UP-TO-DATE SURGICAL TACTICS IN ECHINOCOCCOSIS OF THE LUNGS

The paper provides analysis of surgical treatment of 132 patients with echinococcosis or hydatid disease (86 patients with uncomplicated and 46 with complicated echinococcosis) of the lungs. It was possible to perform echinococcectomy of the lungs through mini-invasive approaches in more than 2/3 patients and employment of endovisual technology made it possible to shorten the number of postoperative complications from 35.71 % to 4% and the terms of treatment from 14.2 to 6.4 days.

In our opinion, echinococcectomy of the lungs through mini-invasive approach requires further technical improvement. It is easier and more effective to perform echinococcectomy through minithoracotomy approach. At the same time it should be acknowledged that echinococcectomy via thoracotomy approach is more often recommended in recurrent echinococcosis of the thoracic cavity and sometimes in complicated course of the disease. Simultaneous operations using mini-approaches in bilateral echinococcosis of the lungs or in combination with the liver are the operations of the choice and can be performed in patients with good functional indexes of the cardiovascular and the respiratory systems.

Keywords: Echinococcosis of the lung, echinococcectomy of the lung, minimal invasive surgery of lung echinococcosis.

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Introduction

At present echinococcosis of the liver and lungs is one of frequent human diseases and continues to be a serious medical problem in many countries of the world, especially in epidemiologically unfavorable regions where frequency of the disease achieves high values, about 9 persons per 100000 inhabitants (Karimov et al., 1999). During the last years complicated course of echinococcosis makes from 25% to 45%, according to the data of different authors (Perelman, 1999; Chetverikov et al., 2001). One of the important problems is high morbidity of young people. Lethality achieves 2.5% - 7% in echinococcosis (Karimov et al., 1999; Perelman, 1999). Surgical treatment of echinococcosis is the single radical method and introduction of endosurgical technology has eliminated one of the most essential defects of traditional cavity surgery, namely, discrepancy between traumatic approach and minimal interference in the organ (Karimov et al., 1999; Crisci et al., 1999). Extensive development of the operative endoscopy, insignificant traumatism and low frequency of complications, economic efficacy and shortage of rehabilitation terms make it possible to revise the principles of treatment of patients with echinococcosis of all localizations (Halerezoglu et al., 1997; Salih et al., 1998).

Statements on thoracoscopic echinococcectomy of the lungs and laparoscopic echinococcectomy of the liver and spleen appeared in literature (Massound, 1996; Guibert et al., 1995).

Materials and methods

The paper observe surgical treatment results of 132 patients with echinococcosis of the lungs; of them 86 patients with uncomplicated and 46 with complicated echinococcosis of
the lungs. 118 (90.28%) of the all patients underwent minimal invasive interference. The age of the patients varied from 5 to 83 years old. There were 57 (43.18%) men and 75 (56.82%) women. 86 patients with uncomplicated echinococcosis were operated: depending on the volume and size echinococcosis cysts were small (5cm) in 15 cases (17.4%), middle (5-10cm) in 38 cases, and big (more than 10cm) in 33 cases (38.4%). Cysts were localized mostly in the lower lobes in the 48 (55%) patients. Echinococcosis cysts were indicated on the left side in 26 (30.23%), on the right side in 39 (45.35%), on both sides in 11 (12.79%), and in combination with the liver in 10 (11.63%) patients.

Thoracoscopic echinococcectomy was performed in 14 (16.28%) patients, videothoracoscopic echinococcectomy through minithoracotomy approach was performed in 61 (70.93%) patients, cysts in the lungs were removed through thoracotomy approach in 11 (12.79%).

46 patients with complicated echinococcosis of the lungs were kept under our observation: of them 12 (26.09%) with purulency, 28 (60.87%) with rupture into the bronchus, 6 (13.04%) with rupture into the pleural cavity. In cases with purulent cysts of the lungs with signs of marked purulent intoxication, thoracocentesis into 3rd or 7th intercostal area along anterior and posterior auxiliary line was performed; thoracoscope was introduced and exact localization of the cyst was determined as well. Subsequently, thoracocentesis above the cyst was performed; the cyst was penetrated into by specially designed trocar extractor, then the membrane was extracted and the cavity washed by chlorhexidine and furacilin. The residual cavity was revised by endoscope following with the leave of drainage tube in the cavity. The cavity was washed by antiseptics and proceeded active drainage during following 2-3 days.

