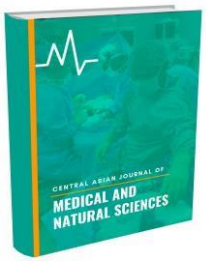

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Article

Comparative Results of The Long-Term Period After Echinococcectomy from the Liver

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Abstract: Over the past decades, human echinococcosis has remained one of the most studied parasitic diseases. All patients were divided into two groups: the first (main) group included 202 patients for whom the treatment of the residual cavity after echinococcectomy from the liver was performed using an improved technique, the second group included 240 patients for whom the treatment of the residual cavity was performed by traditional methods. The comparative analysis was carried out taking into account the representative division between the main group of patients who underwent various types of residual cavity elimination, taking into account their pretreatment with an antiseptic in combination with ultrasonic cavitation, and the comparison group, whose patients underwent the same type of interventions with pretreatment of the residual cavity by traditional methods. In a comparative aspect, during follow-up up to three years after echinococcectomy from the liver, the proposed tactical aspects of residual cavity treatment reduced the need for long-term drainage from 11.3% to 3.5%.

Keywords: liver echinococcosis, method of echinococcectomy, ultrasonic cavitation, residual cavity

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1. Introduction

Over the past decades, human echinococcosis has remained one of the most studied parasitic diseases. This problem is especially thoroughly investigated in the countries of the post-Soviet space, where there are endemic foci of echinococcosis, namely: in the countries of the Central Asian region, the Russian Federation.

To date, human echinococcosis has become the most common parasitic disease worldwide. According to WHO, currently more than 1 million people are affected by echinococcosis in the world [1].

This situation is due to a number of key points, which, first of all, include the increased migration of the population from the endemic regions of the Middle East and Central Asia to the countries of Western Europe and the United States, which was associated with the outbreak of military conflicts in these regions. Secondly, in recent years, there has been a deterioration in the epidemiological situation of this disease in all countries of the Central Asian region, which is mainly due to the weakening, and in some cases the lack of sanitary and veterinary control over cattle, planned deworming of dogs, preventive measures and control of the parasite [2].

To date, and despite the successes achieved in surgical parasitology, the treatment of liver echinococcosis presents certain difficulties. This is confirmed by a large number (12-50%) of postoperative infectious and inflammatory complications and a significant frequency (3.3-54%) of recurrente of the disease [3].

Surgical treatment of liver echinococcosis is the only radical method currently available [4, 5, 6, 7]. Clinical practice and analysis of literature data show that the surgical component in the prevention of recurrente of the disease is more effective than chemotherapy [8, 9, 10, 11].

However, a meager amount of literature has been devoted to the prevention of recurrence of echinococcosis in the postoperative period and, in general, to the prevention of infection by this pathology in a global, organizational direction. This explains the very disappointing situation regarding the prevalence of echinococcosis in the Republic.

2. Materials and Methods

The study was based on the results of diagnosis and treatment of 442 patients with liver echinococcosis at the Department of General Surgery of Urgench branch of Tashkent Medical Academy for the period from 2010 to 2023. The study was conducted in two stages. A program was drawn up for each stage, which included the content and scope of work, the indicators studied, and the expected results.

All patients were divided into two groups: the first (main) group included 202 patients for whom the treatment of the residual cavity after echinococcectomy from the liver was performed using an improved technique, the second group included 240 patients for whom the treatment of the residual cavity was performed by traditional methods. Table 1 shows the distribution of patients by group and type of residual cavity treatment.

Table 1. Distribution of patients by group and type of surgery

Methodology	Uncomplicated echinococcosis		Complicated echinococcosis		Total	
	Abs.	%	Abs.	%	Abs.	%
The main group						
Treatment of the residual cavity with Decasan	170	100,0%	32	100,0%	202	100,0%
Ultrasonic cavitation of the fibrous capsule	121	71,2%	29	90,6%	150	74,3%
Suturing (complete or partial) of the residual cavity	140	82,4%	23	71,9%	163	80,7%
Comparison Group						
Traditional treatment of the residual cavity	206	100,0%	34	100,0%	240	100,0%
Suturing (complete or partial) of the residual cavity	129	62,6%	8	23,5%	137	57,1%

The methods of surgical treatment depended on their localization, prevalence, the presence of certain complications, and the severity of the patient's condition. Conventional methods of echinococcectomy were used by pericystectomy and treatment of the residual cavity by various methods of suturing, such as capitation, suturing with pouch sutures along the Delba, and with marginal arrangements, ideal echinococcectomy without opening the cavity. All surgical interventions were performed after preoperative preparation, the volume and duration of which were individual depending on the severity of the condition and complications. Organ-preserving operations (closed and semi-closed echinococcectomies) were performed mainly (82.3%).

