

# LIVER HEMANGIOMA ULTRA SOUND TEST AND EXAMINATION ADVANTAGES

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## Abstract

Liver neoplasms represent a diverse group of tumors of benign and malignant nature. Their differential diagnosis often causes certain difficulties. At the present stage of the development of diagnostic methods, there is a need to choose a non-invasive, highly informative and minimally sufficient research method for solving diagnostic problems, influencing the choice of further therapeutic and diagnostic tactics. Ultrasound examination using modern technologies has advantages in the diagnosis of focal liver damage. The article discusses the ultrasound differential diagnostic signs of focal liver neoplasms using various ultrasound diagnostic methods.

**Keywords:** Ultrasound examination, contrast-enhanced ultrasound examination, hemangioma, liver adenoma, hepatocellular carcinoma, liver metastases.

## Introduction

Hepatic hemangioma (GP) is the most common benign liver tumor [2, 8]. The prevalence of the disease according to autopsy data ranges from 0.4% to 7.4% [3,7]. All age groups and mainly women are susceptible to the disease (the ratio of women to men is 1.5—6:1), while the size of the formation may increase due to pregnancy or the administration of estrogens. Most GP are small and are not accompanied by any symptoms. About 20% of GP have dimensions of more than 5 cm; 10-29% of patients have multiple hemangiomas [8-10, 13, 14].

There is a description of GP in the medical literature, the dimensions of which reached  $63 \times 48 \times 40$  cm, and the weight was 18 kg [14]. GP is most often detected accidentally during ultrasound, CT of the abdominal cavity and laparotomy or during autopsy. The widespread use of ultrasound and CT has now led to an increase in the number of patients with GP. Symptoms of the disease usually appear when the tumor reaches a certain size. The most common complaint is abdominal pain or discomfort. Rarely, with large amounts of education, symptomatic thrombocytopenia develops, known as Kasabach— Merritt syndrome.

The most serious complication is a rupture of the hemangioma followed by intra-abdominal bleeding [3, 7-10, 13]. Approaches to GP treatment are still controversial. The most controversial issue remains the need for surgical interventions for patients with GP. It is also discussed at what period of hemangioma development it is necessary to perform surgery and what volume of surgery is optimal. In recent years, a more active management strategy has been proposed for patients with GP, in whom, with dynamic monitoring, a stable tendency to tumor growth is revealed. In our



opinion, the main factor hindering the implementation of this approach is the psychological unwillingness of surgeons to resort to traumatic interventions with small sizes of a benign tumor. Usually, a decision in favor of surgery occurs when the tumor reaches a large size. At the same time, according to most authors, the radical method of GP treatment is surgical — tumor enucleation or liver resection. However, the search for ways of low-traumatic treatment of this essentially benign disease continues to this day. Low-traumatic methods of thermal ablation are increasingly being introduced into the clinical practice of surgeons. This makes it possible to change the tactics of surgical treatment of patients with GP with a stable tendency to growth, and to carry out minimally invasive operations at a time when the tumor has not yet reached large sizes.

### The Purpose of the Study

Evaluation of the effectiveness of percutaneous microwave ablation (CHMA) in the treatment of patients with small GP with a stable tendency to growth.

