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Complementary comments on diagnosis, severity and prognosis prediction of acute pancreatitis

Imaging of acute pancreatitis

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Abstract

The radiological differential diagnosis of acute pancreatitis includes diffuse pancreatic lymphoma, diffuse autoimmune pancreatitis and groove located mass lesions that may mimic groove pancreatitis. Dual energy Computed Tomography (DECT) and Diffusion weighted Magnetic Resonance Imaging (DWI) are useful in the early diagnosis of acute pancreatitis, and DECT is also useful in severity assessment and prognosis prediction. Walled off necrosis is an important complication in terms of prognosis, and it is important to know its radiological findings and distinguish it from pseudocyst.

Key Words: Acute pancreatitis; Computed Tomography, Diffusion weighted imaging, Dual Energy Computed Tomography, Walled off necrosis

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Core Tip: Hu *et al* summarized the clinical and radiological aspects of diagnosis, severity assesment and prognosis prediction of acute pancreatitis. This letter adds to the mentioned literature with radiological differential diagnoses of pancreatitis and

additional imaging techniques that can be used in acute pancreatitis. Also we described the imaging features of walled off necrosis, which is a complication that negatively affects prognosis.

TO THE EDITOR

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Hu and his colleagues recently published a study that reviews diagnosis, severity prediction and prognosis assessment of acute pancreatitis. In their article details are provided regarding the utility and certain restrictions of ² magnetic resonance imaging (MRI), computed tomography (CT), and ultrasonography in the diagnosis, severity assessment, and the prognostic evaluation of acute pancreatitis (1). This letter aims to contribute to the study by describing conditions that, based on their radiological appearance, can be mistaken for acute pancreatitis. This letter also discusses the usefulness of dual energy CT (DECT) and diffusion weighted MRI (DWI) for diagnosis, severity assessment, and prognosis prediction. This letter also covers the imaging methods that characterize walled off necrosis, as it is a serious complication of acute pancreatitis that impacts prognosis.

In the section of the article devoted to imaging, Hu *et al* provided detailed imaging findings of acute pancreatitis. On the other hand, there are some diseases that, both clinically and radiologically, can be mistaken for acute pancreatitis. For instance, primary or secondary lymphomas may affect pancreas. Amylase and lipase levels are frequently high, and the clinical symptoms frequently resemble acute pancreatitis. Involvement of pancreatic lymphoma can be focal or diffuse. On imaging diffuse type shows enlarged pancreas with irregular peripancreatic fat infiltration, mimicking acute pancreatitis (2). Autoimmune pancreatitis, a form of chronic pancreatitis is also a mimicker of acute pancreatitis with diffuse pancreatic enlargement and mild peripancreatic fat stranding (3). Additionally, mass lesions in the groove between the

pancreatic head, duodenum, and common bile duct may be mistaken for groove pancreatitis (4).

As mentioned in Hu *et al's* article, imaging methods, especially CT and MRI, play an important role in determining the severity and predicting the prognosis of acute pancreatitis. CT is frequently used to determine the presence and extent of pancreatic necrosis, as well as to identify complications and thus shows the severity of the acute pancreatitis. In addition to being crucial in the diagnosis of acute pancreatitis, MRI can also be used to assess the severity and predict the prognosis of acute pancreatitis by identifying and characterizing extrapancreatic necrosis and inflammation. (1). Our clinical experience also suggests that appropriately timed CT scans can be used effectively to diagnose acute pancreatitis, determine its severity, and predict its prognosis. In our practice, MRI is used in acute pancreatitis in the presence of equivocal findings on CT and to better understand the nature (necrotic or non-necrotic) of extrapancreatic collections.

In addition to the imaging techniques listed in Hu *et al's* article, DECT is another technique that can be used in diagnosis, severity assesment and prognosis prediction. When compared to standart CT, the DECT has a better sensitivity for early acute pancreatitis (5). While necrosis is a late finding on standard CT in patients with acute pancreatitis, DECT may be helpful for early diagnosis and prognosis prediction (6). Additionally, Hamada *et al* found in their study that determining iodine concentration using DECT is useful for determining the severity of acute pancreatitis (7). Figure 1 shows severe necrotic pancreatitis on DECT.

Acute pancreatitis findings can be successfully shown on diffusion weighted MRI (DWI) at an earlier stage. Yencilek *et al* reported that Apparent diffusion coefficient (ADC) values decrease with increasing pancreatitis severity (8). Figure 2 illustrates early acute pancreatitis with low ADC values that indicates diffusion restriction.

While imaging is essential to the diagnosis and the management of acute pancreatitis, its ability to diagnose, estimate severity, and predict prognosis is not without limitations. For example because of its limited sensitivity in detecting the

necrotic debris in the early stage, it is challenging to differentiate between acute necrotic collection and acute peripancreatic fluid collection on CT. For that reason the ideal time to have an initial CT assessment is between 72 and 96 h after the onset of symptoms, according to the recommendations from the American Pancreatic Association and the International Association of Pancreatology. The limitations of MRI include its higher level of patient cooperation, limited field of view, and increased cost and duration of the scan (1,9).

As stated in Hu *et al*'s article, necrosis can be mistaken for pseudocysts on a CT scan, which could lead to an underestimation of the disease's severity (1). Walled off necrosis is a late complication of necrotizing pancreatitis and it is a collection with solid luminal content that is partially liquified. The walled off necrosis seen on CT and MRI is a fluid collection that forms within the pancreatic necrosis and extends into the peripancreatic region (10). MRI and DECT are superior to standard CT in discriminating walled off necrosis from pseudocyst (6,7,10). Figure 3 shows CT and MRI images of walled off necrosis and Figure 4 shows a complication caused by walled off necrosis in the same patient.

In this letter, we aimed to contribute to the literature by discussing radiological differential diagnosis, new imaging techniques and complications of acute pancreatitis with original images of cases in our daily practice. All authors are in complete agreement with the information stated. The content of this manuscript is our original work and has not been published, in whole or in part, before or simultaneously with this submission.

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