# URINARY TRACT INFECTION WITH MYROIDES SPP, MULTIDRUG RESISTANT STRAIN – A CASE PRESENTATION

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***Keywords:*** *Myroides spp, nosocomial, urinary tract infection*

***Abstract:*** *In the last years, more and more cases of infections with bacterial strains of the Myroides genus have been presented, that have drawn the attention because of their resistance to antibiotics. Most of these occurred in the cases of the immunocompromised patients and some of them were fatal. We present a case of urinary tract infection with Myroides spp in a patient with diabetes and chronic peripheral arterial disease of the lower limbs. The patient presented himself at the emergency department with septic state, wet calcaneal gangrene extending to the lower leg of the left inferior limb and dry gangrene of the right thumb toe; subsequently, he was hospitalized in the general surgery department. Conclusions: Although Myroides spp are unusual pathogens, they can cause infections in the immunocompromised patient. Clinicians need to be familiar with these types of bacteria, which cause treatment problems due to the resistance to antibiotics.*

## INTRODUCTION

In the last years, in the specialty literature, more and more cases of bacterial strains of the Myroides genus have been presented, that have drawn the attention because of their resistance to antibiotics. Most of these infections occurred in the cases of the immunocompromised patients and some of them were fatal.(1)

Originally named Flavobacterium odoratum belonging to the Flavobacterium genus, these strains were later assigned to the new Myroides genus, with two species: *Myroides odoratus* and *Myroides odoratimimus*. They are widely distributed in the environment, especially in the freshwater or salty waters and in the soil; they were isolated from eggs and fly larvae (2) but also from food (dairy products, fish and seafood).

## CASE PRESENTATION

A 65-year-old man with multiple comorbidities comes at the emergency department with lesions of wet gangrene on the left lower leg with cellulitis and edema and dry gangrene of the right thumb toe.

The pathological personal history is significant: stroke with left hemiparesis a year ago, type II diabetes complicated with diabetic arteriopathy of lower limbs, chronic ischemic heart disease and high blood pressure. Objective examination, on admission: patient with low-grade fever, general altered condition, pale, underweight, with urinary incontinence and with the above mentioned lesions of the inferior limbs.

Laboratory investigations revealed the leukocytosis-$38,98x10^3$/µL with neutrophilia (87,9%), anaemia (Hb-10,9 g/dL), raised thrombocytes ($462x10^3$ /µL) hyper glycaemia (213 mg/dl), syndrome of hepatic cytolysis (TGO-80 U/L, TGP 97 U/L) and there were isolated Bacillus proteus and Enterobacter - positive strain ESBL- from the purulent secretion from the left lower limb.

The initial antibiotic treatment was with Piperacillin/Tazobactam (4g/0,5g), 3 vials/day, changed from the $10^{th}$ day of hospitalization with Ceftazidime 4g/day and Amikacin 1g/day. Emergency surgical intervention was performed with general anesthesia after the installation of a urinary catheter in the surgery room, namely amputation of the left upper leg and of the right thumb toe. After the surgery, in the first week, the evolution was slow favourable, with diurnal afebrile condition and night low grade fever condition (37,2-37,4$^o$C), with decreasing trend of the values of the leucocytes. The initial treatment with antibiotics was continued, supplemented with fresh frozen plasma transfusions and red cell mass, local dressings. Subsequently, approximately from the $10^{th}$ day of hospitalization, the evolution complicated with the occurrence of generalized thrombocytopenia purpura, bleeding tendency even at the level of the amputation, amid the severe hypopotassaemia (2.58mEq/L), accompanied by hypoproteinaemia (3,9 g/dL) with generalized oedema, raised values of the C-reactive protein (78.71 mg/dL) with the occurrence of the suppuration at the level of the amputation.