After cleaning from purulence, the cavity was left for passive drainage. The cavity was usually flattened or decreased in its volume in 10-15 days. The drainage tube was removed in 12-15 day depending on the condition of the residual cavity.

Results and discussions

In uncomplicated echinococcosis of the lungs only in 14 (87.5%) patients was possible to perform thoracoscopic echinococcectomy through trocar centesis (Figure 1).

![Figure 1. Thoracoscopic echinococcectomy of lung](image)

Intraoperative technical difficulties in 2 (12.5%) cases required the transfer to minithoracotomy. Cyst sizes varied from 5 to 8 cm. In 3 (21.43%) cases partial pericystectomy was performed after thoracoscopy, and cappitongage was performed according to Vishnevsky due to the absence of bronchial fistulas. In 2 (14.28%) cases the
residual cavity was eliminated according to Vahidov method. And in the rest 9 (64.29%) cases a fibrous cavity was eliminated according to Bobrov method.

Postoperative complications were observed in 2 (14.28%) patients (residual cavity in the lung). In 2 cases we had to proceed to minithoracotomy due to technical difficulties during thoracoscopic echinococcectomy by trocar method; subsequently manual revision echinococcectomy was performed.

In 61 cases videothoracoscopic echinococcectomy with employment of miniapproach was performed. Cyst sizes varied from 10 to 17 cm. 3 cysts were removed in every patient in 2 (3.28%) cases, 2 cysts were removed accordingly in 3 (4.92%) patients. During localization of the cyst in the upper lobe, minithoracotomy on the 4th intercostal space was performed in 8 (21.05%) patients. During localization of the cyst in lower lobes, this operation was performed on the 5th intercostal space in 30 (78.95%) patients; on the 6th intercostal space - in 7 (14.58%); on the 7th intercostal space - in 41 (85.42%) patients. In cases with large cysts, minithoracotomy was performed without previous thoracoscopy in 42 (68.85%) patients with the purpose to prevent impairment of the cyst during thoracocentesis and thoracoscopy.

Capitonnage (liquidation) of the cavity was performed depending on the cyst configuration and volume. Cavity in round cysts was eliminated in 25 patients according to Vahidov method. Cappitonage in deep semi-oval cysts was performed by vertical half purse - string sutures in 14 patients. Bobrov-Spasokukotsky method was performed in 14 patients and Vishnevsky method - in 8 cases. Stage-by-stage operations in bilateral cysts were performed in 7 patients (63.64%), and one-stage echinococcectomy - in 3 (36.36%). Lung echinococcectomy through a wide thoracotomy approach was performed in 11 (12.79%) patients.

Antero-lateral thoracotomy was applied to all patients. It should be recognized that lung echinococcectomy in most cases was performed by means of thoracotomy approach only in severe cases of echinococcosis.

Transthoracal drainage of cyst under thoracoscopy and roentgenoscopy control in purulence of echinococcus cyst was made in 12 patients: drainage of cavities under thoracoscopic control - in 7 (58.33%) cases and under roentgenological control - in 5 (41.67%) cases. 8 (66.67%) patients had a right side single cyst and 4 (33.33%) patients had a left side cyst. One patient had a complication that was displayed by empyema of pleura. Conservative measures with drainage of abscess alleviated the process. Cyst cavity was not obliterated in one case and a dry residual cavity was left. Cysts were localized in the right lung in 28 patients (42.86%), in the left lung - in 9 (32.14%) patients, and bilateral localization was noted in 7 cases (25%). 3 cysts were indicated in one lung in 2 patients and 2 cysts were found in 5 patients.

All patients underwent operative interference. Operations were performed by means of thoracotomy in 25 (89.29%) patients. Miniapproach was performed without preliminary thoracoscopy due to possible complications in the given category. Miniapproach, after polypositional roentgenoscopy, was performed through 1st intercostal space according to our method in 3 cases, on 5th - in 7 cases, on 6th - in 14 cases, and on 7th intercostal space in 6 cases. We succeeded in removing 3 cysts from one lobe through the miniapproach in 2 (8%) cases and 2 cysts from 2 lobes in 4 (16%) cases. Cysts localization was bilateral in 7 cases. One-stage operation through miniapproaches (Figure 2) was performed in 3 (42.86%) patients. These patients had a risk of cyst rupture in the opposite lung during the operation or the nearest postoperative period. Cyst rupture into the pleural cavity is considered to be one of severe complication of echinococcosis. Patients must undergo operations in good time in order to prevent pyopneumothorax.

