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THE TREATMENT OF THE PULMONARY HYDATID CYST IN THE STAVROPOL REGION

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ЛЕЧЕНИЕ ЛЕГОЧНОЙ ФОРМЫ ЭХИНОКОККОЗА В СТАВРОПОЛЬСКОМ КРАЕ

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The study included 58 patients with pulmonary hydatid cysts. There were 33 (56.9 %) men and 25 (43.1 %) women. Based on the choice of treatment method, the patients were divided into two groups: group I (16 patients) underwent video-assisted thoracoscopy (VATS); group II (42 patients) – open echinococcectomy. Surgical techniques that provide parenchyma-preserving approaches were key in choosing the treatment of pulmonary echinococcosis. In group II, the development of postoperative complications in 5 (11.9 %) patients were noted. Echinococcosis recurrence was not observed in any of the groups. The use of VATS reduces the duration of surgical intervention with a simultaneous decrease in the number of postoperative complications and the length of the patient's stay in the hospital.

Keywords: hydatid cyst, pulmonary echinococcosis, video-assisted thoracoscopic surgery, echinococcosis, thoracic surgery

Под нашим наблюдением находились 58 больных с эхинококкозом легких. Мужчин было 33 (56,9 %), женщин – 25 (43,1 %). Исходя из выбора метода лечения, пациенты были разделены на 2 группы: в группе I (16 пациентам) выполнялась видеоассистированная торакоскопия (ВАТС); в группе II (42 больным) – открытая эхинококкэктомия. Хирургические методики, обеспечивающие паренхимосохраняющие подходы, были ключевыми при выборе лечения эхинококкоза легких. В группе II отмечалось развитие послеоперационных осложнений у 5 (11,9 %) пациентов. Рецидив эхинококкоза не отмечался ни в одной из групп. Применение ВАТС обеспечивало сокращение длительности оперативного вмешательства с одновременным уменьшением количества послеоперационных осложнений и длительности нахождения пациента в стационаре.

Ключевые слова: эхинококкоз, легкие, видеоассистированная торакоскопия, торакальная хирургия

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HC – hydatid cyst
PHC – pulmonary hydatid cyst
VATS – video-assisted thoracoscopy

Hydatid cyst (HC) is one of the most common zoonotic diseases in the southern countries of the world [1, 2]. In Russia, HC occurs with varying frequency in the republics of the North Caucasus, the Stavropol Territory, in the northern livestock areas of the Khabarovsk, Krasnoyarsk, and Altai Territories [3–5]. In connection with the significant migration of the population and tourism in recent decades, there

has been an increase in the number of cases of this disease in those areas for which this disease was not typical before [6].

The most common localizations of HC are the liver and lungs, which account for up to 60–80 % of cases [7–9]. Despite the development of detailed diagnostic methods and surgical methods for hydatid cysts, early diagnosis remains difficult [10]. In treating pulmonary hydatid cysts (PHC), surgery plays a major role in removing cysts and preventing recurrence. In this case, cystotomy, enucleation, capitonnage, or atypical lung resections are performed [11–13].

The aim of the study was to evaluate the results of treating pulmonary cyst form in the Stavropol region with the choice of the optimal surgical method.

Material and Methods. Fifty-eight patients with PHC were treated from 2018 to 2022 at the Stavropol Regional Clinical Hospital. There were 33 men (56.9 %) and women – 25 (43.1 %). The distribution of patients by age showed (Table 1) that the most common hydatid cyst lesions were at the age of 51–60 years (19, 32.8 %).

Table 1

Distribution of patients by age groups

Age of patients	Gender				Total
	Men		Women		
	Abs.	%	Abs.	%	
18–29 years	2	3.5	0	0	2
30–40 years	7	12.1	3	5.2	10
41–50 years	8	13.8	7	12.1	15
51–60 years	10	17.2	9	15.5	19
Over 60 years	6	10.3	6	10.3	12
Total	33	56.9	25	43.1	58

All patients underwent a complex clinical and laboratory-instrumental examination, including: a collection of epidemiological history, biochemical and general blood tests, enzyme immunoassay for hydatid cyst, plain X-ray, ultrasound diagnostics, and computed tomography (CT). Eosinophilia was noted in 35 (60.5 %) patients. A positive reaction to HC by ELISA was in 48 (82.8 %) patients. Solitary HC of the lungs was detected in 44 (75.9 %) patients, multiple HC of one lung – 11 (18.9 %), with bilateral PHC – 3 (5.2 %). All patients underwent CT imaging of the chest organs with 3D reconstruction. The most common localization of PHC was segment VI (13; 22.4 %), and segment X was the least affected (1; 1.7 %) (Table 2). Combined forms of HC were not included in the present study.

