Infection and Drug Resistance

Dovepress
Taylor & Francis Group

Open Access Full Text Article

CASE REPORT

Cutaneous Melioidosis Presenting as a Red Nasal Plaque: A Case Report

Sarocha Huang[1], Pitak Santanirand[2], Suwichak Chairanaicharoen[2], Teerapong Rattananukrom[1]

[1]Division of Dermatology, Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; [2]Clinical Pathology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Correspondence: Teerapong Rattananukrom, Division of Dermatology, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, 270 Rama VI Road, Ratchathewi, Bangkok, 10400, Thailand, Tel +662-201-1141, Fax +662-201-1211, Email teerpongrattananukrom@gmail.com

Background: Melioidosis, caused by *Burkholderia pseudomallei*, is endemic to tropical regions. Cutaneous forms, often presenting as non-healing ulcers, are rare and may mimic other skin diseases. Recognizing risk factors is key to prompt diagnosis and treatment.

Case Presentation: We report the case of a 51-year-old female with a 2-month history of chronic erythematous plaques on her nose. Aerobic tissue culture confirmed the diagnosis of primary cutaneous melioidosis by identifying *B. pseudomallei*. There was no evidence of systemic involvement, and blood culture results were negative. The patient was successfully treated with oral sulfamethoxazole-trimethoprim monotherapy. After three months of treatment, the lesion resolved completely, leaving an atrophic scar. At the eight-month follow-up, there was no evidence of recurrence.

Conclusion: This case illustrates an atypical presentation of cutaneous melioidosis without systemic involvement, which was effectively treated with oral sulfamethoxazole-trimethoprim monotherapy. A comprehensive evaluation to exclude dissemination is critical for ensuring successful treatment outcomes.

Keywords: cutaneous melioidosis, nasal plaque, oral therapy, sulfamethoxazole-trimethoprim

Introduction

Melioidosis is an infection caused by *Burkholderia pseudomallei*, an environmental intracellular gram-negative bacillus most commonly reported in northern Australia and Southeast Asia.[1,2] Thailand is a recognized endemic region, with an incidence rate of 3.95 cases per 100,000 people per year,[3] predominantly affecting the northeastern region.[3,4] The most common acute presentation is community-acquired pneumonia, whereas chronic melioidosis can mimic tuberculosis.[1] However, cutaneous manifestations of melioidosis are rare and can be classified as primary or secondary. Primary cutaneous melioidosis involves localized skin infections, whereas secondary cutaneous melioidosis involves skin lesions associated with systemic infections. Diagnosis of cutaneous melioidosis is particularly challenging because of its unusual clinical presentation and low index of suspicion for *B. pseudomallei* as the causative organism. Herein, we report a case of primary cutaneous melioidosis presenting as an erythematous plaque on the nose that was successfully treated with a three-month course of trimethoprim-sulfamethoxazole.

Case Presentation

A 51-year-old female with a history of hypertension, controlled with amlodipine, presented with a two-month history of erythematous plaques on her nose (Figure 1A). The patient was afebrile and showed no systemic symptoms. The lesion initially began as a small pustule on her nose, which she self-treated with an over-the-counter antibiotic of unknown type. However, the lesion gradually progressed to an erythematous plaque accompanied by occasional pain over one month. She denied history of previous trauma. She subsequently sought medical attention at the outpatient department of Ramathibodi Hospital. On physical examination, an ill-defined erythematous to violaceous scaly plaque was noted on her nose, with no other remarkable findings. The initial diagnosis was a rhinophyma. She was prescribed a two-week course

Received: 25 February 2025
Accepted: 15 May 2025
Published: 30 July 2025

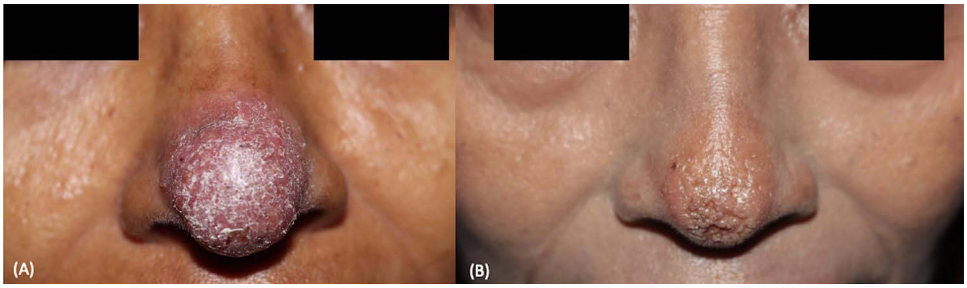

Figure 1 A 51-year-old female presented with an erythematous to violaceous scaly plaque on the nose (**A**). Clinical improvement was observed at the 8-month follow-up after a course of oral trimethoprim-sulfamethoxazole treatment (**B**).

of doxycycline and needle aspiration was performed for pus aerobic culture to exclude infection. However, there was no clinical improvement, and culture showed no growth at the follow-up visit.

