



Published in final edited form as:

J Infect Public Health. 2025 October ; 18(10): 102937. doi:10.1016/j.jiph.2025.102937.

Melioidosis presenting as septic arthritis in hip joint of a 60-year old patient: Findings from a hospital-based surveillance in Bangladesh

Ayesha Jamal Ananna^a, Lovely Barai^b, Jamal Uddin Ahmed^b, Jubaidul Islam^b, Muhammad Abdur Rahim^b, Tushar Kumar Das^a, Nurun Nahar Chisty^a, Saima Akter^a, Jay E. Gee^c, Christopher A. Gulvik^c, Caroline A. Schrodtt^c, Zachary P. Weiner^c, Sukanta Chowdhury^{a,*}

^aInternational Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), Dhaka, Bangladesh

^bBangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) General Hospital, Dhaka, Bangladesh

^cBacterial Special Pathogens Branch, Centers for Disease Control and Prevention, Atlanta, United States

Abstract

Melioidosis is a fatal bacterial infection caused by a soil-borne bacterium *Burkholderia pseudomallei*. Pneumonia, localized abscess and acute septicemia are the most common clinical presentations for melioidosis. Septic arthritis is relatively uncommon clinical manifestation and may cause severe infection. Here, we report a melioidosis case of a 60-year old diabetic male presenting with fever and acute hip pain. *B. pseudomallei* was isolated from blood culture and it was sensitive to meropenem, amoxicillin-clavulanic acid, cotrimoxazole, ceftazidime and doxycycline. The genome sequence from the clinical isolate obtained from this patient clusters with other Bangladeshi strains and it is within the major clade of East and Southeast Asia strains. The patient received parental meropenem for four weeks followed by six months of oral cotrimoxazole and doxycycline. We followed up the patients every three months over the past seven months. After seven months of oral antibiotic therapy, the patient fully recovered without feeling pain in hip joint and no further complications. His blood culture was tested negative

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

* Corresponding author. sukanta@icddr.org (S. Chowdhury).

Authors contributions

A.J.A and S.C. participated in conceptualization and methodology. A.J.A., L.B, J.U.A, J.I, A.R, T.K.D, N.N.C, S.A, C.A.S and S.C worked on analysis, and A.J.A prepared the manuscripts. J.E.G, C.A.G and Z.P.W performed genome sequencing and interpreted results. C.A.S and S.C. contributed to the supervision of methodology, data analysis, and manuscript edition. A.J.A., L.B, J.U.A, J.I, A.R, T.K.D, N.N.C, S.A, C.A.S and S.C participated in manuscript edition.

Ethical approval statement

The melioidosis surveillance protocol was reviewed and approved by the Institutional Review Board of icddr,b (PR-20096). The patient provided informed, written consent to participate in the study.

Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention. This work was supported by CDC Emerging Infectious Disease funds.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

after seven months. The findings of the case report are valuable for raising clinical suspicion and prompting laboratory testing to detect melioidosis. The report also detailed the disease progression and the response to antibiotic therapy.

Keywords

Burkholderia pseudomallei; Septic arthritis; Bangladesh

Introduction

Melioidosis is a deadly infection caused by the gram-negative bacterium *Burkholderia pseudomallei*, found in soil and water and transmitted via skin contact, ingestion, or inhalation [1,2]. Melioidosis is highly prevalent in tropical countries, especially in Southeast Asia and Northern Australia [3,4]. Case fatality rate may reach up to 40 %, even with treatment [4,5]. Conditions like diabetes, chronic lung, liver or kidney disease, cancer, heavy alcohol use, and other immune-suppressive states increase the risk and severity of melioidosis [6]. Agricultural farmers with frequent soil and water exposure are especially vulnerable, with most cases occurring during the monsoon season [7,8]. The major clinical manifestations include pneumonia, localized abscess and acute septicaemia [4,9,10]. Melioidosis cases involving septic arthritis and osteomyelitis are infrequent, with the knee being the most commonly affected joint, followed by the ankle, hip, and shoulder [11–13]. Bangladesh reported over 100 melioidosis cases, most presenting with pneumonia, skin abscesses, urinary tract infections, or acute septicaemia [4,14,15]. In 2023, we detected a melioidosis case with left hip septic arthritis through hospital-based active surveillance. This case report outlines the clinical presentation, laboratory diagnosis, treatment approach, and patient outcome.

