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Urinary Isolation of *Presumptive Burkholderia* pseudomallei in an Older Adult: The Contribution of a Primary Health Care Center to Early Recognition and Referral

Christina Seitopoulou[1,2], Georgia Kalliora[3], Evangelia Evangelou[4], Antonia Mourtzikou[2]* and Maria Kimouli[2]

[1]*Biopathology Laboratory, Primary Health Center of Nikea Piraeus, Greece*

[2]*Microbiology Laboratory, GHNP "Agios Panteleimon", Greece*

[3]*Department of Biology, NKUA, Greece*

[4]*Independent Researcher, Medical School UNIC ATHENS, Greece*

***Corresponding author:** Antonia Mourtzikou, Microbiology Laboratory, GHNP "Agios Panteleimon", Greece

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ABSTRACT

Background: Melioidosis is a potentially life-threatening infectious disease caused by *Burkholderia pseudomallei*, an environmental Gram-negative bacterium endemic in tropical and subtropical regions. Although pulmonary infection is the most common clinical presentation, genitourinary involvement is less frequently reported. Recognition may be challenging in non-endemic countries because of the nonspecific clinical presentation and the potential for laboratory misidentification.

Case Presentation: We describe an 84-year-old man with type 2 diabetes mellitus, chronic kidney disease, nephrolithiasis, and a history of colorectal cancer treated surgically five years earlier, followed by radiotherapy and chemotherapy. According to information provided by his caregiver and documentation in his electronic health record, he was still receiving oral anticancer treatment. He presented to the Nikaia Health Center, a Primary Health Care facility in Greece, with low-grade fever, dysuria, fatigue, myalgia, headache, and transient abdominal pain. Urinalysis revealed marked pyuria, hematuria, and bacteriuria. Urine culture yielded pure growth of presumptively identified *B. pseudomallei*, exceeding 10^5 CFU/mL. Identification was performed using the Rapid Remel NF Plus system, and antimicrobial susceptibility was assessed by the Kirby–Bauer disk diffusion method. Given the potential severity of the infection and the patient's comorbidities, he was referred to a tertiary-care hospital, where treatment with intravenous ceftazidime and co-trimoxazole was reportedly administered. Clinical recovery was subsequently reported by his relatives. An additional epidemiological observation concerned the caregiver, who had recently travelled to Sri Lanka, participated in agricultural activities, and reportedly experienced nonspecific symptoms after returning to Greece. Possible person-to-person transmission was considered; however, this could not be established microbiologically or epidemiologically.

Conclusion: This case highlights the importance of clinical awareness and microbiological vigilance in Primary Health Care. The recognition of an unusual and potentially high-risk pathogen at the Nikaia Health Center prompted referral to tertiary care and illustrates the contribution of primary-level facilities to the early detection and management pathway of rare infectious diseases.

Keywords: *Burkholderia pseudomallei*; Melioidosis; Urinary Tract Infection; Genitourinary Melioidosis; Primary Health Care; Diabetes Mellitus; Chronic Kidney Disease; Laboratory Diagnosis; Greece

Introduction

Melioidosis is an infectious disease caused by *Burkholderia pseudomallei*, a Gram-negative, motile, non-spore-forming, facultative intracellular bacterium that is naturally present in soil and surface water in tropical and subtropical environments Chieng SCR [1]. The disease has long been recognized as an important public health problem in Southeast Asia and northern Australia, although its geographical distribution is broader than previously appreciated. Increasing recognition of cases in South Asia, parts of the Americas, and other previously under-recognized regions has highlighted the need for improved clinical awareness, laboratory capacity, and epidemiological surveillance worldwide Wiersinga, et al. [2-4]. The bacterium was first described in the early twentieth century and is also known as the causative agent of Whitmore's disease. Its ability to persist in the environment, survive under adverse conditions, and establish infection in a wide range of mammalian hosts contributes to its epidemiological importance. *B. pseudomallei* is a saprophytic environmental organism rather than a component of the normal human microbiota. Consequently, its isolation from a clinical specimen, when correctly identified, is considered clinically significant and should prompt immediate clinical and public health attention Cheng, et al. [3,5,6].

