaluate extent of disease process except, focal mass in chronic pancreatitis where MDCT was not able to differentiate between inflammation or carcinoma. FNAC is required to differentiate it from malignancy. In this study, MDCT was 100% specific in characterization of diagnostic radiological features of pancreatitis and 98% specific for pancreatic neoplasm. Thus we conclude that MDCT scan is most important single modality to evaluate the patients with pancreatic disease.

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