Role of 256-Detector Row MDCT in Diagnosis of Pancreatic Lesions

Ramesh Chandra Adurti[1], Supraja Jonnalagadda[2], Priyanka adurthy[3], Nagababu Pyadala[4,5]

[1]Assistant Professor, Department of Radio Diagnosis, Suryapet Government Medical College, Suryapet, Telangana, [2]Assistant Professor, Department of General Surgery, Kamineni Institute of Medical Sciences, Narketpally, Telangana, [3]Senior Resident, Department of Radio Diagnosis, Suryapet Government Medical College, Suryapet, Telangana, [4]Associate Professor, Department of Biochemistry, MNR Medical College, Sangareddy, Telangana, [5]QC Manger, Genomix CARL, Pulivendula, Andhra Pradesh, India.

Corresponding author: Dr. Priyanka Adurthy, Senior Resident, Department of Radio Diagnosis, Suryapet Government Medical College, Suryapet, Telangana, India.

A B S T R A C T

Introduction: Pancreatic cysts can be benign, malignant and borderline type of lesions. It can be cystic or cystic degeneration of solid tumors. This present study was focused on assess the diagnostic accuracy of 256-detector row MDCT in the detection of pancreatic cystic lesions (PCLs).

Material and methods: Images from total of 172 patients were studied on the basis of signs of malignancy.

Results: We analysed 220 PCLs in 172 patients (solitary in 145 and ≥2 in 47; incidence 2.05%). Size ranged from 3 to 132 mm (mean 15 mm); body was the most common location. Intralesional septa were detected in 23/132 lesions (17.4%), wall thickening >2 mm in 6%, enhancing wall and mural nodules in 4.5% and 5.3%, respectively. IPMNS was the most common finding around 83%, while 10.6% were cystadenomas and 6% were others.

Conclusion: As cross-sectional imaging uses frequently, the MDCT contributes structured features for insignia of PCLs.

Keywords: Pancreatic Lesions, 256- Detector Row MDCT.

INTRODUCTION

The improvement of resolution of cross-sectional imaging makes it mostly used imaging technique daily basis in clinical settings, due to this benefit unexpected cystic lesions of the pancreas reported easily.[1-3] Therefore it decreases the diagnostic and therapeutic difficulties. Pancreatic cysts can be benign, malignant, borderline lesions or may be due to cystic degeneration of solid tumors.[3-6] The pancreatic cysts are like pseudocysts, intraductal pappilary mucinous neoplasms (IPMNs), mucinous, serous or cystic endocrine tumors.[7] Symptomatic lesions has the higher risk of malignancy, moreover asymptomatic cysts are like IPMNs and mucinous cystadenomas.[3,5,8] There was very few data presented about the prevalence of incidental detection of pancreatic cyst on cross-sectional imaging.[3,8,9] There is lack of proper imaging criteria for the differentiation of benign and malignant lesions.[8] However the presence of certain signs like thickened walls, increased mural nodules, main pancreatic duct size of ≥5 mm with distal pancreatic atrophy can be correlated to understand the risk of malignancy.[3,10,11] So, there is huge need of accurate method to evaluate the suspicious features of pancreatic lesions which is necessary for proper characterization, management and even follow up of pancreatic lesions.[7,11-13] The MDCT is recommended as the first-line imaging method to identify t the first-line imaging method to identify the pathologic conditions of pancreatic lesions. MDCT is widespread in clinical setting because of its high spatial resolution.[12] There was less study available regarding the diagnostic accuracy of 256-detector row MDCT imaging in patients with pancreatic lesions. Therefore this present study aimed to evaluate the diagnostic accuracy of 256 detector row MDCT in pancreatic lesions and also report cystic lesions correlated with high risk of malignancy.

MATERIAL AND METHODS

Study Population: A total of 1598 abdominal MDCT examinations performed in our department from May 2018 to June 2019. The final imaging analysis was based on following conditions such as; a) no evidence of pancreatic lesions on previous imaging technique, like USG or MRI. B) no prior history of pancreatic lesions or surgical intervention. c) no symptoms suggested of pancreatic disease. d) no evidence of Von Hippel-Lindau syndrome related to risk of pancreatic lesions. The informed consent was collected from all the patients involved in MDCT study.

MDCT Protocols: 256 detector row MDCT were used for all the image analysis and the different protocols were

International Journal of Contemporary Medicine Surgery and Radiology   Volume 4 | Issue 4 | October-December 2019   **D96**

ISSN (Online): 2565-4810; (Print): 2565-4802 | ICV 2018: 86.41 |

used based on the clinical conditions such as, tumor staging, undefined abdominal pain and follow up.

Image Analysis: All images were studied on a PACS (IMPAX 6.4, Agfa HealthCare NV, Mortsel, Belgium), assuming as cystic an oval or round pancreatic lesion with a predominant or uniform low attenuation appearance. Evaluation of axial images and multiplanar reformatted based on the diagnosis of pancreatic cystic lesions. The location of pancreatic lesions and number of lesions were recorded. Whole study followed the standard guidelines listed in the In ternational Consensus Guidelines for the Management of MCN and IPMN of the Pancreas (2012) (Table 1).[11] Patients sex, age and other demographic data were recorded.

