



Right Lung Multiple Hydatid CYST Excision

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ABSTRACT

Echinococcosis or hydatid disease is caused by larvae of the tapeworm *Echinococcus*. Four species are recognised and the vast majority of infestations in humans are caused by *E. granulosus*. *E. granulosus* causes cystic echinococcosis, which has a worldwide distribution. Humans are exposed less frequently to *E. multilocularis*, which causes alveolar echinococcosis. *E. vogeli* and *E. oligarthrus* are rare species and cause polycystic echinococcosis.

In cystic echinococcosis, humans are an accidental host and are usually infected by handling an infected dog. The liver and lungs are the most frequently involved organs. Pulmonary disease appears to be more common in younger individuals. Although most patients are asymptomatic, some may occasionally expectorate the contents of the cyst or develop symptoms related to compression of the surrounding structures. Other symptoms of hydatid disease can result from the release of antigenic material and secondary immunological reactions that develop from cyst rupture. The cysts are characteristically seen as solitary or multiple circumscribed or oval masses on imaging. Detection of antibody directed against specific echinococcal antigens is found in only approximately half of patients with pulmonary cysts.

KEYWORDS

Surgical excision of the cyst is the treatment of choice whenever feasible.

Introduction

Echinococcosis and/or hydatidosis one of the most important zoonotic diseases in the world. In some parts of India, echinococcosis is an endemic disease, however, hydatid disease of the lung is uncommon and usually caused by *Echinococcus granulosus*. In its adult stage, the parasite lives in the intestinal tract of carnivores such as dogs and cats, as well as in herbivores such as sheep. The head is composed of a double crown of hook-like structures, and the body is formed by three or four rings, the last of which bears the eggs. After being eliminated with feces, the eggs contaminate fields, irrigated land and wells. Herbivores ingest the eggs, which develop into larvae, or hydatids, within the viscera of these animals. The cycle is completed with the ingestion of the infected viscera by carnivores. Humans contract the disease from water or food or by direct contact with dogs. Once the eggs reach the stomach, the hexacanth embryos are released. These pass through the intestinal wall and reach the tributary veins of the liver where they undergo a vesicular transformation and develop into hydatids. If they overcome the hepatic obstacle, they may become lodged in the lung, where they also transform into hydatids. If they advance beyond the lung, they may remain in any organ to which they are carried by the bloodstream. It has been shown that the embryos can reach the lung via the lymphatic vessels, bypassing the liver, and there is also evidence that the disease can be contracted through the bronchi [1]. In the majority of cases, a combination of imaging and serological methods usually yields the diagnosis of cystic echinococcosis. A patient who has lung cysts should be investigated for associated liver cysts. In pulmonary cystic echinococcosis, routine laboratory tests do not show specific results. Less than 15% of cases exhibit eosinophilia, which generally occurs only if there is leakage of antigenic material

For patients who are able to undergo surgery, it is considered the treatment of choice since the parasite can be completely removed and the patient cured. The surgical options for lung cysts include lobectomy, wedge resection, pericystectomy, intact endocystectomy and capitonnage [17]. During surgery it is important to rigorously minimise spillage of cyst contents in order to prevent intraoperative dissemination and eventual recurrence. This may be accomplished by the delivery of intact cyst or by cystic fluid aspiration with or without the use of a scolicidal solution and preoperative therapy with albendazole [18].

Puncture, aspiration or injection of a helminthicide and reaspiration has been advocated for hepatic cysts. Scolicidal agents such as hypertonic saline, cetrimide, povidone-iodine, formalin, ethanol or hydrogen peroxide may be used. If a protoscolicidal agent is used, it must remain in contact with the cyst for ≥ 15 min. Most surgeons use 1% formaldehyde or hypertonic saline solution for deactivation of cysts and protection of the operative field [19].

Bilateral hydatid disease of the lungs may be managed by one- or two-stage surgery via either bilateral thoracotomy, sternotomy or video-assisted thoracic surgery. Some prefer two-stage thoracotomy, operating on the side with the larger ruptured and infected cyst first. However, median sternotomy is a better alternative for the treatment of bilateral hydatid disease of the lung. This method is more economical, causes less pain and is better tolerated than two thoracotomy procedures. Prevention of cystic echinococcosis can often be achieved by avoiding close contact with dogs. Careful washing of fresh produce can also reduce infection. Prohibition of home-slaughter of sheep and proper offal disposal prevents dogs from consuming infected viscera, thus disrupting the life cycle of the parasite. Elimination of stray dogs and surveillance techniques, involving either diagnostic purging of dogs or co-proantigen tests, have helped to reduce infections in some endemic areas [20]. Vaccination is also a prospect for prevention of echinococcosis, since protective immunity develops in intermediate hosts [20-22].