Table 2

Localization of PHC in the study groups

Localization PHC	Right lung (n=36)		Left lung (n=25)	
	Abs.	%	Abs.	%
I segment	–	–	2	8.0
II segment	3	8.3	2	8.0
III segment	1	2.8	6	25.7
IV segment	4	11.1	5	20.0
V segment	5	13.9	3	12.0
VI segment	8	22.2	5	20.0
VII segment	7	19.4	1	4.0
VIII segment	5	13.9	1	4.0
IX segment	2	5.6	–	–
X segment	1	2.8	–	–

Based on the choice of treatment method, the patients were divided into two groups. Group I (16 patients) underwent video-assisted thoracoscopy (VATS); group II (42 patients) – open echinococcectomy. Surgical techniques that provide parenchyma-preserving approaches were key in choosing the treatment of PHC.

In group I, VATS was performed. The patients included in this group had a peripheral location of PHC. In these cases, HC were located in segments II, III, VIII, and IX of the lungs. VATS was performed by placing trocars depending on the localization of the PHC: in VIII and/or IX segments – along the posterior axillary line; in II and/or III segments – along the anterior axillary line. After the primary surgical procedure, including hardware atypical resection, the final stage included minithoracotomy.

In group II, thoracotomy with pericystectomy was performed. One patient underwent bilateral simultaneous thoracotomy. At the same time, surgery was started from the side where there were large cysts. The main postulates of the surgical treatment of PHC were: removal of a cyst with a chitinous membrane, germicidal treatment of the cyst cavity (hypertonic solution), a «water» test to exclude a bronchopleural fistula and eliminate the residual cavity with maximum preservation of lung tissue. The residual cavity was treated with argon plasma coagulation.

All patients underwent a single preoperative (14 days) and postoperative chemotherapy of Albendazole (from 3 to 4 courses of 28 days).

The significance of the differences in the mean values of the independent samples was estimated using the methods of variation statistics. All statistical procedures were performed using the software package «Statistica 10.0» (StatSoft, USA).

Results and Discussion. The average size of PHCwas 7.1±1.3 cm in group I and the largest cyst removed by VATS was 10.3 cm. The length of hospital stay was 9.8±1.2 days. In group II, the average size of PHC was 9.6±2.5 cm, and the largest HC removed by open surgery was 16.7 cm. The length of hospital stay was 14.2±1.5 days. As a result of treatment, all patients in group I had an easier postoperative period. The time of wound healing was shorter ($p<0,05$) in group I (7.9±0.5 days) than in group II (11.3±1.3 days). The duration of pain relief occurred in group I at 2.9±0.2 days ($p<0,05$) and in the control group – at 5.1±0.3 days.

When analyzing the postoperative period in the study groups, we identified intraoperative and postoperative complications. In group II, the frequency of complications was higher than in group I (Table 3). An integrated approach (operative and conservative stages) in managing patients in group I made it possible to reduce the frequency and postoperative complications by 11.9 %. The highest frequency of complications was noted in group II and was associated with the development of bronchopulmonary fistula in 2 (4.7 %) patients. However, conservative tactics made it possible to eliminate fistula reasonably quickly. The use of drug therapy in the pre- and post-operative period prevented the development of the recurrence of echinococcosis.

The use of the proposed approach made it possible to obtain not only a good clinical effect in the postoperative period but also to improve the quality of life of patients. At the same time, the integrated indicator of quality of life in group I was significantly higher ($p<0.05$) than in group II.

