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Morphological Features of Recurrent Pulmonary Echinococcosis

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Annotation: The article is devoted to the clinical and morphological aspects of the recurrence of echinococcosis of the lungs. Immediate complications after surgery were observed in 6 (11.3%) patients. An analysis of the morphological characteristics of echinococcal cysts of the lungs showed that recurrent echinococcosis was most often found in Echinococcus veterinorum (50.9%), Echinococcus hominis (37.7%), and in Echinococcus acephalocystis no relapses of the disease were observed, and if they did occur (6 - 11, 3%), it was associated with the reinvasion of the parasite.

Keywords: echinococcosis of the lungs, morphological types, clinical features.

Relevance. Currently, human echinococcosis remains a severe parasitic disease. According to WHO and a number of other sources, its widespread distribution and significant increase in morbidity among the population, especially in the lungs and other organs, are noted [2, 3, 7].

At the same time, along with the increase in the number of new cases of the disease, a high percentage of relapses of echinococcosis is noted, the frequency of which, according to different authors, fluctuates widely from 3.3 to 54%, which is due to the existing terminological confusion [1, 4, 5, 6]. It is also necessary to note the increase in the number of errors made both in the diagnosis of this pathology and in the establishment of others [8,9,10].

The aim of the study was to establish the clinical and morphological forms of echinococcal cysts in patients with recurrent pulmonary echinococcosis.

Material and methods of the study. In the surgical department of the 1st clinic of the Samarkand State Medical University, 53 patients with recurrent pulmonary echinococcosis were operated. Echinococcosis of the right lung was detected in 29 patients, left lung - in 17 patients. In 76% of cases, cysts were located in the lower lobe. Combined echinococcosis of both lungs was observed in 7 patients, the largest number of echinococcal cysts were also located in the lower lobe of both lungs. In recurrent pulmonary echinococcosis, solitary cysts were detected only in 24% of cases, mainly patients with multiple and combined echinococcosis predominated in 76% of cases (Table 1).

Table 1.Distribution of patients by localization of echinococcal cysts

The nature 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 cyst size, the patients were distributed as follows: small cysts were detected in 6 patients, medium cysts in 24 patients, large cysts in 17 patients, and 6 patients had giant cysts over 20 cm. Complicated cysts were noted in 15 patients, i.e. in 28% of cases. Among them, cyst suppuration was observed in 7 patients, cyst breakthrough into the bronchus was noted in 4 patients, and in 3 patients the breakthrough was into the pleural cavity. In 1 case, there was profuse hemoptysis. The studies were carried out during the preoperative preparation period and in dynamics until the normalization of the indices in the postoperative period.

Among the instrumental methods of examination, radiography, computed tomography and ultrasound were used according to indications. We analyzed the morphological modifications of echinococcal lung lesions. The modification 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 were noted in 6 (11.3%) observations.

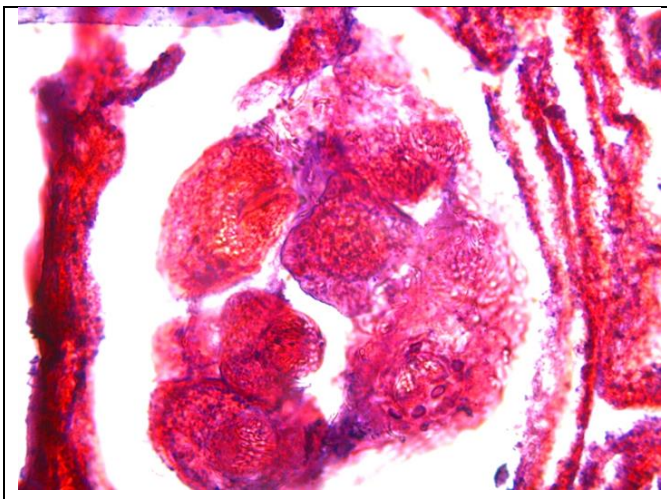

Fig. 1. Structure of the echinococcal cyst of the modification Echinococcus hominis. Scolex of echinococcus in the thickness of the fibrous capsule (hematoxylin and eosin staining, magnification x 400)

