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OUTCOME OF HEPATIC HYDATIDOSIS MANAGED BY MINIMALLY INVASIVE AND OPEN SURGICAL METHODS A STUDY FROM A DEVELOPING COUNTRY

Abdul Rashid Ganai, Mohammed Anyees Khanday*, Iqbal Saleem Mir and Zainub Nabi

Post Graduate Scholar House No. 63 Sanat Nagar Govt Housing colony Sanat Nagar Srinagar Jammu and Kashmir India 190005.

***Corresponding Author: Dr. Mohammed Anyees Khanday**

Post Graduate Scholar House No. 63 Sanat Nagar Govt Housing colony Sanat Nagar Srinagar Jammu and Kashmir India 190005.

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ABSTRACT

Introduction: Hydatidosis is a zoonotic parasitic disease caused by the parasite Echinococcus. **Materials and Methods:** 31 patients were operated for isolated hepatic hydatidosis in our hospital and parameters such as presentation of patients, distribution among hepatic lobes, Operative time, Rate of conversion to open technique, Post-operative complications, Hospital stay were assessed. **Results:** Majority of patients belonged to younger age group with the disease being more prevalent in females, dragging pain in right upper part of abdomen being commonest presentation, Right lobe of liver was more commonly involved, patients with external tube drainage had a longer stay in the hospital **Conclusion:** 83.3% cases in our study had single cyst and 16.7% had multiple cysts. Hydatid Serology in our study was positive in 40% cases. Laparoscopic approach was adopted in 68.6% cases and open approach in 33.3% cases. Residual cavity managed by external tube drainage in majority of cases (86.6%) followed by omentopexy (10%) and capitonnage in (3.33%) cases. Majority of complications occurred in patients being treated by external tube drainage with wound infection occurring in 10%.

INTRODUCTION

Hydatid disease (HD), or echinococcosis, is a widespread zoonotic parasitic disease caused by a tapeworm that continues to be a clinical and public health problem worldwide, especially in areas where animal husbandry and subsistence farming form an integral part of community life. Hydatidosis infects a large number of wild and domestic animals and humans, and the larval stage of the disease develops into a hydatid cyst.[1] Hydatid Disease is most frequently caused by Echinococcus granulosus, and the liver is the most commonly involved organ in two thirds of patients, although it may affect any part of the body, either as a primary or secondary event.[2] The life cycle of Echinococcus requires a definitive host, which is often a dog, and an intermediate host, which is commonly sheep. Humans become accidental intermediate hosts when they become infected after ingesting ova passed in dog faeces. During the natural history of hydatid cysts in the liver, several complications may occur, the most frequent and severe of which are secondary infection of the cyst cavity, biliary fistula causing jaundice and cholangitis, and rupture of the cyst into the peritoneal or pleural cavity. The diagnosis is confirmed by non-invasive radiologic imaging. Increasing migration and world travel require that clinicians, radiologists, and surgeons in developed countries have a clear understanding of the diagnosis and treatment of hydatid disease. Surgery is the treatment of choice for complicated cases. In recent years, laparoscopic surgery has been used for uncomplicated cysts located in anterior liver segments. Percutaneous treatment techniques represent an important therapeutic advance in the treatment of hydatid disease. This procedure, suggested when surgery is contraindicated or declined by patients,[1] combines percutaneous aspiration, injection, and reaspiration (PAIR) and is often combined with oral treatment by albendazol (APAIR) Medical treatment alone for univesicular cysts, and in conjunction with surgical and percutaneous techniques, is effective in Hydatid disease is a disease that has been known since antiquity and was described by Hippocrates with the particular term “Liver filled with water” followed by famous Arabian physician Al-Rhazes who wrote on hydatid cyst of liver about 1000 years ago,[3] The life cycle of parasite was acknowledged by Dew et al.[4]

Hydatid disease commonly known as Cystic Echinococcosis (CE) is a parasitic infestation caused by flatworm Echinococcus granulosus. The echinococcus granulosus has been described the most frequent cause of hydatid cyst.[5] Three broad morphological forms of echinococcus are recognised clinically: Cystic echinococcosis caused by Echinococcus granulosus, Alveolar echinococcus caused by Echinococcus multilocularis and Polycystic echinococcus caused by Echinococcus vogeli or Echinococcus oligarthus. Until 2005, only 4 species were recognized but a 5th species

Echinococcus shiquicus has now been described in small mammals from Tibetan plateau, although its zoonotic potential is unknown.[6-9] Hydatid disease is a major endemic health problem in sheep and cattle rearing areas mainly in Mediterranean countries particularly Greece, Middle East, South America and India.[10-11]

