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Inflammation and infection

Novel presentation of Raoultella planticola-induced epididymo-orchitis post gastroenteritis

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ABSTRACT

This report documents the first case of Raoultella planticola epididymo-orchitis following campylobacter gastroenteritis in a 76-year-old male. Highlighting R. planticola's expanded pathogenic potential beyond common urinary tract infections, this case emphasizes its clinical significance in atypical genitourinary presentations, particularly in individuals with pre-existing conditions like diabetes mellitus and renal failure. Despite intrinsic ampicillin resistance, targeted ciprofloxacin treatment proved effective. This case underscores the necessity for broad diagnostic considerations and tailored antibiotic therapy in managing complex infections, advocating for increased awareness of emerging resistant uropathogens in clinical practice.

1. Introduction

In the realm of urological infectious diseases, discovering unusual pathogens in unexpected clinical scenarios presents a significant diagnostic and therapeutic challenge. Raoultella planticola, a gram-negative, non-motile, aerobic bacterium traditionally associated with environmental reservoirs, has recently emerged as a noteworthy human pathogen.[1] While its presence in urinary tract infections (UTIs) has been documented, the occurrence of R. planticola in epididymo-orchitis is unprecedented. This case report delineates the first instance of R. planticola-induced epididymo-orchitis, following a preceding bout of campylobacter gastroenteritis in an immunosuppressed elderly male with a complex medical background. The emergence of this rare infection highlights the critical necessity for a broad diagnostic approach and underscores the importance of precise antibiotic therapy in treating complicated infections.

2. Case presentation

A 76-year-old man with a history of chronic lymphocytic leukemia (CLL), Type 2 Diabetes Mellitus (T2DM) and stage III chronic kidney disease (CKD) presented to the emergency department with a 3-day history of severe diarrhea, vomiting, dizziness, and fevers. The patient reported no voiding difficulties, testicular pain or haematuria. His macroscopic urinalysis revealed he was positive for blood and +1 leukocyte esterases but negative for nitrites.

The patient was initially managed under the presumption of viral gastroenteritis by the gastroenterology team; his treatment included supportive care with intravenous fluids. Notably, the patient was not catheterized as a post-void bladder scan on admission demonstrated a low post-void residual. However, he was commenced on azithromycin due to persistent fevers, suspecting a bacterial aetiology.

Despite improvement in his gastrointestinal symptoms with a confirmed diagnosis of campylobacter in both stool and blood cultures, the patient reported the development of new bilateral scrotal erythema and tenderness on day 3 of his admission. Urological examination revealed bilaterally swollen, hard, and tender testicles, raising concerns for epididymo-orchitis. Urine cultures grew Raoultella planticola, sensitive to ciprofloxacin but resistant to all penicillins and Tetracycline.

An ultrasound demonstrated enlarged hyperemic testicles with generalized scrotal wall thickening, compatible with bilateral epididymo-orchitis (Fig. 1). The patient was discharged with a total of two weeks of Ciprofloxacin treatment as per recommendation from the Infectious Disease team. A follow-up review two weeks post-discharge confirmed the complete resolution of both his gastrointestinal and genitourinary symptoms. A repeat urine culture showed no growth.

3. Discussion

The identification of R. planticola as the causative agent in the case

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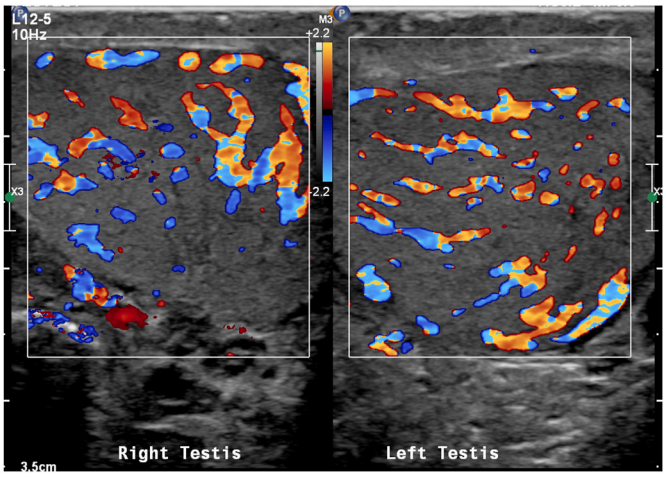

