Introduction

Hydatid disease is seen quite frequently in the sheep-raising areas of the world, such as South America, Australia, Greece and Middle Eastern countries. Kuwait is one of the Middle Eastern countries in which hydatid disease is endemic. Hydatidosis is quite common in this country so this disease should always be considered in the differential diagnosis of mass lesions and other respiratory symp-
toms. Over the past 15 years, from 1983 till 1998, 60 cases were studied in retrospective analysis. The clinical presentation of these cases and their management were analysed.

Patients and Methods

The medical records of 60 patients with pulmonary hydatidosis who presented to Chest Diseases Hospital in Kuwait between 1983 and 1998 were reviewed. Thirty-five patients were males (58.5%) and 25 were females (41.5%). The ages ranged from 4-65 years with a mean age of 28.4 years. In 12 patients who were asymptomatic (19.2%), the diagnosis were purely accidental. The rest evidenced a diversity of symptoms (Table 1). Chest radiographs and computed tomography (CT) of the chest and upper abdomen were done for all patients. Chest X-
Table 1. Incidence of clinical picture in 60 patients with hydatid cyst

<table>
<thead>
<tr>
<th>C/P</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>12</td>
<td>19.2</td>
</tr>
<tr>
<td>Cough</td>
<td>41</td>
<td>65.5</td>
</tr>
<tr>
<td>Expectoration</td>
<td>26</td>
<td>43.5</td>
</tr>
<tr>
<td>Chest pain</td>
<td>26</td>
<td>43.5</td>
</tr>
<tr>
<td>Fever</td>
<td>17</td>
<td>27.2</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>7</td>
<td>11.2</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>5</td>
<td>8.0</td>
</tr>
<tr>
<td>Rt. hypochondrial pain</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>Bitter taste</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Some patients presented with more than one symptom.

Ray showed a rounded shadow in 42 patients (67%) (Fig. 1), pleural effusion in 6 patients (9.6%), and an ill-defined lung shadow in 8 patients (12.8%). Cysts with fluid levels were seen in 3 patients (5%) (Fig. 2). CT scanning of the chest and abdomen allowed accurate localization, measurement, and confirmation of hydatid cysts (Fig. 3). Fifteen cases (24%) were discovered to have other visceral hydatid cysts (11 cases liver hydatid cyst, 2 cases in the spleen, and left kidney and heart, one case each).

Surgical procedures

The operative approaches used in this series were thoracotomy only in 46 cases, thoracotomy and transdiaphragmatic incision in 9 cases, thoracotomy and laparotomy in 2 patients, skin incision and enucleation of chest wall cysts in 2, and median sternotomy in one. Several operative techniques were used in our series. Forty cases were managed initially with instillation of 1% formalin into the cyst under careful isolation of the cyst area. After that, the cyst was opened and removed (liquid + hydatid membrane with complete extirpation of the endocyst). Twelve cases were managed initially by injecting 10 ml of 10% Nacl solution into the cyst. In almost all cases we resected a piece of the adventitia with the purpose of leaving the residual cavity largely open to pleura. After that, careful control of small and large bronchial fistulae, was carried out with or without removal of the fibrous pericyst. Cystectomy by suction and marsupialization were done in 36 patients, enucleation with marsupialization in 5 patients, capitonage in 9 cases, and enucleation with wedge resection in 6 cases. Decortication was done in 2 patients, lobec-
tomography was performed when after removal of the cyst, the lung tissue was found to be destroyed by prolonged compression or infection in 9 cases. In some patients whom had multiple hydatid cysts, more than one operative techniques were used.

Results

Pre-operative diagnosis was pulmonary hydatid cyst in 41 patients (65.7%), 8 patients (13%) were presented as pleural effusion, empyema or hydropneumothorax and an intercostal tube was inserted for every one of them before the surgical treatment. Eight patients (13%) were presented with ill defined lung shadow. Cyst with air fluid level were seen in 3 patients (5%). Nineteen cases (29%) presented with a cyst of a vigorous size >10 cm (Fig. 3). The lesion was on the right side in 43 patients (69%) and the left side in 22 cases (35%). The lower lobe was affected more than the upper or middle lobe. Multiple hydatid cysts were seen unilaterally in 3 cases (5%) and 6 cases (10%) were multiple and bilateral. The mean hospital stay was 9 days (7-16 days). The following complications occurred in the early postoperative period; prolonged air leak (more than 10 days) in 4 cases (6.5%), pleural effusion in 3, pneumothorax and wound infection in one patient each. The management of patients with prolonged air leak was pleural drainage in 2 cases, reoperation and closure of air leak in one, and right lower lobectomy in one patient. Only one patient in this series died at the 6th postoperative day most probably from pulmonary embolism. The postoperative follow-up was from 2-15 years, recurrence of hydatid cysts had been noted in 4 patients and were operated upon and covered by a course of albendazol 400 mg twice daily for three months.

