Concomitant Lung and Liver Hydatid Cyst Managed as One-Stage Surgery

Usha DALAL*1, Ashwani Kumar DALAL*a, Rikki SINGALb

aDepartment of Surgery, Government Medical College and Hospital, Sector -32, Chandigarh, Punjab, India
bDepartment of Surgery, Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana (Distt-Ambala) Haryana, India

ABSTRACT

Objective: Over the world, hydatidosis is endemic in many countries. It is more prevalent in Turkey. We came across with concomitant hydatidosis of the lung and liver and reviewed the management.

Material and Methods: This is a prospective study that was carried out in the Government Medical College and Hospital, sector-32, Chandigarh, India, between 2004 and 2010, in the Department of Surgery. A total of five patients diagnosed with concomitant liver and pulmonary hydatid disease underwent surgery. They were operated by thoracotomy and laparotomy in the same sitting.

Results: Hydatid cysts located in the lungs were managed by means of cystotomy and capitonnage. For liver cysts, cystotomy and inversion of the cavity with sutures was the surgical method of choice, and a drain was left in place. Excessive biliary drainage occurred in one patient who was managed successfully.

Conclusions: We believe that simultaneous management of pulmonary and hepatic cysts through the thoracic route and by laparotomy is convenient and should be encouraged in patients because this approach decreased morbidity and mortality by deferring second operation. Needle aspiration can be applied only for liver cysts but it is absolutely contraindicated in lung hydatid cysts.

Keywords: lung, liver, hydatid cyst, single-stage surgery

INTRODUCTION

Hydatid disease as parasitosis caused by Echinococcus granulosus remains a widespread health problem in endemic areas, including the Middle East, Mediterranean countries and Central Asia. Concomitant pulmonary and liver hydatid disease may occur in 4% to 25% of patients with hydatidosis (1). Isolated hydatid disease of the spleen is very exceptional especially in the hilum region. Human hydatid disease can involve the liver (66%), lung (5–15%), spleen (less than 2%) and rarely other parts of the body (2).

This disease is quite prevalent in Turkey. It is characterized by round lesions in lungs and liver. A considerable number of patients with lung hydatid cysts also have liver cysts (3). Peripheral or-
gan hydatidosis is much less common, as few embryos can escape the capillary filtrating systems of the liver and lung (4).

Here we evaluate our patients with lung and liver cysts and present our experience. Also, we discuss the principles of treatment for hydatid disease.

**MATERIAL AND METHODS**

This study was carried out in the Department of Surgery, Government Medical College and Hospital, sector-32, Chandigarh, India, from 2004 to 2010. A total of five patients were diagnosed with concomitant hepatic and pulmonary hydatid disease. They underwent a successful single-stage surgery. There were 3 males, one female and one child, whose ages ranged from 8 to 67 years, with a median age of 43. The cysts were located on the diaphragmatic surface of the right and left lobes of the liver. Thoracotomy with laparotomy was the method of approach.

All the five patients with concomitant lung and liver cysts had subphrenic location (100%); one of them had a cyst in the right lung (20%), two in the left lung (40%), and two had bilateral cysts (40%). In one case, chest X-ray revealed a cyst on both sides and a ruptured cyst on the left side (Figure 1).

On admission, all patients had either other parenchymatous lesions of the lung or pleural complications, including pneumothorax and pleural effusions. Empyema was found in one patient. In the patient with empyema, the operation was delayed until his recovery after drainage of the empyema.

**RESULTS**

In the single-stage surgery for lung and liver cysts, a posterolateral thoracotomy was done through the 5th intercostal space – on the right side in two patients, bilateral thoracotomy in one patient, and left sided thoracotomy in two patients. Lung cysts were operated first in supine position with a sand bag on the back on opposite side. After posterolateral thoracotomy, the lung was freed from all adhesions to the chest wall. Then, the edges of the wound and the surface of the lung other than the cyst surface were covered with sponges soaked in saline solution and diluted (10%) povidone-iodine solution to prevent inadvertent implantation of scolices or a daughter cyst.

While the lungs were kept inflated by Barret’s technique, a large needle connected to the suction tip was inserted into the cyst. An anticolicidal agent was not injected into the cystic cavity before needle aspiration. When the cyst was aspirated and its fluid evacuated, the most prominent part of the cyst was opened (cystotomy), and the cyst membranes were removed with sponge holding forceps. Then the cavity was irrigated with saline solution and cleaned with sponges moistened with diluted povidone-iodine. The bronchial openings were sutured.

