Case Report

A rare case of pulmonary cysticercosis manifesting as lung cavity with pleural effusion

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ABSTRACT

Isolated pulmonary cysticercosis is extremely rare manifestation of a rather common disease which is distributed worldwide. Most common sites which provide perfect nourishment for the growth of cysticercosis are muscle and brain followed by eye. Pulmonary involvement in cisticercosis is very rare and if at all present, then ill-defined nodular shadows distributed throughout the lung is the usual radiological presentation. No case of cysticercosis presenting as lung cavity with pleural effusion has been reported so far in literature. We came across a rarest presentation of cysticercosis as cavity in the lung with effusion. After nullifying all the differential diagnosis of cavitary lung lesions, a diagnosis of pulmonary cysticercosis was made by histopathological examination of the lung cavity aspirate and enzyme linked immunosorbent assay (ELISA) for cysticercosis. Case was successfully treated with albendazole (15mg/kg) with steroid cover.

KEY WORDS: Cavitary lung lesions, pulmonary cysticercosis, Pleural effusion.

INTRODUCTION

Taenia solium has a world wide distribution but it is most commonly found in Mexico, Russia, South-east Asia and South America. Human cysticercosis is caused by pork tapeworm (Taenia solium). Infestation of tapeworm in humans can be divided into two major clinical groups. One group has humans as the definitive host with the adult tapeworm residing in wall of intestine whereas in the other group humans act as the intermediate host and only a larval stage of the parasite is present in the tissues.

Infection of Taenia solium in humans most commonly occurs due to consumption of undercooked pork or contaminated food stuff and water which is harboring eggs of tapeworm. The eggs of adult tapeworm are hatched to embryos in the upper gastrointestinal tract where they penetrate the intestinal wall and invade the blood stream to get disseminated to other organs of the body like brain, subcutaneous tissue, eyes, etc.

Pulmonary involvement has been seen in many cases of disseminated cysticercosis but isolated pulmonary involvement is seldom reported. The presence of lung cavity with effusion is again making this case unique because the usual manifestation of cysticercosis in lungs is presence of pulmonary nodules.

CASE REPORT

A 56-year-old male, sweeper by occupation presented with continuous mild grade fever coupled with right-sided chest pain and cough with phlegm production for 2 months. Purulency and amount of cough increased in last 7 days with a mucoid, foul-smelling expectoration which had postural variation (more in left lateral position). Chest pain was dull aching and continuous without any radiation.

Chest X-ray PA view revealed a large thin walled cavity with smooth margins and an air fluid level in right lower lung with obliterated costophrenic angle (Figure 1). Air fluid level was in a waveform shape as compared to levels seen in lung cavity or loculated pyothorax which usually look more horizontal. Ultrasonography (USG) thorax revealed encysted pleural fluid with septations (volume 407.55cc). USG abdomen was normal. A contrast enhanced computerized tomography (CECT) was done thereafter which revealed a thick-walled cavitary lesion measuring $7.5 \times 5.2 \times 6.6$ centimeters with surrounding consolidation. Routine hemogram did not reveal any
significant abnormality except a raised eosinophilic count of 650 cells per microliter. Sputum for acid-fast bacilli was negative (Ziehl-Neelsen stain and by concentration method). Pyogenic culture showed Gram-positive bacilli (suspected aerobic contamination), ELISA for Echinococcus was negative (IgM-6.88U/ml, IgG -4.90 U/ml).

On examination patient was of average built with no history of any chronic medical illness. No lymphadenopathy was seen. No history of hemoptysis, shortness of breath, abdominal pain, vomiting, visual abnormality or any other focal neurological deficit was present.

USG guided aspiration of around 200ml of deep straw-colored pleural fluid was done from the pleural space which revealed protein of 5.1gm/dl, sugar 75mg/dl, adenosine deaminase (ADA) of 46 IU/L, differentials showing 55% lymphocytes, 30% eosinophils and rest neutrophils.

