

EVALUATION OF 236 PATIENTS WITH PULMONARY CYST HYDATID TREATED WITH PARENCHYMAL PROTECTIVE SURGICAL TREATMENT

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[La valutazione di 236 pazienti con cisti idatidea polmonare trattato con trattamento protettivo parenchimale chirurgico]

ABSTRACT

Introduction: Hydatid cyst is a parasitic disease 99% of which is generated by *echinococcus granulosus*. The disease usually affects the liver and lungs. In rare cases, other organs are involved. However, hydatid cyst, may settle in more than one organ, in more than one focus in the same organ or even on both sides in the lung in patients. Therefore, surgical methods which will protect the organ it is settled and the parenchyma for the lung as much as possible should be used.

Material and method: Two hundred and thirty six patients operated in Şanlıurfa Balıklı Göl State Hospital and Harran University Faculty of Medicine Clinic of Thoracic Surgery between 2007 and 2012 were included in our study. Of all the patients, 99 were male and 137 were female. The average age was 26.58 and the eldest patient was 76 and the youngest was 3.

Results: There were a total of 298 cysts in 236 patients. The most common location of cysts was detected to be the right lower lobe surgical approach applied to 236 patients was determined by the location of the cyst. Of all the 298 cysts, cystotomy-capitonnage was performed in 258 (86.5%). Only one patient had lobectomy due to massive hemoptysis. Peripherally located small-size cysts were applied wedge resection with steap. Segmentectomy was performed only in 3 patients. After the surgical procedure, a total of 7 recurrence occurred, 3 of which were in the lung and 4 were in the liver.

Conclusion: Based on the results of our study, we basically have two claims. The first is that resection should not be considered and parenchymal protective surgery should be applied even by considering cyst size and when there are multiple cysts in the same lobe. Our second claim is that approach to especially peripheral, small and a large number of cyst hydatids should be performed in the form of wedge resection with the help of steap due to the fact that it severely reduces complications such as especially empyema, pneumonia and prolonged air leak.

Key words: Cyst hydatids, parenchymal protective surgery, wedge resection.

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Introduction

Hydatid cyst is a parasitic disease 99% of which is generated by *echinococcus granulosus*. It is seen endemically in Mediterranean countries, South America, Australia, New Zealand, Canada, Middle East and North Africa, where sheep and cattle are raised, in the world. It is a characteristic of workers of animal husbandry and of those who do not pay attention to sanitation⁽¹⁻³⁾. The disease usually affects the liver and lungs. In rare cases, other organs are involved. In this disease, human is the

intermediate host and carnivorous animals are the main host. Transmission from animals to humans is through the digestive tract. Eggs opened in duodenum passing to portal vein and the liver, to both lungs from here through the inferior vena cava and to the heart from here, and spreads to every organ by the systemic circulation⁽⁴⁾. The optimal rate of killing parasites is provided if albendazole is given in 3 cycles in 28 days preoperatively and postoperatively. In soft tissues such as especially the lung, however, it is said that after the use of albendazole, the cyst wall gets thinner and then the cysts are rup-

tured and spread. In this case, especially in people without a regular drug use, pulmonary hydatid cysts erupt before they become non-infectious. In the lung without a natural solid organ buffer preventing the spread of the cyst unlike liver or spleen, erupting cysts are known to settle in new areas in the lung. Therefore, the first form of treatment in pulmonary hydatid cysts is surgery.

Surgical treatment methods applied in the lung are cystotomy, cystectomy and capitonnage, pericystectomy, wedge resection, segmentectomy and lobectomy. However, hydatid cyst, may settle in more than one organ, in more than one focus in the same organ or even on both sides in the lung in patients. Therefore, surgical methods which will protect the organ it is settled and the parenchyma for the lung as much as possible should be used.

In this study, we retrospectively reviewed surgical methods and results applied to 236 patients operated due to pulmonary cyst hydatid.

Material and method

In our study, 236 patients operated in Şanlıurfa Balıklı Göl State Hospital and Harran University Faculty of Medicine Clinic of Thoracic Surgery between 2007 and 2012. Of all the patients, 99 were male and 137 were female. Female/male ratio was calculated as 1.38. The average age was 26.58; the eldest patient was 76 and the youngest was 3.

In all patients, computed tomography was used as a radiological diagnosis method in addition to chest x-ray. Chest pain was the most common symptom in patients. Fever was the second most common symptom. It was followed by a dry non-productive cough and dyspnea. Ruptured patients complained of sour water coming into the mouth. In rupture patients, there were signs of bronchospasm due to allergic reaction. It was detected that bronchoscopy was made to 7 patients for diagnostic purpose before surgery by chest diseases clinic. Bronchoscopy has not been made to any patients by us.

All patients underwent thoracotomy. Muscle protective thoracotomy was usually preferred. No patient underwent sternotomy. Thoractomy was performed to the opposite side in two-sided hydatid cysts with an interval of 6 weeks. Thoracotomy was performed to all patients with settlement of cysts in right lung and liver, and cysts in both lung and liver were operated in the same session. Cystotomy was applied to all cysts in the liver with trans-diaphragmatic approach.

After the application of thoracotomy in patients with settlement of cysts in left lung and liver, laparotomy was performed by general surgery. During cystotomy to pulmonary cysts, these last were inclosed with gauze pads with hydrogen peroxide or iodopovidone after they were visualized. Then, iodopovidone at concentration of 10%, as much as that was taken out from the cyst, was injected into the cysts themselves and we waited for a while. The patient was controlled in terms of bronchial fistula at this stage. Then, cystotomy was performed. In all capitonnages performed after cystotomy, absorbable poly galactin suture was used. Double-lumen intubation tube was used in all patients. Each patient was taken to intensive care unit for short-term follow-up.

