

# Urinary Tract Infection in a Renal Transplant Patient by *Myroides* Species: A Case Report from Pakistan

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## ABSTRACT

*Myroides* species are mostly considered to have low pathogenic potential causing infections in immuno-compromised patients; though, few cases of urinary tract infections (UTIs), bacteremia, pneumonia, endocarditis, ventriculitis, skin, and soft tissue infections have been reported. The two most common species associated with human infections are *M. odoratus* and *M. odoratimimus*. Due to the multi-drug resistant nature of this bacteria, prompt identification and antibiotic susceptibility testing in the laboratory are of paramount importance in order to direct the clinician towards an appropriate antibiotic treatment. A 32-year male diabetic patient, on immunosuppressants and post renal transplant, presented with UTI. This is the first reported case of a clinically significant infection caused by *Myroides* species from Pakistan. The patient in this case responded favorably to treatment by oral minocycline and was treated successfully.

**Key Words:** *Myroides*, Multi-drug resistant, Urinary tract infection, Renal transplant.

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## INTRODUCTION

The genus *Myroides*, previously part of the genus *Flavobacterium*, consists of Gram-negative, non-motile, oxidase-positive, non-fermentative, and aerobic bacteria. These bacteria are ubiquitous in the environment, being present in the soil and water. They are not part of normal human flora and have rarely been implicated in clinically significant human infections.<sup>1</sup> They are mostly considered to have a low pathogenic potential and cause infections in immune-compromised patients. However, a few cases of infections in immunocompetent hosts have also been reported in the literature.<sup>2</sup> The clinical infections reported in the literature include urinary tract infections (UTIs), bacteremia, pneumonia, endocarditis, ventriculitis, and skin and soft tissue infections.<sup>3</sup>

Here, we report a case of UTI in a post-renal transplant patient on immunosuppressive therapy. To the best of our knowledge, this is the first reported case from Pakistan.

## CASE REPORT

A 32-year male, known hypertensive and diabetic, received a pre-emptive renal transplant for end-stage kidney disease from a matched donor in July 2022.

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The postoperative course was uneventful and the patient was discharged on 15<sup>th</sup> August 2022. The patient was on immunosuppressive therapy (Tacrolimus, Prednisolone, and Mycophenolate). He was re-admitted two weeks later with complaints of fever and leakage from the drain site. His urine, paired blood, and discharge from the drain were sent for culture and sensitivity to the microbiology department. The culture from the drain site yielded growth of *Acinetobacter baumannii* that was only susceptible to colistin and tigecycline, while, paired blood and urine cultures were negative. The patient received intravenous colistin sulphate for two weeks during which his fever and discharge from the drain site settled. Two days after discontinuation of colistin, the patient again developed a fever. His paired blood and urine cultures yielded the growth of oxidase-positive, gram-negative colonies on MacConkey and sheep blood Agar (Oxoid, UK). These were identified on vitek 2 (bioMerieux, France) as *Myroides* species with 98% probability. Antimicrobial susceptibility testing (AST) was also performed using vitek 2. The isolate was found sensitive only to Minocycline (Table I).

**Table I: Antibiotic susceptibility profile of the isolate using CLSI (2022 M100-S32) interpretative criteria for other non-Enterobacterales.**

Antibiotic	MIC (µg/ml)	Interpretation
Ticarcillin/Clavulanic Acid	≥128	Resistant
Piperacillin/Tazobactam	≥128	Resistant
Ceftazidime	≥64	Resistant
Cefepime	≥64	Resistant
Meropenem	≥16	Resistant
Imipenem	≥16	Resistant
Amikacin	≥64	Resistant
Gentamicin	≥16	Resistant
Tobramycin	≥16	Resistant
Aztreonam	≥64	Resistant
Ciprofloxacin	≥4	Resistant
Trimethoprim/Sulphamethoxazole	≥320	Resistant
Minocycline	2	Sensitive

The patient was given oral Minocycline for 7 days. The patient responded well to the given treatment, his fever settled and a repeat urine culture after one week did not yield any growth.

## DISCUSSION

Over the past decade, there have been increasing reports of clinically relevant infections caused by *Myroides* species. The two most common species associated with human infections are *M. odoratus* and *M. odoratimimus*.<sup>4</sup> However, there are rare reports of human infections with other *Myroides* species as well.<sup>3</sup> Species-level identification was not performed in the present case.

The present case was a UTI in a diabetic patient on immunosuppressants, post-renal transplant. The commonly reported infections with *Myroides* species are skin and soft tissue infections followed by UTIs.<sup>5</sup> Most cases in the literature have been reported in patients with risk factors like diabetes, liver cirrhosis, and alcoholism, patients receiving immunosuppression or chemotherapy, and chronic steroid use.<sup>6</sup> Chauhan *et al.* reported a series of cases of catheter-associated UTIs in diabetic patients.<sup>7</sup> These bacteria have the ability to form biofilms, thus, indwelling catheters are an important risk factor.<sup>7</sup> Another case of UTI was reported from Saudi Arabia in a diabetic patient who was on post-renal transplant immunosuppressive therapy, similar to the patient in the present case.<sup>8</sup> These bacteria have also been implicated in hospital outbreaks of UTIs. They can survive in the hospital environment posing a risk for nosocomial infections and outbreaks.<sup>9,10</sup> In our case as well, the infection was hospital-acquired.

The *Myroides* species are frequently multidrug-resistant and can be difficult to treat. They are intrinsically resistant to beta-lactams due to the presence of beta-lactamases. In addition, multiple other resistance genes have also been identified including tetX that confers tetracycline resistance, cat (chloramphenicol resistance), ereB, cfrA, and lasE (macrolide resistance).<sup>7</sup> The isolate in the present case was only susceptible to Minocycline; similar results of AST were reported by Licker *et al.*<sup>9</sup>

The patient in the present case responded favorably to treatment by oral Minocycline similar to another reported case.<sup>4</sup> Tige-cycline and a combination of ciprofloxacin with rifampicin have been used as an effective treatment option for *Myroides* UTIs.<sup>9</sup> The infection was successfully treated once the cause was established and directed antibiotic therapy was given.<sup>6,9</sup>

This is the first reported case of a clinically significant infection caused by *Myroides* species from Pakistan. The isolation of this organism from clinical specimens should be regarded as significant, especially in patients with predisposing conditions. Due to the multi-drug resistant nature of this bacteria, prompt identification and AST in a laboratory are of paramount importance in order to guide the clinician towards an appropriate antibiotic treatment.

## COMPETING INTEREST:

The authors declared no competing interest.

## AUTHORS' CONTRIBUTION:

RB: Manuscript writing.

AI: Critical review.

IAM: Final approval of version to be published.

SHN: Analysis and Interpretation of data.

RS: Contribution to concept and study design.

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