Case Report

PULMONARY ASCARIASIS AND HOOKWORM INFESTATION IN A PATIENT WITH SUPPURATIVE LUNG DISEASE (EMPYEMA THORACIS): A CASE REPORT.

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ABSTRACT

There is limited data on parasitic lung diseases as they are often missed or misdiagnosed as tuberculosis or lung malignancies and hence a high index of suspicion is needed to make a diagnosis. We report a case of Ascaris and Hookworm lung infestations with empyema thoracis in a 63 year old Farmer who was thought to have pulmonary tuberculosis.

Keywords: Ascaris, Hookworm, Empyema Thoracis.

INTRODUCTION

Parasitic lung diseases have a worldwide distribution particularly in high endemic areas and regions of high rate of immigration from endemic areas. They affect the respiratory system particularly the lungs, the mediastinum and thoracic wall in several ways.¹ They are often misdiagnosed either as pulmonary tuberculosis or lung malignancies especially in low resource settings. Here we report a rare case of parasitic lung disease in a farmer who had empyema thoracis. Initial diagnostic considerations from the referring hospital were tuberculosis and a lung malignancy. A Computed Tomography and Sputum microscopy revealed empyema thoracis and the larvae of Ascaris and Hookworm species respectively hence, it is important to consider parasitic lung diseases as a differential diagnosis in such clinical scenario.

CASE REPORT

A 63 year old Farmer who presented to the medical emergency via referral from a private hospital, with a month history of right sided pleuritic non-radiating chest pain, cough productive of sputum, difficulty with breathing and a 3 week history of high grade swinging fever. He had not been treated for tuberculosis in the past, was not aware of his retroviral status and had no history of recurrent childhood upper respiratory tract infections. He smoked 4.5 pack years which was not significant. Diagnostic considerations from the referral hospital was pulmonary tuberculosis to exclude a lung malignancy.

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Pulmonary Ascariasis and Hookworm Infestation as Empyema Thoracis

General physical examination revealed a febrile and pale patient with chest examination findings in keeping with a right sided pleural effusion. A diagnostic thoracentesis revealed purulent effluent, chest radiograph showed a right pleural effusion. Sputum microscopy however showed the larvae of Ascaris and Hookworm species and subsequent stool microscopy done revealed the eggs of Ascaris and Hookworm species. A chest computed tomography (fig 1) revealed features in keeping with empyema thoracis; an isodense lesion in the right hemithorax and thick regular wall with multiple hypodense foci within it, with an attenuation of -681 HU suggestive of air and a thickening and separation of the visceral and parietal pleura.

Based on the above, a diagnosis of parasitic lung disease in a patient with chronic empyema thoracis was made.

Other investigations done included pleura aspirate culture which yielded a mixed growth of *Klebsiella species and Proteus vulgaris*, complete blood count showed eosinophilia of 12.3%,

**Fig 1: Chest CT showing isodense lesion in the right hemithorax in keeping with empyema thoracis**

keeping with empyema thoracis; an isodense lesion in the right hemi thorax and thick regular wall with multiple hypodense foci within it, with an attenuation of -681 HU suggestive of air and a anaemia with a packed cell volume of 20% and a microcytic hypochromic picture (MCV = 67.7 FL and MCH = 22.4 Pg.). Retroviral screen was non-reactive, sputum GeneXpert MTB/RIF was...
negative. Bronchoscopy and histology were normal.

He was given oral Albendazole 400 mg daily for 5 days, had several courses of antibiotics, was transfused and subsequently had a posterolateral thoracotomy and decortication on the 17th day of admission by the Cardiothoracic unit with intraoperative findings of about 2 litres of copious pus and debris within the right thoracic cavity, thickened fibrotic membrane and a collapsed and trapped right lung. On repeat sputum microscopy and stool microscopy following completion of Albendazole, no Ascaris or Hookworm species were seen. He improved clinically post operatively and was discharged to the Respiratory and Cardiothoracic Clinics after 25 days of admission.

DISCUSSION:

Parasitic lung diseases clinically can present either as focal or diffuse lung diseases, with focal lesions manifesting either as cystic lesions, coin lesions and consolidation/pleural effusion.³ They have a worldwide distribution with a higher prevalence in developing countries, most particularly areas of poor sanitation. In 2013, there was a reported case of respiratory failure associated with Ascaris lumbricoides infection in a 66 year old Polish man who was managed for acute myeloblastic leukaemia.²

Ascariasis and hookworm infestation present with transient pulmonary infiltrates. Ascariasis is caused by Ascaris lumbricoides which is distributed worldwide typically in areas of poor sanitation and transmitted faecoorally. The ingested eggs hatch and larvae migrate via the portal circulation to the liver and then via the heart to reach the lungs 2 weeks after ingestion. The larvae then ascend to the trachea, are swallowed and eventually develop into adult worms in the small intestine producing eggs 10 – 12 weeks after ingestion.³ Within the second week of infection, a small percentage of patients manifest with symptoms of Loeffler’s Syndrome as a result of larval invasion of the lung tissue.³

Hookworm infestation on the other hand is caused by 2 species; Ancylostoma duodenale and Necator americanus with Ancylostoma duodenale found in the Middle East and South Europe and Necator americanus occurs sporadically in South Eastern USA.³ The eggs are passed in faeces and develop into filariform larvae in soil. They penetrate the exposed skin of the human host when they come in contact with infected soil. The larvae then penetrate the blood vessels and migrate from the heart to the lungs before breaking out into the alveoli and ascending into the pharynx from where they are swallowed and subsequently mature in the small intestine. Similar to Ascariasis, during hookworm migration to the lung, it may manifest as Loeffler’s Syndrome though usually mild.

Loeffler’s Syndrome occurs as a result of larval migration into the alveoli triggering an allergic response leading to respiratory symptoms such as cough, wheeze, dyspnœa, chest pain, fever and haemoptysis. The illness typically resolves spontaneously after several weeks. It could however persist as a chronic eosinophilic pneumonia or rarely complicated by spontaneous pneumothoraces.³ The diagnosis is confirmed by identifying the larvae of parasites in sputum and eggs in stool. Other findings on investigation include leucocytosis, peripheral blood eosinophilia and elevated total serum IgE.³

Treatment for both conditions involves the use of Albendazole. Other drug options include Mebendazole, Piperazine, Praziquantel and pamoate. Chronic suppurative lung diseases include various lung diseases like bronchiectasis, lung abscess, empyema thoracis and less common necrotizing pneumonia which are characterised by chronic cough and progressive lung damage. Empyema thoracis, which is one of the parapneumonic effusions refers to the presence of frank pus in the pleural cavity.

Pleural infections have an annual incidence of about 65,000 cases each year in the US and UK with about 57% of patients with community acquired pneumonia developing a parapneumonic effusion.⁴ About 5 – 10% of parapneumonic effusions progress to empyema with an average mortality rate of 6 – 24%.⁴ Empyema is more common in extremes of age with adults presenting in the 6th or 7th decade of life. There is no significant sex predilection.
Pulmonary ascariasis and hookworm infestation are rare findings in our environment in comparison to intestinal infestation hence are often missed or misdiagnosed as pulmonary tuberculosis or lung malignancies. Physicians should thus keep in view the possibility of such diseases as this may reduce misdiagnosis of such cases.

REFERENCES