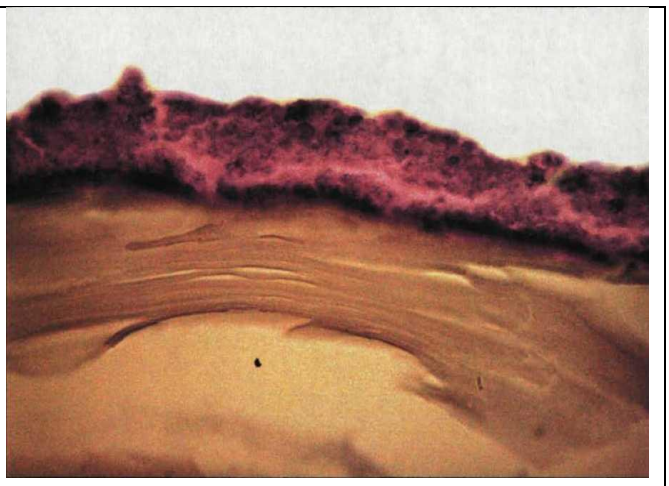

Fig. 2. Structure of the echinococcal cyst modified Echinococcus veterinorum (hematoxylin and eosin staining, magnification x200)

Plain chest radiography has no specific features characteristic of the Echinococcus hominis modification. The nature of the morphological form was finally determined intraoperatively. The Echinococcus hominis modification is characterized by the fact that inside the cyst, in addition to the hydatid fluid, brood capsules with protoscolexes, there are daughter and sometimes granddaughter vesicles. Maternal cysts have a macroscopically matte rough surface and are colored milky-white or whitish-yellow, as shown in the slide. With this form, migration of scolexes beyond the chitinous membrane into the thickness, or even beyond the fibrous capsule, is noted, and exogenous budding occurs during the growth of the echinococcal cyst. It was with this modification that relapses of the disease were observed at the site of previously existing cysts.

Preoperative diagnostics of the modification of Echinococcus veterinorum is possible using computed tomography of the chest. In this case, a specific sign is "hydatid sand" at the bottom of the cyst (Fig. 3).

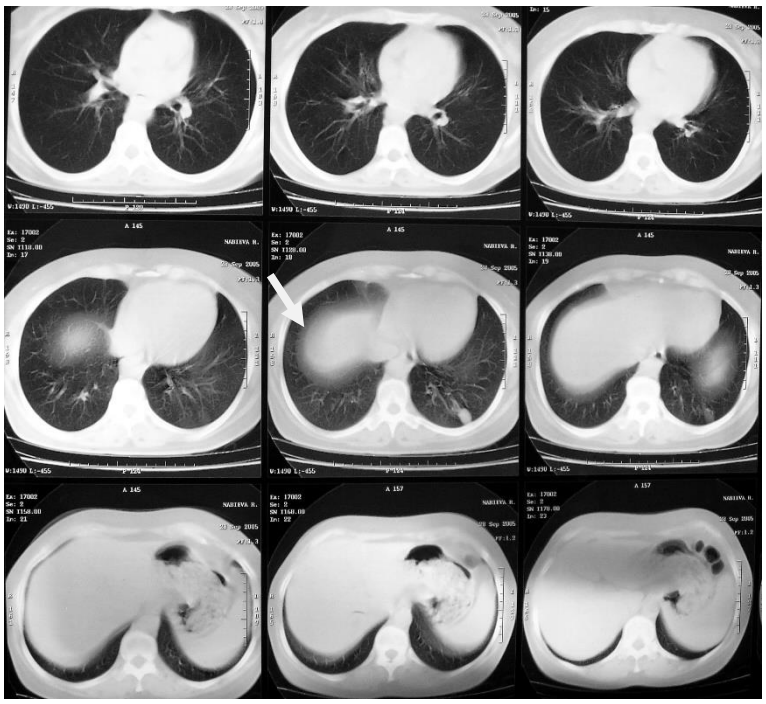

Fig. 3. Computed tomography of the chest "hydatid sand" in echinococcal cyst modification echinococcus veterinorum.

In the Echinococcus veterinorum form of the disease, there are only brood capsules and echinococcal fluid inside the laurel cysts. The formation of daughter bubbles does not occur. Echinococcus veterinorum is perhaps the most aggressive form of the parasite's existence, which is due to the high pressure of the hydatid fluid containing a large number of viable scolexes, which, with the slightest violation of the integrity of the membrane, enter the pleural cavity, causing massive damage to the internal organs by echinococcosis. According to our data, this form prevailed in the greatest number of cases (51%).