Case presentation

A 60-year-old man from Sherpur, Bangladesh, was admitted to BIRDEM hospital on July 20, 2023, with a 34-day history of fever, loss of appetite, and over three weeks of upper chest pain. On hospital admission, the patient had severely restricted movement in the left hip, which was mildly warm but showed no swelling. His vital signs (body temperature, pulse, respiratory rate, and blood pressure) were normal, and he was on oral antihypertensive medications. He had type 2 diabetes for over 20 years and hypertension for 8 years. He also had a history of pulmonary tuberculosis 20 years ago, which was cured after treatment. According to his clinical history, the patient was in good health until five weeks ago when he developed a continuous fever, with night time temperatures reaching 103°F-104°F, along with chills and rigors. He also experienced a burning sensation while urinating, which could be indicative of urinary tract infection (UTI). He consulted a physician, who, after a primary examination, recommended routine tests for the fever. The Complete Blood Count (CBC) showed normal (haemoglobin: 12.4 g/dl, leucocytosis: 12,300/cu mm with 75 % neutrophils) with elevated ESR (105 mm), and CRP (48 mg/l). The WIDAL test was negative, and random blood sugar was 16.2 mmol/L. He was initially treated with cefixime and ceftriaxone for seven days, but his condition did not improve. He was then admitted to Sherpur District Hospital and treated for UTI with intravenous Meropenem for eight days.

He recovered from the urinary tract infection, but his fever persisted. He then developed upper chest pain and visited BIRDEM Hospital, a specialized diabetes care facility in Dhaka. After clinical evaluation, he was diagnosed with pyrexia of unknown origin, acute kidney injury, diabetes, and hypertension. He was initially treated with intravenous Ceftazidime 1 g twice daily for the first four days. Two days after admission, his fever subsided, but he developed severe pain in the left hip joint and inguinal region, along with swelling in the left inguinal area and upper chest pain. The hip pain progressively confined him to bed, with no pain in other joints.

Blood, sputum, and urine samples were collected on admission for routine tests and culture. The blood culture showed *B. pseudomallei* colonies on blood and MacConkey agar, with gram-negative bacilli and bipolar staining. On Ashdown media, the colonies were wrinkled and deep pink to purple. The bacteria were sensitive to meropenem, ceftazidime, amoxicillin-clavulanic acid, cotrimoxazole, and doxycycline, but resistant to gentamicin, amikacin, and colistin. Immunochromatography tests for malaria and kala-azar were negative.

The CBC showed elevated white blood cell count with increased polymorphonuclear leukocytes, along with high ESR, CRP, serum AST, ALT, blood sugar, and HbA1c levels (Table 1). Urine analysis showed 0–2 WBCs/HPF, 0–3 epithelial cells/HPF, 0–2 RBCs/HPF, presence of glucose and albumin, and acetone negative. Urine culture showed no growth. X-rays of the chest and hip, Magnetic Resonance Imaging (MRI) of the left hip, and an inguinal ultrasound were performed. MRI findings indicated septic arthritis in the left hip joint, showing altered signal intensities in the femoral head, neck, and surrounding muscles, with joint space widening and mild fluid accumulation (Fig. 1, Supplementary Figure 1). Multiple mildly enlarged lymph nodes were noted in both inguinal regions, with no bone abnormalities (Supplementary Figure 2). The chest X-ray was normal (Supplementary Figure 3). The chest pain might be a result of lung involvement associated with pneumonia. Ultrasound showed a few enlarged lymph nodes in the left inguinal region, the largest measuring 15 × 7 mm, with no hernia, mass, or fluid collection.

The phylogenetic tree of *B. pseudomallei* (Fig. 2) shows that the genome sequence from the clinical isolate (strain B0557 – red branch) obtained from this patient clusters with other Bangladeshi strains and it is within the major clade of East and Southeast Asia strains (red dotted circle), but unfortunately no other detailed disease information exists for those isolates besides causing melioidosis. While such extensive case information is lacking for strain B0557's near neighbours, including a comprehensive tree will enable a future lookback if more isolates are gathered in the future with or without septic arthritis.

After confirming *B. pseudomallei* infection, the patient received intravenous meropenem (1 g every 12 h) for four weeks, followed by oral cotrimoxazole and doxycycline (100 mg every 12 h) for six months. He was referred to orthopaedics and physical medicine for hip joint pain and rehabilitation exercises. His pain gradually subsided, inflammatory markers normalized, and WBC count returned to normal by day 13 (Supplementary Table 1). Under close follow-up, he fully recovered after seven months, with no joint pain or complications. Follow-up blood cultures were negative.

