SURGICAL TREATMENT OF PULMONARY HYDATID DISEASE

Amer Bilal, Mohammad Saleem, Asif Nadeem, Sharif Jan, Shoaib Nabi

Department of Cardiothoracic Surgery,
Postgraduate Medical Institute,
Lady Reading Hospital, Peshawar.

ABSTRACT

Objectives: To study the outcome of surgical treatment of pulmonary hydatid disease.

Material and Methods: This study comprised of two hundred patients, operated for pulmonary hydatid disease in Cardiothoracic unit, LRH, Peshawar form 01.07.1990 to 30.06.2000. The preoperative work up, apart from history and examination included FBC, LFTs, Blood grouping, chest X-ray PA and Lateral views, Casoni’s test, haemagghitination test, Ultra sound abdomen and chest, and CT thoracic. Patients were operated for cystectomy, lobectomy decortication, thoracoplasty and combined pulmonary and hepatic cystectomy as required. All patients were put on post operatively mebendazole for at least 28 days. Patients were followed up for complication.

Results: Two hundred patients underwent surgery for pulmonary hydatid cyst over a ten years period. Operations performed were cystectomy 168, lobectomy 24, (primary 18, revision 6), decortications 13 and 1 thoracoplasty. Mortality was 4/200 i.e. 2%. The main/ major morbidity was air leak for which 9/200 patients were re-explored, with resuturing in 3 cases and secondary lobectomy in 6.

Conclusion: Cystectomy, without needle aspiration, was found to be the procedure of choice for pulmonary hydatid.

Key words: Hydatid disease, Pulmonary, Surgical treatment.

INTRODUCTION

Hydatid disease, which is caused by Echinococcus Granulosus, has been acknowledge as a clinical entity since ancient times. Organs of sacrificed animals were described in the Talmud as “Bladder full of water” and Hippocrates referred to hydatid disease in the Aphorism. “When the liver is filled with water and bursts into the epiploa, the belly is filled with water and the patient dies.”
Rudolphi (1808) first used the term “Hydatid Cyst” for the description of Echinooccus in human.1

Echinooccus is frequently encountered in the sheep and cattle raising regions of the world and has been observed most frequently in Australia, New Zealand, South Africa, South America and the Mediterranean countries of Europe, Asia and Africa.2 The lungs are the second most common site of lodgment of the parasite, as Barret, Dew and others noted, with an incidence varying between 10 and 30%.3 Hydatid disease of the lung constitutes 15% of our pulmonary operative workload.4 Two hundred patients were operated upon over a ten years period in Cardiothoracic unit, LRH for pulmonary hydatid. An attempt has been made to audit these cases and to share the Peshawar experience with other colleagues.

**MATERIAL AND METHODS**

A total of two hundred patients underwent surgery for Pulmonary Hydatid between 01.07.1990 to 30.06.2000. Ages ranged from 4-70 years with a mean age of 37.8 years and M:F 135:65 and L:R 72:128; size ranged from 0.5 cm-9 cm diameter with a mean size of 3.6 cm (as judged on CXR). Cough was the most common presenting symptom 162/200 (81%) with hemoptysis in 105/200 (52.2%), followed by chest pain 136/200 (68%), empyema in 13/200 (6.5%) while 32/200 (16%) were asymptomatic and incidentally found on CXR (Table-1).

The preoperative workup, apart from history and examination, included FBC, 

**PRESENTING SYMPTOMS**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>164/200</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>105/200</td>
</tr>
<tr>
<td>Chest Pain</td>
<td>136/200</td>
</tr>
<tr>
<td>Empyema</td>
<td>13/200</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>32/200</td>
</tr>
</tbody>
</table>

**OPERATIONS PERFORMED**

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystectomies</td>
<td>168</td>
</tr>
<tr>
<td>Combined with hepatic</td>
<td>14</td>
</tr>
<tr>
<td>Lobectomies</td>
<td>24 (18% Primarily) (16% Secondly)</td>
</tr>
<tr>
<td>Decortication</td>
<td>13</td>
</tr>
<tr>
<td>Thoracoplasty</td>
<td>01</td>
</tr>
</tbody>
</table>

LFT’s, Blood Grouping, CXR PA and Lateral views and the following specialized investigations: Casoni’s 23/200 Haemag-glutination test 180/200 Ultrasound chest and abdomen 180/200 and CT Thorax 9/200. Pulmonary function tests were done in all cases as part of a thoracotomy workup (Table-2).