Based on the clinical suspicion of lung abscess, patient was started with broad spectrum intravenous antibiotics. He showed no response to 1 week of antibiotic therapy and a clinico-radiological deterioration was seen with subsequent chest X-ray revealing multiple air fluid levels inside the cavitary lesion. Repeat USG pleural space showed around 190 cc of pleural fluid with enormous septations. No pleural fluid was aspirable on repeated attempts but about 5 ml of pinkish gelatinous material was aspirated under ultrasound guidance from the cavitary content which was sent for cytopathological examination. Results of cytopathology confirmed the presence of scolices and chitinous cell wall of cysticercosis [Figure 2b]. Figure 2 shows fragments of fibrillary bluish material interspersed with small blue oval nuclei and honeycomb appearance of scolices of cysticercus. Figure 2a shows single scolex of cysticercus. After the cytopathological confirmation, serum IgG antibodies (ELISA) for cysticercosis was done which came out to be positive (IgG-6.1IU/L).

After the cytopathological and serological confirmation, diagnosis of pulmonary cysticercosis cellulosae was made and patient was now asked about the dietary habits, which were consistent with intake of pork till 8 months back, though no history of pet animal was there. Magnetic resonance imaging (MRI) of brain and eye was then done and no evidence of cysticercosis was found in these sites. Albendazole therapy (15mg/kg) with oral steroid cover (to contain the inflammatory response caused by dead cysticerci) was started. After 2 weeks of albendazole therapy patient showed drastic improvement both clinically as well as radiologically. Chest X-ray after 3 weeks of therapy showed almost complete resolution of the cavitary lesion. Albendazole therapy was given for a total duration of 1 month.

DISCUSSION

Infection occurs by the ingestion of tapeworm larvae via contaminated food, water or improperly cooked pork. Auto infection can also occur in humans by reverse peristalsis. This disease also has feco-oral route of transmission[2].

The clinical symptoms of cysticercosis are protean and vary according to the organ involved. The most common site is muscle where it is rarely symptomatic. Intracranial lesions can present with convulsion whereas intraventricular cysticercosis can present with headache, nausea and vomiting due to raised intracranial pressure. Intraocular cysticerci can present with decreased visual acuity. Herculean appearance is seen in few cases due to abnormal bulky pseudohypertrophy of skeletal muscles as a result of heavy infestation with cysticerci.

The rarity of pulmonary involvement by cysticerci can be explained by the life cycle of *Taenia solium* parasite. Humans may be an intermediate host for the adult larvae.
which mostly favors muscle and brain tissue to complete their life cycle. Moreover, pulmonary involvement is mostly overlooked because patients usually present with neurological symptoms and other clinical features which are more cumbersome and prominent\(^3\). The radiological appearance of cysticercous lesions mimics many other parasitic infections like Echinococcosis, Paragonamiasis etc. Magnetic resonance imaging is usually the investigation of choice to rule out intracranial and ocular lesions\(^5\).

Till now about 60 cases of disseminated cysticercus cellulosae have been reported in literature so far but no case of isolated pulmonary involvement in cysticercosis is available on medline search. However one case report on unknown association of eosinophilia, pleural effusion and cysticercosis is reported\(^6\). Other case of pleural and pulmonary involvement in disseminated cysticercosis was reported from Brazil where pulmonary nodules were found on CECT thorax and final diagnosis was made by histopathological confirmation after open lung biopsy\(^7\). A case series of cyticercosis from South India revealed pulmonary involved in just one case out of total 38 cases diagnosed by histopathological examination over a span of 10 years with incidence of less than 3\%\(^8\). Diagnostic criteria as per textbook of Harrisons principles of internal medicine is by demonstration of cysticerci by histologic or microscopic examination of biopsy material (absolute criteria) and by demonstration of antibodies to cysticerci in serum by enzyme linked immunoelectrotransfer blot (major criteria). Both these criteria were met in the present case. Lesions responding to albendazole (15mg/kg) or praziquantel therapy (50mg/kg) is also one of the major diagnostic criteria for diagnosis of cysticercosis. Differential diagnosis in this case included tuberculosis, hydatid cyst, lung abscess and cavitating malignancy.

To best of our knowledge no case of isolated pulmonary cysticercosis presenting as lung cavity with pleural effusion is reported in literature till now.

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