

## TREATMENT OF PATIENTS WITH CAVITY LIVER FORMATION WITH A SIMPLE AND COMPLEX SUBDIAGHRAGMAL POSITION

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### RESUME

**The aim** of our study was to study the results of surgical treatment of patients with cavity formations of the liver with its different anatomical location.

The results of surgical treatment were analyzed in 37 patients with cavity liver formations. Of these, 26 patients of group I were with cavity formations in the I-IV segments of the liver, which does not require great technical difficulty during the operation, associated with its anatomical location. Group II of the study included 11 patients with cavitory liver lesions with complex anatomical locations of the liver, in which the lesions were located in the VII and VIII segments of the posterior clique of the diaphragm, which caused great technical difficulties in performing the operation due to the difficulty of access to the lesion.

**Keywords:** cavitory formations of the liver, liver cysts, liver abscess.

### RELEVANCE

Liver cavitory formation (LLE) is one of the most urgent problems of modern reconstructive surgery [1, 5]. Often formed as a result of surgical treatment of cavitory liver formations, there is a threat of development of formidable complications: bleeding, formation of purulent and biliary fistulas, suppuration and breakthrough of the infected cavity into the biliary tract, bronchial tree, into the abdominal cavity, into the subdiaphragmatic and subhepatic spaces [6]. Residual cavities are a chronic focus of infection in the body [3]. Various methods have been proposed for the elimination of residual liver cavities after echinococectomy. The most famous and frequently used are capitonnage of the cavity by bringing the cyst close to the internal sutures (according to Delba) and invagination of the fibrous capsule protruding above the liver into the lumen of the cyst cavity, followed by its fixation with interrupted catgut sutures (Bobrov-2 method). V. G. Gostishchev et al. [12] proposed a method for correcting the residual cavity after echinococectomy by screwing the edges of the fibrous membrane into the cavity with interrupted catgut sutures. The authors believe that this method reduces the invasiveness of the operation and prevents the formation of secondary non-parasitic cysts in the postoperative period. Treatment of the residual cavity by capitonnage or screw sutures is not safe in conditions of inflammation and destruction of the fibrous membrane or is impossible due to the rigidity of the cyst walls [8, 13, ]. Surgical treatment of echinococcal cysts located in the subdiaphragmatic space is a particularly difficult task. Often after surgery in this area

non-parasitic cysts are formed [4, 15, ]. With subdiaphragmatic localization of the cyst (VII–VIII segments), after echinococectomy, capitonnage according to Delba or closure of the residual cavity according to A. T. Pulatov is also performed. The residual cavity of the cyst is treated with various antiparasitic agents (2–5% formalin solution, 80% glycerol solution, 5% iodine solution, 96% alcohol, etc.), as well as cryotherapy and a defocused CO<sub>2</sub> laser beam [2]. The anatomical location of the lesion is of great importance for the outcome of surgical treatment in this category of patients. With the subdiaphragmatic location of the cavity formations of the liver to the VII and VIII segments, surgical treatment, in contrast to their location to the I-IV segments of the liver, has a number of technical difficulties. The aim of our study was to study the results of surgical treatment of patients with cavity formations of the liver with its different anatomical location.

### MATERIAL AND METHODS

The results of surgical treatment were analyzed in 37 patients with cavity liver formations. Of these, 26 patients of group I were with cavity formations in the I-IV segments of the liver, which does not require great technical difficulty during the operation, associated with its anatomical location. Group II of the study included 11 patients with cavitory liver lesions with complex anatomical locations of the liver, in which the lesions were located in the VII and VIII segments of the posterior clique of the diaphragm, which caused great technical difficulties in performing the operation due to the difficulty of access to the lesion. The complex method of treatment of the examined patients included general strengthening symptomatic treatment before the operation period. Surgical treatment for all patients was performed by mid-median laparotomy access.

All patients were divided by sex and age according to the classification of age groups adopted at the regional seminar of the World Health Organization in Kyiv in 1963 [83; c. 24-30]. Of the examined patients - 20 (54.5%) men and 17 (45.5%) women aged 19 to 60 years.

The majority of patients (72.7%) were in the most able-bodied age (from 20 to 50 years).

Of all the examined patients, 27 (72.9%) patients were admitted to the clinic with the guiding stage of hepatic echinococcus, 7 (18.9%) patients were admitted with suppuration of the residual cavity after hepatic echinococectomy, and 3 (8.1%) patients were admitted with acute liver abscess of various etiologies. (Table1)

Table1 Distribution of examined patients by etiological factor.

