(e) ISSN Online: 2321-9599

(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

To study the characterization of cystic lesions of pancreas by computer tomography scan

Kirti Sharma

Assistant Professor, Department of Radio Diagnosis, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

ABSTRACT:

Aim: To study the characterization of cystic lesions of pancreas by computer tomography scan. **Materials and methods:** A total of 60 patients with proven diagnosis were selected. CT protocol for imaging pancreas includes triphasic scan which is a non-contrast study, arterial phase, a late arterial phase and a venous phase imaging. Triphasic CT protocol paves way for selective visualization of main arterial, venous structures, hence allowing assessment of vascular invasion by the tumour. The features of cystic lesions in the pancreas were studied like the overall size of the lesion, location, thickness of septation, nature of calcification, pancreatic duct dilatation if any, size of the largest cyst within the lesion, approximate number of cysts, presence of any solid component, nature of enhancement, presence of the wall and contour of the lesion were studied. **Results:** Out of the total 60 patients, 29 patients had pseudocysts and 31 patients had neoplastic cysts proven by histopathology or endoscopy guided aspiration. The neoplastic cysts include 8 benign IPMN, 11 serous cystadenoma, 6 mucinous cystadenoma, 3 SPEN and 3 mucinous cystadenocarcinomata. All the non-neoplastic cysts were pseudocysts and were predominantly seen in males than females with high prevalence between 20-50 yrs. All of them had association with acute or chronic pancreatitis. 2/3rd of the SPEN were seen in females. About 66.67% of the mucinous cystadenomas were female. **Conclusion:** Pseudocysts are linked to pancreatitis. Pseudocysts are the predominant kind of cysts seen in the pancreas, with serous cystadenomas being the second most prevalent. Serous cystadenomas have a lobulated shape with an indiscernible boundary that contains several smaller cysts and core chunky calcifications. Mucinous cystadenomas have a sleek outline, a discernible wall with calcifications around the outer edge, and a reduced number of larger cysts. Malignant cysts have solid components that demonstrate enhancement.

Keywords: Cystic lesions,Pancreas,Computer tomography scan

Corresponding author: Kirti Sharma, Assistant Professor, Department of Radio Diagnosis, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

This article may be cited as: Sharma K. To study the characterization of cystic lesions of pancreas by computer tomography scan. J Adv Med Dent Scie Res 2016;4(3):219-221.

INTRODUCTION

Pancreatic cystic lesions are often seen in clinical practice. Radiologists must be familiar with and understand differential diagnoses to accurately determine the etiology of patients, often resolving uncertainties[1].Pancreatic pseudocysts are the most common cystic abnormalities seen in the pancreas. Cystic pancreatic neoplasms, which are a kind of lesion, are not common and make up about 10%-15% of all pancreatic cysts. The rise in the use of diagnostic imaging techniques such as Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) has led to an increase in the identification of these abnormalities, thus resulting in a higher number of surgical removals[2].The most common types of non-Pseudocyst lesions in the pancreas are Serous Cystadenoma, Mucinous Cystic Neoplasm, and Intraductal Papillary Mucinous Neoplasm (IPMN). These three types account for 90% of all cystic pancreatic lesions. The first assessment should focus on ruling out pancreatic pseudocysts, which are often seen in individuals with a past medical history of acute or chronic pancreatitis or abdominal trauma. Cystic cancers lack these precursors[3]. The appearance of cystic lesions plays a role in interpreting the pictures and making a diagnosis. However, accurately characterizing these lesions may be challenging owing to the wide range of cell types involved.Intraductal papillary mucinous neoplasm (IPMN) is categorized into three distinct types: Main duct, branch type, and mixed type. The main duct type is characterized by widespread or localized dilatation of the ducts and is associated with the greatest risk of malignancy. The branch type of cyst is mostly seen at the head of the pancreas. It manifests as either a single-chambered or multiple-chambered cysts that are connected to the primary pancreatic duct[4]. MRCP is crucial in illustrating the connection between the cyst and duct. The imaging characteristics suggestive of cancer include duct dilation more than 5 mm, an enhancing nodule larger than 5 mm, a cyst diameter exceeding 3 cm, and a thickened enhancing wall. Female individuals often exhibit solid pseudopapillary neoplasms, typically occurring at an average age of 25 years[5]. On imaging, they are seen as distinct masses with well defined boundaries, including both solid and cystic regions that exhibit necrosis and hemorrhagic debris. Most individuals with solid pseudopapillary neoplasms have a favorable prognosis due to the low-grade nature of these neoplasms. Epithelial cysts of the pancreas that are really true are very uncommon

and are seen in disorders such as Von Hippel Lindau syndrome[6].

