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IMPROVING SURGICAL RESULTS OF ANTIPARASITIC TREATMENT OF RESIDUAL CAVITY OF ECHINOCOCCAL CYST IN THE LIVER

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Abstract
Echinococcosis is still a serious problem today. Cystic echinococcosis (CE) is an endemic helminthic disease caused by infection with metacestodes (larval stage) of the tapeworm Echinococcus granulosus. Echinococcosis is more common in Australia, North and East Africa, Central Asia and some Mediterranean countries. Analysis of the literature data has shown that the problem of echinococcosis is still very relevant, especially in endemic regions, and, unfortunately, one of the current problems of surgical treatment of liver echinococcosis is still the prevention of relapses of the disease. There are still both residualand recurrent forms of the disease, despite the fact that many methods of treatment of the residual cavity, methods of pre-and postoperative chemoprophylaxis with mebendazole derivatives have been developed. However, only strict adherence to the protocol of preserving operations, their implementation in specialized hospitals and mandatory antiparasitic therapy with albendazole will bring success to minimally invasive surgery for liver echinococcosis.

Keywords: Echinococcosis, experimental part,laser surgery, interventional radiology.

Introduction

Hippocrates in his writings wrote about "jecur aqua repletum" - a liver filled with water, and for the treatment of this disease (most likely referring to- echinococcosis) suggested burning the tissues of the abdominal wall with a red - hot iron to remove the fluid overflowing the liver. Only in 1801, when the sexually mature form *of Taenia echinococcus was isolated*, Rudolphi introduced the term "echinococcus". *E.. Granulosus* causes accidental infection of humans; adult tapeworms are found in the intestines of canids (dog, wolf); the larval cyst stage is present in the internal organs of herbivores (sheep, cattle, horses, deer, pigs, camels). By far, surgery is the most commonly used treatment for CE. It is aimed at removing parasites and the germ layer from the cyst cavity. The conservative method involves sterilizing and draining the cyst contents, including the cyst shell, in addition to removing part of the cyst. With the radical method, the cyst is completely removed, with or without resection of the liver tissue. Surgeons must make a choice between radical and conservative surgery based on the characteristics of the patient and the cyst.

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The conservative method is faster and easier to perform than radical surgery with minimal intraoperative blood loss.

Modern aspects of the development of domestic healthcare include many measures aimed at improving the results of treatment of patients with liver echinococcosis by introducing modern principles of prevention, conservative and surgical treatment. The implementation of these tasks, including by improving the prevention of infectious and inflammatory complications and relapses in the treatment of liver echinococcosis using new technologies, is one of the most relevant areas of abdominal surgery and medicine in general, due to the high clinical and social significance of this serious problem.

Purpose of the Study

To improve theresults of surgical treatment of liver echinococcosis by combined intraoperative antiparasitic treatment of the residual cavity.

Material and Methods

The study included 99 patients operated on for primary and recurrent liver echinococcosis complicated by suppuration, treated in 2015-2023 in двутwo medical institutions of the Republic of Uzbekistan. All patients were divided into two groups. The comparison group consisted of 57 patients who underwent standard echinococcectomy, treatment of the residual cavity with a 3% solution of hydrogen peroxide, alcohol and iodine, while verifying the bile fistulas, the latter were sutured, and then drainage of the residual cavity and abdominal cavity was performed. The main group included 42 patients in whom, after the standard stage of echinococcectomy, the residual cavity was treated according to the proposed method, after which the fibrous capsule was excised as much as possible (within healthy liver tissue) and the residual and abdominal cavities were drained separately or with a wide abdominal fibrosis with a single drainage tube.

The data in Table 1 show a significant difference between the groups, so if in the comparison group almost in half of cases pericystectomy was not performed, then in the main group this tactic was applied only in 7 (16.7%) cases.

Table 1 Distribution of patients by type of operation

Operation	Comparison group		Main group	
	Abs.	%	Abs.	%
Echinococcectomy, separate drainage of the residual and abdominal cavity	28	49.1%	7	16.7%
Echinococcectomy, pericystectomy, separate drainage of the residual and abdominal cavity	23	40.4%	24	57.1%
Echinococcectomy, pericystectomy, drainage of the residual and abdominal cavity with one drainage	6	10.5%	11	26.2%
Total	57	100.0%	42	100.0%
Significance of differences	χ^2=12.097; df=2; p=0,003			

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There were no significant differences in gender in the groups, women slightly predominated: in the main group – 57.9%, in the comparison group-60.2%. In both samples, the age category from 20 to 44 years prevailed, although the main group was slightly dominated by elderly patients over 60 years of age: 7.1% versus 3.5% in the comparison group (Table 2).