Microbiological Characteristics and Pathogenicity

B. pseudomallei is a Gram-negative bacillus, non-spore-forming, that may demonstrate characteristic bipolar staining, sometimes described as a "safety-pin" appearance. It is motile and oxidase-positive, catalase-positive, indole test-negative, nitrate reduction-positive, arginine dihydrolase-positive (differentiates it from *Burkholderia cepacia*), and its colonies may show variable morphology depending on the culture medium and incubation time. Colonies can initially appear smooth and creamy, subsequently developing dry, rough, or wrinkled characteristics. Selective media, including Ashdown's agar, may facilitate its recovery and recognition, particularly in laboratories experienced in the diagnosis of Melioidosis Cheng [5,6]. The pathogenicity of *B. pseudomallei* is closely associated with its capacity to survive and replicate intracellularly. The bacterium can invade and persist within different host cell types, including macrophages and other phagocytic cells. Its virulence mechanisms include a polysaccharide capsule, lipopolysaccharide, multiple secretion systems, and proteins involved in intracellular survival and intercellular spread. The type III secretion system contributes to escape from the phagosome into the host-cell cytoplasm, while the BimA protein facilitates actin-based motility and movement between adjacent cells.

The type VI secretion system is also involved in intracellular interactions and cell-to-cell fusion. These mechanisms allow the organism to evade some components of host immune surveillance and contribute to the development of localized, disseminated, or persistent infection Wiersinga, et al. [2,3,6]. The clinical course is therefore highly variable. Infection may remain localized, become disseminated, or present as acute severe sepsis. Chronic infection and delayed presentation after previous exposure have also been described. Although latent infection and reactivation are recognized phenomena, the precise mechanisms and frequency of such events remain incompletely understood Currie, et al. [3,7].

Epidemiology and Routes of Transmission

Melioidosis is predominantly an environmentally acquired infection. Human exposure usually occurs through direct contact with contaminated soil or water, particularly during agricultural activities, gardening, construction, or other activities involving wet soil and surface water. The main recognized routes of acquisition are percutaneous inoculation through skin abrasions or wounds, inhalation of contaminated dust or water droplets, and ingestion of contaminated water or food. Heavy rainfall, flooding, and severe weather events may increase environmental exposure and have been associated with increased numbers of cases in endemic regions Birnie, et al. [3,8]. The geographical distribution of *B. pseudomallei* includes several countries in Southeast Asia, northern Australia, and South Asia. Sri Lanka is of particular relevance to the present case. Although it was not historically considered a major endemic focus, national surveillance and laboratory investigations have demonstrated the presence of culture-confirmed Melioidosis across the country. A nationwide surveillance report documented cases in multiple provinces, with a substantial proportion occurring in rural populations and among individuals with diabetes mellitus. Agricultural occupations were also represented among reported cases Corea, et al. [9,10]. Person-to-person transmission is considered exceptionally rare Foong [11]. The overwhelming majority of infections are acquired from environmental sources Ibrahem [12].

Nevertheless, isolated reports have documented possible or confirmed human-to-human transmission under particular circumstances. A genomic investigation demonstrated a rare transmission event, emphasizing that although such transmission is biologically possible, it should not be assumed without appropriate epidemiological and molecular evidence McCormick [13,14]. This distinction is particularly important when evaluating individuals with recent travel to endemic regions and close contact with a person subsequently diagnosed with Melioidosis Norman [15]. A temporal association between symptoms in a contact and infection in a patient may raise an epidemiological hypothesis, but it does not establish the source or route of acquisition Thanasai [16]. Confirmation would require appropriate clinical investigation of the suspected contact and, ideally, molecular comparison of isolates [17,18].

Risk Factors and Clinical Manifestations

Although Melioidosis may occur in individuals without recognized underlying disease, several clinical conditions are strongly associated with an increased risk of infection and severe outcomes Wiersinga [2]. Diabetes mellitus is one of the most important risk

factors. Chronic kidney disease, chronic pulmonary disease, chronic liver disease, hazardous alcohol consumption, malignancy, and immunosuppressive conditions or treatments are also recognized risk factors. The coexistence of several such conditions may further increase clinical vulnerability Wiersinga, et al. [2,3,7]. The clinical presentation of Melioidosis is diverse and may range from localized skin or soft-tissue infection to severe pneumonia, bacteremia, septic shock, and disseminated disease. Pneumonia is the most frequently reported clinical manifestation. Other recognized presentations include genitourinary infection, osteomyelitis, septic arthritis, neurological infection, lymphadenitis, and abscess formation in internal organs, particularly the liver, spleen, and prostate Cheng [5,7]. Genitourinary Melioidosis is relatively uncommon compared with pulmonary disease. It may involve the kidneys, prostate, urinary bladder, or other structures of the genitourinary tract.

