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Co-Infection of Pulmonary Hydatid Cyst and Tuberculosis: A Rare Association

KEYWORDS: Hydatid cyst, Echinococcosis, Pulmonary tuberculosis

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ABSTRACT *Human hydatid cyst and tuberculosis are two important public health problems especially in developing countries like India. Co-infection of pulmonary hydatid cyst and tuberculosis is very rare. Early clinical diagnosis of this rare co-infection is important as delayed treatment may lead to fatal outcome from either of the diseases. We are reporting a case of a young boy who was presented with and operated for pulmonary hydatid cyst and on surgical exploration later he was histopathologically diagnosed to be co infected with pulmonary tuberculosis. He was started with anti tubercular therapy and albendazole and was improved on follow up. There is limited review in this rare occurrence and with reference to our case we are analyzing the literatures on this condition.*

Introduction:

Echinococcosis is a human zoonotic infection caused by adult or larval (metacestode) stages of cestodes belonging to the genus Echinococcus and the family Taeniidae, often result in asymptomatic infection to severe disease; may even be fatal. Globally around 2-3 million people are livings with this infection1. In India numerous reports and surveys on seroprevalence of human hydatidosis have been published from various parts of the country. Tuberculosis remains a major global public health problem responsible for ill health among millions of people each year. Globally, it is ranked as the second leading cause of death from an infectious agent next only to the human immunodeficiency virus. According to recent World Health Organization (WHO) data, in 2013 an estimated 9 million people developed tuberculosis and 1.5 million died from the disease. India accounts for almost one quarter of all tuberculosis cases globally2.

Concomitant hydatid cyst and tuberculosis have been described before but their existence in one lesion is very rare3,4. We report a case of 24 year young male who presented with left pulmonary hydatid cyst and found to have coexistent tuberculosis on histopathology finding postoperatively.

Case report:

Twenty four year young male patient presented with low grade fever, recurrent cough with expectoration, left sided pleuritic chest pain and dyspnea on exertion for three months duration. There was no history of hemoptysis and weight loss in the recent past. On examination the patient was febrile (temperature of 38.4oC with a pulse rate of 96 beats per minute, blood pressure of 110/70 mmHg and respiratory rate of 22/minute. There was no clubbing or lymphadenopathy. On respiratory system examination there was decreased breath sounds on left side of chest with coarse crepitation. Other systems yielded no clinical abnormalities. Except for a mild anaemia (Hemoglobin 9.6 gm%), and high erythrocyte sedimentation rate (ESR- 48 mm at the end of first hour), the haematological profile was normal. Other biochemical parameters (blood glucose, serum electrolytes, renal functions and liver functions) were normal. The viral markers for human immunodeficiency virus (HIV) and hepatitis B & C were non reactive. Sputum for AFB was negative. Enzyme Immunoassay (EIA) for Echinococcus IgG in serum was positive. Chest X Ray was showing non homogenous opacity in the left lower lobe. Contrast enhanced computed tomography (CECT) chest revealed soft tissue density lesion measuring 3.7 × 2.3 cm with lobulated margins noted abutting the left oblique fissure in the left lower lobe with peripheral enhancement suggestive of hydatid cyst(Figure 1).

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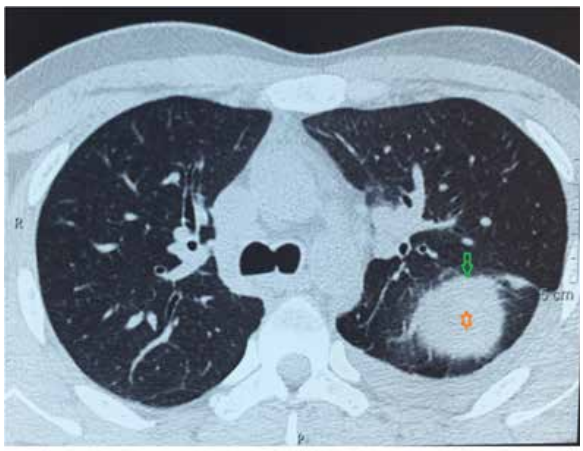