The patient, a former businessman, had been homebound for the past five years. A day before symptom onset, he was exposed to soil and water while farming. He had also cared for a sick cow over four months, which died a month after his melioidosis diagnosis. He had no travel history in the past year and no history of smoking, alcohol, or drug use.

Discussion

Diagnosis of melioidosis in Bangladesh is challenging due to its diverse clinical presentations, limited diagnostic facilities with adequately trained personnel and insufficient attention from healthcare authorities. This case report provides valuable insight into a relatively uncommon clinical presentation and its successful treatment, which may aid clinicians in managing similar cases. The patient was referred from a rural area located a considerable distance from the study hospital. We systematically recorded the patient's clinical history, healthcare-seeking behaviour, and disease progression. This case reflects the limitations of diagnostic services outside Dhaka and illustrates the potential risks of misdiagnosis, inappropriate treatment, and prolonged suffering. The case presented a range of symptoms throughout the course of the illness, including chest pain, UTI, severe pain in the left hip joint and inguinal region, as well as fever. The distribution of *B. pseudomallei* in the environment spans a wide geographical range, including areas where cases are reported either frequently or sporadically. Clinical manifestations reported from various countries are diverse and often challenging to diagnose. Although relatively uncommon, septic arthritis has been documented in patients with melioidosis [7,13]. The differential diagnosis, including pathogens like *B. pseudomallei*, *Staphylococcus aureus*, and *Haemophilus influenzae*, makes diagnosing melioidosis particularly challenging [3]. A significant number of osteomyelitis and septic arthritis cases have been reported from melioidosis-endemic countries [7]. Large joints, such as the knee, ankle, elbow, hip, and shoulder, are commonly affected by *B. pseudomallei*, similar to other pathogens. Symptoms in lower extremity joints have also been reported [12].

This case of melioidosis was distinctive because it presented with involvement of the hip joint. Following bloodstream entry, *Burkholderia pseudomallei* disseminates to distant sites, including the lungs, liver, spleen, brain, and joints [16,17]. In this patient, long-standing poorly controlled diabetes and frequent exposure to mud could facilitate widespread dissemination. A large number of patients from Northern Australia and Thailand showed similar clinical presentations [3]. In Australia, pneumonia was the most common presenting feature in 50 % of cases, while septic arthritis was observed in only 4 % of cases [3]. South China reported 19 patients with septic arthritis due to *B. pseudomallei* [18]. Diagnosing melioidosis remains challenging in Bangladesh, especially with rare clinical presentations and limited resources for culturing *B. pseudomallei*.

Conclusion

This case report describes a distinct form of melioidosis with septic arthritis in the hip joint from a rural area, treated at a specialized hospital, emphasizing the importance of clinical suspicion, proper diagnosis, and timely appropriate treatment. It highlights the need

for nationwide physician training on recognizing and managing both typical and atypical presentations of melioidosis.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgement

We gratefully acknowledge icddr,b core donors (Government of Bangladesh and Canada) for their unrestricted support. We are thankful to the laboratory staffs of microbiology department, BIRDEM hospital. Specially we are grateful to María E Negron, Bacterial Special Pathogens Branch, Centers for Disease Control and Prevention, Atlanta, United States of America.

Funding

The melioidosis surveillance was funded by the Centers for Disease Control and Prevention, USA (cooperative agreement no. U01GH002403).

Data availability

The data that support the findings of this case report are available on request from the corresponding authors.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:[10.1016/j.jiph.2025.102937](https://doi.org/10.1016/j.jiph.2025.102937).

Abbreviations:

ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
BIRDEM	Bangladesh institute of research and rehabilitation in diabetes, endocrine and metabolic disorders
CBC	Complete blood count
CRP	C-reactive Protein
ESR	Erythrocyte sedimentation rate
HPF	High-power field
HbA1c	Hemoglobin A1c
MRI	Magnetic resonance imaging
RBC	Red blood cell
UTI	Urinary tract infection