Chronic infection was considered the most likely differential diagnosis, including lupus vulgaris, nontuberculous mycobacterial infection, and chromoblastomycosis. An incisional skin biopsy was performed and the specimens were sent for histopathology, molecular identification, and culture. Histopathological examination revealed pseudocarcinomatous epithelial hyperplasia with dense, diffuse infiltration of lymphocytes, neutrophils, histiocytes, and multinucleated giant cells, forming tuberculoid granulomas in the dermal layer (Figure 2). Although special stains including Fite, Brown-Brenn, acid-fast bacilli, Gomori methenamine silver, and periodic acid-Schiff were all negative, the findings were consistent with chronic infection.

Molecular identification via 16S and 18S ribosomal RNA sequencing as well as polymerase chain reaction (PCR) testing for Mycobacterium tuberculosis were negative. However, *B. pseudomallei* was subsequently isolated from an aerobic culture three days later (Figure 3), establishing a diagnosis of melioidosis. The organism was identified using conventional methods including colony morphology, Gram staining, and biochemical tests. MALDI-TOF MS (Bruker Daltonics, Bremen, Germany) was used to confirm species identity. Antimicrobial susceptibility testing was performed with the THAN4F panel (Thermo Fisher, USA) using the microbroth dilution technique. The results were interpreted according to the CLSI M45 guidelines.

The patient, a construction worker living in Bangkok, reported gardening as a hobby—a potential source of exposure. Laboratory investigations, including complete blood count (White blood cell count 9,690 /μL, neutrophils 69.8%, lymphocytes 23.5%, monocytes 4.2%, eosinophils 0.5%), liver function tests, and renal function tests, were all within normal limits. Two blood culture samples were negative, and imaging studies, including chest radiography and upper abdominal CT, showed no abnormalities.

B. pseudomallei is susceptible to ceftazidime (MIC 2 mg/L), imipenem (MIC ≤0.5 mg/L), trimethoprim-sulfamethoxazole (MIC 2 mg/L), and amoxicillin-clavulanate (MIC ≤4 mg/L). The patient was treated with trimethoprim-sulfamethoxazole 240/1,200 mg twice daily for three months following the diagnosis of localized cutaneous

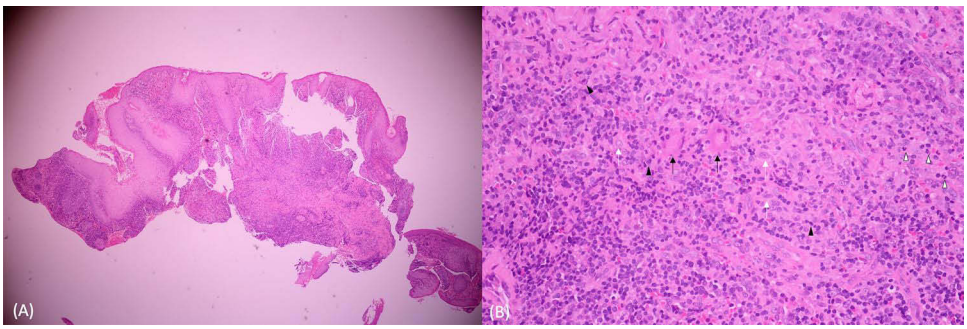

Figure 2 Pseudocarcinomatous epithelial hyperplasia with dense, diffuse infiltration in the dermis (**A**, H&E, x40). The infiltrate consists of lymphocytes, plasma cells (black arrowhead), neutrophils (white arrowhead), histiocytes (white arrow), and multinucleated giant cells (black arrow) forming a tuberculoid granuloma (**B**, H&E, x400).

