



## Evaluation of pulmonary hydatid cyst cases

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### ABSTRACTS

**Background:** The incidence of pulmonary hydatid cyst has been high in developing countries such as Turkey.

**Objective:** The aim of this study was to evaluate the clinical presentation, treatment and outcomes of pulmonary hydatid cyst disease at a tertiary centre.

**Methods:** A total of 138 patients, aged between 9 and 72 years with pulmonary hydatid cyst were diagnosed between 2000 and 2008 in 2nd thoracic surgery clinic at our hospital. Clinical characteristics of patients, epidemiological features, cyst diameters and localizations, laboratory findings, surgical approaches were recorded and analyzed.

**Results:** The most frequent symptoms of pulmonary hydatid cyst were chest pain and cough (44.9%, 37.6%). According to cyst size, there was no difference between younger than twenty and older age groups ( $p > 0.05$ ). Twenty-two patients had complicated cyst cases. Most of them were symptomatic (90.9%). Association of complicated cyst with hepato-pulmonary involvement was significantly higher as compared with single hydatid cyst ( $p = 0.01$ ). Cystectomy was performed in 84.05% of patients and post-operative mortality was seen in only one patient due to pulmonary embolism.

**Conclusion:** Association of lung and liver hydatid cyst increased the risk of occurrence of a complicated pulmonary hydatid cyst. Choice of surgical approach had satisfactory results and post-operative mortality was low.

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## 1. Introduction

Hydatid disease, an infestation commonly caused by *Taenia echinococcus*, is still an important health and socio-economic problem in Turkey.<sup>1</sup> Infestation by the cestode, *Echinococcus*, occurs in every continent that has domestic animals. In human beings, who serve as accidental intermediate hosts, infection is acquired by ingesting food or soil contaminated with eggs excreted from the canine, the definitive host. It is endemic in South America, East Africa, Australia, and Mediterranean countries<sup>2,3</sup> and is a health problem especially in eastern and southeastern Turkey.<sup>4</sup> Most cases in the USA and Central Europe occur in immigrants from endemic areas.<sup>5</sup>

Lung is the second localization organ in adults after liver.<sup>6,7</sup> Hepato-pulmonary hydatid cysts, were reported 34.8%.<sup>1</sup> Extrapulmonary and extrahepatic localizations are rarely seen and have been reported in 2.1% of the patients with hydatidosis.<sup>8</sup>

In this retrospective study, our aim was to evaluate the clinical presentation, treatment and outcome of pulmonary hydatid cyst disease at a tertiary centre.

## 2. Materials and methods

According to the records of the Surgical Department at Süreyyapasa Chest Disease and Thoracic Surgery Training and Research Hospital, 138 consecutive patients with hydatid cyst of lung underwent surgical treatment were diagnosed between January 2000 and March 2008 in 2th surgery department. Serum biochemistry results, complete blood counts were done for all patients. Indirect hemagglutination assay was carried out at initially in 93 cases. Chest roentgenogram, abdominal ultrasonography examination and/or chest and abdominal computed tomography (CT) scan were performed to define thoracic and abdominal disease. Demographic and clinical findings, localizations and diameters of cysts, surgical treatment modalities were recorded and analyzed. All patients were called by phone for gathering the information about the study variables (immigration, living of rural or urban area). Only 96 patients were reached.

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Pearson's  $\chi^2$  and Fisher exact test was used to determine the statistical significance of differences among groups of complicated cyst, hepato-pulmonary hydatid cyst (SAS version 10.0; SAS Institute; Cary, NC) and Pearson's  $\chi^2$  test (SPSS version 10.0; SPSS; Chicago, IL).

### 3. Results

There were 138 (aged between 9 and 72 years) pulmonary hydatid cyst (PHC) patients whose mean age was 34.9 years and 19.5%(27/138) of them were under 20 years of age. Fifty-two of 96 patients who were known they had lived in rural areas (54.1%).

The most common symptoms were cough (52/138, 37.6%) and chest pain (62/138, 44.9%). All symptoms were shown in Table 1. Echinococcal antibody titre using the indirect hemagglutination assay was carried out in the initial 93 patients, out of whom only 58 (62.3%) cases had positive results.

