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# ULTRASOUND AND MSCT OF SIGNS OF CHRONIC DIFFUSE LIVER DISEASES AT VARIOUS STAGES OF THEIR DEVELOPMENT

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**Relevance**

Chronic diffuse liver diseases (CDLD) are one of the most common and clinically significant pathologies in gastroenterology and hepatology [1,3]. Long-term inflammatory and destructive processes in the liver lead to gradual restructuring of the parenchyma, the formation of fibrosis, and then cirrhosis, which in some cases is complicated by the development of hepatocellular carcinoma (HCC) [2]. In this regard, non-invasive radiation diagnostic methods are of particular importance, allowing for a timely assessment of morphological changes, determining the stage of the process and identifying signs of malignancy [4,5].

**The aim of this study** was to conduct a retrospective analysis and comparison of ultrasound (US) and multispiral computed tomography (MSCT) signs of chronic cervical cancer at various stages of their development.

**Materials and methods.** The retrospective study included data from 86 patients aged 28 to 72 years, who were examined in the Department of Radiology. All patients were divided into three groups: Group I - Liver fibrosis - 34 patients; Group II - Liver cirrhosis - 32 patients; Group III - Hepatocellular carcinoma (HCC) - 20 patients . All patients underwent a comprehensive examination, including ultrasound

(B-scan and Doppler mode) and multispiral computed tomography (MSCT) with contrast enhancement.

**Results and discussion.**

**1. Ultrasonic characteristics**

At the stage **of liver fibrosis** , ultrasound revealed moderately increased echogenicity and uneven parenchyma, slight thickening of the portal vascular walls, and a smoothed vascular pattern. Doppler ultrasound revealed a decrease in portal blood flow velocity with preserved directionality. Liver size generally remained within normal limits or was slightly enlarged.

At the stage **of liver cirrhosis ,** marked heterogeneity of the echotexture , the presence of regenerative nodules of varying diameters, irregular contours, and capsule deformation were observed. The right lobe of the liver was reduced in size, while the left and caudate lobes were enlarged. Ultrasound with Doppler ultrasonography revealed signs of portal hypertension—dilated portal and splenic veins, the appearance of collaterals, and splenomegaly . Ascitic fluid was often detected.

In **hepatocellular carcinoma** (associated with cirrhosis), one or more hypoechoic or isoechoic lesions with fuzzy edges and irregular vascular patterns were detected. Doppler ultrasonography demonstrated increased arterial blood flow and chaotic, uneven vascularization , which was considered a sign of tumor growth.

**2. Computed tomographic characteristics**

In **liver fibrosis,** MSCT data revealed a moderate decrease in parenchymal density, smoothed vascular patterns, and thickened portal tracts. In the arterial phase, uniform contrast accumulation without focal changes was visualized.

At the **cirrhosis stage** , MSCT revealed gross deformation of the liver contours, reduction of the right lobe, compensatory enlargement of the caudate and left lobes, and signs of portal hypertension and splenomegaly . The parenchyma was characterized by a mosaic structure, alternating areas of increased and decreased density. In the late phase of contrast enhancement, delayed and uneven contrast washout was noted.

In **hepatocellular carcinoma,** MSCT revealed a typical contrast pattern: hypervascular contrast accumulation in the arterial phase and rapid "washout" into the portal phase. HCC lesions were irregular in shape, with hypodense areas of necrosis. Tumor invasion into blood vessels, particularly into the portal vein branches, was frequently detected, which was an unfavorable prognostic sign.

### 3. Comparative analysis of ultrasound and MSCT data

A comparative analysis showed that ultrasound is the method of choice in the early stages of chronic liver disease, especially in the presence of fibrosis, when structural changes are still minimal. This method allows for dynamic monitoring and assessment of hemodynamic abnormalities. MSCT has an advantage in cases of significant morphological changes, advanced cirrhosis, and developing HCC due to its high spatial resolution and the ability to evaluate contrast phases.

The agreement between diagnostic findings based on ultrasound and MSCT data was : **78%** for fibrosis , **88%** for cirrhosis , and **95%** for hepatocellular carcinoma . Thus, the results of the study indicate the high diagnostic information value of both methods, while their combined use can significantly improve the accuracy of staging chronic liver diseases and early detection of HCC.

### Conclusions

Ultrasound remains the leading method for the primary diagnosis of chronic liver disease due to its safety, availability, and the possibility of dynamic monitoring. Contrast-enhanced CT provides the most accurate morphological and vascular assessment of the liver, especially at the stages of cirrhosis and HCC. Comparison of ultrasound and CT data allows for the reliable determination of the stages of fibrosis, cirrhosis, and hepatocellular carcinoma, the identification of complications, and the monitoring of treatment effectiveness. A comprehensive radiological approach is key in the modern diagnosis of chronic liver diseases and plays a significant role in the development of individualized treatment strategies.

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