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BRIEF REPORT

Large Pericardial Effusion Due to Paragonimiasis in a 4-Year-Old Chinese Boy

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Large pericardial effusion (PE) and bilateral pleural effusion were found in a 4-year-old Chinese boy. An emergent surgery was performed. The biopsy showed massive eosinophil infiltration. Serologic test for *Paragonimus skrjabini* was positive. Postoperative praziquantel therapy was effective.

Keywords. children; China; paragonimiasis; pericardial effusion; pulmonary distomatosis.

Paragonimiasis is a parasitic infection caused by lung flukes of the *Paragonimus* genus [1–4]. Consumption of raw or undercooked crustaceans containing metacercariae of the *Paragonimus* genus leads to paragonimiasis. Large pericardial effusions (PEs) caused by paragonimiasis are rarely reported in children, and here we report a 4-year-old boy with paragonimiasis and a large pericardial effusion.

CASE REPORT

A 4-year-old male, who lived in Shizhu county (Chongqing, China), was admitted to the internal service of People's Hospital of Shizhu Tujia Autonomous County. He complained of vomiting and coughing for 3 days. These symptoms were exacerbated with significant abdominal pain and shortness of breath the following day. He was diagnosed with pneumonia 1 month before, but his symptoms were relieved after the use of antibiotics. He lived in a rural area and had a history of consumption of raw crabs. Physical examination showed a distended jugular vein and low blood pressure. A routine blood test revealed that his leukocyte count was 12 870/mm^3. The percentage and count of eosinophil were 11% and 1420/mm^3, respectively. Abdominal and chest ultrasonography revealed ascites and bilateral pleural effusion. Cardiac ultrasonography showed a large pericardial effusion with 26-mm depth of the maximal diastolic separation between epicardium and pericardium, along with increased echogenicity within fluid, suggestive of exudative effusion. A chest computed tomography (CT) scan showed a bilateral pleural effusion and a large pericardial effusion (Figure 1A, B).

This patient was transferred to the Children's Hospital of Chongqing Medical University for further treatment after resuscitation. An emergent thoracoscopic surgery was performed for this patient. Partial resection of the pericardium and clearance of the ipsilateral pleural effusion were conducted. The PE was 600 mL in size and was viscous, yellowish, and turbid. A 4×4 cm pericardial specimen was sent for biopsy.

A serologic test for *Paragonimus skrjabini* using IgG enzyme-linked immunosorbent assay (ELISA) was performed [5]. The ELISA was positive for *P. skrjabini* infection. Postoperative biopsy revealed massive eosinophil infiltration (Figure 1C) suggestive of parasitic infection. No *Paragonimus* ova were identified according to the biopsy. The eosinophil count of the PE was 4520/mm^3, which was also elevated significantly. The level of protein of the PE was 49.8 g/L. Sputum and effusion smears were stained with Ziehl-Neelsen stain and cultured for acid-fast bacilli. A purified protein derivative test and interferon-γ release assays were also performed. However, tests regarding tuberculosis infection were all negative.

A diagnosis of paragonimiasis was highly suspected because of the serologic test and was confirmed by biopsy in this case. Praziquantel therapy with a dose of 25 mg/kg 3 times a day was ordered. The patient was discharged after 1 course of praziquantel therapy, at which point CT of the chest showed absorption of the pleural effusion. Due to incomplete absorption of the pulmonary lesions and pleural effusion, he was required to finish another course of praziquantel therapy. Cardiac and chest ultrasonography at his most recent follow-up showed no sign of PE and mild pleural effusion. He is still receiving close follow-up.

DISCUSSION

Large PEs caused by paragonimiasis in children are rarely reported to our knowledge. Gong and colleagues [6] reported that patients with paragonimiasis and PE were relieved after pericardiocentesis. However, in our case, the PE was viscous and contained massive fibrous exudation. To potentially lessen the likelihood of constrictive pericarditis, pericardiocentesis was insufficient and surgical drainage was necessary. Besides,

Received 15 January 2019; editorial decision 14 March 2019; accepted 15 March 2019.

