

Research Article

DOI: <http://dx.doi.org/10.18203/2349-2902.ijssj20162748>

Clinical study of hydatid disease

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Received: 31 May 2016

Accepted: 02 July 2016

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ABSTRACT

Background: Hydatid cyst is zoonosis caused due to *Echinococcus* species *Echinococcus granulosus*. In developing countries like India, Iran, China and Mediterranean countries it is still remains a major problem. It can involve any organ and can mimic almost any pathological condition. Complication associated rather than disease itself, are difficult to treat. Aims was to study about; (1) The major organs involved by hydatid disease. (2) The best treatment modality depending upon the site, size and organ involving the cyst. (3) The preoperative and postoperative complications of hydatid disease.

Methods: Prospective clinical study was conducted on 58 patients. All patients diagnosed as hydatid disease mainly by ultrasound or CT scan and then treated either operatively or non-operatively were included in this study. The choice of surgical procedure was guided by site, size, organ involving the cyst and associated complications. The patients were followed up for a period of 6 months.

Results: The highest incidence was found in 3rd decade (27.59%). It is more common in females (70.69%). Liver is most common organ involved (86.2%). Ultrasonography was the imaging modality of choice for diagnosis. Partial cystectomy with omentoplasty with external drainage was most commonly performed surgery after through irrigation with scolicidal solution. Presence of cystobiliary communications was most common intra-operative complication (22%). The mean duration of stay after surgery was about 9.34 days.

Conclusions: Hydatid disease is still a major problem in rural agricultural population. Surgery is most widely acclaimed procedure for treatment of hydatid.

Keywords: Hydatid disease, *Echinococcus granulosus*

INTRODUCTION

Hydatid cyst is zoonosis caused due to *Echinococcus* species - Cestode parasite commonly known as small tape worms of carnivorous animals. There are predominantly two species affecting the human population; *Echinococcus granulosus* and *Echinococcus multilocularis*. It was first described by Hippocrates as "Liver full of water".¹ With evolving science, advanced diagnostic and treatment facilities and above all better living conditions in developed countries, the disease now being limited only to agriculture and ranch work associated people of Australia,² Latin America, Eastern Europe and New Zealand.²

But in developing countries like India, Iran, China and Mediterranean countries it is still remains a major problem. In India the most affected areas are Central India, Andhra Pradesh and Tamil Nadu.³ It can involve any organ and can mimic almost any pathological condition. Complication associated rather than disease itself, are difficult to treat.²

Although hydatid cysts can be treated by various modalities, like surgery, chemotherapy, and/or percutaneous aspiration, but surgery by far remains the gold standard for treatment among day by day evolving new procedures. It is the only treatment which is applicable over the entire spectrum of disease.

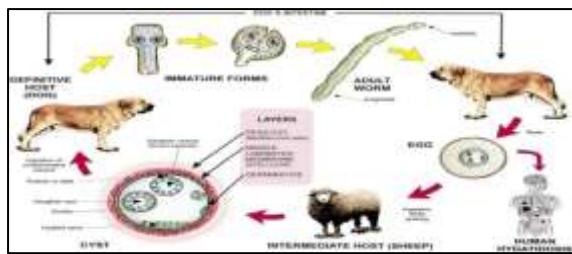


Figure 1: Life cycle of echinococcus granulosus.

METHODS

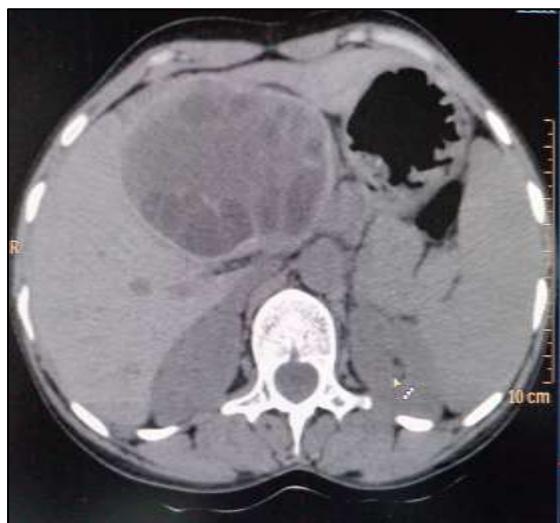


Figure 2: CT Abdomen showing (i) hydatid cyst of liver with multiple daughter cysts.