Third generation cephalosporin was started at induction and cover was continued for 48 hrs. All operations were performed via posterolateral thoracotomy, using manual 2 lung ventilation, with ECG and oxygen saturation monitoring. Operations performed were Cystectomies 168, Lobectomies 24, Decortications 13, Thoracoplasty 1 and combined pulmonary and hepatic Cystectomies 4 (Table-3). After identifying the hydatid cyst removing any adhesions, diathermy was used to incise the false capsule. Thereafter the cyst was delivered in toto through this incision, aided by lung bogging by the anaesthetist. Thereafter all bronchial communications were individually sutured, prior to multilayered obliteration of the residual cavity. Upon completion of procedure thoracic cavity was thoroughly washed with normal saline. Single chest drain in case of cystectomy and two chest
SEGMENTAL DISTRIBUTION

<table>
<thead>
<tr>
<th></th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper lobe</td>
<td>53</td>
<td>23</td>
</tr>
<tr>
<td>Middle lobe</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>Lower lobe</td>
<td>78</td>
<td>27</td>
</tr>
</tbody>
</table>

**TABLE – 4**

Drains in case of lobectomies and decortications, were put in. Drains were removed from 2-18 days postoperatively with a mean duration of 4.3 days. All patients had postoperatively adjuvant Mebendazole, in a dose of 10 mg/kg/day (children) and 800 mg/day (adults) for at least one cycle of 28 days.

**RESULTS**

Out of the two hundred cases operated, 145 had a single cyst, 45 had multiple cysts, while 12 were bilateral. Segmental distribution was predominantly Right Lower Lobe (RLL) 78/200, Right Upper Lobe (RUL) 53/200, Left Lower Lobe (LLL) 27/200. Left Upper Lobe (LUL) 23/200 and Right Middle Lobe (RML) 19/200. Out of 23 Left Upper Lobe (LUL) ones 14 were in the Lingula (Table-4). Casoni test was done in 23 cases and was positive only in 7 cases, and was therefore abandoned (both due to its low yield and logistical inconvenience). Haemagglutination test was done in 180 cases and was positive in 163 cases.

Ultrasound chest was done in 180 cases and showed the shadow to be cystic in 145, echogenic in 32 and solid in 3 cases. Abdominal ultrasound showed liver cysts in 45, splenic in 3 and 2 others (Table-5). Out of the two hundred operations performed there were 168 cystectomies. 24 lobectomies, 8 decortications and 1 thoracoplasty. Of the 168 cystectomies 4 had a combined hepatic cystectomy trans-diaphragmatically. The 13 decortications were for empyema resulting from an infected/ruptured cyst.

The postoperative complications were (i) Wound infections 11/200 (ii) Recurrence in 4/200 (iii) Air leak 51/200. Of the 51 patients with air leaks 42 responded to conservative treatment i.e. chest intubations with/without low pressure suction. The remaining 9 had to be re-explored and of these 3 had resuturing done while 6 had the lobe removed. Out of these 6 lobectomies one patient had to be re-explored a 3rd time for persistent space and air leak and a thoracoplasty done (Table-6). There were 4 deaths in our series, all starting with an aggressive air leak BPF Pneumonia and death.

**SPECIALIZED INVESTIGATION**

<table>
<thead>
<tr>
<th>Test</th>
<th>Total</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casoni</td>
<td>23</td>
<td>07</td>
</tr>
<tr>
<td>Haemagglutination</td>
<td></td>
<td>180</td>
</tr>
<tr>
<td>Ultrasound Chest</td>
<td>Cystic</td>
<td>99</td>
</tr>
<tr>
<td>Ultrasound Abdomen</td>
<td>Hepatic</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Splenic</td>
<td>03</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>02</td>
</tr>
</tbody>
</table>

