

Scrub Typhus Mimicking Acute Appendicitis in a Paediatric Patient with Concealed Eschar and Hypoxia

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Case Report

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Abstract

Background: Scrub typhus causes 25–30% of undifferentiated acute febrile illness in South India and can mimic acute abdomen.

Case Report: A 7-year-old boy presented with five-day fever, right iliac fossa pain, peritoneal signs and hypoxia (SpO₂ 88%). Examination revealed perineal eschar. Ultrasound showed compressible 8.24 mm appendix without inflammatory changes. Because fever preceding pain and sonographic findings were atypical for appendicitis, appendicitis was considered unlikely. Empirical intravenous doxycycline and azithromycin were initiated.

Defervescence occurred within 48 hours, and IgM ELISA confirmed scrub typhus. The presence of the eschar prevented unnecessary diagnostic laparoscopy.

Conclusion: In endemic regions, peritoneal signs with systemic features do not always indicate surgical disease, but appendectomy remains necessary when appendicitis cannot be excluded. Systematic examination for concealed eschar and careful ultrasound interpretation are critical, though eschar is absent in 50–60% of paediatric cases.

Background

Scrub typhus accounts for 25–30% of undifferentiated acute febrile illness in several endemic regions of South India, with a rising incidence trend documented over two decades.^[1, 2] For surgeons, distinguishing infectious mimics from true appendicitis is critical when peritoneal signs are present. *Orientia tsutsugamushi* infection has been associated with unnecessary surgical exploration in reported cases.^[3] The pathognomonic eschar occurs in only 50–60% of paediatric cases, and 56.8% are located in concealed sites.^[4, 5]

The perineal eschar, identified only on deliberate concealed-site examination, enabled medical management and avoided negative appendectomy in a setting where unnecessary operative intervention for gastrointestinal vasculitis (including non-scrub typhus causes) has been reported in up to 66.6% of cases in small series.^[6] This case is reported because it presented with the concurrent triad of fever, hypoxia, and right iliac fossa pain with peritoneal signs. Hypoxia is not a feature of appendicitis; this combination may substantially increase the risk of unnecessary operative intervention if the diagnosis of scrub typhus is not considered.

Case Report

A 7-year-old male child (weight 22 kg) residing in rural South India. Self-presented with guardian to the emergency department of a tertiary care teaching hospital, with 5-day fever (39°C), 3-day progressive dyspnoea, and acute-onset right iliac fossa pain. Examination demonstrated tachycardia (HR 128/min), tachypnoea (RR 32/min), hypotension (BP 100/60 mmHg), hypoxia (SpO₂ 88%), bilateral basal crackles,

and right iliac fossa guarding. A 1-cm necrotic eschar with an erythematous halo was identified on systematic examination of the perineal skin posterior to the scrotum (Fig. 1).

Laboratory findings showed WBC 15,770/ μ L (91.6% neutrophils), platelets 143,000/ μ L, CRP 102 mg/L, AST 48 U/L. Chest radiography showed bilateral perihilar infiltrates. Abdominal ultrasound demonstrated compressible 8.24 mm appendix without periappendiceal fluid, fat stranding, or appendicolith (Figs. 2, 3). Although the appendiceal diameter exceeded typical age-based norms, the absence of periappendiceal fat stranding, free fluid, appendicolith, and preserved compressibility argued strongly against acute appendicitis. Scrub typhus IgM ELISA (InBios International, 56-kDa antigen) was positive on day 3 of hospitalisation

The principal challenge was distinguishing scrub typhus-related mesenteric vasculitis from acute appendicitis. Fever preceding abdominal pain, a concealed perineal eschar, and a compressible appendix without secondary inflammatory signs favoured a non-surgical inflammatory cause. Empirical anti-rickettsial therapy was initiated with close clinical monitoring.

Acute appendicitis was considered less likely given a compressible appendix without secondary inflammatory signs and fever antedating pain by 5 days; early or atypical appendicitis cannot be completely excluded without histopathology. Scrub typhus with mesenteric vasculitis was favoured due to perineal eschar, thrombocytopenia, transaminitis, hypoxia and endemic exposure. Other rickettsial infections were considered less likely after positive *O. tsutsugamushi*-specific IgM ELISA.

Empirical doxycycline and azithromycin were started with oxygen and intravenous fluids. Surgery was deferred because imaging and clinical findings favoured a non-surgical cause. Doxycycline 2.2 mg/kg twice daily (100 mg BID) and azithromycin 10 mg/kg once daily (220 mg OD) were administered. Oxygen was delivered via nasal cannula at 2 L/min for 48 hours.

Fever, abdominal pain, and hypoxia resolved within 48 hours. The patient recovered fully without complications at 2-week follow-up.

