

Pulmonary Hydatid Cyst in a 13 Years Old Child: A Case Report

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Abstract

Hydatid disease is caused by genus *Echinococcus*, it's transmitted to human through sheep and cattle. People who lived in an endemic area should be suspected to have the disease. Pulmonary hydatid disease can be presented by respiratory manifestations as in our case. We report a case of a child, 13 years old, who was presented by shortness of breath and non-productive cough 2 months ago. The patient had an attack of hemoptysis 3 months ago but there is no history of fever, other constitutional symptoms or any medical illness. The patient had a close contact with horse. On examination, the patient was oriented and vitally stable. Both sides of the chest were moving equally with decreased air entry on the left side of the chest. Cervical lymph node enlargement was also detected. The case was provisionally diagnosed as tuberculosis. The x-ray was normal, while CT scan showed two cysts on the left side. The patient was treated surgically with resection of both cysts without lobectomy. Broncho-alveolar lavage was done and together with plural effusion and both cysts were sent for histopathology. The patient received the following medication: Albendazole 200 MG/BID/Orally for 30 days and Cefuroxime 250 MG/Q12H/Orally for 10 days.

Keywords: *Echinococcus granulosus*, Hydatid disease; Pediatrics; Pulmonary hydatid cyst

Review

Hydatid disease is a parasitic infestation caused by a tapeworm of the genus *Echinococcus*, which is the larval cystic stage. It's traveled to human through sheep and cattle and the definitive host is the dog. There are four known species of *Echinococcus* three of them are medically relevant: "*Echinococcus granulosus*, causing cystic echinococcosis (CE); *Echinococcus multilocularis*, causing alveolar echinococcosis (AE); and *Echinococcus vogeli*" [1].

The illness should be expected in people who lived or traveled to endemic area as in the middle east, the central part of Europe, Russia, the Central Asian Republics, China, northern Japan, northwestern Canada, and Alaska [1].

Liver and lungs are the most common organ that get infected by echinococcosis disease [2]. Muscles, brain and kidneys may rarely get involved in the hydatid disease. Pulmonary manifestations include chronic cough either dry or productive, dyspnea, pleuritic chest pain, and hemoptysis [3]. The patient also may be presented by a complication of pulmonary hydatidosis including compression of bronchi or intrabronchial rupture as a result of late diagnosis [3].

Hydatid disease rarely infects children, but more common in adult with an average age at diagnosis of 30-40 years [3]. The disease may be misdiagnosed and treated as another respiratory disease [4].

Case Report

13 years old Saudi boy patient presented to the emergency department with complaint of shortness of breath and non-productive cough 2 months ago. The patient had an attack of hemoptysis 3 months ago but there is no history of fever, other constitutional symptoms or

any medical illness. The patient had a close contact with horse and he didn't use any antibiotics for his symptoms.



Figure 1: 1A and 1B CT scan showed: Two large sharply circumscribed fluid filled cysts with thin enhancing walls are seen in left lung measuring about 11 × 8.5 and 10.5 × 8 cm with almost clear surrounding lung parenchyma. They exert mass effect with contralateral mediastinal shift, No calcification of the cyst wall is seen.

On examination, the patient was oriented and vitally stable. Both sides of the chest were moving equally with decreased air entry on the left side of the chest. Cervical lymph node enlargement was also detected. The rest of lab results were non-significant: CBC {HGB: 13 g/dl, WBC: 6500/mL, Platelet: 350,000/mL}, Chemistry {Potassium: 4.8 mmol/L, Sodium: 140 mmol/L, Alanine aminotransferase (ALT): 28 U/L, Aspartate aminotransferase (AST): 25 U/L, Direct bilirubin: 5 μmol/L, Total bilirubin: 18 μmol/L and Total protein: 65 g/L} and coagulation profile {PT: 12 seconds, PTT: 29 Seconds and INR:1.03}. Chest x-ray and CT scan revealed the presence of two large sharply circumscribed fluid filled cysts with thin enhancing walls are seen in left lung measuring about 11 × 8.5 and 10.5 × 8 cm with almost clear surrounding lung parenchyma. They exert mass effect with contralateral mediastinal shift, No calcification of cyst wall noted (Figure 1).

Patient admitted three times to hospital with a provisional diagnosis of Tuberculosis. The patient was admitted to thoracic surgery, and he underwent fibre-optic bronchoscopy and left thoracostomy. Both cysts were resected without lobectomy and broncho-alveolar lavage (BAL) was done. BAL, pleural effusion, and both cysts were sent for histopathology lab. The intercostal tube was inserted after the operation and the child was discharged with albendazole 200 MG/BID/Orally for 30 days and Cefuroxime 250 MG/Q12H/Orally for 10 days. After 4 days the intercostals tube and the stitches were removed. The patient did quite well post-operatively and was doing well during one month in the follow-up in the OPD.

