RESULTS OF SURGICAL TREATMENT OF RECURRENT PULMONARY ECHINOCOCCOSIS DEPENDING ON MORPHOLOGICAL MODIFICATIONS

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Abstract.

Relevance. Along with the increase in the number of new cases of the disease, there is a large percentage of relapses of echinococcosis, the frequency of which, according to different authors, varies widely from 3.3 to 54%, which is due to the existing terminological confusion.

Material and research methods. Between 2005 and 2019 53 patients with recurrent pulmonary echinococcosis were operated on in the surgical department of SamMI clinic number 1.

Research results. Immediate complications after surgery were observed in 6 (11.3%) patients. Postoperative mortality was noted in 1 (1.9%) case. The cause of death was acute cardiovascular failure.

Conclusion. Analysis of the morphological characteristics of echinococcal cysts of the lungs showed that recurrent echinococcosis most often occurred with echinococcus veterinorum (50.9%) echinococcus hominis (37.7%) and with echinococcus acephalocystis no relapses of the disease were observed, and if they did occur (6 – 11, 3%) we associate this with reinvasion of the parasite.

Keywords:pulmonary echinococcosis, morphological modifications, surgical treatment.

Relevance. Human echinococcosis continues to be a serious parasitic disease. According to the WHO and a number of other sources, there is widespread prevalence and a significant increase in incidence among the population [3, 7].

Along with the increase in the number of new cases of the disease, there is a large percentage of relapses of echinococcosis, the frequency of which, according to different authors, varies widely from 3.3 to 54%, which is due to the existing terminological confusion [1, 4, 5, 6].

The purpose of the study : to search for ways to optimize diagnostic and therapeutic measures in patients with recurrent pulmonary echinococcosis, taking into account the morphological forms of hydatid cysts.

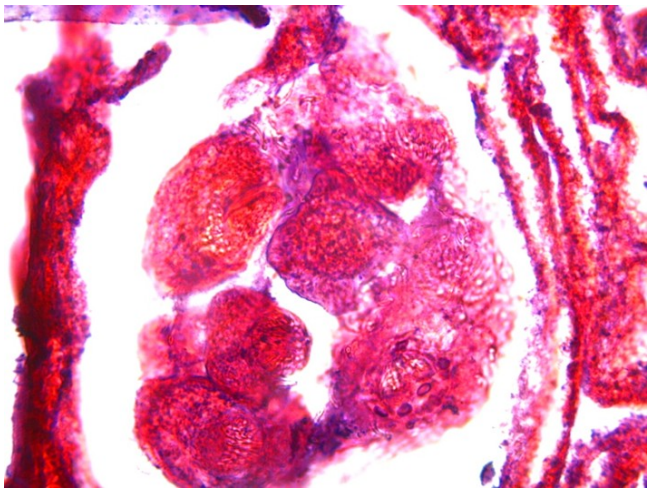
Material and research methods. Between 2005 and 2019odes53 patients with recurrent pulmonary echinococcosis were operated on in the surgical department of SamMI clinic 1. Echinococcosis of the right lung was detected in 29 patients, of the left lung in 17 patients. In 76% of cases, the cysts were located in the lower lobe. Combined echinococcosis of both lungs was observed in 7 patients; the largest number of hydatid cysts were also located in the lower lobe of both lungs.In case of recurrent pulmonary echinococcosis, solitary cysts were detected only in 24% of cases, mostly patients with multiple and combined echinococcosis predominated in 76% of cases (Table 1).

Table 1.distribution of patients by location of echinococcal cysts

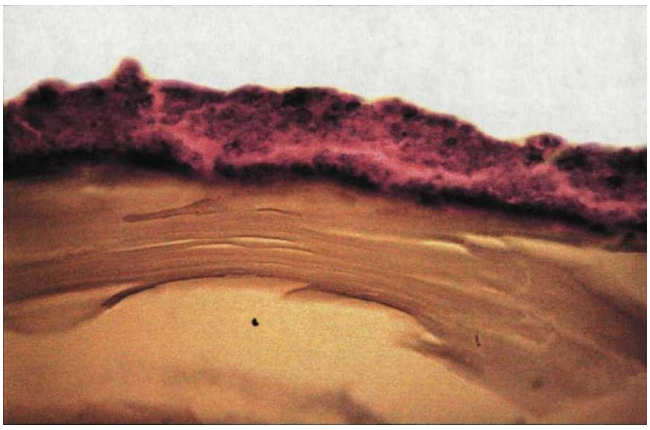
Character and localization of cysts		**Number of patients**	
		Abs.	%
Solitary echinococcosis	Right lung	6	11.3
	Left lung	7	13.2
Multiple echinococcosis	Right lung	23	43.4
	Left lung	10	18.9
Combined echinococcosis		7	13.2
Total		53	100

