

## CASE REPORT

# A Case of *Angiostrongylus cantonensis* Infection Involving the Liver in Shaoxing

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### SUMMARY

**Background:** *Angiostrongylus cantonensis* is a rare zoonotic parasitic illness contracted by consuming raw or semi-raw food contaminated with the third-stage larvae of *Angiostrongylus cantonensis*, such as freshwater shrimps, fish, snails, frogs, etc. [1]. The parasite can stimulate the host to generate an immune response and cause tissue damage, primarily invading the central nervous system of the human body. However, the liver is relatively infrequently affected and is prone to missed diagnosis and misdiagnosis.

**Methods:** Comprehensive laboratory routine examinations, including blood routine, biochemistry, and others, were carried out on the patient. Additionally, abdominal enhanced CT and MRI imaging inspections were conducted, and in combination with the patient's epidemiological history, parasitic antibodies, and mNGS were detected.

**Results:** Blood routine examination reveals a white blood cell count of  $12.54 \times 10^9/L$ , with an eosinophil percentage of 52.9%. The C-reactive protein (CRP) is 45.74 mg/L, alanine aminotransferase (ALT) is 325 U/L, aspartate aminotransferase (AST) is 149.2 U/L, alkaline phosphatase (ALP) is 324.7 U/L, gamma-glutamyl transferase (r-GT) is 424.8 U/L, and lactate dehydrogenase (LDH) is 375 U/L. A full abdominal enhanced CT scan indicates multiple low-intensity foci in the liver. An enhanced MRI of the upper abdomen shows abnormal liver signals, suggesting a higher possibility of inflammatory lesions. The parasite antibody test turned out positive for antibodies against *Angiostrongylus cantonensis*. It is considered that the patient is infected with *Angiostrongylus cantonensis* involving the liver. After two weeks of clinical treatment with albendazole, the patient's symptoms improved, and no significant abnormalities were detected in related examinations.

**Conclusions:** Shaoxing is a non-endemic region of *Angiostrongylus cantonensis*. The diagnosis and treatment of this disease are rather challenging, and cases involving liver are even rarer. During the process of diagnosis and treatment, if an abnormal increase of eosinophils is detected in routine blood tests, in combination with clinical symptoms and epidemiological history, tests such as parasitic antibodies and mNGS should be added for a clear diagnosis.

(Clin. Lab. 2024;70:xx-xx. DOI: 10.7754/Clin.Lab.2024.240707)

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### KEYWORDS

*Angiostrongylus cantonensis*, eosinophils, detection of parasite antibodies, albendazole

### CASE PRESENTATION

The 42-year-old male patient from Shaoxing was admitted to the hospital on February 23, 2024, due to "repeated fever with cough and sputum for 2 weeks". Pre-

Case Report accepted July 12, 2024

viously, he had a history of traveling to Guangzhou and consuming raw fish. The patient experienced fever for 2 weeks, with a temperature reaching up to 39.0°C, accompanied by muscle soreness, irritating cough, and a small amount of white sputum. There was slight chest tightness, no symptoms such as nausea, vomiting, dizziness, or headache. He self-administered cold and antipyretic drugs but the fever persisted. The blood routine was examined in the outpatient department of our hospital: the percentage of eosinophils was 33.5% and CRP was 45.91 mg/L. After admission, levofloxacin injection was administered for infection prevention, but the effect was unsatisfactory. The patient continued to cough and the temperature rose to 39.0°C. Re-examination of the blood routine indicated that the white blood cell count was  $12.54 \times 10^9/L$ , the percentage of eosinophils was 52.9%, CRP was 45.74 mg/L, ALT was 325.8 U/L, AST was 149.2 U/L, ALP was 324.7 U/L, r-GT was 424.8 U/L, LDH was 375 U/L. However, liver antibodies A, B, C, and E were negative, and no eggs were found in the stool. Multiple nucleic acid tests for respiratory diseases yielded negative results. A chest CT scan disclosed microscopic nodules in the upper lobe of the left lung. A full abdominal enhanced CT demonstrated multiple low-intensity foci in the liver. Upper abdominal enhanced MRI suggested abnormal liver signals, which were more likely to be attributed to inflammatory lesions.