Observation case. Patient M. aged 15 years old, was transferred in severe condition to our clinic from Resuscitation Department of the Emergency Center. From anamnesis: two days ago a large amount of salty fluid was discharged during cough attack. The patient was admitted to the Resuscitation Department with signs of respiratory insufficiency. Objectively:

- severe condition rash on the whole body, respiratory rate is 28 respirations per minute.
Auscultation: numerous rates are heard on the left side at the background of amphoric breathing, sharply weakened breathing on the right. Percussion: dullness is determined to the right from the III intercostal space. X-ray: a large cavital formation with the level of liquid 12x12 cm in size is marked in the left pulmonary field on the projection of the lower lobe. Homogeneous formation with clear contours of oval form 14x10 cm in size is marked on the right (Figure 2).

**Figure 2. X-ray of the patient M**

The patient, after preoperative preparation, is diagnosed with bilateral echinococcosis of the lungs, rupture of echinococcosis cyst in the left bronchus and respiratory insufficiency of the II degree.

Surgery process. Videothoracoscopic echinococcectomy of the left lung. Lateral minithoracotomy on the left axillaris media into 6 intercostal spaces was performed. Cystotomy with removal of chitin. Bronchial fistulas were sutured. The cavity was eliminated by cappitonage according to Vahidov method. Pleural cavity was drained by 2 drainages. The patient was turned on the other side and minithoracotomy on the 5th intercostal space was performed. A large cyst was revealed, 300ml of fluid was pumped out as a result of cyst puncture. Glycerin was introduced into the cavity and then pumped out. Cystotomy was performed and chitin membrane was removed. One bronchial fistula was sutured. The residual cavity was proceeded according to Vishnevsky method. Pleural cavity was drained.

The postoperative period passed smoothly. Control roentgenoscopy of the chest revealed the infiltration area of pulmonary tissue in the lower lobe of the left lung; insignificant amount of fluid in the residual cavity on the left. Upper drainages were removed at the same day and the lower ones were removed on third day. There was healing of the wound via primary tightening. The patient was receiving antibioticotherapy and nonnarcotic analgetics during 3 days, he was discharged in satisfactory condition.

**Figure 3. View of the postoperative wound**

X-ray examination revealed hydropneumothorax in 6 patients. Operations in all these patients were performed through minithoracotomy approach after preliminary thoracoscopy had discovered the rupture of echinococcosis cysts into the pleural cavity. In
echinococcosis cyst rupture into the pleural cavity, sanation of the pleural cavity with ozonized with physiological solution and removal of chitin membrane and cappitionage of residual cavity were performed. 10 patients with combined echinococcosis of the lungs and liver were operated. Operative interferences on the lungs and liver in 6 patients were performed through separate one-stage approaches (Figure 3).

Echinococcectomy from the lungs and liver was performed through one-stage separate miniapproaches in 4 cases and minithoracotomy approach was combined with wide laparotomy in 2 cases. Stage-by-stage removal of cyst from the lungs and liver was performed in 4 patients. Organ saving operations with residual cavity plastics in different modifications were implemented in the majority of cases - 42 (91.30%) patients. Indications for lobectomy in 2 patients were made in the cases of complicated echinococcosis when cysts occupied the whole lobe of the lung and caused pneumocirchosis.

**Conclusion**

Echinococcectomy of the lungs through mini-invasive approaches was possible to perform in more than 2/3 patients; employment of endovisual technology made it possible to shorten the number of postoperative complications from 35.71 % to 4% and the terms of treatment from 14.2 to 6.4 days. In our opinion, performing of echinococcectomy of the lungs through mini-invasive approach requires further technical improvement. Our results suggest performing echinococcectomy through minithoracotomy approach as easier and more effective. At the same time it should be acknowledged that echinococcectomy through thoracotomy approach is more often indicated in recurrent echinococcosis of the thoracic cavity and sometimes in complicated course of the disease. One-stage operations using miniapproaches in bilateral echinococcosis of the lungs or in combination with the liver are the operations of the choice and can be performed in patients with good functional indexes of the cardiovascular and the respiratory systems.

**References**


