

Study of Analysis of Ultrasonographic Findings in Patients Suffering From Liver Cirrhosis

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ABSTRACT

Background: Cirrhosis is characterized by the histological formation of regenerative nodules encased in fibrous tissue, which occurs as a response to chronic liver damage. The present study was conducted for analysis of ultrasonographic findings in patients suffering from liver cirrhosis.

Materials & Methods: A total of 50 patients with the presence of cirrhosis of liver were enrolled. Complete demographic and clinical details of all the patients were obtained. Ultrasound reports that included the terms cirrhosis, cirrhotic, nodular, nodularity, fibrosis, irregular, heterogeneous, and/or coarse were identified for analysis. Only liver biopsies conducted within 12 months following the initial ultrasound were considered for this study. All data were systematically recorded in a Microsoft Excel spreadsheet and subsequently analyzed using SPSS software.

Results: A total of 50 patients were enrolled. The mean age of the patients was 49.2 years. Majority proportion of patients were males. Biopsy was done in 44 percent of the patients. Among these 44 percent cases, cirrhosis was confirmed in 86.36 percent of the cases. Hence; diagnostic accuracy of USG was 86.36 percent.

Conclusion: The advancement of novel imaging techniques for the diagnosis of liver cirrhosis has facilitated the identification and quantification of subtle alterations. This progress has contributed to the early and precise diagnosis of liver cirrhosis.

Key words: Liver, Cirrhosis, Ultrasonography.

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INTRODUCTION

Cirrhosis is characterized by the histological formation of regenerative nodules encased in fibrous tissue, which occurs as a response to chronic liver damage. This condition ultimately results in portal hypertension and progresses to end-stage liver disease. Recent advancements in the comprehension of the natural progression and underlying mechanisms of cirrhosis, along with improvements in the management of its complications, have led to enhanced treatment strategies, thereby improving the quality of life and life expectancy for patients suffering from cirrhosis. The causes of cirrhosis can typically be determined through a combination of the patient's medical history and serological and histological assessments. In the Western world, alcoholic liver disease and hepatitis C are the predominant etiological factors, whereas hepatitis B is more prevalent in many regions of Asia and sub-Saharan Africa. Following the discovery of the hepatitis C virus in 1989 and the identification of nonalcoholic steatohepatitis (NASH) in individuals with obesity and diabetes, instances of

cirrhosis diagnosed as cryptogenic, or without a known cause, have become increasingly rare.¹⁻³

Cirrhosis often progresses insidiously, remaining asymptomatic and unrecognized until complications associated with liver disease arise. A significant number of individuals with this condition do not seek medical attention, and cases of previously undiagnosed cirrhosis are commonly identified during autopsy examinations. Imaging techniques such as ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) lack the sensitivity required for the detection of cirrhosis, with definitive diagnosis still dependent on histological analysis.⁴ Nevertheless, these imaging modalities exhibit high specificity when a clear etiology is identified, particularly when imaging reveals an irregular hepatic texture or surface, a diminished hepatic central vein, an enlarged caudate lobe, splenomegaly, or the presence of collateral veins. It is essential to rule out other conditions, including portal vein thrombosis, parasitic infections, or

hematological cancers, as normal imaging results do not eliminate the possibility of compensated cirrhosis. The primary utility of radiographic techniques lies in their ability to identify and assess the complications associated with cirrhosis, such as ascites, hepatocellular carcinoma (HCC), and thrombosis of the hepatic or portal veins.⁵⁻⁷ Hence; the present study was conducted for analysis of ultrasonographic findings in patients suffering from liver cirrhosis.

MATERIALS & METHODS

The present study was conducted for analysis of ultrasonographic findings in patients suffering from liver cirrhosis. A total of 50 patients with presence of cirrhosis of liver were enrolled. Complete

demographic and clinical details of all the patients was obtained. Ultrasound reports that included the terms cirrhosis, cirrhotic, nodular, nodularity, fibrosis, irregular, heterogeneous, and/or coarse were identified for analysis. A total of 22 patients underwent liver biopsy based on clinical indications and/or ultrasound findings indicative of cirrhosis. Only liver biopsies conducted within 12 months following the initial ultrasound were considered for this study. The abdominal ultrasounds were executed, capturing both longitudinal and transaxial images of the right and left hepatic lobes. Percutaneous liver biopsies were carried out utilizing a right lateral, intercostal approach. All data were systematically recorded in a Microsoft Excel spreadsheet and subsequently analyzed using SPSS software.