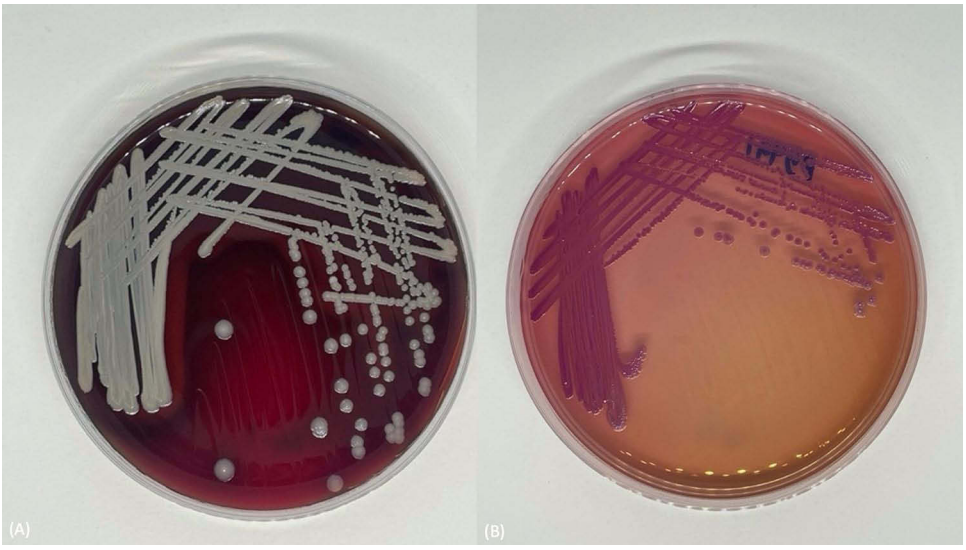

Figure 3 B. pseudomallei appears smooth and cream-colored on blood agar (**A**) and pink on MacConkey agar (**B**) after 3 days of growth at 37°C.

melioidosis. At the eight-month follow-up, the lesion had completely healed, leaving an atrophic scar with no evidence of recurrence (Figure 1B).

Discussion

Melioidosis is an emerging infectious disease that is often underrecognized and underdiagnosed due to limited awareness and its variable clinical presentations, earning it the nickname "the great mimicker".[1,5] The primary modes of transmission include inhalation and percutaneous exposure to contaminated soil and water in endemic areas. The ingestion of unchlorinated water is less common.[1,2] Person-to-person transmission of *B. pseudomallei* is very rare. Sexual transmission has been suggested but has not been definitively established as a mode of infection.[6] *B. pseudomallei* thrives in moist soils and can persist for years in distilled water, particularly in tropical areas with a high moisture content. Chlorine treatment in water effectively reduces the risk of melioidosis outbreaks, as it has activity against *B. pseudomallei*.[7,8] Melioidosis has the highest incidence in Australia and northeast Thailand, with other endemic regions including Malaysia, Singapore, Vietnam, Cambodia, and Laos.[9] Due to its significant global burden, with an estimated 165,000 cases annually and 89,000 fatalities, the World Health Organization has classified melioidosis as a Neglected Tropical Disease.[1]

In Thailand, melioidosis is predominantly endemic to the northeastern region, with lower incidence rates in other areas, leading to reduced awareness among health care providers. However, recent reports have highlighted the increasing prevalence and expanding global distribution of the disease.[1,5] In this case, the patient resided in an endemic region, and her occupational exposure and gardening hobbies involving soil contact were assumed to have increased the risk of infection.[10]

Melioidosis can affect any organ in the body and present with diverse clinical manifestations, including pneumonia, genitourinary infection, skin and soft tissue infection, septic arthritis, internal organ abscesses, ocular or neurological melioidosis, and fulminant septicemia without evident focus.[11] Patients with cutaneous melioidosis should be assessed for dissemination, particularly in those with systemic symptoms such as fever, malaise, or weight loss; underlying risk factors (eg, diabetes, immunosuppression); or residence in endemic areas. Evaluation is also warranted for persistent or progressive lesions. Recommended investigations include blood cultures, chest imaging, abdominal ultrasound or CT, and organ-specific assessments based on clinical findings.

Cutaneous melioidosis occurs in approximately 10–20% of melioidosis cases and includes both primary and secondary infections.[1] The most common presentation is a solitary, nonhealing ulcer or inflamed skin lesion that does not respond to standard antibiotics,[2,10] as *B. pseudomallei* demonstrates intrinsic resistance to penicillins and aminoglycosides.[12] Cutaneous melioidosis often presents as localized skin ulcers, clinically resembling bacterial pyoderma or atypical mycobacterial infections. These lesions may be chronic, non-healing, and occasionally accompanied by systemic symptoms such as fever