STATISTICAL ANALYSIS

All the clinical data and other information with imaging features were saved in an electronic datasheet. The SPSS 20.0 statistical analysis software was used to analyze all data.

RESULTS

A total of 172 patients were evaluated in this study. Among them 87 were female and 85 were male. The age ranged between 31to 90 years. 76.74% patients belong to over 60 year's age. The mean age was 63 years (Table 2). Among all patients, 132 were analyzed as pancreatic cyst. The size of cyst ranged between 4-145 mm with mean size of 15mm.

Main imaging features	Patients	Percentage
Inner septa	23/132	17.4%
Communication with ductal system (MPD)	10/132	7.5%
Wall thickening >2 mm	8/132	6%
Mural enhancing nodules	6/132	4.5%
MPD diameter >5 mm	7/132	5.3%

Table-1: International Consensus Guidelines for the Management of MCN and IPMN of the Pancreas shows the morphologic features of cystic lesions associated to high risk of malignancy.

Age range (years)	Number of patients	Percentage
< 40	6	3.4%
40- 49	10	5.8%
50-59	14	8.13%
60-69	53	30.8%
70-79	56	32.5%
>80	33	19.2%
Total	172	

Table-2: Incidence of PCLs detected on MDCT studies, in relation to age ranges.

Lesions	Percentage
Intraductal papillary mucinous neoplasms (IPMNs)	110/132 (83%)
Cystadenomas	14/132 (10.6%)
Others	8/132 (6%)

Table-3: Final diagnosis of the 132 pancreatic cystic lesions detected in 172 patients, according to histopathology, cytopahtological analysis, or imaging features evaluations.

There was no relation found between size of lesions and their location in the pancreas. The presence of inner septa 17.4% was most commonly found with higher risk of malignancy. Communication with ductal system was observed in 7.5%. Wall thickening >2 mm was present in lesions 6%, presence of mural enhancing nodules in 4.5%, and a concomitant dilation of MPD in 5.3%. Based on these the most common diagnosis in our population study were branch type IPMNs 83%; Cystadenomas 10.3% and others 6% (Table 3).

DISCUSSION

The frequently uses of high-resolution cross-sectional imaging technique in daily practice has increased the diagnostic accuracy of several lesions, even malignant. Thus MDCT findings reveals pancreatic cyst most common observation in asymptomatic lesions. The lesions has many different characteristics such as differentiate benign cyst from premalignant and malignant ones.[1,10,14] MDCT is proved to be widely used technique with higher spatial resolution for imaging of several diseases like pancreatic, also preoperative staging of malignancies.[15] MRI has better sensitivity than MDCT in characterization of pancreatic cysts[12] and recorded high frequency for small lesions as less as <10mm.[11,16] MRCP is proved to be best diagnostic method to detect IPMN and their type, extent and differences of branch type from MCN's.[17] Hence, diagnosis of PCL, MRI is the gold standard radiological technique.[18] MRI and Endoscopic ultrasound has almost similar accuracy rate.[19] In case of invasiveness, EUS can be used to get cystic fluid and cytopathological specimens by FNAC.[20,21] In case of autoptic series cystic lesions present up to 25%.[22] Laffan et al. study revealed 2.6% pancreatic lesions in 2382 CT scans.[3] Our data also showed more or less similar report. Therefore MDCT is not strongly associated with depiction rate of unexpected smaller PCLs as compared to older scanners. To increase the diagnostic accuracy of MDCT, it is recommended to maintain the standard protocol.[10,15] In this study MDCT not performed with pancreas tailored protocol, because patients with known pancreatic lesion were excluded from the study. In our study morphological features correlated with a high risk of malignancy. In this study many patients underwent follow-up or second line studies. Hence MDCT has significant role in patients with incidentally detected PCLs, it can help doctors to make proper decisions. Although there are some limitations in this study. Studies were held on in different clinical settings with different protocols. Hence it is quite impossible to regularized the performance of 256-detector row MDCT in diagnosis of pancreatic lesions. We did not set any gold standard radiodaignostic technique for comparison of our results. So, no accuracy of MDCT compared to other technique.

CONCLUSION

The results from 256-row detector MDCT is not actually correlated with an increased diagnostic of smaller pancreatic cystic lesions, while compared with old scanner data. However, MDCT is proved to be a strong radiological technique for the illustration of morphological features related to higher risk of pancreatic malignancy.

REFERENCES

1. D. V. Sahani, R. Kadavigere, A. Saokar, C. Fernandez-del Castillo, W. R. Brugge, and P. F. Hahn, "Cystic pancreatic lesions: a simple imaging-based classification system for guiding management," Radiographics, 2005;25(6): 1471–1484.

2. K. S. Spinelli, T. E. Fromwiller, R. A. Daniel et al., "Cystic pancreatic neoplasms: observe or operate," Annals of Surgery 2004;239(5):651–659.

