

CASE REPORT

Pan Digital Gangrene: A Rare Phenomenon in Scrub Typhus

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ABSTRACT

Introduction: Scrub typhus is an acute, febrile zoonosis, caused by an obligate intracellular bacterium *Orientia tsutsugamushi*. The disease is of greatest public health importance in rural areas of Asia and in Western Pacific Islands. The clinical manifestations of the disease range from subclinical disease to an organ failure. The various complications known with this disease are jaundice, renal failure, pneumonitis, acute respiratory distress syndrome, septic shock, myocarditis, vasculitis, and meningoenzephalitis. The complications of scrub typhus usually develop after the first week of illness.

Case report: We report a case of a 70-year-old female, farmer by occupation, who presented with acute febrile illness and was diagnosed as scrub typhus. She subsequently developed vasculitis, which resulted in pan digital gangrene. After thorough workup for digital gangrene, it was established that scrub typhus is the cause of gangrene in this patient.

Conclusion: Thus, our inference is that vasculitis might be seen in very few cases of scrub typhus and it may progress up to gangrene of digits. Only one such case has been reported, thus making it a very rare phenomenon.

Keywords: Digital gangrene, Scrub typhus, Vasculitis.

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INTRODUCTION

Scrub typhus, caused by *Orientia* (formerly Rickettsia) *tsutsugamushi*, is an acute infectious disease of variable severity that is transmitted to humans by an arthropod vector of the Trombiculidae family. "Tsutsuga" means small and dangerous, and "mushi" means insect or mite. It affects people of all ages including children. Humans

are accidental hosts in this zoonotic disease. While scrub typhus is confined geographically to the Asia-Pacific region, a billion people are at risk and nearly a million cases are reported every year.¹ Mite can serve as both the vector and the reservoir.

It is endemic to a part of world known as "tsutsugamushi triangle," which extends from northern Japan and eastern Russia in the north to northern Australia in the south and to Pakistan and Afghanistan in the west.² Scrub typhus is often acquired during occupational or agricultural exposures³ because active rice fields are an important reservoir for transmission.⁴

The incubation period may range from 5 to 21 days. The common symptoms are fever, chills, headache, myalgia, dry cough, lymphadenopathy, and gastrointestinal disturbances. Scrub typhus can affect skin, lung, heart, and central nervous system with the potential of causing serious life-threatening complications. The clinical and laboratory features are nonspecific in scrub typhus. The eschar is the single most useful diagnostic clue and is pathognomonic for *O. tsutsugamushi*, but is seen in less than 10% of cases in the Indian subcontinent.

CASE REPORT

A 70-year-old female, farmer by occupation, presented to our emergency department with complaints of high-grade fever associated with chills for 12 days. She had shortness of breath with dry cough for 3 days and from last 2 days she developed altered sensorium and then she was referred to our hospital from district hospital.

Arterial blood gas test was done and showed respiratory alkalosis. Patient was admitted in the intensive care unit and was kept on ventilator. Intravenous fluids with broad spectrum antibiotics were initiated and routine investigations along with scrub and dengue serology were sent.

On second day, doxycycline 100 mg bd with azithromycin 500 mg bd was started, as scrub typhus was confirmed. Patient developed blackish discoloration of digits of upper limb, which was later followed in lower limb also. Discoloration was progressive and eventually it turned into dry gangrene (Tables 1 and 2).

Mild calcification with no narrowing in bilateral axillary and brachial artery was seen in arterial Doppler study. However, there was multiple wall calcification and

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Table 1: Complete blood count

Bilirubin total	0.80 (0.20–1.30 mg%)
Bilirubin direct	0.20 (0.10–1.20 mg%)
SGOT (AST)	135 (15–46 U/L)
SGPT (ALT)	17 (13.00–69.00 U/L)
Alkaline phosphatase	450 (38.00–126.00 U/L)
Urea	58 (15–45 mg%)
Creatinine	0.9 (0.52–1.25 mg%)
Uric acid	7.5 (2.5–6.2 mg%)
Serum sodium	138.00 (137–145 mmol/L)
Serum potassium	4.5 (3.50–5.10 mmol/L)
Serum chloride	108 (98–107 mmol/L)

