



ROLE OF MDCT IN EVALUATION OF PANCREATIC MASS LESIONS (STUDY OF 50 PATIENTS)

Dr. Dipali Shah

Associate Professor, Department Of Radiodiagnosis, B J Medical College, Ahmedabad.

Dr. Shital Turakhia*

Associate Professor, Department Of Radiodiagnosis, B J Medical College, Ahmedabad. *Corresponding Author

Dr. Pratik Kaswekar

Senior Resident, Department Of Radiodiagnosis, B J Medical College, Ahmedabad.

Dr. Hardik Raiyani

1st Year Resident, Department Of Radiodiagnosis, B J Medical College, Ahmedabad.

ABSTRACT

Pancreas is an important organ of the body but still a difficult organ to evaluate by both clinical and routine radiological methods. Pancreatic masses have propensity for producing high morbidity and mortality. They are insidious in their presentation on most occasions. Modalities for imaging of pancreas include Plain X-Ray, Barium Study, Ultrasonography, Endoscopic Ultrasound, Endoscopic Retrograde Cholangio Pancreatography, Contrast Enhanced Multidetector Computed Tomography, Magnetic Resonance Imaging, Optical Coherence Tomography & Positron Emission Technology. Here, we discuss the role of MDCT in detecting various pancreatic mass lesions & to characterize various MDCT features in diagnosing pancreatic mass lesions. Also discuss about how MDCT facilitate early detection of small pancreatic lesions and likely to impact the treatment of pancreatic tumors, especially pancreatic adenocarcinoma. And also discuss about provision of preoperative diagnosis and staging of the pancreatic mass lesions and help in treatment planning and follow-up in patients with pancreatic tumours with the help of MDCT.

KEYWORDS : Mdct, Adenocarcinoma, Mucinous, Neuroendocrine Tumors, Mass Forming Pancreatitis

I. INTRODUCTION

Carcinoma of pancreas is the 4th leading cause of death from cancer worldwide. The overall five-year survival rate is only 4%. (1) Because of its silent course, late clinical symptoms and rapid growth pattern, it has been known as a 'silent killer'. About two third of pancreatic masses arise in the head of the pancreas. (2) Despite the recent advances in imaging and treatment, pancreatic carcinoma continues to be a lethal disease. While newer diagnostic techniques have improved the accuracy for detecting these tumors, no significant inroads have been made in finding 'early' cancers. Most tumors are diagnosed late and approximately 85% of tumors are unresectable at the time of diagnosis. Despite the fact that tumor serum marker CA 19.9 is considered a sensitive but nonspecific marker for the diagnosis of carcinoma of the pancreas, it is rarely positive in tumors less than one cm in diameter. Therefore diagnostic imaging plays a critical role in the evaluation of the disease. (3)

Detection of pancreatic abnormality by routine non-invasive radiological methods namely plain radiography and gastrointestinal barium studies is possible but these tests are insensitive and non-specific. Supine, lateral decubitus and erect films of abdomen help to exclude other diagnosis such as a perforated viscus.

Evaluating pancreas by USG is advantageous as it is economical, easily available, non-invasive with no radiation hazards, provide real time imaging and can be repeated as and when required.

The advent of endoscopic US (EUS), has added a new dimension as it provided ultrahigh resolution images and exquisite details of pancreatic tumors, particularly in cystic lesions. Additionally, EUS allows simultaneous tissue sampling of pancreatic lesions with EUS-guided fine needle aspiration (FNA).

With introduction of CT, at present dynamic incremental bolus CT scan is the gold standard in the imaging of pancreatic

pathologies.

Although MRI, PET, EUS, etc. can provide valuable and distinctive information on pancreatic mass, multidetector CT should be used first in the detection of pancreatic masses. Carefully timed CT scan acquisition can maximize the difference in attenuation between neoplastic mass and the pancreatic parenchyma and allows accurate diagnosis, staging as well as assessment of local resectability. On one hand CT scan is an affordable, quick, available investigation for a patient with pancreatic mass. On the other hand, it is a very effective procedure that can elucidate maximum information regarding a pancreatic mass lesion.

