Diagnosing Acute Pancreatitis Radiologically: A Case Report

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Abstract:
The Pancreas is an organ of the digestive system and endocrine system of humans. Pancreatitis considered the most common pancreatic disease in children and adults. Imaging plays a signiûcant role in the diagnosis, severity assessment, recognition of complications and guiding therapeutic interventions. Ultrasound (US), contrast enhanced computed tomography (CECT), magnetic resonance imaging (MRI), magnetic resonance cholangiopancreatography (MRCP) and endoscopic retrograde cholangiopancreatography (ERCP) have important complementary roles in the assessment and management of patients with acute pancreatitis. This case report is about diagnosing a patient with acute pancreatitis radiologically.

Keywords: *Pancreas,* Pancreatitis, US, CECT, MRI, MRCP

Introduction:

Pancreatitis is defined as the inflammation of the pancreas and considered to be the most common pancreatic disease in children and adults. It can be acute; representing an acute inflammatory process of the pancreas, or chronic; progressing slowly with continued, permanent inflammatory injury to the pancreas. Acute pancreatitis is sudden inflammation that lasts a short time. It can range from mild discomfort to a severe, life-threatening illness. Most people with acute pancreatitis recover completely after getting the right treatment. In severe cases, acute pancreatitis can cause bleeding, serious tissue damage, infection, and cysts. Chronic pancreatitis is long-lasting inflammation. It most often happens after an episode of acute pancreatitis. Another top cause is drinking lots of alcohol for a long period of time. Damage of pancreas from heavy alcohol use may not cause symptoms for many years, but then you may suddenly have severe pancreatitis symptoms.

Imaging plays a significant role in the diagnosis of acute pancreatitis in clinically suspected cases or suggesting alternative diagnoses. It helps determine the causes of pancreatitis: gallstones, biliary duct obstruction or structural abnormalities. It also helps in grading the severity of the disease and identifying pancreatic or peripancreatic complications. Additionally, imaging can be utilized to guide therapeutic interventions. The incidence of acute pancreatitis continues to increase worldwide, in parallel with an increasing demand on imaging resources to evaluate the severity of disease. Imaging modalities available for assessment of acute pancreatitis include conventional radiography, abdominal ultrasound (US), multidetector computed tomography (CT) and magnetic resonance imaging (MRI). Magnetic resonance cholangio-pancreatography (MRCP) and endoscopic retrograde cholangiopancreatography (ERCP). Among these, CT has become the standard of choice and worldwide. It is the most commonly used imaging modality for the initial evaluation of acute pancreatitis and its sequelae.

Case report:

A 50 years old female was admitted on 8th December at surgery unit of Holy family Red Crescent Hospital with the complaints of pain in the whole abdomen for one day which was accompanied by vomiting. According to the statement of the patient she was alright one day back. Then she suddenly developed pain in the upper abdomen which radiated to the chest. Pain was continuous in nature. She was non diabetic. Her ESR was raised which was 42mm in 1st hour. Serum SGPT was 77 U/L which was within normal limit. Serum Amylase level was high beyond normal limit, which was 404 U/L. Serum LDH and Lipase was also raised which was 291 U/L and 921 U/L respectively. USG report revealed pancreas was grossly swollen and hypo echoic in echo texture. Moderate Peri pancreatic fluid collection was seen. Pancreatic duct was not dilated. Features were suggestive of acute pancreatitis (Figure 1). CT report revealed pancreas was swollen in size. No abnormal focal lesion or contrast enhancement was seen. Significant peri pancreatic fluid collection and inflammatory change were seen. The posterior wall of the stomach was thickened. The adjacent bowel walls were also thickened. The pancreatic duct was not dilated. CT findings suggested acute edematous pancreas with significant inflammatory changes (Figure 2)

