CASE REPORT

Papilledema: A Rare Presentation of Scrub Typhus

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ABSTRACT

Scrub typhus caused by *Orientia tsutsugamushi*, typically presents with nonspecific febrile illness but can lead to severe systemic complications. Ocular manifestations are uncommon, and papilledema is a particularly rare finding. We report the case of a 29-year-old female who presented with fever, headache, and altered sensorium, later diagnosed as scrub typhus based on positive serology. During treatment with intravenous doxycycline, she developed horizontal diplopia, and fundus examination revealed grade 4 papilledema, despite a normal neuroimaging study. Cranial nerve examination was nonfocal. Other causes of raised intracranial pressure were excluded, implicating scrub typhus as the likely etiology. The patient showed clinical and ophthalmologic improvement with continued doxycycline therapy. This case highlights the importance of considering scrub typhus in the differential diagnosis of papilledema in endemic areas and underscores the need for early fundoscopic evaluation in patients with neurological symptoms.

Keywords: Scrub typhus, papilledema, doxycycline, ocular manifestations, neuroinfection

Scrub typhus, caused by *Orientia tsutsugamushi* (formerly *Rickettsia tsutsugamushi* or *Rickettsia orientalis*), is a zoonotic disease transmitted by trombiculid mites. It is prevalent across East Asia, from Korea to Indonesia, and in the Pacific Islands, including Australia. Initially observed in Japan, the disease was named *tsutsugamushi* (from *tsutsuga*, meaning dangerous, and *mushi*, meaning insect or mite). The vectors include *Leptotrombidium akamushi* in Japan and *L. deliensis* in India[1].

The severity of scrub typhus varies from mild to potentially fatal. The incubation period ranges from 6 to 21 days, with symptoms including fever, headache, muscle pain, cough, and gastrointestinal disturbances. Common manifestations include an eschar at the bite site, regional lymphadenopathy, and a maculopapular rash, although fewer than 50% of Western patients develop an eschar, and <40% exhibit a rash, usually appearing between days 4 and 6 of the illness. Severe cases may present with encephalitis and interstitial pneumonia due to vascular damage, with a case-fatality rate of approximately 6% for untreated classic cases[2].

Papilledema, defined as optic disc edema secondary to increased intracranial pressure (ICP), is often bilateral and symmetric but can be asymmetric or unilateral. It can result from various conditions, including brain tumors, meningitis, and cerebral venous sinus thrombosis, or may be idiopathic[3].

The presentation of papilledema in scrub typhus is extremely rare; hence, we are reporting this case.

CASE REPORT

A 29-year-old female was admitted to the medical ward, with a chief complaint of high-grade fever for 5 days, headache for 3 days, and altered sensorium for 1 day. There was no history of cough, rash, vomiting, or blurred vision, and the patient had no significant comorbidities.

On admission, she was conscious but disoriented to time, place, and person. Vital signs included fever (102°F), tachycardia (pulse rate 118 bpm, regular), blood pressure 100/60 mmHg in the right upper limb in a supine position, tachypnea (respiratory rate 24/min), and SpO_2 90% on room air. Icterus was noted, but there was no pallor, cyanosis, clubbing, edema, or lymphadenopathy.

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Respiratory system examination revealed crepitations in bilateral infra-axillary and infrascapular regions. Neurological examination showed no deficits, and there was no neck rigidity or positive Kernig's or Brudzinski's signs. The rest of systemic examination was normal. Considering the clinical phenotype of an acute febrile illness and rising incidence of tropical infections in our region, the differential diagnosis of enteric fever, scrub typhus, dengue, and malaria were kept and investigations planned accordingly.

Initial blood investigations revealed patient hemoglobin - 12g/dL, total leukocyte count - 15,500/μL, platelet count - 1,22,000/ μL. Renal function test showed serum urea - 22.1 mg/dL, serum creatinine - 0.6 mg/dL. Liver function tests were deranged (total protein - 5.6 g/dL, serum albumin - 2.3 g/dL, serum glutamic-oxaloacetic transaminase (SGOT) - 199 U/L, serum glutamic-pyruvic transaminase [SGPT] - 159 U/L, alkaline phosphatase [ALP] - 263 U/L, total bilirubin - 2.1 mg/dL, direct bilirubin - 2.010 mg/dL). Patient had raised triglyceride levels (187 mg/dL). Patient thyroid profile was normal (triiodothyronine [T3] - 122 ng/dL, thyroxine [T4] - 5.1 μg/dL, thyroid-stimulating hormone [TSH] - 1 mIU/L). Glycated hemoglobin (HbA1c) - 5.6%. Urine examination was within normal limits. Serological test for scrub typhus turned out positive on the second day, while dengue and malaria tests were negative.

Chest radiography showed bilateral pulmonary infiltration suggestive of acute respiratory distress syndrome (Fig. 1). ECG indicated sinus tachycardia, and ultrasonography suggested minimal fluid in the pelvic cavity.

