The Pattern of Hydatid Disease—A Retrospective Study from Himachal Pradesh, India

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Received: 20 July 2009 / Accepted: 5 October 2009 / Published online: 23 November 2010
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Abstract Hydatid disease is a common but little studied disease in Himachal Pradesh, India. This is a retrospective study from the Lady Willingdon Hospital, Manali. 115 patients presenting from April 1996 to March 2007 were included. Outcome measures were mortality and morbidity. 70 patients were female and 46 were male. (One female patient was operated on twice). 78% (n=90) of the occurrences were hepatic. There were other varied sites. There were fourteen pulmonary hydatids. All patients underwent surgical cystectomy. An “AIR Technique” (Aspiration, Injection, Reaspiration) is described for scolical deactivation after March 2003 utilized in thirty two patients. There was no mortality. There were five documented recurrences in our series all of which occurred in cystectomy done without the AIR (Aspiration, Injection, Reaspiration) technique. Hydatid disease is a common disease in Himachal Pradesh warranting a high index of suspicion leading to an early diagnosis. A simple technique called the “AIR TECHNIQUE” (Aspiration, Injection, Reaspiration) is described.

Keywords Hydatid disease · AIR technique · Scolical, deactivation · Himachal Pradesh

Introduction

Hydatid disease is commonly caused by the scolices of *Echinococcus granulosus*. *Echinococcus multilocularis* has been isolated in pulmonary hydatids. The disease is found in communities where animal husbandry is common. It has been reported in large numbers from the Mid Eastern countries [1–3] Australia and New Zealand. In India, the disease has been reported from Chandigarh [5], Varanasi [6], Lucknow [7], Kashmir, Pondicherry [8] and Madurai [9]. Despite animal husbandry being extremely common in Himachal Pradesh, the only review from this mountain state is a report from 1974 [10]. The debate on optimal surgical treatment for this condition still continues. Traditional methods of open cystectomy, omentoplasty, and radical surgery [4, 11] have been compared with laparoscopy [12, 13], percutaneous aspiration [14], and a technique described as the PAIR technique [15, 16]. This technique was further modified and described as a co-axial technique for scoliceal deactivation in high risk sites of occurrence [17]. We review our surgical results of cystectomy and describe an easily constructed non co-axial technique we describe as the “AIR Technique” (Aspiration, Injection, Reaspiration) using easily available materials. We have not been able to find a reference to this technique in the literature.

Materials and Methods

One hundred and fifteen patients presented to the Lady Willingdon Hospital from April 1996 to March 2007 with Hydatid disease. Their demographic details and clinical presentations were noted. The modality of diagnosis and surgical procedure performed was recorded. Most patients were investigated with an abdominal ultrasound and chest

Presentation The contents of this paper was presented at the Annual meeting of the Association of Rural Surgeons of India held at Mahatma Ghandi Institute of Medical Sciences, Sevagram, Wardha, on 15th November 2008.

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X rays. Their course in the hospital was evaluated from the records, and subsequent follow up noted through their course in the outpatient department. Complications arising were noted and follow up ultrasounds performed during their outpatient visits to look for recurrence. There was no structured protocol to examine for recurrence, which is a limitation of this study. The absence of any alternative health service in the region serviced by the hospital could serve as a reliability of representation at this hospital in the eventuality of recurrent problems. This is also the reason why the study is limited to a one year follow up. Patients present to this hospital from as far as three hundred miles away, and their return to the hospital for a routine follow up and regular intervals is an unreasonable expectation. Though presentations were varied, diagnosis was invariably made with in house ultrasonography for abdominal hydatids and with X rays for pulmonary disease. CAT scans, for which referral was necessary, was performed only in three patients. The course in hospital and complications were analyzed. The primary modality of surgery utilized was the hydatid cystectomy in which the cyst cavity was opened after scoliceal deactivation. The scolicedal agent used was hypertonic saline (30%). After March 2003, a technique we describe as the “AIR Technique” (Aspiration, Injection, Reaspiration) was utilized for scoliceal deactivation. Twenty nine subsequent patients with liver disease and three with lung disease were chronologically selected for this procedure. Prior to this the traditional cystectomy approach was followed.