№	Types of diseases	Mount of patients	Group of patients	
			I	II
1.	liver cyst	27 (72,9 %)	20 (76,9 %)	7 (63,6 %)
2.	Residual liver cavity	7 (18,9 %)	4 (15,3 %)	3 (27,2 %)
3.	liver abscess	3 (8,1 %)	2 (7,6 %)	1 (9,0 %)
	total	37	26	11

All patients on the day of admission were urgently measured body temperature, respiratory rate, an objective study of the liver (palpation, percussion), ultrasound examination and, if

necessary, MSCT or CT scan of the liver and abdominal cavities, conservative general strengthening and symptomatic therapy was started. In patients with residual cavities and liver abscess, empiric antibiotic therapy was performed, followed in the postoperative period, taking into account the sensitivity of the microflora.

After an appropriate examination and preoperative preparation, traditional surgical interventions were performed in elective or urgent delayed orders. Diagnosis of the disease began with the collection of patient complaints, their severity, anamnesis of the duration of the disease, analysis of the results of clinical and objective examination of the patient. During the collection of anamnesis, attention was paid to determining the etiological factors in the development of the disease, the nature and duration of complaints, concomitant and background pathology. General clinical and physical examination methods were aimed at identifying an accurate diagnosis of the cavity of the liver formation, size, nature and its anatomical location. All patients underwent a detailed complete blood count, biochemical blood parameters were determined, a general urinalysis was performed, blood was taken for ELISA or EMF for syphilis, markers of viral hepatitis B and C, antibodies to HIV were determined, an ECG was performed. To establish the diagnosis of echinococcal liver brush, a serological test was carried out, the reaction of precipitation and a blood test for eosinophils. When concomitant pathology was detected, the patients were consulted by the relevant specialists, profile examinations were performed.

Microbiological analysis was carried out by sampling secretions from the contents of the liver cavities during the operation and in the postoperative period from the drainage tube with a qualitative and quantitative assessment of the isolated infection, as well as its susceptibility to various antibiotics.

## RESULTS AND DISCUSSIONS

Out of 20 patients with liver echinococcosis of group I, in 3 (15.0%) patients, the parasitic cyst was localized in the segment I of the liver, in 5 (25.0%) patients, the localization of the parasitic cyst in the segment II of the liver was detected, in 5 (25.0%) cases localization of the echinococcal brush was noted in the III segment of the liver, the rest in 7 (35.0%) patients, the cyst was localized in the IV segment of the liver. All these patients had hydatidosis of liver echinococcosis. Surgical interventions were performed by upper median laparotomy access. Conducting a retrospective analysis of postoperative complications, depending on the chosen access, in patients with hydatid liver echinococcosis, we obtained the following data, which are shown in Table 2.

Table number 2 The frequency of complications from surgical wounds depending on the surgical access in the control group of patients

Type of operational access	Number of surgical interventions		Suppuration of the surgical wound		Postoperative hernia		Iatrogenic liver damage		Bleeding from cavities	
	Abs	%	Abs	%	Abs.	%	Abs	%	A	%
Upper middle, middle middle laparotomy	21	80,7	-	-	-	-	-	-	-	-
Upper median laparotomy with extensions below the umbilicus.	5	19,3	1	3,8	-	-	-	-	-	-
Total:	26	100	1	3,8	-	-	-	-	-	-

Of the 20 patients with liver echinococcosis, 13 (65.0%) patients underwent a closed method of capturing the cavity of the hydatid hand, and 7 (35.0%) patients underwent semi-closed echinococcectomy.

In 6 patients of the control group, who were with suppuration of the residual cavities and acute liver abscess, respectively, the following tactics were performed:

- after establishing an accurate differentiated diagnosis based on the results of anamnesis, ultrasound, MSCT studies and clinical and laboratory data, infusion, detoxification, general strengthening and symptomatic treatment was carried out as a preoperative preparation for 1-2 days.

After appropriate premedication, these patients also underwent an upper-median or upper-median-median laparotomy. Both in patients with residual liver cavity and in patients with acute liver abscess, intraoperative drainage and sanitation of the cavity of the purulent focus were performed with drainage into the cavity, which was fixed on the liver capsule with catgut sutures, followed by the end of the drainage tube, which was brought out through the contour aperture to the outside and fixed to the skin with silk sutures.

