



CASE FOR DIAGNOSIS

Tuberculosis mimicry

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CASE HISTORY

A 29-yr-old Thai female presented with a persistent productive cough with yellow phlegm and blood streaked sputum of several weeks' duration. This was associated with significant weight loss. She was a smoker of 1 pack·day⁻¹ for >10 yrs. The patient had taken several courses of antibiotics without any clinical improvement. Physical examination was unremarkable.

The chest radiograph carried out on presentation (figures 1 and 2) was suggestive of an infection. A tuberculin skin test was 7mm. Sputum examination for acid fast bacilli was negative.

The patient was started on anti-tuberculosis (TB) therapy. Two samples of sputum were negative for *Mycobacterium tuberculosis*.

Despite receiving 4 months of anti-TB therapy, she did not show any symptomatic or radiological improvement (fig. 3).

Bronchoscopy and lung biopsy were performed, with trans-bronchial lung biopsy (fig. 4) and bronchoalveolar lavage (BAL; fig. 5) sent for examination. The findings prompted examination of a stool sample. The total white blood cell count was $6.5 \times 10^9 \text{L}^{-1}$ with 1.2% eosinophils present.



FIGURE 1. Chest radiograph on presentation.



FIGURE 2. Chest radiograph on presentation, lateral view. Arrow indicates a lesion.

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FIGURE 3. Chest radiograph after 4 months of anti-tuberculosis therapy.

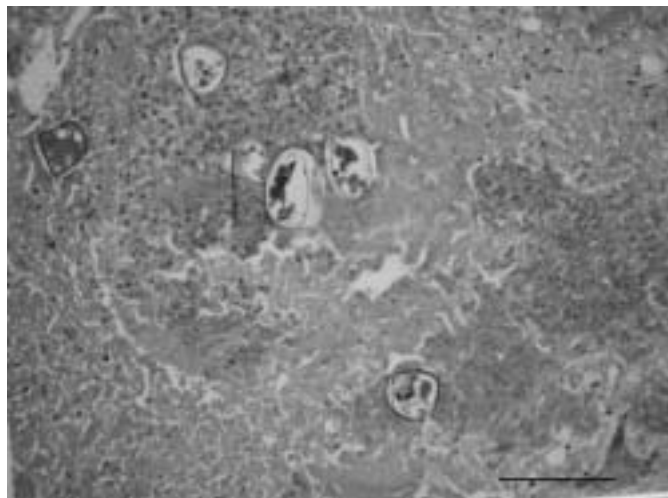


FIGURE 4. Histopathology slide showing transbronchial lung biopsy. Horizontal scale bar=2.4mm. Vertical scale bar=1.6mm.

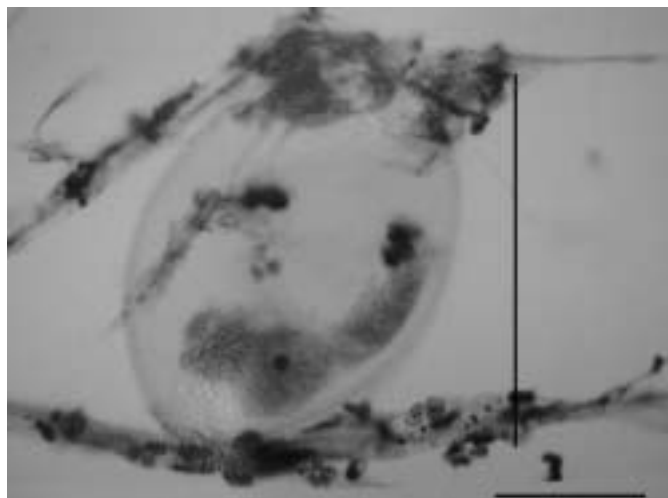


FIGURE 5. Histopathology slide showing bronchoalveolar lavage. Horizontal scale bar=0.67mm. Vertical scale bar=1.6mm.

BEFORE TURNING THE PAGE, INTERPRET THE RADIOGRAPHS AND HISTOLOGY SLIDES, SUGGEST A DIAGNOSIS AND A POSSIBLE CAUSE

INTERPRETATION

Chest radiographs

The chest radiograph (fig. 1) on presentation showed infiltrates in the right lower zone and nodular opacity over the right hemidiaphragm. The lateral view (fig. 2) localised the lesion to the right middle lobe.