Pathological Examination

Grossly, the specimen consisted of two cysts measuring 11 × 10 cm and 10 × 8 cm, white in coloration. Both cysts were unilocular (Figure 2a).



Figure 2a: Gross examination showed 2 cysts, measured 11 × 10 cm and 10 × 8 cm, white in color. Both cysts were unilocular.

Microscopy; both cysts consisted of 2 layers, an innermost layer with nuclei and the laminated membrane, which is vascular refractile membrane and protoscolices were seen also. The cervical lymph nodes showed the picture of reactive hyperplasia of the lymphoid follicles with expansion of the germinal centers. The lymph nodes exhibit preserved architectures and opened sinusoids and there is no malignancy seen (Figure 2b).

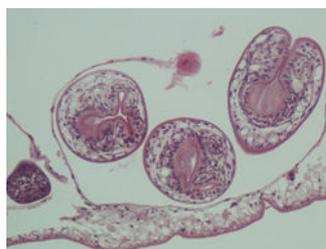


Figure 2b: Microscopic examination showed cyst wall consisted of 2 layers, an innermost germinal layer with nuclei and the laminated membrane, which is vascular refractile membrane and the organism is *Echinococcus granulosus* (H&EX400).

Discussion

Hydatid disease caused by larval stage of *Echinococcus granulosus*, the definitive host is the dog while the intermediate hosts are cattle and sheep. Transmission of the disease to humans by ingestion of eggs

which presented in the contaminated water or food and can be transmitted when they contact with dogs [5]. There are several domestic animals may be involved as an intermediate host of echinococcosis transmission such as sheep, pigs, goats, camels, deer, cattle and horses as in our case [6]. However, direct transmission from human to human doesn't happen. The prevalence of Cystic echinococcosis disease is higher in an endemic area such as Middle east, the central part of Europe, Russia, the Central Asian Republics, China, northern Japan, northwestern Canada, and Alaska [1].

Patient with pulmonary hydatid cyst is usually presented by respiratory symptoms including; a dry or a productive cough, chest pain, hemoptysis, dyspnea, fever or could be presented by the complication symptoms as compression of bronchi or intrabronchial rupture [3]. If the cyst ruptured, the patient may develop allergic symptoms and anaphylaxis, transbronchial spread to other lobes, pleural hydatidosis and pleural effusion [7]. Therefore those patients may be misdiagnosed by other respiratory diseases as in our case; the patient was first misdiagnosed as having tuberculosis due to respiratory symptoms and cervical lymph node enlargement. The above-mentioned data are in keeping with those of Mohsen et al. [4], who reported a case of hydatid cyst in a 9-year-old child which was misdiagnosed as having plural effusion.

Similarly, Fraz et al. [3] found in their observational study that dry cough is the commonest symptom among patient with pulmonary hydatid cyst.

Imaging studies should be used for the diagnosis and exclusion of another disease that enter in the differential diagnosis of pulmonary hydatidosis. Chest X-ray is a screening test and basic tool. Computerized tomography (CT) can rule out any pulmonary disease, nevertheless, the using of CT is not preferable in children to avoid radiation exposure [8]. Bronchoscopy usually used as a diagnostic test as well as a therapeutic one for clearance of the obstructed bronchial passages [4].

An indirect hemagglutination test and enzyme-linked immunosorbent assay can be performed first in acute cases but there are high false positive results due to cross reaction with other helminthic infestation, so we have to use Arc-5 antigen, which is considered the only specific serologic test for hydatidosis [3].

Casoni intradermal test and complement fixation test (CFT) are antibody assay tests that have a good accuracy and remain positive even after death of parasite or surgical removal of the cyst. Half of patients with isolated pulmonary cysts lack detectable anti echinococcal antibodies. So the diagnosis can be confirmed by detection of protoscolices or hydatid membranes after percutaneous aspiration of the cyst, guided by ultrasonography and under antihelminthic coverage [2].

The surgical intervention is a definitive treatment for Hydatid cyst. Resection of the cyst can be done with other surgical modalities; lobectomy, wedge resection, pericystectomy, and endocystectomy or without it depend on cyst size [8], however, we should avoid any aspiration or puncture which can cause allergic reaction and anaphylactic shock [8]. Albendazole used to avoid recurrent and spread of disease in combination with surgery as in our case we used albendazole 200 MG/BID/Orally for 30 days.

In conclusion, pulmonary hydatid disease can be presented by respiratory symptoms that may mimic another pulmonary disease, therefore; hydatid disease should be considered as one of differential

diagnosis for any patient coming with respiratory symptoms and in those who are live in the endemic area.

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