WBC

White blood cells

References

- [1]. Cheng AC, Currie BJ. Melioidosis: epidemiology, pathophysiology, and management. *Clin Microbiol Rev* 2007;20:533.
- [2]. Amadasi S, Dal Zoppo S, Bonomini A, Bussi A, Pedroni P, Balestrieri G, et al. A case of melioidosis probably acquired by inhalation of dusts during a helicopter flight in a healthy traveler returning from Singapore. *J Travel Med* 2015;22:57–60. [PubMed: 25183194]
- [3]. Cheng AC, Currie BJ. Melioidosis: epidemiology, pathophysiology, and management. *Clin Microbiol Rev* 2005;18:383–416. [PubMed: 15831829]
- [4]. Chowdhury S, Barai L, Afroze SR, Ghosh PK, Afroz F, Rahman H, et al. The epidemiology of melioidosis and its association with diabetes mellitus: a systematic review and meta-analysis. *Pathogens* 2022;11:149. [PubMed: 35215093]
- [5]. Melioidosis White N. *Lancet* 2003;361:1715–22. [PubMed: 12767750]
- [6]. Wiersinga WJ, Virk HS, Torres AG, Currie BJ, Peacock SJ, Dance DA, et al. Melioidosis. *Nat Rev Dis Prim* 2018;4:1–22.
- [7]. Limmathurotsakul D, Peacock SJ. Melioidosis: a clinical overview. *Br Med Bull* 2011;99:125–39. [PubMed: 21558159]
- [8]. Zheng X, Xia Q, Xia L, Li W. Endemic melioidosis in Southern China: past and present. *Trop Med Infect Dis* 2019;4:39. [PubMed: 30823573]
- [9]. Chaowagul W, White NJ, Dance DA, Wattanagoon Y, Naigowit P, Davis TM, et al. Melioidosis: a major cause of community-acquired septicemia in northeastern Thailand. *J Infect Dis* 1989;159:890–9. [PubMed: 2708842]
- [10]. Currie BJ, Mayo M, Ward LM, Kaestli M, Meumann EM, Webb JR, et al. The Darwin prospective melioidosis study: a 30-year prospective, observational investigation. *Lancet Infect Dis* 2021;21:1737–46. [PubMed: 34303419]
- [11]. Arunpriyandan V, Pakkiyaretnam M, Umakanth M. Systemic melioidosis presenting as septic arthritis. *Cureus* 2022;14.
- [12]. Teparrukkul P, Nilsakul J, Dunachie S, Limmathurotsakul D. Clinical epidemiology of septic arthritis caused by *Burkholderia pseudomallei* and other bacterial pathogens in northeast Thailand. *Am J Trop Med Hyg* 2017;97:1695. [PubMed: 29016319]
- [13]. Chantratita N, Phunpang R, Yarasai A, Dulsuk A, Yimthin T, Onofrey LA, et al. Characteristics and one year outcomes of melioidosis patients in northeastern Thailand: a prospective, multicenter cohort study. *Lancet Reg HealthSoutheast Asia* 2023;9.
- [14]. Chowdhury FR, Jilani MSA, Barai L, Rahman T, Saha MR, Amin MR, et al. Melioidosis in Bangladesh: a clinical and epidemiological analysis of culture-confirmed cases. *Trop Med Infect Dis* 2018;3:40. [PubMed: 30274436]
- [15]. Barai L, Jilani MSA, Haq JA. Melioidosis case reports and review of cases recorded among Bangladeshi population from 1988–2014. *Ibrahim Med Coll J* 2014;8:25–31.
- [16]. Raja NS, Scarsbrook C. *Burkholderia pseudomallei* causing bone and joint infections: a clinical update. *Infect Dis Ther* 2016;5:17–29. [PubMed: 26728713]
- [17]. Jayarajah U, Arulanantham A, Koculen V, Palkumbura C, Faleel A, Sooriyachchi R. *Burkholderia pseudomallei* peri-prosthetic infection following medial malleolar internal fixation: a case report. *BMC Infect Dis* 2020;20:1–5.
- [18]. Wu H, Wang X, Zhou X, Chen S, Mai W, Huang H, et al. Osteomyelitis and septic arthritis due to *Burkholderia pseudomallei*: a 10-year retrospective melioidosis study from south China. *Front Cell Infect Microbiol* 2021;11:654745.

