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Case Report

Ophthalmology Section

A Rare Case of Scrub Typhus Presenting as Pre Septal Cellulitis

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ABSTRACT

Scrub typhus, a vector-borne disease caused by *Orientia tsutsugamushi*, is known for its diverse clinical manifestations. However, atypical presentations, such as pre septal cellulitis, are rarely documented and pose diagnostic challenges. Hereby, the authors present a case study of a 24-year-old female agricultural worker from a rural area who presented with fever, abdominal pain, vomiting, and facial rashes, along with significant swelling over the right eye since two days. She reported a history of an insect bite on her right upper eyelid. On further examination, an eschar on right upper eyelid, a hallmark of scrub typhus, was noted. Diagnostic tests confirmed scrub typhus with a positive Weil-Felix Test and Immunoglobulin M (IgM) Enzyme-linked Immunosorbent Assay (ELISA). The patient was successfully treated with antibiotics doxycycline, Meropenam and supportive therapies, showing significant improvement. The present case underscores the necessity of considering scrub typhus in the differential diagnosis of pre septal cellulitis, particularly in endemic regions. Recognising atypical presentations is crucial to prevent misdiagnosis and to ensuring timely and appropriate management.

Keywords: Eschar, *Orientia tsutsugamushi*, Vector-borne diseases, Zoonoses

CASE REPORT

A 24-year-old female agricultural worker from a rural area presented with complaints of swelling over her right upper eyelid, fever, abdominal pain, vomiting, and facial rashes for two days. She reported a history of an insect bite on her right upper eyelid.

On examination, diffuse, tender, erythematous swelling with increased temperature on right upper and lower eyelids was observed, along with ecchymosis [Table/Fig-1]. A localised scab formation indicative of an eschar was noted on the lateral 1/3rd of the right upper eyelid [Table/Fig-2]. The patient's visual acuity was 6/6 in both eyes, and colour vision was intact. Ocular motility was full, free, and painless. Proptosis was absent. A slit-lamp examination revealed no chemosis, and the pupils were equal, circular, and reactive to both direct and consensual light reflex. Indirect ophthalmoscopy with 20D lens was within normal limit. The patient's vital signs showed a heart rate of 110 bpm and blood pressure of 120/80 mmHg. Based on the patient's history and clinical findings, the presentation was highly indicative of rickettsial infection, most likely scrub typhus, characterised by periorbital cellulitis and presence of an eschar-a classic hallmark of the disease.

[Table/Fig-1]: Diffuse tender swelling with ecchymosis on the right upper and lower eyelid.

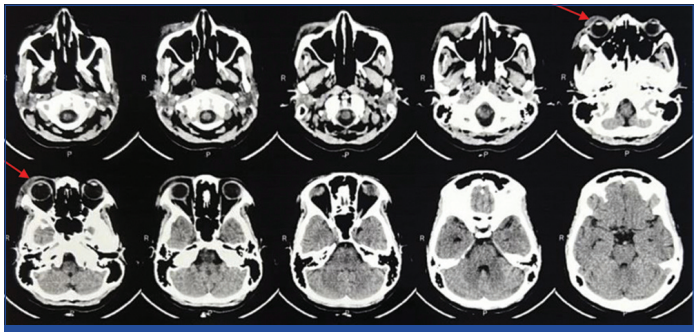
Laboratory investigations were done which showed an elevated total leukocyte count (15,000 cells/microliter), C-reactive Protein (18.6 mg/L), elevated Erythrocyte Sedimentation Rate (ESR) (56 mm/hr), and liver enzyme elevation {Serum Glutamic Oxaloacetic Transaminase (SGOT) 150 U/L, Serum Glutamic Pyruvic Transaminase (SGPT) 112 U/L)}. The Weil-Felix test was positive, supporting the diagnosis of rickettsial infection. Proteus OXK antigens were significantly elevated (1:80, 1:160). An IgM ELISA for scrub typhus was positive (OD 2.14) [Table/Fig-3].

[Table/Fig-2]: Localised eschar formation on the lateral third of the right upper eyelid.

Laboratory investigations	Findings	
Total leukocyte count	15,000 cells/microliter	
C-reactive Protein (CRP)	18.6 mg/L	
Erythrocyte Sedimentation Rate (ESR)	56 mm/hr	
Liver enzyme levels (SGOT, SGPT)	SGOT: 150 U/L SGPT: 112 U/L	
Weil-Felix Test (Proteus OXK Antigens) PROTEUS OXK (O antigen of Proteus mirabilis strain OXK) PROTEUS OX19 (O antigen of Proteus vulgaris strain OX19) PROTEUS OX2 (O antigen of Proteus vulgaris strain OX2)	 1:80+, 1:160+ - -	 Positive Negative Negative
IgM ELISA for Scrub Typhus	OD 2.14	Positive

[Table/Fig-3]: Laboratory investigations.
OD: Optical density

The CT scan orbit showed soft-tissue swelling in right pre septal region, suggestive of pre septal cellulitis [Table/Fig-4]. Based on the presentation, clinical findings, serological results, and the imaging reports, the patient was diagnosed with pre septal cellulitis secondary to scrub typhus.



[Table/Fig-4]: CT imaging of right orbital pre septal soft-tissue swelling indicative of pre septal cellulitis.