Depending on the size of the cyst, patients were distributed as follows: small cysts were detected in 6 patients, medium cysts in 24 patients, large cysts in 17 patients, and in 6 patients the cysts were gigantic in size over 20 cm. Complicated cysts were observed in 15 patients, that is, in 28% of cases. Among

them, cyst suppuration occurred in 7 patients, cyst rupture into the bronchus was observed in 4 patients, and in 3 patients the cyst ruptured into the pleural cavity. In 1 case there was profuse hemoptysis. The studies were carried out during the preoperative preparation period and over time until the parameters normalized in the postoperative period. Among the instrumental research methods, radiography, computed tomography and ultrasound were used according to indications. We analyzed the morphological modifications of echinococcal lung damage. Modification of echinococcus hominis (Fig. 1) was noted in 20 (37.7%) patients,echinococcus veterinorum(Fig. 2)was noted in 27 (50.9%) patients and echinococcus acephalocystis was noted in 6 (11.3%) observations.



Rice. 1. The structure of an echinococcal cyst modified by echinococcus hominis. Scolex of echinococcus in the thickness of the fibrous capsule (hematoxylin-eosin staining, magnification x 400)

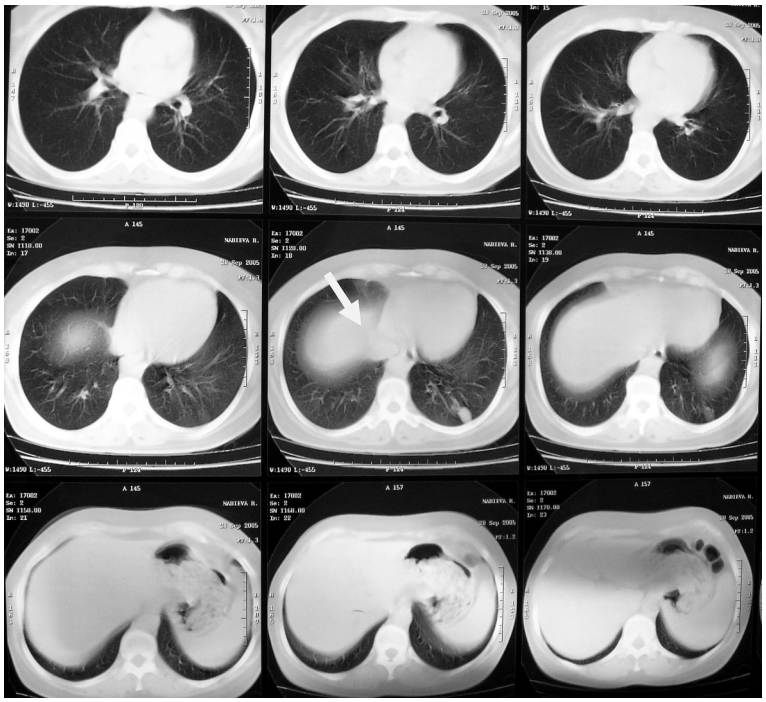


Rice. 2. Structure of an echinococcal cyst modified by echinococcus veterinorum (hematoxylin-eosin staining, magnification x 200)

Plain radiography of the chest does not have specific signs characteristic of the modificationechinococcus hominis. The nature of the morphological form was finally judged intraoperatively.The modification of echinococcus hominis is distinguished by the fact that inside the cyst, in addition to the hydatid fluid, brood capsules with protoscolexes, there are daughter and sometimes grandchild

bladders. Maternal cysts macroscopically have a matte, rough surface and are colored milky white or whitish-yellow, as shown in the slide.With this form, there is a migration of scolex beyond the chitinous shell into the thickness, or even beyond the fibrous capsule, and exogenous budding occurs during the growth of the echinococcal cyst.It was with this modification that relapses of the disease were observed on the mnature of pre-existing cysts.