Discussion

Negative appendicectomy carries avoidable risks of anaesthesia, postoperative complications, and cost. This case illustrates mesenteric vasculitis caused by scrub typhus, cause right iliac fossa pain with peritoneal signs resembling acute appendicitis, yet was managed without surgery. *O. tsutsugamushi* causes endothelial dysfunction and systemic vasculitis, that may involve the mesentery, causing pain and peritoneal irritation.^[7] Since standard appendicitis scoring systems such as the Paediatric Appendicitis Score (PAS) and the Appendicitis Inflammatory Response (AIR) score do not include respiratory status, fever-pain interval, platelet count, or transaminases, the presence of hypoxia and bilateral pulmonary infiltrates in this case cannot be explained by appendicitis alone. These finding should prompt consideration of infectious causes alongside surgical evaluation in endemic regions. Previous reports have described scrub typhus presenting as acute abdomen with unnecessary surgical

exploration, though paediatric cases with concurrent respiratory involvement and concealed-site eschar detection remain sparsely documented.

Three findings altered the operative decision. First, fever preceding abdominal pain by 5 days was atypical for appendicitis, in which pain classically precedes or coincides with fever. Second, ultrasonography revealed a compressible appendix without secondary inflammatory signs, a combination associated with a low probability of appendicitis when secondary signs are absent.^[8, 9] Although the measured appendiceal diameter of 8.24 mm exceeded typical paediatric norms, the absence of periappendiceal fat stranding, free fluid, or appendicolith, together with preserved compressibility, argued strongly against acute appendicitis. Third, systematic examination identified a concealed perineal eschar, similar to the case reported by Basukala et al.^[3] in 2022, though unlike that report our case additionally featured hypoxia and bilateral infiltrates, underscoring the systemic nature of scrub typhus vasculitis. In the absence of the eschar, the combination of peritoneal signs and borderline appendiceal diameter might have prompted diagnostic laparoscopy at some centres; the eschar was a key diagnostic clue. This reinforces the importance of integrating sonographic findings with clinical context rather than relying on appendiceal diameter alone. A summary of these clinical red flags is presented in Table 1. The decision to defer surgery was based on concordance between clinical, radiological, and dermatological findings.

Table 1
Clinical red flags suggesting scrub typhus over appendicitis in endemic regions

Clinical Feature	Typical Appendicitis	Scrub Typhus (Red Flag)
Fever-pain interval	Pain precedes or coincides with fever	Fever precedes pain by ≥48–72 hours
Respiratory involvement	Rare (late atelectasis only)	Dyspnoea, hypoxia, interstitial infiltrates
Platelet count	Normal or reactive thrombocytosis	< 150,000/μL
Transaminases (AST/ALT)	Normal	> 40 U/L
Appendiceal ultrasound	Enlarged (> 6 mm), non-compressible, periappendiceal fluid	When visualised: compressible appendix without secondary inflammatory signs (no fat stranding, no fluid, no appendicolith)
Eschar at concealed site	Absent	Present in perineum, axillae, scalp, or external auditory canal
Response to doxycycline	None	Defervescence within 48 hours

A policy of concealed-site examination before surgical referral is low-risk and requires no equipment, but will identify an eschar in only 40–50% of paediatric cases.^[4, 5] Absence of an eschar does not exclude

scrub typhus; in eschar-negative cases with persistent red flags, empirical anti-rickettsial therapy and serial examination remain reasonable alternatives to immediate surgery.

Limitations include single IgM-based diagnosis without PCR or histopathology, short follow-up, and unvalidated clinical red flags.

Conclusion

Scrub typhus may mimic acute appendicitis in children from endemic regions, causing right iliac fossa pain and peritoneal signs. Fever preceding abdominal pain, systemic features, ultrasound findings, and occasional eschar detection may suggest a non-surgical cause. However, appendicectomy may still be required when appendicitis cannot be excluded. Further prospective multicentre studies are needed.

Declarations

Consent for Publication

Written informed consent was obtained from the patient's legal guardian (father) for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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Authors' contribution

AP contributed in the conception and design of the work, defining intellectual content, drafting of the work, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, contributed in the literature review.

RL contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work.

PA contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work.

AG contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work.

AK contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work.

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Author Contribution

AP contributed in the conception and design of the work, defining intellectual content, drafting of the work, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, contributed in the literature review. RL contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work. PA contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work. AG contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work. AK contributed in the conception and design of the work, literature review, revision of the manuscript for important intellectual content, approval of the final version of the manuscript, and agreed for all the aspects of the final work.

Availability of data and materials

The clinical data supporting the findings of this case report are presented within the manuscript. No external datasets were created or analysed for this study.

Competing Interests

None declared.

