



IMAGING FINDINGS IN PANCREATIC NEOPLASMS ON MDCT: A PICTORIAL CASE SERIES FROM A TERTIARY CARE HOSPITAL

Radio-Diagnosis

Dr. Shivani Chandra*

Resident, Department of Radiodiagnosis, Atal Bihari Vajpayee Institute of Medical Sciences & Dr. RML Hospital, New Delhi. *Corresponding Author

Dr. Vinay Yadav

Resident, Department Of Radiodiagnosis, Atal Bihari Vajpayee Institute of Medical Sciences & Dr. RML Hospital, New Delhi.

ABSTRACT

It is crucial to recognize and characterize pancreatic masses as they differ widely in their management and prognosis. MDCT is touted as the "main workhorse" for their evaluation. In addition to being quick and cost-effective, it allows for multiphasic imaging, which enables excellent characterization of the mass lesion and provides information about the extent, vascular infiltration, and sites of metastasis, all of which are crucial determinants for resectability. It is also helpful in characterizing cystic lesions and can help in segregating them into premalignant, malignant or benign, thus aiding in taking landmark and life altering decisions for patient treatment. 40 patients in the age range of 54 - 67 years were studied using a 128 slice MDCT scanner with a pancreatic protocol. Pancreatic neoplasms were more common in males than in females. The most common solid pancreatic neoplasm was pancreatic adenocarcinoma, and the most common cystic neoplasm was IPMN. All of the cases of mucinous cystadenomas were females. In this review, we showcase the imaging findings of cystic as well as solid pancreatic tumours using MDCT.

KEYWORDS

pancreas, MDCT, imaging

BACKGROUND:

Pancreatic neoplasms, especially adenocarcinomas, are increasingly becoming a public health problem worldwide. They frequently have nonspecific clinical symptoms as well as serum biomarkers. In India, as with other countries, there is no screening programme available for pancreatic tumours. Although the current incidence of pancreatic cancer in India is low, this is expected to increase in the near future due to its association with lifestyle factors like smoking, alcohol consumption, and diabetes.^[1,2] Malignant pancreatic tumours are especially notorious to have strikingly poor survival outcomes,^[1] thus underlining the importance of diagnostic modalities for this entity. MDCT (Multidetector Computed Tomography) is considered to be an accurate and the best validated modality for characterizing pancreatic masses and determining essential resectability criteria.^[3,4] It is also helpful in characterizing cystic lesions and predicting their biologic aggressiveness,^[5] thus earmarking the further management protocol for treatment.

AIM:

Characterization of pancreatic neoplasms using MDCT.

MATERIALS & METHODS:

This was a cross sectional observational study conducted from May 2021 to October 2021. Scans were performed on the 128 slice MDCT scanner (Somatom Definition Flash, Siemens Healthineers AG, Erlangen, Germany) in the Department of Radiodiagnosis. Patients who demonstrated a pancreatic lesion on ultrasonography were included in this study. Oral administration of 500–700 ml of water, approximately 30 minutes before the scan was performed. Post contrast imaging was done by administration of intravenous iomeprol (400 mgI/ml) at 4 ml/s using a pressure injector. Phases imaged were non-contrast, early arterial, pancreatic and portal venous at approximately 20, 40 and 70 seconds respectively, after injection of contrast agent. The images were reviewed in all 3 planes using multiplanar reconstructions on the available workstation using commercially available software.

RESULTS:

40 patients (28 males, and 12 females) were included in this study, out of which 22 patients (55%) demonstrated solid neoplastic pancreatic lesions and 18 patients (45%) had cystic pancreatic neoplasms. Of the 22 cases of solid neoplasms, 17 cases (77%) were pancreatic adenocarcinomas, 2 (9%) were metastatic deposits, 2 (9%) were neuroendocrine tumors, and 1 (4%) was a pancreatic lymphoma.

In the remaining cystic group of lesions, 8 cases (44%) comprised of IPMNs (intraductal papillary mucinous neoplasms), 5(27%) were mucinous cystadenomas, and 5 (27%) were serous cystadenomas.

