



Case report

Brevibacterium massiliense bacteremiaMaude Vecten^{a,b}, Frédérique Gouriet^{a,b,*}, Aline Cano^c, Didier Raoult^{a,b}^a Unité de Recherche sur les Maladies Infectieuses et Tropicales Emergentes, UM 63, UMR CNRS 7278, IRD 198, Inserm 1095, Aix-Marseille Université, Faculté de Médecine, 13385 Marseille, France^b Pôle de Maladies Infectieuses, Hôpital de la Timone, Rue St Pierre, 13385 Marseille France^c Centre de Référence des Maladies Héritaires du Métabolisme- Service Pr CHABROL, CHU La Timone Enfants, Rue St Pierre, 13385 Marseille, France

ARTICLE INFO

Article history:

Received 15 September 2016

Received in revised form 22 November 2016

Accepted 22 November 2016

Keywords:

Bacteremia

Brevibacterium sp.

ABSTRACT

Brevibacterium massiliense infection in man is rare. We report here the second case with isolation of *B. massiliense* in human. This micro-organism requires specific laboratory investigations such as 16S rRNA gene sequencing for accurate species identification. The clinical outcome was favorable.

© 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Case presentation

In December 2015, a 4-year-old boy was admitted to the pediatric neurology unit of Timone Pediatric Hospital, Marseille, France for fever.

The patient is followed in the center of reference for metabolic disease because of a methylmalonic acidemia (with C.844C>G mutation homozygous in the MUT gene) diagnosed when he was 8 months old in a context of metabolic acidosis and preexisting hypotonia, during an intercurrent illness. Because of feeding difficulties due to his metabolic disease, a gastrostomy tube was placed when he was 2 years old. The treatment of his metabolic disease consist of a protein restricted diet, with hypercaloric nutrition and antimicrobial therapy with metronidazole 3 weeks per month to reduce propionic acid formation (a source of intoxication in this disease) by gut flora.

Before hospitalization, he saw his general practitioner for fever, cough and vomiting for 4 days, who prescribed cefixime orally. On admission his physical exam shows only congestive eardrums and a discharge of left ear without pharyngitis. Blood test included CRP=0.59 mg/dL, white blood cells=9400 μ L, platelets: 363,000 μ L; creatine: 37 μ mol/L, urea: 3.5 mmol/l, ASAT:74UI/L, ALAT: 32UI/L, oxalemia: 0.020 mmol/l, HCO₃: 22.4 mmmol/l. The oral cefixime was stopped, and intra-auricular ofloxacin was prescribed for 8 days. After 3 days in hospital, he returned to home

with no symptoms. The blood culture (pediatric blood culture BACTEC; Becton Dickinson, Sparks, MD) performed on admission was positive after 72 h of culture with Gram positive bacilli. The Gram-positive bacillus was isolated but no phenotypic identification was obtained by MicroFlex mass spectrometer (Bruker Daltonics, Bremen, Germany). Molecular identification based on 16s rRNA gene sequence comparison was performed [6] and showed that the isolate was *Brevibacterium massiliense* with 99.60% of similarity with the genbank sequence NR116479. Susceptibility of the strain was tested using the disk diffusion method on Mueller-Hinton agar plates incubated at 37 °C for 24 h. Our isolate was susceptible to amoxicillin, amoxicillin clavulanic acid, cefixime, imipenem, ofloxacin and vancomycin. The mother was contacted, and the boy had no fever and was in a good healthy state. No more antimicrobials were prescribed.

