

A Case of *Paragonimus westermani* Infection by Eating Imperfectly Cooked Wild Boar Flesh

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Abstract: A 19 year old woman was admitted because of abnormal chest X-ray showing smoothly outlined cystic lesion. The eggs of *Paragonimus westermani* was identified in the broncho-alveolar lavage fluid. Anti-*Paragonimus westermani* antibody was positive in the serum by the ELISA method. Six eggs were observed in one gram of feces before the administration of praziquantel. Praziquantel (75mg/kg) was administered for two day, the egg of *Paragonimus westermani* disappeared in the feces and the size of cystic lesion in the chest X-ray decreased.

Key words: *Paragonimus westermani*, ELISA, praziquantel

INTRODUCTION

Paragonimiasis is caused by flukes of the genus *Paragonimus*, among which *Paragonimus westermani* is the best known as the pathogen of lung infection. Patients acquire the disease by ingesting raw or undercooked crabs, cryfish, wild boar flesh or by drinking water contaminated by the metacercariae. The chest roentgenographic changes of pulmonary paragonimiasis have a characteristic features of pneumothorax, pleural effusion, ring shadows or thin wall cysts. The diagnosis can be made readily in most patients by identifying the typical operculated eggs in the sputum, stool, plural effusion or broncho-alveolar lavage fluid. We reported a 19-year-old female who got infection of paragonimiasis by eating the wild boar flesh in Miyazaki prefecture.

CASE REPORT

A 19-year-old woman complaint chronic intermittent nonproductive cough for several months. Chronic nocturnal cough, anorexia, and fever had been present for several weeks before admission. Her father was a hunter and hunted wild boar in the wood of southern part

of Miyazaki prefecture which is an endemic area of paragonimiasis reported by Doutsu *et al.* (1993). She ate wild boar flesh with family on a new year day. Her father was admitted to a hospital in Miyazaki prefecture for the examination of pleural effusion but not had the final diagnosis. She produced a chest film taken on May 25 in 1993 by school medical extermination showing smoothly outlined cystic lesion on the left upper lung.

On physical examination the girl was well nourished and in no distress. Her temperature was 36.6 °C, and her pulse rate and respirations were 60 beats per minute and 18 /min, respectively. There was no abnormal physical findings in the chest. Initial laboratory investigation disclosed the following values: hemoglobin, 13.0 g/dl, WBC count, 8900/cu mm, with 3% band forms, 51% polymorphonuclear leukocytes, 32% lymphocytes, 4% monocytes, and 10% eosinophils. The C-reactive protein showed 0.4 mg/dl. Other studies were unremarkable except for an elevated immunoglobulin E (3745 mg/dl).

A chest roentgenogram displayed a smoothly outlined cystic lesion in the left upper lung without pleural effusion (Figure 1). The PPD skin test and the latex agglutination test for detecting antigen of *Cryptococcus neoformans* were negative. The sputum smears and cultures were negative for *Mycobacterium tuberculosis*. Bronchofiberscopic examination was performed in a week after administration. The operculated eggs of *Paragonimus westermani* were identified in broncho-alveolar lavage fluid (Figure 2) and the diagnosis of pulmonary paragonimiasis was established. The stool specimens were examined by formaline-ether method (MGL method) reported by Beaver *et al.* (1984), and it was also positive for *P. wester-*

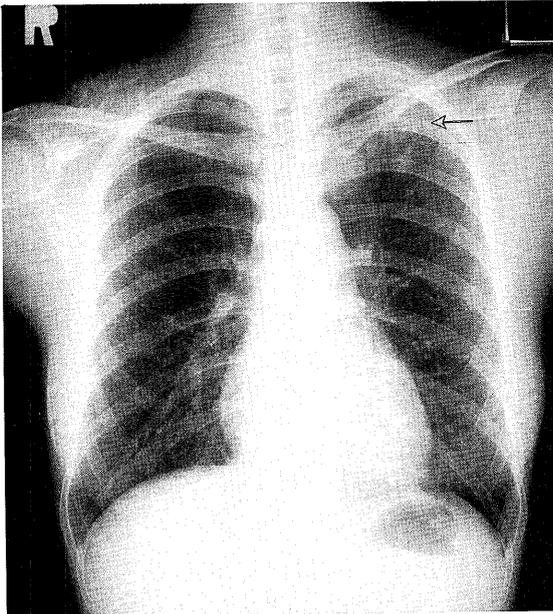


Fig. 1. Chest roentgenogram on admission. There were multiple outlined cystic shadows of the left upper lung.

