RADIATION DIAGNOSTICS OF VOLUMETRIC FORMATIONS OF THE LIVER

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Abstract. *Despite the development of highly informative diagnostic methods, the risk of erroneous diagnosis remains relevant, as a result of which a malignant tumor may be missed. The aim of the study was to improve the diagnosis of volumetric formations of the liver by using radiation research methods-complex echography and computed tomography. Materials and methods of research. The work was carried out on the basis of the Tashkent Pediatric Medical Institute in the regional oncological dispensary from 2015 to 2021. 70 patients aged 20 to 70 years were under observation, of which 30 (42.8%) were men and 40 (57.2%) were women. The results of the study. With ultrasound, CT of the liver, the sensitivity depended on the size of the detectable formations and the massiveness of the liver lesion. With adenoma, a rounded formation with clear contours, a moderately heterogeneous internal structure was determined, the echogenicity of the adenoma was with some predominance of hyperechoic variants. During ultrasound, the hemangioma was more often visualized as a hyperechoic formation, sometimes with an acoustic shadow located behind it. A characteristic CT sign of hemangioma was the clarity of its contours, which we noted in 82% of cases. A smooth contour was characteristic of small hemangiomas and was observed in half of the patients. Conclusions. for the primary detection of benign focal liver lesions, it is advisable to start the examination with ultrasound examination followed by CT diagnostics.*

Keywords: *volumetric formations of the liver, liver adenoma, liver hemangioma, diagnostics, ultrasound diagnostics, Dopplerography, computer tomography.*

Relevance. Technological progress and the introduction of new diagnostic equipment into clinical practice make it possible to detect volumetric liver formations in the early stages of the disease, before the appearance of clinical symptoms [1,4,8]. However, among the focal formations of the liver, both benign (hemangiomas, adenomas) and malignant (primary liver cancer, metastases of various tumors) can occur, the approach to treatment of which is fundamentally different.

Benign focal liver lesions are observed in 24.5% of cases of all diseases of this organ, of which non-parasitic cystic liver lesions currently account for 11.8% [3, 7]. The frequency of liver abscesses in general surgical pathology reaches 0,1% - 0,5% [4, 6, 7].

Volumetric formations of the liver from the moment of their occurrence until the first clinical manifestations develop rather covertly and asymptomatically.

Despite the development of highly informative diagnostic methods, the risk of erroneous diagnosis remains relevant, as a result of which a malignant tumor may be missed [2].

Ultrasound examination plays the main role in the early detection of focal liver diseases. But the practical significance of the method is not limited to this. In recent years, ultrasound has been used not only for diagnosis, but also for performing minimally invasive puncture-drainage interventions [3,5].

The purpose of the work. Improving the diagnosis of volumetric formations of the liver through the use of radiation research methods-complex echography and computed tomography.

Materials and methods of research. The work was carried out on the basis of the Tashkent Pediatric Medical Institute in the regional oncological dispensary from 2015 to 2021. 70 patients aged 20 to 70 years were under observation, of which 30 (42.8%) were men and 40 (57.2%) were women. The study did not include patients with chronic viral hepatitis in combination with focal liver lesions.

To obtain their own regulatory data on echography of the liver, gallbladder, pancreas and spleen, 35 practically healthy people, aged 20 to 70 years, with normal clinical, laboratory and echographic indicators at the time of examination were examined. The main group consisted of patients with focal liver lesions, of which 5 (14.3%) with adenoma, 5 (14.3%) with hemangioma, 15 (42.9%) with liver metastases and 10 (28.5%) with liver cancer.

For a comprehensive ultrasound examination of the hepatobiliary and pancreatoduodenal system, a seroscale ultrasound device operating in real time using a convexic electronic scanning sensor with a frequency of 3.5-5 MHz was used. Patients were examined on an empty stomach, polypositionally: in the supine position, on the left side, in the longitudinal, transverse and oblique scanning planes, in obese patients, intercostal scanning was also resorted to, achieving the best visualization of all anatomical parts of organs and "zones of interest". The study was carried out comprehensively, the condition of the liver, gallbladder, pancreas and spleen, as well as vessels of the portal and inferior vena cava systems were evaluated. A complete description of all quantitative and qualitative parameters of the studied organs is given.

The results of the study. Depending on the severity and stage of the disease, various changes in the echographic picture occurred in adenoma. Etiopathogenetic factors - variants of bacterial, toxic and metabolic lesions - played a certain role in the speed and severity of the dynamics of the echographic picture of the liver in adenoma.

Among patients with liver hemangiomas, there were 1 men (aged 36 to 65 years, average age -52.7 years), 4 women (aged 31 to 69 years, average age - 54.2 years). In 2 patients, hemangiomas were located in the right lobe of the liver, 2 of them had single tumors ranging in size from 2.2 to 12.1 cm.