or malaise, suggesting potential dissemination. Regional lymphadenopathy is frequently observed, and the lesions may persist despite standard antibiotic therapy. The pathogenesis involves direct bacterial entry through skin breaches, followed by intracellular survival within phagocytes, promoting abscess formation and possible hematogenous spread.[2,10] Other reported skin manifestations include abscesses, cellulitis, pustules, and rare dermatological manifestations including necrotizing fasciitis,[13] polyarteritis nodosa,[14] erythema nodosum,[15] and Sweet syndrome[16] secondary to melioidosis.[1,12] While the legs are the most frequently affected site, the head, neck, upper extremities, and trunk can also be involved.[12] In our case, the patient initially presented with a pustule that progressed to an erythematous plaque on the nose, an atypical location with an unusual clinical morphology. To our knowledge, this is the first reported case of a nasal plaque as a manifestation of cutaneous melioidosis. Furthermore, cutaneous melioidosis was not initially considered in the differential diagnosis by the clinician.

Risk factors for melioidosis include diabetes mellitus, male sex, alcohol use, chronic kidney disease, chronic pulmonary disease, and immunosuppressive therapy. However, as in our case, patients with primary cutaneous melioidosis often appear younger and lack the typical risk factors. A detailed history of occupational and recreational activities involving soil and water exposure may help to identify potential sources of infection.[1,5,10]

Culture remains the gold standard for diagnosing melioidosis. Routine media, such as sheep blood agar and MacConkey agar, can be used under aerobic conditions. Colonies on blood agar typically appear cream-colored with a metallic sheen and develop a wrinkled texture after 24 hours. On MacConkey agar, the colonies were pale, exhibited a metallic sheen, and turned pink after 48 h. However, selective media, such as Ashdown agar, are essential when sampling non-sterile sites to prevent overgrowth of non-pathogenic bacteria. Automated identification systems often misidentify organisms such as *Pseudomonas* spp., other *Burkholderia* species, or other organisms, especially in non-endemic regions where *B. pseudomallei* is less familiar. Matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) is a rapid and accurate method for identifying isolates by comparing their mass spectrometry profiles against databases, enabling the differentiation of *B. mallei, B. pseudomallei*, and *B. thailandensis*.[1,5,17]

Standard treatment consists of an intensive phase with intravenous antibiotics such as ceftazidime, meropenem, or imipenem for at least 10–14 days, followed by an eradication phase with oral trimethoprim-sulfamethoxazole for 12–24 weeks. Alternative oral regimens include doxycycline and amoxicillin-clavulanic acid.[1]

In cases without systemic dissemination, oral antibiotic monotherapy may be sufficient, although data on the efficacy and safety of this approach are limited.[1,18] One case report described the successful treatment of primary cutaneous melioidosis on the shin using a three-month course of trimethoprim-sulfamethoxazole, resulting in complete resolution within two months and no recurrence.[18] Surgical intervention is rarely necessary but may be considered for abscess drainage.[12,19] Overall, cutaneous melioidosis generally has a favorable prognosis.[20] The patient was thoroughly evaluated to exclude systemic involvement. Based on infectious disease consultation, oral trimethoprim-sulfamethoxazole monotherapy was initiated without an IV intensive phase, leading to complete lesion resolution without recurrence.

Conclusion

Melioidosis remains a diagnostic challenge, even in endemic regions, owing to its diverse and non-specific cutaneous manifestations. High clinical suspicion is crucial for timely diagnosis and treatment. In low-incidence areas, detailed history taking is essential to identify potential exposure risks. Comprehensive physical examination and investigation are necessary to exclude systemic dissemination. In selected cases of primary cutaneous melioidosis, treatment with oral trimethoprim-sulfamethoxazole alone may be a viable and effective option.

Data Sharing Statement

Data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

The authors certify that they have obtained all appropriate patient consent forms. The patient provided written informed consent for the publication of clinical information and photographs. Institutional approval was not required for this case study.

Funding

The authors received no financial support for this report.

Disclosure

The authors declare that this manuscript was prepared in the absence of any commercial or financial relationships that could be construed as potential conflict of interest.

