

BRIEF ARTICLE

A Suspected Case of Imported Yaws in New York

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ABSTRACT

Introduction: Yaws is an endemic non-venereal treponematoses, which is caused by *Treponema pallidum*, subspecies *pertenue* and is spread from person-to-person through direct skin contact with an infected lesion. Yaws causes a chronic skin infection that is characterized by papillomas and ulcers and if left untreated can be disfiguring and debilitating. Cases typically occur in warm, humid, tropical climates and cases are commonly seen in children under 15 years old. However, due to migration, cases can be seen outside of its endemic region.

Case Description: We present a case of a 39-year-old African American male who presented with painless bilateral ulcers on his dorsal feet that began as blisters approximately 1-2 weeks prior to presentation at our clinic. Our patient had recent travel history to Jamaica and reported potential sources of trauma to his feet by walking barefoot on the beach and roofing in sandals prior to onset. These findings led to the clinical diagnosis of Yaws. A regimen of azithromycin and basic wound care led to significant improvement.

Discussion: Non-venereal endemic treponematoses, such as Yaws, are typically not seen outside of their endemic region. However, due to migration and the ease of travel non-venereal endemic treponematoses can be found elsewhere and it is important for healthcare workers to keep these diseases on their differential, especially in a patient with travel history. After making the diagnosis of Yaws, proper treatment and basic wound care can result in rapid significant improvement and prevent the progression of Yaws lesions to the subsequent stage.

INTRODUCTION

Yaws is a non-venereal endemic treponematoses, which is morphologically and antigenically identical to venereal syphilis, caused by *Treponema pallidum*, subspecies *pallidum*.^{1,2} Yaws is caused by subspecies *pertenue*, and is characterized by chronic skin infections.³

Yaws occurs in warm, humid, tropical climates, with an annual temperature of >27°C, and an annual rainfall of >1,300 mm/year.^{1,4}

Transmission occurs through direct skin-to-skin contact with an infected lesion.^{3,4} Risk factors include broken skin and injuries, such as bites and wounds.⁵⁻⁷ Lesions are most commonly found on the lower extremities.^{2,3} A majority of cases (70-85%) occur in children under 15 years old.² Those affected

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Progression of Yaws Lesions			
Lesion	1° Lesion “Mother Yaw” ¹	2° Lesion “Daughter Yaws” ¹	3° Lesion
Location	•Site of inoculation ¹	•Adjacent to mucous membranes (nose, mouth) ¹	•Destruction of tissue, bone, and cartilage ¹²
Description	•Erythematous, infiltrated, painless papule/papilloma ^{1,3} •Enlarges peripherally (1-5 cm) → ulcerates & forms an amber-yellow crust ¹ •Heals spontaneously over 3-6 months ¹	•Multiple, smaller and raised yellow lesions ² •Can present as pain and swelling in long bones and fingers (dactylitis) ² •More widespread than 1° lesions ¹ •Expand or ulcerate ¹	•Abscess formation → necrosis & ulceration ¹ •Ulcers can coalesce into serpiginous tracts → heals with significant scarring → deformities (periostitis, dactylitis, osteitis) ¹
Other Information	•Occurs within 9 days to 3 months (Mean = 21 days) of inoculation ² •Lesion is rich in treponemes ¹	•Weeks to months after 1° lesions ²	Only 10% of patients progress to 3° lesions ¹
Infectivity	•Highly infectious ¹	•Highly infectious ¹	Not infectious ¹²

Figure 1. Progression of Yaws Lesions.



Figure 2. Ulcerative plaque with a rolled border and amber-yellow crust on the patient’s right (A) and left (B) dorsal aspect of his foot and ankle in November 2022. Photo taken one week after turning from Jamaica and two weeks after initial onset.