Fig. 1. Scrotal USS images demonstrating enlarged bilateral hyperemic testicles with generalized scrotal wall thickening.

of epididymo-orchitis represents a notable extension of its known pathogenic repertoire. Historically, Raoultella urinary tract infections have been relatively rare. A recent literature review on R. planticola urinary tract infections, and a separate retrospective analysis of a single center collectively identified just 71 documented cases of R. planticola UTIs. Notably, among these instances, only two involved significant genitourinary tissue penetrance: one case of acute prostatitis and another of chronic prostatitis.[2,3] This scarcity underscores the importance of our case, particularly given the absence of typical environmental exposures, such as contact with water or soil or recent urological procedures that might predispose to infection. This unique scenario highlights the need to consider Raoultella planticola in infections where traditional risk factors are absent, suggesting its potential for opportunistic infection even in unusual clinical contexts.

The literature increasingly recognizes R. planticola as an opportunistic pathogen with a predilection for immunocompromised hosts, mirroring the circumstances of our case. The patient's scenario, devoid of direct environmental or procedural risk factors, emphasizes the organism's capacity to exploit compromised host defenses, as seen in individuals with conditions such as chronic lymphocytic leukemia (CLL), Type 2 Diabetes Mellitus (T2DM), chronic kidney disease (CKD), and concurrent bacteremia. Such a clinical backdrop, combined with R. planticola's known mechanisms of pathogenicity—including biofilm formation—presents significant challenges for effective treatment.[3] This case accentuates the critical need for a nuanced understanding of Raoultella's behavior and resistance patterns to inform therapeutic decisions.

The patient's initial non-response to azithromycin, followed by notable improvement upon administration of ciprofloxacin, offers critical insights into the complexities of antibiotic resistance inherent to Raoultella species. This shift in therapeutic efficacy underscores the importance of discerning antibiotic selection, particularly in light of Raoultella's well-documented intrinsic resistance to ampicillin, attributed to the overexpression of class-A β-lactamase enzymes.[4] Such resistance necessitates a strategic approach to antibiotic therapy. Furthermore, the burgeoning issue of carbapenem-resistant Raoultella strains compounds the challenge, intensifying the necessity for vigilant antibiotic stewardship. This development mandates rigorous susceptibility testing to ensure the judicious use of antimicrobials, thereby optimizing patient outcomes in the face of evolving bacterial resistance patterns.[5]

Given the patient's profile and Raoultella's evolving resistance patterns, clinicians should maintain a high index of suspicion for this pathogen in similar cases. Early and accurate identification, coupled with tailored antibiotic therapy, is crucial for managing infections effectively and mitigating the risk of antibiotic resistance.

4. Conclusion

This case represents the inaugural documentation of Raoultella planticola epididymo-orchitis, expanding the known pathogenicity of this organism. It underscores the necessity of considering rare pathogens in patients with atypical presentations of epididymo-orchitis, especially immunosuppressed and therefore predisposed to more unusual infectious aetiologies. This case emphasizes the critical importance of tailored antimicrobial therapy, guided by accurate microbial identification and susceptibility testing, to ensure effective treatment. Early recognition and appropriate management are paramount to prevent potential complications, underscoring the necessity for heightened clinical awareness and a comprehensive approach to the care of patients at risk for infections with emerging resistant organisms.

Consent

Informed consent was obtained from the patient for the publication of this case report.

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CRediT authorship contribution statement

Darshan Sitharthan: Conceptualization, Funding acquisition, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Andrew Mitterdorfer:** Supervision, Writing – review & editing.

Declaration of competing interest

The authors declare no conflict of interest.

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