A retrospective analysis of medical records revealed that a 5% iodine solution and 96% ethyl alcohol were used to treat the residual cavity. Subsequently, we used the following scheme for the treatment of the residual cavity: treatment with 5% iodine solution, 70% ethyl alcohol, 0.02% Decasan solution. In addition, with medium and large sizes of the residual cavity and intrahepatic location, ultrasonic cavitation with the SIGMA-01 apparatus, 1990 (France) with a radiation frequency of 26.4-26.6 Khz was used.

Statistical processing of the material was carried out on a Pentium IV computer using MS Office Excel for Windows XP application programs. The arithmetic mean (M), its error (m), the mean square deviation (σ) were calculated, the reliability of the differences was established using the Student-Fisher criteria (t).

3. Results and Discussion

The comparative analysis was carried out taking into account the representative division between the main group of patients who underwent various types of residual cavity elimination, taking into account their pretreatment with an antiseptic in combination with ultrasonic cavitation, and the comparison group, whose patients underwent the same type of interventions with pretreatment of the residual cavity by traditional methods.

The nature of the operations performed in the compared groups included:

- complete elimination of residual cavities;
- partial elimination of residual cavities;
- drainage of residual cavities;
- abdominization of residual cavities.

The comparative analysis was carried out taking into account the study of the results, the long-term period after various types of echinococcectomy.

The main criteria for assessing the long-term period were: timing of drainage removal, complications in the long-term period, recurrence of the disease. Table 2 shows data on the timing of drainage removal after surgery.

Table 2. Timing of drainage removal after echinococcectomy from the liver

Timing after surgery	Main group		Comparison Group	
	Abs.	%	Abs.	%
In the nearest period (up to 10 days)	140	69,3%	102	42,5%
11-20 days	45	22,3%	66	27,5%
21-30 days	10	5,0%	45	18,8%
1-2 months	5	2,5%	21	8,8%
3 months or more	2	1,0%	6	2,5%
Total	202	100,0%	240	100,0%
	Criterion $\chi 2=41,096$; df=4; $p<0.001$			

Up to 10 days, drains were removed in 140 (69.3%) patients from the main group and 102 (42.5%) patients from the comparison group; on days 11-20 – 45 (22.3%) patients from the main group and 66 (27.5%) patients from the comparison group; on days 21-30 – 10 (5.0%) patients from the main group and 45 (18.8%) patients from the comparison group; after 1-2 months – 5 (2.5%) patients from the main group and 21 (8.8%) patients from the

comparison group; after 3 months or more – 2 (1.0%) patients from the main group and 6 (2.5%) patients from the comparison group. The reliability of the difference in the compared groups was determined within the range of $\chi 2=41,096$; df=4; $p<0.001$.

The structure and frequency of complications in the long-term postoperative period were traced for up to 3 years and presented in Table 3. In total, a complicated course of the long-term period was observed in 9 (7.0%) patients from the main group and in 22 (15.0%) patients from the comparison group.

Table 3. The structure and frequency of complications in the long-term postoperative period for up to 3 years

Complication	Main group (n=202)		Comparison Group (n=240)	
	abs.	%	abs.	%
Accumulation of liquid in the residual cavity	3	2,3%	8	5,4%
Suppuration of the residual cavity	2	1,6%	5	3,4%
Abscess in the abdominal cavity	1	0,8%	2	1,4%
Recurrente	3	2,3%	7	4,8%
Patients with complications	9	7,0%	22	15,0%

As can be seen from the table, fluid accumulation in the residual cavity was observed in 3 (2.3%) patients from the main group and in 8 (5.4%) patients from the comparison group; suppuration of the residual cavity – in 2 (1.6%) patients from the main group and in 5 (3.4%) patients from the comparison group; abscess abdominal cavity – in 1 (0.8%) patient from the main group and in 2 (1.4%) patients from the comparison group; reduction of liver echinococcosis in 3 (2.3%) patients from the main group and in 7 (4.8%) patients from the comparison group. Table 4 shows the methods of treating complications in the long-term period after surgery.

Thus, conservative treatment was effective in 7 (5.4%) patients from the main group and in 11 (7.5%) patients from the comparison group; repeated surgery for suppuration of the residual cavity and abdominal abscess was performed only in 3 (2.0%) and 1 (0.7%) patients, respectively, from the comparison group; puncture drainage of the residual cavity was performed in 2 (1.6%) patients from the main group and 4 (2.7%) patients from the comparison group. Repeated surgical intervention in case of recurrence of liver echinococcosis was performed in 1 (0.8%) patient from the main group and 3 (2.0%) patients from the comparison group.

