Pharmacy2 (Chisinau, Moldova)

Although there is no standard size to determine the growth of hydatid metacestode to impressive sizes [3, 4].

...developed immune system, causes the rapid asymptomatic growth of the cyst, which can be complicated by endobronchial rupture [1, 2]. The negative intrathoracic pressure combined with significant postoperative morbidity is present on the right side, contralateral ragged breathing.

...contralateral ragged breathing. Pulse – 95-100 beats/min, blood pressure – 90/60. Routine laboratory tests showed leukocytosis (18.2x10⁹), increased ESR.

...the collapse of the hydatid larvocyst can be observed. The chest x-ray showed a large cystic formation located in the middle and lower lung with a well-defined internal contour, with a horizontal hydro-aerial plane, the external contour being obliterated; massive perifocal pneumonia and areas of pneumofibrosis (Fig. 1). Computed tomography allowed to establish with certainty the diagnosis of pulmonary hydatid cyst complicated by endobronchial rupture with subtotal involvement of the right lower lobe (Fig. 2).

In the projection of the lower lobe of the right lung, a solitary massive hydroaerial cystic formation, well outlined, with dimensions of 10.3x8.0x9.0 cm is visualized. The floating membrane sign (“Camelot sign”) is clearly highlighted. On the posterior wall of the cavity, the presence of some linear structures with a tortuous path determined by the collapse of the hydatid larvocyst can be observed. There is hyperattenuation of the adjacent lung parenchyma determined by consolidation with involvement of the lower and middle lobe on the right. Pleural effusion is present on the right (18-20 UH) with a maximum thickness of 4.0 cm.

...the right lower lobe, with significant compression of the adjacent lung segments and the middle lobe. After opening the formation, the ruptured hydatid larvocyst was found, which had a thin wall and was floating in a small residual amount of hydatid fluid (Fig. 3).
Fig. 1. Patient C., 15 years old. Preoperative chest X-ray (explanation in text)

Fig. 2. Patient C., 15 years old. Preoperative CT.

Fig. 3. Intraoperative appearance of pulmonary hydatid larvocyst complicated by endobronchial rupture after opening the fibrous capsule (A) and after removal of the parasitic agent (B)
After extraction of the parasitic formation and aspiration of the fluid content, a bronchial communication of about 3-4 mm in diameter was observed. The residual cavity was treated with silver nitrate as a scolicidal agent, after which the bronchial fistula was liquidated. After placement of an intracavitary drain, the residual cavity was filled post-technococcectomy by suturing through meridional puncture in the superimposed bursae plan-on-plan with absorbable wires and a final “round-trip” suture, completing the operation with drainage of the pleural cavity and restoration of the anatomical plan. The intrapleural drain was removed on postoperative day 5, and the patient was discharged in satisfactory general condition on postoperative day 14.

In the postoperative period, the partial insufficiency of the padding sutures was associated (Fig. 4A, B), the intracavitary drain being removed 3.2 months postoperatively. However, the development of serious complications, which would have required some surgical interventions, was not noticed, the remaining cavity gradually disappearing completely (Fig. 4C, D, E, F).

**Fig. 4.** Patient C., 15 years old. Chest X-ray in 2 incidences (right profile) taken 1.2 months (A, B), 3.4 months (C, D), and 12 months (E, F) from the time of surgery. The presence of a small cavity with drained hydro-aerial content, located in the lower lobe of the right lung, is determined, which gradually decreases in size until it disappears completely.
The morphopathological examination revealed complicated necrolytic and proliferative changes with suppurative erosive-ulcerative lesions in the fibrous capsule, associated with pseudofollicular and perivascular inflammatory reaction, cystic reorganization of the bronchiolo-alveolar component with proliferative-polypous alveolitis of the pericystic lung tissue (Fig. 5).

Fig. 5. Morphopathological changes of the fibrous capsule and pericystic lung tissue.
A – histopathological aspects of the fibrous capsule: 1 – ischemic changes and disjunction of the fibrous capsule; 2 – penetration of the polymorphocellular inflammatory process with an eosinophilic component into the fibrous capsule; 3 – destructive inflammatory process in the pericystic regional area;
B – bronchogenic inflammatory process: 1 – ulcerative erosive inflammatory process with giant cell symplasts; 2 – fibro-muscular and connective tissue;
C – increasing parietal vascular thrombosis;
D – Reminiscences of cystic deformed intracapsular bronchoalveolar structures with granular polyp structures

Discussions. Giant pulmonary hydatid cyst in children represents a special clinical entity, characterized by delayed onset of clinical symptoms due to high elasticity and compliance of the lung [1], which determines the expansion of the parasitic formation, the rupture of the parasitic larvocyst contributes to the development of serious consequences [5, 8]. The incidence of pulmonary hydatid cyst complicated by rupture is 34.2-39.5% [9].

