

First Case Isolated of *Kerstersia gyiorum* from Purulent Ear Discharge in North Africa: Case Report

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Abstract

Kerstersia gyiorum is an uncommon opportunistic pathogen rarely isolated in human infection. Most reported cases have concerned patients with otitis media. We describe a case of a 73-year-old patient with type 2 diabetes who developed bilateral otorrhea following head trauma in Morocco. Cytobacteriological analysis of the purulent ear discharge revealed polymicrobial infection with the presence of *Kerstersia gyiorum*, *Escherichia coli*, and *Achromobacter xylosoxidans*, which were identified using MALDI-TOF MS. Our study highlights the importance of using advanced identification techniques, such as MALDI-TOF MS, for the detection of uncommon and underrecognized pathogens.

Keywords: *Kerstersia gyiorum*; Rare pathogen; Purulent ear discharge; MALDI-TOF MS

Introduction

Suppurative otitis media is common infection characterized by inflammation of the middle ear associated with purulent ear discharge. It represents an important cause of morbidity worldwide and may lead to hearing impairment and other complications if not adequately treated. A wide range of bacterial pathogens have been implicated in these infections, most commonly *Pseudomonas aeruginosa* and *Staphylococcus aureus*, as well as other Gram-negative bacilli [1,2]. With the increasing use of advanced microbiological identification techniques, uncommon and previously underrecognized microorganisms are increasingly detected in clinical specimens.

Kerstersia gyiorum is a rarely reported, non-fermenting Gram-negative bacterium belonging to the genus *Kerstersia* within the family *Alcaligenaceae*, a group that includes opportunistic pathogens widely distributed in nature such as *Alcaligenes* and *Bordetella* [3]. The species *Kerstersia gyiorum* was first described by Coenye et al. in 2003 following taxonomic studies of several clinical isolates [4].

It is a small Gram-negative bacillus measuring approximately 1-2 μm , characterized by flat colony morphology, catalase positivity and oxidase negativity, while the activities of urease and β -galactosidase remain under investigation [4]. The organism has been isolated from various clinical specimens including ear swabs, wound discharge, blood, sputum and urine sample [5-8].

However, only a few cases of human infection have been reported to date, suggesting that it is a rare cause of infection in humans [5]. Because of its phenotypic resemblance to other non-fermenting Gram-negative organisms, it may be misidentified using conventional biochemical methods. Accurate identification generally requires advanced diagnostic techniques, such as matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS) [5,9].

Most reported cases of *Kerstersia gyiorum* have involved patients with otitis media, where the bacterium was isolated from purulent ear discharge [9]. In this case report, a purulent ear discharge specimen was obtained from a patient hospitalized following trauma.

Case Presentation

A 73-year-old male patient with a medical history of type 2 diabetes mellitus and arterial hypertension, both under medical treatment, was admitted to the emergency department of the Mohammed VI University Hospital Center in Tangier following a road traffic accident. The patient presented with multiple traumatic injuries associated with an initial loss of consciousness and vomiting.

A brain computed tomography (CT) scan performed as part of the trauma assessment revealed multiple frontal hemorrhagic contusions associated with bilateral oto-mastoid filling and non-visualization of the ossicular chain.

Laboratory investigations showed hyperleukocytosis with white blood cell count of $13500/\text{mm}^3$ and an elevated C-reactive protein level of 147 mg/L. During hospitalization, the patient developed bilateral otorrhea, without any pain or fever, and with inflammation of the right tympanic membrane, while the left tympanic membrane could not be visualized on otoscopic examination. A swab of the purulent ear discharge was collected and sent to the microbiology laboratory for cytobacteriological analysis.

After 24 hours of incubation at 37°C in 5% CO_2 significant polymicrobial bacterial growth was observed on blood agar. The colonies appeared flat and slightly greyish, while others were small and transparent. Identification was performed using MALDI-TOF MS (Bruker Daltonics, Bremen, Germany), which revealed the presence of *Kerstersia gyiorum*, *Escherichia coli* and *Achromobacter xylosoxidans*. The isolate log score of *Kerstersia gyiorum* was 2,38 indicating high-confidence species identification according to the manufacturer's criteria (Figure 1).

