

A RETROSPECTIVE STUDY OF CHARACTERIZATION OF CYSTIC LESIONS OF PANCREAS BY COMPUTER TOMOGRAPHY SCAN

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Abstract

Introduction: Cystic pancreatic neoplasms (CPNs), whether congenital, inflammatory, or neoplastic, are diagnostically challenging. They account for 10-15% of cystic lesions of the pancreas and 5% of primary pancreatic neoplasms. Many reports show that the prevalence is rising. They are commonly found incidentally on computed tomography (CT) scans and represent a growing indication for resection at referral centers.

Materials and Methods: All patients with verified cystic pancreatic lesions who received CT imaging utilizing a 16 slice Toshiba Scanner at our institution from March 2022 to February 2023 were included in this retrospective research. All lesions were proven either by surgery or by endoscopy guided aspiration or follow up. A total of 94 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.

Results: Out of the total 188 patients, 100 patients had pseudocysts and 88 patients had neoplastic cysts proven by histopathology or endoscopy guided aspiration. The neoplastic cysts include 24 benign IPMT, 32 serous cystadenoma, 16 mucinous cystadenoma, 8 SPEN and 8 mucinous cystadenocarcinomata (chart-1). All the non-neoplastic cysts were pseudocysts and were predominantly seen in males than females with high prevalence between 41-50 yrs. All of them had association with acute or chronic pancreatitis. Most (58%- 44/76) of the benign neoplastic cysts were seen in females and all the 8 malignant cysts (mucinous cystadenocarcinomas) were seen in the males. All the SPEN were seen in females. About 75% (12/16) of the mucinous cystadenomas were female. All patients with mucinous cystadenoma were below 52 years and all the IPMT patients were above 54 years. Serous cystadenoma had even age distribution. All the SPEN were diagnosed before 30 years.

Conclusion: CT scans helps us to diagnose various cystic lesions of pancreas based on different characteristic imaging features.

Key Words: Cystic pancreatic neoplasms, computed tomography, mucinous cystadenocarcinomata.

INTRODUCTION

Cystic pancreatic neoplasms (CPNs), whether congenital, inflammatory, or neoplastic, are diagnostically challenging. They account for 10-15% of cystic lesions of the pancreas and 5% of primary pancreatic neoplasms. Many reports show that the prevalence is rising.¹ They are commonly found incidentally on computed tomography (CT) scans and represent a growing indication for resection at referral centers.² The diagnosis relies principally on CT and magnetic resonance imaging (MRI). Efforts to differentiate among these tumors from imaging tests have met with mixed

success. Although certain features have been emphasized as being classic for specific kinds of CPN, the diagnostic power of these features has not been subjected to objective analysis.³

Endoscopic ultrasound (EUS) is now being used to investigate cystic pancreatic lesions, particularly as a means of cyst aspiration. How analysis of cyst fluid will strengthen the diagnostic algorithm remains unsettled.⁴

Intraductal papillary mucinous neoplasm (IPMN) is classified into three types- Main duct, branch type, and mixed type. Main duct type presents as diffuse or segmental duct dilation and has the highest malignant potential. Branch type is mostly seen in head of pancreas and present as a unilocular or multifocal cysts communicating with the main pancreatic duct. MRCP plays a vital role in demonstrating the communication between the cyst and duct. Imaging features concerning for malignancy are duct dilatation >5 mm, enhancing mural nodule >5 mm, cyst diameter >3 cm and thick enhancing wall.⁵ Solid pseudopapillary neoplasms are frequently seen in the female population with a mean age 25 years. On imaging, they appear as well-defined mass with solid-cystic areas with necrosis and haemorrhagic debris. Solid pseudopapillary neoplasms are low-grade neoplasms with excellent prognosis noted in most patients. True epithelial cysts of the pancreas are very rare and are seen in syndromes like Von Hippel Lindau syndrome.

MATERIALS AND METHODS

Study design: A retrospective study.

Study location: Department of radiology, Maheswara Medical College, Isnapur, Patancheruvu, Telangana.