References

1. Schwartzman G, Reddy SA, Berg SH, Currie BJ, Saavedra AP. Cutaneous melioidosis: an updated review and primer for the dermatologist. *J Am Acad Dermatol*. 2023;89(6):1201–1208. doi:10.1016/j.jaad.2023.07.1032
2. Stavrou C, Veraitch O, Morris-Jones S, Walker SL. Leg ulceration due to cutaneous melioidosis in a returning traveller. *BMJ Case Rep*. 2021;14(6):e241490. doi:10.1136/bcr-2020-241490
3. Hantrakun V, Kongyu S, Klaytong P, et al. Clinical epidemiology of 7126 melioidosis patients in Thailand and the implications for a national notifiable diseases surveillance system. *Open Forum Infect Dis*. 2019;6(12):ofz498. doi:10.1093/ofid/ofz498
4. Vuddhakul V, Tharavichitkul P, Na-Ngam N, et al. Epidemiology of Burkholderia pseudomallei in Thailand. *Am J Trop Med Hyg*. 1999;60(3):458–461. doi:10.4269/ajtmh.1999.60.458
5. Kuijpers SC, Klouwens M, de Jong KH, et al. Primary cutaneous melioidosis acquired in Nepal - Case report and literature review. *Travel Med Infect Dis*. 2021;42:102080. doi:10.1016/j.tmaid.2021.102080
6. Chang CY, Lau NLJ, Currie BJ, Podin Y. Disseminated melioidosis in early pregnancy - an unproven cause of foetal loss. *BMC Infect Dis*. 2020;20(1):201. doi:10.1186/s12879-020-4937-8
7. Inglis TJJ, Sagripanti J-L. Environmental factors that affect the survival and persistence of Burkholderia pseudomallei. *Appl Environ Microbiol*. 2006;72(11):6865–6875. doi:10.1128/AEM.01036-06
8. Limmathurotsakul D, Kanoksil M, Wuthiekanun V, et al. Activities of daily living associated with acquisition of melioidosis in northeast Thailand: a matched case-control study. *PLoS Negl Trop Dis*. 2013;7(2):e2072. doi:10.1371/journal.pntd.0002072
9. Wiersinga WJ, Currie BJ, Peacock SJ. Melioidosis. *N Engl J Med*. 2012;367(11):1035–1044. doi:10.1056/NEJMra1204699
10. Liu S-W, Chiang C-P, Wang W-M, Hung C-T. Cutaneous melioidosis in a healthy young man. *Dermatologica Sinica*. 2020;38(3).
11. Chang CY. Periorbital cellulitis and eyelid abscess as ocular manifestations of melioidosis: a report of three cases in Sarawak, Malaysian Borneo. *IDCases*. 2020;19:e00683.
12. Fertitta L, Monsel G, Torresi J, Caumes E. Cutaneous melioidosis: a review of the literature. *Int J Dermatol*. 2019;58(2):221–227. doi:10.1111/ijd.14167
13. Wang YS, Wong CH, Kurup A. Cutaneous melioidosis and necrotizing fasciitis caused by Burkholderia pseudomallei. *Emerg Infect Dis*. 2003;9(11):1484–1485. doi:10.3201/eid0911.030370
14. Choonhakarn C, Jirarattanapochai K. Cutaneous polyarteritis nodosa: a report of a case associated with melioidosis (Burkholderia pseudomallei). *Int J Dermatol*. 1998;37(6):433–436. doi:10.1046/j.1365-4362.1998.00403.x
15. Tantawarak N, Techasatian L, Ungarreevittaya P, Kosalaraksa P, Lumbiganon P. Case report: melioidosis-related severe cutaneous features of erythema nodosum in a Thai child. *Am J Trop Med Hyg*. 2024;110(1):133–135. doi:10.4269/ajtmh.23-0332
16. Vithoosan S, Thanushah B, Piranavan P, Gamlaksha D, Karunatilake H, Jayanaga A. A rare case of sweet syndrome secondary to melioidosis. *BMC Dermatology*. 2019;19(1):16. doi:10.1186/s12895-019-0096-2
17. Hoffmaster AR, AuCoin D, Baccam P, et al. Melioidosis diagnostic workshop, 2013. *Emerg Infect Dis*. 2015;21(2). doi:10.3201/eid2102.141045.
18. Smith S, Hanson J. Successful treatment of localized cutaneous melioidosis with oral antibiotic therapy alone. *Am J Trop Med Hyg*. 2019;100(5):1039–1040. doi:10.4269/ajtmh.18-0940
19. Fertitta L, Monsel G, Delaroche M, Fourniols E, Brossier F, Caumes E. Cutaneous melioidosis: two cases of chronic primary forms. *J Eur Acad Dermatol Venereol*. 2018;32(7):e270–e2. doi:10.1111/jdv.14800
20. Achappa B, Madi D, Vidyalakshmi K. Cutaneous Melioidosis. *J Clin Diagn Res*. 2016;10(9):Wd01–wd2. doi:10.7860/JCDR/2016/18823.8463