

SURGICAL MANAGEMENT OF HEPATIC HYDATID CYST IN CHILDREN

**Muhammad Yunas Khan, Muhammad Jehangir Khan, Syed Asad Maroof, Muhammad Uzair,
Muhammad Tariq Khan, Mohammad Ayub Khan, Kifayat Khan**

Department of Paediatric Surgery,
Postgraduate Medical Institute, Lady Reading Hospital, Peshawar - Pakistan

ABSTRACT

Objective: To know the effectiveness of removal of hydatid cyst of liver along with pericyst (pericystectomy) as operative treatment, in terms of intra-operative and post-operative complications in the pediatric age group.

Material and Methods: This study was conducted on paediatric patients with liver hydatid cysts at Department of Paediatric Surgery, Lady Reading Hospital, Peshawar from January 2000 to December 2006. All patients with ultrasound findings for hydatid cyst disease of the liver were included in the study. They were evaluated according to age, clinical presentation, ultrasound and CT scan findings for operative management. After Laparotomy through right transverse incision, half of the contents of the cyst were aspirated, refilled with hypertonic saline solution of the aspirated volume and after waiting for five minutes Pericystectomy was carried out, followed by careful examination and stoppage of any leakage of blood or bile from the residual cavity. In infected cases the cavity was drained.

Results: Out of 21 paediatric patients operated for liver hydatid cysts during the study period, 11(52.4%) were girls and 10 (47.6%) were boys, with age ranging from 4 to 15 years. Cystectomy with tube drainage was performed in 20 patients while in one patient de-roofing was performed because of rupture. Hypertonic saline was used as a scoliocidal agent. There was no operative mortality. The mean hospital stay was 6.5+3.8 days. Recurrence after operation was seen in one (4.8%) patient.

Conclusion: Hepatic hydatid cysts in children can be treated successfully by peri-cystectomy.

Key Words: Hepatic hydatid cyst, Cystectomy, Paediatric.

INTRODUCTION

Hydatid cyst is caused by the larval stage of dog tapeworm called, *Echinococcus granulosus*¹. The ingested ova burrow through the intestinal mucosa and travel to the liver through the mesenteric veins. A few ova may pass the liver and get trapped in the lung. Hydatid disease has been known since Hippocrates mentioned it as "liver full of water" in 400 B.C². Echinococcal infestation is common in sheep raising countries of the world, and hydatid disease is endemic in the Mediterranean region, South America, Australia, New Zealand and Middle east³. Generally the annual incidence of hydatid disease is 12 cases per 100,000 inhabitants in the endemic regions mentioned above⁴. The lung (18% to 35%) is the second most common location for hydatid disease

after liver (50% to 70%) in adults⁵. In children, hydatid disease is found in the lungs in 64% and liver in 28%⁶. This study was conducted to know the effectiveness of removal of hydatid cyst of liver along with pericyst (pericystectomy) as operative treatment, in terms of intra-operative and post-operative complications in the pediatric age group studied in seven years.

MATERIAL AND METHODS

Between January 2000 and December 2006, 21 patients under the age of 15 years with liver hydatid cysts were operated in the department of Paediatric Surgery Lady Reading Hospital Peshawar. All patients were evaluated with history, physical examination and blood tests including complete blood count and serum chemistries. The

CLINICAL FEATURES OF PATIENTS WITH HEPATIC HYDATID CYSTS

Sign / Symptoms	Number of patients (n=21)	% age
Upper abdominal Mass	11	52.38%
Pain abdomen	04	19.04%
Fever	03	14.28%
Liver enlargement	03	14.28%
Asymptomatic incidental findings	03	14.28%
Weight loss	01	04.76%
Jaundice	01	04.76%
Urticaria with shock	01	04.76%

Table 1

positive indirect haemagglutination assay with supportive ultrasound findings and CT scan abdomen were used as the diagnostic tool for liver hydatid cyst disease. Patients were evaluated according to sex, age, symptoms, clinical and radiographic findings, and the method of treatment. Laparotomy was performed by right transverse incision in all patients, with adequate access and with isolation of cyst in the middle of packs soaked in hypertonic solution. Half of the contents of the cyst was aspirated and then refilled with the same volume of hypertonic saline and left in situ for five minutes. The cyst was completely emptied by aspiration, opened and its contents examined and hypertonized to kill the scolices. Where multiple cysts existed all of them were dealt with during the same operation, taking care not to damage excessive liver tissue. All cysts were subjected to histopathologic examination to confirm the diagnosis. Finally all collected information's were recorded and analyzed.

