

## Hepatic Echinococcal Cysts: 8-Years Follow-Up Study

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### Abstract

**Background:** Until now, Iran has been considered as a high-risk country for cystic echinococcosis. However, it was recently demonstrated by sero-prevalence study that in some parts of southwest Iran (Khorram Abad), up to 15.4% of the people infected by *E. granulosus*.

**Objectives:** The aim of this retrospective study was to evaluate clinical presentation and long-term outcome of patients treated surgically for complicated liver hydatid cysts.

**Materials and Methods:** A total of 145 patients who were operated on for 197 echinococcal cysts at the surgery department of Shohadaye Ashayer Hospital, Lorestan University of Medical Sciences (Khorram Abad) between 2007 and 2015 were evaluated. It included 54 men and 51 women with median age 35.2 years. A computed tomography scan, ultrasound from abdominal and serological test established for diagnosis. Cysts with infection, rupture into the biliary tract and peritoneal cavity were categorized as complicated cysts.

**Results:** Of the 145 operated patients, One-hundred and five (72.4%) patients underwent surgery for hepatic hydatid cysts. Most patients, 86 (81.9%) were intact and uncomplicated. In total, 97/197 (49.2%), the hydatid cysts localized in the right lobe. In the liver cysts, 9 (6.1%) cysts were both ruptured and infected and 5 (3.4%) cysts were ruptured only. Four patients (3.8%) had giant liver hydatid cysts, which were equally and/or more than 10 cm diameter and had hepatomegaly. Wound infections developed in 6 cases (5.7%) and resolved with local treatment. A positive association between sex and the distribution of the cysts in lobes was observed and the difference between the distribution of the cysts in the lobes and age groups and residency of patients was not found statistically.

**Conclusions:** Complicated liver hydatid disease is frequent and was observed in more than half of patients operated for liver hydatid cysts at our center. Using a surgical strategy aimed at complete removal of cystic and pericystic tissue with simultaneous treatment with albendazole may be preferred owing to lower mortality and morbidity rates and hospitalized time.

**Keywords:** Liver Cysts; Hydatidosis; Echinococcosis; Surgical Treatment; Iran

### Introduction

Cystic echinococcosis, also known as “hydatid cyst”, is one of the commonest important zoonotic diseases of animal and human that arise from eating infective eggs of the cestode *Echinococcus granulosus*. Dogs and other canids are the definitive host for the adult tape worms, whereas livestock (particularly sheep) acting as intermediate hosts and human as aberrant intermediate host [1-8].

The disease is characterized by the development cystic lesion in various organs. Seventy-five percent of all hydatid cysts are found in the liver [9,10]. Patients may be asymptomatic for years and usually present with non-specific complaints. However, at any time any particular hydatid cyst can undergo any of complications which can be life threatening unless treated early [9].

Due to official reports, the annual incidence of human cystic echinococcosis is 1-2000 per 100,000 [8]. The infection has a worldwide distribution and is endemic in several countries including South America (Ecuador), Far East (China), Mediterranean region (Turkey), Africa (Kenya), and Middle East (Iran) [6]. Zibaei, *et al.* [11] studied the prevalence of hydatid cyst and reported *Echinococcus* antibodies (15.4%) among the people in Khorram Abad district, Iran. They are found that the liver was the organ where most of the hydatid cysts (51.7%) were located.

There are currently three treatment options for hydatidosis: surgery, which remains the most deficient treatment, percutaneous aspiration, and medical treatment [12]. Spillage of the cyst contents is very common, despite taking technical precautions. This is the major case of recrudescence, which is seen in approximately 10 percent of postoperative cases. Operative spillage can sometimes also lead to secondarily disseminated intraperitoneally echinococcosis [13].

In the present study, we respectively evaluated patients with hepatic echinococcosis treated operatively in order to study of the clinical presentation and surgical management of complicated hydatid cyst of the liver.

### Materials and Methods

A retrospective review was made of one-hundred cases with hepatic echinococcosis, who were treated surgically in the division of surgery, Shohaday-e-Ashayer Hospital, Lorestan University of Medical Sciences, between October 2007 and December 2015. The total number of patients included in the study was 54 men and 51 women, whose ages ranged between 5 and 82, years with an average of 35.2 years.

All patients were evaluated with a history and physical examination and blood tests including a complete blood count and serum chemistries. Radiologic examinations were investigated by abdominal radiography or upper abdomen computed tomography (CT) scan and ultrasonography.

Patients were operated on after a preoperative course of 10 - 14 mg/kg albendazole for 3 - 6 months to achieve sterilization and decrease the risk of recurrence in case of intraoperative spillage, except in patients with peritonitis due to intraperitoneal rupture, who were taken for immediate surgery. The choice of operative procedure was guided by the size and location of the cyst and the presence of complication. Cysts with rupture into peritoneal cavity and biliary tract and infection were categorized as complicated cysts.

### Results

Of the 145 operated patients, 105 patients (72.4%) were diagnosed for liver hydatid cysts, 31 cases (21.4%) pulmonary hydatid cysts and 9 (6.2%) extra pulmonary hydatid cysts during an eight year study period at the surgery department, Lorestan University of Medical Sciences in Khorram Abad, southwest Iran. Due to age groups, patients between 20-29 years dominant significantly with 35 cases (33.3%). Age groups less than 20 years old (between 0 - 9 and 10 - 19 years old) were almost equally presented (3.8 percent). Sixty-five patients from the urban and 40 from the rural populations, with common symptoms such as abdominal pain, abnormal abdominal tenderness, hepatomegaly with an abdominal mass, jaundice, fever and/or anaphylactic reaction a history of contact with dogs presented at the clinic. Thirty-three patients were farmers and 23 were students (Table 1).