Hydatid disease is characterized by cystic lesions occurring in different parts of body most commonly liver (60-70%), lungs (10-15%). Unusual sites of involvement include muscles (3-5%), bones (2-5%), kidney (1-3%), spleen (1- 2%), diaphragm (1%), ovary (0.2%).[10-13]

Aim and Objectives

1) Operative time
2) Rate of conversion to open technique.
3) Post-operative complications.
4) Hospital stay

Inclusion criteria

All diagnosed cases of Liver hydatid disease involving adult age groups requiring surgery.

Exclusion criteria:

1. All non-parasitic cysts including simple cysts.
2. Extra Hepatic hydatid disease.
3. Malignant hydatid disease.
4. Recurrent hydatidosis.
5. Patients aged less than 16 years
6. Any Contraindication to General Anaesthesia
7. Patients with Previous Hepato-Biliary Surgery
8. Patients with Calcified cysts

Methods of data collection

This study was conducted after approval from hospital ethical review committee. The patients were enrolled in the Department of General Surgery Government Medical College Srinagar. All patients, including age group (>18 years) were assessed by detailed history taking and thorough clinical examination.

Apart from base line investigations like CBC, KFT with serum electrolytes, blood sugar, LFT, Coagulogram, Urine routine hydatid serology and chest roentogram, patients were subjected to investigations like Ultrasound abdomen and CECT abdomen and pelvis.

Once the diagnosis was confirmed, Patients were counselled for further management and treatment options available in the institute were discussed with the patient. The patients were managed by surgical techniques as per recent guidelines.

The Patients were followed up for 6 months during the period of study. First follow up was after 1 week of discharge, next follow up was after 2 weeks of discharge then after 1 month followed by 6 months after discharge. All detailed data was entered on a pre- designed proforma and was analysed

Surgical procedure for open approach

With open surgery the abdomen was exposed through right subcostal incision, and the abdominal viscera were examined for potential sites of dissemination. The area around the cysts was packed with swabs soaked with hypertonic sodium chloride solution as a scolecidal agent. The cyst was punctured and the cyst content was aspirated with a 16-gauge needle connected to a 50-mlsyringe through a three-way stopcock; the aspirate was replaced with the scolecidal agent. Then the protruding dome was incised and the hydatic fragments, including the laminated membrane, were removed with a sponge-holding forceps. The residual cavity of the cyst was scrubbed with swabs soaked with povidone-iodine and carefully inspected for biliary communication. Any visible fistulas were sutured with non-absorbable sutures. Cavities were drained with tubes and an additional sub-hepatic drain was placed in all cases to control biliary leakage. Drains were removed on the fifth to seventh postoperative days, and a cavogram was usually obtained before the removal of the tube in order to rule out biliary communication. Patients with prolonged drainage were considered to have biliary Fistulas.

Surgical procedure for laparoscopic approach

The laparoscopic procedure was begun with the establishment of pneumoperitoneum with carbon dioxide after which the abdominal cavity was carefully explored and cysts were identified. Three to four trocars were required for each operation according to cyst locations. Along, 10/12-mm trocar was introduced close as possible to the cyst, and two long strip of gauze soaked with 10% **betadine** solution as a scolecidal agent were placed around the cyst. The cyst was then punctured with a 14-gauge 120-mm insufation needle and the cyst content was rapidly aspirated. At that moment, an additional aspirator tip was placed close to the puncture point to avoid spillage of cyst contents. The cyst cavity was then nearly filled with 10% Betadine solution for irrigation, which was left in the cavity for 5– 10 minutes. In the next step, the cyst wall was opened and the endocyst was evacuated into a specimen-retrieval bag with careful observation of the separation from pericyst. The cystic cavity was re-irrigated with Betadine Solution and the telescope was introduced into the cavity to explore for potential biliary openings and retained daughter cysts. The procedure was completed with partial unroofing, and closed-suction drains were placed into the cysts with subhepatic or perihepatic drains

OBSERVATION AND RESULTS

In our study, the most common age group involved in this disease was 21-30 years (60%), followed by 31-40 years (23.3%%) and <20 years(10%). The age group of 41-50 year had a distribution of 6.67%% and >50 years had 0% as shown in Table 1. The mean age in our study was 31.1±12.38 with range of 18-75 years

Table 1: Age distribution of study patients.