Table 2 Gender and age of patients with complicated liver echinococcosis

Age	Male		Female		Total	
	abs.	%	abs.	%	abs.	%
Comparison group						
Under 19 years	of age 6	10,5%	9	15,8%	15	26,3%
20-44 of the year	13	22,8%	16	28,1%	29	50,9%
45-59 years	4	7,0%	7	12,3%	11	19,3%
60-74 years	1	1.8%	1	1.8%	2	3.5%
Total	24	42.1%	33	57.9%	57	100.0%
Main group						
Before 19 years	old 1	0,5%	4	0,0%	5	11,9%
20-44 of the year	10	11,9%	14	15,9%	24	57,1%
45-59 years	3	13,9%	7	22,9%	10	23,8%
60-74 years	0	9,5%	3	15,4%	3	7,1%
Total	14	39,8%	28	60,2%	42	100,0%

The groups were also representative by эechopathogenetic trait (Table 3). Primary solitary echinococcosis was most common: in the comparison group – 27(47.4%) and 18(42.9%) in the main group. The lowest number of recurrent multiple echinococcosis cases was observed: in the comparison group – 5(8.8%) and 4(9.5%) in the main group.

Table 2.4 Distribution of patients by etiopathogenetic sign (primary/recurrent) and number of cysts in the liver

Classification attribute	Comparison group		Main group	
	Abs.	%	Abs.	%
Primary solitary echinococcosis	27	47.4%	18	42.9%
Recurrent solitary echinococcosis	14	24.6%	11	26.2%
Primary multiple echinococcosis	11	19.3%	9	21.4%
Recurrent multiple echinococcosis	5	8.8%	4	9.5%
Total	57	100.0%	42	100.0%

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The study of the clinical effectiveness of photodynamic therapy in the surgery of liver echinococcosis complicated by suppuration was carried out using the developed method of antiparasitic and anti-inflammatory treatment of the residual cavity of an echinococcal cyst in the liver complicated by suppuration, based on the application of the photosensitization effect. The proposed method of treatment of the residual cavity after echinococcatomy from the liver is implemented in clinical practice.

Research Results

A patient with liver echinococcosis is given an upper-median laparotomy, after revision, the area of the cavity formation is covered with gauze swabs, after which the echinococcal cyst is punctured, if there is a thick content and it is impossible to remove it through a puncture needle, the fibrous capsule is opened and the chitinous membrane is removed, and if all daughter and grandchild cysts are present, in compliance with the recommended principles of aparasitarity. After removing all the contents, the residual cavity is treated with a 3% H2O2 solution(hydrogen peroxide), after which the bile fistulas are revised and, if detected, sutured. Further, the entire internal surface of the residual cavity (fibrous capsule) is irradiated with the infrared spectrum of a surgical laser "LAKHTA-MILON" (Russia) with a wavelength of 910 nm, power of 20 W in a pulsed periodic mode, while the laser spot area is from 1 to 2 cm^2, respectively, the entire surface of the capsule is irradiated for 2-3 seconds on the field (laser spot area), then the residual cyst cavity is treated with a solution of FarGALS in a dilution of 1: 3 for 3 minutes (with a wide section of the fibrous capsule, a gauze swab soaked in FarGALS solution can be used), after which the remaining solution is removed by suction and the residual cavity is irradiated with a laser "LAKHTA-MILON", but already in green spectrum with a wavelength of 520 nm, a power of 0.5-1.0 MW in continuous mode with a spot area of 1 cm^2 for 3 seconds per field (for each 1 cm^2 of the fibrous capsule for 3 seconds), then the residual cavity is drained with a tube removed through the skin. The surgical wound is sutured in layers.

To complete this method, you must:

- antiseptic preparation "FarGALS" in its pure form, antiseptic preparation "FarGALS", diluted with water for injection in a ratio of 1: 3.
- Surgical laser "LAKHTA-MILON" - a laser device for resection and coagulation.

Both groups were representative of the intraoperative characteristics of parasitic cysts, dominated by cysts with a capsule thickness of more than 5 mm, with a dense inelastic capsule, and curd-like contents inside. All cysts had live daughter and grandchild cysts.