Of the 6 patients with purulent foci of the liver of the I control group, 1 (16.6%) patients had a purulent focus localized in the I and II segments of the liver, in 2 (33.3%) patients, the purulent focus was localized to the III segment of the liver, in 3 (50%) observations noted the localization of the purulent focus in the IV segment of the liver.

Clinical and laboratory blood tests revealed a relatively high level of intoxication in patients with suppuration of the residual liver cavities and acute liver abscess than in patients with liver echinococcosis. On the day of admission, all indicators of intoxication were significantly deviated from the norm. In the process of preoperative preparation included infusion-detoxification, antibacterial, general strengthening therapy by the 3rd day of treatment, which basically coincides on the day of surgery, all indicators were closer to normal, which was aimed at the goal of preoperative preparation to improve the outcomes of surgical treatment. In the postoperative period, all these indicators of intoxication, except for the blood ESR, returned to normal by the 7th day. All these patients were discharged for outpatient observation by 7-8 days with drainage tubes in the residual cavities. By 10-13 days, all drains after the control ultrasound examination of the residual cavity were removed on an outpatient basis. At the same time, the size and content of the liver cavity were taken into account. The drains are removed when the size is less than 30 mm without fluid content. It should be noted that the average duration of operations performed in the control group I was 70+8.5 minutes. As noted above, out of 26 operated patients, 1 (1.16%) patient had postoperative suppuration of the wound, which, after appropriate treatment, the wound healed by secondary intention. In these patients, intraoperative complications and postoperative hernia were not observed.

Thus, our studies of the control group I showed that in patients with cavitory liver formations with simple anatomical locations, when using the traditional method of treatment using the operation of the upper-middle access, it does not pose a great technical difficulty and most cases have a favorable outcome. In all 11 examined patients of group II with complex anatomical locations of the cavitory formation of the liver, the lesion was localized in the region of the posterior segment of the diaphragm, segments VII-VIII of the liver. Of these, 8 (72.3%) patients

had hydatid echinococcosis of the liver, 3 (27.3%) patients had purulent foci of the liver. (2 patients were with suppuration of the residual cavity, 1 with a liver abscess).

All patients of group II underwent surgery using the upper median laparotomy approach. Due to the technical difficulties of access to the lesion, all patients were forced to expand the laparotomic wound to below the navel up to 10 cm.

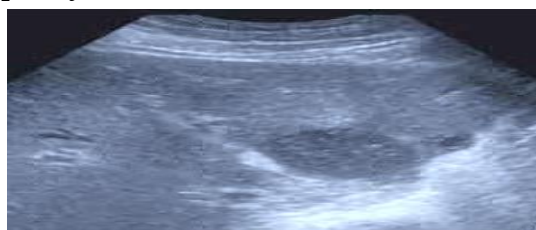
It is known that modern adequate surgical methods for the treatment of hepatic echinococcosis require complete removal of parasite membranes and sealing of the residual cavity. Treatment of a purulent focus of the liver (suppuration of residual cavities, liver abscess) requires drainage, emptying of the purulent focus and sanitation of the cavity with antiseptic solutions in the interoperative and postoperative period, which we did in the treatment of these categories of patients.

During the surgical treatment of patients with liver echinococcosis with complex anatomical location to the VII-VIII segments of the liver, a wide upper median approach was performed, bypassing the navel on the left, expanded to 10 cm below the navel. To mobilize the liver, it was necessary to cross the ligaments of the corresponding lobe and carefully delimit the surgical field.

Practically in all 8 patients with echinococcosis of the VII-VIII segments of the liver, the operation was performed with great technical difficulties. For this, it was required to bring the body of the patient in a special position to the field-back position with an elevated lumbar region. Often there was a forced change in the position of the patient during the operation with the placement of additional cushions in the infralumbar region. In obese patients, even more technical difficulties were noted both during the mobilization of the liver and during the main stages of the operation. For maximum mobilization of the liver, the region of the posterior cascade of the VI-VII segment of the liver was plugged with a film material. Great difficulties were noted during the opening of echinococcal cavities, especially after emptying the echinococcal fluid and removing the chitinous membrane, sanitation and revision of the residual cavities had great technical difficulties. At the same time, the main operating surgeon had to perform the main stage of the operation in the remaining small space between the hands of the assistant, who holds the surface of the liver for maximum immobilization and the abdominal wall. Or the first operating surgeons during the main stage of the operation often had to be held with one left hand to mobilize the liver, with one right hand to perform the main stage of the operation. All of the above stated technical complexity of the operation undoubtedly increases the risk of iatrogenic damage to internal organs during the operation. That was the reason for two patients with iatrogenic liver damage during the operation: there was a rupture of the liver capsule up to 3 cm in size, during mobilization from the hands of an assistant.