In men, prostatic abscesses are a particularly recognized manifestation. In a descriptive study of 20 adults with culture-confirmed genitourinary Melioidosis, diabetes mellitus was a common underlying risk factor, and prostatic involvement was the most frequent genitourinary manifestation. Renal involvement, including pyelonephritis and renal abscesses, has also been described Koshy [19]. Urinary tract infection may occasionally be the presenting manifestation, including in individuals without previously recognized risk factors Carlson [20]. The nonspecific nature of the symptoms may delay diagnosis, particularly in regions where Melioidosis is not routinely encountered Kuehn [21]. Fever, dysuria, abdominal discomfort, fatigue, and inflammatory laboratory abnormalities may initially suggest more common urinary tract infections Hoffman [22]. In patients with diabetes, renal impairment, malignancy, or immunosuppressive treatment, however, unusual pathogens should be considered when microbiological findings are atypical or when the clinical course is potentially severe Qian, et al. [22-24].

Laboratory Diagnosis and Biosafety Considerations

The diagnosis of Melioidosis relies primarily on the isolation and correct identification of *B. pseudomallei* from clinical specimens Gassiep, et al. [18,25,26]. Appropriate specimens may include blood, urine, respiratory samples, wound material, and aspirates from abscesses or other infected sites. Culture remains a central diagnostic method, while molecular techniques, including polymerase chain reaction and whole-genome sequencing, may be used for confirmation and epidemiological investigation Trinh, et al. [3,27]. Laboratory recognition is challenging, particularly in non-endemic settings. The organism may be misidentified by routine biochemical or automated identification systems as another non-fermenting Gram-negative bacillus or as a different *Burkholderia species*. Misidentification may result in delayed diagnosis, inappropriate treatment, and potentially hazardous laboratory handling. For this reason, an unusual isolate with characteristics suggestive of *B. pseudomallei* should be handled with appropriate precautions and referred to a specialized or reference laboratory for confirmation whenever possible Dance, et al. [28,29]. The laboratory safety implications are particularly important. *B. pseudomallei* can cause laboratory-acquired infection, and certain procedures involving cultures may generate aerosols. Suspected isolates should therefore be handled by appropriately trained personnel, with strict adherence to biosafety procedures.

The identification of a suspected isolate should prompt communication with the relevant public health and reference laboratory services CDC [17,18]. Antimicrobial susceptibility testing is also important for treatment planning. The disk diffusion method has been evaluated for *B. pseudomallei* using the EUCAST methodology, although interpretation must be based on appropriate organism-specific guidance and validated procedures. The publication by Dance and colleagues provides specific guidance on interpreting disk diffusion susceptibility results for this organism Dance [30]. Results obtained in laboratories without access to reference confirmation should be interpreted cautiously, particularly when the identification itself has not been independently verified [29,31-34].

Principles of Treatment

Treatment of Melioidosis generally consists of two sequential phases: an initial intensive phase and a subsequent eradication phase. The intensive phase involves intravenous antimicrobial therapy, most commonly ceftazidime or meropenem, with the choice and duration depending on disease severity, anatomical involvement, complications, and clinical response. The intensive phase may extend from approximately two weeks to substantially longer periods in patients with deep-seated infection or complicated disease Pitman, et al. [35-37]. An oral eradication phase follows the intravenous treatment in order to reduce the risk of relapse. Trimethoprim-sulfamethoxazole (TMP-SMX) is generally the preferred oral agent, and treatment is usually continued for several months. The precise regimen and duration should be determined by the treating infectious diseases team according to the site and severity of infection, renal function, tolerability, and current treatment recommendations Dance, et al. [17,38,39]. The need for prolonged treatment, together with the possibility of relapse and the potential toxicity of antimicrobial agents, makes specialist supervision essential. Renal impairment is particularly relevant because it may require dose adjustment and careful monitoring of renal function, electrolytes, blood counts, and adverse effects Pitman, et al. [29,35-41].

