



Case Report

Thoughts underlying “pneumonia” resulting from eating: A case report

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ABSTRACT

As a rare zoonotic helminth disease, paragonimiasis is easy to be misdiagnosed. Adequate attention to the medical history of the patient and early detection of serological antibodies can improve the diagnosis rate. Praziquantel and trichlorobendazole are commonly used for treatment, and the prognosis is good. This case report mainly introduces the classification, diagnosis, and treatment of paragonimiasis, with an aim to draw the attention of doctors to the disease.

A 48-year-old male patient was admitted to the hospital for paroxysmal distention and pain in the middle and upper abdomen for 1 week. One week before admission, the patient experienced sudden distension and pain in the middle and upper abdomen. The specific abdominal pain site was not constant. The attack was paroxysmal, and the degree was not severe. Each attack lasted approximately 2–3 min. There was spontaneous remission without radiation pain in the shoulder and back. Changes in body position did not relieve the pain. Moreover, the pain aggravated after eating. The patient felt slightly relieved after defecation but was exhausted. He used to wake up at night because of pain. The pain was not related to fatigue and satiety. There were no symptoms of paroxysmal aggravation. Acid reflux was noted. Before the onset of the disease, the patient had consumed crab food and drank white wine. The patient had previously developed hepatitis A. He had a history of smoking and drinking for some decades, with consumption of 100 ml white wine daily.

Physical examination at admission revealed the following findings: clear mind, no apparent dry and wet rales in both lungs, uniform heart rhythm, no murmur, soft abdomen, tenderness in the right lower abdomen, no rebound tenderness, active bowel sounds, and no swelling of both lower limbs.

After admission, the relevant examination of the digestive system was performed. Abdominal ultrasound showed a rough surface of the gallbladder wall and multiple cholesterol crystals in the gallbladder. Gastroscopy revealed chronic superficial gastritis and duodenitis. Colonoscopy showed swelling and bulge of mucosa of the descending colon. Blood routine examination showed that the white blood cell count was $11.7 \times 10^9/L$, and the eosinophil ratio was 14.3%. Considering the patient's abdominal pain, symptomatic treatment such as esomeprazole magnesium enteric-coated tablets for protecting the stomach and pinaverium bromide tablets for relieving spasms were given. Four days later, the patient developed cough, expectorating white phlegm, and mild asthma. In the physical examination, a few wet rales could be heard in both lower lungs. The white blood cell and the levels of CRP and PCT increased. Combined with chest radiographs, lung infection was considered, and cefodizime combined with azithromycin was given for treatment. Chest CT showed the following findings: (1) Multiple patch dense shadow and nodular shadow in both lungs, with a high possibility of inflammation. It was recommended to re-examine after anti-inflammatory treatment, by excluding tumors; (2) Partial atelectasis in the lower lobe of both lungs; (3) Multiple slightly larger lymph nodes in the mediastinum and hilum of both lungs; and (4) lo-

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cal thickening of the pleura on both sides. After transfer to the respiratory department, the patient was given piperacillin-tazobactam combined with levofloxacin for anti-infection treatment. C-reactive protein and procalcitonin showed a downward trend. Re-examination of the blood routine showed that T lymphocytes increased while B lymphocytes and NK cells decreased. Bronchoscopy showed that all bronchial lumens were unobstructed, and the mucosa was smooth. No new organisms were found, and no special findings were found in the related pathogen examination. TBLB showed chronic inflammation and interstitial mucus degeneration (bronchial mucosa of right BII, right BIX, and left BIII). The pathological examination with colonoscopy showed that chronic inflammation in the descending colon accompanied with submucosal inflammatory granulation tissue formation and necrosis. The results of the delivery examination showed that paragonimiasis was positive, and *Cryptococcus* latex qualitative test was negative. The definite diagnosis was paragonimiasis.

1. Discussion

The present case of paragonimiasis was caused by eating freshwater crab. According to this case, the misdiagnosis rate of this disease can be greatly reduced by the detailed inquiry of the history of eating raw, half-baked crabs and drinking raw stream water, supplemented by antibody detection [1].

Paragonimiasis is caused by *Paragonimus westermani* and *Paragonimus skrjabini*, which parasitizes the human body. It is estimated that 29.38 million people in the world are infected, of which 19.5 million are in China [2]. People are infected by eating raw or half-baked freshwater crabs or crayfishes containing metacercaria [3]. The first intermediate host of paragonimus is snails. The second intermediate host is mostly freshwater crabs or crayfishes [4]. The present case of paragonimiasis was caused by eating crabs and drinking white wine.

