



CASE REPORT

Bilateral simultaneous facial palsy following scrub typhus meningitis: A case report and literature review

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Abstract Scrub typhus is widely distributed across the Asia-Pacific region, Taiwan included. The clinical manifestations and complications of scrub typhus vary and the illness ranges in severity from mild to fatal. The etiology of facial nerve palsy varies and infectious agents have been associated with this condition. *Rickettsiae* species have, however, rarely been reported as the causative agents. We report the case of a 49-year-old man who had fever, malaise, headache, oligouria and tea-colored urine. Bilateral pneumonitis, acute renal failure, acalculous cholecystitis and aseptic meningitis were diagnosed after a series of examinations. The patient recovered after doxycycline treatment but he developed bilateral facial palsy during the convalescent phase, which improved after the administration of a steroid. The diagnosis of infection with *Orientia tsutsugamushi* was confirmed by the Taiwan Center of Disease Control and the tests for *Leptospira*, *Rickettsia typhi* and *Coxiella burnetii* were all negative. This case indicates that scrub typhus needs to be included in the differential diagnoses of cases of bilateral and simultaneous facial nerve palsy, particularly in areas where the disease is endemic.

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Introduction

Scrub typhus caused by *Orientia tsutsugamushi* is distributed across a definite geographic region, termed the 'tsutsugamushi triangle'. This triangle covers an area from northern Japan and far eastern Russia in the north, to northern Australia in the south and to Pakistan and Afghanistan in the west [1]. Taiwan, which is located in the

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central region of this triangle, reported 4,601 confirmed scrub typhus cases from January 1996 to July 2010, according to the data from the Center for Diseases Control (CDC) in Taiwan.

Scrub typhus, an acute febrile illness, has an incubation period of 6 to 21 days, and it varies in severity from mild and self-limiting to fatal [2]. The disease is characterized by an eschar lesion, generalized lymphadenopathy, maculopapular rash and several nonspecific symptoms, such as fever, chills, headache, cough, abdominal pain and myalgia. Eschar and skin rash were, however, only found in 23.1% and 21.7% of the 403 confirmed cases in eastern Taiwan [3]. In addition to this, a small number of patients develop severe complications, including prominent meningoencephalitis, interstitial pneumonia, acute respiratory distress syndrome, acute cholecystitis, acute renal failure, hemophagocytic syndrome, myocarditis, venous occlusion, rhabdomyolysis and disseminated intravascular coagulation [4]. Late complication with facial palsy in patients with scrub typhus is extremely rare, however, especially with bilateral simultaneous involvement.

This article presents a case of severe scrub typhus with jaundice, acute renal failure, aseptic cholecystitis and aseptic meningitis, with a late complication of bilateral simultaneous facial palsy.

Case report

A previously healthy 49-year-old man was admitted with a history of fever for 8 days plus progressive malaise, oliguria and tea-colored urine. The associated symptoms included persistent headache, chest discomfort, mild cough and sore throat. On examination, he had a tympanic temperature of 36.5°C, blood pressure of 112/70 mmHg, a pulse rate of 98/min and a respiratory rate of 20/min. Physical examination revealed injected conjunctiva, icteric sclera, nuchal stiffness, bilateral lung crackles, right upper quadrant tenderness and positive Murphy's sign, but there were no skin lesions.

Laboratory data revealed a leukocyte count of 11,870/ μ l with 86.2% neutrophils, hemoglobin of 12.1 g/dl, a platelet count of 116,000/ μ l, total bilirubin of 6.2 mg/dl (0.2–1.0 mg/dl), direct bilirubin of 4.26 mg/dl (0.0–0.2 mg/dl), aspartate aminotransferase of 120 IU/L (10–35 IU/L), alanine aminotransferase of 101 IU/L (10–40 IU/L), lipase of 201 IU/L (7–58 IU/L), C-reactive protein of 255.7 mg/L (<5 mg/L), blood urea nitrogen of 36.4 mg/dl (5–25 mg/dl), and creatinine of 3.8 mg/dl (0.5–1.4 mg/dl), as well as microscopic hematuria and proteinuria. Chest X-ray films revealed bilateral interstitial infiltration. Computerized tomography (CT) of the abdomen disclosed a distended gallbladder.

The patient had undergone percutaneous transgallbladder draining due to acute cholecystitis. His brain CT scan disclosed no significant abnormality. Lumbar puncture showed clear cerebrospinal fluid (CSF) with high opening pressure (258 mmH₂O), containing a leukocyte count of 124/ μ l with 95% mononuclear cells, a sugar level of 69 mg/dl, and a protein level of 80 mg/dl. Gram stain, acid fast stain, India ink stain, venereal disease research

laboratory test, *Cryptococcus* antigen, immunoglobulin M antibody for herpes simplex virus and varicella-zoster virus from CSF were all negative. Cultures for bacteria, *Mycobacterium* and virus from CSF were all negative. Polymerase chain reaction of CSF for *Mycobacteria tuberculosis* was also negative. Bile and blood cultures were sterile.

Due to the patient's history of recent mountain hiking, rickettsiosis or leptospirosis was initially suspected and he was treated with intravenous crystal penicillin G (3 million units) every 4 hours and oral doxycycline of 100 mg twice a day. His clinical condition, including liver and renal dysfunction, improved progressively. Both facial numbness and palsy over the left side were noted, however, on day 5 of hospitalization, with extension to the right side 10 days later. A motor nerve conduction velocity (NCV) study of the facial nerve carried out immediately after the appearance of left facial palsy before right-sided involvement revealed prolonged distal latency with reduced compound muscle action potential amplitude and normal right facial motor NCV. Intravenous dexamethasone (5 mg every 12 hours) was given and tapered gradually. The patient's facial palsy was partially improved 3 months later.

The diagnosis of scrub typhus was confirmed by the reference laboratory of the Taiwan CDC. Serology for *Leptospira*, *Rickettsia typhi* and *Coxiella burnetii*, which are endemic pathogens in Taiwan, were all negative.

Discussion

The etiology of peripheral facial paralysis varies, but it has occasionally been attributed to a number of infectious pathogens or diseases: herpes simplex virus, varicella-zoster virus, human herpes virus 6, Epstein-Barr virus, cytomegalovirus, human immunodeficiency virus, human T cell lymphotropic virus 1, Lyme disease, syphilis, leptospirosis, *Mycoplasma pneumoniae*, malaria, leprosy and tuberculosis [5]. Rickettsiosis rarely contributes to this manifestation. Furthermore, the simultaneous involvement of bilateral facial palsy is extremely rare. Simultaneous onset is defined as the involvement of the opposite side within 30 days of the initial onset. It is most often found in a symptom complex of systemic diseases, including Guillain-Barré syndrome (GBS), which exists in 0.3% to 2.0% of facial palsy cases [6,7]. Although bilateral facial palsy associated with leptospirosis [5,8] and coinfection of leptospirosis plus scrub typhus [9] has been reported elsewhere, the possibility of leptospirosis in this patient was excluded by the Taiwan CDC.

Only three reported cases of rickettsial infection considered peripheral facial palsy to be associated with infection by *R typhi* and *R conorii* [10,11]. Lee et al. reported the case of a 42-year-old female with scrub typhus followed by GBS, presenting as quadriparesis, facial diplegia and areflex [12]. To our knowledge, our patient is the first to present with bilateral and simultaneous facial palsy as a late complication of scrub typhus.

Nerve involvement in association with scrub typhus, with severe systemic manifestations such as deafness, pyramidal syndrome, brachial plexus neuropathy and GBS has been reported [12–16]. There was one report of scrub typhus

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