We report here the second case of isolation with *B. massiliense* in human, in blood culture. *B. massiliense* was isolated and this new species was described for the first time in 2009 [8] and his draft genome sequence was performed in 2012 [9]. The strain was isolated from an ankle discharge obtained from a patient with open dislocation on the left ankle and a fibula fracture [8]. *Brevibacterium* species are Gram positive bacilli, non-spore-forming, non-branching rods. The genus *Brevibacterium* consists of 50 different species. Nine species have been isolated from human: *B. casei* is the most frequent human isolate, *B. epidermidis*, *B. otitidis*, *B. paucivorans*, *B. sanguinis*, *B. linens*, *B. iodinum*, *B. mcbrellneri*, and *B. massiliense* [8,9]. *Brevibacterium* spp. have been isolated from dairy product (raw milk and surface-ripened cheeses) and it is part of normal human skin [4]. In the literature, *Brevibacterium* have been isolated from human. *Brevibacterium* sp. have been implicated in several infections such as peritonitis [1], bacteremia [4], bone

* Corresponding author at: Unité de Recherche sur les Maladies Infectieuses et Tropicales Emergentes, UM 63, UMR CNRS 7278, IRD 198, Inserm 1095, Aix-Marseille Université, Faculté de Médecine, 27 Blvd Jean Moulin, 13385, Marseille, cedex 05, France.

E-mail address: frederique.gouriet@ap-hm.fr (F. Gouriet).

infection [7,8], pericardial infection [2], endocarditis [3], brain abscess [5]. These organisms have emerged as opportunistic pathogens in most reported cases; patients had underlying malignancy or immunodeficiency disease [10].

Conclusion

Phenotypic method failed in the identification of *B. massiliense* only the 16S rRNA gene sequencing allowed to identify the strain. Misidentification in routine microbiology laboratory conduces to underestimation of such relevant bacteria and may considerably impact the diagnosis of emerging pathogens. Therefore, it is important to sensitize microbiologists to identify this environmental bacteria using the 16S rRNA gene sequencing.

Consent

Written consent was obtained from the patient parent's for publication of this Case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Competing interests

None.

Authors' contributions

MV participated to write the manuscript, FG participated in the design and coordination and helped to draft the manuscript, AC

managed the patient, DR conceived of the study. All authors read and approved the final manuscript.

Acknowledgments

We thank Emmanuelle Bosdure, Sophie Edouard, and Brigitte Chabrol for the patient management.

References

- [1] Althaf MM, Abdelsalam MS, Alsunaid MS, Hussein MH. *Brevibacterium casei* isolated as a cause of relapsing peritonitis. *BMJ Case Rep* 2014;19:..
- [2] Cannon JP, Spandoni SL, Pesh-Iman S, Johnson S. Pericardial infection caused by *Brevibacterium casei*. *Clin Microbiol Infect* 2005;11:164–5.
- [3] Dass KN, Smith MA, Gill VJ, Goldstein SA, Lucey DR. *Brevibacterium endocarditis*: a first report. *Clin Infect Dis* 2002;35:e20–1.
- [4] Janda WM, Tipirneni P, Novak RM. *Brevibacterium casei* bacteremia and line sepsis in a patient with AIDS. *J Infect* 2003;46:61–4.
- [5] Kumar VA, Augustine D, Panikar D, Nandakumar A, Dinesh KR, Karim S, et al. *Brevibacterium casei* as a cause of brain abscess in an immunocompetent patient. *J Clin Microbiol* 2011;49:4374–6.
- [6] Morel AS, Dubourg G, Prudent E, Edouard S, Gouriet F, Casalta JP, et al. Complementarity between targeted real-time specific PCR and conventional broad-range 16S rDNA PCR in the syndrome-driven diagnosis of infectious diseases. *Eur J Clin Microbiol Infect Dis* 2014;34:561–70.
- [7] Neumeister B, Mandel T, Gruner E, Pfyffer GE. *Brevibacterium* species as a cause of osteomyelitis in a neonate. *Infection* 1993;21:177–8.
- [8] Roux V, Raoult D. *Brevibacterium massiliense* sp. nov., isolated from a human ankle discharge. *Int J Syst Evol Microbiol* 2009;59:1960–4.
- [9] Roux V, Robert C, Gimenez G, Raoult D. Draft genome sequence of *Brevibacterium massiliense* strain 541308T. *J Bacteriol* 2012;194:5151–2.
- [10] Ulrich S, Zbinden R, Pagano M, Fischler M, Speich R. Central venous catheter infection with *Brevibacterium* sp. in an immunocompetent woman: case report and review of the literature. *Infection* 2006;34:103–6.