In terms of distribution the lesions, a total of 197 cysts were found in 145 patients. In 97 (49.2%) of subjects, ultrasonographic or CT scan examination of the upper abdomen showed that the cysts were predominantly located in light lobe (Table 2).

Factors	No. (%) of patients	P - value <sup>†</sup>
<b>Age group (years)</b>		
< 10	4 (3.8)	> 0.05
10 - 19	4 (3.8)	
20 - 29	35 (33.3)	
30 - 39	16 (15.2)	
40 - 49	14 (13.4)	
50 - 59	15 (14.3)	
60 - 69	10 (9.5)	
≥70	7 (6.7)	
<b>Sex</b>		
Female	51 (48.6)	> 0.05
Male	54 (51.4)	
<b>Residence</b>		
Rural	40 (38.1)	> 0.05
Urban	65 (61.9)	
<b>Occupation</b>		
Farmer	33 (31.4)	< 0.05
Student	23 (21.9)	
Housewife	17 (16.2)	
Other	32 (30.5)	
<b>Schooling level</b>		
Illiterate	13 (12.4)	
Primary	17 (16.2)	> 0.05
Secondary	44 (41.9)	
More than high school	31 (29.5)	
<b>Total</b>	105 (100)	

**Table 1:** The epidemiological and demographical factors in the patients.

<sup>†</sup> Significance by the  $\chi^2$  test

Location	No. (%) of patients
Liver cysts	
Right lobe	97 (49.2)
Left lobe	50 (25.4)
Pulmonary cysts	41 (20.8)
Extra cysts	9 (4.6)
Total	197 (100)

**Table 2:** Distribution of hydatid cysts.

In the studied population, 86/105 (81.9%) were intact and uncomplicated, postoperative complications were infrequent, and no mortality was seen. Wound infections developed in 6/105 (5.7%) cases and resolved with local treatment. In the liver cysts observed, 9/147 (6.1%) cysts were both ruptured and infected, and 5 (3.4%) cysts were ruptured only. In the hepatic patients, 4/105 (3.8%) patients had giant liver hydatid cysts, which were equally and/or more than 10 cm diameter and had hepatomegaly. In 9/105 patients (8.6%), there were concomitant pulmonary echinococcosis.

A positive association between sex and the distribution of the cysts in lobes of liver was observed ( $P = 0.036$ ). The difference between the distribution of the cysts in the lobes and age groups and residency of patients was not found statistically ( $P > 0.05$ ). No recurrences were seen on control abdomen radiography during 8 years of follow up.

### Discussion

A liver hydatid does not form symptoms unless it reaches a large size and shows indications of liver compression or becomes complicated. When a liver hydatid cyst becomes complicated, it can result in serious clinical outcomes. Cysts that rupture or open to the intrabiliary ducts and that become infected develop a number of jaundice, a conditions known as a complicated cyst. Complicated cyst are difficult to diagnose and differentially diagnosis. The diagnosis of hydatid cyst is usually based on a suspicion resulting from an unexpected finding on imaging on routine chest radiographs. More than 90 percent of the patients are diagnosed by radiography. The CT scan and MRI provide the most accurate finding [14]. Other tests, such as complementary fixation, indirect haemagglutination and dermal tests that are of less importance also can be used for diagnostic purpose [15].

Hydatid cysts can be located in various tissues, although they are usually seen in liver and lung [14]. The right lobe is the most frequently attacked area of liver in the hepatic hydatosis. According to our results, localization of the right lobe (97/147, 65.9%) was more frequent than the left. In previous studies, 77% of cysts were localized in the right hepatic lobe [16,17].

The present study showed that more than 90 percent of patients had single organ involvement. During an eight year study, a more part from the total of 145 patients that operated, were diagnosed with liver echinococcosis and aged group from 20 to 29 years.

There are various opinions regarding the medical treatment of hydatid cyst, but is not the ideal treatment for hydatid cyst of the liver when used alone. Therefore, drug therapy should be performed only in inoperable patients, and we do not recommend the use of anti-helminthic drugs during the preoperation period [18]. Response to medical treatment such as albendazole and mebendazole is apparently related to the thickness of the cyst wall, which the drug must penetrate to reach the germinal layer [19]. The failure rate of this therapy and the recurrence rate after the treatment is discontinued are apparently high [20]. Medical therapy was not applied routinely to prevent the possibility of relapse. Considering the efficiency in lower dose, shorter treatment period and fewer side-effects, albendazole was preferred to mebendazole [21].

Reports on the application of PAIR (puncture, aspiration, injections, and respiration) technique that used in hepatic hydatidosis, are insufficient with limited patients number [22]. Approximately 40 - 80% of patients with cystic echinococcosis have single-organ involvement and harbors a solitary cyst [23,24].

The surgical treatment of cystic echinococcosis is usually satisfactory. Recurrence rates were reports between 4.6 to 22% in the literature, and mortality rate associated with the operation were reported as 0.5 - 4.5% [25, 26].

### Conclusion

In conclusion, hepatic hydatid disease, which particularly endemic in our region, is a public problem. The disease can progress a symptomatically for a long time and can occur alongside various other diseases and disorders such as jaundice, urticaria and erythema, Tender hepatomegaly, ascites, abdominal pain and weight loss. The prevention of cystic echinococcosis is more important than treatment may

be applied in inoperable cases or after surgery to avoid a relapse as an adjunctive therapy. Surgery is the treatment of choice for hepatic echinococcosis. Conservative surgical methods that preserve liver parenchyma are usually preferred. However, simultaneous surgical approaches involving two or three organs may be preferred owing to lower mortality and morbidity rates and hospitalized time.

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