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Figures

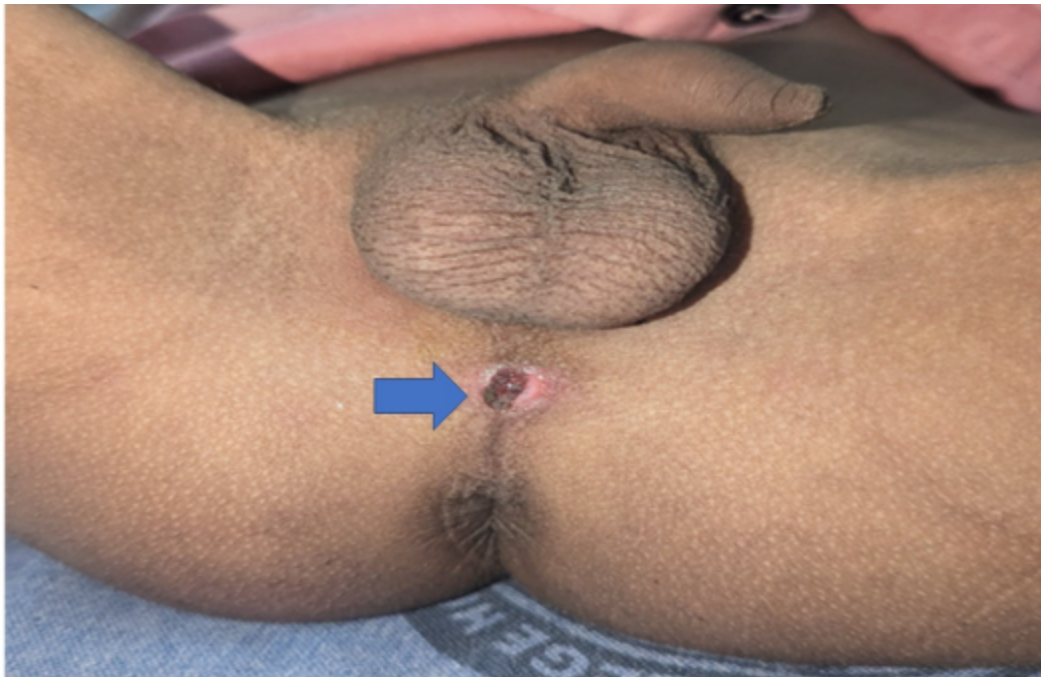


Figure 1

Eschar in the perineal region posterior to the scrotum.



Figure 2

Abdominal ultrasonography showing a compressible 8.24 mm appendix with no secondary inflammatory signs.

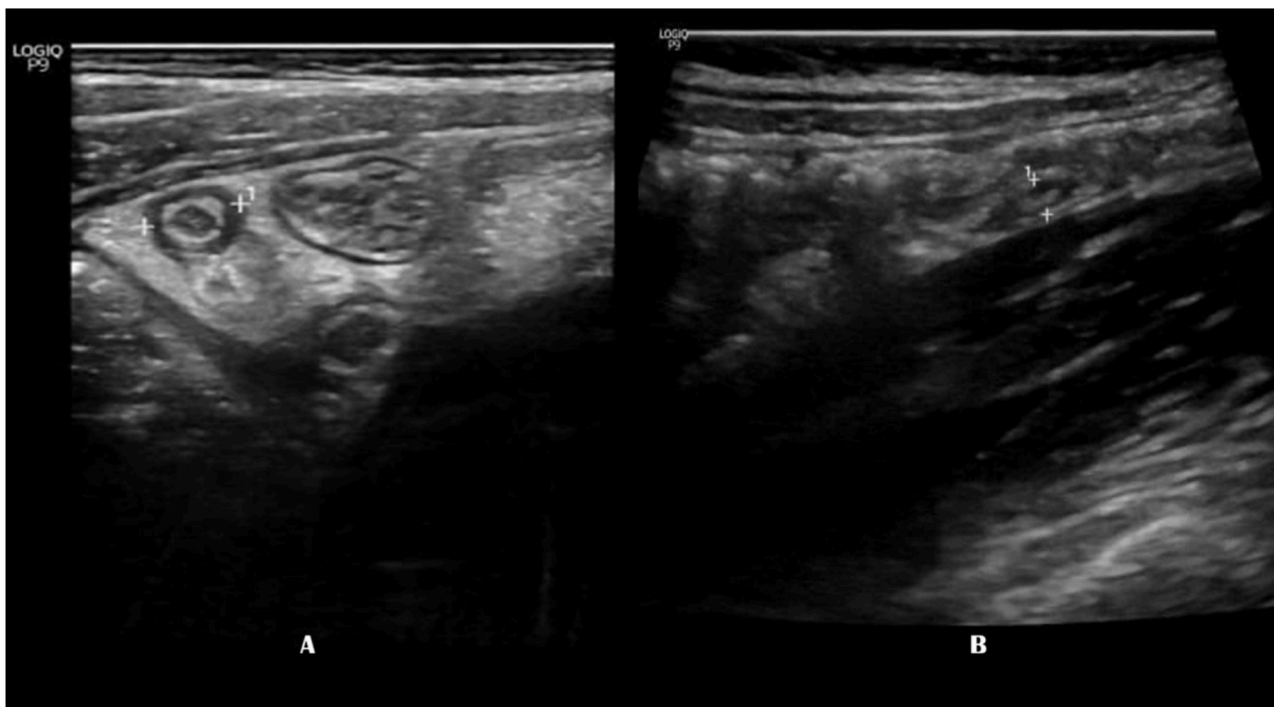


Figure 3

Abdominal ultrasonography. (A) No periappendiceal fluid or hyperechoic mesenteric fat change. (B) No appendicoliths; the appendix is compressible with no secondary inflammatory signs.