

SHORT REPORT

Strongyloides stercoralis infection mimicking a malignant tumour in a non-immunocompromised patient. Diagnosis by bronchoalveolar cytology

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J Clin Pathol 2005;58:420–422. doi: 10.1136/jcp.2004.017756

Autoinfective strongyloidiasis is often fatal in immunosuppressed patients or in immunocompromised hosts. An interesting case of *Strongyloides stercoralis* hyperinfection was seen in an immunocompetent patient. This report describes a case of fatal strongyloidiasis in a 79 year old man, who had suffered gastrointestinal discomfort for years, and who presented because of respiratory illness. A chest radiograph showed an irregular mass close to the mediastinum and interstitial infiltrates, but blood eosinophilia was not observed. Cytological examination of the samples obtained from bronchial aspiration and brushing identified several filariform larvae. Thus, cytology was essential for the correct diagnosis in this patient and is a very reliable method to diagnose lung parasitosis.

The endemic parasitic nematode *Strongyloides stercoralis* is most often found in tropical and subtropical regions, although cases have been reported in other areas.¹ Infection with this parasite is diagnosed relatively frequently in areas of Spain where paddy fields are found, and farm workers are most often affected (with or without symptoms).^{2–4} Thus, the Valencian coastal region is an endemic site for this parasitosis, which can also rarely be seen in other areas, such as Galicia or Aragón.⁵ Human infection begins with the filariform larvae penetrating the skin and migrating haematogenously to the lungs. Larvae then ascend the airway, are swallowed, and finally mature in the gut. Unlike other nematodes, *S stercoralis* can autoinfect the same host and persist for decades. The different categories of infection include chronic infection, hyperinfection syndrome, and disseminated strongyloidiasis.⁶ The infection can disseminate as a result of changes in the larval phase, and this principally affects the lung. Although it is not necessary for patients to be immunosuppressed, systemic infection is often seen in such patients, and is usually more severe and frequently fatal.⁷ We report a patient who had no obvious immunodeficiency, but who suffered from hyperinfective syndrome with disseminated strongyloidiasis. Initially, a pulmonary tumour was suspected, and an accurate diagnosis was only achieved by the study of cytological material. Once the definitive diagnosis was reached an appropriate therapeutic protocol was established, but the patient died two days later as a result of intercurrent pulmonary complications.

CASE REPORT

A 79 year old man from Zaragoza (Aragón, Spain), who had no associations with local endemic areas or a history of travel to other countries, had suffered from abdominal discomfort for the past 20 years. Several days before admission to our

hospital, the patient showed effort dyspnoea, orthopnoea with progressive malleolar oedema, and pain in the right hypochondria. The electrocardiogram and eosinophil values were within normal limits, and no other changes were seen. A chest radiograph was performed and revealed an irregular central pulmonary mass (fig 1). A bronchoscopy was carried out because of the suspicion of neoplasia, and showed narrowing in the left bronchi, with abundant brown exudates but no endobronchial tumour. Examination of cytological samples obtained from the bronchial aspirate and brushings revealed normal epithelial cells with scarce polynuclear neutrophils, lymphocytes, foamy cells, and some filariform larvae measuring approximately 300–600 µm (fig 2). All larvae showed an eosinophilic cuticle and a good state of conservation, so that their morphological characteristics could be perfectly assessed, particularly their oral cavity and the long, slim, and cylindrical oesophagus and notched tail. Based on this morphological information, the filariform larvae were identified as *S stercoralis*. Therefore, the diagnosis was infection with *S stercoralis* in the absence of immunosuppression, diabetes, alcohol abuse, and corticosteroid intake. The patient received specific treatment with thiabendazole (25 mg/kg/ twice a day), which unfortunately lasted only two days because of the fatal outcome. The evolution of the disease was unfavourable, showing pulmonary oedema, haemorrhagic alveolitis, complete atelectasia in the left lung, and hepatic and renal insufficiency. Finally, the patient died as a result of cardiorespiratory failure. Necropsy was not authorised.

DISCUSSION

There are several pulmonary entities that could be confused with tumours, such as hamartoma, fungal infection, hydatidic cyst, or other parasitic infections.^{8–10}

Although radiological techniques are important diagnostic tools, histology and cytology are the most accurate and specific methods for diagnosis. Sputum, bronchoalveolar lavage, transbronchial aspirates, brush biopsy specimens, or



Figure 1 Chest x ray showing an irregular mass near the mediastinum.