Age (Years)	Number	Percentage
< 20	3	10.00
21-30	18	60.00
31-40	7	23.33
41-50	2	6.67
> 50	0	0.0
Total	30	100
Mean±SD (Range) =31.1±12.38 (18-75)		

Sex distribution

Most of our patients were females 16 (53.33%) and males 14 (46.67%). Male: Female ratio of our study is 1:1.5 as shown in Table 2

Table 2: Gender distribution of study patients.

Gender	Number	Percentage
Male	14	46.67
Female	16	53.33
Total	30	100

History of contact with animals

In our study there was association with dogs or cattle in 12 cases (40%) and in 60% cases no association was seen as shown in Table 3

Table 3: History of contact with dogs or cattle among study patients

History of contact with dogs or cattle	Number	Percentage
Yes	12	40
No	18	60
Total	30	100

Socioeconomic status

In our study most of the patients were from low socioeconomic status which included house wives involved in farming (40%), labourers (26.67%) followed by housewives (16.67%), students (13.33%) and sweeper (1%) as depicted by Table 4

Table 4: Distribution of study patients as per occupation.

Occupation	Number	Percentage
Farmer	12	40.0
Sweeper	1	3.33
Student	4	13.33
Labourer	8	26.67
Housewife	5	16.67
Total	30	100

Symptoms at presentation

In our study majority of patients presented with abdominal pain (86.67%) followed by vomiting (10%) and palpable mass was found in 1 case (3.3%) as shown in table 5

Table 5: Symptoms of hydatid cyst at presentation.

Symptoms	Number	Percentage
Pain	26	86.67
Palpable mass	1	3.33
Vomiting	3	10.0

Prodormal symptoms

In our study majority of patients had no prodormal symptom (60%) followed by fever (26.67%) of cases, malaise was seen in 3 cases (10%) and fatigue in 1 (3.3%) as shown in table 6 below:

Table 6: Prodormal symptoms of hydatid cyst

Prodormal symptoms	Number	Percentage
Fever	8	26.67
Malaise	3	10.0
Fatigue	1	3.3
No prodormal symptom	18	60.0
Total	30	100

Location of hydatid cyst in liver

Right lobe of liver is most commonly involved in 73.33% cases followed by left lobe 16.67% cases and both lobes were seen in 3 (10.0%) cases.

Table 8: Location of hydatid cyst in liver

Lobe involved	Number	Percentage
Right lobe	22	73.33
Left lobe	5	16.67
Both lobes	3	10.0
Total	30	100

Distribution as per number

In our study solitary cyst was found in 25 cases (83.3%) followed by multiple (16.7%) cases as shown in table 7

Table 9: Distribution as per number of hydatid cysts

Number of hydatid cysts	Number	Percentage
Single	25	83.3
Multiple	5	16.7
Total	30	100

Serology of hydatid cysts

In our study Hydatid serology was negative in 18 cases (60%) and positive in 12 cases (40.0%).

Table 10: S*e*rology of hydatid cysts.

Hydatid serology	Number	Percentage
Positive	12	40.0
Negative	18	60.0
Total	30	100

Choice of surgical procedure

Table 11: Distribution of study patients as per type of surgical procedure

Site	Surgical procedure	Number	Percentage
Liver	Lap hydatid cystectomy	20	66 .6
	Open hydatid cystectomy	10	33 .3
Total			100

Residual cavity management

External tube drainage for management of residual cavity was done in 86.6% cases followed by omentopexy in 10 %of cases and capitonnage in 3.3% cases as shown in Table 12

Table 12: Residual cyst management among study patients

Residual cyst management	Number	Percentage
External tube drainage	26	86.6
Omentopexy	3	10
Capitonnage	1	3.3
Total	30	100

Post operative hospital stay

Mean duration of hospital stay was 5.8±2.79 (3-12 days) with prolonged hospital stay in patients being managed by external tube drainage. In 22 cases (73.3%) duration

of stay was 3-5 days, duration was 5-8 days in (20.0 %), and duration was more than 8 days in (6.67%) cases.

Table 14: Postoperative hospital stay (Days) among study patients

Postoperative hospital stay (Days)	Number	Percentage
3-5 Days	22	73.3
5-8 Days	6	20.0
8 Days	2	6.67
Total	30	100
Mean±SD (Range)=5.8±2.79 (3-12 Days)		

Post-operative complications according to management

Table 13: Postoperative complications according to management.