One hundred and twelve patients (82.9%) had unilateral lung involvement. Twenty-three patients (17.1%) had bilateral lung cysts. Three patients had pleural effusion. The distribution of lung involvement is shown in Table 2. Thirty-two of 138 (23.1%) patients were found to have hepato-pulmonary cyst (HPC). The percentage of twenty-five hepato-pulmonary involvement patients had multiple cyst Fig. 1. Most of the pulmonary hydatid cysts' sizes were smaller than 10 cm, particularly 2–7 cm in diameter (95/135, 70.3%). There were twenty-three cases with larger than 10 cm cyst size and all of them were seen only in PHC patients (Fig. 2). According to cyst size greater than 10 cm, there was no difference between younger than twenty and older age groups ( $p = 0.1$ ).

Twenty-two complicated PHC were demonstrated in our study. Higher rate of complicated PHC were associated with hepato-pulmonary localization (50%) than with single PHC localization ( $p = 0.01$ ). Most of the complicated pulmonary hydatid cyst cases were symptomatic (90.9%).

All patients underwent a standard thoracotomy with general anesthesia. Cystotomy was performed for cysts deep inside the parenchyma in 116 patients, with needle aspiration for a large cyst within the parenchyma to prevent the implantation of cyst fluid. After removal of the germinative layer, the residual cavity was cleaned with suction apparatus and irrigated with 0.04% chlorhexidine gluconate and the cyst cavity was closed by capitonnage. Twelve patients who had bilateral multiple hydatid cysts were treated with staged thoracotomies at intervals of 1 month. Among 22 complicated patients, eleven and six patients underwent radical surgical procedures, in the form of pulmonary wedge resection and lobectomy respectively, for destruction of the lung parenchyma surrounding the cyst caused by pro-longed compression. Decortication was performed in 5 cases because of pleural complications such as severe pleural thickening and adhesions prevented lung expansion (Table 3). Pulmonary hydatid cyst was treated first in hepato-pulmonary hydatid cyst cases. Post-operative mortality was 0.07 (one patient) due to pulmonary embolism. Post-operative complications were wound infection (2 cases), pro-longed air leak (one case), post-operative hemorrhage (two cases). Wound

**Table 1**  
Clinical symptoms of PHC patients.

	Number of patients	%
Chest pain	62	44.9
Cough	52	37.6
Hemoptysis	35	25.3
Dispnea	29	21
Asymptomatic	22	15.9
Fever	16	11.5
Exporaction of cystic fluid material	11	7.9

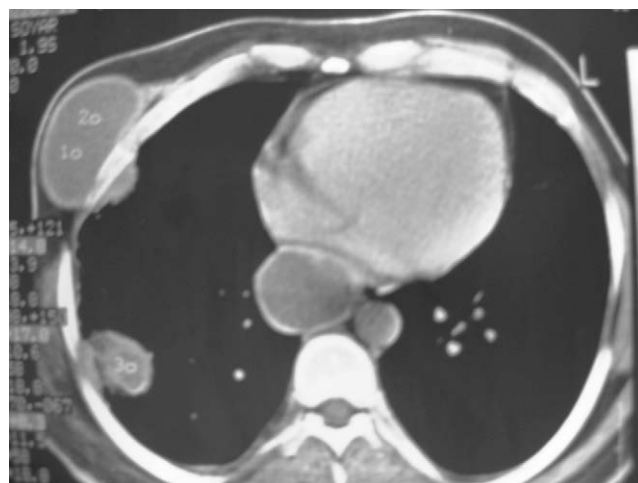
**Table 2**  
Localizations of PHC.

Localization	Number of patients	%
Lung		
Right		
Upper lobe	14	10.7
Middle lobe	13	9.3
Lower lobe	53	38.1
Left		
Upper lobe	13	9.3
Lingual lobe	2	1.4
Lower lobe	48	34.5
Bilateral involvement	12	8.6
Hepato-pulmonary involvement	32	23.1

infection was treated with appropriate antibiotic agents. Histo-pathological examination of all cysts confirmed the diagnosis. The post-operative hospital stay was ranged between 2 and 20 day (mean 8.6 day). Albendazole or mebendazole was administered after operation to all complicated cyst cases. The patients were followed for a period of 1 month to 5 years. Reccurence was detected at 5.07% patients' records.