Primary Health Care and the Recognition of Rare Infections

Primary Health Care facilities are often the first point of contact for patients with common and nonspecific symptoms. Their contribution is not limited to the management of frequent conditions; they also play an important role in identifying atypical presentations, initiating appropriate diagnostic investigations, recognizing unusual laboratory results, and referring patients to higher-level facilities when specialized assessment is required Mourtzikou [42]. In non-

endemic countries, rare imported infections may initially present in primary care settings without an obvious clinical diagnosis. The ability of primary care professionals and clinical laboratories to recognize unusual microbiological findings is therefore important for patient safety and timely referral. In this context, the present case illustrates the contribution of a Primary Health Care facility to the initial microbiological recognition of a presumptive *B. pseudomallei* isolate and the subsequent referral of a clinically vulnerable patient to tertiary care Demas, et al. [18,21,31,43,44].

Case Presentation

An 84-year-old man presented to the Nikaia Health Center, a Primary Health Care facility in Greece, for urinalysis and urine culture. His medical history included arterial hypertension, type 2 diabetes mellitus, chronic kidney disease, hypercholesterolemia, hepatic steatosis, left-sided nephrolithiasis, and dementia under treatment. He was a former smoker. The patient also had a history of colorectal adenocarcinoma. According to the updated information available to the authors, he had undergone major surgery for malignancy approximately five years earlier, followed by radiotherapy and chemotherapy. Information provided by his caregiver, together with entries in the patient's electronic health record, indicated that he was still receiving oral anticancer treatment at the time of the present episode. The combination of advanced age, diabetes, chronic renal impairment, malignancy, and ongoing anticancer treatment represented a clinically important background that could increase his susceptibility to severe infection. At presentation, the patient reported low-grade fever for approximately one week, dysuria, marked fatigue, myalgia, headache, and transient abdominal pain. Urinalysis was performed using a 10-parameter Multistix method. Microscopic examination and urinalysis findings demonstrated abundant leukocytes, numerous erythrocytes, and abundant microorganisms. Proteinuria (++) was also recorded.

Laboratory Investigations

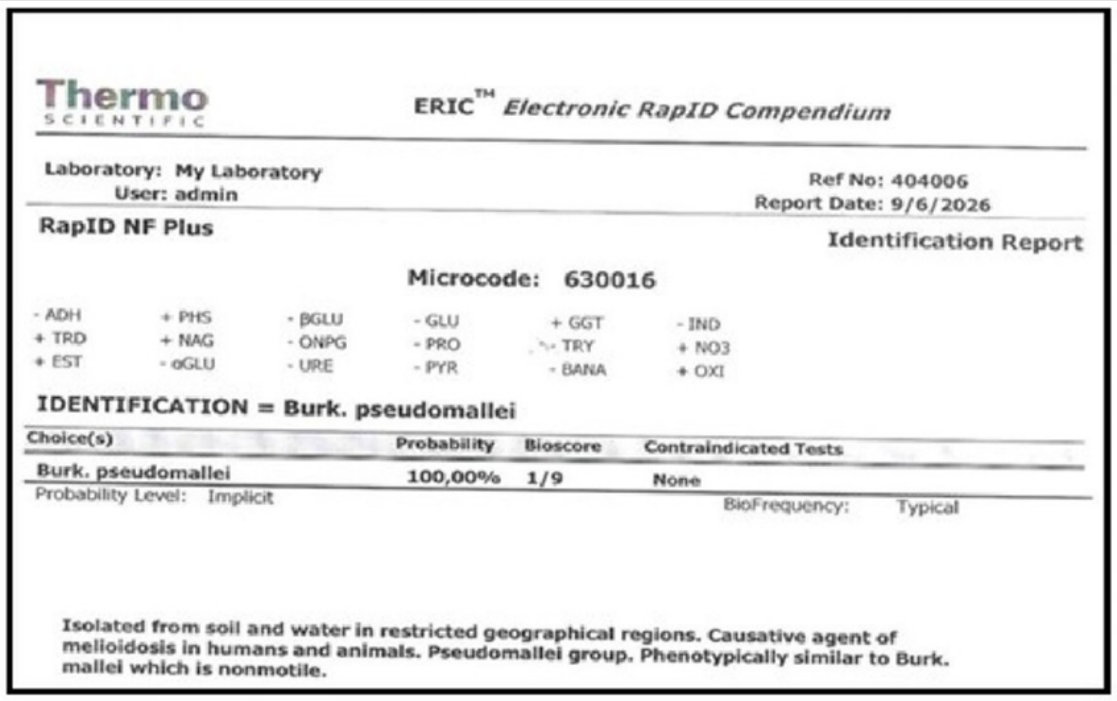
The laboratory investigations were performed using the following analytical systems: CelltacG G (Nihon Kohden) for hematological analysis, KONELAB 60 for biochemical testing, and ACL-ELITE for coagulation testing (Table 1). The hematological examination additionally demonstrated anisocytosis, poikilocytosis, and microcytosis. The findings indicated a marked inflammatory response, leukocytosis, anemia, thrombocytopenia, and suboptimal glycemic control.

