



## Laparoscopic Management of Simultaneous Liver and Pulmonary Hydatid Cysts

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### General Note



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### ABSTRACT

Hydatid disease is a widely prevalent parasitic infection caused by cestode species *Echinococcus granulosus* and *Echinococcus multilocularis*. Infestation by *Echinococcus granulosus* in humans most commonly occurs in the liver 55-70% followed by the lung 18-35%. Four approaches exist in the clinical management of cystic echinococcosis. The goals of treatment are a complete

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elimination of the parasite and prevention of recurrence, minimizing mortality and morbidity risk. A stage-specific approach is recommended. Surgery is still the first choice of treatment. Laparoscopic approach along with its inherent benefits provided the access to difficult areas along with controlled drainage without adding to the existing morbidity. We present here the case report where the laparoscopic surgery for the liver cysts and video-assisted thoracoscopic surgery for the simultaneous pulmonary hydatidosis was performed.

#### Key-words

Liver and pulmonary echinococcosis, laparoscopic management, cystic echinococcus.

#### Abbreviations

HD-hydatid disease

CE-cystic echinococcosis

US-ultrasonography

CT-computed tomography

cm-centimeters

VATS-video assisted thoracoscopy

LT-liver transplant

BMZ-benzimidazole

PT-percutaneous treatment

PAIR- puncture, aspiration, injection and re-aspiration

## 1. INTRODUCTION

Hydatid disease is a widely prevalent parasitic infection caused by cestode species *Echinococcus granulosus* also known as cystic hydatid disease (HD) or echinococcosis, and *Echinococcus multilocularis* also known as alveolar HD or echinococcosis<sup>[1]</sup>

HD is an ancient disease and even was known to Hippocrates.<sup>[2]</sup>

Infestation by *Echinococcus granulosus* in humans most commonly occurs in the liver 55-70% followed by the lung 18-35%. The two organs can be affected simultaneously in about 5-13% of cases. 5

In liver *Echinococcus* tends to affect the right lobe more frequently than the left lobe due to the nature of portal blood flow. *Echinococcus granulosus* infections usually present as solitary cysts, and have single-organ involvement.<sup>[3]</sup>

Incidence of unusual sites is about 8-10%.<sup>[2]</sup>

Symptoms of hydatidosis are related with size, location, rupture and infection for cysts. Identification of cyst is confirmed by ultrasonography and computed tomography scan. By a very slow process of growth, the asymptomatic period is too long and hydatidosis might be diagnosed after 20–25 years post infection.<sup>[4]</sup>

Four approaches exist in the clinical management of cystic echinococcosis (CE): surgery, percutaneous techniques and drug treatment for active cysts, and the “watch and wait” approach for inactive cysts. Allocation of patients to these treatment options should be based on cyst stage, size and location, available clinical expertise, and comorbidities.<sup>[5]</sup>

## 2. MATHERIAL AND METHODS

A female patient, 61 years old, without past surgical or medical history, was transferred from the Department of Gastroenterology due to diagnosed cystic liver disease. She complained to pains in the upper right abdominal part that are moving to the right shoulder. During the hospitalization she complained to have a dispnea and cough with the white-yellow coloured sputum. The abdominal CT revealed in both liver parts several cystic formations density of fluid, the largest in diameter of 10 centimeters (cm).Thoracal CT showed cystic formation in laterobasal part of the right lung, 3 cm in diameter. ( Figure 1.)

Some of the liver cysts made the compression to the right hemidiaphragm.

Thoracal CT revealed 3 cm large cystic formation with the maior amount of pleural fluid as well as minor pericardial fluid collection.

Serum serologic testing for antibodies against hydatid antigens was positive and the eosinophilia was found in the specific blood exams.

In her anamnesis the patient had no any farm exposures but had a dogs as a pets.



**Figure 1** Thoracal and abdominal computed tomography showing the simultaneous pulmonary and liver cyst

### 3. RESULTS

The patient was put on seven-days albendazole therapy. After the usual patient preparation the pneumoperitoneum was made. Laparoscopic abdominal cavity inspection showed five liver cystic formations in segments 5,6,7, and 8, which prominated to the liver surface. (Figure 2.)