Modern imaging techniques are quite effective in the diagnosis of pulmonary hydatid cyst. At the same time, in giant forms and those complicated by rupture, the radiological diagnosis of empyema or hydrothorax is often incorrect, but it is precisely in these forms of the disease that the need for prompt surgical treatment as soon as possible after stabilization of the patient is imposed, with the aim of removing the hydatid larvocyst with maximum preservation of lung tissue [6, 10].

Among the options for surgical treatment of large pulmonary hydatid cysts, the Baret/Posadas technique, which consists of cystotomy with closure of bronchopleural fistulas with or without padding, has been widely used [11]. Cystotomy with padding involves aspiration of fluid from the cyst together with removal of the parasitic larvocyst, padding of the residual cavity contributes to the reduction of the risk of infection of the residual cavity and formation of empyema, liquidation of air leaks from the airways with the risk of deformation of the lung parenchyma [12, 13], in this context some modifications of the padding technique have been proposed [14]. It should be noted that the Ugon enucleation technique, which is a surgical procedure that allows the removal of the intact parasitic cyst, can be used primarily in small hydatid cysts with a low risk of rupture [15]. The method of solving the residual cavity without padding may be an alternative to the padding procedure in cases of pulmonary hydatid cyst; proponents of this method claim that padding is not essential in the surgical treatment of pulmonary hydatid cysts, and careful closure of the bronchial oriﬁces should reduce morbidity [16, 17].

Some authors have suggested to perform lung resection in cases of giant pulmonary hydatid cysts as a last option, the rate of these interventions is 6-13% [18, 19]. Some studies have adopted specific criteria for lung resection, such as: severe hemorrhage in the hydatid cyst complicated by rupture, giant pulmonary hydatid cysts with a destructive process exceeding 50% of a lung lobe, suppuration of the cystic cavity, concomitant aspiration with lobe stiffness [19].
Taking into account the high capacity of lung tissue recovery in children, there is a contrary opinion, which suggests that this type of surgery should be avoided, which has high rates of postoperative complications, including: postoperative wound infection (19.4%), pneumonia (11.1%), atelectasis (8.3%), empyema (8.3%), prolonged air leaks (5.5%), etc. [20].

Although surgical procedures have shown satisfactory results in the treatment of hydatid cysts, there is a risk of developing secondary infections, with recurrence rates ranging from 2 to 25% of patients. In this context, particular attention has been paid to scolicidal agents used for intraoperative inactivation of the germinal elements of the hydatid larvocyst and determination of the effective exposure time [21, 22]. In addition to the scolicidal substances known and used in practice [21], several recent studies have reported, as an alternative option, the use of scolicidal agents of plant origin [23, 24], nanoparticles of silver, iron, copper, selenium, etc. [25, 26], the venom peptides of some scorpion species [27, 28], although the results obtained are still in the stage of desideratum.

1. Filling of the post-techniococcetomy residual cavity in superimposed bursae in giant pulmonary hydatid cyst complicated by endobronchial rupture is an effective technical procedure that allows to reduce postoperative morbidity and length of hospitalization.

2. The morphopathologic changes found in the giant pulmonary hydatid cyst complicated with endobronchial rupture indicate a potential risk of development of insufficiency of padding sutures with development of prolonged air leaks. In this context, with the aim of monitoring and resolving prolonged air leaks that may occur in the postoperative period, the padding procedure can be completed with simultaneous drainage of the residual cavity.

3. The intraoperative use of silver nitrate as an attempt to inactivate the germinal elements of the hydatid larvocyst is based on both the scolicidal and bactericidal action of the substance, which, together with the necrolytic action, ensures favorable conditions for the obliteration of the residual cavity of the post-techniococcetomy and contributes to the prevention of recurrences and postoperative complications.

Conclusions:

1. Filling of the post-techniococcetomy residual cavity in superimposed bursae in giant pulmonary hydatid cyst complicated by endobronchial rupture is an effective technical procedure that allows to reduce postoperative morbidity and length of hospitalization.

2. The morphopathologic changes found in the giant pulmonary hydatid cyst complicated with endobronchial rupture indicate a potential risk of development of insufficiency of padding sutures with development of prolonged air leaks. In this context, with the aim of monitoring and resolving prolonged air leaks that may occur in the postoperative period, the padding procedure can be completed with simultaneous drainage of the residual cavity.