Solid Neoplasms

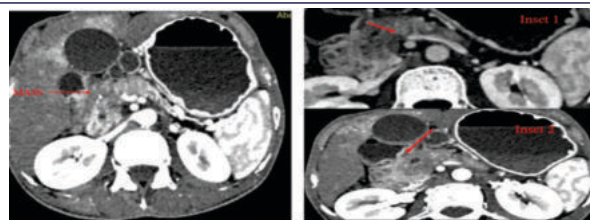


Figure 1: Heterogenous, hypodense mass in the pancreatic head with atrophy of pancreatic tail. Inset 1-obliteration of splenoportal confluence. Inset 2- Infiltration into D2 segment of duodenum. Diagnosis was **pancreatic adenocarcinoma**.

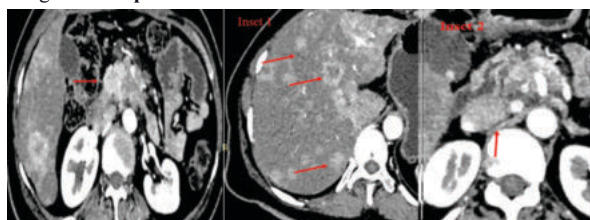
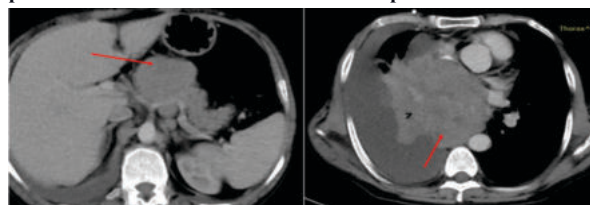
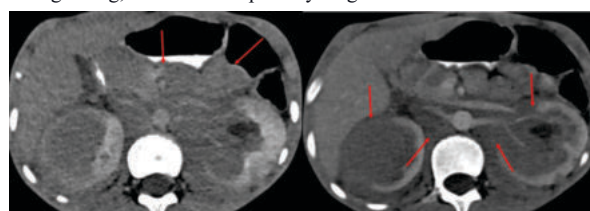


Figure 2: Hypervascular, arterial phase enhancing mass in the pancreatic neck. Inset 1: Hypervascular, arterial phase enhancing metastatic deposits in the liver. Inset 2: Hypervascular, arterial phase enhancing deposit in the paracaval lymph node. Diagnosis was **pancreatic neuroendocrine tumour with hepatic metastasis**.



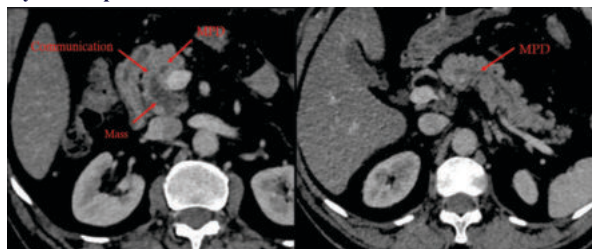
Figures 3, 4: Hypovascular, rounded **metastatic deposit** in the pancreatic body. Heterogeneously enhancing irregular mass lesion in the right lung, which was the primary lung carcinoma.



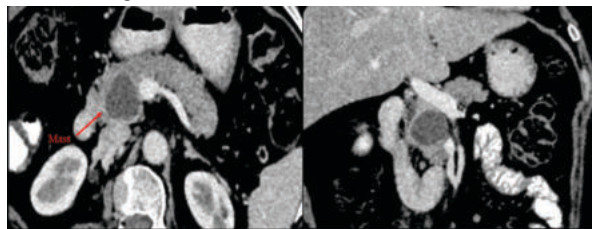
Figures 5, 6 : Multiple, rounded hypoattenuating masses seen in the

pancreatic body and tail. Multiple hypoenhancing masses seen in bilateral kidneys with enlarged aortocaval & paraortic lymph node masses. Diagnosis was **secondary pancreatic lymphoma**.