Conventional laparoscopic rigid instruments were used. Prior to the liver cysts unroofing the 20% hypertonic saline was injected and aspirated from every single cyst.

Due to large number of cystic liver formations percutaneous aspiration and injection was not previously attempted.

The cystic formations were unroofed using the Harmonic scalpel. Internal cystic walls were extracted and sent to the pathology. (Figure 3.)

The liver parenchym was checked for hemostasis and biliary leakage. The abdominal drain was placed in the right subhepatic space.

The patient was now put in the left decubital position. Using the two lumen Carlens tubus the right lung was excluded.

Right video-assisted thoracoscopy (VATS) was performed. Using the vascular stapler we performed the edge resection of the lower right pulmonary part.

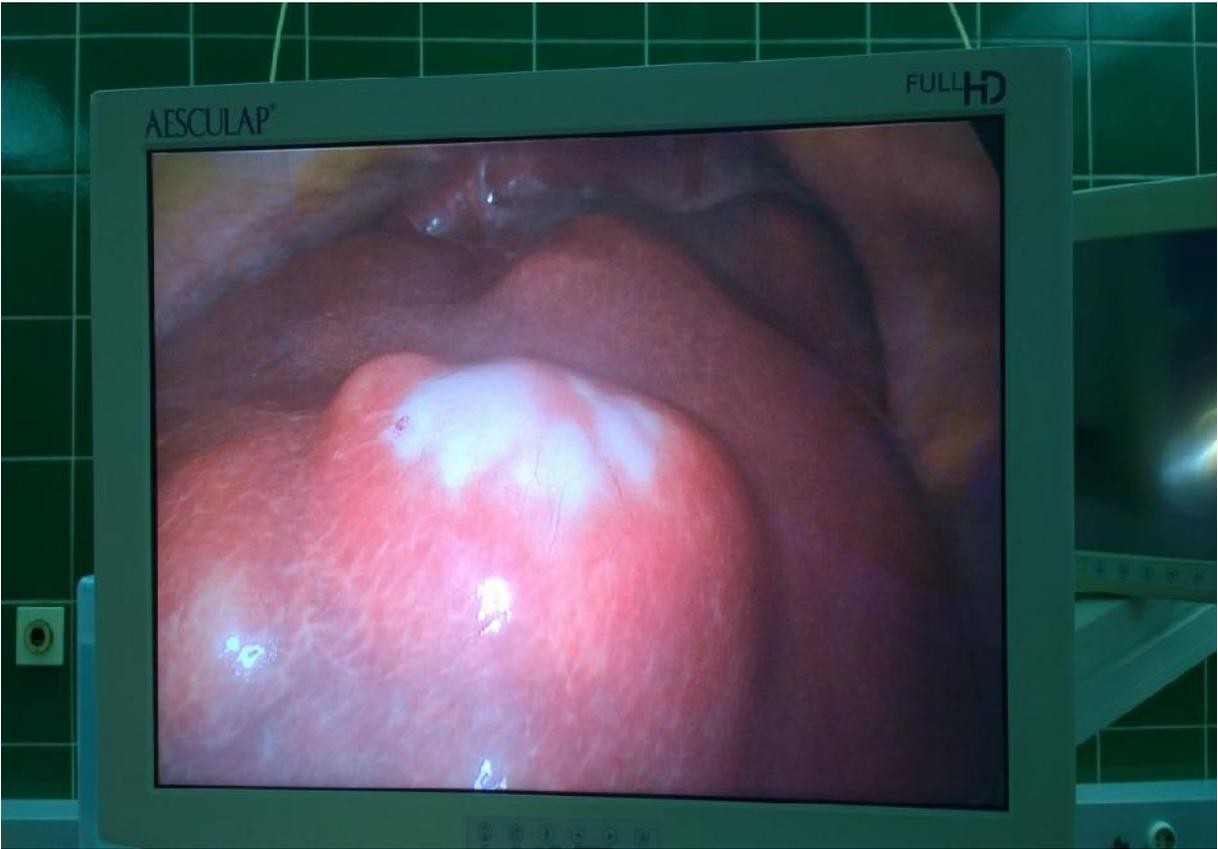
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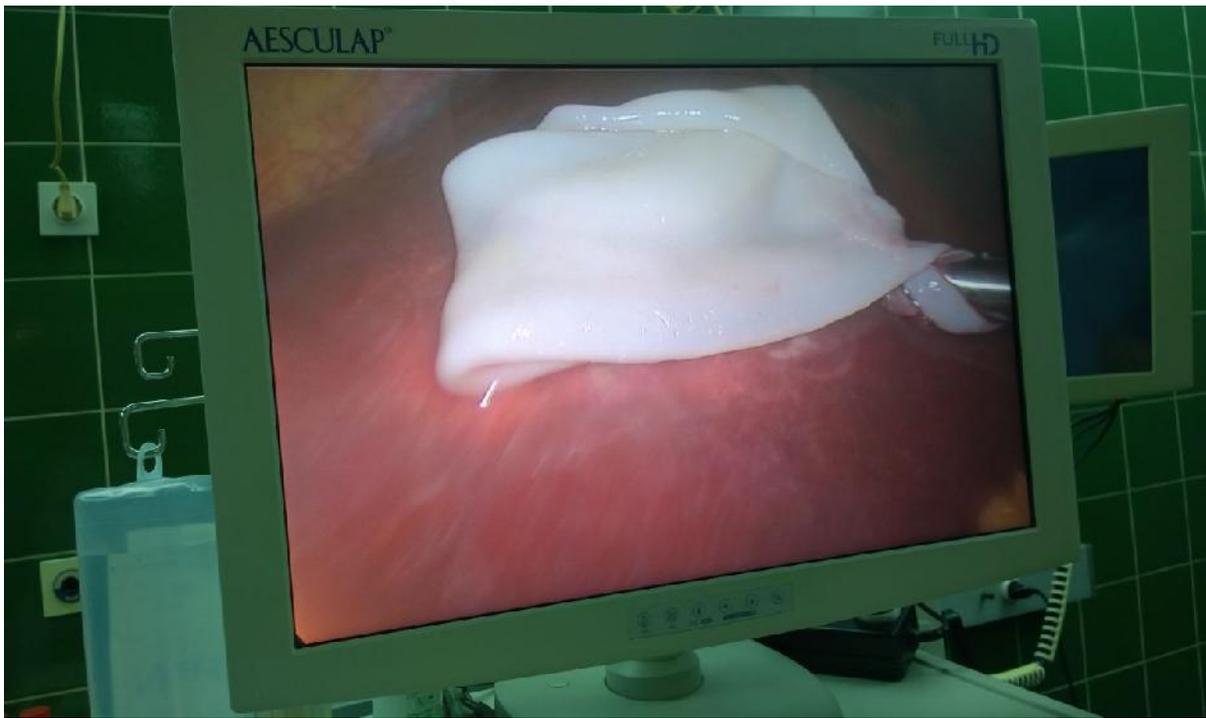
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**Figure 2** Laparoscopic view of multiple liver cystic formations