Table 1: Patient's main laboratory findings in whole blood and serum.

Laboratory Parameter	Patient's Result	Reference Ranges
Hematological Parameters		
White blood cell count	22,000 c/μL	5,000-10,000 cells/μL
Hemoglobin (HGB)	9.7 g/dL	12-16 g/dL
Hematocrit (HCT)	28.2%	36-48%
Platelet count (PLT)	86 x 10^3μL	140 x 10^3 /μ L- 440 x 10^3/μL
Inflammatory Markers		
Erythrocyte sedimentation rate (ESR)	90 mm/hr	Men 50 years and older: 0-20 mm/hr
C- reactive protein (CRP)	237 mg/L	< 10 mg/L
Ferritin	1,471 ng/mL	30 to 300 ng/mL for adult males
Coagulation Testing		
Prothrombin Time/INR	1.83	0.8 to 1.1
Blood Chemistry		
Glycated Hemoglobin (HbA1c)	9.2%	<5.7 % For most adults with diagnosed diabetes the goal is often < 7.0%
Blood glucose	217 mg/dL	65-110 mg/dL
Potassium	5.6 mEq/L	3.6 – 5.1 mEq/L
Sodium	132 mEq/L	136 – 150 mEq/L
Toatl bilirubin	1.40 mg/dL	0.1 to 1.2 mg/dL
AST (SGOT)	72 IU/L	4-40 IU/L
ALT (SGPT)	77 IU/L	4-41 IU/L
Gamma-glutamyl transferase (γ- GT)	118 IU/L	5-36 IU/L
Alkaline Phosphatase (ALP)	179 IU/L	40 to 129 IU/L
Lactate dehydrogenase (LDH)	324 IU/L	105-280 IU/L
Creatine phosphokinase (CPK)	61 IU/L	20 to 200 IU/L

Microbiological Findings and Organism Identification

Urine culture was performed using Columbia blood agar, MacConkey agar, and Sabouraud dextrose agar. The culture yielded pure growth of a Gram-negative bacillus, subsequently identified presumptively as *Burkholderia pseudomallei*, at a concentration exceeding 10^5 CFU/mL. The isolate was initially identified using the RAPID REMEL® NF Plus identification system, according to the manufacturer's instructions, approximately 24 hours after culture (Figure 1). The identification was considered presumptive, as no subsequent molecular confirmation, sequencing, or verification by a specialized reference laboratory was performed. Therefore, the organism is referred to as presumptive *Burkholderia pseudomallei* throughout this report.


Thermo SCIENTIFIC

ERIC™ *Electronic RapID Compendium*

Laboratory: My Laboratory
User: admin

Ref No: 404006
Report Date: 9/6/2026

RapID NF Plus — **Identification Report**

Microcode: 630016

- ADH	+ PHS	- βGLU	- GLU	+ GGT	- IND
+ TRD	+ NAG	- ONPG	- PRO	- TRY	+ NO3
+ EST	- αGLU	- URE	- PYR	- BANA	+ OXI

IDENTIFICATION = Burk. pseudomallei

Choice(s)	Probability	Bioscore	Contraindicated Tests
Burk. pseudomallei	100,00%	1/9	None

Probability Level: Implicit — BioFrequency: Typical

Isolated from soil and water in restricted geographical regions. Causative agent of melioidosis in humans and animals. Pseudomallei group. Phenotypically similar to Burk. mallei which is nonmotile.

Figure 1: Identification of presumptive *Burkholderia pseudomallei* from the patient's urine culture using the RAPID REMEL® system.

Antimicrobial Susceptibility Testing

Antimicrobial susceptibility testing was performed using the Kirby–Bauer disk diffusion method Dance [30]. The results were interpreted by the laboratory according to the EUCAST criteria applied at the time of testing. The original inhibition-zone diameters were not available for independent reassessment; therefore, the susceptibility profile is reported as documented in the original laboratory records.

The reported susceptibility profile was:

a) **Reported susceptible:** Ceftazidime, imipenem, meropenem, and trimethoprim-sulfamethoxazole.

b) **Reported intermediate susceptibility:** Doxycycline and chloramphenicol.

c) **Reported resistant:** Amoxicillin-clavulanic acid, gentamicin, amikacin, tobramycin, colistin, polymyxin B, and quinolones.

