

## Case report



# Clinical case of *Sphingomonas paucimobilis* associated with hemospermia, a rare location of a poorly described infectious agent at Lumbulumbu Hospital Center, in Democratic Republic of Congo: a case report

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**Clinical case of *Sphingomonas paucimobilis* associated with hemospermia, a rare location of a poorly described infectious agent at Lumbulumbu Hospital Center, in Democratic Republic of Congo: a case report**

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## Abstract

*Sphingomonas paucimobilis*, known in the past as *Pseudomonas paucimobilis*, is a strictly aerobic, non-fermenting Gram-negative bacilli, producing a yellow pigment and having a single polar flagellum. It is an opportunistic germ, its clinical implication is often explained by the presence of immunosuppressive comorbidities, which would explain several possible clinical presentations. The hemospermia associated with *S. paucimobilis* never described in the literature, here we describe the case of a 69-year-old patient in whom *S. paucimobilis* was identified in his semen after bacterial culture, who was treated with a successfully combination of ciprofloxacin and cefotaxime for 3 weeks with remission of hemospermia. This study would like to discuss about this atypical association, and to speculate on the possible role of *S. paucimobilis* in the occurrence of hemospermia with prostatic involvement, the explanations for which are not yet known.

## Introduction

*Sphingomonas paucimobilis*, known in the past as *Pseudomonas paucimobilis*, is a strictly aerobic, non-fermenting Gram-negative bacilli producing a yellow pigment and having a single polar flagellum [1,2]. Even if more than 30 species of *Sphingomonas* known to date are almost found in both natural and artificial aqueous environments, community infections are very few reported. *S. paucimobilis* is most frequently species involved as a human pathogen, and causes several types of infections, including pneumonia, meningitis, bacteremia associated with the catheter, urinary tract infections, and wound infections [1,3,4]. *S. paucimobilis* is used for environmental recycling for its properties to break down aromatic residues. It has also been identified in various environmental locations in the hospital, including hospital water system, respiratory therapy equipment and laboratory instruments. Nosocomial outbreaks of *S. paucimobilis* have been described and considered to come from a contaminated hospital

environment and equipment [5]. *S. paucimobilis* is very little documented in Africa, some description both in patients and in healthy carriers, as well as in the environment from Ghana, Egypt, Zimbabwe are available [6-8]. *S. paucimobilis* which is an opportunistic germ, its clinical implication is often explained by the presence of immunocompromised comorbidities, which would explain several possible clinical presentations [5]. Hemospermia is the presence of blood in the ejaculate in particular, it can result from various etiological factors including infections, various anatomic abnormalities, tumors, trauma, iatrogenic causes, such as prostate biopsy and other urological procedures, systemic disease, atypical sexual practices [9,10]. The identification of *S. paucimobilis* in the semen of a patient with chronic hemospermia has never been described in the literature, hence the interest of this striking clinical description.

## Patient and observation

This is the story of a 69-year-old patient who consulted a local health structure on April 4<sup>th</sup>, 2017 for hemospermia without any other symptoms. Every time he had sex with his wife, he only ejaculated blood. A treatment based on lincomycin injection and exacyl, at unknown doses, had been instituted for 7 days without any improvement. Given the persistence of the symptomatology, the patient moved to a remote urban centre where prostatic problems will be suspected and a PSA (Prostatic Surface Antigen) screening will be indicated and the first PSA screening done was 9,95 ng/ml. Two months later, the PSA screening will be redrafted and given 10.13 ng/ml without voiding disorder but with persistent hemospermia. Anxious, the patient will decide a sexual abstinence for 3 years. In May 2020, the patient got an appointment in our hospital; the physical exam done showed a tonic anal sphincter when doing the Digital Rectal Examination (DRE), with a flexible consistency prostate, regular and painless surface, with the presence of the median path. A spermoculture, PSA screening, syphilis, *Chlamydia*

*sp.* and HIV (Human Immunodeficiency Virus) testing by rapid test were performed.