The patient was started on intravenous (IV) antibiotics: doxycycline (200 mg/day). She improved and regained orientation after 2 days of antibiotics. On day 4, she complained of horizontal diplopia, particularly on lateral gaze, suggestive of possible sixth nerve involvement.

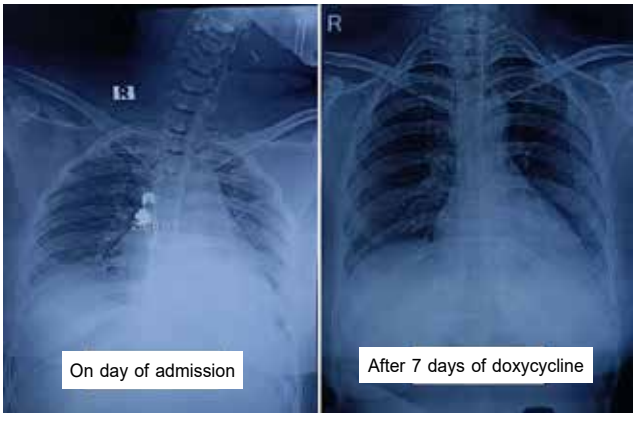


Figure 1. Chest radiograph showing bilateral pulmonary infiltrates consistent with acute respiratory distress syndrome.

However, detailed cranial nerve examination revealed no definitive deficit and non-contrast CT scan of the head was normal (Fig. 2).

Fundus examination revealed grade 4 papilledema (Fig. 3). Visual acuity was 6/6 in both eyes. Pupillary reflexes and extraocular movements were normal. There was no evidence of uveitis or retinal hemorrhages. Intraocular pressure was within normal limits. Other causes of papilledema were excluded, and cerebrospinal fluid (CSF) analysis was deferred due to risk of herniation

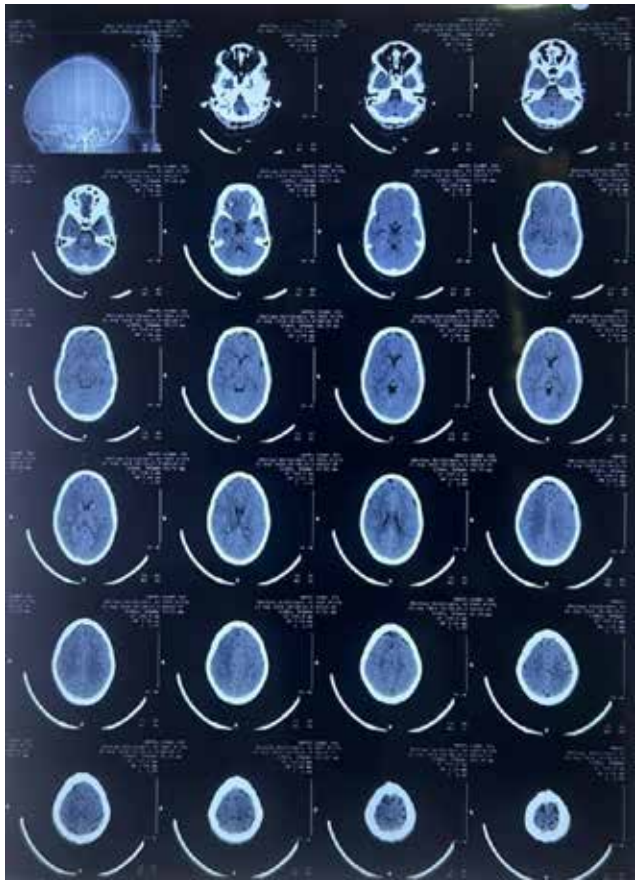


Figure 2. Non-contrast CT scan of the head showed no abnormality.

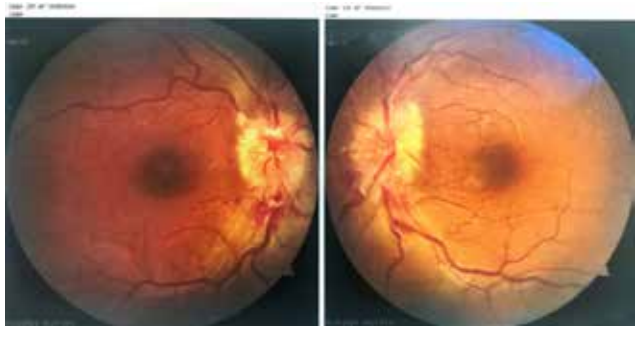


Figure 3. Fundus examination showing grade 4 papilledema in both eyes.

from severe papilledema in absence of clinical meningitis. Fundus examination was performed by the treating physician and later confirmed by an ophthalmologist as blurred disc margins with elevation, hemorrhages, and absence of spontaneous venous pulsation, consistent with grade 4 papilledema. The patient's diplopia resolved by day 7 with continued doxycycline treatment.