Figure 1: CECT chest revealed soft tissue density lesion (Red star) measuring 3.7 × 2.3 cm with lobulated margins noted abutting the left oblique fissure in the left lower lobe with peripheral enhancement (Green arrow) suggestive of hydatid cyst

Under all aseptic and antiseptic measures, patient was taken for operation for pulmonary hydatid cyst with left postero lateral thoracotomy approach. In the exploration a hydatid cyst of around 3×4×4 cm in lower left lobe has been identified and surprisingly there was a hard ragged edge nodular lesion adjacent to it. Hydatid cyst cavity was decompressed and savlon wash was given in the cavity. Decortication and marsupialisation of cyst was done. Materials of wedge resection and from the adjacent hard nodules were send for histopathological review. Two Intercostal Drainages(ICD) were put over base and apex and thorax was closed in layers. The patient was started with Albendazole 400 mg twice daily. Histopathological examination of the cyst wall showed lamellated wall of Eccinochoccus granulosus consisting of ectocyst and endocyst (H&E, x40) which was consistent with diagnosis of hydatid cyst(Figure:2).

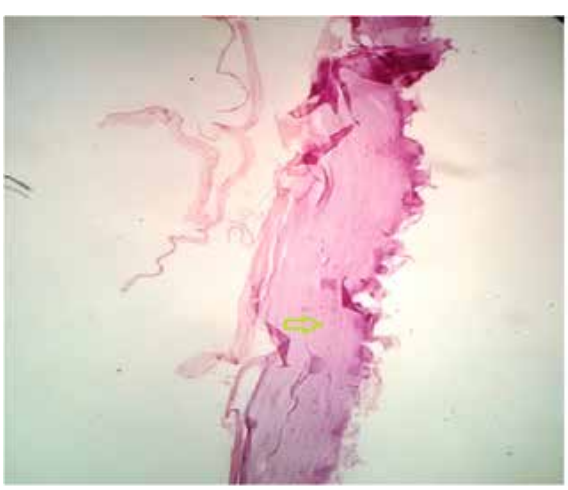

Figure 2: showed lamellated wall of Eccinochoccus granulosus consisting of ectocyst and endocyst (H&E, x40) which was consistent with diagnosis of hydatid cyst

The sections studied from the nodules sent separately showed lung parenchymal tissue with epithelioid granuloma with caseating necrosis (H&E, x10) favoring a diagnosis of tuberculosis (Figure:3) though Zeihl Neelson's stain for acid fast bacilli was negative.

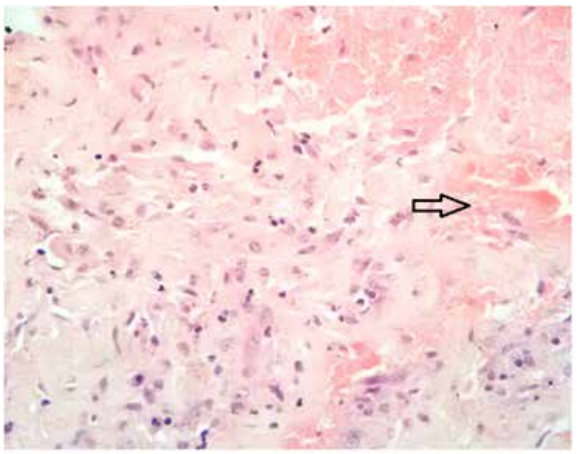

Figure 3: showed lung parenchymal tissue with epithelioid granuloma with caseating (Black arrow) necrosis (H&E, x10) favoring a diagnosis of tuberculosis

Anti-tubercular therapy was started with a regimen containing isoniazid, rifampicin, ethambutol and pyrazinamide for 2 months followed by isoniazid and rifampicin for 4 months under Directly Observed Treatment Short-course (DOTS) regimen. The patient responded to treatment and was doing well on follow up.