A complaint of general weakness was presented with hemangioma and liver abscess in 4 (80%) and 4 (80%) patients. Rapid fatigue and decreased performance were one of the main symptoms of this pathology.

Of the dyspeptic manifestations, the feeling of bitterness and dry mouth, decreased appetite and intolerance to fatty foods, bloating and constipation were most often noted. The symptom of bitterness in the mouth is most often detected by liver adenoma in 5 (100%) patients. With liver adenoma, a high frequency of symptoms such as heartburn was also noted in 4 patients, decreased appetite in 5 and stool disorders in the form of constipation in 4 (80%) patients. 80% of patients with these pathologies complained of intolerance to fatty foods, 60% of patients complained of belching, 60% of patients complained of nausea, 80% of patients with adenoma and hemangioma of the liver complained of a feeling of overflow in the epigastrium and bloating. With an objective study, the condition of patients in most cases is satisfactory, the position is active. The skin and visible mucous membranes had an icteric color. During ultrasound, liver adenoma was suspected when a rounded formation with clear contours, moderately heterogeneous internal structure, intra-tumor vessels, septa, surrounded by a hypoechoic rim was detected. The echogenicity of the

adenoma was with some predominance of hyperechoic variants. Diagnostics of liver hemangiomas in our study were transabdominal ultrasonography and X-ray computed tomography. A characteristic CT sign of hemangioma was the clarity of its contours, which we noted in 82% of cases. A smooth contour was characteristic of small hemangiomas and was observed in half of the patients. In other cases, the contour was uneven, which was explained by the appearance of its tuberosity with an increase in the size of the tumor.

Diagnostic criteria for hemangioma (according to CT and ultrasound) revealed the following: it is never encapsulated, edematous, tends to be located next to the hepatic veins, sometimes approaching the shape of the liver lobes. Its contours were irregular, but clear. During the study, a very slow growth was observed in dynamics.

During ultrasound, the hemangioma was more often visualized as a hyperechoic formation, sometimes with an acoustic shadow located behind it. However, in the presence of concomitant fatty infiltration of the liver, the hemangioma acquired hypoechogenicity and was then difficult to distinguish from cysts or metastases. The cavernous cavities looked like hypo- and anechoic areas, which made their interpretation difficult.

Table 1.

Diagnostic criteria for focal liver lesions

Criteria	Hepatoma	Metastasis
Shape	Rounded + the child nodes	Rounded, irregular
Contours	Fuzzy	Fuzzy
The presence of a capsule	Yes	No
The internal structure	is inhomogeneous in 58% of cases	Inhomogeneous
Intra -tumor vessels	Yes	No
Edema	Sometimes	Sometimes
Signs of bleeding	Sometimes	Sometimes
Ultrasound characteristics:	Echogenicity is almost any, somewhat more often hypoechoic. Pronounced heterogeneity of the internal structure, detection of hypointensive rim	Polymorphism of the picture. Combination of various echographic types of metastases: hyperechogenic, isoechogenic, hypoechogenic, anechogenic, mixed echogenicity
CT Characteristics:	Low density. There may be calcifications, necrosis. Portal vein thrombosis. Bumpy contours	Low density. The multiplicity of foci. Foci of necrosis, calcification

The computed tomography picture of large hemangiomas, 6-8 cm in diameter, had distinctive features. Compared with small hemangiomas, their contour was also clear, but bumpier. It is characteristic that small areas appeared on the CT section in the parenchyma of the hemangioma in the form of individual dots, 2-3 mm in diameter or strips up to 3 mm in size with reduced density. Similar areas were located throughout the hemangioma section or grouped in the center, but practically did not occur in the peripheral areas of the liver.

With hemangiomas larger than 8 cm, CT sections revealed a symptom specific to these formations, consisting in the appearance of a uniformly low density, stellate or oblong-branched area in the center of the tumor, with clear contours. In contrast, the low-density areas encountered during the decay of a malignant tumor had a more rounded shape, fuzzy borders and uneven density.

In ultrasound, CT of the liver, the sensitivity depended on the size of the detectable formations and the massiveness of the liver lesion (Table 1).

The characteristic CT signs of small hemangiomas were the clarity of contours and homogeneous structure. For large hemangiomas, in addition to the clarity of the contours, the presence of peculiar low-density zones in the form of "outgrowths" spreading from the periphery to the center was characteristic. This specific feature of large hemangiomas made it possible to differentiate them from liver tumors with a decay zone without the use of intravenous contrast enhancement.

Conclusions. Thus, for the primary detection of benign focal liver lesions, it is advisable to start the examination with ultrasound examination followed by CT diagnostics.

As our study has shown, the use of modern minimally invasive interventions is the method of choice in the treatment of benign focal liver lesions. The volume and type of minimally invasive surgical intervention depends on the nature of liver damage, the size and localization of the formation.

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