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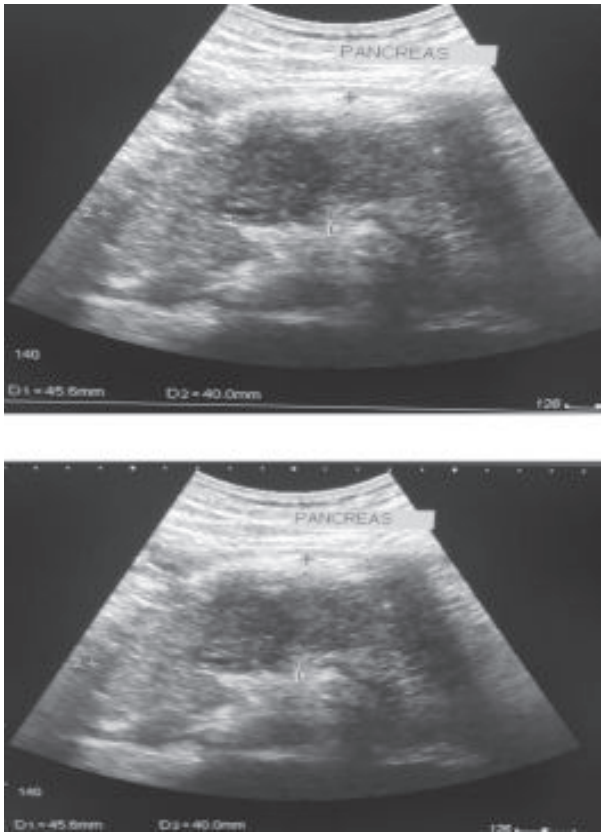

Fig.-1: *Pancreas is grossly swollen and hypoechoic in echo texture. Moderate Peri pancreatic fluid collection is seen. Pancreatic duct is not dilated.*

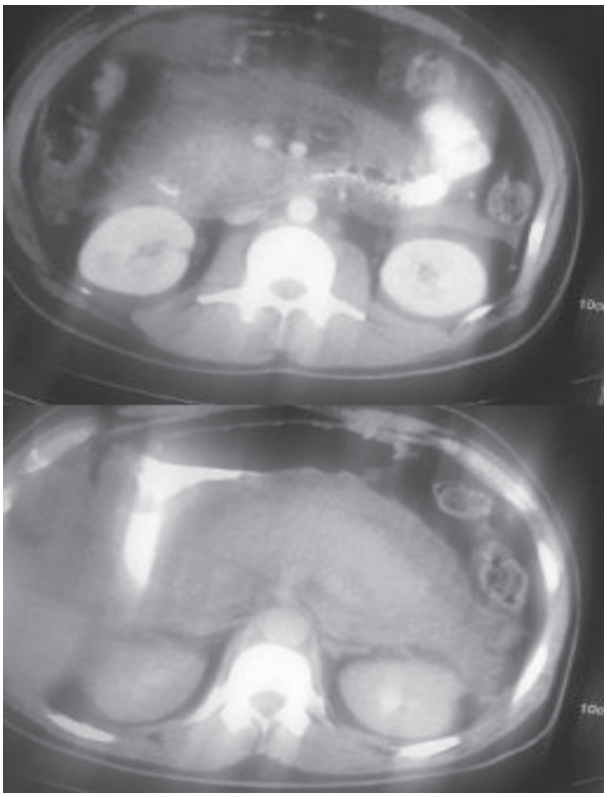

Fig 2: *Pancreas is swollen. No abnormal focal lesion or contrast enhancement is seen. Significant peri pancreatic fluid collection and inflammatory change are seen. The posterior wall of the stomach is thickened. The adjacent bowel walls are also thickened. The pancreatic duct is not dilated.*