Table 1: Demographic data

Variable	Number	Percentage
Mean age (years)		49.2
Males	31	62
Females	19	38

Table 2: Diagnostic accuracy of USG in comparison to liver biopsy for diagnosis of cirrhosis

Variable	Number	Percentage
USG report of cirrhosis	50	100
Biopsy done	22	44
Biopsy confirmed cases of cirrhosis		19 out of 22
Diagnostic efficacy of USG		86.36 percent

RESULTS

A total of 50 patients were enrolled. The mean age of the patients was 49.2 years. Majority proportion of patients were males. Biopsy was done in 44 percent of the patients. Among these 44 percent cases, cirrhosis was confirmed in 86.36 percent of the cases. Hence; diagnostic accuracy of USG was 86.36 percent.

DISCUSSION

Cirrhosis is the final stage attained by various chronic liver diseases after years or decades of slow progression. There are, however, ways to prevent cirrhosis, because the diseases that most commonly lead to it progress slowly, and measures are available to prevent and treat them. Moreover, most cases of hepatocellular carcinoma (HCC) arise in a cirrhotic liver, so cirrhosis prevention is, in fact, also HCC prevention. The risk of developing HCC depends on the underlying disease: It is low, for example, when the underlying disease is autoimmune hepatitis, and high when the underlying disease is chronic hepatitis B with a viral burden greater than 10⁷ copies/mL. Aside from chronic viral hepatitis, fatty liver disease due to any of the very common underlying disorders (obesity, diabetes, alcohol abuse) commonly progresses to cirrhosis and thus merits both specialized medical treatment and close follow-up by the primary-care physician.⁸⁻¹⁰ The course by which cirrhosis develops from a chronic liver disease is not linear; rather, it is modulated by the influence of

various disease-specific, host-specific, and environmental factors. Knowledge of these factors enables individual risk stratification, which, in turn, serves as the basis for personalized treatment.^{11,12} Hence; the present study was conducted for assessing USG findings in liver cirrhosis patients in a known population.

A total of 50 patients were enrolled. The mean age of the patients was 49.2 years. Majority proportion of patients were males. Biopsy was done in 44 percent of the patients. Among these 44 percent cases, cirrhosis was confirmed in 86.36 percent of the cases. Hence; diagnostic accuracy of USG was 86.36 percent. Simonovský V et al assessed the clinical usefulness of high-resolution ultrasound (US) analysis of the liver surface for the diagnosis of cirrhosis. US evaluation of the ventral contour of the liver was performed using a 7.5 MHz linear transducer in 100 patients with suspected liver disease. Only reproducible diffuse ventral liver surface irregularities were considered as an objective US sign of cirrhosis. All patients underwent liver biopsy and/or laparoscopy in order to obtain a definitive diagnosis. Disease prevalence for cirrhosis was 49%. In nine cases the visualized US irregularities were both unconvincing and hardly reproducible. Consequently, they were considered non-diagnostic and excluded from further analysis. On 91 diagnostic studies, the sensitivity of US for cirrhosis was 91.1%, the specificity 93.5% and the accuracy 92.3%. Positive and negative predictive values were

93.2% and 91.5%, respectively. Provided non-diagnostic cases were considered technically satisfactory studies and included as true-positive and false-positive cases, this would slightly increase the sensitivity but decrease specificity and accuracy to 91.8%, 84.3%, and 88.0%, respectively. High resolution US analysis of the ventral liver contour is a clinically reliable non-invasive test for the diagnosis of cirrhosis.¹³

Gaiani et al confirmed that the presence of cirrhosis may be underestimated when based on a single parameter. The finding is considered positive if instead of a straight and regular hyperechoic line, the liver surface appears as a dotted or irregular line and/or the liver parenchyma shows areas with different echogenicity. Both the right and left lobes of the liver should be assessed as changes may be more readily apparent in one side only.¹⁴ Harbin et al originally measured the ratio of the transverse width of the caudate lobe, to the transverse width of the right lobe of the liver. Caudate lobe hypertrophy is defined as a ratio of greater than 0.6 between the transverse diameter of the caudate lobe and the transverse diameter of the right lobe. Using this technique, cirrhosis could be correctly diagnosed with a sensitivity of 84%, a specificity of 100%, and a diagnostic accuracy of 94%. Other studies have found similar results. Hess et al used the ratio of the multidimensional caudate index to the transverse diameter of right lobe and found it superior to using the transverse diameter of caudate lobe alone with a specificity of 95% and sensitivity of 94.7%.¹⁵⁻¹⁸

CONCLUSION

The advancement of novel imaging techniques for the diagnosis of liver cirrhosis has facilitated the identification and quantification of subtle alterations. This progress has contributed to the early and precise diagnosis of liver cirrhosis.

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