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## To study clinical profile and management of hydatid cyst of liver in patients attending tertiary care hospital

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### Abstract

**Background:** The hydatid cyst is unique and localized in the right lobe of the liver in 65%. The most frequent extrahepatic locations are the lungs, the spleen and the peritoneum. Liver (55-70%) is the obvious first site after entry through the gut and passage in the portal circulation. Most cysts tend to be located in the right lobe. Hence this study has been undertaken to study various types of clinical presentations and different modalities of treatment.

**Objectives:** To study the various types of clinical presentation of Hydatid cyst of liver and its different modalities of management and To analyze mortality and morbidity due to Hydatid cyst of liver, To study the commonest causative species of Echinococcosis.

**Materials and Methods:** The patients attended surgical OPD and got admitted with hydatid cyst of Liver during the study period. Patients presenting with varying gastrointestinal symptoms and signs, and symptoms of space occupying lesions of liver like pain abdomen, obstructive jaundice, mass per abdomen, patients with complications due to rupture of hydatid cyst. A total of 60 cases of hydatid cyst of Liver.

**Results and Discussion:** Out of 60 patients, 48 patients underwent surgery (80%). 42 of them underwent complete pericystectomy (87.5%) and 6 patients underwent incomplete pericystectomy (12.5%). Patients recovered uneventfully in post operative period. On subsequent follow up 4 patients were found to have residual disease. One of these patients had undergone complete pericystectomy for disseminated intra abdominal hydatidosis, the other had undergone partial pericystectomy for solitary hydatid cyst in right lobe of liver near the posterior surface.

**Conclusion:** Hydatid disease of liver is a complex and dynamic disease with an evolving phase when the cysts grow, followed by an involution process during which the parasite is gradually dying off leaving behind a solidified, often calcified cyst or a scar. Each successive active cyst stage carries its own risks for serious and even life threatening complications. For complex diseases, no "one size fits all" approach is to be adopted and a stage-specific and resource-specific approach would be deemed necessary.

**Keywords:** Hydatid cyst, liver, pericystectomy, echinococcosis

### Introduction

A hydatid cyst of the liver (HCL), a disease most commonly caused by a tapeworm *Echinococcus granulosus*, is a significant yet neglected public health problem in developing nations [1]. A World Health Organization (WHO) study in 2010 estimated the incidence of cystic echinococcosis per 100,000 population in southeast Asia to be 0.8 (95% uncertainty interval (0.2-2)) [2]. However, it is difficult to quantitate the burden of HCL in Nepal because of several reasons. First, the overall prevalence of the disease is grossly underreported in many epidemiological studies and series because systematic studies and surveys encompassing the entire endemic population have not been performed. Second, the Health Management Information System, Despite these shortcomings, a study by Devleesschauwer *et al.* showed that, between 2000 and 2012, cystic echinococcosis was only behind neurocysticercosis and congenital toxoplasmosis among parasitic zoonosis in terms of disability-adjusted life years [3]. Echinococcosis affects the liver rather than other organs in 50–70 % of cases. While surgery is recognized as the only satisfactory method of treatment for liver echinococcosis (LE), many controversial results have been reported [5] but total excision of the cyst alone or with part of the liver appears to be the most effective. This method is not always feasible, however, since it depends on the size and site of the cyst. Moreover, intraoperative blood loss and postoperative bile leakage from the resected area may occur. A conservative approach of evacuation of the cyst contents may lead to problems of a residual cavity with the subsequent complications of

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biliary fistula, cavity contamination and drainage of purulent material. Various procedures have been developed to overcome these complications such as external or internal drainage following evacuations and capitonnage with or without omentoplasty<sup>[7]</sup>.

There are many studies in the literature both in support of and against radical and conservative approaches used in the surgical treatment of liver hydatid cysts<sup>[17-19]</sup>. Each technique has advantages and disadvantages. It seems that debates on this topic will continue until safe, controlled randomized studies are performed. We thus planned this study to evaluate the clinical characteristics of patients with liver hydatid cyst and different treatment modalities at SIMS, Hyderabad, Telangana, India.