The macroscopic examination of the sample (an ejaculate) showed a glued, red colored semen with no smell. The fresh microscopic examination showed the presence of immobile spermatozoa (100%), a bunch of white and red blood cells, nothings were seen on a Gram staining on the smear. The sample was enriched in thioglycolate broth and put into culture on available fresh blood agar plate. After an overnight incubation at 37°C aerobically, a massive, homogeneous, and monomorphic growth on fresh blood agar plate, with flat colonies, with regular contours without hemolysis. Gram's staining done on a few colonies showed Gram-negative bacilli. Bacterial identification and antibiotic susceptibility testing using the VITEK-2 automated system and ID-GNB card, AST-GN card for Gram-negative bacilli according to manufacturer's instructions (bioMérieux, Marcy-l'Étoile, France) confirm the identification of *Sphingomonas paucimobilis* that was sensitive to ciprofloxacin, ofloxacin, ticarcillin, piperacillin/tazobactam and cefotaxime. It was resistant to ceftazidime, imipenem, amikacin, tobramycin, and trimethoprim/sulfamethoxazole. The rapid plasma reagin (RPR) test was negative for syphilis, HIV and *Chlamydia sp.* were also negative. No prostatic echography results were available. Based on this strain profile, the patient was being treated by ciprofloxacin 500 mg tablets twice daily for 21 days, combined with cefotaxime 3 times daily for 10 days. An adjuvant treatment was added made of vitamin E, 3 times 1 capsule of 200 mg / day for 1 month and vitamin C, 3 times 1 tablet of 500 mg / day for 1 month. At the end of the antibiotic treatment (21 days), the hemospermia had disappeared and the semen had turned milky white again. At the last check-up last month (July 2020), the total PSA was 14.83 ng/ml without any voiding problems.

**Ethical considerations:** this study was conducted in accordance with existing ethical guidelines and was approved by the Institutional Review Board of the Catholic University of Bukavu

(UCB/CIES/NC/08/2019). The study was conducted in accordance with the principles of the Declaration of Helsinki. Anonymous and codified clinical patient data were used with strains collected, stored for epidemiological studies and for antimicrobial stewardship purposes; informed consent was no longer required.

## Discussion

This is, to our knowledge, the first description of an atypical clinical features of prostatitis linked to a very rare pathogen, *Sphingomonas paucimobilis* as most non-fermentative Gram-negative bacilli, their pathogenic role for humans most often linked in the presence of foreign material or Immunosuppression conditions. *S. paucimobilis* which is an environmental germ like the other non-fermenting ones, of the *Sphingomonadaceae* family; however, seems to be much easier to treat than the others. He would usually be sensitive to anti-Pseudomonas beta-lactams [11]. Although more common in patients under 40 years of age, the second most common cause of hemospermia is infection. In 40 to 55%, hemospermia is the probable expression of prostatovesiculitis, but also of posterior urethritis, etiopathogenic agents are those generally responsible for urinary tract infections, including *Escherichia coli*, *Proteus mirabilis*, *Klebsiella pneumonia* and *Enterobacter*. It should be noted that hemospermia is not a classic symptom of chronic prostatitis or chronic pelvic pain syndrome [9,12]. Other specific infections include pathogens some of which are sexually transmitted such as *Neisseria gonorrhoeae* and *Treponema pallidum*; some viruses such as cytomegalovirus. Moreover, in endemic areas, schistosomiasis and tuberculosis are also found as a cause of hemospermia. It will be the first time that *S. paucimobilis* also associated with this symptomatology in this study [13].

Although anxious, hemospermia is indicative of prostate cancer in only 5% of patients, mostly over 40 years old [14]. With a prostate without

abnormalities on DRE, with the unavailability of ultrasound elements of the prostate, and the presence of *S. paucimobilis* in the semen, all of this allow us to confirm the diagnosis of infectious prostatitis. Given the absence of prostatic biopsy, with a PSA screening greater than 3 ng/ml three times, it was difficult for us to exclude an apparently beginning tumor. Our *S. paucimobilis* isolate was sensitive to most antibiotics tested, and was resistant to ceftazidime, imipenem, amikacin, tobramycin and trimethoprim / sulfamethoxazole, this is different from the isolate described. in the study by kuo *et al.* in 2009, Souto *et al.* in 2012 and in 10 isolates from the study of Tho *et al.* in 2011, in which studies all isolates were sensitive to the tested antibiotics including beta lactams, fluoroquinolones, aminoglycosides, cotrimoxazole, piperacillin / tazobactam, carbapenems [15-17]. On the other hand, Pascale *et al.* in 2013 had identified an isolate that was resistant to cefotaxime, ceftazidime, gentamicin, amikacin, fluoroquinolones. This last isolate has a resistance profile close to ours, except that it was not resistant to imipenem [18]. After 21 days of treatment with antibiotics, our patient had a clinical cure with the end of hemospermia, the microbiological control was not done.

## Conclusion

In conclusion, *S. paucimobilis* an emerging non-fermenting Gram-negative bacilli, found in the environment and generally sensitive to usual antibiotics, its involvement in several infections has already been documented, this study would like to discuss about this atypical association, and to speculate on the possible role of *S. paucimobilis* in the occurrence of hemospermia with prostatic involvement, the explanations for which are not yet known.

## Competing interests

The authors declare no competing interests.

## Authors' contributions

All the authors have read and agreed to the final manuscript.

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