The AIR (Aspiration, Injection, Reaspiration) technique has been devised indigenously. A large bore (16 gauge) needle is connected to a 20 cc. syringe via two Luer Lock three way stopcocks. The side arms of the stop cocks lead into two bowls via flexible tubing, one empty and the other one with scolicedal agent. After extensive and thorough packing of the field with scolicedal agent soaked sponges,

Fig. 1 Demonstrating the AIR assembly being used

Fig. 2 Showing the AIR assembly (Aspiration, Injection, Reaspiration)

the needle assembly is introduced into the most accessible part of the cyst cavity. The photograph for the modified AIR technique (Aspiration, Injection, Reaspiration) is shown in Fig. 1 and the sketch in Fig. 2. The hydatid fluid is aspirated by using the stopcocks (Fig. 3) and emptied into the empty bowl. The stopcocks regulate the direction of flow. The scolicedal agent is drawn into the syringe by turning the stopcocks (Fig. 4), and then injected into the cavity, not disturbing the needle assembly at the point of entry into the cavity. After a wait of two to three minutes, the fluid from the cyst is aspirated and discarded through the tubing into the empty bowl again, by regulating the direction of flow with the stopcocks. These cycles are repeated till the entire cyst cavity volume has been replaced with scolicedal agent. Multiseptate cavities would need repositioning of the needle. The pericyst is then opened

Fig. 3 Showing the Aspiration phase

Fig. 4 Showing the injection phase

between Babcock clamps and a large bore suction curette used to empty the cavity of smaller cysts which are sucked out of the field. The cyst walls are examined for biliary communications. The color of the initial aspirate would betray evidence of biliary communication. If visible communications are found they are ligated with 3-0 Prolene suture. The cavity is then filled with normal saline, and an extrahepatic drain placed. Recurrent and infected hydatid cavities were drained with an additional drain placed within the cyst cavity. One cavity was packed with omentum, and another cavity was closed with caputponage sutures of 2-0 chromic catgut.

A similar cystectomy procedure was followed for lung hydatids, with the difference that the drain was left within the cyst cavity and connected to an external underwater seal bottle. The drain was removed after operative x rays demonstrated adequate pulmonary expansion.

All extrahepatic abdominal hydatids including that of the spleen were entirely excised with the pericyst intact. Splenic hydatids allowed this and did not cause hemorrhage, leaving a remnant of the unaffected spleen. A similar procedure was adopted for renal hydatid. Both perioperative sites were drained.

The course till discharge and suture removal was followed. Albendazole therapy was not uniform. The first follow up ultrasound was usually performed at one month. Complications were noted. Subsequent follow visits ranged from a period of three months to one year.

Results

46 males and 70 females had presented with operable disease. (One lady was operated upon twice). 49 patients were from within the district, (a radius of sixty miles) and 14 patients were local (within a radius of ten miles). 67 had presented to us from as far as three hundred miles away to one hundred miles away.

51 patients had presented with pain, 17 of whom had a palpable abdominal mass. Other overlapping symptoms were fever, cough and a fullness ($n=3$). 15 patients presented with a mass in the right hypochondrium, one of whom was jaundiced. Jaundice alone ($n=1$) was not a common presenting complaint. Six patients presented with a range of symptoms varying from fullness, pallor and fever, to distension. Twenty nine patients presented with vague non specific symptoms and were diagnosed on ultrasonic examination. All 14 patients with lung hydatids presented with chest pain. Cough was present in four patients, of whom one had hemoptysis. One patient with cough also had a pneumothorax. The classical expectoration of hydatid scolices was not encountered in our series. There were five patients with recurrence in our series [18]. One patient was operated upon thrice outside, and underwent a successful procedure with us. The latter was not included in our series as our recurrence. The spectrum of presentation is listed in Table 1.

90 occurrences were in the liver (78%) of which 61 occurred in the right lobe (67%), and 7 in the left (7%). There were 13 patients with lesions in both lobes (14%). Three patients with liver disease also had coincidental disease in the spleen, lesser sac, and pelvis. Four recurrences occurred in the liver. One recurrence occurred in the spleen. Twelve patients had extrahepatic occurrences which are listed in (Table 2). Fourteen occurrences were pulmonary hydatids, of which four were in the left lung. For

Table 1 Presenting features of hydatid disease

Presentation	Number	Percentage(%)
Pain	31	27
Mass	14	12
Pain and mass	17	15
Pain and fullness	1	1
Unspecified	29	25
Jaundice and mass	1	1
Jaundice	1	1
Heaviness	1	1
Heaviness and cough	1	1
Cough	5	4
Cough and fever	1	1
Fullness	1	1
Dyspnoea	1	1
Recurrence	6	5
Complications	2	2
Distension	1	1
Pallor	1	1
Fever	1	1
Total	116	

Table 2 Sites of extrahepatic hydatid occurrences

Site	Number
Spleen	1
Ovaries	2
Retroperitoneum	1
Broad ligament	1
Mesocolon	1
Renal	2
Mesentery	2
Complicated (abscess formation)	2
Total	12

purposes of consideration, each site was recorded as an individual event.

