



Mite Bite Underlying A Lid Swelling - A Rare Presentation Of Scrub Typhus

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Abstract: Scrub Typhus, a vector-borne and zoonotic disease by *Orientia tsutsugamushi*, is one of the causes of acute febrile illness in India. In endemic regions where Scrub Typhus is prevalent, healthcare providers should keep an eye out and be very suspicious about this disease, especially when encountering patients with acute febrile illness and exposure to mite-infested areas. Prompt recognition and appropriate diagnostic testing, such as serological assays or molecular methods, are essential for accurate diagnosis. Once diagnosed, treatment with appropriate antibiotics, such as doxycycline or azithromycin, can effectively manage Scrub Typhus and prevent complications. Early initiation of treatment is crucial to reduce the chance of severe disease and potential mortality. This case report highlights the importance of considering Scrub Typhus as a potential differential diagnosis in lid infections and acute febrile illnesses, particularly in areas where the disease is endemic. Healthcare providers should be aware of the diverse clinical presentations and remain vigilant to ensure timely and accurate diagnosis, leading to appropriate management and improved patient outcomes. Public health efforts should also focus on increasing awareness about Scrub Typhus, its prevention, and early detection to minimize the burden of this often underdiagnosed disease. In this case report, we presented a child with febrile illness and unilateral lid swelling misdiagnosed as stye. The presence of eschar prompted an investigation of Scrub typhus, which was positive. This case is reported as the lid is an unusual site for eschar formation. To reiterate, scrub typhus should be considered a differential diagnosis in lid infections and acute febrile illness, particularly in endemic areas.

Keywords: Eschar, stye, scrub typhus, *Orientia Tsutsugamushi*, endemic.

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I. INTRODUCTION

Scrub Typhus is an endemic disease mainly occurring in the geographic region extending from Pakistan in the west to Japan in the east and Australia in the South, named the "Tsutsugamushi Triangle"¹. There has been a resurgence of scrub typhus across India in recent years, and scrub typhus has re-emerged as a major cause of acute undifferentiated febrile illnesses (AUFI) with high morbidity and mortality.^{2,3,4} The causative organism is an obligate intracellular bacterium *Orientia tsutsugamushi* transmitted by the bite of chiggers that ⁵ an eschar.⁶ Hence, there should be high suspicion in febrile cases from areas where these mites thrive.⁷ The common ophthalmic presentations include conjunctivitis, keratitis, granulomatous uveitis, retinitis, optic neuritis, and cranial nerve palsies.⁸⁻¹² In this case report, we presented a rare scrub typhus with an eschar over the lid, an unusual site for the chigger bite. The diagnosis of this disease is delayed due to many presentations ranging from nonspecific symptoms to multiorgan involvement.¹³ Further, the case mimicked Hordeolum externum or stye, a common cause of lid infection. The spotting of eschar and IgM ELISA for scrub typhus helped clinch the diagnosis in this case.^{14,15} This case is presented for its rare presentation site. It highlights the necessity to include tests for Scrub typhus in areas with landscape and vegetation favoring the vector transmission of this disease. In this case report, we presented a unique instance of scrub typhus, wherein the patient exhibited an eschar on the lid, an uncommon site for chigger bites. A description of scrub typhus can be difficult because of its diverse range of presentations ranging from nonspecific symptoms to multiorgan involvement. This case report is significant for highlighting the uncommon presentation site. It emphasizes the importance of including scrub typhus testing in areas with landscapes and vegetation that favor the transmission of the illness by vectors. Prompt recognition and diagnosis are crucial in managing scrub typhus effectively and preventing complications. The identification and timely treatment of typhus scrub rely on a comprehensive understanding of the disease's clinical presentations, the epidemiology of the region, and the appropriate use of diagnostic procedures. Awareness among healthcare providers about clean-up typhus and its varied manifestations is vital for accurate diagnosis and management. Public health should also focus on increasing

awareness among the general population regarding preventive measures, such as avoiding exposure to chigger-infested areas and wearing protective clothing. The study aims to provide insights into this atypical case's clinical presentation, diagnosis, and management, highlighting the significance of scrub typhus testing in regions with suitable landscapes and vegetation for vector transmission. The objective of this study includes,

1. Unusual Presentation Description: Detail the clinical characteristics of rare scrub typhus presenting with eschar on the eyelid, highlighting its deviation from typical manifestations.
2. Diagnostic Insights: Investigate the diagnostic challenges posed by the unique presentation, assessing the utility of eschar identification and IgM ELISA in confirming the diagnosis.
3. Interdisciplinary Collaboration Evaluation: Examine the collaborative efforts between ophthalmologists and infectious disease specialists in achieving accurate diagnosis and comprehensive management.
4. Treatment Implications: Analyze the therapeutic approach undertaken for the case, considering the impact of the unconventional presentation on treatment decisions and patient outcomes.
5. Public Health Awareness: Emphasize recognizing and documenting rare scrub typhus presentations, enhancing healthcare professionals' awareness and preparedness for diverse clinical scenarios.
6. Contribution to Knowledge: Extend the medical literature by adding a unique case study that expands the understanding of scrub typhus's clinical spectrum and contributes to the body of knowledge on the disease.

