

# Pulmonary Strongyloidiasis

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## Abstract

In patients with abnormalities of cell-mediated immunity, strongyloides hyperinfection syndrome may occur producing pulmonary infection that may manifest as asthma, chronic bronchitis, haemoptysis, eosinophilia and pulmonary infiltrates. We report a case of an uncontrolled asthma patient who presented with fever and haemoptysis. She had no evidence of immunosuppression and CT chest showed a lesion suspicious of malignancy, sputum cytology showed strongyloides larvae and the patient had complete recovery with treatment.

## Introduction

*Strongyloides stercoralis* is a soil-dwelling nematode worm, common in the wet tropics of South America, Africa, and South East Asia. The larval forms of this nematode penetrates the skin of the host and circulate widely before maturing and settling in the small intestine.<sup>1</sup> In patients with abnormalities of cell-mediated immunity, strongyloides hyperinfection syndrome may occur producing pulmonary infection that may manifest as asthma, chronic bronchitis, haemoptysis, eosinophilia and pulmonary infiltrates.<sup>2</sup> In a patient population with a high prevalence of chronic lung disease, many of these symptoms are nonspecific and the diagnosis is often missed.<sup>3</sup> Sputum cytology is a useful test for strongyloidiasis in patients with steroid-dependent unexplained lung disease or lung shadows. We report a case of an uncontrolled asthma patient who presented with fever and haemoptysis. Sputum cytology showed strongyloides larvae and the patient had complete recovery with treatment.

## Case Report

A 50 year old female presented with two months history of irregular fever, productive cough with mucoid expectoration and episodes of streaky haemoptysis inbetween. She was a known asthmatic since the age of 28 years and was on irregular treatment. She gave history of frequent exacerbations of her asthma symptoms at least twice in a month for which she used to take one or two steroid injections and a course of oral steroids. She was treated in a local hospital with antibiotics, bronchodilators and steroids on the present occasion without any symptomatic relief. On admission she was febrile, respiratory rate 20/mt, pulse rate 90/mt, blood pressure 124/84 mmHg. On general examination there was no clubbing, no cushingoid features or fungal skin infections. Her respiratory system showed bilateral rhonchi and crepitations in the left interscapular region.

Her hemoglobin was 10 gm% with normal blood counts and no eosinophilia, ESR 40 mm/hour. Her blood sugar was normal, liver and renal functions were normal. She was HIV negative with normal CD4 counts. Her x-ray chest showed a rounded opacity in the left upper zone (Fig. 1). CT scan chest showed a rounded well circumscribed lesion in the left upper lobe without any significant lymph nodes (Fig. 2). Sputum Gram staining,



Fig. 1 : X-ray chest showing opacity in the left upper lobe

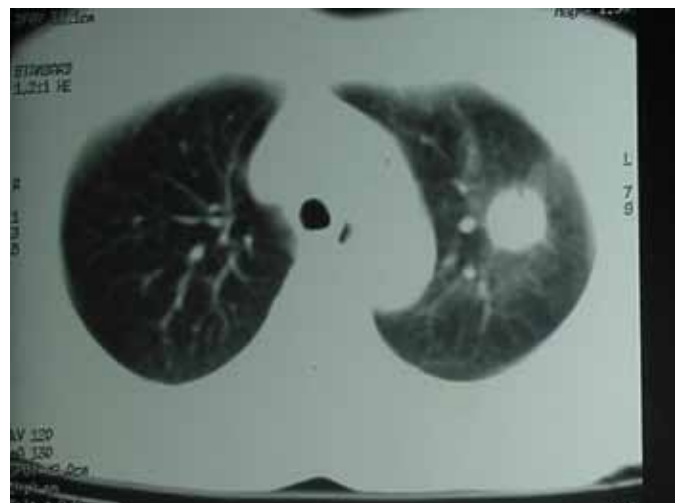


Fig. 2 : CT scan chest showing a well circumscribed lesion in the left upper lobe

culture and AFB were negative. Sputum cytology was done to look specifically for malignant cells in view of the CT shadow.

All sputum samples were negative for malignant cells; however large "ghost" larvae of strongyloides were identified in the rhabditiform stage having a worm like configuration with one rounded and thicker end (Fig. 3). Wet smears of sputum and stool specimens also contained motile larvae of strongyloides.