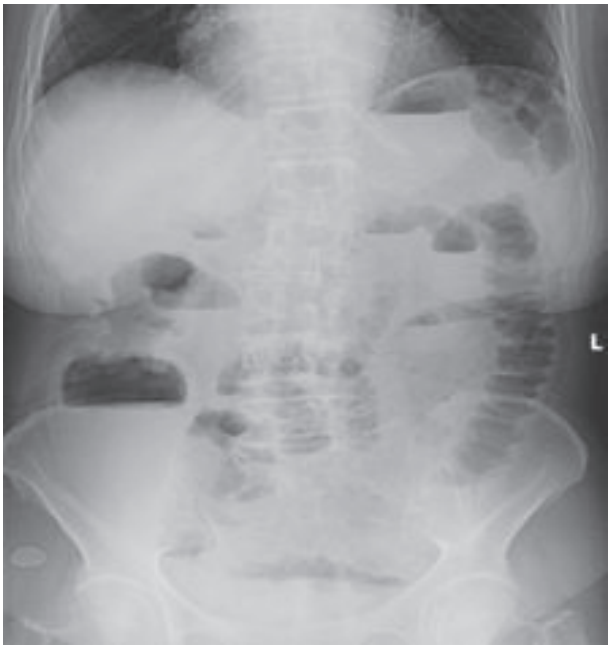

Fig:3: *Sentinel loop- A focal dilated proximal jejunal loop.*

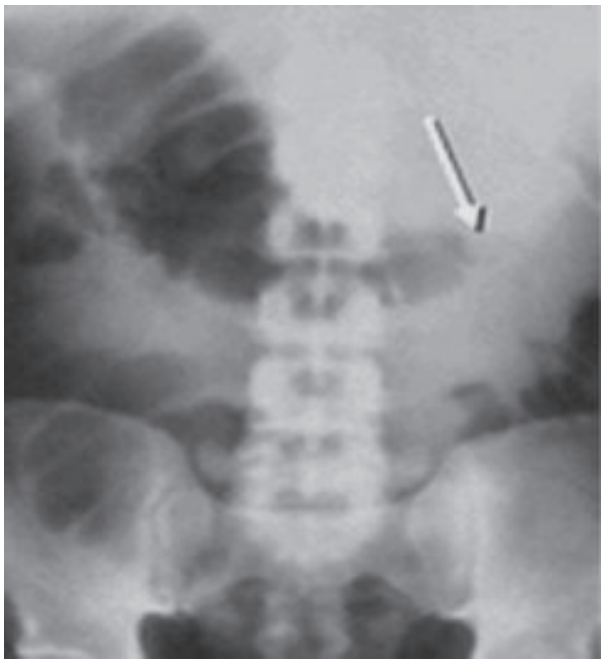

Fig:4: *Colon cut off sign- Distention of the left side of transverse colon with the paucity of gas*

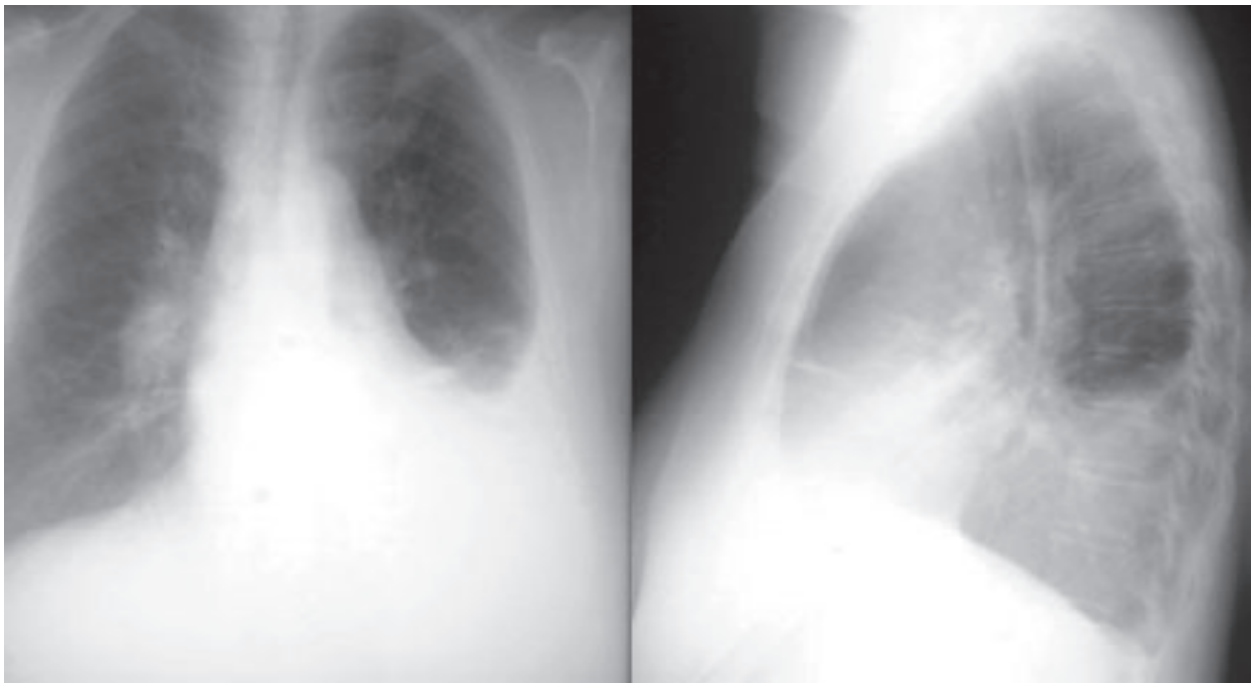

Fig.-5: *Left sided Plural effusion*

Discussion:

