



## CONSERVATIVE SURGICAL TACTICS FOR HEPATIC ECHINOCOCCOSIS

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<p><b>Received:</b> February 8<sup>th</sup> 2022 <b>Accepted:</b> March 8<sup>th</sup> 2022 <b>Published:</b> April 26<sup>th</sup> 2022</p>	<p>Echinococcosis is a disease developing as a result of penetration into the human body and development in it of the larval stage of the tapeworm echinococcus. Analysis of literature data and current clinical practice indicates an increase in the incidence of hepatic echinococcosis, expansion of endemic regions and more frequent cases of infection in non-endemic areas. An increase in the number of complicated forms of the liver echinococcosis has been registered during the last 20 years, their frequency reaches 84,6%. Relapses are observed in 54% of cases. This situation is due to the deterioration of sanitary and epidemiological control and clinical examination in the endemic areas, increased migration of the population, which has led to the aggravation of the problem of diagnostics and surgical treatment of echinococcosis in the CIS countries.</p>

**Keywords:** Minilaparotomic Echinococcectomy, Laparoscopic Echinococcectomy, Liver Echinococcosis, Albendazole

### INTRODUCTION.

Currently, echinococcosis has a worldwide distribution and represents a serious public health problem in many countries of the world. At the end of the XX century and at the beginning of the XI century the scientists of the CIS achieved great success in diagnostics and treatment of echinococcosis. Representatives of various surgical schools, depending on the relation of the parasite and the host organ, give preference to a variety of surgical interventions, ranging from cyst abdominization to "radical" (resection, pericystectomy) operations. The dispute about the nature and extent of surgical interventions continues to this day. However, the use of the terms "radical, perfect echinococlectomy" is more correct for echinococcal cysts, not for echinococcosis. Moreover, the incidence of false recurrence of the disease depends not on the method of surgery, but on the primary multiple and combined lesion, which occurs most frequently when cysts are localized in the liver and other organs of the abdominal cavity. The remaining controversies in the views on treatment tactics (often polar points of view) concerning both primary and residual hepatic echinococcosis do not contribute to the improvement of treatment results of patients with hepatic echinococcosis. Quite high recurrence rate of the disease after nonradical liver surgeries makes us be cautious about the

popularization of minimally invasive techniques, including laparoscopic cystopericystectomies and puncture-drainage methods of treatment. Minimally invasive methods of treatment of hepatic echinococcosis demonstrate positive immediate and long-term results, as a rule, in specialized departments with sufficient experience in performing open radical operations.

Over the past decade, surgery has undergone significant changes in the principles of surgical treatment of many diseases, and endoscopic surgery technique has developed. It was endosurgery that allowed the most radical transition to minimally invasive interventions. With all the undeniable advantages of laparoscopic technique, it has certain drawbacks, which does not allow it to displace competing traditional methods in the course of hepatic echinococcectomy. Difficulties arising during evacuation of the parasitic cyst content, isolation of the abdominal cavity in order to observe aparasitism, liquidation of the residual cavity in the liver refer to disadvantages of purely laparoscopic technique. Combination of laparoscopic technique and mini-access surgery, preserving the advantages of both techniques, allows avoiding these disadvantages.

**The introduction of minimally invasive** methods of treatment and traditional surgical interventions



today cannot be imagined without the use of modern safe anthelmintic agents, as evidenced by the high rate of echinococcal recurrence.

Conservative and surgical treatment of echinococcosis complement each other and require strictly individual approach. It should be emphasized that almost all researchers note a significant decrease in the number of recurrences of the disease when albendazole is used in the postoperative period.

### **MATERIAL AND METHODS:**

We have analyzed the results of examination and treatment of 338 patients with hepatic echinococcosis admitted for the last 10 years to the Clinic of General Surgery of Samarkand Medical Institute. The patients' age varied from 5 to 83 years. Distribution of patients into age groups showed that 90.89% of patients were of working age.

A total of 485 liver cysts were detected. Segmental involvement of the liver looked as follows: II-III segments, 65 cysts; IV-V segments, 81 cysts; V-VI segments, 95 cysts; VI-VII segments, 109 cysts; and VII-VIII segments, 135 cysts. Thus, in the liver, cysts were most often located in segments VI-VIII of the liver ( 50.31%). Hepatic cysts ranged in size from 3 to 20 cm in diameter: cysts up to 5 cm were found in 92; cysts up to 10 cm - 196; cysts up to 15 cm - 165; cysts over 15 cm in diameter or giant cysts were found in 32 observations.

Complicated course of the disease in the liver was detected in 115 (23.71%) patients. Cystobiliary fistulas were found in 33 (28,69%) patients, in another 79 (68,70%) patients a cyst suppuration was observed, and in 3 (2,61%) patients a cyst burst into the abdominal cavity was registered. 338 patients were operated on for liver echinococcosis. The basic group consisted of 227 patients conventionally divided into 3 groups: the first - 38 (16,74%) patients operated on laparoscopically, the second - 102 (44,93%) patients operated on minilaparotomically, and the third - 87 (38,33%) patients operated on laparotomically. 111 patients constituted the control group which was currently eligible for minimally invasive surgical interventions.