The patient presented with an abnormal elevation of eosinophils and a recent travel history to Guangzhou along with the consumption of sashimi. Consequently, the probability of parasitic infection was clinically contemplated, and the parasite antibody test was ordered. The findings revealed that the patient had a relatively rare infection of *Angiostrongylus cantonensis* involving the liver and was prescribed albendazole at a dose of 400 mg three times daily for one week. During the course of treatment, the patient's head MRI demonstrated scattered ischemic lesions in both the frontal and parietal lobes, thus a lumbar puncture was performed, and the brain pressure was 170 mmH<sub>2</sub>O. No abnormalities were identified in routine cerebrospinal fluid and biochemistry examinations, and the cerebrospinal fluid mGNS examination was also negative, indicating that the central nervous system was not involved. The patient was followed up two weeks later, and the patient's symptoms improved. The blood routine and liver function were re-examined, and all the indices returned to normal, with no obvious abnormalities detected in the abdominal B-ultrasound.

## DISCUSSION

*Angiostrongylus cantonensis* was initially discovered in 1935 by Chinese professor Chen Xintao within the heart and lung tissues of *rattus noricus* [2]. The adult parasite parasitizes in the pulmonary artery of rats and is mostly contracted by raw or semi-raw feeding involving inter-

mediate or secondary hosts carrying infective larvae. Endemic regions are mainly distributed in tropical and subtropical areas, and outbreaks or sporadic epidemics have occurred in some island countries of the Pacific Ocean and Indian Ocean, Southeast Asia, Australia, as well as Guangdong and Fujian in China [3-5]. With the alteration of people's eating habits and the augmentation of global trade of pets such as giant snails, angiostrongyliasis has been escalating year by year globally, presenting a grave threat to public health and people's well-being [6].

The incubation period of the disease is approximately two weeks. The larvae invade the intestinal wall, inducing nausea, vomiting, abdominal pain, diarrhea and other symptoms related to the digestive system, and subsequently enter the bloodstream, causing symptoms such as fever, cough, and expectoration [4]. It has been reported that the parasite can infect the lungs of patients, with small nodules being observable [7]. It has also been discovered that its larvae are capable of invading the retina and vitreous body of the eye, resulting in permanent visual impairment [8]. Nevertheless, it is most frequently observed to invade the central nervous system, giving rise to eosinophilic meningitis, encephalitis or cerebrospinal meningitis [9]. Hepatic involvement is infrequent. Studies have revealed that larvae recovered from snails infected with *Angiostrongylus cantonensis* were utilized to model adult female *Rattus norvegicus* by oral gavage, and elevated liver enzymes were detected in the infected group [10]. A 22-year-old patient suffering from diplopia was identified as being infected with *Angiostrongylus cantonensis*, and his abdominal CT also demonstrated a low-density lesion in the liver [7]. However, the outcomes of the follow-up review were not reported in the literature. In this study, following infection with *Angiostrongylus cantonensis*, the patient presented with elevated liver enzymes and multiple low-intensity foci in the liver. After deworming treatment, liver enzymes returned to normal, and liver B-ultrasound indicated no obvious abnormalities, thereby being regarded as a rare case of *Angiostrongylus cantonensis* infection with hepatic involvement.

Through this case, in daily diagnosis and treatment, if an abnormal increase of eosinophils is detected in the blood routine and there is an epidemiological history of parasites, a comprehensive analysis can be conducted by combining parasite antibodies, mNGS, and other examinations to minimize the chances of missed diagnosis and misdiagnosis of rare diseases [11]. Albendazole is a safe and broad-spectrum deworming drug and is the preferred choice for the treatment of *Angiostrongylus cantonensis* infection [12]. However, when there is a combined infection of the central nervous system, it is recommended to utilize corticosteroids to enhance the therapeutic effect [9].

### Sources of Support:

This research project was funded by Zhejiang Traditional Chinese Medicine Science and Technology Plan Project (no. 2024ZL1130, no. 2023ZL731) and by The Medical Science and Technology Project of Zhejiang Province (no. 2022KY1299).

### Declaration of Interest:

All authors declare that they have no competing interests.

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