RESULTS

Out of 21 paediatric patients operated for liver hydatid cysts during the study period, 11(52.4%) were girls and 10 (47.6%) were boys, with age ranging from 4 to 15 years. Three (14.3%) patients were incidentally found to have liver hydatid cyst disease and 18 (85.7%) patients were symptomatic. The most frequent symptoms being upper abdominal mass, pain abdomen, fever, liver enlargement, jaundice and weight loss (table 1). The diagnosis was confirmed by indirect haemagglutination assay, ultrasound and / or CT scan abdomen. Indirect hemagglutination assay was positive in 15 cases (71.4%).

The cysts were unilateral in 18 (85.7%) patients, and bilateral in 3(14.3%) patients. One (4.8%) patient had two cysts in the right lobe. In 9 (42.9%) cases ultrasonographic or C.T scan examination of the chest showed lung involvement.

The cysts were predominantly located in right lobe of liver (n=16/21, 76.2%), mostly unilocular, of considerable size and rare calcification of adventitia, but easily distinguishable, making dissection technically feasible (Table 2).

Pre-operatively one (4.8%) patient had infected cyst and another (4.8%) had traumatic intra-peritoneal rupture of the cyst. One patient (4.8%) with traumatic intra abdominal rupture presented with severe anaphylactic shock and urticaria (table 3).

Laparotomy and pericystectomy was performed in 20 (95.2%) patients and only one (4.8%) patient underwent marsupialization of the cyst because of traumatic rupture. Twenty (95.2%) patients were operated on elective list while one (4.8%) patient was operated in emergency department because of traumatic rupture who presented as an emergency. Drains were used in cases where needed.

Intra-operative and early post operative complications included fever in 3 (14.28%) cases, abdominal distension, infection, urticaria and shock in one (4.76%) case each with no case of preoperative/postoperative hemorrhage, adjacent visceral injury or rupture of cyst (Table 3).

Post-operative course in all patients was uneventful with none having any of the complications, such as fistula, leak, haemorrhage or abscess formation. Recurrence after operation was seen in one (4.76%) patient only (table 3). The mean hospital stay in our series was 6.5±3.8 days.

DISCUSSION

Liver is the most frequent site in children for hydatid cyst. However, in literature hydatid cyst is reported to be in the lungs in 64 % and in the liver in 28% in children.^{7, 8} The clinical and radiographic features and distribution of the hepatic hydatid cysts in our patients are similar to other series.⁹⁻¹¹ The pre-operative diagnosis based on ultra-sonographic and / or abdominal CT scan was confirmed per-operatively as well as on histopathology. Cassoni's skin test and Weinberg's complement test are no longer performed because of the high percentage of false positive results.¹² In

LOCATION OF HEPATIC HYDATID CYSTS IN 21 PATIENTS

Location of Cysts	Frequency (n=21)	% age
Right lobe	16	76.2
Left lobe	2	9.5
Both Lobes	3	14.3

Table 2

INTRA OPERATIVE AND EARLY POST OPERATIVE COMPLICATIONS

COMPLICATIONS		Number of cases (n=21)	Percentage of total
Intraoperative and early post operative	Fever	3	14.28
	Abdominal distension	1	4.76
	Infection	1	4.76
	Urticaria and shock	1	4.76
Late Post operative	Recurrence	1	4.76

Table 3

this study the indirect hemagglutination assay was positive in 15 cases (71.4%). Eosinophilia is a non specific finding that can be seen in many parasitic infestations. Thus, we did not use this test.

The current treatment of hydatid cyst is surgical and for uncomplicated liver cysts, percutaneous therapy by puncture, aspiration, injection and reaspiration (PAIR) combined with albendazole treatment is a good alternative to cystectomy and reduce the hospital stay¹³. There is no agreed standard method for laparoscopic treatment of hepatic hydatid cyst. Treatment historically evolved are de-roofing plus tube-drainage, capitonnage, omentoplasty, pecicystectomy and radio frequency thermal ablation of echinococcal liver cysts.¹⁴ The ideal operative treatment is to excise the parasite as well as its adventitia en bloc. As early as 1904, Napalkoff devised this technique of complete cystectomy, but the operation fell into disrepute because when performed blindly, it led to severe haemorrhage with a prohibitive mortality.¹⁵ We consider it the operation of choice when performed under optimal conditions and direct vision. The use of a small gauze swab greatly facilitates the dissection without virtually any blood loss. The post operative course is surprisingly uneventful after extensive and multiple pericystectomies. At the end of the operation the cavity is carefully examined and any blood or biliary leakage is stopped. The cavity is left open without any drainage or using drainage tube which is left for two days. We introduced hypertonic solution into the cavity, but protected the operating field with saline pads. However some investigators do not agree with this because they think that this may cause undesirable complications.¹⁶ Use of albendazole in the pre operative period is not recommended because the parasite in the liver dies, the membranes are retained, and the patient needs operation for recurrent infection.¹⁷ For the same reason, percutaneous aspiration is not suitable for the treatment of hepatic hydatid cysts. Success has recently been reported in uncomplicated hydatid abscess by using

percutaneous aspiration or percutaneous drainage or injection of hypertonic saline.^{18,19} Administration of mebendazole or albendazole 10mg/kg for 4 to 8 weeks may decrease the incidence of recurrence.²⁰

We routinely prescribe albendazole (10mg/kg/day) after all surgically accessible intact cysts have been removed. Debate remains as to weather it is better to treat hepatic cysts by conservative surgery or removing the cyst completely, including the pericysts, by total pericystectomy or by partial hepatectomy. The choice will be heavily influenced by the level of surgical skill and supportive care available.