The patient was treated with intravenous doxycycline (100 mg twice daily) and Meropenam (1.5 g twice daily). Supportive treatments included warm compressions, lubricating eye drops, and evening chloramphenicol ointment application. The patient responded favourably showing significant improvement in symptoms and resolution of eyelid in two weeks [Table/Fig-5].

[Table/Fig-5]: Post-treatment showing healed eschar and reduced swelling.

septal cellulitis, are rare. Pre septal cellulitis is an infection of the eyelid and the surrounding skin anterior to the orbital septum. Such uncommon presentations can complicate diagnosis, particularly in endemic regions [2]. Early recognition and appropriate management of atypical presentations are crucial in preventing complications [3]. For instance, a study by Gupta N et al., highlighted cases where scrub typhus presented with Acute Respiratory Distress Syndrome (ARDS), without the typical eschar [4].

Comparative studies have shown varying atypical presentations of scrub typhus [Table/Fig-6] [5-9]. Narayanasamy DK and Arun Babu T (2021) and Singh AK et al., (2022) documented cases of scrub typhus presenting as pre septal cellulitis, which were initially misdiagnosed as hordeolum externum and showed poor response to conventional antibacterial therapy [5,8]. Similarly, Sun CB et al., reported a case of optic neuritis in a patient with scrub typhus, who presented with visual impairment and field defects, and was successfully managed with oral doxycycline and corticosteroids [6]. Chandra K et al., described a rare association of acute macular neuroretinopathy with scrub typhus [9]. Additionally, Balasundaram MB et al., highlighted cases of Indian tick typhus presenting with retinitis [7]. Collectively, these reports and present case add to the growing body of evidence on the diverse ocular manifestations of rickettsial infections.

The reports on ophthalmic manifestations of rickettsial infection has been presented in [Table/Fig-6] [5-9]. These studies illustrate that the clinical presentation of scrub typhus can be highly variable, and ocular manifestations like pre septal cellulitis should be considered, especially in endemic regions. There is a need for healthcare professionals to consider vector-borne diseases in the differential diagnosis of ocular infections and to emphasises the importance of vigilance [10].

To further understand the pathogenesis and best practices for managing these uncommon symptoms, future research should concentrate on the wider range of atypical scrub typhus presentations [11]. More information on the incidence and consequences of ocular problems in scrub typhus may be available from multicentre research with larger sample numbers. Furthermore, to avoid misdiagnosis and guarantee proper treatment, more sensitive and targeted diagnostic instruments are required to quickly detect unusual instances of scrub typhus [12]. Simple personal protective measures, such as avoiding walking barefoot, wearing full-length protective clothing while working outdoors, and using mat while sitting on grass, are simple personal protective measures to protect oneself from vectors. Eschar should be considered as a

Authors name/year of the study	Place	Presentation	Ophthalmic manifestations	Diagnosis	Management
Sun CB et al., (2023) [6]	Beijing, China	Diminution of vision, inferior visual field defect	Optic neuritis	Scrub typhus associated with optic neuritis	Oral Doxycycline, oral omadacycline, oral steroids
Balasundaram MB et al., (2018) [7]	Salem, Tamil Nadu, India	Diminution of vision, fever	Retinitis	Indian tick typhus associated with retinitis	Oral Doxycycline, systemic steroids
Singh AK et al., (2022) [8]	New Delhi, India	Swelling of eyelid, preauricular lymphadenopathy, fever	Eyelid eschar, Pre septal cellulitis	Pre septal cellulitis secondary to scrub typhus	Oral Doxycycline
Narayanasamy DK and Arun Babu T (2021) [5]	Mangalagiri, Andhra Pradesh, India	Eyelid swelling, fever	Eyelid eschar, Pre septal cellulitis	Pre septal cellulitis secondary to scrub typhus	Oral Doxycycline
Chandra K et al., (2021) [9]	Chandigarh, India	Diminution of vision, central scotoma, fever	Acute macular neuroretinopathy	Acute macular neuroretinopathy associated with scrub typhus	Oral Doxycycline, systemic steroids
Present case	Pune, Maharashtra, India	Eyelid swelling, fever, abdominal pain, vomiting and facial rashes	Eyelid eschar, Pre septal cellulitis	Pre septal cellulitis secondary to scrub typhus	Intravenous Doxycycline, Intravenous Meropenam

[Table/Fig-6]: Reports on ophthalmic manifestations of rickettsial infection [5-9].

DISCUSSION

Scrub typhus, caused by *Orientia tsutsugamushi*, is a zoonotic disease primarily transmitted through the bites of infected chiggers. It commonly presents with systemic symptoms such as fever, rash, body aches, and a characteristic eschar at the site of the chigger bite [1]. However, atypical manifestations, such as pre

differentials apart from common unilateral lid lesions like chalazion and hordeolum.

CONCLUSION(S)

The example of scrub typhus presenting as pre septal cellulitis sheds important light on the disease's unusual manifestations.

When evaluating ocular infections, especially in areas where scrub typhus is widespread, this case emphasises the value of taking a broad differential diagnosis into account. To avoid problems and enhance patient outcomes, prompt diagnosis and suitable treatment are essential. The results of this study emphasise the need for increased clinical awareness among healthcare practitioners and add to the expanding body of knowledge on the various symptoms of scrub typhus.

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