A study [14] shows that uniportal VATS can be safely used in pulmonary echinococcosis because it has several advantages over open thoracotomy. The authors report the results of the surgery for 39 PHC patients. The article

presents two groups of patients: operations performed by thoracotomy and operations performed by single-port systems. Surgery time, postoperative pain, and chest tube delay were significantly higher in the thoracotomy group. Patients with uniportal VATS were discharged from the hospital earlier (p=0.011) and had fewer complications (p=0.060). However, none of these groups had relapses or 30-day mortality.

Table 3

Development of postoperative complications and relapses in the study groups

Investigated characteristic	Main group N=16	Control group N=42
Intraoperative complications	0	0
Residual cavity	0	1 (2.4 %)
Bronchopulmonary fistula	0	2 (4.7 %)
Pleural empyema	0	1 (2.4 %)
Infected postoperative wound	0	1 (2.4 %)
Recurrence of hydatid cyst	Not observed	Not observed
Total	0	5 (11.9 %)

The systematic review [15] comprised five studies reporting 85 cases of PHC that underwent uniportal VATS. The average size of PHC was 8.41 cm. The duration of surgery was 86.2 min. Postoperative complications in 11 (9.4 %) patients were presented. The most difficult were emphysema and long-term air leakage. At the same time, there was no relapse of PHC.

Attention should be paid to the fact that the rate of bronchial rupture varied between 21.1 % and 53.1 % [16]. At work [17] result of surgery in 94 children with PHC was carried out. The rupture was detected in 52.5 % of patients with a diameter of HC of <10 cm. Pneumothorax was seen in six patients after the operation on average in two months, one of whom was a VATS patient.

In our study, preoperative CT with 3D reconstruction of the chest cavity in patients with PHC allows VATS to be performed after careful selection of patients (single peripherally located uncomplicated hydatid cysts up to 7 cm in diameter) and to avoid several complications (bronchopulmonary and bronchopleural fistulas).

Unfortunately, VATS may not be applicable in certain clinical settings. At first, in the preoperative period, we can note the difficulties in treating the residual cavity [8, 15]. Second, if there's a fear of cystic fluid contamination of the chest cavity. Third, VATS requires technical equipment and the improvement of a surgical team.

Conclusion. The integrated approach used in the treatment of PMS with intraoperative use of plasma coagulation argon helps to obtain good treatment results and often reduces postoperative complications. It should be noted that the most significant number of complications in the form of bronchopulmonary fistula was observed in the case of family forms of pulmonary hydatid cysts.

The treatment of choice for PHC is open echinococcectomy and VATS. Methods of parenchyma preservation were key in choosing cyst surgery for pulmonary hydatid. Using VATS provided a short operation time with a decrease in the number of complications and the length of stay in the hospital.

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ANALYSIS OF THE FUNCTION OF THE GENES WITH THE HIGHEST NUMBER OF GERMINAL MUTATIONS IN PATIENTS WITH LEUKOPLAKIA AND CANCER OF THE ORAL MUCOSA

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АНАЛИЗ ФУНКЦИИ ГЕНОВ С НАИБОЛЬШИМ КОЛИЧЕСТВОМ ГЕРМИНАЛЬНЫХ МУТАЦИЙ У ПАЦИЕНТОВ ПРИ ЛЕЙКОПЛАКИИ И РАКЕ СЛИЗИСТОЙ ОБОЛОЧКИ РОТОВОЙ ПОЛОСТИ

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To date, a small fraction of the mutations associated with a high risk of developing neoplasms of the oral mucosal (OM) have been described. An important consideration is the determination of germ genetic variants related to the development of leukoplakia (LOM) and squamous cell carcinoma (SCCOM). The function of the genes with the highest number of bacterial mutations was carried out in 24 patients with LEO and 24 patients with SCCOM.

It was found that the structure of the identified mutations was dominated by variants of the MUC3A, MUC4, MUC12, and MUC16 genes responsible for the synthesis of the mucin glycoprotein family (44.7 % and 41.2 % of germinal mutations in patients with LOM and SCCOM, respectively). Insufficient production or a decrease in the functional activity of mucins is a trigger factor for both the development of keratosis and malignant degeneration of epitheliocytes. An infrequent germline