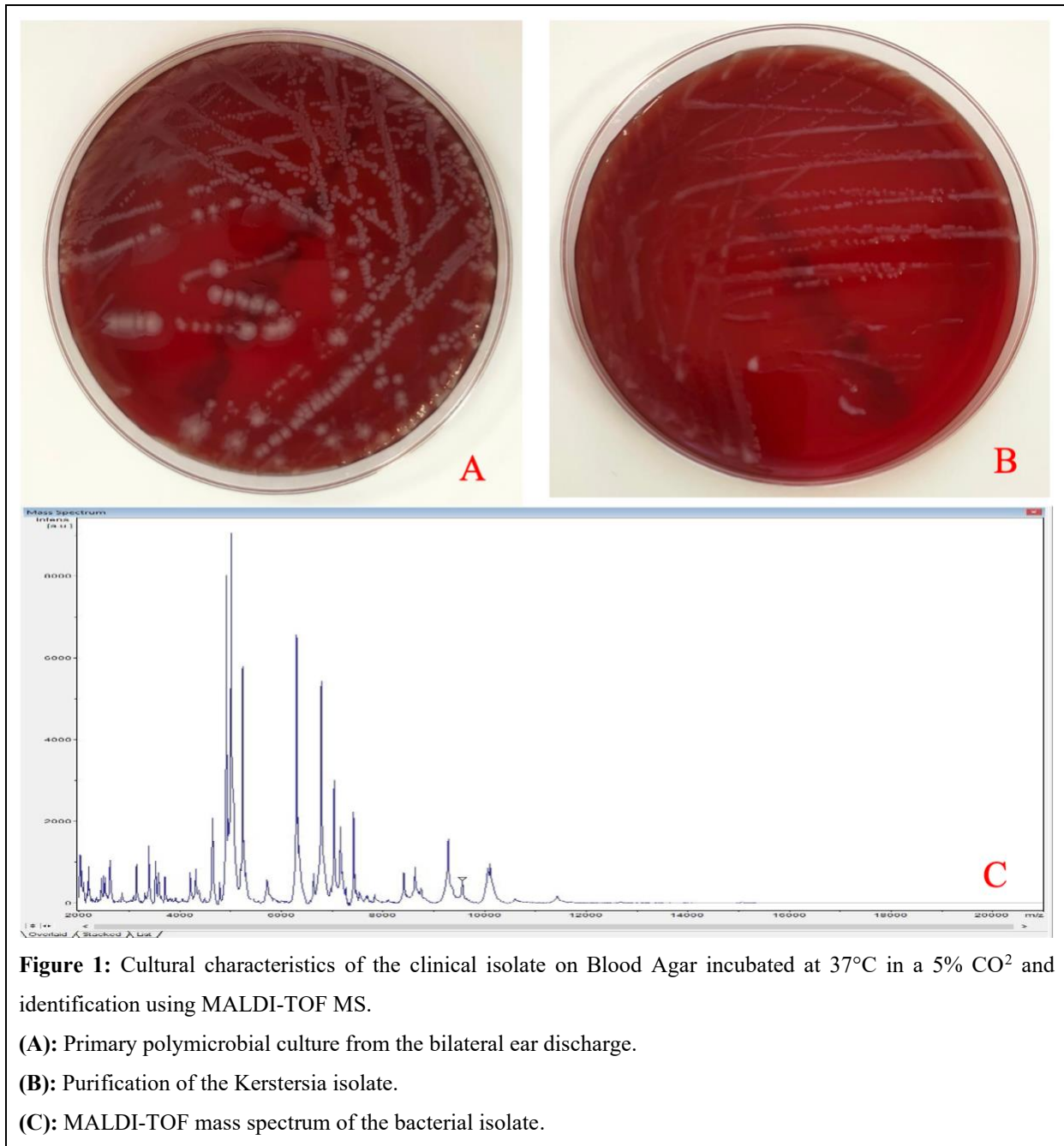


Figure 1: Cultural characteristics of the clinical isolate on Blood Agar incubated at 37°C in a 5% CO² and identification using MALDI-TOF MS.

(A): Primary polymicrobial culture from the bilateral ear discharge.

(B): Purification of the *Kerstersia* isolate.

(C): MALDI-TOF mass spectrum of the bacterial isolate.

Antimicrobial susceptibility testing was performed using the disk diffusion method on Mueller–Hinton agar according to the guidelines established by the Antibiogram Committee of the French Society of Microbiology (CA-SFM). The antibiotic evaluated included amikacin, amoxicillin/clavulanic acid, piperacillin/tazobactam, ceftriaxone, ceftazidime, cefepime, ciprofloxacin, levofloxacin, imipenem, meropenem and sulfamethoxazole/trimethoprim. The isolate demonstrated susceptibility to all antibiotics that were tested.

Based on the microbiological findings and the antimicrobial susceptibility results, the patient was treated with amoxicillin/clavulanic acid (1g every 8 hours) The patient showed clinical evolution with progressive resolution of symptoms.

Discussion

Based on the available literature, this remains the first reported case of *Kerstersia gyiorum* isolated from purulent ear discharge specimen in a patient with acute otitis media associated with underlying immunodeficiency. To our knowledge, this is also the first case described in North Africa, particularly in Morocco. Most published reports of *Kerstersia gyiorum* infections involve chronic otologic disease [5,10-13].

The isolation of *Kerstersia gyiorum* in our patient may be explained by the disruption of the natural protective barriers of the ear following trauma. In cases of cranial injury or tympanic membrane damage, local defense mechanisms may be compromised, facilitating colonization by opportunistic environmental microorganisms. The possibility of underlying chronic otitis that was not previously known or documented in the patient's medical history cannot be excluded.

Another important feature of infections involving *Kerstersia gyiorum* is their frequent polymicrobial nature. Previous studies have reported its isolation together with other microorganisms such as *Staphylococcus aureus*, *Proteus mirabilis*, *Escherichia coli* and *Pseudomonas aeruginosa* in chronic ear infections [11,12]. In our case, *Kerstersia gyiorum* was isolated together with *Escherichia coli* and *Achromobacter xylosoxidans* from purulent ear discharge, supporting the hypothesis that this organism may participate in polymicrobial infections.

