Anternational	Original Research Paper	Radiology
	Role of Contrast Enhanced CT in the Diagnosis of Carcinoma Pancreas and its Mimics in Indian Scenario.	
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ABSTRACT Care lesio in di	inoma head of pancreas is a disease with grave prognosis and the only curative treatments as autoimmune pancreatitis and interstitial pancreatitis are close mimic of the les Ins as autoimmune pancreatitis and interstitial pancreatitis are close mimic of the les Ifferentiating carcinoma pancreas and its close mimics. <b>Material and methods</b> The	nent is surgery. Pancreatic ion. <b>AIM</b> : To use imaging study was a retrospective

study of 93 patients were evaluated, including 40 patients with autoimmune pancreatitis, 26 patients with pancreatic adenocarcinoma, and 27 patients with acute interstitial pancreatitis, their imaging and the diffrentaiting features were studied statistically with the help of Pearson's chi-squared test. **Result**: The most common findings associated with autimmune pancreatitis was diffuse involvement while in carcinoma pancreas it was focal involvement and in acute interstitial pancreatitis was peripancreatic fat stranding.

**Conclusion**: The study highlights the significant positive findings on the multidetector CECT for an early diagnosis and early management if the pancreatic lesions. This helps in reduction of the chances of unnecessary surgical managements and thus reduces the time of management and mortality in the patients.

# **KEYWORDS :Multidetector CT scan, Fat stranding, Dilated ducts**

Carcinoma head of pancreas is a disease with grave prognosis and the only curative treatment is surgery. Pancreatic lesions as autoimmune pancreatitis and interstitial pancreatitis are close mimic of the lesion. The concept of autoimmune pancreatic disease is a recent term in the last two decades, about the characteristic presentations of this disease [1-4]. However, definitive diagnosis is always a challenge[5-11]. The autoimmune pancreatitis and pancreatic adenocarcinoma may coexist and differentiating acute interstitial pancreatitis from autoimmune pancreatitis is not always easy [12-16]. The dual-phase contrast-enhanced MDCT remains the first line imaging modality in the evaluation of suspected pancreatic disease [17-20]. The purposes of this study is to identify the most common MDCT features of autoimmune pancreatitis and to evaluate the utility of MDCT for differentiating autoimmune pancreatitis from two more frequently encountered differential diagnoses-pancreatic adenocarcinoma and acute interstitial pancreatitis in Indian subjects.

# **Materials and Methods**

The study was a retrospective study approved by the ethical board with a waiver of the requirement for informed consent as the examination was already accomplished before the study no additional issue of exposure of patient for further investigations.

# **Selection of Patients With Autoimmune Pancreatitis**

The known cases of chronic pancreatitis who were on follow up at our institution underwent pretreatment dual-phase pancreatic MDCT meeting the ICDC [6] between June 2013 and June 2016 were included for evaluation. Three patient with findings of both autoimmune pancreatitis with and 2 patients with adenocarcinoma pancreas with partial resection of pancreas were excluded from analysis.

# **Control Patient Selection**

Control subjects were randomly selected from our institutional imaging database by query of reports of all dual-phase pancreatic MDCT examinations performed between June 2013 and June 2016 for the following search terms: pancreatic adenocarcinoma, pancreatic cancer, pancreatic malignancy, pancreatic mass, pancreatic neoplasm, and acute pancreatitis. The inclusion criteria for control subjects with pancreatic adenocarcinoma were pretreatment dual-phase pancreatic CT study and histopathologic diagnosis. The exclusion criterion was an MDCT finding of over evidence of post-operative status and evidence of any metastasis. Ultimately, 26 patients with pancreatic adenocarcinoma and 27 patients with acute interstitial pancreatitis patients were selected as control subjects.

## MDCT Imaging Protocol

All studies were performed with a high-resolution imaging protocol on 16 slice  $\mbox{CT}$ 

Scanner over the course of the study period (2013, Philips Brilliance ). After unenhanced images of the upper abdomen were obtained with 5.0-mm reconstruction, 100-125 mL of iohexol (Omnipaque 300) was power injected IV at 3 mL/s into an antecubital vein with a delay of 45-50 seconds and with reconstructed to 2-3mm sections. Oral contrast medium was not administered. Images were acquired 45–50 and 70-80 seconds after contrast injection and reconstructed to 2.0- to 3.0-mm section width .

## **MDCT Imaging Analysis**

Three trained radiologists reviewed the images. The presence of the following previously described pancreatic imaging features was evaluated in consensus: diffuse or focal distribution of pancreatic lesion , sausage shape , low-attenuation halo and pancreatic duct dilatation (> 5 mm). The presence of the following extrapancreatic imaging features were also evaluated: peripancreatic stranding; peripancreatic lymphadenopathy; biliary abnormality; vascular involvement of the celiac axis, hepatic artery, splenic artery or vein, superior mesenteric artery or vein, or portal vein; and characteristic solid renal lesions . Vascular involvement was defined as pancreatic abnormality abutting at least 50% of the vascular circumference for suspecting of vascular invasion in pancreatic cancer .