**TABLE – 5**

**MORBIDITY**

1. Wound Infection 11/200
2. Recurrence 4/200
3. Air Leak 51/200

Conservative Treatment
Reexplored

Resutured
Lobectomy
Thoracoplasty

**TABLE – 6**
DISCUSSION

Pulmonary hydatids constitute 10-30% of hydatid disease\(^3\) and 15% of our pulmonary operative workload. The most common presenting symptoms are non productive cough, sometimes hemoptyses, and a dull aching pain in the chest, with no aggravating or relieving feature.\(^4,5,6\) In our series too this was true as 162/200 (81%) had chest pain while 32 (16%) were asymptomatic and incidentally picked up on CXR. Diagnosis of an intact echinococcus cyst is usually based on a radiological appearance of a smoothly outlined dense spherical opacity.\(^7\) The first radiographic signs of impending rupture of a cyst is the pulmonary meniscus sign by Saidi\(^8\) as a clear crescentic shadow on one side. Complete rupture of the cyst produces the water lily sign\(^9\) and is produced by the floating membrane of the cyst. Ultrasound chest is useful in confirming the cystic nature of the radiological opacity, though in infected cysts it would give an echogenic appearance.\(^9,10\) In our series ultrasound showed cyst in 145/180, echogenic 32/180, and solid in 3/180 cases. Concomitant abdominal cysts were picked up in 50/200 i.e. 45 hepatic, 3 splenic and 2 others. Several clinical laboratory tests useful in the diagnosis of hydatid disease include Casoni’s intradermal test and the indirect haemagglutination test.\(^11,12,13\) Casoni’s intradermal test has been the most widely used diagnostic test but because it lacks specificity, it is no longer recommended. In our series Casoni was done in 123 cases, mostly by referring physicians and was positive only in 7 cases. Indirect haemagglutination test, first used by Garabedian and associates in 1975, is the clinical test of choice.\(^12,13,14\) Kagan and colleagues reported that its sensitivity ranges from 66 to 100% and false positive results are few 1-2%. In our series haemagglutination test was done in 180 cases, and was positive in 163. Medical treatment for hydatid disease of the lung was non-existent until the 1980’s. Grande and associates (1983) reported the use of mebendazole with 36-94% partial to complete response rate.\(^14,15\) Morris and colleagues (1985) used albendazole with some remission in 15/22 cases.\(^15\) Agerwal and Wali (1991) however used the same agent in 10 patients for 8 weeks with little response.\(^16\) The failure rate of medical therapy and recurrence rate after treatment is discontinued are high, and the side effects considerable.\(^2\) As a result, this form of treatment alone is considered for those selected cases, under close observation which are inoperable because of dissemination, or unfitness for surgery.\(^2,16\) Surgical treatment of hydatid disease of the lung is based on complete excision of the disease process with maximum preservation of lung tissue.\(^17\) Cystectomy without needle aspiration is the treatment of choice.\(^2,17,18,19,20\) In our series 168/200; underwent this procedure. The important points are (i) incising the false capsule with diathermy (ii) in toto delivery of the cyst (iii) identifying and individually suturing all bronchial communications (iv) obliteration of the cavity (v) meticulous surgical toilet of the thoracic cavity.\(^16,19\) In our series, observing the above principles, air leaks requiring active intervention were only 9/200, though level of skill of the operator ranged from senior consultant to trainee medical officer. Lobectomy was performed in 24/200 cases, 18 primarily and 6 subsequently as a 2nd procedure. The principal indication for lobectomy are large cysts involving more than 50% lobe, cysts with severe pulmonary suppuration not responding to preoperative treatment, multiple unilobar cysts and sequelae of hydatid disease, such as pulmonary fibrosis, bronchiatisation, or severe haemorrhage.\(^2,17,18,19,20\) Decortication was done in 13 cases, which presented as chronic empyema following rupture of an infected cyst. One patient needed a thorocoplasia because of persist-
ing air leak and infected space and rapidly deteriorating general condition.

Bilateral lung cysts should be resected in 2 stages. In a patient with uncomplicated lung cysts, the lung with the larger cyst or with the greater number of cysts should be operated upon first. In a patient with lung cyst larger than 4-5 cm in one lung and a ruptured cyst in the other lung, the intact cyst should be removed first to prevent its future rupture. The lesions in the other lung are then resected 6-8 weeks after the first operation. In our series 12/200 had bilateral cysts who had two procedures following the principles outlined above.

There were 4 deaths in our series (2%). All these 4 cases had a persistent air leak–BPF pneumonia–death. All these patients were too sick to undergo a 2nd subsequent procedure.

REFERENCES


Address for Correspondence:
Dr Amer Bilal,
Deptt. of Cardiothoracic Surgery,
Post Graduate Medical Institute,
Lady Reading Hospital, Peshawar.