Postoperative complications			Minimally Invasive		Open Surgery	
	No.	%age	No.	%age	No.	%age
Wound infection	3	10 .0	-	-	3	10
Infection of residual cavity	1	3.3	-	-	1	3.3
Prolonged drainage	3	10.0	1	3.33	2	6.66
Cysto biliary communication	2	6.6	**1**	3.33	1	3.33

DISCUSSION

Hydatid disease has been known since antiquity and was described first by Hippocrate.[3] Hydatid disease is a cyclozoonotic disease caused by larval stage of cestode flatworm belonging to genus E. granulosus and family taeniidae.[5]

Our study included 30 patients after fulfilment of inclusion and exclusion criteria. The patients were followed for a period of 6 months. In our study majority 18 patients (60%) belonged to 21-30 year age group followed by 7 patients (23.33%) which belonged to 31-40 year age group, 3 patients (10%) which belonged to <20 year age group, 2 patients (6.67%) belonged to 41-50 year age group. The mean age of patients in our study was 31.1±12.38 with youngest patient being 18 years of age and eldest 50 year of age. Females outnumbered males with 16 (53.33%) females in comparison to 14 (46.67%males). Male female ratio in our study is 1:1.5.

Our study was compared to Rb Mehta et al (1982)[47] in which commonest age group was 21-30 years (27%) followed by 31-40 years (18.8%). Rb Mehta had slight male predominance 56.3% males and 43.7% females. Venukumar (2017)[18] conducted a study in which most common age group affected was 25-29 years (50%) followed by 35-39 years (46.7%) and then 30-34 years (3.3%). In relation to sex males constituted 46.7% and females 53.3%. Thus it signifies that hydatid disease distribution is seen in all age groups but less likely in younger age due to its slow growth. There exists a wide variation in sex distribution due to difference in life style, geographical factors. Female predominance in our study could be explained by their involvement in agricultural and cattle rearing activities.

In our study, history of contact with dogs or sheep was present in 12 cases (40%) and absent in 18 cases (60%). This is comparable to R.N Sibal et al (1974)[48] were history of contact with dogs or cattle was seen in 32.6% of cases. In Sk Bhobhate[49] et al 49.4% of patients gave history of contact with dogs and cattle. This variation in study is due to small sample size of 30 cases. Presence of contact with pets is an important risk factor which plays important role in etiopathogenesis of disease. Poor personal hygiene, use of unwashed vegetables, low socioeconomic status adds to risk in those people who don't have history of contact with animals.

Most of patients in our study were from low socioeconomic status which included housewives involved in farming, labourers. Housewives involved in farming were 40% followed by labourer's 26.67%. G.H Upadhaya et al (1974)[50] also reported that most patients in his study were farmers with low socioeconomic status.

The most common presentation of our study was abdominal pain (86.67%) followed by vomiting (10%) and palpable mass (3.3%). Prodormal symptoms like fever were present in 28.67% cases followed by malaise (10%). In 60% cases no prodormal symptom was seen. Our study was comparable to Ahmet A[51] et al (1999) having 74% patients with abdominal pain and 55% with lump. R.V.S Yadaw et al (1989)[51] showed lump in 85.7% followed by pain in abdomen (61.4%). The variation might be due to the fact that most people in our state take over the counter analgesics and consult doctors late due to ignorance.

In our study most common organ involved is liver (73.3%) followed by omentum (1.1%) and spleen (1.1%). Baran et al (1995) conducted a study in which liver was common organ involved 65% followed by lungs 15%, spleen 2%, Omentum was rarely involved.[12]

Our study showed right lobe harboured cyst in 73.33% cases followed by left lobe 16.67% cases and both lobes 10% cases. This was comparable to study by RVS Yadav et al (1989)[51] 65% cyst were in right lobe and 18% left lobe. Ahmet A et al (1999)[43] study revealed 78% were in right lobe and 13% left lobe. Thus our study is comparable to others and comes to conclusion that right

lobe is involved commonly.

USG was done among our study subjects which revealed 83.3% cases had single cyst and 16.7% had multiple cysts. Venukumar R (2017) revealed 93% had single cyst and 7% multiple cyst.

Our study showed hydatid serology was Positive in 40% cases and negative in 60% cases. It was comparable to Sarkari b et al (2010)[53] in which serology was positive in 40% and negative 60% cases. Serological assay has a complementary role to imaging. Low sensitivity and specificity is seen. Also lack of standardization of immune diagnosis assay contribute to discrepancy in results in different laboratories.