3. T. A. Laffan, K. M. Horton, A. P. Klein et al. Prevalence of unsuspected pancreatic cysts on MDCT. The American Journal of Roentgenology 2008;191(3):802–807.

4. W. R. Brugge, G. Y. Lauwers, D. Sahani, C. Fernandez-Del Castillo, and A. L. Warshaw. Cystic neoplasms of the pancreas. The New England Journal of Medicine, 2004;351(12):1218– 1226.

5. K. de Jong, C. Y. Nio, J. J. Hermans et al. High prevalence of pancreatic cysts detected by screening magnetic resonance imaging examinations. Clinical Gastroenterology and Hepatology 2010;8(9):806–811.

6. C. Fernandez-Del Castillo, J. Targarona, S. P. Thayer et al. Inci- ´ dental pancreatic cysts: clinicopathologic characteristics and comparison with symptomatic patients. Archives of Surgery, 2003;138(4):427–434.

7. B. Buerke, D. Domagk, W. Heindel, and J. Wessling, Diagnostic and radiological management of cystic pancreatic lesions: important features for radiologists. Clinical Radiology 2012;67(8):727–737.

8. K. S. Lee, A. Sekhar, N. M. Rofsky, and I. Pedrosa, Prevalence of incidental pancreatic cysts in the adult population on MR imaging. American Journal of Gastroenterology 2010;105(9):2079–2084.

9. D. V. Sahani, A. Saokar, P. F. Hahn, W. R. Brugge, and C. Fernandez-Del Castillo. Pancreatic cysts 3 cm or smaller: how aggressive should treatment be?" Radiology 2006;238(3):912–919.

10. M. Del Chiaro, C. Verbeke, R. Salvia et al. European experts consensus statement on cystic tumours of the pancreas. Digestive and Liver Disease 2013;45(9):703–711.

11. M. Tanaka, C. Fernandez-del Castillo, V. Adsay et al. Interna- ´ tional consensus guidelines 2012 for the management of IPMN and MCN of the pancreas. Pancreatology 2012;12,(3):183– 197.

12. N. I. Sainani, A. Saokar, V. Deshpande, C. Fernandez-Del ´ Castillo, P. Hahn, and D. V. Sahani. Comparative performance of MDCT and MRI with MR cholangiopancreatography in characterizing small pancreatic cysts. American Journal of Roentgenology, 2009;193(3):722–731.

13. D. V. Sahani, N. I. Sainani, M. A. Blake, S. Crippa, M. MinoKenudson, and C. Fernandez Del-Castillo. Prospective evaluation of reader performance on MDCT in characterization of cystic pancreatic lesions and prediction of cyst biologic aggressiveness. American Journal of Roentgenology 2011;197(1):W53–W61.

14. R. H. Hruban, K. Takaori, M. Canto et al. Clinical importance of precursor lesions in the pancreas. Journal of Hepato-BiliaryPancreatic Surgery 2007;14(3):255–263.

15. S. Bipat, S. K. S. Saffire, O. M. Van Delden et al., Ultrasonography, computed tomography and magnetic resonance imaging for diagnosis and determining resectability of pancreatic adenocarcinoma: a meta-analysis. Journal of Computer Assisted Tomography, 2005;29(4):438–445.

16. X. M. Zhang, D. G. Mitchell, M. Dohke, G. A. Holland, and L. Parker. Pancreatic cysts: depiction on single-shot fast spinecho MR images. Radiology, 2002;223(2):547–553.

17. J. A. Waters, C. M. Schmidt, J. W. Pinchot et al. CT vs MRCP: optimal classification of IPMN type and extent. Journal of Gastrointestinal Surgery 2008;12(1):101–109.

18. L. L. Berland, S. G. Silverman, R. M. Gore et al., Managing incidental findings on abdominal CT: white paper of the ACR incidental findings committee. Journal of the American College of Radiology 2010;7(10):754–773.

19. E. Ohno, Y. Hirooka, A. Itoh et al. Intraductal papillary mucinous neoplasms of the pancreas: differentiation of malignant and benign tumors by endoscopic ultrasound findings of mural nodules. Annals of Surgery 2009;249(4):628–634.

20. A. Nakagawa, T. Yamaguchi, M. Ohtsuka et al., Usefulness of multidetector computed tomography for detecting protruding lesions in intraductal papillary mucinous neoplasm of the pancreas in comparison with single-detector computed tomography and endoscopic ultrasonography," Pancreas 2009;38(2):131–136.

21. M. Genevay, M. Mino-Kenudson, K. Yaeger et al., Cytology adds value to imaging studies for risk assessment of malignancy in pancreatic mucinous cysts. Annals of Surgery 2011;254(6):977–983.

22. W. Kimura, H. Nagai, A. Kuroda, T. Muto, and Y. Esaki. Analysis of small cystic lesions of the pancreas. International Journal of Pancreatology 1995;18(3): 197–206.