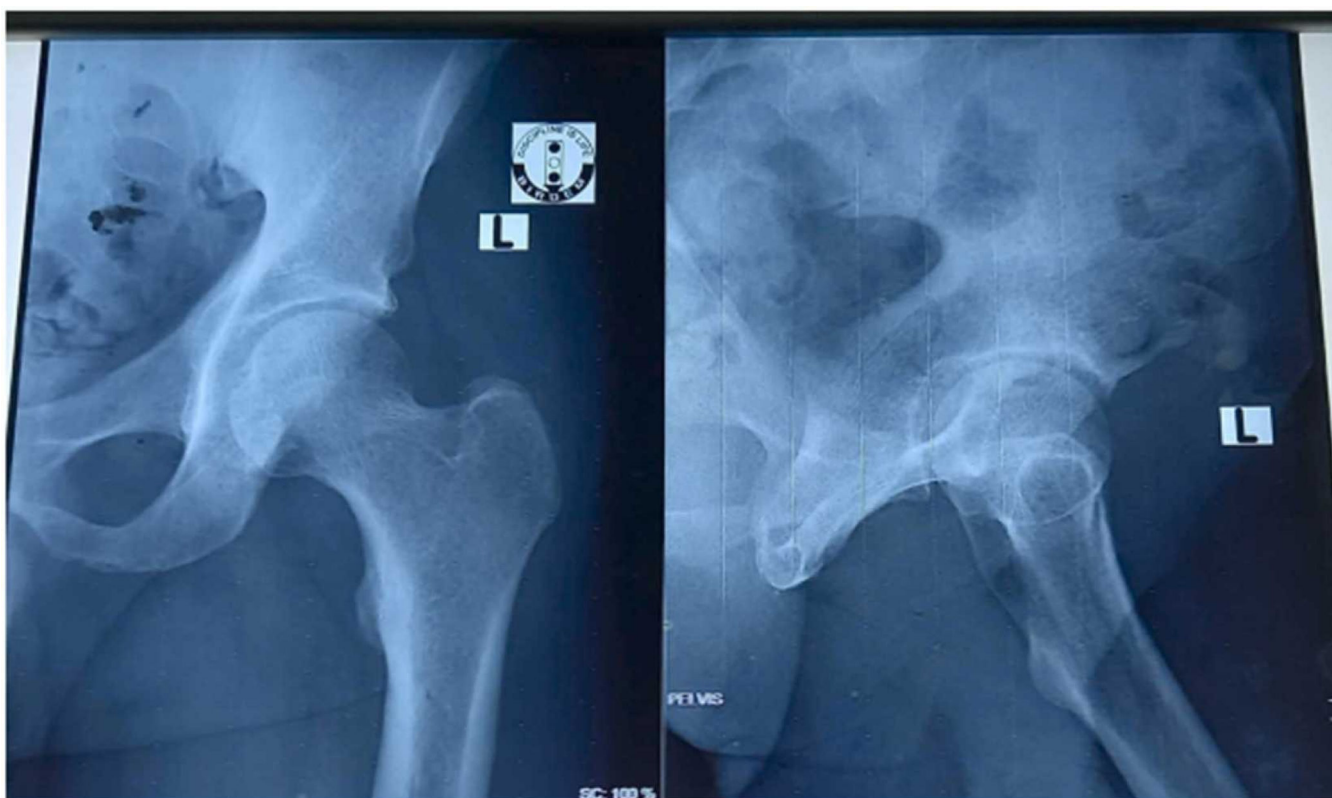


Fig. 1.
X ray of left hip joint (Lateral view).