To study the various types of clinical presentation of Hydatid cyst of liver and its different modalities of management.

### Objectives

To analyze mortality and morbidity due to Hydatid cyst of liver.  
To study the commonest causative species of Echinococcosis.

### Materials and methods

**Study design:** Interventional Case series study

**Study setting:** This study was carried out in the Department of Surgery, SIMS, Hyderabad.

**Study period:** January 2017 to July 2019

### Study population

The patients attended surgical OPD and got admitted with hydatid cyst of Liver during the study period.

### Inclusion criteria

Patients presenting with varying gastrointestinal symptoms and signs, and symptoms of space occupying lesions of liver like pain abdomen, obstructive jaundice, mass per abdomen, patients with complications due to rupture of hydatid cyst.

### Exclusion criteria

1. Non hepatic hydatid cyst
2. Advanced complications where diagnosis was difficult

### Sample size

A total of 60 cases of hydatid cyst of Liver.

### Method of collection of data

**Study tool:** Pre tested semi structured Questionnaire.

The Questionnaire was presented in the Department for critical review, following which necessary changes were made in the Questionnaire.

Data was collected using Pre tested semi structured Questionnaire by interview technique. The informants were informed about the study.

For all patients meticulous records was maintained regarding clinical features, family history, dietary habits and by performing various investigations

### Investigations

- Blood routine
- Blood urea
- Serum creatinine
- Liver function tests
- Plain X ray erect abdomen
- USG abdomen
- CT abdomen

### Statistical tests used

1. Proportion
2. Chi square test
3. Mean
4. Standard deviation

**Data entry and analysis:** Using Micro soft excel and Statistical package for social sciences.

**Ethical consideration:** The protocol designed for the present study was submitted to the Ethical committee, after getting clearance from Research Committee, Medical College. Ethical clearance certificate was issued by the institution. Informed consent for the study was obtained.

### Results

**Table 1:** Distribution based on age

Age group	Frequency	Percentage (%)
25 – 29 years	30	50.0
30 – 34 years	02	03.3
35 – 39 years	28	46.7
Total	60	100.0

The most common age group affected was 25 – 29 years seen in 30 patients (50%) followed by 35 – 39 years seen in 28 patients (46.7%) The age of patients range from 25 years to 40 years.

**Table 2:** Distribution based on gender

Gender	Frequency	Percentage (%)
Male	28	46.7
Female	32	53.3
Total	60	100

Study subjects included both males and females. Males constituted 46.7% (28) and Females constituted 53.3% (32).

**Table 3:** Distribution based on occupation

Occupation	Frequency	Percentage (%)
Farmer	46	76.7
Housewife	8	13.3
Student	6	10.0
Total	60	100

Majority of patients were farmers by occupation (76.7%) and some of them were house wives (13.3%) and Students (10%).

**Table 4:** Distribution based on dog contact

Dog contact	Frequency	Percentage (%)
Yes	50	83.3
No	10	16.7
Total	60	100

History of dog contact was present in 50 (83.3%) patients.

**Table 5:** Descriptive statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Hb	60	7.00	13.00	10.86	1.31
Tc	60	2400	15700	7340	2183
Eosiniophils	60	0.1	0.4	0.23	0.07
Bilirubin	60	0.3	1.3	0.74	0.24
AST	60	12.0	42.0	21.15	6.51
ALT	60	10.0	40.0	25.60	7.75
ALKP	60	28.0	149.0	89.54	23.88

The mean Hb was 10.9mg/dl the mean TC was 7341 cells/mm<sup>3</sup>  
The mean eosinophil 0.24% the mean bilirubin was 0.75mg/dl  
The mean AST was 21.2U the mean ALT was 25.7U the mean ALKP was 89.6U.

**Table 6:** Distribution based on number of cyst (USG)

Cyst	Frequency	Percentage (%)
Single	56	93.3
Multiple	4	6.7
Total	60	100

On USG, the proportion of patients with single cyst found were 93.3% (56) and with multiple cyst were 6.7% (4).