The susceptibility findings were communicated as part of the laboratory report. The absence of recorded inhibition-zone diameters and independent reference-laboratory confirmation should be considered when interpreting these results.

Referral and Subsequent Clinical Management

In view of the presumptive identification of *B. pseudomallei*, the patient's advanced age, underlying comorbidities, marked inflammatory response, and potentially severe clinical condition, the patient was referred to a tertiary-care hospital for further assessment and management. According to information provided by the patient's relatives, following referral, the patient received intravenous antimicrobial therapy with ceftazidime and co-trimoxazole (trimethoprim–sulfamethoxazole). The patient was subsequently reported to have recovered clinically. However, the authors did not have access to the complete hospital medical records. Consequently, the exact antimicrobial dosages, duration of intravenous treatment,

administration of any subsequent oral eradication therapy, and microbiological follow-up could not be independently verified.

Additional Epidemiological Information Concerning the Caregiver

An additional epidemiological observation emerged from information provided by the patient's caregiver and relatives. The caregiver, a woman originally from Sri Lanka, had travelled to her home country during her summer leave and had participated in agricultural activities with members of her family. According to the information subsequently provided, after returning to Greece she experienced mild symptoms like fatigue, headache, mild lower abdominal and inguinal pain, slight dysuria, myalgia, and low-grade fever. These symptoms reportedly occurred approximately one week before the onset of the patient's symptoms. She stated that she had not received medical assessment or antimicrobial treatment for these complaints The caregiver continued to provide close personal care to the patient, including assistance with toileting and changing his incontinence pads. This history raised the possibility of a potential epidemiological association between the caregiver's environmental exposure and the patient's infection. Nevertheless, no microbiological investigation of the caregiver was performed, and no isolate was available for molecular comparison. Accordingly, neither infection in the caregiver nor transmission to the patient could be established.

Discussion

The present case describes the urinary isolation of presumptive *B. pseudomallei* in an 84-year-old man with several important predisposing conditions, including type 2 diabetes mellitus, chronic kidney disease, nephrolithiasis, a history of colorectal malignancy, and ongoing oral anticancer treatment. Its particular significance lies not only in the unusual genitourinary presentation but also in the role of the Nikaia Health Center, a Primary Health Care facility, in the initial recognition of the microbiological finding and the subsequent referral of the patient to tertiary care.

Clinical Significance and Predisposing Conditions

The patient had several conditions associated with an increased risk of Melioidosis and potentially severe disease. Diabetes mellitus is consistently identified as one of the most important risk factors, while chronic kidney disease and malignancy or immunosuppressive treatment are also recognized predisposing conditions Wiersinga, et al. [2,3,7]. In this patient, diabetes was poorly controlled, as indicated by an HbA1c of 9.2%. Chronic renal impairment and nephrolithiasis further complicated the clinical background. In addition, the patient had undergone major surgery for colorectal cancer and had received radiotherapy and chemotherapy. According to the information available from his caregiver and electronic health record, oral anticancer treatment was still ongoing. This combination of comorbidities and treatment history may have contributed to impaired host defense and increased vulnerability to infection. The laboratory findings were also concerning. The marked leukocytosis, elevated CRP and ferritin, anemia, and thrombocytopenia indicated a substantial systemic inflammatory response. However, the available information does not include blood culture results, imaging findings, or a complete hospital assessment.

Therefore, the presence of bacteremia, disseminated infection, renal abscesses, or other focal complications cannot be established from the data available to the authors. The case should consequently be described as a urinary isolation of presumptive *B. pseudomallei*, rather than as confirmed bacteremic or disseminated Melioidosis.

Genitourinary Involvement

Although pulmonary infection is the most common presentation of Melioidosis, genitourinary involvement is a recognized, less frequent manifestation. The kidneys and prostate are among the structures that may be affected. In the descriptive study by Koshy and colleagues, genitourinary Melioidosis was associated with diabetes mellitus and frequently involved the prostate, although renal and other genitourinary manifestations were also reported Koshy [19]. The isolation of presumptive *B. pseudomallei* from a urine culture with pure growth exceeding 10^5 CFU/mL, in association with dysuria, pyuria, hematuria, and systemic inflammatory findings, is clinically important. The patient's diabetes, chronic kidney disease, and nephrolithiasis provide a relevant clinical context for urinary tract infection. Nevertheless, because no imaging findings or further microbiological investigations were available, the precise anatomical extent of infection cannot be determined. This case also emphasizes that unusual urinary pathogens should not be dismissed, particularly in older patients with multiple comorbidities. The recognition of a potentially significant organism in urine may be the first indication of an uncommon infection requiring specialist evaluation.