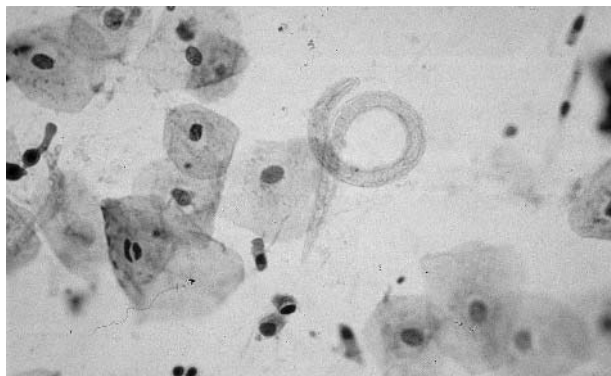


Figure 2 Squamous cells, some bronchial cells, and the presence of a filariform larva (Papanicolaou stain; original magnification, $\times 400$).

open lung biopsy specimens are useful methods to diagnose all types of pulmonary pathology. Parasitosis of the lung can produce pneumonia, pneumonitis, or Loeffler's syndrome,^{6–11} and rarely it can mimic a malignant tumour.¹⁰ Both migrating larvae and eggs may be found in the lung and therefore demonstrated in cytological samples,⁶ allowing a correct diagnosis.

“Pulmonary strongyloidiasis is seldom diagnosed until late in the course of the disease, which contributes to the increased mortality rate among immunocompromised hosts”

Strongyloides stercoralis is often found in the digestive tract and produces abdominal pain, epigastric tenderness, mild gastrointestinal symptoms, and non-specific diarrhoea—as was seen in our patient—in addition to non-specific inflammatory changes that can be seen in the endoscopic-pathological studies.¹² However, widespread dissemination involving extraintestinal organs such as the lung, skin, liver, kidneys, spleen, heart, brain, and meninges has also been described.^{13–16} Pulmonary infection is often seen in the hyperinfection syndrome, and is also relatively common in the case of deep autoinfection in immunocompromised patients or those with cancer.^{17–19} However, our patient was immunocompetent and diabetes, malnutrition, alcoholism, and corticosteroids treatment were absent, so that initially a tumour was suspected. Our patient also lacked other predisposing factors such as achlorhydria, prolonged intestinal transit, dementia, or being an institutionalised resident. Our patient only presented symptoms mimicking peptic ulcer disease and mild malnutrition related to his age. Even though the cytological findings were surprising they led to the correct diagnosis. Different methods to achieve an accurate diagnosis have been described,²⁰ and blood eosinophilia has been reported to have the best predictive value by Roman-Sánchez *et al.*,²³ because the absence of eosinophils is associated with a worse prognosis. Unfortunately, pulmonary strongyloidiasis is seldom diagnosed until late in the course of the disease, which contributes to the increased mortality rate among immunocompromised hosts; nevertheless, the most important factor affecting outcome is early diagnosis and treatment. Unfortunately, our patient did not have a prompt diagnosis, so that the treatment was less effective, and the patient died from this parasitosis. An exhaustive study of the cytological material showed some filariform larvae in the presence of squamous, cylindrical, ciliated or caliciform cells without the presence of atypical cells or an inflammatory component. Larvae can sometimes be seen

Take home messages

- We report a fatal case of *Strongyloides stercoralis* hyperinfection in an immunocompetent patient
- A chest radiograph showed an irregular mass close to the mediastinum and interstitial infiltrates, but blood eosinophilia was not seen
- Bronchoscopy was performed because of the suspicion of neoplasia, but cytological examination of the samples obtained from bronchial aspiration and brushing identified several filariform larvae
- Thus, cytological study was essential for the diagnosis in this patient and is a very reliable method to diagnose lung parasitosis

using basic staining methods, such as Papanicolaou²¹ or haematoxylin and eosin, although the Giemsa stain is superior for obtaining morphological details of the larvae. Cytology may be essential in some cases,^{21,22} as was the case here, and we believe that it should be carried out for all atypical pulmonary processes.

In conclusion, we encourage the use of respiratory cytology in all patients with an atypical pulmonary clinical outcome. Cytological studies are useful in the diagnosis of lung parasitoses, especially when radiography or computed tomography do not yield a definitive diagnosis, and should be used before other more invasive procedures.^{10,21}

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Accepted for publication 14 September 2004

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doi: 10.1136/jcp.2004.017756

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