All patients in our study were treated surgically. Laparoscopic hydatid cystectomy was done in 68.6% case and in 33.3% cases open technique was employed. Our study had 26 cases of hydatid liver in which residual cavity was managed by external tube drainage (86.6%), 10% cases omentopexy was done and capitonnage in 3.3%% cases. Study by Ahmet (1999) et al[54] shows 40% underwent external drainage and 13.2% underwent omentopexy. On comparison we found that management of residual cavity with external tube drainage was common procedure adopted to deal with pathology.

In our study group 1 (ETD) wound infection was seen in 10% cases which was comparable to Xynos (1991) et al[53] study where wound infection was seen in 12.2% cases. Infection of residual cavity was seen in 18.8% cases compared to Sozen[54] et al (2011) (12.5%). Prolonged drainage, CBC, recurrence was seen in 6.3% cases. Our study was comparable to Ahmet et al (1999)[41] where CBC was seen in 8.2% and recurrence in 5.9% cases. Wound infection was higher in group

1. Tubes may introduce infection from external environment into body. Wound infection in our study was treated by daily dressings and culture sensitive antibiotics. In our study patients with infection of residual cavity had prolonged drainage of pus from tube.

Our study group recurrence was seen in 0% cases) which was comparable to Ahmet et al[41] (1999) in which recurrence was seen in 6% cases. Wound infection, CBC was absent in this group. It is due to excellent absorption and sealing property of omentum decreasing chances of post-operative bile leak.

Omentum helps in healing of raw surfaces, resorption of serosal fluid and attracting macrophages to septic foci.

Our study group 3(Cp) had wound infection in 10%% cases comparable to Xynos et al[51] where wound infection was seen in 20% cases.

In our study complications were more frequent in external tube drainage group (P<0.05) as compared to omentopexy (P>0.05). Our study was comparable to Ahmet A et al (1999)[41] where significant complications occurred in external tube drainage group (P<0.05).

Mean duration of hospital stay in our study was 5.8±2.79 (3-12 days). Absence of additional tube drain helped in early ambulation and early discharge of omentopexy group patients. Hospital stay was prolonged in patients being treated by external tube drainage in comparison to Ahmet et al (1999)[41]

The present study titled "Clinical profile and surgical management of abdominal hydatid disease in adults – A prospective observational study" was conducted on 30 patients. The following conclusions were made on our observation:

- Majority of patients (60%) in our study belonged to 21-30 year age group and mean age was 31.1±12.38 with youngest patient being 18 year of age and eldest 50 year.
- Females outnumbered males with 53.3% of our patients being female. Male female ratio was 1:1.5.
- History of contact with dogs or cattle was seen in 12 cases (40%).
- Majority of our patients belonged to low socioeconomic status with farming being the main occupation (40%) followed by labourers (26.67%).
- Abdominal pain was the commonest symptom at the time of presentation (86.67%) of cases followed by palpable mass (3.3%) cases.
- Most common organ involved in our study was Liver (93.3%) cases followed by omentum (1.1%) and spleen (1.1%).
- Right lobe of liver was commonly involved in our study in 73.33% cases followed by left lobe 16.67% cases and both lobes 10%.
- 83.3% cases in our study had single cyst and 16.7% had multiple cysts.
- Hydatid Serology in our study was positive in 40% cases
- Laparoscopic approach was adopted in 68.6% cases and open approach in 33.3% cases.
- Residual cavity in our study was managed by external tube drainage in majority of cases (86.6%) followed by omentopexy (10%) and capitonnage in (3.33%) cases.
- Majority of complications occurred in patients being treated by external tube drainage with wound infection occurring in 10% cases followed by infection of residual cavity (3.33%), prolonged drainage in 6.66% and cystoscope biliary communication in 3.33% cases.
- Mean duration of hospital study was 5.8±2.79 (3-12) days with prolonged hospital stay in patients being treated by external tube drainage

CONCLUSION

Hydatid disease can occur in any age group but is seen most commonly in middle age group, females, patients belonging to low socioeconomic status and involved in

farming. Low socioeconomic status, agricultural activities and association with dogs or cattle were risk factors for the disease. Absence of history of contact with pets doesn't rule out the possibility of disease. Liver is most common organ involved. Right lobe is commonly involved. Abdominal pain was the most common presenting complaint. Surgery is the gold standard for management of hydatid disease. Residual hepatic hydatid was treated by external tube drainage, omentopexy, capitonnage. Wound infection and infection of residual cavity were common complications encountered in post-operative period and majority of them belonging to external tube drainage group. Hospital stay was prolonged in external tube drainage group.

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