Discussion

The term simple hydatid disease is used to indicate that the parasite itself is intact; but a simple cyst may, upon occasion, cause suppuration in the lung. A complicated cyst is one in which the hydatid has ruptured and this accident may or may not be associated with pneumonitis. Primary hydatid disease indicates that the cyst in question has developed from an embryo derived directly from a dog. Secondary hydatid disease means that a primary cyst lodged elsewhere has ruptured and caused a new cyst to develop by embolism or by direct spread. Daughter cysts are cysts which grow within the cavity left by spontaneous evacuation or inadequate surgical removal of the parasite. The cyst consists of three layers: first, a protective membrane called the pericyst, second the laminated membrane on its outside and third the innermost germinative layer with the hydatid fluid. The germinative layer performs two major functions: (1) production of the laminated membrane on its outside and (2) germination of later generation scolices. The scolices appear to be from the broad capsules and not directly from the germinative membrane. Presumably after the broad capsule has become loaded with scolices, it breaks off from the germinative membrane, forming miniscule particles floating in the hydatid fluid or settling at the bottom to become part of the hydatid sand. The clinical picture is often limited and nonspecific in pulmonary hydatid disease and diagnosis may be made only if a routine X-ray film is taken, which is the main diagnostic tool or infection or rupture of the cyst into the bronchus or pleural space occurs. For some time, great importance was placed upon Casoni and Weinbers reactions, but at present these are discredited.

Every patient who has hydatid cysts of the lung should be investigated for associated cysts in the liver or other abdominal organs by chest computed tomography (CT) and upper abdomen and abdominal ultrasonography and if those cysts are accessible through the diaphragm, they should be resected at the same thoracotomy setting. After having made a tentative diagnosis, we have always found, it is necessary to confirm the identity of the lesions pathologically, and until the present, the only treatment for hydatid disease has been surgical excision. We are not only in agreement with the authors Dogan et al. regarding chemotherapy, it should be considered only in patients with cysts that are inoperable (because they are anatomically inaccessible or the patient is a poor surgical risk) or for recurrent disease, when operative morbidity and mortality are higher but also with its usage before surgery to decrease the recurrence rate. The recommended regimen for adults is 10 to 15 mg/kg/day or 400 mg twice daily for 28 days, followed by 14 days rest and then a second and, perhaps, third course. Six weeks of therapy before surgery and three cycles afterwards are recommended. The operation for hydatid cyst has undergone considerable modification since recent advances in thoracic surgery have been made. Our surgical goals are (1) total eradication of the parasite; (2) prevention of the cyst rupture in the operative field and its consequent dissemination; (3) extirpation of the residual cavity; (4) preserving the lung parenchyma as far as possible and avoiding radical procedures so as to limit resections to only those cases with seriously ruptured cysts which have given rise to considerable destruction of adjacent tissue. Opinion as to the injection of formalin into the...
cyst before opening it or swabbing the cyst with formalin after evacuation varied. The type of operation varied according to the state of the disease present in the patient and the result was excellent.1,3,13,15) Some authors advocate aspiration of the cyst followed by installation of a parasiticidal agent such as hypertonic saline. The evidence that this is effective is not well grounded.13,17) However, none of these procedures provides sure protection against dissemination. Furthermore, the literature indicates that recurrence of the disease is extremely rare.6) In the small simple cysts, enucleation and closure of the resulting cavity by suture should be done.22) When the simple cyst is large, segmental resection and closure of the resulting cavity by suture should be avoided. Resection should be avoided in children if possible because the damaged lung parenchyma has a great capacity for recovery.17,23) As we have 9 cases (14.5%) out of the 60 where some were complicated cysts and other were so large that the remaining pulmonary tissue is not believed salvageable and were managed by resectable techniques.

**Conclusion**

1. The clinical picture is non-specific and radiological investigation is suggestive.
2. Surgery is the primary treatment for most patients with pulmonary hydatid disease.
3. The lung parenchyma should be preserved as far as possible in patients with pulmonary disease and radical procedure should be avoided.
4. The use of albendazol pre-operatively for one month and postoperatively for 3 interrupted courses is recommended to decrease the incidence of recurrence.
5. The choice of operation in the individual patient must be guided by whether the cyst is simple or complicated.

**References**