Findings: of the 236 patients, there was metastase only in the lung in 166 patients, in both liver and lung in 62 patients, and in an organ except from liver in addition to the lung. There were a total of 298 cysts in 236 patients. The most common location of cysts was detected to be the right lower lobe (Table-1).

Right upper lobe	50
Right middle lobe	35
Right lower lobe	105
Left upper lobe	41
Left lower lobe	67
TOTAL	298

Table 1: Settlement of cysts in the lung according to lobes.

Surgical approach applied to 236 patients was determined by the location of the cyst. Sternotomy was not preferred and after a break of 6 weeks, two-sided muscle protective thoracotomy was performed in 11 patients with bilateral settlement. Of the 62 patients with metastase in the lung in addition to the one in the liver, trans-diaphragmatic thoracotomy was performed in 39 (right lung and liver metastases), both thoracotomy and laparotomy were performed in 23 patients (Table-2).

Only thoracotomy	163
Transdiafragmatic thoracotomy	39
Thoracotomy +Laparotomy	23
Bilateral thoracotomy	11
TOTAL	236

Table 2: Method of approach to cysts.

Of all the 298 cysts, cystotomy-capitonnage was performed in 258 (86.5%). Only one patient had lobectomy due to massive hemoptysis. Peripherally located small-size cysts were applied wedge resection with steap. Segmentectomy was performed only in 3 patients (Table-3).

Cystotomy-capitonnage	238 (79.86%)
Wedge resection	56 (18.79%)
Segmentectomy	3 (1.02%)
Lobectomy	1 (0.33%)
TOTAL	298

Table 3: Process applied to cysts.

After the surgical procedure, a total of 7 recurrence occurred, 3 of which were in the lung and 4 were in the liver. In one of the recurrences in the lung, the recurrence was in left lung while the patient was operated on the right. A patient has died as a result of post-operative respiratory failure and of peritonitis. In another patient, ischemic encephalopathy developed resulting from bronchospasm depending on anaphylaxis and allergic reaction (Table-4).

Exitus	1
Allergy ischemic encephalopathy	1
Atelectasis	10
Abscess-empyema pneumonia	5
Prolonged air leak	6
Wound infection	7
Pneumothorax	3
TOTAL	33

Table 4: Post-operative complications.

Patients were subjected to a 28-day treatment with albendazole during their post-operative follow-up. They were taken into outpatient clinic control quarterly in the first year.

Discussion

The disease known since the times of Hippocrates and Galen was first defined by Thebesius in 17th century and it was referred to as "hydatid cyst" by Rudolph in 1808⁽⁵⁻⁷⁾. The disease is frequently seen in endemic areas where animal care is widespread and no attention is shown

against sanitation. The most common involvement site of hydatid cyst is the liver. After the liver, it most commonly settles in the lung⁽⁸⁻⁹⁾. In most of the studies on hydatid cyst, it has been reported that it was detected significantly higher between the ages 20 and 50 and that the youngest patient was 2.5 and the eldest was 94⁽¹⁰⁻¹²⁾. Pulmonary cysts, in addition to being in both lobes of the lung, often settle in right hemithorax and the lower lobes⁽¹³⁾. When studies on pulmonary hydatid cyst are examined, it can be seen that the settlement rate of pulmonary cysts in the right hemithorax is between 52.7% and 63.2%. It was stated in the studies that 50.1% to 76.7% of the cysts are settled in the lower lobes⁽¹⁴⁻¹⁵⁾. The findings of our study are compatible with these knowledge of literature. Of the 298 cysts, 190 of them (63.75%) settled in the right lung; and 172 of them (57.71%) settled in the lower lobes.

The primary treatment of pulmonary cyst is surgery. Medical treatment may be applied to patients who reject the proposal of operation or who have an obstacle to the operation or who have cysts with multiple settlements. Settlement of cyst may be more than one in cyst hydatid surgery. These settlements may be in different lobes or even in different hemithoraxes. Therefore, the purpose in surgical practice should be to protect the lung tissue as much as possible when taking the cyst away. Looking at the past literature, it can be seen that in the surgery performed in cyst hydatid, number of lobectomy is much higher than it is in present-day.

Studies on pulmonary cyst hydatid show that amounts of radical resection performed (segmentectomy, lobectomy, pneumonectomy) seem to exist in a wide range. In published series of the patients, it is reported that segmental resections were performed between 0% and 6.6%; lobectomy was performed between 0% and 7.4%; and pneumonectomy was performed between 0% and 0.2% (16-17). In our study, only one patient underwent lobectomy and segmentectomy was performed in 3 patients. The wedge resections applied were performed only to peripheric and small lesions. Wedge resections were performed through steap. For this reason, prolonged air leak was observed in 6 of our 236 patients and re-operation was performed to only one of them.

Looking at the data of the entire study, rates of complications and exitus turned out to be low. Prolonged air leak which is considered as the complication affecting morbidity most has been reported to be 6.8-11% in literature⁽¹⁸⁾.

In our study, this ratio (6/236) was found to be 2.54%. We have detected in our study that especially for small cysts with multiple settlements, wedge resections, performed by protecting parenchyma as much as possible with the help of stap, rather than cystotomy and capitonnage, significantly reduce recurrence and prolonged air leak.

Conclusion

Based on the results of our study, we basically have two claims. The first is that resection should not be considered and parenchymal protective surgery should be applied even by considering cyst size and when there are multiple cysts in the same lobe. Our second claim is that approach to especially peripheral, small and a large number of cyst hydatids should be performed in the form of wedge resection with the help of stap due to the fact that it severely reduces complications such as especially empyema, pneumonia and prolonged air leak.

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