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CASE REPORT

Unrecognized threat in immunocompromised care: A case of *Leclercia adecarboxylata* bacteremia associated with long-term indwelling urinary catheter

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Abstract

Leclercia adecarboxylata, a rare facultative gram-negative bacillus, is increasingly being recognized as an opportunistic pathogen, especially in immunocompromised hosts or those with indwelling devices. We report a case of *L. adecarboxylata* bacteremia in a 68-year-old diabetic male with a long-term Foley catheter. The patient presented with fever and confusion. Laboratory analysis revealed bacteremia and pyuria. Both blood and urine cultures isolated *L. adecarboxylata*, confirmed via MALDI-TOF MS. Treatment involved catheter removal and targeted ceftriaxone therapy based on susceptibility testing, resulting in clinical recovery. This case reinforces the organism's pathogenic potential and highlights the importance of accurate identification and early intervention.

1. Introduction

Leclercia adecarboxylata was first described in the 1960s and is typically found in the environment and the gastrointestinal tract (Gajdács et al., 2020). Historically considered non-pathogenic, its role as an opportunistic pathogen is now emerging, particularly in the presence of immunosuppression or foreign bodies (Méthot and Alizon, 2014; Ristori et al., 2024). Due to its biochemical similarity with *E. coli*, accurate identification often requires advanced molecular or proteomic methods, such as MALDI-TOF MS or 16S rRNA sequencing (Nomura, 2015; Sandrin et al., 2013).

The clinical importance of *L. adecarboxylata* lies in its capacity to cause a wide spectrum of infections including bacteremia, urinary tract infections, and peritonitis (Spiegelhauer et al., 2019; Zayet et al., 2021), especially in vulnerable populations. The organism's growing antimicrobial resistance and association with indwelling devices necessitate a revaluation of its clinical significance.

2. Case Report

A 68-year-old male with a history of type 2 diabetes mellitus, chronic kidney disease (Stage IV), and neurogenic bladder managed by a long-term indwelling Foley catheter, presented to the emergency department with fever, generalized weakness, and altered mental status for two days. He denied dysuria, flank pain, or hematuria. No recent antibiotic use or hospitalization was reported (Table 1, 2, 3, & 4).

3. Discussion

Although typically viewed as an environmental and commensal organism, *L. adecarboxylata* is increasingly recognized as a pathogen in immunocompromised hosts or patients with indwelling medical devices (Tan et al., 2022). Initially described by Leclerc in the 1960s, the bacterium has been isolated from soil, water, and the human gastrointestinal tract (Leclerc et al., 2002). However, clinical infections are rare and underreported.

Recent literature suggests an association between *Leclercia* infections and immunocompromised states such as malignancy, diabetes mellitus, chronic renal failure, and post-transplant immunosuppression. Device-related infections, including central venous catheter infections, peritonitis from peritoneal dialysis, and urinary tract infections due to long-term catheters (Crnich and Drinka, 2012), have been documented.

Table 1: Patient Demographics and Clinical History

Parameter	Value
Age/Sex	68 / Male
Comorbidities	Type 2 Diabetes Mellitus, Chronic Kidney Disease (Stage IV)
Medical Devices	Indwelling Foley catheter (in situ > 6 months)
Presenting Complaints	Fever, confusion, weakness (duration: 2 days)
Vital Signs at Admission	Temp: 38.5°C; HR: 106 bpm; BP: 138/82 mmHg; SpO_2: 98%

Table 2: Laboratory Investigations at Admission

Test	Result	Reference Range
WBC	15,400 /µL	4,000–11,000 /µL
Neutrophil %	85%	45–75%
CRP	96 mg/L	<10 mg/L
Creatinine	2.4 mg/dL	0.6–1.3 mg/dL
Urinalysis	+ Nitrites, + WBC >100	Negative

Our case aligns with previous findings where urinary catheterization served as a nidus for bacteremia. In a study by Alosaimi and Muhmmed kaaki, 2020, a similar case of catheter-related ESBL producing *Leclercia adecarboxylata* Septicemia in hemodialysis patient was reported, highlighting its tropism for foreign materials. Another report by (Pindi et al., 2020), described continuous ambulatory peritoneal dialysis peritonitis and outcomes.

While most *Leclercia* isolates remain susceptible to third-generation cephalosporins, quinolones, and carbapenems (Abrar et al., 2024), there are increasing reports of multidrug-resistant strains. A case from Italy documented identification of the *L. adecarboxylata* VR-01-1 ESBL as an SHV-12 β-lactamase (Mazzariol et al., 2003). Thus, culture and susceptibility testing are critical.

A distinguishing feature in this case was the organism's isolation from both urine and blood, providing strong evidence for its pathogenic role rather than contamination. The rapid clinical improvement following catheter removal and directed antimicrobial therapy further supports causality.

The mechanism of pathogenesis in *Leclercia* is not fully understood but may involve biofilm formation on synthetic surfaces, similar to other Enterobacteriaceae. This is particularly relevant in patients with long-standing indwelling devices. Given the increasing incidence and antibiotic resistance, clinicians should maintain a high index of suspicion for *Leclercia* in immunocompromised or catheterized patients presenting with sepsis.

4. Conclusion

This case highlights *L. adecarboxylata* as a legitimate cause of bacteremia in immunocompromised individuals with indwelling devices, despite its low clinical prevalence. Misidentification as *E. coli* and dismissal as a contaminant may delay diagnosis and appropriate management. Our case underscores the need for awareness of this rare but emerging pathogen, appropriate diagnostic identification, and timely removal of potential sources like catheters. As multidrug-resistant strains begin to emerge, susceptibility-guided antibiotic therapy becomes increasingly vital. Future studies are warranted to better understand its pathogenicity, resistance mechanisms, and optimal treatment approaches.

Table 3: Microbiology and Susceptibility Testing

Specimen Source	Organism Isolated	Identification Method	Susceptibility
Blood culture	Leclercia adecarboxylata	MALDI-TOF MS	Sensitive to ceftriaxone, piperacillin-tazobactam, ciprofloxacin
Urine culture	Leclercia adecarboxylata	MALDI-TOF MS	Same as above

Table 4: Treatment Course

Intervention	Outcome
Empiric IV piperacillin-tazobactam	Initiated at admission
Indwelling Foley catheter removal	Performed on Day 1 of admission
De-escalation to IV ceftriaxone	Based on susceptibility results (Day 3)
Symptom resolution	Fever subsided; mental status improved by Day 4
Repeat blood cultures	Negative after 72 hours
Discharge plan	Oral ciprofloxacin for 7 days, urology follow-up

Declarations

Ethics approval statement

No ethical approval was required for the current study as it did not deal with any human or animal samples.

Consent to participate

Not applicable

Consent to publish

Not applicable

Data Availability Statement

The data are available from the corresponding author upon reasonable request

Competing Interests

The authors declare that they have no conflict of interest

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Author contribution

Conceptualization, Data curation, Investigation, Formal analysis, Writing—review and editing: S.C. All authors have read and agreed to the published version of the manuscript

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