Figure 2: CT abdomen showing (ii) calcified hydatid cyst of liver.

Prospective clinical study conducted from July 2011-December 2013. All patients diagnosed as hydatid disease mainly by ultrasound or CT scan and then treated either operatively or non-operatively in our institute. All the diagnosed cases

were subjected to detailed history and physical examination with all the base line investigations. Ultrasound remains the main diagnostic modality and CT done only for those cases which are difficult to assess on USG.



Figure 3: Intra-op photo showing bilateral liver hydatid cyst.

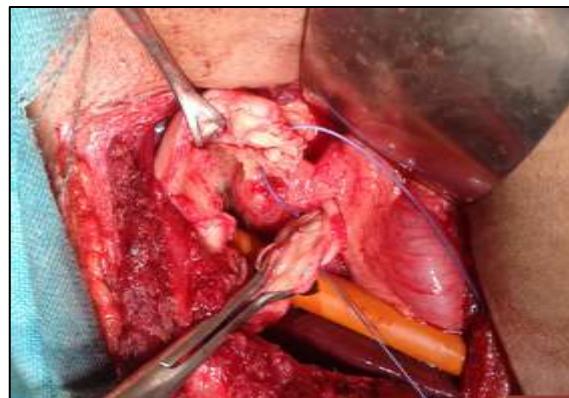


Figure 4: Partial cystectomy with omentoplasty.

Patients were operated after a preoperative Albendazole therapy for 28 days in dose of 10mg/kg and postoperatively all patients were put on Albendazole three course of 28 weeks each with 1 week gap in between. The choice of surgical procedure was guided by site, size, organ involving the cyst and associated complications.

The patients who are unfit for any surgical procedure are started on Albendazole therapy for 6 months, 28 days cycle with 1 week gap in between, in dose of 10mg/kg. The patients were followed up for a period of 6 months. Two times a month for three months, and then monthly. In follow up period, patients were subjected to history, USG and routine investigations.

RESULTS

Table 1: Organ involvement in hydatid disease.

Organ involved	Present study	Hakan et al ⁴ (2001) 446 patients	Polat et al ⁵ (2003) 368 patients
Liver	86.20%	82.7%	74.8%
Lung	10.35%	20.8%	24.1%
Spleen	6.9%	4.27%	0.8%
Omentum and Peritoneum	8.6%	1.12%	3.8%
Kidney	1.72%	1.12%	3.8%
Muscle	1.72%	1.12%	0.8%
Bone	0%	0.8%	0.8%
Brain	0%	1.12%	3.8%
Others	0%	1-2%	1-2%

Table 2: Single or multiple organ involvement.

Cysts	Magistrelli et al ⁶ (%)	Akther et al ⁷ (%)	Present study
Single	87.40%	90.59%	94%
Multiple	12.60%	9.40%	6%

Table 3: Lobe involvement.

Lobe involved	Kalinova et al ⁸	Akther et al ⁷	Present Study
Right	77.95%	62.5%	72%
Left	15.75%	26.13%	24%
Both	6.30%	11.36%	4%

Table 4: Size of liver cyst.

Size of cyst	Kalinova et al ⁸	Chowbey PK et al ⁹	Present Study
Mean size	9.1 cm	9.2 cm	9.4 cm

Table 5: Chief complaints/clinical presentation.

Complaints	Percentage	LAnger et al ¹⁰	Akther et al ⁷
Pain in abdomen	84%	87%	89.47%
Lump in abdomen	50%	59%	85.26%
Jaundice	18%	21%	6.31%
Fever	20%	23%	26.31%
Asymptomatic	0%	13%	

Table 6: Investigation for abdominal hydatid.

Modality of diagnosis	Sensitivity in present study	Pedrosa et al ¹¹ Sensitivity %	Kalinova et al ⁸ Sensitivity %
Ultrasonography	92.72%	98%	90%
Computed tomography	100%	99-100%	98%

Table 7: Investigation for thoracic hydatid.

Modality of diagnosis	Sensitivity in present study	Sharifi Mood et al ¹²
X Ray	66.67%	69%
Ultrasonography	100%	
CT scan	100%	92%

Table 8: Operative modality for Hydatid cyst.