2. CASE REPORTS

A five-year-old boy presented with a history of swelling over the right upper eyelid associated with fever and headache for one week. The child was febrile with no major systemic involvement. Ocular examination showed a localized swelling on the lateral aspect of the right upper eyelid with minimal tenderness and mucopurulent discharge (Figure 1).



Fig 1: Lid swelling on the lateral aspect of the right upper eyelid with discharge

The anterior segment examination of the right eye revealed upper palpebral congestion. The rest of the anterior segment and posterior segment were within normal limits. Investigations were done to exclude causes of acute febrile illness, including malaria, dengue, enteric fever, and COVID-19, which were found to be negative. Blood counts were normal, with the elevation of C-reactive protein. (Table 1)

Table 1. Lab Investigations

| Variables | Results | Reference Range |
|------------------------------------|--|------------------------|
| Haemoglobin | 10.9 gm/dl | 13-16 gm/dl(males) |
| Total WBC count | 7,400 cells/cu.mm | 4500-10,000cells/cu.mm |
| Differential count | N ₅₀ L ₄₆ E ₄ M ₀ | |
| CRP | 98.2mg/l | <6 .0 |
| Dengue test (Rapid Antigen method) | NSI not detected, IgG & IgM -negative | |
| WIDAL | S. typhi 'O' S. typhi 'H'negative S. paratyphi 'AH'1:20 dil S. paratyphi 'BH' | |
| Blood urea | 16 mg/dl | 15-45 mg/dl |
| S. creatinine | 0.6 mg/dl | 0.7 -1.2 mg/dl |
| Sodium | 135 mmol/L | 135-145mmol/L |
| Potassium | 3.9mmol/L | 3.5 -5.0 mmol/L |
| Chloride | 104 mmol/L | 95-107mmol/L |
| Bicarbonate | 17 mmol/L | 25-30 mmol/L |
| Total Bilirubin | 0.5mg/dl | 0.3-1.2mg/dl |
| SGOT(AST) | 57 U/L | 0-40 IU/L |
| SGPT (ALT) | 26 U/L | 0-50 IU/L |
| Alkaline Phosphatase | 142 U/L | 53-128(males) |

The child was treated with Oral Amoxycillin and potassium clavulanate suspension and topical 0.3% Gatifloxacin ointment with a presumptive diagnosis of Hordeolum externum with preseptal cellulitis. After two days of treatment, an eschar was noted over the lid swelling (Figure 2), which gave a clue to the diagnosis.



Fig 2: An eschar developed over the lid swelling after 2 days

IgM ELISA for scrub typhus was done as few cases were reported from the locality from which the boy hailed. The boy was started on Oral Azithromycin 12.5mg/kg since the IgM ELISA test was positive. The patient became afebrile, and the eschar healed the next day (Figure 3).



Fig 3: Healed eschar after treatment.

On further probing, the boy gave a history of playing with his friends in the nearby hills around bushy areas, which further supported the diagnosis.

3. DISCUSSION

Scrub Typhus is a preventable and curable zoonotic disease caused by *Orientia tsutsugamushi*, the obligate intracellular parasite of the 'trombiculid mites.' The natural transmission is maintained from the female to its eggs ('transovarial transmission'), and from the eggs to adults ('transstadial transmission').^{16,17} It is transmitted by mite larvae ('chiggers') from rodents, the natural hosts of mites, to humans through accidental bites. The organism belonging to the Rickettsiaceae family was originally called *Rickettsia tsutsugamushi* but was renamed *Orientia tsutsugamushi* due to its unique properties.¹⁸ The disease was long thought to be confined to the Tsutsugamushi Triangle, which included countries in the west (Pakistan, Afghanistan, Tajikistan, Nepal, India, Bangladesh, Sri Lanka, and Maldives), northeast (China, Russia, Republic of Korea, Japan, and Taiwan), south (Australia, Papua New Guinea, Indonesia, and the islands of the southwestern Pacific), and middle (Myanmar, Thailand, Laos, Cambodia, Malaysia, Vietnam, and Philippines).¹⁹ Though there have been anecdotal case reports of Scrub typhus-like illness from the African subcontinent and countries like the United Arab Emirates and Chile, it is still considered an Asian-Australian-Pacific disease. Recently, there has been a surge in the cases reported from India, and Scrub typhus is emerging as a public health problem warranting more attention.³ Scrub typhus usually presents as an acute febrile illness with a wide spectrum of clinical manifestations affecting nearly every organ. The main pathophysiology, though poorly understood. It is thought to be due to systemic vasculitis induced by a direct effect of the organism and an exaggerated immune response.²⁰ Diagnosis is often missed or delayed due to the striking similarities with other tropical infections. Eschar, if present, provides a distinct diagnostic value, as in our case. The common ocular manifestations in the anterior segment include conjunctivitis and subconjunctival haemorrhage, and the posterior segment includes retinitis, retinal vasculitis, optic neuritis, and cranial nerve palsies. The lid is a relatively rare site to be involved. In our case, the eschar was found on the lid, which is quite unusual, albeit misdiagnosed initially, and helped clinch the diagnosis. Diagnosis of this condition is often challenging and can be missed or delayed due to its striking similarities with other tropical infections. However, the presence of an eschar, as observed in our case, provides a distinct diagnostic value²⁹. While common ocular manifestations in the anterior segment typically involve conjunctivitis and subconjunctival hemorrhage, and in the posterior segment include retinitis, retinal vasculitis, optic neuritis, and cranial nerve palsies, the involvement of the lid is relatively rare. In our unique case, the eschar was discovered on the lid, which is unusual. Although there was an initial misdiagnosis, identifying the eschar ultimately played a crucial role in confirming the accurate diagnosis. This emphasizes the importance of careful examination and consideration of atypical presentations to ensure timely and appropriate management. Early recognition and timely diagnosis of this condition are crucial for initiating appropriate treatment and preventing further complications. Although rare, an eschar on the lid should raise suspicion and prompt further investigation in cases where tropical infections are suspected. Misdiagnosis or delayed diagnosis can have serious implications, as the disease may progress and result in significant ocular morbidity. Therefore, healthcare professionals should maintain a high index of suspicion, particularly in regions where tropical infections are endemic or in individuals with relevant travel history. Improved awareness among healthcare providers, along with the use of advanced