Chemotherapy was administered for prophylactic and therapeutic purposes. 107 patients with liver echinococcosis and 21 patients with combined lung and liver echinococcosis received chemotherapy with albendazole 82 (64,07%) patients received one course each, and 42 (32,81%) patients with multiple liver cysts and 4 (3,12%) with cyst rupture into abdominal cavity received 3 courses each.

### **RESULTS AND DISCUSSION:**

Laparoscopic echinococectomy with adherence to parasitic principles was undertaken in 38 patients with solitary uncomplicated hydatid cysts of the liver. Localization and location of the cyst in the liver tissue are of great importance when planning and choosing the method of treatment. It is notoriously difficult to assess the feasibility of endovideosurgical intervention on the basis of conventional ultrasound (US) and computed tomography (CT) before surgery. An important stage of our tactics is laparoscopic revision of the abdominal cavity, after determining the exact localization and assessment of the cyst condition we undertook further tactics. All manipulations on evacuation of the contents and injection of antiparasitic solutions into the cyst cavity were performed by switching a two-way tap attached to the puncture needle. Antiparasitic treatment was performed with 100% glycerol. After puncture, evacuation of the contents, and antiparasitic treatment of the cyst, the chitinous membrane was removed. Endovideoscopy of the residual liver cavity was performed in all cases for revision of the residual cavity, complete removal of the cuticular sheath and detection of biliary fistulas. Liquidation of the residual cavity was the final stage of surgical intervention for hepatic echinococcosis. Abdominization of the residual cavity with omentopexy was used most often.

Echinococectomy from the liver was performed through minilaparotomy access in 102 patients. Single liver cysts up to 15 cm in diameter located in the II, III, IV, V, VI, VII segments of the liver were indications for such operation. At the same time the surgeries were completed by residual cavity capitonage.

Liver echinococectomy was performed through wide laparotomy accesses in 87 patients. In the main group of patients only upper midline laparotomy was used.

227 patients operated with hepatic echinococcosis underwent various options of echinococectomy. Five types of operations were used: cyst extirpation (pericystectomy), closed echinococectomy, semi-closed echinococectomy, open echinococectomy, omentoplasty according to Askerkhanov. In 39 (17,18%) patients with multiple hepatic echinococcosis 2-3 types of the mentioned surgeries were used simultaneously due to different characteristics of the cysts.

Closed echinococectomy consisting in complete liquidation of the residual cavity in the liver was performed in various variants. The indications for



closed echinococectomy were cysts without signs of inflammation with pliable walls of the fibrous capsule. This operation was performed in 117 (51.54%) patients.

Most often closed echinococectomy was performed by suture plasty. Capitonage liquidation of the fibrous cavity according to Delba is indicated for small and medium sized cysts and was performed in 34 (29,06%) cases. In this method, closure of the residual cavity was achieved by consecutive suturing of the fibrous capsule wall. Unfortunately, the method was not applicable in rigid walls of the fibrous capsule, which could not be brought together due to suturing, and in large cavities of the residual cavity.

Liquidation of a residual cavity by intussusception stitches according to Yu.S. Gilevich is indicated in patients with rigid fibrous capsule and location of echinococcal cysts near main vessels and bile ducts, and was carried out in 29 (24,80%) patients. Capitonage in 17 (14.52%) patients was performed according to our method (rationale proposal No. 1508).

A very effective and simple method of closing the residual cavity was omental filling on a feeding stem, which was performed in 37 (31.62%) patients. The pronounced reparative properties of the omentum contributed to the rapid obliteration of the residual cavity. Underdevelopment of the omentum, large cavities, multiple cysts, adhesions in the abdominal cavity were obstacles to this operation.

In case of hepatic echinococcosis complicated by cysts suppuration and cystobiliary fistulas, semi-closed echinococectomy was performed more often. This type of surgery was performed in 29 (12,77%) patients. The essence of the operation was in leaving drains in the sutured residual cavity of the liver. If necessary, in the postoperative period the drainage was connected to vacuum suction.

Open echinococectomy is an urgent method of surgery in case cysts are localized at the liver gate or the intrahepatic ducts can be damaged, which was performed in 26 (11,45%) patients. Large size of the cavity forced to use not only vertical drains, but also horizontal drainage through a contraperitoneum with the withdrawal of these drains to the lateral posterior wall, thus ensuring the outflow of the contentso.

Pericystectomy (cyst extirpation) is the removal of an echinococcal cyst together with the fibrous capsule; it is performed in cases of marginal cysts and their calcification. The operation consisted in complete dissection of the fibrous cap, and it was performed in 16 (7.06%) patients.