CONCLUSION

Hepatic hydatid cysts in children can be treated successfully by peri-cystectomy. We recommend pericystectomy with drainage tube plus post operative albendazole therapy. Partial hepatectomy may be avoided especially in paediatric patients because of severe bleeding. Infected cyst must be drained.

RETRENCHES

1. Eckert J, De-plazes P. Biological, epidemiological, and clinical aspects of echinococcosis, a zoonosis of increasing Concern. *Clin Microbiol Rev* 2004; 17: 107-35.
2. Dhaliwal RS, Kalkat MS. One-stage surgical procedure for bilateral lung and liver hydatid cysts. *Ann Thorac Surg* 1997;64:338-41.
3. Battelli G, Mantovani A, Seimenis A. Cystic echinococcosis and the Mediterranean region: A long-lasting association. *Parassitologia* 2002; 44: 43-57.
4. Altintas N. Past to present: Echinococcosis in Turkey. *Acta Trop* 2003; 85:105-12.
5. Harandi MF, Hobbs RP, Adams PL. Molecular and morphological characterization of *Echinococcus granulosus* of human and animal origin in Iran. *Parasitology* 2002; 125:367-73.

6. Eckert J, Conraths FJ, Tackmann K. Echinococcosis: An emerging or reemerging zoonosis? *Int J Parasitol* 2000; 30:1283-94.
7. Craig PS, Giraudoux P, Shi D. An epidemiological and ecological study of human alveolar echinococcosis transmission in south Gansu, China. *Acta Trop* 2000;77:167-77.
8. Del Carpio M, Moguilansy S, Costa MT. Diagnosis of human hydatidosis: Predictive values of a rural ultrasonographic survey in an apparently healthy population. *Medicina (Buenos Aires)* 2000; 60:466-8.
9. Slim MS, Kbayat C, Nasr A. Hydatid disease in childhood. *J Pediatr Surg* 2005; 6: 440-4.
10. Cohen H, Paolillo E, Bonifacino R. Human cystic echinococcosis in a Uruguayan community: A sonographic, serologic, and epidemiologic study. *Am J Trop Med Hyg* 1998; 59:620-7.
11. Dowling PM, Torgerson PR. A cross-sectional survey to analyze the risk factors associated with human cystic echinococcosis in an endemic area of mid-Wales. *Ann Trop Med Parasitol* 2000; 94:241-5.
12. Bartholomot B, Vuitton D, Harraga S. Combined ultrasound and serologic screening for hepatic alveolar echinococcosis in central China. *Am J Trop Med Hyg* 2002; 66:23-9.
13. Filice C, Brunetti E. WHO Informal Working Group on Echinococcosis: PAIR Network. Percutaneous drainage of echinococcal cysts (PAIR-puncture, aspiration, injection, reaspiration): results of a worldwide survey for assessment of its safety and efficacy. *Gut* 2000; 47:156-7.
14. Brunetti E, Filice C. Radiofrequency thermal ablation of echinococcal liver cysts. *Lancet* 2001; 358:1464-7.
15. Erdener A, Ozok G, Demirca M. Surgical treatment of hepatic hydatid disease in children. *Eur J Pediatr Surg* 1992 ; 2:87-9.
16. Kays D. Pediatric Liver cyst and abscess. *Semin Pediatric Surg* 1992;1: 107-14.
17. Ammann R W, Hirsbrunner R, Cotting J. Recurrence rate after discontinuation of long-term mebendazole therapy in alveolar echinococcosis (preliminary results). *Am J Trop Med Hyg* 1990; 43:506-15.
18. Filice C, Pirola , Brunetti E. A new therapeutic approach for hydatid liver cysts. Aspiration and alcohol injection under sonographic guidance. *Gastroenterology* 1990; 98:1366-8.
19. Yamada N, Shinzawa H, Ukaj K. Treatment of Symptomatic hepatic cysts by percutaneous instillation of Minocycline hydrochloride *Dig Dis Sci* 2005; 39: 2503-9.
20. Khuroo MS. Percutaneous drainage versus albendazole therapy in hepatic hydatidosis: A prospective randomized study. *Gastroenterology* 2003;104:1452-4.

Address for Correspondence:

Dr. Muhammad Yunas Khan
 Department of Paeds Surgery,
 Lady Reading Hospital,
 Peshawar.