Preoperative diagnosis of modification of echinococcus veterinorum is possible using computed tomography of the chest. In this case, a specific feature is “hydatid sand” at the bottom of the cyst (Fig. 3).



Rice. 3. Computed tomography of the chest “hydatid sand” with hydatid cyst modification of echinococcus veterinorum

In the echinococcus veterinorum form of the disease, only brood capsules and echinococcal fluid are present inside the laurocysts. The formation of daughter bubbles does not occur. Echinococcus veterinorum is perhaps the most aggressive form of the parasite, which is due to the high pressure of the hydatid fluid containing a large number of viable scolex, which, at the slightest violation of the integrity of the membrane, enter the pleural cavity, causing massive

damage to the internal organs by echnococcosis. According to our data, this form predominated in the greatest number, in 51% of cases.

Laurocysts of the third modification, echinococcus acephalocystis (Fig. 4), were noted in 6 observations. These types of cysts are characterized by the absence of brood capsules and protoscolexes and are more common in animals than in humans.Preoperative diagnosis of this modification of cysts is very difficult. The X-ray and echographic characteristics of such cysts are very similar to non-parasitic lung cysts.Histological examination of the germinal membrane showed that its entire surface undergoes dystrophic changes, and brood capsules are absent. Therefore, these cysts are not capable of producing germinal elements.

Rice. 4. The structure of an hydatid cyst modified by Echinococcus acephalocystis. (hemotoxylin-eosin stain, magnification x 200).

Research results.53 patients with recurrent pulmonary echinococcosis (100%) underwent surgical intervention. A complicated course of the disease was observed in 17 patients (32.1%).

The timing of surgical interventions was determined by the nature of organ damage by the parasitic process, the presence of complications, how long ago they developed, and concomitant pathology. Since the majority of patients

with recurrent echinococcosis were admitted to the hospital in severe and moderate condition, with already developed complications from the cysts, which required preliminary conservative treatment, surgical interventions were mainly delayed and planned.

In order to prevent intraoperative contamination, the pleural cavity was limited with gauze swabs soaked in 100%glycerin solution. Next, puncture of the cyst was performed, evacuation of its contents, cystotomy and removal of the chitinous membrane with daughter and grandchild blisters. For puncture, a thick needle was used, the end of which was connected to a syringe or to an electric suction device.A 100% glycerin solution was used to treat the residual cavity. With regard to the elimination of the residual cavity, the issue was resolved depending on the localization of the process, the size of the residual cavity, the presence of suppurative changes in the thickness of the fibrous capsule and surrounding tissues.

Rice. 5. Echinococcal cyst of the VIII segment of the right lung. Removal of the chitinous membrane from the lumen of the cyst. The pleural cavity is limited by gauze swabs soaked in 100%glycerin solution

Immediate complications after surgery were observed in 6 (11.3%) patients. Postoperative mortality was noted in 1 (1.9%) case. The cause of death was acute cardiovascular failure. Postoperative complications worsened the

general condition of the patients and prolonged the duration of their treatment and rehabilitation (Table 2).

Table 2. Results of surgical treatment in the early postoperative period

Nature of complications	Number of complications	
	abs.	%
Cardiopulmonary failure	1 (fatal)	1.9
Wound suppuration and pleural empyema	1	1.9
Pneumonia and limited exudative pleurisy	2	3.8
Encapsulated pleurisy	2	3.8
Total	**6**	**11.3**

Conclusions:

There are 3 morphological modifications of pulmonary echinococcosis: echinococcus veterinorum, echinococcus hominis and echinococcus acephalocystis, each of which has its own specific structure, differing primarily in the structure of the germinal layer of the parasite.

Analysis of the morphological characteristics of echinococcal cysts of the lungs showed that recurrent echinococcosis most often occurred with echinococcus veterinorum (50.9%) echinococcus hominis (37.7%) and with echinococcus acephalocystis no relapses of the disease were observed, and if they did occur (6 – 11, 3%) we associate this with reinvasion of the parasite.

The results of surgical treatment of echinococcal cysts of the lungs largely depend on a differentiated approach to the selection of an adequate method of surgical treatment, taking into account the morphological form of the echinococcal cyst and adherence to the principles of aparasitic and antiparasitic.

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