The most common surgical procedure performed was a hydatid cystectomy (n=100). Omentoplasty was performed in one patient and caputonnage in another. All extrahepatic hydatids were excised in entirety. (n=8).

The AIR technique was utilized in twenty nine patients of hepatic disease and three of pulmonary disease. There has been no re-representation as recurrence as yet in these patients, however, since no active protocol for monitoring was used, this cannot be commented upon.

51 patients received Albendazole post operatively, 66 did not. (We had operated on one patient twice for recurrence). The decision to administer albendazole was usually because of large size of the hydatid cyst, multi-septate cysts, multilocularity, or recurrence. We will not be able to comment on the impact of albendazole and recurrence rate.

38 patients were not drained and 78 were drained. There was no difference in time to discharge between those drained or not drained. Two patients with a drain developed a collection despite the drain, and one without a drain developed a collection. Two collections necessitated open drainage. There was one postoperative infection with an abscess formation and one anaphylaxis on table which did not result in a death.

Discussion

Hydatid disease is commonly caused by *Echinococcus granulosus*, and pulmonary disease has been attributed to *Echinococcus alveolaris*. Less common infestations are caused by *Echinococcus oligarthus*. Prevalence is high in societies where animal husbandry is a common occupation [19]. Large series have been reported from the Mid Eastern countries [1–3], Australia and New Zealand. In the latter two countries, public health measures have decreased the incidence [4]. In India, the disease has been reported from

Chandigarh [5], Varanasi [6], Lucknow [7] Kashmir, Pondicherry [8] and Madurai [9]. Despite animal husbandry being extremely common in Himachal Pradesh, the only review from this mountain state is a report from 1974 [10].

The most common location was the liver, though extrahepatic disease occurred in various other locations.

The most common presenting feature was pain with or without a mass, a finding that correlates with documented world patterns of presentation [20]. Chest pain was the most common presentation with pulmonary hydatid disease [21].

The debate on optimal surgical treatment for this condition still continues. Traditional methods of open cystectomy, omentoplasty, and radical surgery have been compared [4, 22] with laparoscopy [23], percutaneous aspiration, and a technique described as the PAIR technique [24]. This technique was further modified and described as a co-axial technique for scoliceal deactivation in high risk sites of occurrence.

Surgery is acknowledged as the standard modality of treatment for hydatid disease. Surgical approaches have been either radical or conservative aiming at either radical removal of the entire disease process with the liver containing it or removing the contents of the active cyst and leaving the pericyst behind. Fingerhut and colleagues evaluated reviews of hydatid disease and had concluded that though conflicting results emerged from non comparable trials, further controlled studies were necessary to determine the preference of one approach over the other [20]. The radical approaches were associated with a reduced recurrence rate [25] but a higher mortality, while conservative approaches has minimum mortality and morbidity [26]. The management of the residual cavity is also debatable, proponents of omentoplasty [27] and tube drainage [28] have reported results in their favor one over the other. No definitive trial has effectively randomized one against the other.

Conclusions

This study is a retrospective chronological study of the surgical management of hydatid disease in a relatively resource poor setting. It indicates the presence of active disease in the State of Himachal Pradesh and underlines the necessity to entertain a high index of suspicion towards its diagnosis. Ultrasonic and radiological diagnosis is relatively cost effective, easily available and should be diagnostic modalities liberally employed.

Though a variety of surgical modalities to treat this disease have been reviewed, and current trends lean towards the radical resection of cystic cavities, this paper can serve to remind relatively resource poor settings that

the safe conservative cystectomy is still a procedure imbued with minimal mortality and low morbidity. The AIR Technique (Aspiration, Injection, Reaspiration) described here preserves sound surgical principles of minimizing scoliceal spill and deactivating scolices intracystically, but its evaluation with respect to recurrence rate has been hampered by the chronological and retrospective bias of this study and the lack of a prospective follow up protocol. However the technique is attractive in its simplicity and effectivity, and we do consider it a valuable procedure worthy of future prospective randomized trials. The outcome measures of no mortality and minimal morbidity [29] in this study do underline the surgical feasibility of undertaking the treatment of this disease in the settings described.

Acknowledgements The authors would like to acknowledge the contribution of Ms. Johanah Hardy who helped with the collation of data. The AIR technique (Aspiration, Injection, Reaspiration) described in this paper has been personally also utilized in Christian Medical College Ludhiana, Punjab, by the first author, though it has not been published before. We are grateful to Ms. Mary Ann Alexander for the illustrations in this paper.

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