Epidemiological Considerations and the Caregiver's Travel History

The caregiver's travel history to Sri Lanka is an important epidemiological observation. Sri Lanka has documented endemic transmission of Melioidosis, with cases reported across multiple provinces and a substantial proportion of patients originating from rural areas. Agricultural activities and exposure to soil and water are relevant environmental risk contexts Corea [9,10]. The caregiver reportedly participated in agricultural activities during her stay in Sri Lanka. Following her return to Greece, she experienced a group of nonspecific symptoms, including fatigue, headache, myalgia, low-grade fever, mild lower abdominal and inguinal pain, and slight dysuria. These symptoms reportedly preceded the patient's illness. Her subsequent close personal contact with the patient, including assistance with toileting and changing incontinence pads, raises a question about a possible epidemiological connection. However, the available evidence does not permit a causal conclusion. The caregiver was not microbiologically investigated, and no clinical isolate from her was available for comparison with the patient's isolate. Therefore,

neither Melioidosis in the caregiver nor any possible person-to-person transmission can be confirmed. Furthermore, the patient's own environmental exposure history is not sufficiently documented to exclude an independent environmental source. Although rare human-to-human transmission has been reported, environmental acquisition remains the predominant route of infection.

The genomic investigation by Aziz and colleagues demonstrated that human-to-human transmission can occur in exceptional circumstances, but such events require careful epidemiological and molecular investigation McCormick, et al. [13,14]. Consequently, the caregiver's history should be interpreted as a hypothesis-generating epidemiological observation. Possible transmission through close personal care, including contact during toileting or changing incontinence pads, may be discussed as a theoretical possibility, but it cannot be presented as the established mechanism of infection. Confirmation would have required microbiological testing of the caregiver and molecular comparison of the relevant isolates.

Laboratory Recognition and Diagnostic Limitations

A central aspect of this case is the initial recognition of the presumptive pathogen at the Nikaia Health Center. The urine culture yielded pure growth of a Gram-negative bacillus, which was identified using the Rapid Remel NF Plus system. The organism was recognized approximately 24 hours after culture. The correct identification of *B. pseudomallei* is challenging, particularly in laboratories located in non-endemic regions. The organism may be misidentified by routine or automated systems, and the consequences of misidentification include inappropriate clinical management and potential laboratory exposure. The CDC emphasizes that suspected isolates should be handled by trained personnel and referred to an appropriate reference laboratory for confirmation CDC [29]. In the present case, no specialized laboratory confirmation or molecular identification was performed. This limitation must be clearly acknowledged. The finding is therefore reported as a presumptive identification based on the available culture and commercial identification system. The case illustrates the importance of recognizing a potentially unusual pathogen, while also emphasizing that definitive identification requires appropriate confirmatory procedures. The susceptibility testing was performed using the Kirby–Bauer disk diffusion method. The EUCAST methodology has been specifically discussed in the literature for *B. pseudomallei*, including recommendations for interpretation of disk diffusion results Dance [30] EUCAST 2026.

Nevertheless, because the isolate was not independently confirmed and inhibition-zone diameters were not available for review, the susceptibility profile should be presented as the result reported by the laboratory rather than as an independently validated susceptibility assessment [45].

Treatment and Clinical Outcome

The standard management of Melioidosis involves an intensive intravenous phase followed by a prolonged oral eradication phase. Ceftazidime and meropenem are the principal agents used during the intensive phase, while TMP-SMX is generally preferred for oral eradication treatment. Treatment duration depends on the clinical presentation, the presence of deep-seated infection, disease severity, and response to therapy Dance [17,38,39]. In the present case, the patient was referred to a tertiary-care hospital, where intravenous ceftazidime and co-trimoxazole were reportedly administered. The patient's relatives subsequently reported clinical recovery. The use of ceftazidime is consistent with established treatment approaches for Melioidosis. However, because the complete hospital record was unavailable, the exact doses, duration of therapy, renal dose adjustments, and whether a subsequent oral eradication regimen was completed could not be independently confirmed. This limitation is particularly relevant in a patient with chronic kidney disease, in whom antimicrobial dosing and monitoring require careful consideration. It is also important not to equate reported clinical recovery with documented microbiological eradication, particularly in an infection associated with the possibility of relapse.