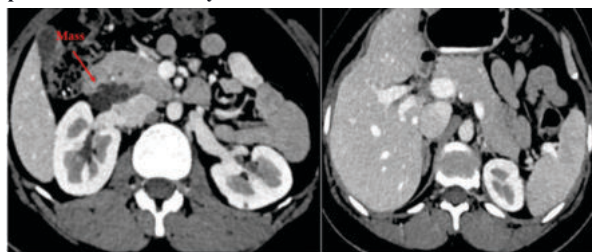
Cystic Neoplasms



Figures 7, 8 : Axial images show a cystic attenuation lesion in the pancreatic uncinate process with a demonstrable communication with the MPD. Diagnosis was a **side branch IPMN**.



Figures 9,10: Axial and coronal reformatted images showing a unilocular cystic lesion in the pancreatic uncinate process and head with no demonstrable communication with the MPD. Diagnosis was a **pancreatic mucinous cystadenoma**.



Figures 11, 12: Axial images show a multilobulated, microcystic lesion in the pancreatic head with no obvious demonstrable communication with the main pancreatic duct. Diagnosis was a **pancreatic serous cystadenoma**.

Pancreatic neoplastic lesions were more common in males (70%) than in females. Out of the solid pancreatic neoplasms, the most common entity was pancreatic adenocarcinoma, comprising 77% of the solid neoplasms. Out of the cystic pancreatic neoplasms, the most common entity was IPMN (intraductal papillary mucinous neoplasms), comprising of 44% of the cystic neoplasms. All of the cases of mucinous cystadenomas were females.

CONCLUSION

MDCT plays a central role in the differential diagnosis of pancreatic neoplasms. This imaging modality enables radiologists to play pivotal roles in deciding the lines of management and determining patient prognosis.

REFERENCES

- Gaidhani RH, Balasubramaniam G. An epidemiological review of pancreatic cancer with special reference to India. *Indian J Med Sci* 2021;73(1):99-109.
- Thapa P. Epidemiology of pancreatic and Periampullary Cancer. *Indian J Surg*. 2015;77(5):358-61.
- Azzaz, H.E.M., Abdullah, M.S. & Habib, R.M. Role of multidetector computed tomography in evaluation of resectability of pancreatic cancer. *Egypt J Radiol Nucl Med* 52, 140 (2021).
- Pietryga JA, Morgan DE. Imaging preoperatively for pancreatic adenocarcinoma. *J Gastrointest Oncol* 2015;6(4):343-357.
- Prospective Evaluation of Reader Performance on MDCT in Characterization of Cystic Pancreatic Lesions and Prediction of Cyst Biologic Aggressiveness. Dushyant V. Sahani, Nisha I. Sainani, Michael A. Blake, Stefano Crippa, Mari Mino-Kenudson, Carlos Fernandez del-Castillo. *American Journal of Roentgenology* 2011 197:1, W53 W61.
- Brennan DD, Zamboni GA, Raptopoulos VD, et al. Comprehensive preoperative assessment of pancreatic adenocarcinoma with 64-section volumetric CT. *Radiographics* 27;2007:1653-1666.
- Procacci C, Graziani R, Bicego E, et al. Serous cystadenoma of the pancreas: report of 30 cases with emphasis on the imaging findings. *Journal of Computer Assisted Tomography* 1997;21:373-382.

- Ogawa H, Itoh S, Ikeda M, et al. Intraductal papillary mucinous neoplasm of the pancreas: assessment of the likelihood of invasiveness with multisecton CT. *Radiology* 2008;248:876-886.
- Curry CA, Eng J, Horton KM, Urban B, Siegelman S, Kuszyk B S, Fishman EK. CT of primary cystic pancreatic neoplasms: can CT be used for patient triage and treatment. *American Journal of Roentgenology*. 2000 Jul; 175(1):99-103.
- Nino-Murcia M, Tamm EP, Chamsangavej C, Jeffrey Jr RB. Multidetector-row helical CT and advanced post processing techniques for the evaluation of pancreatic neoplasms. *Abdominal imaging*. 2003 May; 28(3):0366-77.