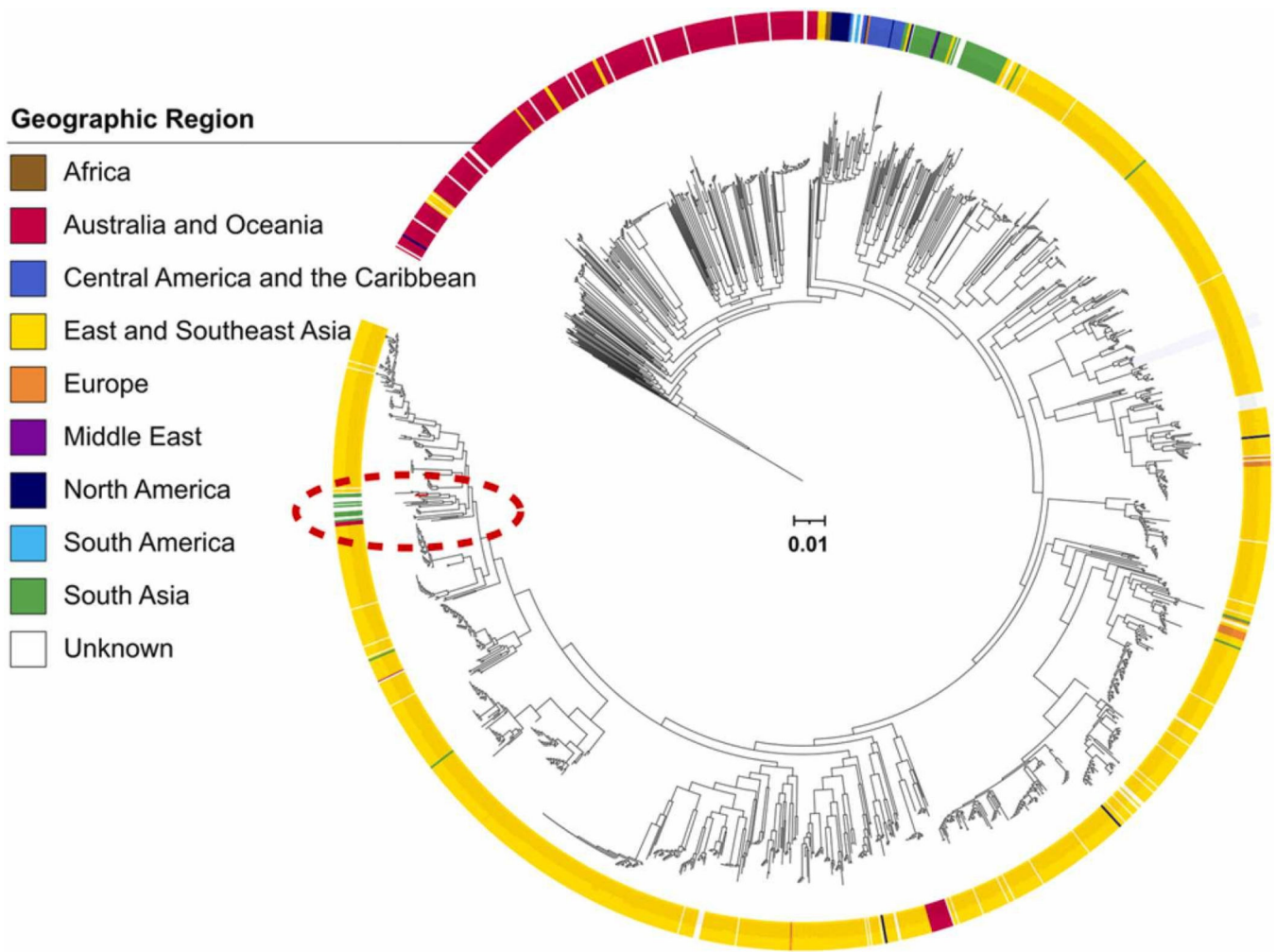


Fig. 2.

Maximum likelihood phylogenetic tree of *B. pseudomallei*. RefSeq assemblies (n = 1755) were compared against strain B0557 (red branch), which shows it clusters (red dotted circle) with other Bangladesh examples within a larger East and Southeast Asia clade. The sample's reads and assembly are under NCBI's accession SAMN49682048. Core alignment size was 1272,732 bp, core SNP sites were 51,607 bp, and the scalebar represents 511 core SNPs. The tree is rooted to strain MSHR668.

Table 1

Biochemistry profile of the patient presenting as septic arthritis in hip joint.

Parameters	Result	Unit	Ref. Range
Serum Sodium	134	mmol/L	136–148
Serum Potassium	4.4	mmol/L	3.5–5.2
Serum Chloride	102	mmol/L	98–108
Serum TCO ₂	21	mmol/L	25–29 (for Male)
Serum Creatinine	2.8	mg/dl	0.67–1.3
Serum Urea	64	mg/dl	10–45
CRP	223.8	mg/L	< 6 mg/L
Serum Total Protein	76.9	gm/L	63–82
Serum Albumin	32.2	gm/L	34–50
Serum Calcium	8.1	mg/dl	8.4–10.4
Serum Phosphate	4	mg/dl	2.5–4.9
Serum Magnesium	0.9	mmol/L	0.9
Serum Ferritin	782	ng/dl	30–400
Liver Function			
Bilirubin (Total)	0.5	mg/dl	0.4–1.2
Serum AST (SGOT)	42	U/L	Up to 37
Serum ALT (SGPT)	44	U/L	Up to 40
Alkaline Phosphatase	113	U/L	39–117 (Adult)
Fasting blood sugar	14	mmol/L	3.9–5.6 mmol/L
Random blood sugar	15.9	mmol/L	< 6.9 mmol/L
HbA1c	12.6	%	4–6 %