



ROLE OF MDCT-TRIPLE PHASE STUDY IN EVALUATION OF PANCREATIC LESIONS

Radio-Diagnosis

Dr. Vishnuvardhan*	Postgraduate MDRD, Department of Radiodiagnosis, BGS Global institute of medical sciences, Bengaluru, Karnataka, India. *Corresponding Author
Dr. Maj. Haribaskar	Department of Radiodiagnosis, BGS Global institute of medical sciences, Bengaluru, Karnataka, India.
Dr. R A George	Department of Radiodiagnosis, BGS Global institute of medical sciences, Bengaluru, Karnataka, India.
Dr. Nagesh R	Department of Radiodiagnosis, BGS Global institute of medical sciences, Bengaluru, Karnataka, India.

ABSTRACT

Aims And Objectives

1. To evaluate & characterize various inflammatory, neoplastic pancreatic lesions and their complications.
2. To assess the contrast enhancement pattern in pancreatic lesions.

Methods And Material Patients of all ages presenting to our hospital with clinical, biochemical, other imaging evidences and previous history of pancreatic pathology are considered. All MDCT scans were obtained using triple phase contrast study protocol with informed consent prior to administration of iodinated IV contrast. Scanning area included from the dome of diaphragm till pubic symphysis. Reconstructed images were obtained and evaluated. **Results** In a series of 50 cases, 82% were inflammatory and 18% were neoplastic pathologies. Among inflammatory conditions, acute pancreatitis (47.5%) was commonest and among neoplastic conditions malignant lesions metastasis was more common (55%). Inflammatory conditions were more common in young adults and neoplastic lesions in elderly. **Conclusion** MDCT triple phase contrast study allows data acquisition during optimal pancreatic enhancement, thinner slices during multiphasic scanning, improved spatial resolution, early detection of small pancreatic lesions like focal pancreatitis and pancreatic neoplasm. The use of multiplanar reformatted and 3D images of vascular structures, ability to provide preoperative vascular mapping helps in accurate staging of tumours and aids in successful surgical resection.

KEYWORDS

Pancreatitis, Pancreatic neoplasm, Modified CT severity score.

INTRODUCTION

Pancreatic lesions are now an increasingly common occurrence and a significant cause of morbidity and mortality. Globally as quoted by WHO in Global Burden of Disease Study 2013, about 17 million cases of pancreatitis occurred. This resulted in 123,000 deaths, up from 83,000 deaths in 1990. 1 Pancreatic neoplasm is the fifth most common cause of cancer deaths and accounts for approximately 3% of all cancers, has shown marked increase in its incidence worldwide 2. Modalities for imaging pancreas range from plain x-ray to ultrasonography (USG), endoscopic ultrasound, Endoscopic Retrograde Cholangiopancreatography (ERCP), Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and Positron Emission Tomography - Computed Tomography (PET-CT)

AIMS OF THE STUDY

- To evaluate and characterize various inflammatory and neoplastic pancreatic lesions.
- To evaluate and assess complications (wherever applicable)
- To assess the contrast enhancement pattern in pancreatic lesions.

Inclusion Criteria:

1. Patients presenting with suspicious clinical symptoms of pancreatic pathology.
2. Associated biochemical parameters such as elevated amylase and lipase levels.
3. Patients with suspicious or definite findings on ultrasound of pancreatic pathology.

Exclusion Criteria:

1. Patients with non-pancreatic causes upper abdominal pain.
2. Pregnant patients.
3. Patient suspected of congenital anomalies of pancreas.
4. Patients with renal insufficiency or elevated urea, creatinine levels that cannot be administered IV contrast and persons having contrast allergy.

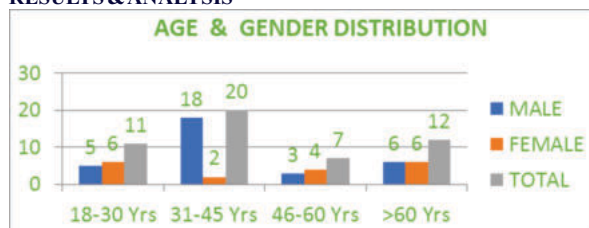
Sample size: 50

MATERIALS & METHODS

- Study period -November 2021 to November 2022.
- Informed written consent was taken for each case.