Case report

A 28-year-old female, suffering from a cough, fever and weight loss for the previous 20 days, was admitted to the emergency department following hemoptysis a day before admission. He was conscious and pale. Blood pressure was 100/64 mmHg, pulse 106 beats per minute. At physical examination, breathing sounds were roughened and inspiratory crackles were present in the right hemithorax. The other results of the physical examination were normal. (No other pathology was obtained.) In laboratory findings, hemoglobin (Hb) of 9.2 mg/dl, Htc of 27.2%, prothrombin time of 28.7 seconds, activated partial thromboplastin time of 14.8 seconds and international normalized ratio of 0.94 seconds were obtained. A 7 × 8 cm circular lesion was located in the upper lobe and 4 by 4 cm in middle lobe of the right lung at X-ray [FIGURE 1]. A computed tomography (CT) scan re-

vealed a cystic lesion 6 by 7 cm in diameter in the posterior segment of the upper lobe of the right lung . In addition, a 3 by 3 cm lesion was revealed in the middle lobe of the right lung . On the first day of hospitalization, massive hemoptysis persisted. Increased respiratory failure and decreased Hb values (from 9.1 to 7.4 mg/dl) forced us to administer blood transfusion, after which surgery was indicated. After right side posterolateral thoracotomy upper and middle lobe hydatid cyst exposed [FIGURE 2].

After aspirating cyst fluid from both cyst with needle syringe ,it was washed with scolicalidal solution hypertonic saline and then stabbed with stab knife. while doing this procedure, all surrounding around cyst was covered by mobs soaked by scolicalidal solution [FIGURE 3]. All cyst material along with daughter cysts removed [FIGURE 4]

Capitonnage the obliteration of the pericystic cavity circumferentially by vicryl 1 size suture in continuous manner from base upto apex of both cyst done [FIGURE 5]. The material obtained sent for histopath revealed hydatid cyst disease. After starting tab albendazole, the patient was discharged in a healthy condition on the eighth day postoperatively.

Discussion

Hydatid disease results from infection by the tapeworm of the genus *Echinococcus*. Dogs are definitive hosts, and ungulates are intermediate hosts. Hydatid disease is thus prevalent in sheep farming communities, in particular, in ones where dogs are fed the viscera of slaughtered livestock. Dogs ingest cyst-containing organs. The adult tapeworm resides in the small bowel and releases eggs, which are passed in the feces. Humans become infected via fecal-oral contact. The eggs hatch in the small bowel, penetrate the intestinal wall, and migrate through the circulation to, most frequently, the liver, but also to the lungs and other organs, where they develop into cysts [2].

Cysts are slow growing. Symptoms develop after months to years, when they become large enough to exert pressure effects on surrounding structures; pulmonary cysts cause cough, dyspnea, chest pain, and hemoptysis [3]. Pulmonary cysts can rupture spontaneously leading to hydatidoptysis, expectoration of hydatid material, and the only pathognomonic sign of pulmonary hydatid disease [3]. Cystic rupture can also cause secondary echinococcosis and acute hypersensitivity reactions [3]. Other complications of pulmonary hydatid cysts include pneumothorax, pleural effusion, and secondary infection.

On chest radiograph, uncomplicated pulmonary cysts appear as round opacities. Perforated cysts have an air-fluid level or the presence of air between the 2 layers of the wall . A differential diagnosis should include tuberculosis, abscess, neoplasm, and benign cysts, such as bronchogenic cysts. Serologic examination can help in the diagnosis of hydatid disease. However, a positive result is most likely if the cyst has ruptured; if the cyst is intact, there may not be a detectable immune response [2]. Other potential clinical effects of hydatid infection include immune complex-mediated disease, glomerulonephritis leading to nephrotic syndrome, and secondary amyloidosis[4,5]. Ruptured cysts may become infected with bacteria or saprophytic or invasive fungi, which are serious complications [6,7]

Hydatid disease is a rare cause of recurrent acute pulmonary embolism. This complication may develop after invasion of the cardiovascular system or direct invasion of the inferior vena cava [8].

Calcification, which usually requires 5–10 yrs for development, occurs quite commonly with hepatic cysts but rarely with pulmonary cysts. Bone cysts also do not undergo calcification. Total calcification of the cyst wall suggests that the cyst may be nonviable [9]

Involvement of the diaphragm and thoracic cavity occurs in ~1–16% of cases of hepatic hydatid disease .Transdiaphragmatic migration of hydatid disease from the posterior segments of the right hepatic lobe has been reported to be a common complication and is probably related to their proximity to the diaphragm.Surgical resection of intact cysts is the treatment of choice in pulmonary hydatid disease; incomplete excision is associated with high recurrence rates [2].Hemoptysis in adults is most often caused by tuberculosis, bronchiectasis and trauma or bronchogenic carcinoma. Parasitic etiology is very rare. Small cysts are usually asymptomatic in hydatid disease. Coughing, chest pain and breathlessness are the common presenting symptoms. Hemoptysis as a presenting symptom is common in adult series, although massive hemoptysis is rare. The mechanism of hemoptysis may be due to pressure erosion of a bronchus or an obstructive effect with bronchial infection. There may be occasional rupture of cysts into the bronchus, resulting in massive hemoptysis. The underlying etiology for hemoptysis may be unknown in 20% of cases, but in cases with pulmonary hydatidosis, the clinical and radiological picture is so unique that it can be easily identified despite its rarity [10].