Complicated hepatic echinococcosis was performed in 47 (20,70%) patients. Semi-closed echinococectomy was performed in 34 (72,34%) patients with cyst suppuration. After echinococectomy and sanitation of the fibrous capsule the residual liver cavity was closed by suture plasty. Given the presence of purulent infection in the obliterated cavity a drainage tube was left, which was connected to passive vacuum suction in the postoperative period. Sanation was performed through the drainage with administration of an antiseptic solution (1% Dioxidine solution). Active drainage insertion in the postoperative period after semi-closed echinococectomy allowed to reduce significantly the number of postoperative complications.

13 (27,66%) patients were operated for hepatic echinococcosis complicated by a biliary perforation. Clinical picture of cysts perforation into biliary tract had 2 variants: severe form with clinical signs of mechanical jaundice and cholangitis and sterile form with little noticeable onset and scanty symptoms. The mild form of the disease was observed in 8 patients. In this group of patients clinical symptoms of cystobiliary fistula were scanty or absent at all. The attacks of pain in the right subcostal area passed quickly and in some cases mild subcutaneousness was noted. In some patients the cystobiliary fistula was detected only during the operation.

At severe form of the disease, which was observed in 4 patients, the clinical picture was characterized by severe symptoms and severity of the course. All patients had mechanical jaundice, which developed as a result of biliary tract obstruction by echinococcal cyst content. Joining infection was manifested by cholangitis clinic. The patients had a pronounced pain syndrome, signs of intoxication, body temperature increase up to 39.0. Tactics and volume of surgery in echinococcal cyst bursting into bile ducts depended on the degree of bile ducts affection.

In 7 patients with a sterile clinical picture of echinococcal cysts bursting into bile ducts the contents of the cysts were found stained with bile during the operation and after cystotomy. At revision of the fibrous capsule a cystobiliary fistula was revealed. The fistula was sutured with an atraumatic needle with non-absorbable thread and in all cases a semi-closed echinococectomy was performed.

In case of hepatic echinococcosis complicated by obstructive jaundice and cholangitis in 4 patients a semi-closed echinococectomy with suturing of the cystobiliary fistula mouth,



cholecystectomy, choledochotomy and bile ducts sanitation was carried out. The operation was completed by external drainage of the choledochus. In echinococcosis of the liver complicated by cysts bursting into the biliary tract, mechanical jaundice and cholangitis with signs of choledochal terminal section narrowing, in 3 patients the operation was completed by using a removable transhepatic drainage.

Since 1997 we started using albendazole chemotherapy in the dosage of 12 mg/kg per day for 30 days in all patients. One of the positive features of this drug is its low toxicity, which allows its use for long enough courses with much less risk of side effects. Mechanism of action of albendazole is associated with inhibition of polymerization of beta-tubulin, disruption of activity of cytoplasmic microtubule system of helminth cells, suppression of glucose utilization and reduction of ATP formation, thus leading to death of parasite.

107 patients with hepatic echinococcosis were also treated with albendazole chemotherapy. 72 (67,29%) patients received one course each, and 32 (29,91%) patients with multiple liver cysts and 3 (2,80%) with cyst rupture into the abdominal cavity received 3 courses each.

21 patients with combined lung and liver echinococcosis underwent 3 courses of chemotherapy. Albendazole was used for therapeutic purposes in 38 patients. These patients were conditionally divided into 3 categories:

- first - 7 patients with primary cysts.
- second - 9 patients with multiple forms of echinococcosis.
- the third category - 22 patients in whom an early relapse was detected.

The efficacy of albendazole treatment of hepatic hydatidosis echinococcosis ranged from 58.37% to 82.23%, relapses were observed in 17.77% of patients on the average.

### **CONCLUSIONS:**

Minimally invasive interventions for hepatic echinococcosis both laparoscopic and via minilaparotomy access are characterized by minimal traumatic effect. Echinococectomy through minilaparotomy access requires certain skills of the surgeon, the use of a small wound spreader and instruments with long jaws. The undoubted advantage of this operation is the possibility of visual control and bright light from the abdominal cavity. Technical simplicity of the operation in comparison

with purely laparoscopic echinococectomy allowed us to use this operation more widely.

At present, the indications for echinococectomy from a wide upper midline laparotomy access are cases of multiple echinococcosis, disease recurrence or previous laparotomies, complicated course of the disease, localization of cysts in hard-to-reach segments of the liver.

In the surgery of hepatic echinococcosis, organ-preserving surgeries are considered to be a priority. Closed echinococectomy is indicated in case of uncomplicated process. Semi-closed echinococectomy was performed in suppurative cysts. Pericystectomy was indicated in cases of marginal location of echinococcal cysts, their calcification. It is hardly possible to achieve effective and radical cure of patients without the use of anthelmintic drugs. Rational combination of invasive methods of treatment of echinococcosis in combination with chemotherapy will undoubtedly improve the treatment results of this category of patients.

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