**Table 7:** Distribution based on lobe of liver involved (USG)

Lobe of Liver	Frequency	Percentage (%)
Right lobe	50	83.3
Left lobe	6	10.0
Both	4	6.7
Total	30	100

Right lobe was involved in 83.3% (50) of patients; Left lobe was involved in 10% (6) of patients; Both lobes were affected in 6.7% (4) of patients.

**Table 8:** Distribution based on positive USG findings (USG)

USG	Frequency	Percentage (%)
Positive	60	100
Negative	0	0
Total	60	100

The positive USG findings were found in 100% of patients

**Table 9:** Distribution based on chest X ray findings

Chest X ray	Frequency	Percentage (%)
Normal	58	96.7
Abnormal	2	3.3
Total	60	100

Abnormal chest X ray finding was present in only one patient (3.3%)

**Table 10:** Distribution based on erect X ray abdomen

Erect X ray abdomen	Frequency	Percentage (%)
Normal	60	100.0
Abnormal	00	00
Total	60	100.0

Erect X ray abdomen was within normal limits in all patients (100%)

**Table 11:** Distribution based on CT abdomen

CT abdomen	Frequency	Percentage (%)
Done	18	30.0
Not done	42	70.0
Total	60	100.0

CT abdomen findings were corroborative with USG findings in all cases.

## Discussion

Hydatid disease is characterized by cystic space – occupying lesions in the liver, lungs and rarely in other parts of the body<sup>[8]</sup>.

All evidences provided ensure that hydatid disease till now major health problem in spite of modern equipments available for diagnosis and treatment. The surgically confirmed cases are the only reliable source of data on human hydatidosis, since hydatid infection is a notifiable disease, and it is difficult to determine the specific source of infection and its usually impossible to know when the infection was acquired this may be due to the fact that cysts are usually slowly growing and the development of symptoms or the ability to diagnose the conditions may require from 6 months to several years after exposure to the infections<sup>[9]</sup>.

Fertile Hydatid cysts are formed in intermediate hosts (human and herbivores) producing protoscolices, at their germinal layers. Infertile cysts are also formed, but they are unable to produce protoscolices. The molecular mechanisms involved in hydatid cysts fertility/infertility are unknown. Nevertheless, previous work has suggested that apoptosis is involved in hydatid cyst infertility and death. On the other hand, fertile hydatid cysts can resist oxidative damage from reactive oxygen and nitrogen species. On these foundations, they have hypothesized that when oxidative damage of DNA in the germinal layers exceeds the capability of DNA repair mechanisms, apoptosis is triggered and hydatid cysts infertility occurs.

There still exists a dilemma of obtaining accurate figures on the prevalence of Hydatid disease, as in the majority of cases the disease manifests with a very few specific signs and symptoms<sup>[10]</sup>. A considerable number of cases present to clinician in an asymptomatic state and the diagnosis will be made incidentally or accidentally. As such, Hydatid disease is an endemic in India. The annual incidence of Hydatid disease per 1,00,000 persons varies from 1 to 200<sup>[11]</sup>. A descriptive study conducted over a period of 3 years i.e. from 2009-2011 at various hospitals and health care centers in 3 districts of Andhra Pradesh [Nandyala (Kurnool dist); Kadapa; Chittoor] revealed 118 cases of Hydatid disease in a strange and peculiar pattern of distribution in accordance with age, sex, occupation, with a varied and unstable clinical picture and anatomical distribution.

In the present study, the most common age group affected was 25 – 29 years (50%) followed by 35 – 39 years (46.7%). This finding was observed in all the other similar studies done by various research workers<sup>[12-14]</sup>. There were some contrast results in other studies, which stated that, it may be anywhere between 2nd to 6<sup>th</sup> decades. This might be attributed to the chronicity and non-specific (asymptomatic) presentation of the disease in majority of cases.

