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Case Report

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Hepatic Steatosis: A Key Diagnosis Through Modern Imaging

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1. Abstract

Hepatic steatosis, also known as fatty liver, is the abnormal accumulation of fat in hepatocytes. It can be detected using imaging techniques, including ultrasound and computed tomography [CT], with the latter being particularly useful in assessing the severity of fat infiltration. This case report describes a patient with hepatic steatosis diagnosed by abdominal CT, both without and after contrast agent injection. The radiological findings suggest diffuse steatosis without associated complications, and the importance of imaging in the management of this condition is discussed.

2. Introduction

Hepatic steatosis, a common condition often associated with obesity, type 2 diabetes, hyperlipidemia, and other metabolic comorbidities, can be diagnosed through a variety of radiological approaches. While ultrasound is often used as the initial examination, computed tomography [CT] provides detailed information on the extent of fat infiltration, particularly when performed with contrast agent injection. Hepatic steatosis can sometimes progress to more severe forms such as non-alcoholic steatohepatitis [NASH] and cirrhosis, highlighting the importance of early detection. CT is also useful in excluding other causes of liver damage [1].

3. Case Report

A 67-year-old female patient was admitted for diffuse abdominal pain and general malaise. She has a history of obesity, type 2 diabetes, and dyslipidemia. On physical examination, there were no signs of jaundice or localized abdominal pain. Laboratory tests revealed a moderate elevation in transaminases [AST/ALT] and GGT, suggesting liver involvement. Due to suspected hepatic steatosis, an abdominal CT scan was ordered.

The abdominal CT scan without contrast injection shows a homogeneous liver with reduced density compared to reference tissues such as the spleen and kidneys (Figure 1). This diffuse hypodensity of the hepatic parenchyma is characteristic of fat infiltration [2]. No focal mass or tumor lesion is observed, which helps exclude conditions such as liver tumors or abscesses. The images suggest moderate to severe hepatic steatosis, but vascular structures, such as the portal vein, remain visible, which is an indicator of the absence of advanced fibrosis or cirrhosis [3].

After contrast agent injection, the liver's density increase is less pronounced compared to adjacent structures [spleen and kidneys], confirming the presence of intra-hepatic fat. The steatosis is homogeneous and diffuse (Figure 2), with no signs of heterogeneity that might suggest fibrosis or focal lesions [4]. Post-contrast images show a liver free of nodules and normal hepatic vascularization, thereby ruling out signs of cirrhosis or liver tumors.

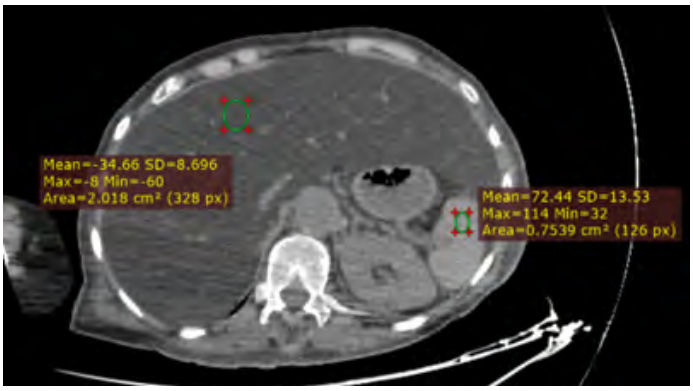

Figure 1: Abdominal CT in axial sections without contrast injection demonstrates a fatty liver with a hepatic parenchymal density of -34 HU, which is lower than the splenic parenchymal density of 72 HU.

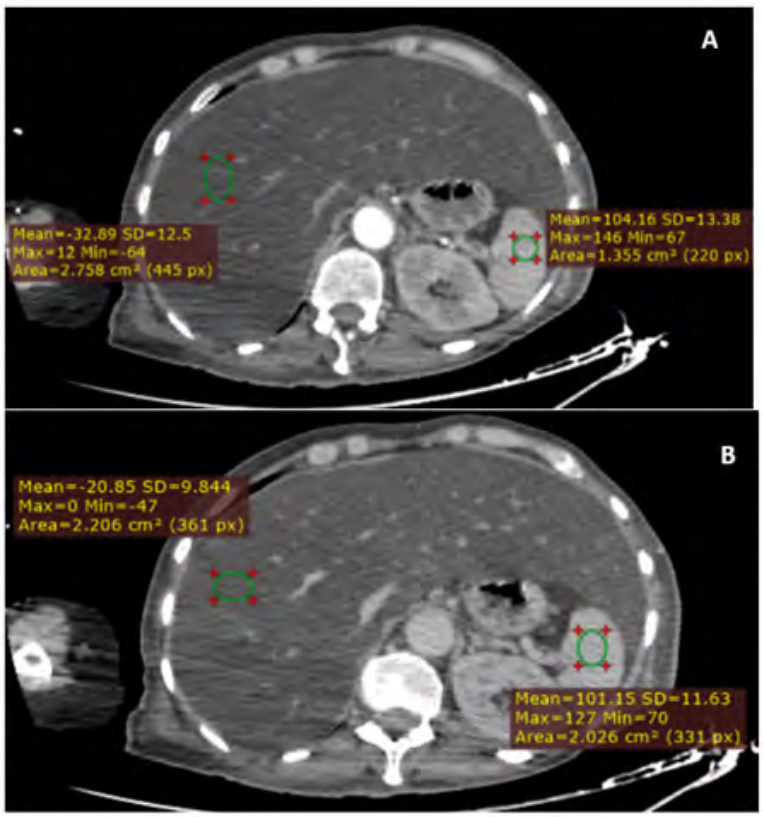

Figure 2: Abdomina CT in axial view, in arteral (A) and portal phases (B), showing a hepatic density of -20 HU compared to the spleen, which demonstrates enhancement after contrast injection.

4. Discussion

Hepatic steatosis is often discovered during abdominal imaging, particularly when abnormalities in liver tests are detected [5]. Abdominal CT, although less commonly used than ultrasound, can provide detailed information about liver density and the extent of fat infiltration. On computed tomography, steatosis typically appears as a homogeneous hypodensity of the liver compared to the surrounding tissues. However, CT may not be sensitive enough for the early stages of the disease or for mild forms of steatosis, where ultrasound may be more sensitive [6].

Contrast injection allows for better assessment of hepatic vascularization and helps exclude vascular abnormalities, such as tumors or abscesses, which could mimic steatosis on non-contrast images. Additionally, although CT is useful for evaluating the severity of steatosis, it is not as precise as MRI for the exact quantification of hepatic fat [7]. It is important to note that while hepatic steatosis is generally benign, it can progress to more severe forms such as non-alcoholic steatohepatitis [NASH] and fibrosis, particularly in patients with a history of diabetes or obesity [8]. High-risk patients should be regularly monitored to prevent disease progression.

5. Conclusion

This clinical case illustrates the use of abdominal CT, both with and without contrast injection, to diagnose hepatic steatosis. CT imaging is an essential tool for assessing the severity of fat infiltration and for excluding other serious liver pathologies. Although ultrasound is the examination of choice for initial diagnosis, abdominal CT can provide valuable complementary information in the evaluation of steatosis and in the follow-up of high-risk patients. Regular monitoring is crucial to prevent progression to more serious complications.

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