Paragonimiasis usually has hidden onset and a chronic course. Its clinical features are cough, bloody sputum, occasional hemoptysis, chest pain, and dyspnea [5]. The clinical manifestations of *Paragonimus* pulmonary infection can be divided into four types: thoracic lung type, abdominal type, nodular type, and brain type. Chest and lung type: the most common symptoms include cough, bloody sputum, and chest pain, and typical sputum shows rust color or brown color. Abdominal type: Abdominal pain, especially right lower abdominal pain, with different severity, diarrhea, hepatosplenomegaly, bloody stool, and other symptoms. Nodular type: Subcutaneous or muscular nodules are the most common. Most of them are in the abdomen, chest, back, groin, thigh, and other parts. Brain type: It is more common in children and young adults, and paroxysmal severe headache and epilepsy often occur. If the spinal cord is injured, lower limb movement or sensory disturbance will occur. In this case, the mixed manifestation of abdominal type and thoracic lung type is considered, namely mixed paragonimiasis.

The diagnosis of paragonimiasis is based on the following criteria [6,7]: ① history of eating raw or half-baked freshwater crabs, crayfishes, or drinking raw stream water; (2) clinical manifestations of paragonimiasis such as migratory subcutaneous mass, cough, chest pain, and epilepsy; ③ significant increase in eosinophils in the blood; ④ positive *Paragonimus* skin test, and positive *Paragonimus* ELISA result; and ⑤ pathological examination revealed eosinophilic granuloma and Charcot-Redden crystal. If four of these criteria are positive, the case is diagnosed as paragonimiasis.

It is worth mentioning that paragonimiasis is easily misdiagnosed as tuberculous pleurisy, *Mycoplasma pneumoniae* pneumonia, and other diseases. The causes of misdiagnosis are as follows: ① This disease is rare, and some clinicians do not have adequate information about it. ② Lack of specificity in clinical manifestations: Paroxysmal abdominal pain, cough, and expectoration were the main manifestations in this case. Gastroscopy showed chronic superficial gastritis and duodenitis, while colonoscopy showed swelling and bulge of mucosa of the descending colon. ③ Inadequate attention to the medical history: The patient had a history of eating crabs and drinking white wine before the onset of the disease, which did not attract the attention of the physician. ④ The condition was not carefully analyzed: The patient's blood routine examination showed a significant increase in eosinophils. In addition to inflammation (allergic asthma, mycoplasma infection, and tuberculosis) and tumor, parasitic infection should also be considered [8]. Video-assisted thoracoscopy is a safe, easy-to-master, economical, and effective diagnostic technique that can help in the diagnosis of pleural effusion of unknown causes, obtain a histological diagnosis, and exclude tuberculosis and malignant tumor [9]. Early detection of serological antibodies, early diagnosis, and early treatment can improve the quality of life of patients.

At present, the general treatment of paragonimiasis is mainly to strengthen nursing, nutritional support, maintain water and electrolyte balance, prevent concurrent infection, etc. Symptomatic treatment is mainly drug and surgical treatment [10].

Symptomatic treatment is mainly drug therapy. According to WHO, praziquantel and trichlorobendazole are the commonly used drugs for paragonimiasis [11]. At present, praziquantel is commonly used in the clinic, at the dose of 25 mg/kg, three times a day, and the treatment course is 2 days. The curative effect of trichlorobendazole is similar to praziquantel, and it is well tolerated. The therapeutic dose of trichlorobendazole is 10 mg/kg twice a day. After taking the medicine, adverse reactions such as headache, dizziness, and abdominal pain may occur. In addition, artesunate has a certain curative effect, but the specific effects need to be studied.

Surgical treatment is suitable for patients with large pericardial effusion, pleural effusion, and subcutaneous mass. Surgical treatment based on drugs can reduce the occurrence of serious complications such as pericardial constriction and further improve biopsy and diagnosis. The prognosis of this disease is generally good.

In conclusion, paragonimiasis is a rare disease, and a detailed history inquiry is necessary to avoid misdiagnosis and missed diagnosis. For an unexplained increase in eosinophils in peripheral blood, the possibility of parasitic infection should be considered, and relevant examinations should be performed as soon as possible. Praziquantel and trichlorobendazole are the commonly used drugs for treatment, and the prognosis is good.

Declaration of competing interest

No potential conflict of interest was reported by the authors.

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