Intraoperatively, the presence of biliary fistulas was necessarily determined, but in both groups, fistulas were identified and sutured only in 70.8% in the comparison group and 73.7% in the main group. Most of the cysts were without biliary fistulas: in the comparison group-57.9%, in the main group-54.8%

For a more differentiated assessment, we distributed patients according to the significance of postoperative complications according to the Clavien-Dindo classification Clavien-Dindo (Figure 1). It turned out that in the main group there were no complications that required additional invasive measures, there were 3 (7.1%) complications that required prolonged drainage, and 3 (7.1%) minor complications. The situation was quite different in the comparison group: 2 (3.5%)

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complications that required additional invasive measures, 14 (24.6%) complications that required prolonged drainage, and only 6 (10.5%) minor complications (χ^2=8.044; df=3; p=0.046).

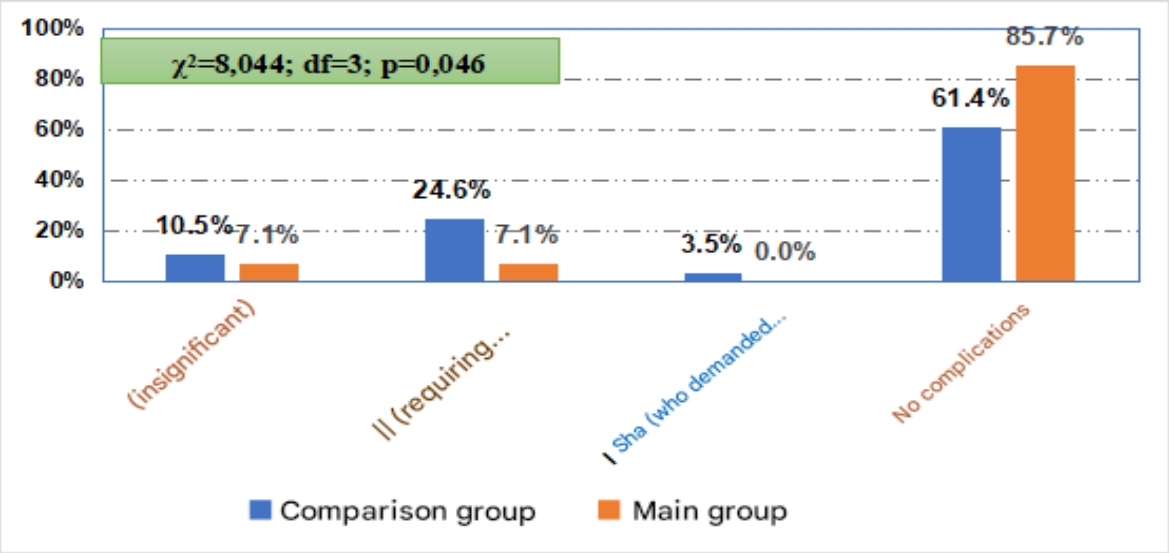

Figure 1. Distribution of patients by significance of postoperative complications according to the Clavien-Dindo classificationClavien-Dindo (Dindo D., 2004)

Due to the reduction of complications in the main group, the duration of the postoperative hospital stage in 40 (95.2%) cases was no more than 10 days.

During 2 months of follow-up after discharge, 5 (8.8%) patients from the comparison group developed 7 complications (Table 4). In the main group, only 2 (4.8%) patients developed complications during the same period (χ^2=7.046; df=1; p=0.008).

See Table 4. Frequency of postoperative complications after discharge during 2 months of follow-up

Complication	Comparison group		Main group	
	Abs.	%	Abs.	%
VFA subhepatic or subdiaphragmal	2	3.5%	1	2.4%
Fluid accumulation in the residual cavity	3	5.3%	1	2.4%
Bile discharge	0	0.0%	0	0.0%
Suppuration of subcutaneous wounds	1	1.8%	0	0.0%
Bronchopulmonary	0	0.0%	0	0.0%
Reactive pleurisy	2	3.5%	1	2.4%
of patients with complications	5	8.8%	2	4.8%
Significance of differences	χ^2=7.046; df=1; p=0.008			

Note: all cases of bile discharge developed in the nearest future

Conclusion

Thus, the proposed method for treating the residual cavity after surgery for liver echinococcosis complicated by suppuration made it possible to reduce the duration of the postoperative hospital

stage from 9.1±1.4 to 7.7±1.3 days, the duration of drainage treatment from 16.9±12.5 to 9.3±6.3 days, and the overall incidence of complications during two months of follow-up from 47.4% (in 27 from 57 patients in the comparison group) to 19.0% (in 8 out of 42 patients in the main group; including grade II severity from 24.6% to 7.1% and grade III (with the need for repeated minimally invasive interventions) from 12.3% to 2.4%, which generally increased the proportion of good results from 63.2 % (in 36 patients in the comparison group) to 90.5% (in 38 patients in the main group) with a decrease in the frequency of unsatisfactory results from 12.3% (7) to 2.4% (1).

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