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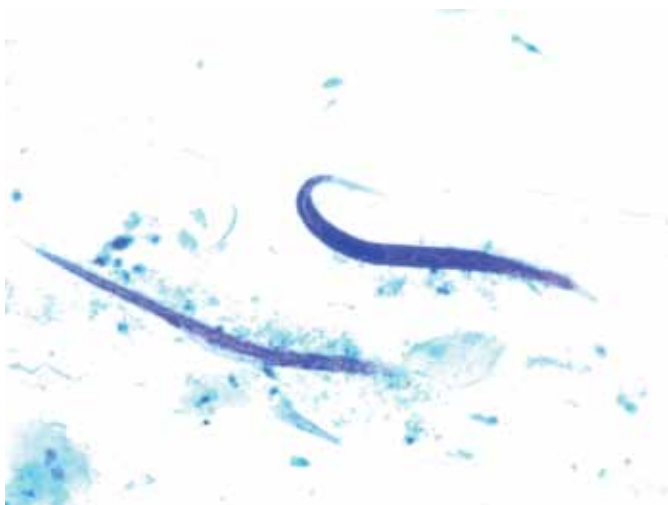


Fig. 3 : Giemsa stain demonstrating Strongyloides larva (200X)

The patient was treated with Ivermectin 10 mg tablet for seven days and her symptoms subsided. Follow up x-ray showed complete clearance.

## Discussion

*Strongyloides stercoralis* is an intestinal parasitic nematode commonly found in Brazil, certain parts of southeastern United States and other tropical countries.<sup>4</sup> The complex parasite has a dual life cycle involving both parasitic and free living stages. Adult worms can survive and reproduce both in the small intestine of man and in the soil, giving rise to a variety of possible routes for infection. During direct development, adult eggs hatch in the intestine into rhabditiform larvae, which are passed in the stool. Under favorable conditions they mature in the soil into filariform (infective) larvae that are capable of penetrating the skin of humans. The rhabditiform larvae also have the ability to develop into free living adult worms that exist in the soil independently of humans and this is known as indirect development.

Once the infective larvae have penetrated the skin, they travel to the lungs via the circulatory system, where they migrate up to the airways, reach the oesophagus, and are swallowed back down to the intestine where mating occurs, completing the cycle. Disseminated strongyloidiasis frequently develops in patients with immunodeficiency caused by poor nutrition, drug therapy (including steroid therapy) for autoimmune diseases, chronic alcoholism, advanced age, diabetes mellitus, collagen disease, and post-surgery status.<sup>5</sup>

Although *S. stercoralis* can cause a severe pathologic state, the initial symptoms are very mild and nonspecific. In endemic areas of *S. stercoralis*, strongyloidiasis should be included as a possible cause of pulmonary disease in differential diagnoses, especially in patients with immunodeficiencies and abnormal chest imaging findings, like alveolar and interstitial shadow patterns or lobar pneumonia. The most important clinically significant pulmonary syndrome induced by strongyloides is hyperinfection, as a rule this syndrome occurs in patients with compromised cell-mediated immunity, although it is occasionally encountered in normal persons.<sup>6</sup> It should be recalled that infection with strongyloides is lifelong and that reactivation with suppression of cell-mediated immunity can occur decades after initial exposure.<sup>6</sup>

For this reason various authors suggested that steroid-treated patients with chronic lung disease or suspected malignant tumors be screened for strongyloides infection.<sup>2</sup> Sputum cytology may be the most useful screening procedure<sup>4</sup> and a broncho-alveolar lavage may be done to identify the organism in case the sputum is negative for larvae. Although it is a potentially lethal iatrogenic opportunistic infection, it is amenable to treatment with antihelminthic agents if recognized in time. The case illustrates the need even in non-endemic areas, to suspect opportunistic pulmonary strongyloidiasis when a patient's asthma worsens despite treatment with increasing doses of corticosteroids even without documented abnormalities in cell-mediated immunity.

## References

1. Lesley AS, Jennifer AY, and ShortlandWebb WR et al. Strongyloides Stercoralis hyperinfection syndrome with Escherichia coli meningitis: Report of two cases. *J Clin Pathol* 1986;39:366-370.
2. Nwokolo C and Imobiosen EAE. Strongyloidiasis of respiratory tract presenting as asthma. *Br Med J* 1973; 2:153-154,
3. Saito A. Strongyloidiasis: Epidemiology, Clinical manifestations and New methods for diagnosis and Treatment. *J Infect Chemother* 1995; 1: 98-106.
4. Pillai KR, Nair GR, Amma NS, Nair MK. Diagnosis of Pulmonary strongyloidiasis by sputum cytology: A Case Report. *Ind J Pathol Microbiol* 1993; 36:4; 489-491.
5. Siddiqui AA, Berk SL. Diagnosis of Strongyloides stercoralis infection. *Clin Infect Dis* 2001; 33: 1040-1046.
6. Jay A Fishman Helminthic Diseases of the Lungs. In: Alfred P.Fishman, Jack A Ellias, Jay A. Fishman, Michael A. Grippi, Robert M. Senior, Allan I. Pack(editors). *Fishmans Pulmonary Diseases and Disorders*, 4<sup>th</sup> edition, 2007. Mc Graw Hill, Vol.2, 2415-2418.

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