Antimicrobial susceptibility profiles of *Kerstersia gyiorum* reported in the literature are variable. Some studies have reported resistance to fluoroquinolones, particularly ciprofloxacin, in isolates recovered from chronic suppurative otitis media [9,12]. However, several reports have described susceptibility to a wide range of antimicrobial agents, including β -lactams, aminoglycosides, and carbapenems [10,12,14]. These findings are consistent with our results, as the isolate recovered in our study was susceptible to all tested antibiotics.

Overall, our case supports previous observations suggesting that *Kerstersia gyiorum* is a rare but potentially underrecognized pathogen in suppurative ear infections. Increased awareness of this organism and the use of modern identification methods such as MALDI-TOF MS may improve its detection in clinical microbiology laboratories.

Conclusion

This case describes the rare isolation of *Kerstersia gyiorum* from purulent ear discharge in a patient with acute otitis media associated with underlying immunodeficiency and trauma. Although this organism has been rarely reported in the literature, our findings suggest that it may be underrecognized rather than truly exceptional, particularly in polymicrobial ear infections. Our findings also suggest that *Kerstersia gyiorum* may be involved not only in chronic otologic infections but also in acute suppurative ear infections, particularly in the presence of disrupted local barriers and polymicrobial conditions. The use of advanced identification techniques, such as MALDI-TOF MS, is important for the accurate detection of this uncommon pathogen. It is necessary to increase awareness among clinicians and microbiologists to facilitate the recognition of *Kerstersia gyiorum* and to clarify its role in ear infections.

Statement

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REFERENCES

1. Verhoeff M, van der Veen EL, Rovers MM, et al. Chronic suppurative otitis media: a review. *Int J Pediatr Otorhinolaryngol.* 2006; 70: 1-12.
2. Mittal R, Lisi CV, Gerring R, et al. Current concepts in the pathogenesis and treatment of chronic suppurative otitis media. *J Med Microbiol.* 2015; 64: 1103-1116.
3. Austin B. The Family Alcaligenaceae. In: *The Prokaryotes.* Springer, Berlin, Heidelberg. 2014; 729-757.
4. Coenye T, Vancanneyt M, Cnockaert MC, et al. *Kerstersia gyiorum* gen. nov., sp. nov., a novel *Alcaligenes faecalis*-like organism isolated from human clinical samples, and reclassification of *Alcaligenes denitrificans* R ger and Tan 1983 as *Achromobacter denitrificans* comb. nov. *Int J Syst Evol Microbiol.* 2003; 53: 1825-1831.
5. Pence MA, Sharon J, McElvania Tekippe E, et al. Two cases of *Kerstersia gyiorum* isolated from sites of chronic infection. *J Clin Microbiol.* 2013; 51: 2001-2004.
6. Almuzara MN, Barberis CM, Traglia GM, et al. Isolation of *Kerstersia gyiorum* from a patient with cholesteatomatous chronic otitis media. *J Clin Microbiol.* 2012; 50: 3809-3811.
7. Bostwick AD, Zhang C, Manninen K, et al. Bacteremia Caused by *Kerstersia gyiorum*. *J Clin Microbiol.* 2015; 53: 1965-1967.
8. Ogawa Y, Lee S-T, Kasahara K, et al. A first case of isolation of *Kerstersia gyiorum* from urinary tract. *J Infect Chemother Off J Jpn Soc Chemother.* 2016; 22: 265-267.
9.  zcan N, Saat N, Yildirim Baylan M, et al. Three cases of Chronic Suppurative Otitis Media (CSOM) caused by *Kerstersia gyiorum* and a review of the literature. *Infez Med.* 2018; 26: 364-368.
10. AlSunbul NF, Somily AM, AlOmar RO, et al. *Kerstersia gyiorum* Isolated and Identified from the External Auditory Meatus of an Immunocompromised Patient: A Case Report and Literature Review. *Cureus.* 2024; 16: 76100.
11. Mwalutende A, Mshana SE, Mirambo MM, et al. Two cases of chronic suppurative otitis media caused by *Kerstersia gyiorum* in Tanzania: is it an underappreciated pathogen in chronic otitis media? *Int J Infect Dis IJID Off Publ Int Soc Infect Dis.* 2014; 29: 25
12. Uysal EB,  elik C, Tuzcu N, et al. A case of chronic suppurative otitis media caused by *Kerstersia gyiorum*. *APMIS Acta Pathol Microbiol Immunol Scand.* 2015; 123: 986-989.
13. Zhang T, Zhu B, Huang C. *Kerstersia gyiorum*-Caused Chronic Osteomyelitis in a Male Patient with Cerebral Infarction: A Case Report and Literature Review. *Infect Drug Resist.* 2025; 18: 6071-6077.
14. Kim J-H, Lee E, Lee Y. The First Case of Chronic Otitis Media due to *Kerstersia gyiorum* in Korea. *Ann Lab Med.* 2018; 38: 607-609.