The chest radiograph (fig. 3) taken after 4 months of TB treatment shows progression of shadowing in the right lower zone.

Transbronchial biopsy

Histopathological sections (fig. 4) showed fragments of lung tissue with interstitial pneumonia. There was fibrous widening of the interstitium with marked acute and chronic inflammatory infiltrate within the alveoli. Eosinophils were also seen and parasitic ova with operculum compatible with *Paragonimus* spp. were noted.

Bronchoalveolar lavage

Histopathological examination of the BAL fluid (fig. 5) showed inflammatory yield and operculated ova compatible with *Paragonimus* spp.

Stool examination

Examination of the stool sample showed eggs of *Paragonimus westermani* were present.

Diagnosis: Parasitic infection caused by the sheep liver fluke *P. westermani*.

CLINICAL COURSE

Additional history was obtained from the patient after these new findings, which revealed that she had lived in Japan for 11 yrs before moving to Singapore. She had often eaten raw seafood whilst in living in Japan.

The patient was treated with praziquantal 1.2 g *t.i.d.* for two days, which improved her symptoms. A further stool examination 6 weeks after treatment was negative for ova, cyst and parasites. A chest radiograph taken 3 months after treatment showed partial resolution of shadowing with residual scarring of the right lower zone.

DISCUSSION

Infection by the liver fluke *P. westermani* is common in countries of Eastern Asia (such as Japan, Korea, China and Indochina), where *P. westermani* is endemic and raw, or partially cooked, crab meat is part of the diet or traditional medication [1–3]. In Singapore, *Paragonimus* spp. infection is rare and no cases have been reported so far.

Paragonimiasis spp. is a parasitic infection caused by the sheep liver fluke *P. westermani*. The life cycle involves the development from embryonated eggs, through the larval stage, to the encysted metacercaria stage. This involves two intermediate hosts, snails and crustaceans. Human infection occurs with the ingestion of crustaceans infected with metacercariae. Upon infection, the metacercariae excysts in the duodenum and pass to the peritoneal cavity, then into the pleural cavity *via* the diaphragm. In the lung, it becomes encapsulated and develops into adult worms [1].

The presentation of pulmonary pleural *Paragonimiasis* spp. mimics that of TB. Between 50–70% of patients are initially diagnosed and treated as for TB. Therefore, a high index of suspicion is needed to diagnose *Paragonimiasis* spp.. The patient's country of origin and dietary habit of eating raw, or partially cooked, crab or crayfish are important features [1, 2].

In this patient, empiric TB therapy was started after she failed to respond to several courses of antibiotics. This is based on the fact that TB is a common cause of haemoptysis and unresolved pneumonia in this region. The patient also originated from an endemic region. Another diagnosis was suspected when she did not show any symptomatic or radiological improvement after 4 months of therapy. Diagnosis was made using bronchoscopic samples which showed the typical operculated ova of *P. westermani*.

The diagnosis of *Paragonimiasis* spp. is made by the detection of ova in the sputum, stool, biopsy or bronchoscopic specimens and *via* serologic testing for the *Paragonimus* spp. specific antibody [1, 4]. In general a reduction is noted in the immunoglobulin G level 1 yr after treatment. Supportive evidence includes marked eosinophilia and elevated interleukin-5 in the blood and pleural fluid [1, 4, 5]. Whilst eosinophilia is common, it is absent in one third of cases as in this patient [1]. Radiographic findings are variable. In the acute stage, hydropneumothorax is a common finding. Manifestation at the chronic stage varies from solitary nodules [2] to infiltrates, cavities, bronchiectasis, cysts and effusions [4].

The treatment of choice is praziquantal 25 mg·kg⁻¹ with a cure rate of >85%. Bithionol was previously an alternative, but has a higher incidence of side effects. In one study, triclabendazole has been shown to be as effective as, and better tolerated than, praziquantal [1].

CONCLUSION

The diagnosis of pulmonary *Paragonimiasis* spp. should be considered in patients from endemic regions presenting with symptoms and radiological features which may mimic pulmonary tuberculosis. The presence of a positive dietary history, negative tuberculosis cultures and lack of response to anti-tuberculosis therapy should prompt a revision of diagnosis, as in this case.

REFERENCES

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