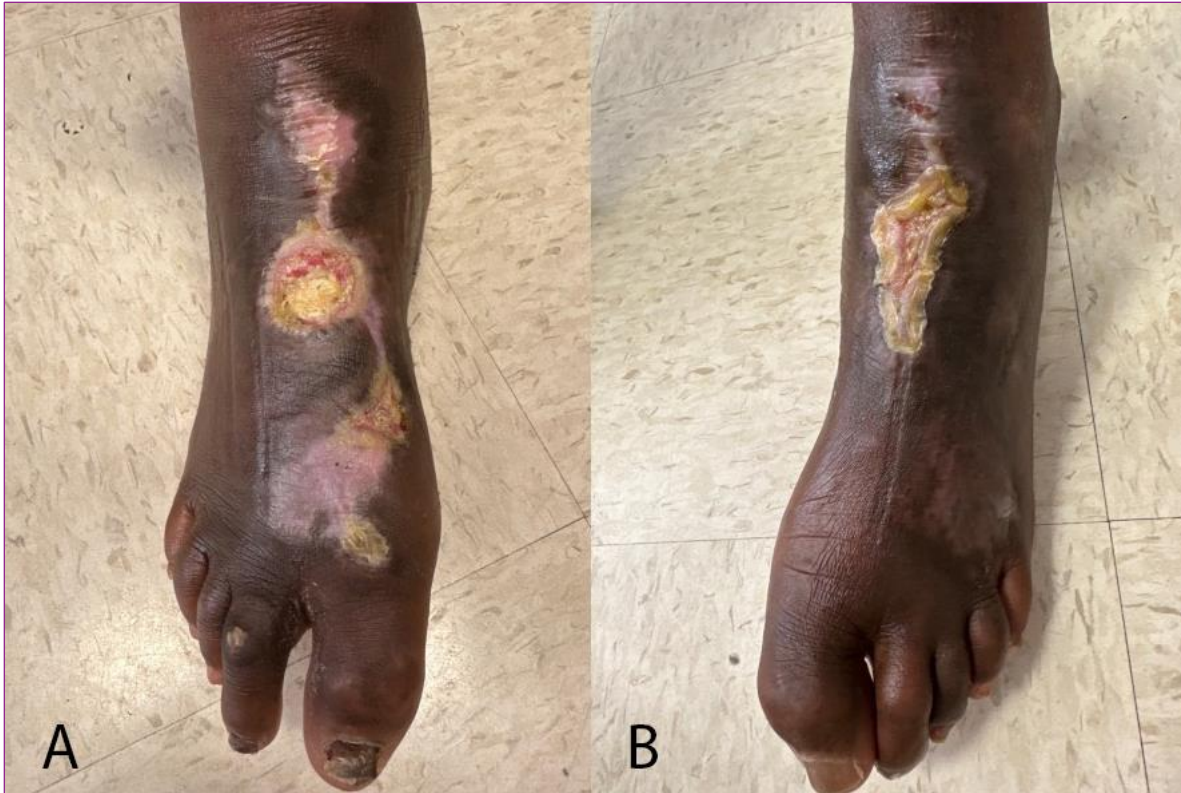


Figure 3. Healing ulcerative plaque on patient's right (A) and left (B) dorsal aspect of his foot and ankle in January 2023, approximately 9 weeks after initial presentation and after taking oral azithromycin and following a wound care regimen.

are typically impacted by low socio-economic conditions, such as overcrowding and poor sanitation.⁴

Lesions can progress through three stages (Figure 1). The primary lesion, "Mother Yaw," occurs at the site of inoculation typically within nine days to three months.^{1,2} It presents as an erythematous painless papule that enlarges peripherally, ulcerates, and develops an amber-yellow crust. Ulcers are typically circular with a raised border and granulation tissue in the center.³ The primary lesion is rich in treponemes, which can disseminate through the bloodstream leading to secondary Yaws. Secondary Yaws, "Daughter Yaws," are smaller and more widespread than primary Yaws.¹ They occur close to body orifices and heal spontaneously over three to six months.^{1,3} Both primary and secondary lesions are highly contagious.⁴

About 10% of individuals will progress to non-contagious tertiary Yaws, in which, abscesses form, become necrotic, and ulcerate.¹

The diagnosis of Yaws is typically made clinically.^{1,3} The treponemes cannot be cultured on synthetic media.³ Silver stains and dark-field microscopy can identify the spirochetes of endemic treponemes, but cannot differentiate between that of venereal syphilis.³ Serologic testing also does not help differentiate between treponematoses.^{1,3}

The current first-line treatment of Yaws is a one-time oral dose of azithromycin (30 mg/kg, maximum 2g).¹ For over 50 years, the first-line treatment was a single intramuscular benzathine penicillin injection.¹ A benefit of azithromycin is that it can be easily

administered orally and can be given to those with a penicillin allergy.¹

We report a case of suspected Yaws in a New York patient who recently traveled to Jamaica.

CASE REPORT

A 39-year-old African American male with a past medical history of Type 1 Diabetes Mellitus presented to the clinic in November 2022 with a chief complaint of painless ulcers on his bilateral dorsal feet. The ulcers started as blisters approximately 2 weeks prior, while he was in Jamaica. He reported that before the blisters appeared, he frequently walked along the beach barefoot and was roofing wearing sandals. He saw a doctor when the blisters started to ulcerate and expand. He received a penicillin injection, a prescription of oral doxycycline 100mg twice daily for one week, and silver sulfadiazine cream applied daily. The patient denied any pain or systemic symptoms when he presented at our clinic.

Physical exam revealed large ulcerative plaques with rolled borders and without exudate on bilateral dorsal feet (**Figure 2**). Yaws, cutaneous leishmaniasis, and pyoderma gangrenosum (PG) were on the differential. A shave biopsy was taken from the patient's left anterior ankle and an RPR blood test was ordered. The patient was prescribed a one-time dose of oral azithromycin 2g and daily application of silver sulfadiazine while keeping the ulcers wrapped.