**Figure 3** Cystic internal membran sent to the pathology

Hemostasis and air leakage were addressed and the patient was put on right pleural cavity suction. The albendazole therapy was continued. The procedure took for a 180 minutes. No postoperative complications were observed. Repeat abdominal US and abdominal and thoracic CT-s are used in continued follow-up surveillance.

#### 4. DISCUSSION

Synchronous pulmonary and hepatic CE may occur in 4% to 25% of cases. <sup>[6]</sup>

Up to 20%-40% of infected people have multiple cysts.

Anaphylaxis complicated 10% of all intraperitoneal ruptures and the other complications are rupture in the biliary tree with secondary cholangitis, biliary obstruction by daughter cysts, portal hypertension, ascites, intracystic or subphrenic abscess formation, development of a bronchobiliary fistula. <sup>[7]</sup>

The goals of hepatic CE treatment are a complete elimination of the parasite and prevention of recurrence, minimizing mortality and morbidity risk. A stage-specific approach is recommended.

Surgery is still the first choice for large CE cysts with multiple daughter cysts or for single superficial cysts, considering the likelihood of spontaneous or traumatic rupture, when percutaneous treatment is not available.

Presence of complicated cysts, e.g., infected cysts or cysts communicating with the biliary tree, and cysts exerting pressure on other vital organs, are other indications for surgical approach.

Surgery is contraindicated in patients whose preexisting medical conditions put them at risk or in patients having inactive asymptomatic cysts or multiple cysts which are difficult to access. If feasible, surgical removal of hydatid cysts has the best chance to completely remove cysts and to immediately cure CE.

Palliative liver surgery is almost always contraindicated, because it does not offer advantages when compared with conservative treatment.

Liver transplant (LT) has been employed in otherwise terminal cases. Indications for LT are the presence of severe liver failure or recurrent life-threatening cholangitis and the inability to perform a radical liver resection. The absence of extra-hepatic CE localizations is mandatory for LT.

Radical procedures are associated with a lower risk of recurrence, but also with a higher operative risk.

Major complications of surgery are postoperative hemorrhage, cholangitis, sepsis and fistulae formation. Operative mortality varies from 0.5% to 4%.

Conservative procedures, on the contrary, are easier to perform but have a higher likelihood of recurrence. Recurrence is usually due to either inadequate cyst removal or to previously undetected cysts, reported recurrence rates range from 2% to 25%.

Whichever technique is used, a benzimidazole (BMZ) agent is usually used to reduce the risk of anaphylaxis and secondary CE. BMZ is administered from 1 d before surgery to 1 month after surgery but, again, no conclusive data about the best timing are available.

Percutaneous treatment (PT) of hepatic CE can aim at the destruction of the germinal layer or the evacuation of the entire endocyst ("modified catheterization technique")

Puncture, aspiration, injection and re-aspiration (PAIR) consists of four steps: percutaneous puncture of the cyst using ultrasound guidance; aspiration of the cyst fluid; injection of a protoscolicidal agent, 95% ethanol or 20% NaCl for at least 15 min, and re-aspiration of the fluid.

PAIR is indicated for a cysts > 5 cm. PAIR has also been used for patients who refused surgery or relapsed after surgical treatment. It is contraindicated for inaccessible or superficially located liver cysts and for inactive or calcified cystic lesions. There is the possibility of secondary echinococcosis which can be minimized by concurrent treatment with benzimidazoles. <sup>[7]</sup>

The disadvantages of this method include dissemination of daughter cysts and fatal anaphylaxis. <sup>[8]</sup>

Laparoscopic approach along with its inherent benefits provided the access to difficult areas along with controlled drainage without adding to the existing morbidity. <sup>[9]</sup>

The indications for surgery in pulmonary hydatidosis include large cysts that are superficial and likely to rupture, infected cysts, cysts in vital anatomical locations, and cysts exerting substantial mass effect.

The goal of surgical intervention includes removal of the entire cyst while preserving the lung parenchyma as much as possible and without allowing intraoperative spillage. <sup>[10]</sup>

Due to multiple liver cysts and considering the pulmonary cyst we performed laparoscopy and VATS.

The postoperative course went without any complications and the patient was after five days returned home.

#### 5. CONCLUSION

The key concept of CE treatment is to adopt a multidisciplinary approach to disease. Surgery and chemotherapy are the cornerstones of CE treatment and a stage-specific approach is recommended. Surgery is still the first choice for large CE cysts with multiple daughter cysts. All patients should be monitored by US at frequent intervals and CT and/or MRI at intervals of 2-3 years, to

evaluate disease recurrence or progression. We believe that using the laparoscopy and VATS, respecting the stage-specific approach and using the chemotherapy, is successful way to treat synchronous liver and pulmonary CE.

## SUMMARY OF RESEARCH

- 1.The goals of hepatic CE treatment are a complete elimination of the parasite and prevention of recurrence, minimizing mortality and morbidity risk. A stage-specific approach is recommended.
- 2.Surgery is still the first choice for large CE cysts with multiple daughter cysts or for single superficial cysts, considering the likelihood of spontaneous or traumatic rupture, when percutaneous treatment is not available.
- 3.Laparoscopic approach along with its inherent benefits provided the access to difficult areas along with controlled drainage without adding to the existing morbidity.

## FUTURE ISSUES

We believe that the more research should be published about individualized and stage-specific approach.

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