II. AIIMS AND OBJECTIVES

1. To facilitate early detection of small pancreatic lesions and likely to impact the treatment of pancreatic tumors, especially pancreatic adenocarcinoma.
2. To determine the role of MDCT in detecting various pancreatic mass lesions.
3. To characterize various MDCT features in diagnosing pancreatic mass lesions.
4. To diagnose various complications of pancreatic mass lesions.
5. To provide preoperative diagnosis and staging of the pancreatic mass lesions and help in treatment planning and follow-up in patients with pancreatic tumors.

III. MATERIALS & METHODS

During the period from June 2016 to October 2018 a prospective study of fifty patients and/or sonographically suspected pancreatic mass lesions, underwent contrast enhanced MDCT using 128 slice Siemens CT scanner. Pre contrast and triphasic CT, including arterial phase, venous phase and delayed phase scanning was performed. Axial, coronal and sagittal reformatted images were analysed systematically.

INCLUSION CRITERIA:

1. Patient presented with acute epigastric pain.

2. Laboratory findings suggestive of pancreatic pathology.
3. USG findings suggestive or suspicious of pancreatic pathology.

EXCLUSION CRITERIA:

1. Patient having allergic reaction to contrast media.
2. Patient who are claustrophobics.

IV. RESULTS

Most of the pancreatic tumours were seen in 60-69 years age-group & 50-59 years age-group. Mean age for male patients was higher than female patients. Most of the lesions were seen in head region of pancreas followed by body & tail region. Out of the 50 patients, most common CT feature of pancreatic mass lesions were hypodense lesions which shows characteristic post contrast enhancement. Out of 50 patients, ductal adenocarcinoma was the most common histopathological type of pancreatic mass lesion, followed by mucinous neoplasm, neuroendocrine tumor, metastasis, mass forming chronic pancreatitis.

V. DISCUSSION

When pancreatic mass is suspected clinically, various imaging modalities have been employed for further evaluation of this mass. The use of non-invasive techniques including US and CT permits a more frequent diagnosis of pancreatic neoplastic lesions. Recent improvements in imaging techniques have made it possible to improve the diagnostic accuracy for detection, staging, and indicating surgical resectability of pancreatic cancer.

Current study was an endeavour to evaluate the role of MDCT in the evaluation of different pancreatic mass lesions. It was conducted among 50 patients of suspected pancreatic mass lesion. All of them underwent CT scan for their current pathology and subsequently histopathology was performed in most of the patient. Histopathology report was used as a foundation for confirming the actual diagnosis of patients and was used as a gold standard for comparing the procedure.

In this study, pancreatic lesions were more common in males (54%) than females (46%).

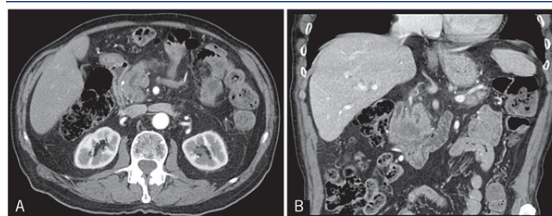
In this study, the commonest age group among the patients was 60-69 years (34 %) followed by 50-59 years age group (30 %) patients. 50 % of tumors occupied the head & uncinate process of the pancreas, 16% involved the body, 4 % involved the tail and 30 % diffusely involved the organ. The most of the patients 43 (86%) were presented with abdominal pain followed by 34 (68%) patients with loss of appetite / weight. 23 patients (46%) with personal history of smoking and 29 patients (58%) with personal history of alcoholism tend to have pancreatic mass lesions. 18 patients (36%) with diabetes mellitus tend to have pancreatic mass lesions in our study. 28 patients (56%) were diagnosed to have malignant lesions while 11 patients (22 %) had benign lesions. Out of 28 malignant cases, 25 (50%) had adenocarcinoma type of pancreas, 2 (4%) had carcinoma with metastasis and 1 (2%) patients had sarcomatoid type of malignancy. Out of 11 benign lesions, 5 (10%) patients had cystic mucinous neoplasm, 2 (4%) had inflammatory mass, 1 (2%) had serous cystadenoma, 1 (2%) had solid papillary epithelial neoplasm and 2 (4%) patient had neuroendocrine tumour. 22 patients (44%) of pancreatic mass lesions tend to have vascular complications.