### Materials and Methods

The study was conducted at the University Clinical Hospital No. 1 on the basis of the Department of Faculty Surgery No. 1 of the I. M. Sechenov First Moscow State Medical University. 38 patients with GP up to 5 cm in diameter were under observation. Patients with a hemangioma size of more than 5 cm were not included in the study. The diagnosis of GP in all patients was confirmed by multispiral CT. In 25 (65.8%) patients with dynamic follow-up, there was no tendency to tumor growth or the growth was insignificant. In 13 patients (34.2%), hemangiomas increased in size 2-2.5 times within 1.5–3 years. There were 4 (30.8%) men and 9 (69.2%) women among patients with a stable tendency to increase GP. The age of the patients ranged from 30 to 58 years (on average 44 years). 12 (92.3%) patients were diagnosed with one hemangioma in the liver (from 3.0 to 5.0 cm), 1 (7.7%) patient had four hemangiomas (from 2.5 to 5.0 cm). Tumors were located in the right lobe of the liver in 9 (69.2%) patients, in the left lobe — in 3 (23.1%), in both lobes — in 1 patient (7.7%). Three patients (23.1%) did not complain, 10 patients (76.9%) had discomfort and dull episodic pain in the right hypochondrium. It should be emphasized that the genesis of pain was probably not related to the size of the tumor and was caused by concomitant diseases of the hepatopancreatobiliary zone.

### Results

In total, CHMA was performed on 13 patients. The patients underwent the operation satisfactorily. In the first two days after the operation, moderate soreness remained at the site of the intervention. Postoperative complications were not noted in any case. In 11 (84.6%) patients, one ablation session was performed, in 2 patients (15.4%) repeated ablation was required due to tumor recurrence with control multispiral CT. A patient with multiple hemangiomas underwent simultaneous ablation of the two largest hemangiomas. This patient continues to be under dynamic supervision. A functional examination of the liver on the first day after the intervention showed an increase in AST and ALT levels by 2-3 times relative to the initial values. On the 2nd-5th day after treatment, these indicators returned to normal. No other changes in the clinical status of patients and laboratory parameters were noted. The patients were discharged on the 3rd-5th day after surgery.



The immediate and long-term follow-up periods ranged from 8 to 32 months (an average of 20 months). In 10 (76.9%) patients, pain and discomfort in the right hypochondrium disappeared (the association with ablation is unreliable). Ultrasound in dynamics showed that within 2-3 months, patients could form small liquid foci at the site of ablation (6 patients), which regressed independently with the formation of fibrosis by the end of the 6th month. The formation of fibrotic foci was confirmed with multispiral CT after 6 months. Histological examination was not performed due to the refusal of patients. One of the options for minimally invasive treatment, contributing to the cessation of growth or reduction in the size of GP, is embolization of the vessels feeding the tumor. The technique was developed at the end of the last century [1,2,4, 11].

Subsequent publications indicated a large number of recurrence of hemangioma when choosing this treatment tactic. It is necessary to take into account the complications of selective embolization, in some cases quite severe and even fatal, — destruction of the walls of the gallbladder with subsequent biliary peritonitis or embolization (ischemia) of a large extent of intact liver parenchyma with the development of liver failure [5, 6, 12]. It is the lack of an acceptable low-traumatic method that takes into account the peculiarities of the course of the disease that has led to a restrained management of patients with GP. The widespread and effective use of minimally invasive methods of treatment based on thermal destruction of tissues in oncological practice has made it possible to apply this method in the treatment of small GP with a tendency to growth.

Microwave ablation, unlike other types of ablation, does not depend on the electrical conductivity of the altered tissues, so the effect on different tumor foci does not differ. The method leads to significantly higher temperatures in the hearth and a reduction in the exposure time to each of the foci with lower generator power, compared with the radio frequency method. Technologically, microwave ablation does not require a closed electrical circuit; when using this method, cooling is not required, as with radiofrequency ablation; The instruments here are not electrodes, but are a radiating antenna. The fabric is subjected to high heating and dried, and thermal coagulation necrosis is created in it with a size from 3.5 to 5.0 cm of oval or spherical shape. Thus, the tumor is destroyed and then replaced with scar tissue.

### Conclusion

Our experience of percutaneous microwave ablation (CHMA) in the treatment of patients with small liver hemangioma with a stable tendency to growth allows us to consider this method a worthy alternative to previously used methods. Preliminary data have been obtained indicating the effectiveness of CHMA as the most gentle method of surgical treatment in patients with liver hemangioma. Further research will determine the place of CHMA in a number of effective treatment methods.

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