Operative procedure	Present study	Tariq E. Al-aubaidi ¹³	Sarmast et al ¹⁴
Partial cystectomy with omentoplasty	11.12%	46.67%	73%
Partial cystectomy with external drainage	16.67%	47.92%	89%
Partial cystectomy with omentoplasty and external drainage	53.84%	25%	-
Partial cystectomy with evacuation and closure	-	40%	41%
Segmental resection	-	0%	-
Total pericystectomy	-	-	-

Table 9: Comparison with radical surgeries.

Compared to radical procedures	Schmidt-Mattiesen A et al ¹⁵	Alfieri S et al ¹⁶	Present study
Complication rate	38.5%	19%	34%
Mortality	2.27%	1.12%	0%
Recurrence	0%	1.12%	6%

Table 10: Intraoperative complications.

Complications	Langer et al ¹⁰ 35 patients	Silva et al ¹⁷ 30 patients	Present study
Presence of cystobiliary communications	31.42%	50%	22%
Injury to hollow viscera	0%	0%	0%
Contamination of abdominal cavity with scolices	5.71%	6.67%	16%
Anaphylaxis	0%	0%	2%
Injury to biliary tree	0%	0%	0%
Haemorrhage	0%	0%	0%

Table 11: Postoperative complications.

Post-operative complication	Langer et al ¹⁰ 35 patients	Silva et al ¹⁷ 30 patients	Present study 50 patients
Bile leak	33.34%	25%	20%
Biliary fistula	0%	0%	0%
Sub-phrenic abscess	3.34%	0%	0%
Liver abscess	16.66%	0%	0%
Respiratory complications	-	10%	14%
Wound complications	16.64%	4%	22%

Table 12: Delayed complications.

Delayed complications	Present study	Langer et al ¹⁰ 35 patients	Silva et al ¹⁷ 30 patients
Recurrence	6%	8.57%	6.67%
Incisional hernia	4%	-	-

Table 13: Duration of hospital stay.

Duration of stay	No. of patients	Percentage
Less than or equals to 7 days	30	51.72%
8-14 days	23	39.65%
More than 14 days	5	8.63%

DISCUSSION

Hydatid surgeries constitute 2.08% of total major surgeries. Total patients included in study were 58.

The highest incidence was found in 3rd decade (27.59%) followed by 5th decade (24.12%). The disease was found to be, more common in females as compared to males (70.69% in females and 29.31% in males). Hydatid disease is more commonly seen in agriculture related population, but females affected more, belongs to non-agriculture related population. Hydatid disease is more commonly associated with agriculture related cattle in the area, mainly cows, goats, and buffalos as compared to dogs.

Liver is most common organ involved in hydatid disease (86.2%), followed by lung (10.35%) followed by Spleen (6.9%). Kidney, muscle, omentum and peritoneum are rarely involved. These findings are compatible to all the previous studies like Hakan et al.⁴

Single organ involvement was more common (84.49%) than multiple organ involvement (15.51%). These findings are similar to those of previous studies, Akther et al⁷; and Magistrelli et al.⁶

In hydatid disease of liver, most common lobe involved is right lobe (72%) followed by left lobe (24%). Both lobes are involved in 4% of patients. These findings were comparable with previous studies of Akther et al; and Kalinova et al.^{7,8}

The more common involvement of right lobe in liver hydatid could be explained on the basis of:

- Portal vein divided into two halves, and the major portion supplies the right lobe of liver.
- The bulk of right lobe is large as compared to left.

Single liver cyst was present in 94% percent of patients, while in 6% of patients multiple cysts were present. The mean size was calculated by taking the mean of maximum diameter of each cyst. The mean size was 9.4 cm. So the mean size was comparable with Kalinova et al and Chowbey et al.^{8,9}

The main presenting symptom of liver hydatid, was dull aching abdominal pain in epigastrium and right hypochondrium (84%) followed by abdominal lump in about 50%. These results are nearly similar to those in previous studies of Langer et al; Akther et al.^{7,10}

For abdominal hydatid, ultrasound is initial diagnostic modality of choice with sensitivity to accurately diagnose the disease about 92.72% and CT scan is done only for those cases, in which ultrasound fails due to patient related difficulties (for example obesity, excessive intestinal gas,

abdominal wall deformities, previous surgeries) or disease complications.