In relation to the sex, Males constituted 46.7% and Females 53.3% which was a similar observation in the majority of studies performed in relation to Hydatid disease<sup>[15]</sup>. Some studies showed a minimal confliction regarding sex distribution, where female preponderance was observed. The distribution of sex was compared with various national and international studies from different parts of the world. Thus, a varied and diverse picture was obtained. The differences in the reports were due to difference in socioeconomic, traditional, cultural variations in different regions in India as well as in other parts of the world. In southern part of India considerable proportion of men are actively involved in livelihood activities of farming, routine labour and animal breeding and agriculture; compared to women, thus are more prone and exposed to infections and diseases. Various animal experiments were performed to relate the distribution of sex<sup>[16-17]</sup>. An interesting finding was male Mice were more susceptible to contact the Hydatid disease than the female species. The basis propounded regarding this result was that, the female goadotrophins (estrogens) have an inhibitory action on level of parasitization, while male hormone

(testosterone) had a little of any such effect or else, might even increase the susceptibility of the host infection [18].

The present study had focused on burden over the society due to the illness of Hydatid disease. The occupation of the individuals were taken into consideration. Majority of patients were farmers by occupation (76.7%) and some of them were house wives (13.3%) and Students (10%).

The higher rate of Hepatic infection may be attributed to the fact that liver acts as a primary filter in the human body and lung is often thought to be the second filter. There was a predominance of single organ involvement over the multiple organ involvement, which was a similar finding in most of the research works done on Hydatid cysts. It is widely accepted that primary cysts are mostly solitary in nature.

In our study USG was able to diagnose hydatid disease of liver in all patients. An abdominal CT was done in 9 patients and findings were corroborative with USG findings and did not provide additional information that could change the management. Hence USG is the investigation of choice as it is cheap and easily available. "Ultrasound" by Benedetti *et al.* highlights the crucial role of USG in management of hydatid disease of liver.

In our study surgery is the mainstay of management of symptomatic hydatid disease of liver. Out of 60 patients, 48 patients underwent surgery (80%). 42 of them underwent complete pericystectomy (87.5%) and 6 patients underwent incomplete pericystectomy (12.5%). Patients recovered uneventfully in post operative period. On subsequent follow up 4 patients were found to have residual disease. One of these patients had undergone complete pericystectomy for disseminated intra abdominal hydatidosis, the other had undergone partial pericystectomy for solitary hydatid cyst in right lobe of liver near the posterior surface.

The remaining 12 patients (20%) were treated conservatively with albendazole drug regimen, reasons being smaller cyst < 5 cms in four cases. One had associated CA rectum and the last had poor general condition owing to compensated chronic liver disease. The following schedule was used Tab Albendazole 400mg twice a day for 28 days, followed by 14 days drug free days. 3 each cycles were given. Patients were monitored at the end of each cycle sonographically for changes in cyst characteristics. No significant changes were observed during 3 cycle therapy. Hence these patients were considered to not have responded to medical therapy [18].

In the immediate post operative period, 1 patient developed bile leak and surgical site infection which was managed conservatively. Another patient developed surgical site infection and one more patient developed bile leak. Both were dealt with conservatively.

### Conclusion

Hydatid disease of liver is a complex and dynamic disease with an evolving phase when the cysts grow, followed by an involution process during which the parasite is gradually dying off leaving behind a solidified, often calcified cyst or a scar. Each successive active cyst stage carries its own risks for serious and even life threatening complications. For complex diseases, no "one size fits all" approach is to be adopted and a stage-specific and resource-specific approach would be deemed necessary.

A variety of techniques, both radical and conservative, are used in the treatment of liver hydatid disease. None of the techniques is applicable alone in the treatment of all cysts. Technique should be chosen based on the characteristics of each cyst, experience of the surgeon and conditions of the medical center will be factors in the choice of the approach. A recent tendency

is to prefer treatment of early stage cysts by minimally invasive methods with less morbidity such as PAIR or laparoscopy. For later stage cases, where these methods are not appropriate, open and radical surgical techniques should be preferred. But regardless of the surgical treatment used in liver hydatid cyst, combination with chemotherapy is the safest and most effective approach.

The key issue in hydatidosis is prevention. Antihelminthic treatment of farm dogs remains currently the best way to reduce the prevalence of the disease. Vaccination of intermediate hosts is making substantial progress and will probably become integral part of eradication programs. This depends on governmental and health organizations policy.

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