Laurocysts of the third modification of Echinococcus acephalocystis (Fig. 4) were noted in 6 observations. These types of cysts are characterized by the absence of brood capsules and protoscolices and are more common in animals than in humans. Preoperative diagnostics of this modification of cysts presents great difficulties. The radiological and echographic characteristics of such cysts have a great similarity with non-parasitic pulmonary cysts. Histological examination of the germinal membrane showed that its entire surface is subject to dystrophic changes, brood capsules are absent. Therefore, these cysts are not capable of producing embryonic elements.

Fig. 4. Structure of the echinococcal cyst modified Echinococcus acephalocystis. (hematoxylin and eosin staining, magnification x 200).

Results of the study and their discussion. 53 patients with recurrent pulmonary echinococcosis (100%) underwent surgical intervention. Complicated course of the disease was noted in 17 patients (32.1%).

The timing of surgical interventions was determined by the nature of the organ damage caused by the parasitic process, the presence of complications, the duration of their development, and concomitant pathology. Since most patients with recurrent echinococcosis were admitted to hospital in severe and moderate conditions, with already developed complications from cysts, which required preliminary conservative treatment, surgical interventions were mainly delayed and planned.

In order to prevent intraoperative seeding, the pleural cavity was limited with gauze tampons soaked in 100% glycerol solution. Then, the cyst was punctured, its contents were evacuated, cystotomy and the chitinous membrane with daughter and granddaughter vesicles were removed. A thick needle was used for the puncture, the end of which was attached to a syringe or an electric suction device. A 100% glycerol solution was used to treat the residual cavity. With regard to the elimination of the residual cavity, the issue was decided 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.

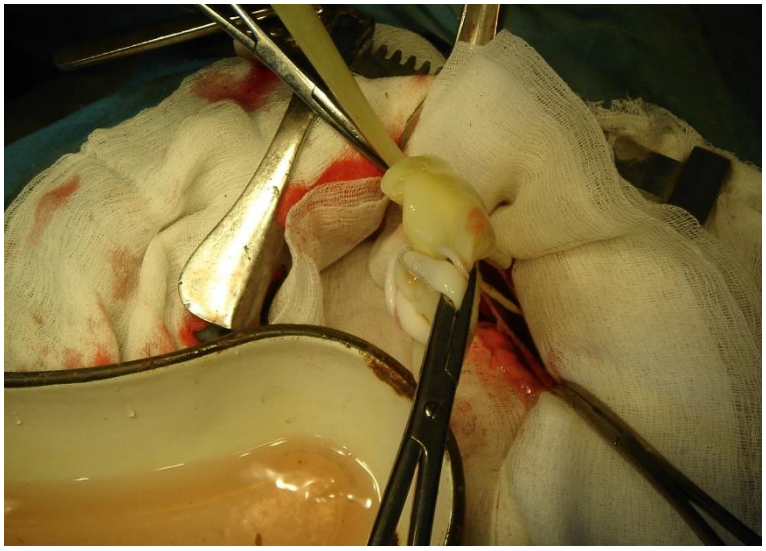

Fig. 5. Echinococcal cyst of the VIII segment of the right lung. Removal of the chitinous membrane from the lumen of the cyst. The pleural cavity is limited by gauze swabs soaked in 100% glycerin solution.

Immediate complications after surgery were observed in 6 patients (11.3%). Postoperative mortality was observed in 1 case (1.9%). The cause of death was acute cardiovascular failure. Postoperative complications worsened the general condition of patients and prolonged the terms of their treatment and rehabilitation (Table 2).

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

The nature of complications	Number of complications	
	abs.	%
Cardiopulmonary insufficiency	1 (death)	1,9
Suppuration of the wound and empyema of the pleura	1	1,9
Pneumonia and limited exudative pleurisy	2	3,8
Encapsulated pleurisy	2	3,8
Total	**6**	**11,3**

Conclusions: Thus, 3 morphological modifications of pulmonary echinococcosis were established: 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 pulmonary cysts showed that recurrent echinococcosis most often occurred with Echinococcus veterinorum (50.9%), Echinococcus hominis (37.7%), and with Echinococcus acephalocystis, relapses of the disease are not observed, and if they did occur (6 - 11.3%), we associate this with reinvasion of the parasite. The results of treatment of echinococcal cysts of the lungs largely depend on a differentiated approach to the choice of an adequate method of surgical treatment, taking into account the morphological form of the echinococcal cyst and compliance with the principles of aparasitic and antiparasitic.

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