During his initial follow-up 4 days later, he reported significant improvement, which made Yaws more likely than PG or leishmaniasis. The patient was instructed to continue the same wound care with the

addition of daily saline soaks. He was then prescribed additional doses of azithromycin (250mg daily for 5 days) and was instructed to follow up in one week.

The patient's RPR returned negative and histopathological examination showed ulceration, granulation tissue and epidermal hyperplasia. The diagnosis of Yaws was made clinically based on the patient's history and rapid improvement with azithromycin. Continuous improvement was seen at each follow-up visit (**Figure 3**).

DISCUSSION

Broken skin and minor injuries are risk factors for Yaws transmission which can occur in an individual of any age.⁷⁻¹² Our patient had a history of walking barefoot and roofing in sandals, which could have easily caused minor traumas to our patient's feet/ankles. Jamaica is a prime location with an ideal climate for Yaws since it is located between the tropics. In the 1950s, Jamaica was known to be an endemic country of Yaws. After the World Health Organization's (WHO) Yaws eradication campaign, formal reporting of Yaws stopped in many countries.⁴ Jamaica currently falls into a group of countries previously known as endemic, with unknown current status.¹¹

Tropical treponematoses only occur in endemic countries, however, due to migration and travel, cases can be imported to non-endemic countries.^{3,7} One case of Yaws was reported in The Netherlands from a child who was infected with the disease in Ghana.⁷ Our patient most likely contracted Yaws in Jamaica and imported the disease to New York. Therefore, it is important for healthcare providers to be aware that these treponematoses exist, as the disease can be easily missed.^{3,7}

The diagnosis of Yaws was made clinically in our patient based on lesion morphology, progression and history, although the WHO requires serologic positivity for case confirmation.⁴ The spirochetes are unable to be visualized on H&E. Dark-field microscopy was not feasible and not completed. An RPR serologic test is a nonspecific non-treponemal antibody test that is typically positive in untreated cases.³ Our patient had already been treated with a penicillin injection in Jamaica by a doctor who also suspected Yaws, which could explain the negative RPR. Additionally, the antibody response in Yaws is often not detected in the first 3 weeks of the infection.³

Our patient received both treatment regimens for Yaws, intramuscular penicillin and oral azithromycin. Additional doses of oral azithromycin were prescribed due to the rapid clinical improvement noted four days after the initial dose. Proper wound care is essential for patients with ulcerative lesions. Rapid improvement was noted in our patient with daily saline soaks, silver sulfadiazine cream application, and having the ulcers wrapped. Consistency with this wound care regimen and follow-up resulted in significant improvement.

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References:

1. Sommer LL, Reboli AC, Heymann WR. Non-venereal (Endemic) Treponematoses. In: *Dermatology*. ; 2018:1259-1295.
2. World Health Organization. Yaws. Published 2023. Accessed February 1, 2023.

3. <https://www.who.int/news-room/fact-sheets/detail/yaws>
 Mitjà O, Šmajš D, Bassat Q. Advances in the Diagnosis of Endemic Treponematoses: Yaws, Bejel, and Pinta. *PLoS Negl Trop Dis*. 2013;7(10). doi:10.1371/journal.pntd.0002283
4. Kazadi WM, Asiedu KB, Agana N, Mitjà O. Epidemiology of yaws: An update. *Clin Epidemiol*. 2014;6(1):119-128. doi:10.2147/CLEP.S44553
5. World Health Organization. Yaws (Endemic treponematoses). Accessed February 1, 2023. https://www.who.int/health-topics/yaws#tab=tab_1
6. World Health Organization. Global report on neglected tropical diseases 2023. Published 2023. Accessed February 5, 2023. <https://www.who.int/teams/control-of-neglected-tropical-diseases/global-report-on-neglected-tropical-diseases-2023>
7. Engelkens HJH, Oranje AP, Stolz E. Early yaws, imported in The Netherlands. *Genitourin Med*. 1989;65(5):316-318. doi:10.1136/sti.65.5.316
8. Meteorological Service Division. Our Climate. Accessed February 5, 2023. <https://metservice.gov.jm/our-climate/#:~:text=The island is surrounded by,Florida and the Panama Canal>
9. Ferguson JA, Bryan P, Buisseret DJ, Black C V. Climate of Jamaica. *Britannica*. Published 2022. Accessed February 5, 2023. <https://www.britannica.com/place/Jamaica/Climate>
10. Jamaica Weather. Met Office. Accessed February 5, 2023. <https://www.metoffice.gov.uk/weather/travel/holiday-weather/americas/caribbean/jamaica-weather>
11. Global Health Observatory Data Repository: Status of Endemicity for Yaws - Data by Country. World Health Organization. Published 2022. Accessed February 15, 2023. https://apps.who.int/gho/data/node.main.NTD_YAWSEND?lang=en
12. Boock AU, Awah PK, Mou F, Nichter M. Yaws resurgence in Bankim, Cameroon: The relative effectiveness of different means of detection in rural communities. *PLoS Negl Trop Dis*. 2017;11(5):1-14. doi:10.1371/journal.pntd.0005557