### 4. Discussion

This infection is more frequently seen in regions where the animal stock market is common. Humans become infested via food contaminated by the eggs within the feces of the primary host. The larva within the gastrointestinal system penetrates the intestinal mucosa and moves to the liver via the porto-caval anastomosis or to the lungs or other organs via the general circulation.<sup>9,10</sup> Pulmonary hydatid cyst is an important thoracic pathology even in non-endemic areas.<sup>11,12</sup> Owing to an increase in worldwide travelling and immigration, thoracic surgeons must be aware of this disease and its management to approaches everywhere.<sup>13</sup> Dogan et al.<sup>6</sup> reported that most of pulmonary hydatid cyst cases (87%) lived in rural parts of Turkey. According to our findings, 54.1% of PHC cases came from rural area. Although cyst hydatids were acquired in childhood, most of them were diagnosed in the 3rd or 4th decade. Tor et al. reported that 31% cases with PHC were below age 20.<sup>14</sup> Only 19.4% of cases were early age group. We thought that Istanbul where our hospital was located was known as a more industrialized northwestern part of Turkey at a relatively low risk of cystic hydatid disease but immigration was common.



**Fig. 1.** Multiple pulmonary hydatid cyst on computerize tomography.



Fig. 2. Giant pulmonary hydatid cyst on computerize tomography.

Cysts once entered the body and have matured in the established organ, they can stay latent for a long time and symptoms may only occur when they grow to a certain size or when complications arise. It has been reported that only 10–19% of patients are asymptomatic. Most common symptoms are cough, chest pain and sputum production.<sup>15–17</sup> While most of the complicated cyst cases were symptomatic (90.9%), according to our results there were 16.4% of cases asymptomatic which was similar with the above literature. Symptoms may be due to perforated and infected cysts, pleural effusion and HPC involvement.

Lungs and the liver are the organs involved frequently in hydatid disease. The liver in adults and the lungs in children are the predominant sites.<sup>15</sup> As reported in the literature, cysts in two-thirds of patients are unilateral and/or solitary.<sup>2,18,19</sup> However, recently it has been noted that there is an increase in the patients with multi-organ localization and multiple cysts.<sup>18</sup> Hydatidosis with multi-organ localization, though it is seen in variable organ combinations, expresses predominantly the presence of cysts both in lungs and liver. Hepato-pulmonary hydatid cysts were reported in 8.8–36.5% in different series.<sup>2,8,18,20</sup> In our study, the rate of HPC cases was 23.1% whereas, complicated pulmonary hydatid cyst cases were significantly predominant ( $p = 0.01$ ).

The elastic capability of lung without any resistance may give rise to the growth of cysts. Halezeroglu et al. noted that cysts larger than 10 cm would be seen in young persons because of the higher tissue elasticity.<sup>21</sup> Aribas et al. noted that the cysts less than 10 cm, mainly 2–5 cm in size were significantly higher in the patients with hepato-pulmonary hydatid cyst cases whereas, those more than 10 cm were higher in the patients of pulmonary hydatid cyst cases.<sup>1</sup> Our findings showed that larger than 10 cm size of cysts located only in PHC. However, there were no significant differences in cyst sizes between older and young age groups ( $p = 0.1$ ).

**Table 3**  
Surgery treatment of pulmonary hydatid cyst cases.

	Patients no	%
Cystectomy + capitonnage	116	84.05
Wedge resection	11	7.9
Lobectomy	6	4.3
Decortication	5	3.6
Bone resection	1	0.7

Surgery is still the treatment of choice. Although cystectomy and cystotomy and capitonnage are commonly applied operative procedures, some patients require major liver and lung resections.<sup>2,6,21,22</sup> Surgery for hydatid cystic disease is associated with morbidity of 0 to 13% and mortality of 0 to 5%.<sup>23</sup> Qian (1988) reported operative mortality of 0.6% in 807 patients.<sup>24</sup> All of our patients were treated surgically. Only one patient had mortality due to pulmonary embolism (0.07%), which could be attributable to our surgical experience.

In conclusion, hydatid cyst is still a healthy problem in urban areas as well as rural areas because of immigration. Complicated hydatid cyst tends to be associated with hepatic involvement. Although lung elasticity decreases with age, hydatid cyst may be in great size regardless of age. Lung preservation surgery should be preferred in pulmonary hydatid cyst owing to get results more satisfactory.

#### Conflict of interest statement

None to declare.

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#### Ethical approval

Approved by ethical committee.

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