Acute pancreatitis results from the exudation of fluid, containing activated proteolytic enzymes into the interstitium of the pancreas and leakage of this fluid into surrounding tissue. There is a general acceptance that a diagnosis of acute pancreatitis requires two of the following three features: (1) Sudden onset of abdominal pain suggestive of acute pancreatitis (epigastric pain radiating to the back), (2) Serum amylase and/or lipase levels at least 3 times greater than the upper limit of normal, and (3) Characteristic imaging findings of acute pancreatitis on contrast enhanced computed tomography (CECT), MRI, or transabdominal ultrasonography (US) studies. In this case the serum lipase was almost three time greater than the normal (921 U/L). If abdominal pain is strongly suggestive of acute pancreatitis but the serum amylase and/or lipase activity is less than 3 times the upper limit of normal, characteristic findings on a CECT or MRI are required to confirm the diagnosis. In 1992, the Atlanta classification for acute pancreatitis was introduced to establish international standards of definitions of acute pancreatitis and its complications[1]. The revision of the Atlanta classification focuses heavily on morphologic criteria for defining the various manifestations of acute pancreatitis as outlined principally by means of CT and MRI. Two distinct phases of acute pancreatitis were introduced: a first, or early, phase that occurs within the 1st wk. of onset of disease; and a second, or late, phase that takes place after the 1st week of onset[1].

The indications of Imaging in pancreatitis is to identify the possible etiology (such as gallstones or gall bladder diseases), to grade the severity, to evaluate complications and to identify possible distinctive imaging features in special types of pancreatitis. The imaging modalities are Plain X-Ray abdomen, USG of whole abdomen, CECT scan of Whole abdomen, MRI and MRCP.

Abdominal radiographs are insensitive for evidence of acute pancreatitis. Moreover, none of the signs are specific enough to establish the diagnosis of pancreatitis. Abdominal radiographs may demonstrate localized ileus of small intestine (sentinel loop : Figure 3) and spasm of the descending colon (colon cut-off sign: Figure 4). loss of the left psoas shadow, or abdominal calcification in midline and to the left 6) Chest radiographs may demonstrate pleural effusion, usually left-sided (Figure-5), hemidiaphragm elevation, basal atelectasis or pulmonary edema suggestive of acute respiratory distress syndrome.

In the initial phase of acute pancreatitis, abdominal US is the primary imaging technique for assessment of biliary stones as the cause of acute pancreatitis and for assessment of the biliary tract.[2] Abdominal US is about 95% sensitive for the detection of cholecystolithiasis but only 50% sensitive for the detection of choledocholithiasis.[3] Furthermore, US is useful for characterization of pancreatic collections by demonstrating necrotic debris within pancreatic collections, and thus, differentiating fluid from nonliquid material.[4] In this case the USG findings revealed grossly swollen pancreas, hypo echoic in echo texture with moderate Peri pancreatic fluid collection and pancreatic duct was not dilated that suggests acute pancreatitis. With Doppler techniques vascular structures can also be evaluated, specially the presence of arterial pseudoaneurysms. US can serve as an imaging guide during diagnostic or therapeutic interventions. US is the imaging technique of choice in children. The major disadvantage of US remains the limited visibility of the pancreas and peripancreatic region in a large proportion of patients with severe acute pancreatitis because of the presence of overlying bowel gas, particularly in case of ileus. The body habitus may also limit the penetration of acoustic waves in obese patients. Additionally, abdominal US is less accurate in delineating extra pancreatic inflammatory spread within retroperitoneal spaces and in detecting intrapancreatic necrosis. Finally, US is operator dependent and displayed on a limited number of images which are not easy to comprehend and convey to practicing clinicians.[5]

CT is at present the best imaging technique for the initial assessment and follow-up of patients with acute pancreatitis.[1] Some advocate performing CT on admission for staging purposes and triaging patients to different levels of care.[6,7] Others defer CT for the first week for several legitimate reasons.[8] Balthazar score is a sub score within the CT severity index (CTSI) for grading of acute pancreatitis. Urgent CT is indicated if an early complication of pancreatitis is suspected, primarily bowel ischemia or perforation. Conversely, at a later stage (after 3-7 days of hospitalization) patients who present with severe acute pancreatitis or who present initially with mild to moderate acute pancreatitis but fail to response to supportive treatment should undergo abdominal CT.[9]

Conclusion:

Imaging is essential, increasingly utilized in the care of patients with acute pancreatitis. It provides critical information for clinicians, especially in those with severe disease. Multi-detector CT is the imaging modality of choice that allows for a quick and accurate overall assessment of acute pancreatitis and its complications. US and CECT explains the etiology of the pancreatitis. Imaging-based predictive systems are useful for identifying groups of patients at risk for local complications or comparing outcomes of different groups in clinical research.

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