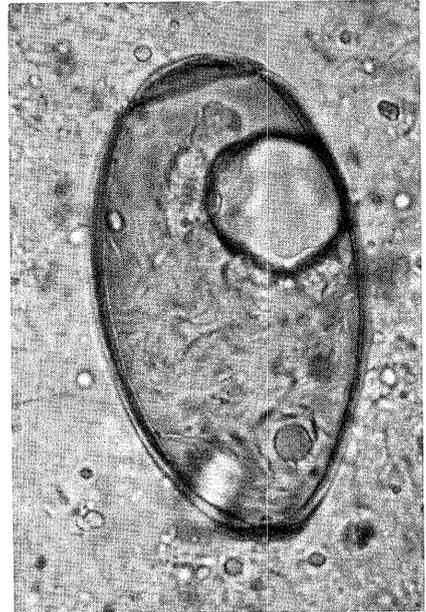


Fig. 2. *Paragonimus westermani* ova in the stool.

mani ova. Anti-Paragonimus antibody was positive in serum by ELISA method reported by Coligan *et al.* (1991).

The patient was treated with praziquantel approximately 75 mg/kg/day (3600 mg twice a day) for two days. The change of number of eggs in feces was followed after treatment of praziquantel (Table 1). The total number of eggs in stool was 1410 before treatment, and then after two days of treatment of number of eggs was decreased remarkably. Thirty six disrupted eggs were shown in stool a week after treatment. *P. westermani* ova was negative in the stool two weeks after treatment. A week after therapy, respiratory symptoms disappeared. The size of cystic shadow in the chest roentgenogram decreased after treatment of praziquantel.

Table 1. Number of eggs in feces after treatment of praziquantel

Days after treatment	Total weight of feces (g)	Total No. of eggs	No. of eggs per 1g of feces
0	235	1410	6
5	288	432	1.5
8	368	0*	0
19	452	0	0

*six disrupted eggs in feces

DISCUSSION

Pulmonary paragonimiasis should not be forgotten as a differential diagnosis of cystic lesions in chest X-ray in Japan. Infection with *Paragonimus westermani* generally occurs after ingesting raw or improperly cooked crayfish or freshwater crabs in which the encysted metacercariae are present. Miyazaki *et al.* (1976) investigated that it has been demonstrated that wild pigs can ingest the crabs or crayfish and harbor infective metacercaria encysted in muscle in Japan.

Clinical findings of pulmonary paragonimiasis include the insidious onset of chronic cough, rust-colored sputum, hemosputum, hemoptysis, night sweat, and chest pain were occurred to pneumothorax or pleural effusion. In many patients, hemosputum is the chief complaint. Richard *et al.* (1982) reported that hemoptysis was observed in patients with infiltration on chest X-ray films. Our case didn't show hemosputum probably because the chest X-ray was a smoothly cystic lesion.

Roentgenographic examination of the chest by plain film and tomography assists in the diagnosis of pulmonary paragonimiasis. Richard *et al.* (1983) reviewed twenty-five Indochinese refugees with paragonimiasis. Roentgenographic lesion inclined diffuse (44%) and segmental (24%) infiltrates, nodules (20%), and cavities (20%), however 20 per cent of patients in whom paragonimus eggs are identified in the sputum showed normal chest X-ray.

The caviary lesion was characterized to be a smoothly outlined cyst. Pleural effusion has been considered to be a rare manifestation of radiographic surveys of patients with positive sputum or stool examination for the parasites and ova of *Paragonimus* reported by Minh *et al.* (1981).

The diagnosis of paragonimiasis is made by detection of the characteristic eggs in the sputum or stools of infected individuals. Neither leukocytosis nor eosinophilia is commonly observed. However, our case showed eosinophilia and elevated immunoglobulin E. She had no allergic disease on her past history. Serological testing may be helpful in egg-negative cases. This case showed negative anti-*paragonimus* antibody by Oucherlony's double diffusion test but positive (0.367 E.O.D) by the ELISA method. The antibody titer by ELISA didn't change even (0.412 E.O.D) one month after treatment, but it gradually decreased (0.209 E.O.D) three months after treatment. Once the diagnosis is established, therapy should be initiated. Praziquantel is given orally in a dose of 25 mg/kg three times per day for one day or 75 mg/kg two times per day for two days. Yokogawa *et al.* (1963) mention about the disappearance of the eggs of *Paragonimus* in the feces after treatment. In our case that the number of eggs of *Paragonimus westermani* decreased on two days, and in a week destructed forms of ova were observed in feces. After two weeks of treatment, the eggs disappeared in the stool. The clinical efficacy of praziquantel was satisfaction in our case.

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