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ПАРЕНХІМОЗБЕРІГАЮЧА ХІРУРГІЯ ПРИ ЛІКУВАННІ ГІГАНТСЬКОЇ ГІДАТИДНОЇ КІСТИ ЛЕГЕНІ, УСКЛАДНЕНОЇ ЕНДОБРОНХІАЛЬНИМ РОЗРИВОМ У ДІТЕЙ: КІНІЧНИЙ ВИПАДОК

С. Бабучі, Н. Доготарі, В. Петрович, І. Негру, В. Негру

Комуніальний медико-санітарний заклад Інститут матері та дитини
Національний науково-практичний центр дитячої хірургії «Наталія Георгіу», Державний університет медицини та фармації «Ніколае Тестеміцану»
(м. Кишинів, Молдова)

Резюме
Автори повідомляють про кінічний випадок 15-річної пацієнтки з гіганською легеневою гідатидною кістю, яка була діагностована лише після розриву, та успішно прооперована. Пациєнка отримала лекту травму під час заняття фізкультурою і через короткий час після травми у неї виникла сильна рота великою кількістю безбарвної рини. Згодом її стан погіршився, з’явився втяг, сильний біль у правій половині трупи, сильний кашель з незначним харканням, задишка та кровохаркання, у зв’язку з чим її госпіталізували. Після госпіталізації комп’ютерна томографія (КТ) підтвердила діагноз гідатидної кісті легені, ускладненоєї ендобронхіальним розривом у субтотальному ураженні правої нижньої частини. Хвора прооперована шляхом правосторонньої латерозадньої торакотомії. Після видалення паратрахматична ларви заповненого стрічкою. У післяоперативному періоді спостерігалася часткова непрохідність накладених швів, яку лікували консервативно.

Автори діяли висновки, що ендохірургія з обробкою нітратом сріблом залишкової порожнини та заповненням неспроможними накладеними бурсами при гіганській легеневій гідатидній кісті, ускладненій ендобронхіальним розривом, є ефективним технічним втручанням, яке дозволяє скоротити післяоперативну захворюваність і термін госпіталізації при цьому тяжкому ускладненні.

Ключові слова: гідатидна кістка; легеня; протосколіцидний засіб; хірургія; дитина.

Contact information:
Stanislav Babuci – MD, PhD, DSc., Head of "Natalia Gheorghiu" National Scientific-Practical Center for Pediatric Surgery, PMSI Mother and Child Institute, "Nicolea Testemitanu" State University of Medicine and Pharmacy (Chisinau, Moldova).
e-mail: babucistanislav1@gmail.com
ORCID ID: https://orcid.org/0000-0002-1153-4871

Nicolae Dogotari – MD, Head of Emergency Reception Unit, PMSI Mother and Child Institute (Chisinau, Moldova).
e-mail: dogotarinicolae17@gmail.com
ORCID ID: https://orcid.org/0000-0002-8672-8897

Контактна інформація: Бабучі Stanislav – MD, PhD, DSc., керівник Національного науково-практичного центру дитячої хірургії «Наталія Георгіу», Комунальний медико-санітарний заклад Інститут матері та дитини. Державний університет медицини та фармації «Ніколае Тестеміцану» (Кишинеу, Молдова).
e-mail: babucistanislav1@gmail.com
ORCID ID: https://orcid.org/0000-0002-1153-4871

Доготарі Ніколае – MD, керівник відділення невідкладної допомоги Комунального медико-санітарного закладу Інститут матері та дитини (Кишинеу, Молдова).
e-mail: dogotarinicolae17@gmail.com
ORCID ID: https://orcid.org/0000-0002-8672-8897
Vergil Petrovici – MD, PhD, Head of the Pathological Anatomy Department of PMSI Mother and Child Institute, “Nicolae Testemițanu” State University of Medicine and Pharmacy (Chisinau, Moldova).
e-mail: petrovicivergil@yahoo.com
ORCID ID: https://orcid.org/0000-0001-8352-4202

Ion Negru – MD, PhD, Head of the Septic Surgery Department of “Natalia Gheorghiu” National Scientific-Practical Center for Pediatric Surgery, PMSI Mother and Child Institute (Chisinau, Moldova).
e-mail: ionnegru@yahoo.com
ORCID ID: https://orcid.org/0000-0002-6758-3613

Virginia Negru – Resident Doctor of Pediatric Surgery, “Nicolae Testemițanu” State University of Medicine and Pharmacy, PMSI Mother and Child Institute (Chisinau, Moldova).
e-mail: virginia.munteanu.m@gmail.com
ORCID ID: https://orcid.org/0009-0000-1934-3327

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