The Contribution of Primary Health Care: Early Recognition and Referral

The most important practical contribution of this case concerns the role of Primary Health Care. The patient initially presented to the Nikaia Health Center, where the clinical and laboratory evaluation was initiated. The urine culture identified an unusual organism that raised concern for a potentially serious infection. Recognition of this finding, in the context of the patient's age, comorbidities, and inflammatory laboratory profile, prompted referral to a tertiary-care hospital. This sequence illustrates several important functions of Primary Health Care: First, primary-level facilities may be the initial point of detection of infections that are rare or unexpected in the local epidemiological setting. A patient may present with common symptoms, such as dysuria and low-grade fever, without an immediately recognizable clinical picture of a tropical infection. Second, access to routine laboratory investigations and urine culture may provide an essential diagnostic opportunity. The recognition of an unusual organism in a clinical specimen can change the clinical pathway and prompt urgent specialist assessment. Third, Primary Health Care facilities have an important role in recognizing the limits of their diagnostic and therapeutic capacity. In cases involving potentially high-risk pathogens, timely referral to tertiary care and appropriate reference laboratories is essential for patient management and laboratory safety. Finally, this case highlights the importance of communication between primary care clinicians, clinical microbiology laboratories, and tertiary-care services.

Early recognition and referral can support more appropriate clinical management, particularly in patients with multiple predisposing conditions. The contribution of the Nikaia Health Center should therefore be understood within this broader framework. The case does not establish that the entire diagnostic process or definitive confirmation was completed in the primary care setting.

Rather, it demonstrates that the initial microbiological recognition at a Primary Health Care facility was a critical event that led to referral for specialized hospital management.

Limitations

This report has several limitations. First, the identification of *B. pseudomallei* was presumptive and was not confirmed by molecular testing or a reference laboratory. Second, the original antimicrobial susceptibility inhibition-zone diameters were unavailable for independent reassessment. Third, detailed clinical records from the tertiary-care hospital were not accessible, and treatment details and clinical outcome were based on information provided by the patient's relatives. Finally, the caregiver's reported illness and travel history could not be microbiologically investigated; therefore, no epidemiological link or person-to-person transmission could be established.

Conclusion

The present case describes the urinary isolation of presumptive *Burkholderia pseudomallei* in an 84-year-old man with diabetes mellitus, chronic kidney disease, nephrolithiasis, and a history of colorectal malignancy under ongoing anticancer treatment. The unusual microbiological finding was initially recognized at the Nikaia Health Center, a Primary Health Care facility in Greece, and prompted referral to a tertiary-care hospital for further management. The case highlights the importance of clinical awareness, routine microbiological investigation, recognition of unusual pathogens, and timely referral from primary to tertiary care. It also illustrates the relevance of epidemiological history, particularly travel and environmental exposure in regions where Melioidosis is endemic. The caregiver's history raises a possible epidemiological hypothesis, but the absence of microbiological investigation and molecular comparison prevents any conclusion regarding person-to-person transmission. Overall, this case emphasizes that Primary Health Care facilities can make a meaningful contribution to the early recognition of rare and potentially life-threatening infections. Their role includes not only the initial assessment of common symptoms but also the recognition of unusual microbiological findings and the timely activation of referral pathways for specialized care.

Declarations

Ethics Approval and Informed Consent

This case report was prepared in accordance with the principles of the Declaration of Helsinki. The report is based on a retrospective review of clinical and microbiological data collected during routine patient care in June 2026. Following the patient's transfer to a tertiary-care hospital, the authors had no further direct contact with the patient or his family. A subsequent telephone communication with the patient's relatives provided limited information regarding his treatment and discharge; however, no further clinical follow-up information was available. Consequently, written informed consent for publication could not be obtained. All clinical and laboratory data used in this report were coded and handled in accordance with applicable patient confidentiality and personal data protection requirements. Direct patient identifiers have been excluded, and appropriate measures have been taken to protect the patient's privacy.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Author Contributions

Antonia Mourtzikou wrote the initial and final versions of the manuscript; Christina Seitopoulou and Maria Kimouli conducted the laboratory analysis; Georgia Kalliora and Evangelia Evangelou performed the literature search..

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