

Cellulitis that was NOT Cellulitis

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ABSTRACT

Cellulitis is a common bacterial skin infection characterized by erythema, swelling, and pain of the affected skin and subcutaneous tissues. The lower limbs are a commonly affected area due to microtrauma and gravity-dependent stagnation of blood. We describe a case of a male patient with an extensive travel history who presented with left lower limb cellulitis, hyperbilirubinemia, and acute kidney injury. When workup for the usual causes of cellulitis did not provide a clearer picture, we had to consider the unusual. Considering his travel history, an exotic tropical zoonotic disease was considered, and an eschar was searched for. Upon further investigation, he tested positive for the Weil-Felix test and responded very well to doxycycline. Our case emphasizes the need to suspect scrub typhus in travelers, even with unusual presentations, for timely diagnosis and treatment to prevent the development of various complications and ensure earlier recovery of patients. It usually presents as an acute febrile illness, but the diagnosis is often missed due to similarities with other tropical febrile infections.

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INTRODUCTION

Cellulitis is an acute affliction of the dermis and subcutaneous layers of the skin. *Streptococcus* species and *Staphylococcus aureus* are the most common Gram-positive cocci that cause this infection.

The common risk factors include trivial skin injuries, venous stasis, obesity, lymphoedema, and other skin infections (including tinea pedis).

Approximately 30% of cellulitis patients are misdiagnosed, as per various studies.

Alternate diagnoses to be considered include eczema, lymphoedema, psoriasis flare-ups, or aggravation of connective tissue disorders.¹

During examination of a patient suspected of cellulitis, the entire body should be uncovered, and micro-abrasions, insect bites, pressure ulcers, and injection sites should be considered as the source of zoonotic illnesses that present with cellulitis.

Scrub typhus is an acute, febrile, infectious illness caused by *Orientia* (formerly *Rickettsia*) *tsutsugamushi*, an obligate intracellular gram-negative bacterium. It was first described in China in 313 AD.

In endemic areas, also called the "tsutsugamushi triangle," it is estimated that approximately 1 billion people may be infected at some point in their lives, and of those, 1 million symptomatic cases are documented annually.²

At the site of infection, a small painless papule appears and enlarges gradually. Then central necrosis increases, followed by eschar formation. At the initiation of the fever, the eschar is well-developed.

The rash, a history of travel to endemic areas, and the presentation of the eschar or sore can be diagnostic of scrub typhus, but it may still remain difficult, as many tropical infections have overlapping features.

CASE DESCRIPTION

A 62-year-old man came to us with symptoms of left lower limb swelling, redness, and pain. He had developed these symptoms during his flight to Ethiopia, which progressively increased during his travel, lasting 8 days (Fig. 1).

He had preexisting diabetes mellitus (HbA1c 5.8%) and had received treatment for psoriasis in the past.

During the initial examination at the casualty department of our hospital, all his parameters were normal. His temperature was 99°F, heart rate was 76 beats/minute, and blood pressure was 110/70 mm Hg.



Fig. 1: Psoriatic scars with left leg edema and erythema at landing in Ethiopia

Oxygen saturation was 98% on room air. On auscultation, the chest and cardiovascular system were clear.

He had no visible eschar, active rash, or palpable lymphadenopathy (Fig. 2).

He was started on a piperacillin-tazobactam combination with metronidazole, along with regular dressing and elevation of the leg. His investigations revealed acute kidney injury with a creatinine of 3.4 mg%, along with hyperbilirubinemia (total bilirubin 14 mg% with direct bilirubin of 8.4 mg%) and a procalcitonin level of 11.95 ng/mL (for a normal of <0.05 ng/mL).

Worsening thrombocytopenia with leukocytosis was seen, but blood culture, immunology workup, and tests for malaria, leptospirosis, and dengue were negative.

Bilateral lower limb arterial and venous Doppler studies showed triphasic flow but no luminal obstruction, with subcutaneous edema suggestive of cellulitis. Computed tomography of the abdomen and pelvis showed liver parenchymal disease with portal hypertension and mild to moderate ascites. His CA-125 and CA-19 levels were borderline high.