MATERIALS AND METHODS

In this retrospective study, all patients with proven cystic lesions of pancreas who underwent CT imaging using a 64 slice GE VCT were selected. All lesions were proven either by surgery or by endoscopy guided aspiration or follow up.A total of 60 patients with proven diagnosis were selected. CT protocol for imaging pancreas includes triphasic scan which is a non-contrast study, arterial phase, a late arterial phase and a venous phase imaging. Triphasic CT protocol paves way for selective visualization of main arterial, venous structures, hence allowing assessment of vascular invasion by the tumour. Non-contrast study is done using 5 mm slice thickness with 2.5 mm reconstruction starting from the liver dome up to the iliac crests. Arterial phase is done with 2.5 mm slice thickness along with 1.25 mm reconstructions from top to bottom of liver at 20 sec delay to obtain excellent hepatic arterial opacification with minimal contrast in portal vein. Immediately after arterial phase, at 40 sec delay, pancreatic parenchymal phase/Late arterial phase is done. Portal venous phase is done using 5 mm slice thickness at 70 sec delay with 2.5 mm reconstructions. Incidence of various cystic lesions based on the histopathological findings, age and sex were analysed. The features of cystic lesions in the pancreas were studied like the overall size of the lesion, location, thickness of septation, nature of calcification, pancreatic duct dilatation if any, size of the largest cyst within the lesion, approximate number of cysts, presence of any solid component, nature of enhancement, presence of the wall and contour of the lesion were studied.

STATISTICAL ANALYSIS

Descriptive statistics like percentage was used for analysis. SPSS Version 25.0 were used for data analysis.

RESULTS

Out of the total 60 patients, 29 patients had pseudocysts and 31 patients had neoplastic cysts proven by histopathology or endoscopy guided aspiration. The neoplastic cysts include 8 benign IPMN, 11 serous cystadenoma, 6 mucinous cystadenoma, 3 SPEN and 3 mucinous cystadenocarcinomata. All the non-neoplastic cysts were pseudocysts and were predominantly seen in males than females with high prevalence between 20-50 yrs. All of them had association with acute or chronic pancreatitis. 2/3rd of the SPEN were seen in females. About 66.67% of the mucinous cystadenomas were female. All patients with mucinous cystadenoma were below 50 years and most of the IPMN patients were above 54 years. Serous cystadenoma was not seen in patients below 20 years. All the SPEN were diagnosed before 37 years. The IPMN were seen in the head, body and tail of the pancreas. 50% mucinous cystadenomas were seen in the tail of pancreas. 54.54% (6/11) serous cystadenomas were seen in the head of the pancreas. All the SPEN were seen in the tail of the pancreas.

Table 1: Gender Distribution of Various Benign and Malignant Cystic Lesions of Pancreas

Gender	Pseudo cysts	Serous cystadenoma	Benign IPMN	Mucinous cystadenoma	SPEN	Mucinous cystadeno-carcinoma
Male	19	4	5	2	1	3
Female	10	7	3	4	2	0

Table 2: Incidence of Cystic Lesions in Different Age Groups

Age	Pseudo-cysts	Serous Cystadenoma	Benign IPMN	Mucinous Cystadenoma	SPEN	Mucinous Cystadeno-carcinoma
Less than 20 years	6	0	2	2	2	0
20-50 years	18	3	0	4	1	2
More than 50 years	5	8	6	0	0	1

Table 3: Distribution of Lesions within the Pancreas

Location within Pancreas	Pseudocysts	Serous Cystadenoma	Benign IPMN	Mucinous Cystadenoma	SPEN	Mucinous Cystadenocarcinoma
Head	12	6	2	0	0	0
Body	8	2	4	3	0	2
Tail	9	3	2	3	3	1

DISCUSSION

Cystic neoplasms account for about 10–15% of pancreatic cystic lesions. Characterization of these lesions is crucial. While some of the lesions are premalignant/malignant and timely resection is mandatory, unwarranted surgical interventions can be avoided in benign asymptomatic lesions.In our study IPMN and pseudocysts are common in males. Karoumpalis et al reported SPEN is seen at 20-40 years, mucinous cystadenoma between 40-50 years, and serous cystadenoma between 50-70 years and IPMN between 60-70 years. They further reported

that IPMN is mainly seen in head and mucinous cystadenoma mainly in body and tail. No difference in distribution of the rest of the lesions within the pancreas[6].