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DOI: 10.1093/ofid/ofz145

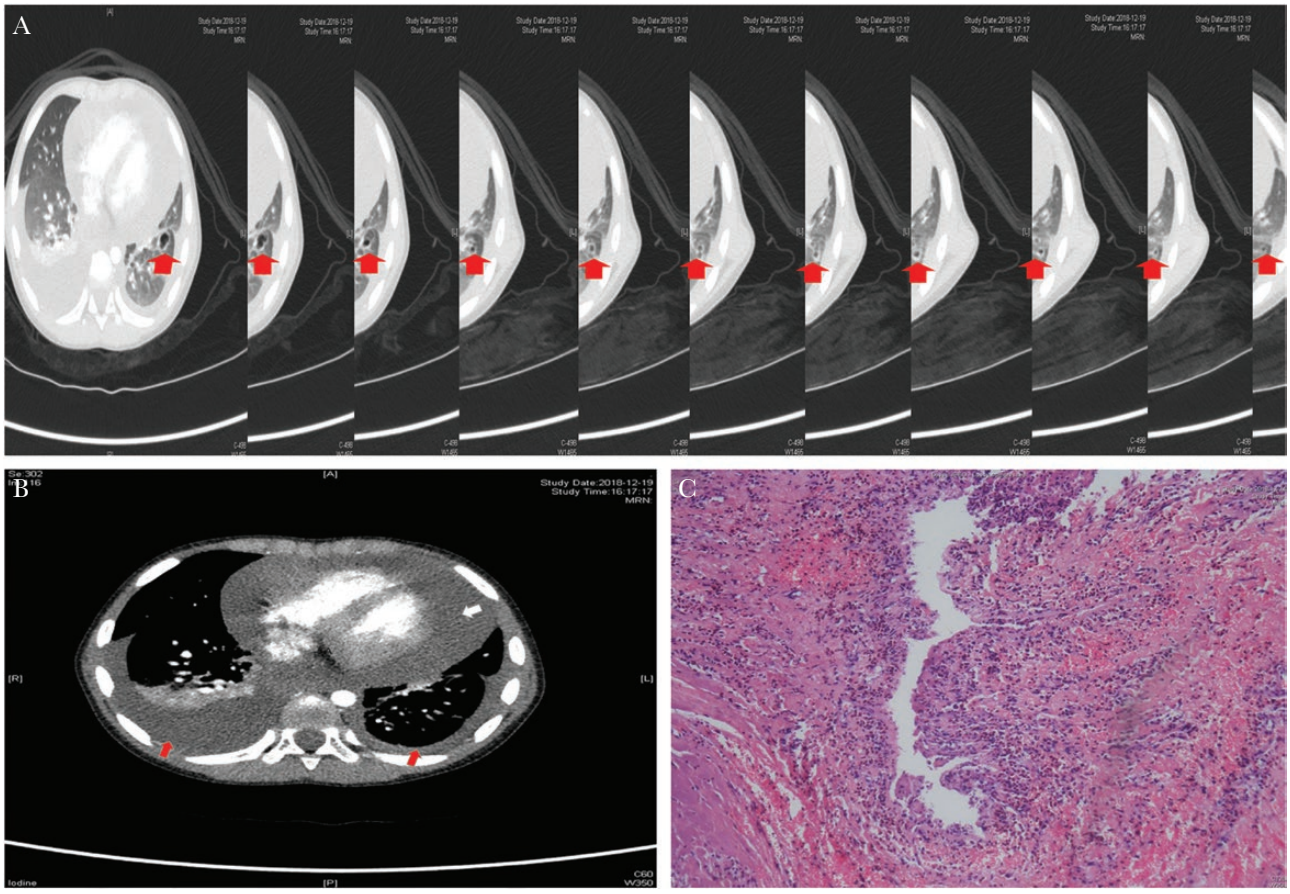

Figure 1. Chest computed tomography scan and biopsy of pericardial specimen. A, Pulmonary cavity lesion of the left lower lobe, which is a tubular structure and indicative of migratory worms (red arrow). B, Large pericardial effusion (white arrow) and bilateral pleural effusion (red arrow). C, Massive eosinophil infiltration (hematoxylin and eosin staining).

thoracoscopic surgery is minimally invasive and provides a pericardial specimen for biopsy.

In the literature, common presentations of *Paragonimus* infection are dyspnea, fever, chest pain, coughing, and hemoptysis [7]. However, *P. skrjabini* usually leads to ectopic paragonimiasis. Therefore, abdominal pain, diarrhea, migratory subcutaneous mass, and cerebral haemotoma are often observed. It is not surprising that the metacercariae migrated into the pericardium in this case as *P. skrjabini* migrate into different organs instead of maturing into adults in humans [8].

Paragonimiasis is a severe public health burden in southwest China. A previous study [8] showed that the crab infection rate with *P. skrjabini* was almost 40% in southwest China. Unfortunately, the belief that children will become stronger after eating the raw claws of crabs is also prevalent in southwest China. It is believed that at least 195 million people in China are at risk of *Paragonimus* infection [2].

Generally, the presence of eggs in sputum or of flukes in biopsy confirms the diagnosis of paragonimiasis [7]. Unlike the other paragonimiasis species, finding *Paragonimus* ova in *P. skrjabini*–infected humans is extremely difficult, as human is the abnormal definitive host [5, 9]. In biopsies from patients with larva migrans of *P. skrjabini,* residual necrosis and inflammatory responses are generally observed [9]. The ELISA for *P. skrjabini* in this case was conducted by Yu and colleagues, who suggested that the specificity was tested against *Echinococcus granulosus, Taenia solium, Schistosoma japonicum,* and *Trichinella spiralis.* However, no other species of the *Paragonimus* genus that have also infected humans, such as *P. westermani* or *P. uterobilateralis,* were tested. Therefore, in this case, the infection was caused by a species of the *Paragonimus* genus with a clinical presentation suggestive of *P. skrjabini*; however, further investigation is required to be definitive regarding the exact species.

In conclusion, paragonimiasis is a possible cause of PE in the endemic area, especially in southwest China. Surgical treatment is necessary in patients with paragonimiasis and large pericardial effusions.

Acknowledgments

Financial support. None.

Potential conflicts of interest. All authors: no conflicts. The author has submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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