DISCUSSION

Scrub typhus causes an acute febrile illness that can range from mild and self-limited to severe or fatal condition. Typical signs and symptoms include fever and chills, headache, myalgia, eschar, altered mental status, ranging from confusion to coma or delirium, lymphadenopathy, rash. Most patients have thrombocytopenia and may also show elevated levels of hepatic transaminases, bilirubin, and/or creatinine. Splenomegaly and hepatomegaly may be observed. Severe manifestations usually develop after the first week of untreated illness and may include multiple organ dysfunction syndrome with hemorrhaging, acute respiratory distress syndrome, encephalitis, pneumonia, renal or liver failure, and death. Papilledema, an uncommon complication in scrub typhus, signifies increased ICP and warrants further discussion given its rarity in this context.

Papilledema, characterized by swelling of the optic nerve head due to increased ICP, can arise from several underlying conditions. Congenital issues such as aqueductal stenosis and craniosynostosis are potential causes. Intracranial space-occupying lesions, including brain tumors, abscesses, tuberculomas, gummas, subdural hematomas, and aneurysms are notable contributors with tumors in the cerebellum, midbrain, and parieto-occipital regions more commonly inducing papilledema. Intracranial infections like meningitis and encephalitis may also be linked to this condition.

Additionally, both cerebral and subarachnoid hemorrhages can lead to significant papilledema. Obstruction of CSF absorption due to damaged arachnoid villi, tumors of the spinal cord, and idiopathic intracranial hypertension are other potential causes. Systemic conditions such as malignant hypertension, pregnancy-induced hypertension, cardiopulmonary insufficiency, blood disorders, and nephritis can also contribute. Lastly, diffuse cerebral edema resulting from blunt head trauma may cause papilledema[4].

In our case, the absence of intracranial mass lesion or infection on neuroimaging, normal blood pressure, and the resolution of disc swelling with systemic antibiotics supported the diagnosis of true papilledema secondary to raised ICP due to scrub typhus. The absence of visual loss and recovery with doxycycline reinforce this attribution.

Scheie et al published a study in 1947 in which the eyes of 451 patients with scrub typhus were studied weekly for evidence of different ocular manifestations. Conjunctival injection occurred in 38%, subconjunctival hemorrhages in 6.4%, ecchymosis of eyelids in 1.0%, eschar on eyelid in 0.5%, and fixation nystagmus in 0.5%. The following ocular changes were noted as engorgement of veins in 67%, retinal edema in 36%, retinal hemorrhages in 6.6% and exudates in 4.9%, uveitis in 1.3% and vitreous opacities in 4.6%[5]. Sen et al reported bilateral optic disc edema with subconjunctival hemorrhage in a 15-year-old scrub typhus IgM + female[6]. Shakthi and Pandit reported a case of bilateral papilledema in a 26-year-old male found positive for scrub typhus[7].

This case emphasizes the importance of considering papilledema in scrub typhus patients who present with neuropsychiatric symptoms. The presence of papilledema could indicate severe disease with possible central nervous system involvement and warrants careful management. Fundus examination is crucial for detecting papilledema, which may guide further diagnostic and therapeutic interventions. Effective management of scrub typhus with appropriate antibiotics (e.g., doxycycline) is essential to control the infection and prevent complications. The resolution of symptoms, including papilledema, upon treatment supports the link between infection control and the improvement of ocular findings.

CONCLUSION

Papilledema is an extremely rare ocular complication of scrub typhus. It should always be considered in a patient of scrub typhus with neuropsychiatric manifestations. Understanding its pathogenesis, recognizing it as a potential complication, and initiating early treatment are critical for improving patient outcomes. This case highlights the need for heightened awareness among clinicians regarding rare but significant presentations of scrub typhus.

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Conflict of Interest

No funding was received for this study. The authors declare no conflicts of interest.

Disclosure

Informed consent was obtained from the patient for publication. The authors certify that they have obtained all appropriate patient consent forms.

The manuscript has been read and approved by all the authors and each author believes that the manuscript represents honest work and the article has not been published in any other Journal/Book.

REFERENCES

1. Kanungo R. Ananthanarayan and Panikar's Textbook of Microbiology. 10th Edition, 2013. p. 415.
2. Walker DH, Dumler J, Blanton LS, Bleeker-Rovers CP. Rickettsial diseases. In: Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson JL (Eds.). Harrison's Principles of Internal Medicine. 21st Edition. New York: McGraw Hill; 2022.
3. Lee AG, Wall M. Papilledema: Are we any nearer to a consensus on pathogenesis and treatment? Curr Neurol Neurosci Rep. 2012;12(3):334-9.
4. Khurana AK. Comprehensive Ophthalmology. 4th Edition, New Delhi: New Age International; 2007. p. 298.
5. Scheie HG. Ocular changes in scrub typhus. A study of 451 patients. Trans Am Ophthalmol Soc. 1947;45: 637-77.
6. Sen S, Nayak B, Parija S. Bilateral optic disc edema with subconjunctival hemorrhage: attributed to scrub typhus? Oman J Ophthalmol. 2022;15(1):99-101.
7. Shakthi KJS, Pandit AK. An interesting case of papilledema in scrub typhus. J Neuroinfect Dis. 2022;13(11):421.

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