The residual cavity starting from the deepest level, with a space of 1.5 to 2 cm left between each layer, was obliterated with absorbable purse-string sutures (polygalactin 3 0, Vicryl; Ethicon, capitonnage), and then laparotomy was done for liver cyst. Cystotomy was performed to
Hydatid disease has been known since the time of Hippocrates and Galen, and the term hydatid cyst was used to describe echinococcosis in 1808 by Rudolphi. Hydatidosis is a parasitic disease caused by the larval growth of the tapeworm (*Echinococcus granulosus*) (5). The dog-sheep cycle is the paradigm for the life cycle of the parasite. People get involved in this cycle as an intermediate accidental host by contact with infected dogs or consuming contaminated vegetables (6). In adults, the most common site of infection is the liver, while in children it is the lung. Moreover, some patients might have hepatic cysts in addition to pulmonary cysts. Synchronous pulmonary and hepatic hydatid disease may occur in 4% to 25% of cases (7). Various ways in which infection spreads have been suggested to explain the escape of liver and lung involvement through lymphatics or through venovenous shunts within the liver and in the space of Retzius (8).

Hepatic cysts can be reached by the transdiaphragmatic route during right thoracotomies for pulmonary cysts in synchronous right pulmonary and subdiaphragmatic hepatic cysts and the two separate procedures may be performed in just one stage (7). With their enlargement, they might cause abdominal pain, discomfort, and a palpable mass. In cases of pulmonary cysts, patients might have dyspnea and non-productive cough. Some patients might have blood-streaked sputum and thoracic pain. Vigorous coughing and expectoration of membranes are the symptoms of ruptured hydatid disease (5). Plain chest radiographs and ultrasonography are the diagnostic tools for hydatid disease. Computed tomography also plays an important role to reach for diagnosis and management in both intact and ruptured cysts (9). Air fluid level or floating membranes may be seen in some cases giving the characteristic appearance of water lily sign, crescent sign, serpent sign, or air-bubble sign, which may be found in cases of ruptured hydatid cysts or complicated cysts with superadded infection (9).

Surgical treatment is advocated for pulmonary and hepatic cysts and in whom medical management has not been successful (10). For lung cysts, various surgical procedures have been described in the literature such as conservative resections, cystotomy with or without capitonnage, or radical resections, such as segmentectomy or lobectomy (2-4). In our experience with 5 patients, we have seen that even in giant liver cysts (size >10 cm), laparotomy is convenient and has good results when lung and liver cysts are situated on opposite sides. For hepatic cysts, obliteration of the residual cavity with a subdiaphragmatic drain leads to good results. For patients with concomitant bilateral liver and lung hydatid disease, a right or left thoracotomy approach was applied. Because of the risks of mediastinitis and hepatobiliary fistula, none of our four patients with concomitant liver cysts underwent median sternotomy. According to Gharbi’s classification, the management for class I and class II liver hydatid cysts can be done by percutaneous needle aspiration. However, in patients with simultaneous right lung and liver hydatid...
cysts, the transdiaphragmatic approach addresses the liver cysts, while opening for a right thoracotomy saves the patient from undergoing a second interventional procedure. With this procedure, many liver cysts can be reached and patients may be prevented from undergoing a second surgical procedure (7).

In our opinion, medical treatment is of no value in pulmonary hydatid disease. However, various points of view concerning medical treatment exist (2-4). A chance of anaphylactic reaction can develop if the cyst ruptures. Intraoperative irrigation of 0.5% cetrimide, 15% hypertonic saline, and 0.5% silver nitrate solution prior to cyst opening may kill daughter cysts and further reduce the risk of dissemination and anaphylactic reaction (11). Although multiple session surgery can be used in selected cases, taking into account the operative trauma, financial consequences, and psychological profile (12). When cysts are cracked or broken on both sides, it is necessary to begin by operating first the lung which contains the most intact cysts. One-stage surgery can be done either by double thoracotomy or median sternotomy in order to reduce the cost and avoid second general anaesthesia. It is mainly indicated for young, uncomplicated and peripheral cysts (13, 14).

**CONCLUSION**

Surgical intervention should be the primary treatment for hydatid disease. Subphrenically located liver cysts should be treated simultaneously with the lung hydatid disease. In patients with coexisting liver cysts, phrenotomy may be convenient and may be applied to prevent a second operation, when lung and liver cysts are on the same side.

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**REFERENCES**