diagnostic techniques, can help avoid diagnostic pitfalls and ensure accurate identification of this condition. Enhancing knowledge and sharing clinical experiences are essential for enhancing diagnostic accuracy and facilitating prompt intervention to optimize patient outcomes. Although the involvement of the lid in this tropical infection is uncommon, it highlights the importance of considering atypical presentations and utilizing all available diagnostic clues. In our case, timely recognition of an eschar ultimately played a vital role in confirming the diagnosis, emphasizing the significance of careful evaluation and thorough assessment in achieving accurate diagnoses and appropriate management. Several methods are currently available for diagnosing scrub typhus including isolation of *Orientia tsutsugamushi*, molecular methods as well as serological techniques such as Weil-Felix test, indirect immunofluorescence assay (IFA), indirect immunoperoxidase assay, enzyme-linked immunosorbent assay (ELISA), immune chromatographic test (ICT) etc.²¹ IgM ELISA was positive in our case which has 92% sensitivity and 94% specificity.²² The disease promptly responds to antibiotics like Doxycycline, Azithromycin, and Chloramphenicol, though none has been proven superior over the other.²³⁻²⁴ Our patient responded well to oral Azithromycin at 12.5mg/kg for 5 days. Follow-up evaluation showed improved clinical status of the patient.²⁵ The patient was discharged once the infection cleared. Regular follow-ups are recommended to monitor if there is a recurrence of the infection. Azithromycin is a broad-spectrum antibiotic that is effective against many pathogens. It is particularly effective in treating this infection because it can penetrate the bacteria's cell wall and disrupt its DNA.²⁶⁻²⁸ The dose and course length were within the recommended guidelines, and the patient responded well to the treatment. As such, azithromycin is an effective and reliable treatment for this infection, providing patient satisfaction and successful outcomes.

4. CONCLUSION

Scrub typhus is a neglected tropical disease that re-emerging in India in many diverse settings. The presentation can vary from common nonspecific symptoms to many unusual manifestations. Awareness of these unusual clinical manifestations and a high index of suspicion will help the clinician arrive at an early diagnosis, resulting in the early administration of appropriate antibiotics. Early diagnosis and treatment of scrub typhus can prevent serious complications and death. Therefore, clinicians need to be aware of the different signs and symptoms of the disease and have a high suspicion index when encountering nonspecific symptoms. With correct and timely diagnosis and treatment, the mortality rate of scrub typhus can be reduced. In conclusion, cleaning up typhus remnants is a significant public health concern, with its incidence increasing in various regions, including India. This case report underscores considering scrub typhus as a differential diagnosis, even in atypical presentations such as lid infections. Healthcare providers should keep a keen sense of mistrust, especially in areas where the disease is endemic, and perform appropriate diagnostic tests to ensure early detection and timely treatment. Continued research, surveillance, and public health education efforts are essential to effectively control scrub typhus and reduce its burden on affected populations.

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6. AUTHORS CONTRIBUTIONS STATEMENT

Dr Dhilsath Raseena. N and Dr. G. Amruthaa conceptualized and gathered the data with regard to this work. Dr. Subha. L analysed these data, and necessary inputs were given towards the design of the manuscript. All authors discussed the case details and contributed to the final manuscript.

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7. CONFLICT OF INTEREST

Conflict of interest declared none.

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