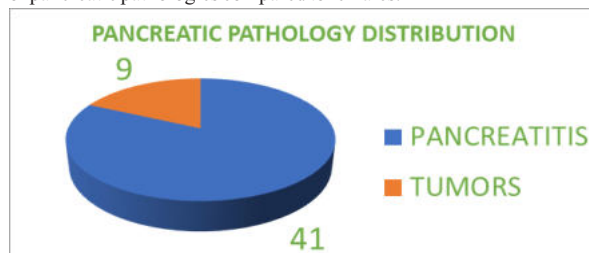
- All patients were scanned using non-contrast and contrast sequences with standard triple phase protocol. Images obtained were reconstructed and analyzed.
- Scanning commenced from the dome of diaphragm till pubic symphysis.
- The sections are taken with slice thickness of 1.5mm.

RESULTS & ANALYSIS



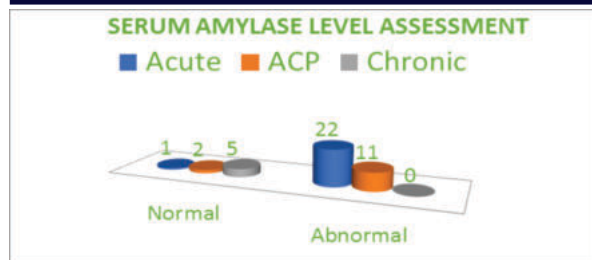
Graph 1: Bar chart showing Age and distribution.

Among 50 cases studies, the most common age group involved was 31-45 years i.e. the middle age group. Overall males have more incidence of pancreatic pathologies compared to females.



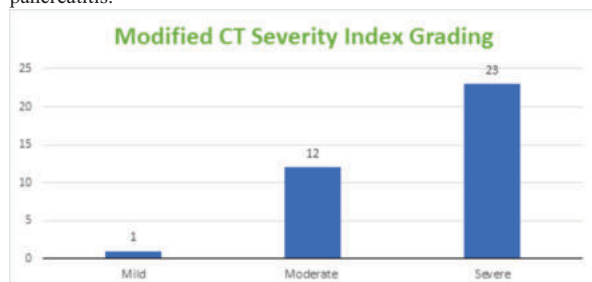
Graph 2: Pie chart distribution of pancreatic pathology.

In our study we have mainly encountered only two types of pathologies. Pancreatitis (inflammatory) was seen in 82% of cases and neoplastic was seen in 18% cases. Inflammatory pathologies were more common among males while the neoplastic Etiology was predominately among females.



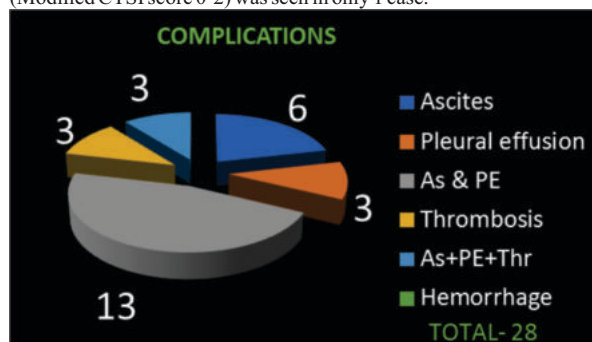
Graph 3: Serum amylase and lipase among spectrum of pancreatitis in bar chart.

Serum amylase and lipase levels were normal in 1 case of acute pancreatitis, 2 cases of acute on chronic pancreatitis and all cases (5) of chronic pancreatitis. Serum amylase and lipase were abnormal in 22 cases of acute pancreatitis and 11 cases of acute on chronic pancreatitis.



Graph 4: Bar chart showing modified CT severity index grading in acute/acute on chronic pancreatitis.

Moderate grade (Modified CTSI score 4-6) pancreatitis was more predominant and is seen in 63.8% of acute cases. Severe grade (Modified CTSI score 8-10) was seen in 12 cases. Mild grade (Modified CTSI score 0-2) was seen in only 1 case.



Graph 5: Complications of acute pancreatitis in pie chart.

Among 36 patients of acute pancreatitis cases 28 patients had complications. Ascites with pleural effusion was the most common complication which was seen in 13 cases (52%)

DISCUSSION

ACUTE PANCREATITIS: Majority of the cases had elevated serum amylase (n=22) with bulky pancreas and fat stranding. Most of the cases were in moderate grade (score 4 and 6) when assessed using Modified CTSI.

ACUTE ON CHRONIC PANCREATITIS: Most of the cases had elevated serum amylase (n=11). Pseudocyst (n=11), MPD dilatation (n=04) and parenchymal calcifications (n=06) with fat stranding (n=13) characterizes Acute on chronic pancreatitis.

