Short Report: Case of Gnathostomiasis in Beijing, China

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Abstract. A 59-year-old woman sought treatment of for creeping eruption and erythematous plaques associated with high fever and systemic symptoms. She had a history of eating undercooked freshwater fish raised in Beijing 10 days before admission and reported no travel during the previous year. Blood examination showed eosinophilia and ultrasonography detected multiple hypoechoic areas in the liver and spleen. Western blot test detected specific antibodies to the larvae of *Gnathostoma spinigerum*. Cutaneous and visceral larva migrations associated with *G. spinigerum* were diagnosed. Twenty-three cases in 12 provinces have been reported in the Chinese literature but none have been reported in English.

INTRODUCTION

Gnathostomiasis has been widely reported in Japan and Southeast Asia, particularly Thailand, and more recently in Mexico. The disease is presumed to be endemic in some areas of China but has been reported only sporadically in the Chinese literature; however, no cases have yet been reported in Beijing. We report a case of gnathostomiasis in Beijing that was associated with both cutaneous and multiorgan infection. To our knowledge, this is the first case of gnathostomiasis in Beijing.

CASE REPORT

A creeping eruption developed on the right side of the back of a 59-year-old Chinese woman in Beijing after a few days of high fever, headache, and nausea. When she was admitted to the dermatological ward of Peking University Third Hospital six days later on November 2, 2001, the eruption had progressed to the anterior median line and was accompanied by worsening headache and nausea and liver dysfunction. At the same time, a migratory, painful swelling was noticed on her left upper arm.

When a skin biopsy was performed at the end of the eruption near the anterior median line on day 8 after admission, the creeping eruption on the patient’s chest wall progressed backward in 3 directions for approximately 13 cm and then converged on the anterior axillary line within 12 hours. Another painful swelling was noticed below the right costal margin. The patient reported eating undercooked freshwater fish 10 days before admission, which was raised in the local area. She reported no travel during the previous year.

On admission, her body temperature was 39.5°C. A 2 cm × 18 cm erythematous, urticarial plaque was noted on the patient’s right trunk from the posterior median line to the posterior axillary line. A subcutaneous and cutaneous swelling approximately 8 cm × 8 cm was located on the outside of the left upper arm; left axillary lymph nodes were firmly enlarged, and the patient’s skin was dermographic. A nontender liver edge descended 2–3 cm below the right costal margin; the spleen was not palpable.

On admission, the patient’s leukocyte count was 10.1 × 10⁹ cells/L with 38% eosinophils, and her 24-hour urine creatinine level was 498 µmol/L. During the course of infection, eosinophils increased continuously (the maximum number was 10.0 × 10⁹ cells/L) until a high dose of albendazole (1,200 mg/day) was first administered on November 3, 2001.

Ultrasonography showed multiple hypoechoic areas in the liver, kidney, and spleen (Figure 1). Magnetic resonance image scans of the liver also showed multiple, hyperintense signals. A biopsy specimen from the creeping eruption was stained with hematoxylin and eosin; nodules were confined to the right epigastrum and the left arm. Histologic examination of a hematoxylin and eosin–stained section of skin biopsy at the leading edge of an eruption showed a structure in the epidermis that was consistent with a nematode larva, and prominent infiltration of eosinophils around the vessels in the dermis accompanied by extensive destruction of subcutaneous tissues (Figure 2A and B).

Serologic test results for a larval extract of *Gnathostoma spinigerum* were positive by microplate enzyme-linked immunosorbent assay. Western blotting showed specific antibodies to a specific 24-kD antigen obtained from advanced third-stage larvae of *G. spinigerum* (Figure 2C).

Gnathostomiasis was diagnosed according to clinical manifestations of creeping eruptions, intermittent erythematous plaques, eosinophilia, pathogenic features, and specific antibodies to *G. spinigerum*. With high levels of creatinine and creatine in urine and multiple lesions in the liver, spleen, and kidney (seen by ultrasonography), she was presumed to have visceral larva migrans at the same time. She was treated with albendazole (400 mg/day). During therapy, a subcutaneous swelling developed on the right epigastrum; it subsequently migrated to the skin and formed a cyst. Three days later, the dose was increased to 400 mg, 3 times/day, and continued for 2 weeks. Two weeks after the first course, another nodule emerged on the inner part of her right upper arm; it formed a cyst and was excised. A second course of albendazole 400 mg, 3 times/day for 2 weeks was then given. The patient recovered gradually after the second course of albendazole. On follow-up six months later, laboratory test results had returned to normal levels, and results of liver ultrasonography were normal.
Figure 1. Ultrasonography showing multiple hypoechoic areas in the liver of the patient with Gnathostoma infection, Beijing, People’s Republic of China. Images on the right side were taken before treatment (November 1, 2001) and images on the left side were taken after treatment with albendazole (200 mg, 3 times/day) for two weeks.
DISCUSSION

Although no case of gnathostomiasis has ever been reported in Beijing, clinical and laboratory results strongly confirmed the diagnosis in our patient. On reviewing the Chinese literature, we found 23 cases in 12 provinces, although the actual incidence may be much higher because infection rates in animals and freshwater fish are high. Of the 23 reported gnathostomiasis cases in China, more than half were in patients who had eaten raw fish. Eleven of these cases began with cutaneous symptoms; 5 involved the stomach, 3 the lungs, 1 the biliary tract, 1 the breast, and 1 the conjunctiva. Our patient had cutaneous and visceral symptoms. With continuous high fever and systemic symptoms, a correct diagnosis was not made until Western blotting confirmed the presence of specific antibodies to \textit{G. spinigerum}. In other Chinese cases, a diagnosis was not made until larvae were expelled, although clinical manifestations were typical.

Albendazole, 400 mg, daily or twice a day for 3 weeks, is effective in treating patients with gnathostomiasis. Our patient responded well to albendazole, 400 mg/day; however, her symptoms were not completely resolved. A new swelling was observed after a complete course of 400 mg, 3 times/day for 2 weeks. We recommend that two courses are needed in patients with visceral migrations.

Although the present case was the first observed in Beijing, the incidence in this area may be higher because the fish our patient ate was farmed in a local area. Because of the severity of our patient’s illness and the number of infecting larvae, we presume a high infection rate in local animals or at least that the full life cycle of \textit{G. spinigerum} is present in this area. The importance of gnathostomiasis should be recognized because of the general unawareness of parasitic diseases by physicians and health authorities.

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