PMT is commonly seen in head (50%), body (39%), tail (7%) and uncinated process (4%). Young reported 76.9% of mucinous cystadenomas and 54% of serous cystadenomas are seen in body and tail. In our study mucinous cystadenoma are seen equally in the body and tail and the serous cystadenomas were mostly distributed in head of the pancreas[7]. IPMN is commonly smaller than 3 cms whereas mucinous and serous cystic neoplasm, SPEN and pseudocyst are commonly >3 cms. 73% of mucinous cystadenomas were round and 80% serous cystadenomas were lobulated and irregular. Pseudocysts are usually unilocular. But they can be rarely multiple in 10% of cases and sometimes also irregular and multilocular. Pseudocysts in acute pancreatitis is seen in 5-16% whereas in chronic pancreatitis it is seen higher in about 20-40%[8].Mucinous cystic neoplasm shows macrocystic lesion with few septations. Serous cystadenomas are microcystic with honeycomb appearance. Rarely 7% are oligocystic or macrocystic. Sun et al showed honeycomb pattern is seen in serous cystadenoma and side branch IPMN whereas none of the mucinous cystadenoma showed honeycomb pattern[9]. Honeycomb appearance is seen in serous cystadenomas and side branch IPMN but rarely has been reported in mucinous cystadenoma. Mucinous cystadenomas have thick (>3 mm) wall and serous cystadenomas have thin wall (<3 mm). 80% of serous cystadenoma show thin septations and 57% of mucinous cystadenomas show thick septations. Serous cystadenomas show >2 septae in 40% and mucinous cystadenomas show <=2 septae in 73%. Mucinous cystadenoma, IPMN, SPEN have malignant potential in descending order. Serous cystadenoma has very low malignant potential[10].

CONCLUSION

Pseudocysts are linked to pancreatitis. Pseudocysts are the predominant kind of cysts seen in the pancreas, with serous cystadenomas being the second most prevalent. Serous cystadenomas have a lobulated shape with an indiscernible boundary that contains several smaller cysts and core chunky calcifications. Mucinous cystadenomas have a sleek outline, a discernible wall with calcifications around the outer edge, and a reduced number of larger cysts. Malignant cysts have solid components that demonstrate enhancement. The IPMN exhibits duct dilatation with ductal connection, protruding papillae, and are mostly unilocular without any discernible wall. SPEN is seen in adolescent girls with solid regions, necrosis, and hemorrhaging. Therefore, CT characteristics aid in the characterization of various cystic lesions of the pancreas.

REFERENCES

1. Manfredi R, Ventriglia A, Mantovani W, Mehrabi S, Boninsegna E, Zamboni G, et al. Mucinous cystic neoplasms and serous cystadenomas arising in the body-tail of the pancreas: MR imaging characterization. EurRadiol. 2015;25:940–9. doi: 10.1007/s00330-014-3493-2.
2. Abdeljawad K, Vemulapalli KC, Schmidt CM, Dewitt J, Sherman S, Imperiale TF, et al. Prevalence of malignancy in patients with pure main duct intraductal papillary mucinous neoplasms. GastrointestEndosc. 2014;79:623–9. doi: 10.1016/j.gie.2013.08.024.
3. Balcom JH, Rattner DW, Warshaw AL, Chang Y, Fernandez- del Castillo C. Ten-year experience with 733 pancreatic resections: changing indications, older patients, and decreasing length of hospitalization. Arch Surg 2001; 136:391-398.
4. Tirkes T, Aisen AM, Cramer HM, Zyromski NJ, Sandrasegaran K, Akisik F. Cystic neoplasms of the pancreas; findings on magnetic resonance imaging with pathological, surgical, and clinical correlation. Abdom Imaging. 2014;39:1088–101. doi: 10.1007/s00261-014-0138-5.
5. Curry CA, Eng J, Horton KM, et al. CT of primary cystic pancreatic neoplasms: can CT be used for patient triage and treatment? American Journal of Roentgenology 2000;175:99– 103.
6. Irie H, Honda H, Aibe H, et al. MR cholangiopancreatographic differentiation of benign and malignant intraductal mucin- producing tumors of the pancreas. American Journal of Roentgenology 2000;174: 1403–1408.
7. Miller F, Keppke A, Balthazar E. Pancreatitis, in: Textbook of Gastrointestinal Radiology, Chapter 99, Gore and Levine Editors, Vol.2. Edit. Saunders Elsevier, Philadelphia (USA); 2008: 1885-1914.
8. Megibow A. Pancreatic Neoplasms, in: Textbook of Gastrointestinal Radiology, Chapter 100, Gore and Levine Editors, Vol.2. Edit. Saunders Elsevier, Philadelphia (USA); 2008: 1915-1932.
9. Bosniak MA. The current radiological approach to renal cysts. Radiology 1986; 158: 1–10.
10. Sahani D, Kadavigere R, Saokar A, Fernandez del Castillo C, et al. Cystic Pancreatic Lesions: A Simple Imaging-based Classification System for Guiding Management. Radiographics 2005; 25:1471-1484.