CHRONIC PANCREATITIS: All the cases had parenchymal atrophy, MPD dilatation and normal serum amylase (n=05). Pancreatic parenchymal calcification and pseudocysts were noted in most of the cases (n=4). One case showed walled off necrosis.

PANCREATIC TUMORS: Female predominance (n=06) with mean age of 60 years is noted. Most of the cases are having solid component. MPD dilatation (n=05) and parenchymal calcifications (n=04).

REPRESENTATIVE IMAGES



Fig 1: Bulky pancreas with minimal per pancreatic fat stranding.



Fig 2: Diffuse enlargement of the pancreas with multiple pancreatic parenchymal calcification, along with peripancreatic fat stranding and collection.

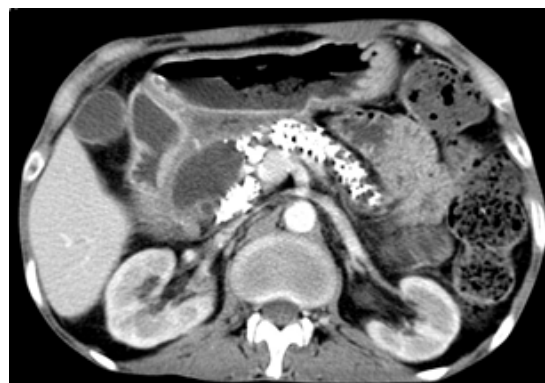


Fig 3: Atrophy of pancreatic parenchyma. Multiple calcification of the pancreatic parenchyma. Pseudocyst of pancreas in the head region.

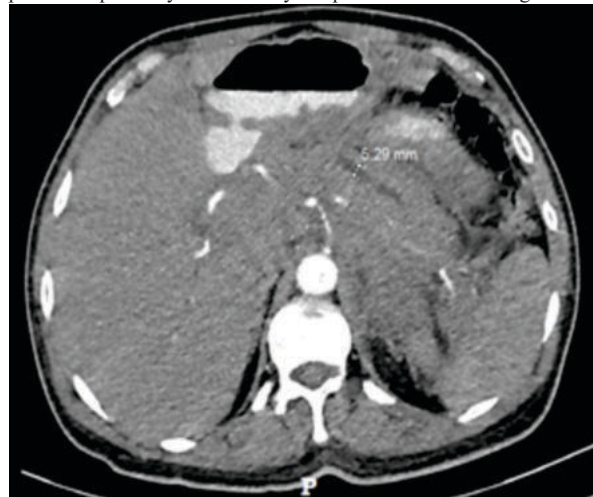


Fig 4: An ill-defined lobulated lesion in peripancreatic area(head) seen encasing celiac axis and SMA.

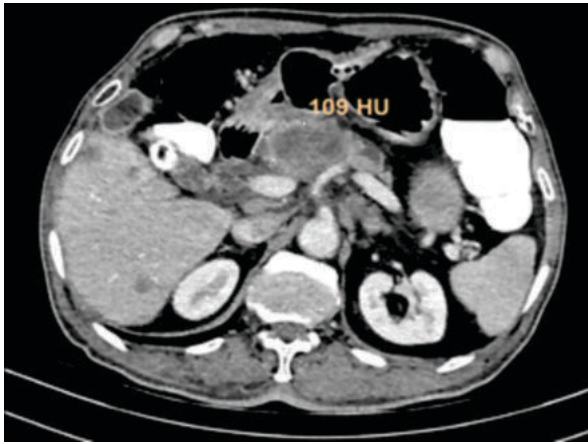


Fig 5: An ill-defined heterodense mass lesion with solid cystic component in head of pancreas. Multiple liver metastasis.

LIMITATIONS ENCOUNTERED

- Pathological correlation was not done for all the cases of pancreatic neoplasm, as they were not operated during the study period.
- Follow up scans, for comparisons of serum amylase and MDCT triple phase was not obtained, as it was beyond the scope of the study period.

SUMMARY

Male predominance in pancreatitis and Female in neoplasms. Elevated serum amylase was strongly associated with acute pancreatitis and acute on chronic pancreatitis. Dilated MPD, parenchymal calcifications and pseudocysts are significant in acute on chronic pancreatitis and chronic pancreatitis. CECT would help in differentiating focal pancreatitis from neoplasm.

CONCLUSION

MDCT triple phase contrast study allows data acquisition during optimal pancreatic enhancement, thinner slices during multiphasic scanning, improved spatial resolution, early detection of small pancreatic lesions like focal pancreatitis and pancreatic neoplasm. CECT helps in grading the severity of pancreatitis by using modified CT severity scoring system. It helps in identifying the complications and to plan for management.

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