SGOT: Serum glutamic oxaloacetic transaminase; SGPT: Serum glutamic pyruvic transaminase; AST: Aspartate aminotransferase; ALT: Alanine aminotransferase

Table 2: Workup for fever

WBC	9.35
RBC	4.27
HGB	11.1
HCT	31.5
PLT	1 Lac
NEUT	75.8%
LYMPH	20.4%
ESR	13 mm in 1 st hr

Table 3: Autoimmune workup for fever

Malaria	Negative
Dengue Serology	Negative
Leptosira Serology	Negative
Anti HCV	Negative
HbsAg	Negative
HIV	Negative

narrowing in distal end of bilateral and ulnar artery. Ultrasonography was suggestive of distended gall bladder with echogenic sludge. Computed tomography brain, electrocardiogram, and echocardiogram were normal.

Autoimmune workup for vasculitis like antinuclear antibodies, antiphospholipid antibodies, C-antineutrophil cytoplasmic antibodies (ANCA), P-ANCA, anticentromere antibody were done and came out to be negative (Table 3).

However, C-reactive protein and rheumatoid arthritis (RA) factor were positive. But she had no clinical manifestation of RA and any other connective tissue disorder.

DISCUSSION

Scrub typhus is widespread in Indian subcontinent. With the involvement of multiple organs, severe complications may develop, which could make it a fatal disease.

Endothelial cells and macrophages are the main target cells for *O. tsutsugamushi*. It disseminates into multiple organs through endothelial cells via hematogenous and lymphatogenous routes and predominantly locates in the macrophages of the liver and spleen.⁵ The bacteria then cause focal or systemic vasculitis and perivasculitis in multiple organs, with various complications. Complications are seen in those patients who are left untreated in their

first week of illness. The various complications known to occur with this disease are acute renal failure, acute hepatic failure, interstitial pneumonitis, acute respiratory distress syndrome, septic shock, myocarditis, pericarditis, meningoencephalitis, and also acute hearing loss.^{6,7}

These complications are the result of endothelial damage and this forms the basis for systemic vasculitis. Sometimes, vaso-occlusion due to venous thrombosis may also lead to development of vasculitis.

Digital gangrene involving all digits of four limbs is a sign of systemic disease, such as infections like syphilis, leprosy, endocarditis, viral (hepatitis B, hepatitis C, human immunodeficiency virus), fungal, and parasites (Fig. 1). With risk factors, such as hypertension, diabetes, dyslipidemia, atherosclerosis has become the leading causes of peripheral arterial disease. Vasculitis and thrombophilic states should be ruled out in all cases of digital gangrene.

In primary systemic vasculitis, medium-sized vessel are commonly involved, such as polyarteritis nodosa, which is associated with hepatitis B, Wegener's granulomatosis, Churg–Strauss syndrome. Though uncommon, large-size vessel vasculitis can also lead to digital gangrene, such as giant cell arteritis and Takayasu arteritis. Digital ischemia is very commonly associated with



Figs 1A to C: Dry gangrene involving all digits of (A) right hand; (B) left hand; and (C) both foot



Fig. 2: Chest X ray shows acute respiratory distress syndrome

systemic lupus erythematosus. Similarly, RA, scleroderma, antiphospholipid syndrome, Raynaud's phenomenon are well-known causes of vasculitis digital ischemia and should be kept in mind. Behçet disease is also associated with digital gangrene (Fig. 2).

All possible causes whether infective or noninfective were ruled out. And, eventually, we reached out to a conclusion that scrub typhus has led to pan digital gangrene in this patient.

CONCLUSION

Scrub typhus is a reemergent zoonosis disease in the Indian subcontinent. Due to its pathophysiology which

involves endothelial dysfunction of small blood vessels it is a multiorgan disease. Vasculitis is one of the dreaded complications of scrub typhus, which can lead to digital ischemia and then gangrene.

Proper evaluation and early and prompt treatment can lead to effective control of its complication. While going through the literature, we found out that not many cases have been reported, so while dealing with pan digital gangrene, scrub typhus should be kept in mind.

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