In our study ultrasonography findings were considered to be further reviewed, by CT scan for four patients due to multiple organ involvement, suspected biliary tract involvement and complexity of disease. The sensitivity of CT scan was about 100% in accurately diagnosing hydatid and acted as important tool for planning operative procedure.

Our study is comparable to both Pedrosa et al and Kalinova et al.^{8,11}

The X-ray was the initial diagnostic modality of choice which usually shows, homogenous round or oval well shaped masses with smooth borders, surrounded by normal lung tissue. But in cases of infection or rupture, diagnosis may become atypical and in such situations CT becomes diagnostic modality of choice.

The two cases in our study, considered negative because X-ray don't shows any well-defined oval or circular margins and one patient had associated pleural effusion. Diagnosis was confirmed and operative intervention made only after CT scan with sensitivity of about 100%.

Our study findings are equivocal with study of Sharifi et al¹⁴, with comparable sensitivity of X-ray and CT scan for diagnosis of thoracic hydatid.

Use of serological tests for diagnosis was not reliable.

Partial cystectomy with omentoplasty was done in patients with simple hydatid cyst without any cystobiliary communications after thorough irrigation with scolicidal solution. External drainage was done for multi-loculated cysts and those with cystobiliary communications. The most common procedure applied was both omentoplasty and external drainage of cysts residual cavity, done for infected, ruptured, or cyst with prominent cystobiliary communications. The scolicidal agent used for irrigation of residual cavity was 2% cetrimide (savlon) in all patients. Results of omentoplasty and external drainage are good as compared to previous studies of Tariq E. Al-aubaidi and Sarmast et al.^{4,13}

The incidence of complications in omentoplasty was about 11.12%; in external drainage was about 16.67%; and in combined omentoplasty and external drainage was about 53.84%. Though the complications were higher in combined procedures, but they are most suitable for complicated hydatid cysts, while omentoplasty is best for simple hydatid cyst of liver.

Presence of cystobiliary communications was most common intraoperative complication (22%), followed by contamination of abdominal cavity with scolices (16%). Anaphylaxis was least common (2%). These findings were comparable to the previous studies conducted by Langer et al and Silva et al.^{10,17}

Out of 11 patients with cystobiliary communications, 10 had bile leak in postoperative period.

Bile leak:

Less than 7 days - 2 patients

Between 8- 14 days - 2 patients

More than 14 days - 5 patients

No bile leak - 1 patient

Contamination of abdominal cavity was observed in 16% of patients and it was mainly in intraoperative period because of rupture and spillage of hydatid cyst during puncture and sometimes due to spontaneous rupture of hydatid at the time of presentation. It was mainly responsible for recurrence of hydatid cyst.

The most common complication in post-operative period was biliary leak (20%) followed by respiratory complications (14%). These findings were comparable to the previous studies conducted by Langer et al and Silva et al.^{10,17}

Most common type of wound infection in post-operative period was stich abscess (8%), followed by localized erythema and induration (6%), partial dehiscence (4%), subcutaneous abscess (2%), and total dehiscence (2%). Post-operative bile leak occurred in patients with prominent cystobiliary communications and who were operated with partial cystectomy and external drainage

Recurrence of hydatid cyst was observed in about 6% of patients of liver hydatid. It was seen in those patients, in which there is either, rupture and spillage of scolices in the abdominal cavity.

Incisional hernia occurred in 4% of patients. In these patients, there was postoperative wound infection which resulted in wound healing and weak abdominal wall. It was managed by mesh hernioplasty in one patient, and conservatively in another with abdominal binder.

Death occurred in study group during intraoperative or postoperative follow up period. These findings

were similar to those of previous studies of Silva et al and Langer et al.^{10,17}

The mean duration of stay after surgery was about 9.34 days. Long duration of postoperative stay was seen in patients with complicated hydatid cysts, patients with prolonged bile leak and after thoracotomy. Newer treatment modalities likePAIR and laparoscopy may also reduce the duration of stay.

CONCLUSION

Hydatid disease is still a major problem in rural agricultural population. Surgery is most widely acclaimed procedure for treatment of hydatid and vary from site, size and organ involved. Good living condition and sanitation with mass education is the most effective for prevention of hydatid disease.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Pothare AN, Deshpande AV, Nandu VV. Clinical study of hydatid disease. *Int Surg J* 2016;3:1564-9.