Table 4. Treatment of complications and re-operation in the long-term postoperative period

Elimination of complications	Main group (n=202)		Comparison Group (n=240)	
	abs.	%	abs.	%
Allowed conservatively	7	5,4%	11	7,5%
Repeated surgery for suppuration of the residual cavity	0	0,0%	3	2,0%
Repeated surgery for an abscess in the abdominal cavity	0	0,0%	1	0,7%
Puncture drainage of the residual cavity	2	1,6%	4	2,7%
Repeated surgery for recurrente	1	0,8%	3	2,0%
Total re-operations	3	2,3%	11	7,5%

A more vivid picture of the long-term period can be traced by the summary results of surgical treatment of liver echinococcosis for up to 3 years of follow-up, which is shown in the diagram Figure 1.

As can be seen from the diagram, an uncomplicated course of the long-term period after surgery was observed in 188 (93.1%) patients from the main group and in 192 (80.0%) patients from the comparison group. The reliability of the difference in the compared groups was determined within the range of $\chi 2=16.708$; df=4; p=0.003.

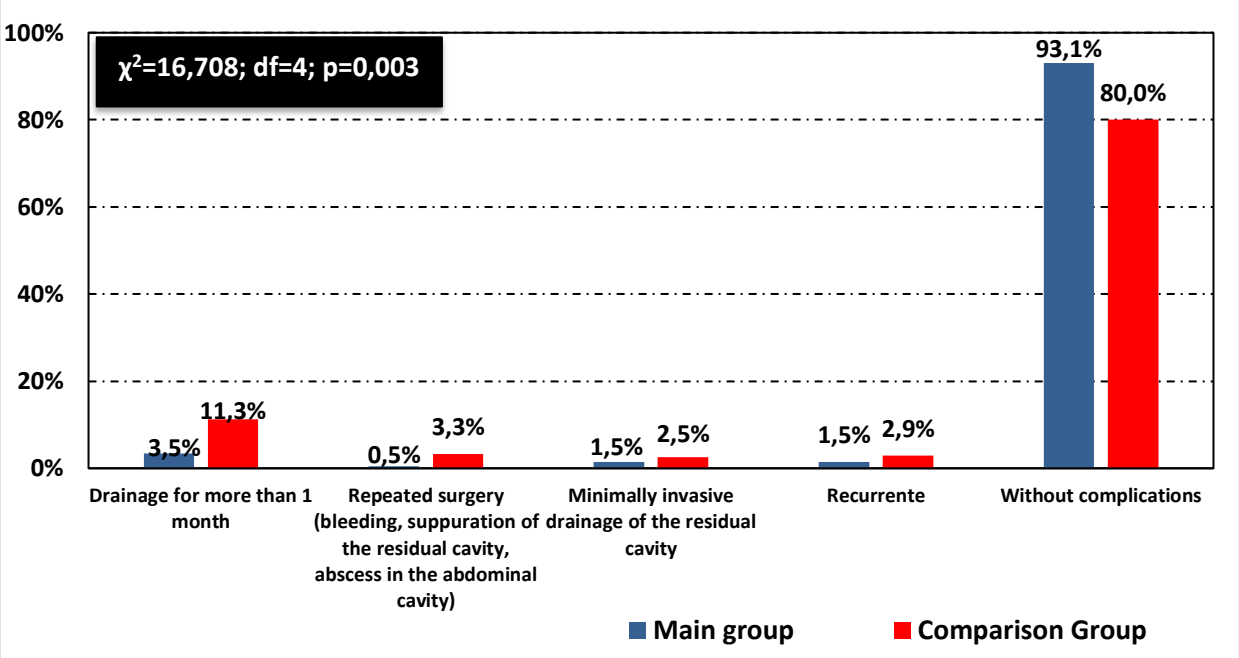

Figure 1. Summary results of surgical treatment of liver echinococcosis for up to 3 years of follow-up

In this section, taking into account the fact that the course of the long-term period directly depends on this, we present some tactical aspects and results of surgical treatment of liver echinococcosis complicated by cystobiliary fistula and (or) suppuration (Figure 2).