Fig. 2: Left leg cellulitis on departure from Ethiopia (day 8 of symptoms)

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Esophago-gastro-duodenoscopy revealed a lax lower esophageal sphincter with a massive necrotic ulcer at the D1 level with no active bleeding. No esophageal varices were found.

He developed hypotension; hence, he was transferred to the intensive care unit, and antibiotics were increased to meropenem, along with inotropic support and a continuous pantoprazole infusion for the ulcer. On repeat questioning, a list of countries he had visited recently was obtained. Keeping in mind tropical zoonotic diseases, the insect bites, wounds, and psoriasis scars were examined minutely, which led to the discovery of an eschar on the dorsum of the left foot at the center of the cellulitis (Fig. 3).

Weil-Felix test was sent, which was positive for OX-K (agglutination 1:80), and he was started on doxycycline (dose adjusted as per creatinine clearance).

He gradually improved with regular dressing of the leg and was discharged with creatinine and bilirubin on declining trends.

DISCUSSION

Zoonotic diseases are spread from an animal host to humans, even though the host may remain unaffected by the pathogen, be it bacteria, virus, parasites, or fungi.

Various methods of spread include direct or indirect contact with contaminated bodily fluids, or vectors, food, or waterborne transmission.

Scrub typhus is spread to people through bites of infected chiggers (larval mites). The name is derived from the type of vegetation that harbors the vector.

The chigger bite is the method of inoculation and is often painless, remaining unnoticed. The incubation period lasts from a minimum of 6 days to a maximum of 20 days. Symptoms then include headache,

lymphadenitis, conjunctivitis, fever, anorexia, and generalized malaise.

The interesting fact about our case was that the patient never complained of fever, but instead had only leg pain, swelling, and generalized malaise.

A small, painless papule initially appears at the site of infection and enlarges gradually. An area of central necrosis develops and is followed by eschar formation.³

The eschar, initially a small papule, is a painless lesion at the site of the bite and is considered pathognomonic.³ It is seen a few days after the chigger bite, but before disease presentation. Target cells, the main type of cells affected by *O. tsutsugamushi*, are endothelial cells, leading to symptoms of pneumonitis, hepatitis, tinnitus, rash, disseminated intravascular coagulation, and meningoencephalitis.⁴

It is underdiagnosed in India due to its nonspecific clinical presentations, low index of suspicion among clinicians, limited awareness, and limited diagnostic facilities.

The maximum number of cases in India has been reported from the months of September to October, as the mites are more active during the rainy season.

The Weil-Felix test is widely used in the diagnosis of rickettsial diseases, but this test is neither sensitive nor specific in the diagnosis of these diseases. The result may be negative during the early stage of the disease because the agglutinating antibodies are detectable only during the 2nd week after the onset of the illness. Some of the more specific immunological tests include the microimmunofluorescence test, which is considered the best approach, followed by latex agglutination (LA), indirect hemagglutination (IHA), immunoperoxidase assay (IPA), and enzyme-linked immuno sorbent assay (ELISA). These specific

immunologic tests are not easily available in India.⁵

Leptospirosis has been reported to be a common coinfection and confusing to the clinician due to the overlap of symptoms, history of exposure to the vectors, and the presence of transaminitis on test results.

Drugs available for the treatment of scrub typhus include azithromycin and doxycycline. In a multicentric open randomized controlled trial conducted in Thailand, 296 adult patients were studied. In conclusion, doxycycline was shown to be an affordable and effective choice for the treatment of both leptospirosis and scrub typhus. Azithromycin was better tolerated than doxycycline but is more expensive.⁶

Identification of the eschar, along with a high index of clinical suspicion, helps to hasten diagnosis and reduce the incidence of complications and end-organ damage.

CONCLUSION

India is an endemic nation for dengue and malaria, among other tropical febrile illnesses.

Scrub typhus remains a diagnostic dilemma for most, as the lack of clinical experience in dealing with these cases is a real problem.

An atypical presentation such as this, with only cellulitis without fever or lymphadenopathy, represents a conundrum for the treating physicians.

Only a multispecialty approach, with careful clinical examination and observation, helped us solve this case, and it served as a reminder that in clinical practice, the learning never ends (Fig. 4)!

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Fig. 3: Eschar on dorsum of left foot



Fig. 4: Resolution of cellulitis and eschar after completing 14 days of doxycycline therapy