In three cases, in order to achieve a qualitative operation, it was forced to perform a transverse transection of the muscles of the anterior abdominal wall at the level of the navel to the right. The main stages of the surgical intervention included: after removal of the chitinous membrane and treatment of the residual cavities with anthelmintic drugs, the operation was completed by leaving the drainage tube in the cavity (in a semi-closed manner). By the 15-16th day, all drains after the control ultrasound examination of the residual cavity were removed on an outpatient basis. At the same time, the size and contents of the liver cavity were also taken into account. Drainage removed when the size is less than 30 mm without liquid content.

Of the 3 patients with purulent foci of the liver with complex anatomical locations of the II control group, in 2 patients the purulent focus was localized in the VII segment of the liver, in 1 patient the purulent focus was localized to the VIII segment of the liver. From the anamnesis, 2 patients underwent hepatic echinococectomy during the last three years. According to the protocol of the surgery, the localization of the purulent focus corresponded to the projection of the transferred echinococectomy. Ultrasound examination and MSCT of the liver revealed a cavitary formation in the liver up to 8 cm in size, intrahepatic locations. The walls of the cavity had a dense thick capsule resembling a fibrous capsule of the liver. The contents of the cavity had a cloudy thick consistency. Of the 3 patients with purulent foci with complex anatomical locations of the liver, 1 patient was diagnosed with an acute liver abscess, which, with ultrasound and MSCT, revealed a cavitary formation in the region VII-VIII segments of the subdiaphragmatic location of the liver. The cavity formation contained a cloudy, thick liquid, the walls of the cavity had a thin pyogenic capsule. Around the lesion of the liver tissue, there was a dense infiltrative area from 3 to 5 cm, the intensity of which gradually decreased from the purulent focus to the periphery.



Rice. 1. Subhepatic abscess.

Clinical and laboratory blood tests revealed a relatively high level of intoxication in patients with suppuration of the residual liver cavities and acute liver abscess than in patients with liver echinococcosis.

On the day of admission, all indicators of intoxication in patients with purulent foci of the liver were significantly deviated from the norm. In the process of preoperative preparation, including infusion-detoxification, antibacterial and general strengthening therapy, by the 3rd day of treatment, these indicators decreased relatively. Practically in all 3 patients with purulent cavitary foci of the VII-VIII segments of the liver, the operation was also performed with great technical difficulties. The cause of which is the same as during the operation of patients with echinococcosis of the liver with complex arrangements of the VII-VIII segments. The absence of a fibrous capsule and the presence of perifocal inflammation of the liver tissues with dense infiltration in patients with acute liver abscess made it difficult to perform an optimal operation. During the operation, it was practically impossible for these patients to fix the walls of the cavity formation to the holder. Since it was noted infiltrated, easily bleeding and resembling, as it were, boiled liver tissue around the cavity formation. All three operations with a purulent focus of the liver with complex anatomical locations were performed with great technical difficulties. The purpose of the operation was drainage, emptying the cavity from purulent contents and sanitation of the liver cavity. After drainage of the purulent focus using silicone drainage, the drainage tube is fixed with catgut sutures on the liver capsule and brought out through the contouropture and fixed to the skin with silk sutures.

In 1 patient with an acute liver abscess in the early postoperative period, bloody contents in the amount of up to 10 ml per day were excreted from the drainage tube. After intravenous administration of 100 ml of aminocaproic acid twice a day and etamsylate 1.0 twice intramuscularly, the removal of blood from the drainage was stopped.

All patients with purulent foci of the liver during the operation, when extracting pus from the cavity, an analysis was taken for a qualitative and quantitative analysis of bacteriological research. After determining the sensitivity of the microflora to antibiotics, antibiotic therapy was carried out taking into account the sensitivity of the microflora. Antibiotic therapy was carried out general and local application. For topical application through the drainage tubes, the antibiotic is introduced into the abscess cavity and with an exposure of 30 minutes. Empiric antibiotic therapy was carried out with the use of the drug Cefaperazone, since according to our own data, the microflora of our region, the majority of microflora, is sensitive to this drug [14]. Of the three patients with purulent foci of the liver, two of the purulent foci revealed St. Aureus. one was found to have Proteus. All of them were sensitive to cefaperazone. In the postoperative period, daily sanitation of the liver cavity was performed through the drainage tube, followed by administration of antibiotics, taking into account the sensitivity of the microflora.