On the $22^{nd}$ postoperative day, the association of the respiratory symptoms with the severe dyspnoea required the transfer of the patient to the Intensive Care Unit (ICU), where during 5 days it was attempted a correction of hypokalaemia and haemorrhagic disorders with the improvement of the dyspnoea but with the appearance of the rectal bleedings which required continued transfusions to the patient. On the day of the transfer to the ICU, the urine culture which pointed out Myroydes spp above $10^5$ CFU/ml was harvested. The urine culture was harvested after the replacement of the urinary catheter which was mounted in the surgery room, on the day of the surgery. The identification was done using the Vitek 2 system - cards GN (BioMerieux) and the susceptibility to the antibiotics was tested on the same apparatus by determining the minimum inhibitory concentration using AST-XN05 cards; the susceptibility to the following antibiotics was tested: ticarcilin/clavulanate, piperacillin, ceftriaxone, ceftazidime, cefotaxime, cefepime, aztreonam, meropenem, imipenem, levofloxacin, ofloxacin, trimethoprim-sulfametoxazole, minocycline, tetracycline, tigecycline, chloramphenicol, colistin, amikacin, gentamicin, tobramycin. Of all the tested antibiotics, the only sensitivity was to the minocycline. The occurrence of the suppuration and of the

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dehiscence at the level of the amputation required surgical re-intervention on the 38th day of the hospitalization, making a secondary suture of the amputation wound from the left thigh and right calcaneal necrectomy, but at ca. 12 hours postoperatively, the patient presented a non-resuscitable cardio-respiratory arrest and death was declared.

## DISCUSSIONS

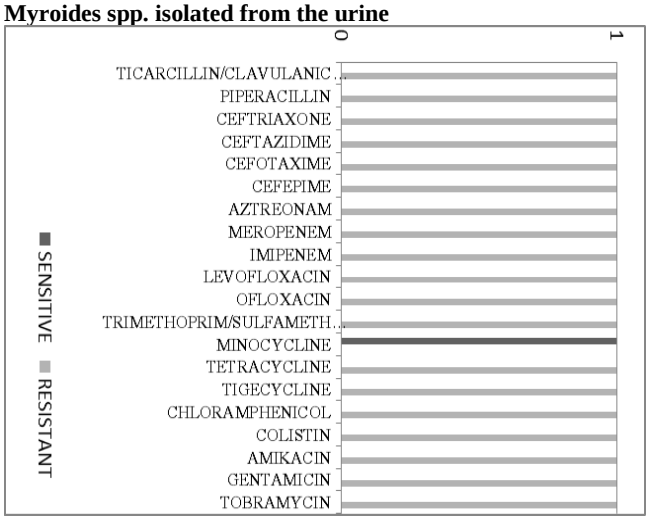
Myroides spp are gram negative, strictly aerobic, immobile bacilli, which form yellow, non-haemolytic, with fruity odour colonies. From biochemical point of view, they are oxidase positive, catalase – positive, indole negative, non-saccharolytic.(3) They are not related to the commensal bacterial flora and the infections determined by these bacteria are rare, even if they are encountered in the environment (especially waters and soil). In the literature, there were described Myroides spp. infections of the amputation stump (4), cellulitis (5), bacteraemia (6), pneumonia (7) necrotizing fasciitis (8), infections of the urinary tract (9), endocarditis (10), pericarditis (1) erysipelas and sepsis.(11)

Although the source of the infections is usually unknown, it was thought that the water from the hospital could be contaminated with these microorganisms.(12)

The epidemiologic process in the cases of the infection with Myroides includes the presence of the immunocompromised hosts: patients with renal dialysis, diabetes mellitus, hepatic cirrhosis, chronic obstructive pulmonary disease (COPD), corticosteroid or cytostatic treatments (7,13) The transmission of the bacteria is possible through direct contact with the environment contaminated by these bacteria.(13) The survival of the bacteria on various elements from the environment is favoured by its ability to form a protective biofilm by adhering to the surfaces it reaches. The nosocomial transmission of the bacterium has been described in the literature (6,9,14) being involved the central vascular catheters, urological endoscopic procedures, but the source of infection is difficult to be demonstrated.

In the case presented in this article, the urinary infection with Myroides spp was considered nosocomial, the germ being identified in the patients' urine in the 23th day of the hospitalization. The patient has been catheterized urinary pre-surgery and the urine was harvested after the maintenance of this catheter for 22 days. It is remarkable the resistance of this strain to the antibiotics, the only susceptible antibiotic being minocycline (figure no.1).