Diagnosis of an intact echinococcal cyst is usually based on a suspicion resulting from an unexpected finding on routine X-rays. Radiographically, the cyst appears as a homogeneous spherical opacity with definite edges. CT scanning and magnetic resonance imaging have added to the diagnosis of hydatid disease of the lung. Serological tests have limited diagnostic value. It is diagnosed by viewing the cystic membrane.

Hydatid cysts are typical, involving one lobe in 72% of cases, usually at the lung base [11-13]. In this case, multiple cysts were present in both middle and upper lobes of the right lung. The hydatid cyst not open to the pleura appears as a circular or oval image with well-defined limits, that can change according to its evolution. If the cyst ruptures, a radiological image of the pneumopericyst appears. If the content of the cyst is completely evacuated to the bronchial tree, a cavity similar to those observed in tuberculosis or pulmonary abscesses appears. However, if the content is only partially evacuated, a waterline image appears, commonly referred to as the Camelot sign [14]. Rupture of cysts may cause an anaphylactic reaction.

The conventional treatment of hydatid cysts in all organs is surgery. Medical treatment with albendazole is also effective in selected patients. Praziquantel may be added to albendazole. Surgical methods related to pulmonary cysts include cystotomy and enucleation of the intact cyst, with or without capitonnage, for complicated or intact cysts. The current treatment of hydatid disease of the lung is complete excision of the cyst, including the germinative membrane, with the maximum preservation of lung tissue [15]. Thoracotomy is the best procedure for removing a hydatid cyst, but video-assisted thoracic surgery is suggested for selected patients [16].

Conclusion

Case report indicate that when a patient presents with massive hemoptysis, zoonotic infections, especially hydatid disease of the lung, should always be considered alongside other common causes of massive hemoptysis. Although it is one of the less common causes of massive hemoptysis, hydatid disease of the lung requires greater attention in countries, such as India , in which hydatid cyst disease is common.Surgery remains the primary choice of treatment in cystic pulmonary echinococcosis. In inoperable alveolar echinococcosis, long-term chemotherapy is advocated. The ultimate aim is to have proper control measures and prevent these cestode infestations.

FIGURE 1 A 7 × 8 cm circular lesion located in the upper lobe and 4 by 4 cm in middle lobe of the right lung at X-ray.

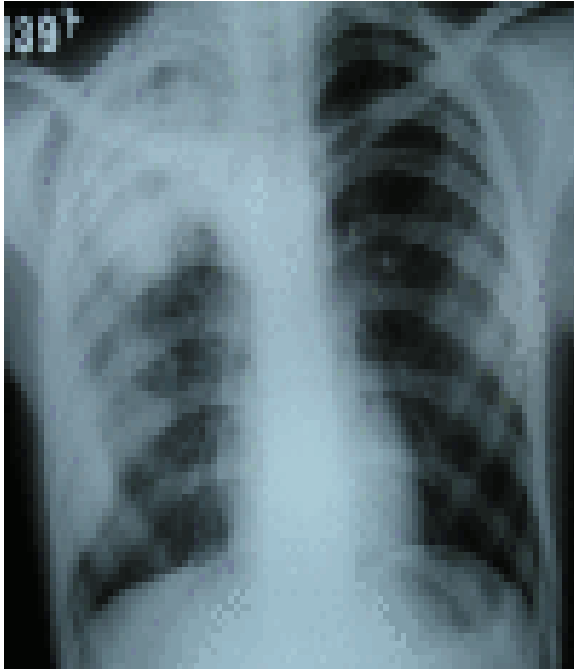


FIGURE 2 RIGHT LUNG UPPER LOBE HYDATID CYST



FIGURE 3 - AFTER ASPIRATING CYST FLUID WITH NEEDLE SYRINGE ,IT WAS WASHED WITH SCOLICIDAL SOLUTION AND THEN STABBED WITH STAB KNIFE. WHILE DOING THIS PROCEDURE, ALL SURROUNDING AROUND CYST WAS COVERED BY MOBS SOAKED BY SCOLICIDAL SOLUTION .



FIGURE 4 – ALL CYST MATERIAL ALONG WITH DAUGHTER CYSTS REMOVED



FIGURE 5 – CAPITONNAGE [CLOSING THE CYST CAVITY CIRCUMFERENTIALLY BY VICRYL 1 SIZE SUTURE IN CONTINEOUS MANNER FROM BASE UPTO APEX]



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