Study Duration: March 2022 to February 2023.

Sample Size: 188 patients.

All patients with verified cystic pancreatic lesions who received CT imaging utilizing a 16 slice Toshiba Scanner at our institution from March 2022 to February 2023 were included in this retrospective research.

All lesions were proven either by surgery or by endoscopy guided aspiration or follow up. A total of 94 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. Microsoft office 2007 was used.

RESULTS

Out of the total 188 patients, 100 patients had pseudocysts and 88 patients had neoplastic cysts proven by histopathology or endoscopy guided aspiration. The neoplastic cysts include 24 benign IPMT, 32 serous cystadenoma, 16 mucinous cystadenoma, 8 SPEN and 8 mucinous cystadenocarcinomata (chart-1). All the non-neoplastic cysts were pseudocysts and were predominantly seen in males than females with high prevalence between 41-50 yrs. All of them had association with acute or chronic pancreatitis. Most (58%- 44/76) of the benign neoplastic cysts were seen in females and all the 8 malignant cysts (mucinous cystadenocarcinomas) were seen in the males. All the SPEN were seen in females. About 75% (12/16) of the mucinous cystadenomas were female. All patients with mucinous cystadenoma

were below 52 years and all the IPMT patients were above 54 years. Serous cystadenoma had even age distribution. All the SPEN were diagnosed before 30 years.

Gender distribution	Pseudo cysts	Serous cystadenoma	Benign IPMT	Mucinous cystadenoma	SPEN	Mucinous cystadenocarcinoma
Male	70	12	16	4	0	8
Female	30	20	8	12	8	0

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

Age	Pseudocysts	Serous Cystadenoma	Benign IPMT	Mucinous Cystadenoma	SPEN	Mucinous Cystadenocarcinoma
<20 years	20	0	0	4	4	0
20-50 years	60	12	0	12	4	4
>50 years	20	20	24	0	0	4

Table 2: Incidence of Cystic Lesions in Different Age Groups

Location within Pancreas	Pseudocysts	Serous Cystadenoma	Benign IPMT	Mucinous Cystadenoma	SPEN	Mucinous Cystadenocarcinoma
Head	38	14	10	0	0	0
Body	30	6	12	4	2	0
Tail	32	12	2	12	6	8

Table 3: Distribution of Lesions within the Pancreas

DISCUSSION

IPMT 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 most of mucinous cystadenoma are seen in the tail and the serous cystadenomas were equally distributed in head and tail of pancreas. IPMN is commonly smaller than 3 cms whereas mucinous and serous cystic neoplasm, SPEN and pseudocyst are commonly >3 cms.⁶ 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%.⁷

Mucinous cystic neoplasm shows macrocystic lesion with few septations. Serous cystadenomas are microcystic with honeycomb appearance. Rarely 7% are oligocystic or macrocystic.⁸ Sun et al showed honeycomb pattern is seen in serous cystadenoma and side branch IPMT whereas none of the mucinous cystadenoma showed honeycomb pattern. Honeycomb appearance is seen in serous cystadenomas and side branch IPMT but rarely has been reported in mucinous cystadenoma.⁹ Mucinous cystadenomas have thick (>3 mm) wall and serous cystadenomas have thin wall (<3 mm). 78.9% 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, IPMT, SPEN have malignant potential in descending order. Serous cystadenoma has very low malignant potential.¹⁰

CONCLUSION

Pseudocysts are the most frequent pancreatic cysts, followed by serous cystadenomas. Pseudocysts are linked to pancreatitis. A lobulated contour with an undetectable wall containing smaller and numerous cysts and core chunky calcifications characterizes serous cystadenomas. Mucinous cystadenomas have a smooth contour, a visible wall, rim calcifications, and fewer larger cysts. Malignant cysts have increasing solid components. IPMT have ductal communication, bulging papillae, and are generally unilocular with no apparent wall. SPEN is found in young girls with solid regions, necrosis, and bleeding. As a result, CT features aid in characterizing the various cystic pancreatic lesions.

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