**Figure no. 1. The antibiotic susceptibility of the strain of Myroides spp. isolated from the urine**




Considering the patient's pathological history and the presence of the septic state at the admission, it is difficult to evaluate the impact which this infection had to the unfavourable evolution of the presented case.

For the clinician, it is important to be pointed out the fact that this multi-drug resistant bacteria contains mechanisms which allow it the survival in hospitalizing environments; once it is in a department of the hospital, the transmission and its persistence depend on three main factors: the susceptibility of the host to the infections, the pressure of selection given by the use of the antibiotics in this hospital ward and the raise of the number of the colonized or infected patients – the so called "pressure of colonization".

Regarding these factors, there are also important the impact and the adherence of the personnel at the effort of the prevention, in order to avoid the appearance of a new cases, especially in the immunocompromised patients.

## CONCLUSIONS

The urinary infection with Myroides spp in an immunocompromised patient with diabetes, in the phase of chronic vascular complications is a feverish infectious complication due to multidrug resistance of the bacteria. For this reason, the treatment options in the presented case were extremely limited. It is obvious that the preventive measures were very important in order to limit the extent of colonization or infection in other patients.

## REFERENCES

1. Prateek S, Gupta P, Mittal G, Singh AK. Fatal Case of Pericardial Effusion Due to Myroides Odoratus: A Rare Case Report, Journal of clinical and diagnostic research, JCDR 2015 Nov; 9(11):DD01-DD02.
2. Lysyk T, Kalischuk-Tymensen L, Selinger L, Lancaster R, Wever L, and Cheng K. Rearing stable fly larvae (Diptera: Muscidae) on an egg yolk medium. J. Med. Entomol. 1999;38:382-388.
3. Chen XC, Liang L, Lin W. Analysis of eleven Myroides sp. isolates from urine culture. Chin J Pract Med Tech. 2009;16(9):691-692.
4. Davis JM, Peel MM, Gillians JA. Colonization of an amputation site by Flavobacterium odoratum after gentamicin therapy. Med J Aust . 1979;2:703-704.
5. Bachman KH, Sewell DL, Strausbaugh LJ. Recurrent cellulitis and bacteremia caused by Flavobacterium odoratum. Clin Infect Dis. 1996;22:1113-1114.
6. Spanik S, Trupl J, Krcmery V. Nosocomial catheter-associated Flavobacterium odoratum bacteraemia in cancer patients. J Med Microbiol. 1998;47:183.
7. Deepa R, Venkatesh KG, Parveen JD, Banu ST, Jayalakshmi G. Myroides odoratus and Chryseobacterium indologenes: two rare isolates in the immunocompromised. Indian J Med Microbiol. 2014;32(3):327-330.
8. Crum-Cianflone NF, Matson RW, Ballon-Landa G. Fatal case of necrotizing fasciitis due to Myroides odoratus. Infection. 2014;42(5):931-935.
9. Ktari S, Mnif B, Koubaa M. Nosocomial outbreak of Myroides odoratimimus urinary tract infection in a Tunisian hospital. J Hosp Infect. 2012;80(1):77-81.
10. Ferrer C, Jakob E, Pastorino G, Juncos LI. Right-sided bacterial endocarditis due to Flavobacterium odoratum in a patient on chronic hemodialysis. Am J Nephrol. 1995;15:82-84.
11. Willems P, Muller J, Verhaegen J, Saegeman V, Desmet S. How to treat a fulminant erysipelas and sepsis caused

by Myroides odoratimimus: case report and literature review. Acta Clin Belg. 2016:1-5.
12. Hsueh PR, Wu JJ, Hsiue TR, Hsieh WC. Bacteremic necrotizing fasciitis due to Flavobacterium odoratum. Clin Infect Dis . 1995;21:1337-1338.
13. Endicott-Yazdani TR, Dhiman N, Benavides R, Spak CW. Myroides odoratimimus bacteremia in a diabetic patient. Proc (Bayl Univ Med Cent). 2015;28(3):342-343.
14. Benedetti P, Rassu M, Pavan G. Septic shock, pneumonia, and soft tissue infection due to Myroides odoratimimus: report of a case and review of Myroides infections. Infection. 2011;39(2):161-165.