## **Statistical Analysis**

The frequency of imaging features were mapped for each diagnosis. Pearson chi-square tests were used to compare the frequency of imaging features in the three diagnoses. ROC curve analysis was performed to determine the diagnostic performance of those combinations of imaging features. Analyses were performed with statistical software (SPSS- IBM).

#### Results

A total of 93 patients were evaluated, including 40 patients with autoimmune pancreatitis,

26 patients with pancreatic adenocarcinoma, and 27 patients with acute interstitial pancreatitis. There was no significant difference in patient age (p = 0.13) or sex (p = 0.85) across the three cohorts.

#### **MDCT Imaging Features**

The most common imaging features among the 40 patients with **autoimmune pancreatitis** were diffuse involvement (**figure 1**)(26/40 [65%]), sausage shape (26/40 [65%]), low-attenuation halo (24/40 [60%]), vascular involvement (17/40 [42%]), and biliary wall enhancement (14/40 [35%]).

The most frequent imaging features among the 26 patients with **pancreatic** 

adenocarcinoma were focal involvement (figure 2 ) (25/26 [96%]), pancreatic duct dilatation

(21/26 [80%]), biliary dilatation (11/26 [42%]), and vascular involvement (10/26  $\,$ 

[38%]) with PPVs of 52%, 64%, 43%, and 28%. Pancreatic duct dilatation had the highest

PPV for the diagnosis of pancreatic adenocarcinoma. The most frequent imaging features

among the 27 patients with **acute interstitial pancreatitis** were diffuse involvement (19/27

[70%]) and peripancreatic stranding (23/27 [85%]) with PPVs of 42% and 55%. Peripancreatic

stranding had the highest PPV for the diagnosis of acute interstitial pancreatitis.



Figure 1 diffuse increase in the bulk of the pancreas in a



Figure 2 showing a focal heterogenously enhancement mass in the tail of pancreas with non enhancing areas suggestive of necrosis in a case of carcinoma tail of pancreas.



Figure 3 Acute interstitial pancreatitis in a patient showing diffuse increase in bulk of the pancreas with peripancreatic fat stranding. Discussion

Autoimmune pancreatitis is usually diagnosed on the basis of a combination of clinical, serologic, radiological, and histological findings however, differentiating the relatively rare autoimmune pancreatitis from more common pancreatic diseases, such as pancreatic adeno carcinoma and acute interstitial pancreatitis, can be difficult, especially when clinical features overlap. Focal mass like enlargement and mild peripancreatic stranding, may also be seen in autoimmune pancreatitis and hence atypical for the diagnosis.

#### **MDCT of Pancreatitis and Cancer**

Focal pancreatic involvement was non specific as it was also common in the patients with acute interstitial pancreatitis. With the better recognition of atypical imaging features of autoimmune pancreatitis, the chances of patients with autoimmune pancreatitis undergoing surgical resection has reduced. However due to overlap of the radiological features, it is not always possible to correctly diagnose autoimmune pancreatitis on imaging alone. Several publications [12–14] have identified cases in which autoimmune pancreatitis and pancreatic ductal adenocarcinoma were diagnosed concurrently or in which pancreatic adenocarcinoma was diagnosed in patients having known history of autoimmune pancreatitis years after the initial workup.

Thererfore these findings suggest that regular follow up is as prudent in autoimmune pancreatitis

as it is in chronic pancreatitis. As in our findings, the presence of peripancreatic stranding was predictive of acute interstitial pancreatitis. Graziani et al also evaluated the relative enhancement rates of each diagnosis and observed that autoimmune pancreatitis had delayed enhancement

compared with acute interstitial pancreatitis. The use of multiphasic pancreatic MDCT for

quantifying enhancement across the unenhanced, pancreatic, portal venous, and delayed

phases to differentiate autoimmune pancreatitis from acute interstitial pancreatitis is promising but has risk of increase radiation dose. This study had several limitations. Its retrospective design may have contributed in selection bias.

Accordingly our study may not be applicable to the general Indian population. Even our sample size was still small owing to the overall low prevalence of autoimmune pancreatitis. In addition, we did not further differentiate the two subtypes of autoimmune pancreatitis (types 1 and 2).

Inspite of all limitation the study focuses for pinpointing the respectable versus non respectable pancreatic conditions and helps in reduction of number of the un-necessary surgical manipulation in unwanted cases thus reduced the mortality of the patient along with diverting the attention of surgeon toward the more demanding patients where surgical management is obligatory.

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