Discussion:

Both hydatid disease and tuberculosis in human are infectious disease with extensive distribution and various manifestations. Hydatid disease is caused by larval form of the tapeworm echinococcus granulosus and transmitted by dogs. The lung is the second most common involved organ after liver, but in children it is the commonest site. A simple pulmonary hydatid cyst can arise anywhere in the lung, but in almost two third of cases it is located in the right side and mostly in the lower lobe5. Hydatid infestation of the lung can be primary or secondary. Primary infestation is determined by the evolution of the hexacath embryo; the secondary is the result of evolution fertile elements originating in a primary cyst. The clinical symptoms of pulmonary hydatid cyst are variable and never pathognomonic. The clinical symptomology often depends on the size of the cysts and their site within the affected organ and the complications related to cyst rupture, spread of protoscoleces, and bacterial infection. Chest pain, chronic cough with expectoration, dyspnea, haemoptysis, fever are the common nonspecific symptoms. Rarely, patient may present with pneumothorax, pleuritis, lung abscess, eosinophilic pneumonitis and parasitic lung embolism. In addition, systemic immunological reactions may be observed like urticaria, asthma, anaphylaxis or membranous nephropathy. Uncomplicated cysts are clearly defined by chest X Ray, usually round or oval structures with diameters between 1 cm and >20 cm, displaying a homogeneous shadow indicating a fluid-filled space. They may also occur as thin-walled 'empty' cysts. The cysts may be located anywhere in the lung as solitary or multiple cysts. Pulmonary cysts usually do not calcify, and daughter cyst formation is rare.

Tuberculosis (TB) remains a major global health problem, responsible for ill health among millions of people each year. TB ranks as the second leading cause of death from an infectious disease worldwide, after the human immunodeficiency virus. The latest estimates included in this report are that there were 9.0 million new TB cases in 2013

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and 1.5 million TB deaths. Without treatment, TB mortality rates are high. In studies of the natural history of the disease among sputum smear-positive/ HIV-negative cases of pulmonary TB, around 70% died within 10 years; among culture-positive (but smear-negative) cases, 20% died within 10 years2. This continued burden of disease is particularly tragic because TB is nearly 100% curable.

Co-infection of tuberculosis and other parasitic diseases in human is an important public health problem especially in endemic countries like India3. As many as 24 cases of co-infection with tuberculosis and parasitic diseases have been described, out of which six cases are co- infected with hydatid cyst6. Although details of pathogenesis of this association are not known, there are postulated hypothesis of low socioeconomic status and unhygienic practice. A study from China has described immunogenic mechanism in relation to simultaneous occurrence of hydatid cyst and tuberculosis. As the chronicity of hydatid cyst increased the immune profile of the host appeared to change from a Th1 to Th2 response and with a suppressed Th1 immune profile the hosts' ability to detect and respond to viruses, bacteria and other pathogens is impaired7.

In our case, the patient was presented with mild low grade fever with cough and left sided pleuritic chest pain and chest X-Ray was showing rounded lesion in left upper lobe. He was treated outside with various courses of antibiotics, but as he was not responding and his sputum for acid fast bacilli (AFB) was negative, we go ahead with CECT chest which showed features suggestive of hydatid cyst. When we took the patient for surgery, we encountered a complicated hydatid cyst along with the presence of a hard nodule in the posterior lobe which was suggestive of an infective pathology. So, we resected the infected nodular lesion and send for histopathological examination. Although granuloma with foreign body giant cell reaction can happen in the host wall of the hydatid cyst , there will not be any caseating necrosis that is characteristic of tuberculosis. In our case histopathology picture was suggestive of caseating epitheloid granuloma that was highly suggestive of tuberculosis considering it is very common infectious disease in our scenario8. Patient was put on antitubercular therapy under DOTS and tablet albendazole was continued. He improved on follow up after 2 motnhs and 6 months.

Conclusion:

Coexistence of pulmonary tuberculosis and hydatid cyst is infrequently reported in literature. Although tuberculosis is much more widespread disease in India, a patient with non specific symptoms and atypical imaging findings should be evaluated properly to rule out hydatid disease and vice versa. Early suspicion and diagnosis will lead to effective and sustainable treatment outcomes and ultimately reducing associated morbidity and mortality.

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