Clinical and laboratory studies of the blood of the examined patients revealed a slight deviation in the level of indicators of intoxication with significant deviations in the blood eosinophil index Table. No.2

Dynamics of indicators of intoxication in patients of the control group with echinococcosis of the liver with complex anatomical locations in the region of the posterior coccyx segments VII-VIII (n=11)

№	Показателе	Норма	Сутки		
			1-день	3-день	7-день
1.	Температура тела	36,6	36,9+0,4	36,8+0,3	36,6+0,2
2.	Лейкоциты крови	4-9	9,8+0,6	9,5+0,4	8,2+0,2
3.	Эозинофил	1-5%	8,4% + 1,2	8,2% +1,1	4,6% + 0,6
4.	ЛИИ	1,2	1,5 + 0,2	1,1 + 0,1	1,0 + 0,2
5	МСМ	0,120	0,166 +0,017	0,138 + 0,014	0,108+0,011
6	СОЭ	1-10 мм/ч	18+1,8	14,8 + 1,2	11,2 + 1,1

As you can see in Table 2, on the day of admission, all indicators of intoxication, except for eosinophils, were slightly deviated from the norm. In the postoperative periods, all these indicators of blood intoxication returned to normal by the 7th day. The average duration of treatment for this category of patients was 11+1.4 days.

Analysis of postoperative complications revealed the following:

During surgical treatment of patients with cavity formations of the liver with complex subdiaphragmatic locations, suppuration of the surgical wound was observed in 27.2%, postoperative hernia in 18.1%, iatrogenic damage to the liver in 18.1%, bleeding from the liver cavity in the early postoperative period in 9% of patients were observed.

At the same time, the average duration of the operation lasted 150+9.4 minutes. Comparative analysis of postoperative complications, average bed of the day and duration of surgery in patients of groups I - II revealed the following interesting points.

Table No. The frequency of postoperative complications, the average bed of the day and the duration of the operation in patients of groups I - II

Группы	Общей число больн ых	Нагноение операционно й раны		Послеоперац ионный грыжи		Ятрогенная повреждения печены		Кровотече ния из полости		Сред. длит. опер	Средне й койка дня
		Абс.	%	Абс.	%	Абс.	%	Абс	%		
<b>I группа</b>	26	1	3,8	-	-	-	-	-	-	70+8,5	7+1,2
<b>II группа</b>	11	2	18,1	1	9,0	1	9,0	1	9,0	150+9,4	11+1,4

Of these complications in group I patients who had cavitory formations in I, II, III, IV segments of the liver without complex anatomical locations (mainly subcapsular, superficial location) of suppuration of the wound, only 3.8% of patients were observed. Postoperative complications such as postoperative hernia, iatrogenic damage to the liver, bleeding from the cavity in group I patients were not observed. In contrast, in patients of group II with complex anatomical locations of cavity formations of the liver, suppuration of the surgical wound was observed in 18.1%, postoperative hernia 9.0%, iatrogenic damage to the liver 9.0%, bleeding from the liver cavity was observed in 9.0% of patients. in the early postoperative period. If the average duration of the operation of group I averaged 70+8.5 minutes, in patients of the control group II the duration of the operation lasted 150+9.4 minutes.

Thus, our analysis of the results of the study of patients of group II revealed that the surgical treatment of patients with complex locations of cavitory formations of the liver has its own characteristics, which is expressed mainly in the technical difficulties of performing a surgical operation. Which, in turn, negatively affects the duration and outcome of surgical treatment, which is expressed in an increase in the duration of the operation up to 150 + 9.4 minutes, iatrogenic liver damage up to 9.0%, the development of postoperative complications in the form of suppuration of postoperative wounds up to 9.0%, the appearance of postoperative ventral hernia up to 9.0%, early postoperative bleeding from the liver cavities 9.0%.

## CONCLUSIONS

1. Performing a surgical operation by the traditional method, patients with complex anatomical locations of cavitory formations of the liver in the VII and VIII segments, has its own technical difficulties, which in turn affects the duration of the operation and contributes to the development of postoperative complications such as suppuration of the wound and postoperative hernia of the anterior abdominal wall, iatrogenic rupture of the liver. Surgical treatment of cavitory liver formations with complex anatomical location of the liver in the region of the posterior cascade of the diaphragm VII VIII segments requires new, more effective low-traumatic surgical tactics.



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