Lu et al (4) proposed a CT-based grading system for determining vascular involvement by pancreatic carcinoma. The authors prospectively graded vascular involvement using the pancreatic phase. A scale of 0 to 4 was used based on the degree of circumferential contiguity of tumor to vessel, where 0 was no contiguity and 4 was >75% contiguity. These criteria

were applied to both arteries and veins, and it was found that if >50% of the vessel circumference (grades 3 and 4) was in contact with tumor, then there was a high likelihood of the tumor being unresectable. A sensitivity of 84% and a specificity of 98% were found for determining tumor resectability based on vascular involvement.

The use of MDCT improves the resolution of sagittal and coronal multiplanar reformatted images and allows for improved detection of changes in vessel caliber. The addition of CTA to conventional axial helical CT resulted in a negative-predictive value for determining tumor resectability of 96% compared with 70% for conventional axial helical CT alone.

VI. FIGURES



CT scan A) axial cut: Wirsung dilation due to a cephalic pancreatic mass;
B) coronal cut: cephalic pancreatic mass CT: computed tomography.



Mucinous Cystadenoma of Pancrease



Clear cell variant of pancreatic mass with liver metastasis

VII. SUMMARY

This study including 50 Patients with pancreatic pathology (except acute pancreatitis) was carried out in large tertiary care teaching hospital with large catchment area. This study included patients with history of abdominal complaints referred from surgery department. In our study, we observe that more number of pancreatic mass lesion are located in pancreatic head region than any other specific location. Out of the 50 patients, most common clinical feature of pancreatic mass lesion was abdominal pain, followed by loss of appetite and weight. We observe that there is strong correlation between personal history of smoking and alcoholism & occurrence of pancreatic mass lesion. We observe that most characteristic CT appearance of pancreatic mass lesion is hypodensity followed by characteristic post contrast phase enhancement. We observed in study that ductal adenocarcinoma was the most common histopathological

type of pancreatic mass lesion, followed by mucinous neoplasm, neuroendocrine tumor, metastasis, mass forming chronic pancreatitis. Less common histopathological type of the lesion was sarcomatoid tumour, solid pseudopapillary epithelial neoplasm, serous cystadenoma of pancreas. Most of the pancreatic mass lesions showed characteristic complication of regional as well as distant metastatic lymphadenopathy followed by arterial or vascular complications. Less common complication of the lesions was liver metastasis followed by peripancreatic inflammation, ascites and pleural effusion, lung metastasis and adrenal metastasis.

VIII. CONCLUSION

Findings of this study support that the excellent soft tissue resolution, better evaluation of peripancreatic fat plane disruption or fascial plane thickening and extension or invasion of growth proved CT scan may be a useful tool for assessing and characterization of pancreatic mass lesions. The use of multiplanar reformatted images and 3D representation of the vascular structures helps in accurate staging of pancreatic tumors and aids in successful surgical resection.

Contrast enhanced CT Scan is more helpful than unenhanced scan in diagnosing and defining tumor extent and in differentiating solid tumor component and cyst. Hypodense non-enhancing or poorly enhancing mass on CT that is poorly marginated, which may encase vessels and the common biliary duct favours ductal adenocarcinoma. Large uni/multilocular cystic pancreatic neoplasm, communicating with the main pancreatic duct, favours mucinous cystic neoplasm.

REFERENCES

1. Sainani N, Catalino O, Sahani D. Pancreas. In: Haage JR, Dogra VS, eds. CT and MRI of whole body. Philadelphia: ELSEVEIR Mobsy, 2003: 1655-59.
2. Adam EJ, Morgan R. The pancreas. In: Grainger RG, Allison D, Adam A, Dixon AR, eds. Textbook of Radiology. London: Churchill Livingstone, 2008: 1343-66.
3. Brennan C, Curry CA, Eng J, Horton KM, Falconi M, Vamentini V, et al. Comprehensive preoperative assessment of pancreatic adenocarcinoma with 64-section volumetric CT. *RG 2007*; 27: 1653-68.
4. Lu et al: 2000;174: CT-based grading system for determining vascular involvement by pancreatic carcinoma.