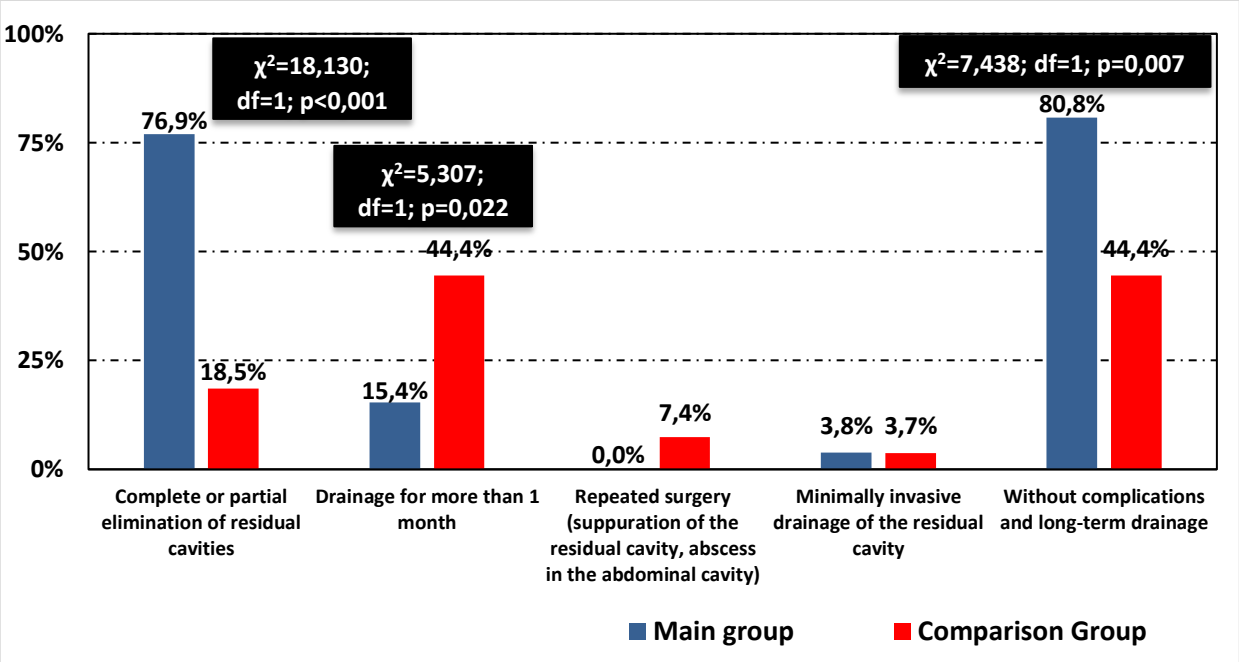

Figure 2. Some tactical aspects and results of surgical treatment of liver echinococcosis complicated by cystobiliary fistula and (or) suppuration

As can be seen in the diagram, complete or partial elimination of the residual cavity in the presence of this complication was performed in 20 (76.9%) patients from the main group and 5 (18.5%) patients from the comparison group ($\chi 2$=18.130; df=1; p<0.001); drainage was observed for more than 1 month in 4 (15.4%) patients from the main group and in 12 (44.4%) patients from the comparison group ($\chi 2$=5,307; df=1; p=0.022); repeated surgery for a purulent complication was performed only in 2 (7.4%) patients from the comparison group; minimally invasive drainage of the residual cavity was performed in 1 (3.8%) patient from the main group and 1 (3.7%) patient from the comparison group. Without complications and long-term drainage was observed in 21 (80.8%) patients from the main group and in 12 (44.4%) patients from the comparison group.

Thus, in a comparative aspect, in terms of follow-up up to three years after echinococcectomy from the liver, the proposed tactical aspects of treatment of the residual cavity made it possible to reduce the need for long-term drainage from 11.3% (in 27 out of 240 patients in the comparison group) to 3.5% (in 7 out of 202 patients in the main group), reduce the frequency of repeated operations (from 3.3% in the comparison group to 0.5% in the main group) and minimally invasive interventions for complications (from 2.5% to 1.5%) and generally increase the proportion of uncomplicated course of the postoperative period from 80.0% (192 patients in the comparison group) to 93.1% (188 patients in the main group) ($\chi 2$=16.708; df=4; p=0.003).

4. Conclusion

In a comparative aspect, during follow-up up to three years after echinococcectomy from the liver, the proposed tactical aspects of residual cavity treatment reduced the need for long-term drainage from 11.3% to 3.5%, reduced the frequency of repeated operations (from 3.3% in the comparison group to 0.5% in the main group) and minimally invasive interventions for complications (from 2.5% to 1.5%) and generally increase the proportion of uncomplicated course of the postoperative period from 80.0% to 93.1% ($\chi 2$=16.708; df=4; p=0.003).

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