

***Brevibacterium casei* bacteraemia in a port-a-cath carrier patient: a case report and literature review**

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SUMMARY

Brevibacteria are part of the normal flora of the skin and adjacent structures, but have been increasingly encountered in humans as opportunistic pathogens and have been isolated from various clinical specimens, generally causing infections in immuno-compromised patients.

We present a case of a port-a-cath-related bacteraemia caused by *Brevibacterium casei* in a woman with a prior history of bilateral breast cancer. The clinical outcome was favourable.

Keywords: *Brevibacterium*, bacteraemia, diagnosis.

■ INTRODUCTION

The *Brevibacterium* genus contains irregular, rod-shaped, Gram-positive bacteria and, until recently, they were postulated to be cutaneous saprophytes with no pathogenic ability [1]. There are some cases of infections caused by this genus, mainly in immunocompromised patients [2-10]. The *Brevibacterium* genus consists of 45 different species, but only ten have been isolated from clinical samples [1, 6, 11]. *Brevibacterium casei* is the species that more frequently causes diseases [3, 5, 10, 12].

Here we report a case of bloodstream infection with *Brevibacterium casei*, probably related to a port-a-cath, in an immunocompetent woman, with a previous history of immunosuppression.

■ CASE REPORT

A 48-year-old woman with a prior history of bilateral breast cancer was subjected to surgery

associated with chemotherapy and radiotherapy in 2013 and successively to annessiectomy for genetic predisposition to neoplasia. She was hospitalized on October 2015, after persistent hyperpyrexia and therapy with oral ciprofloxacin (500 mg twice daily for twenty days), with a temporary remission.

Five days after drug discontinuation, the patient still had fever associated with myalgia.

At the entrance of the Emergency Unit (EU), the objective examination highlighted skin pallor, cardio-thoracic parameters within the limits, abdominal pain susceptible to hypogastric palpation, not superficial lymphadenopathies. She still had a transjugular port-a-cath since the previous chemotherapy treatment, without erythema, pus or tenderness at the site of insertion. Chest X-ray, abdominal ultrasound was normal and urine culture negative. The Widal-Wright serodiagnosis was also negative. The echocardiogram showed no signs of endocarditis. Blood for culture was obtained from peripheral venipuncture. No blood cultures from the port-a-cath could be performed because of its mechanical failure.

Hematochemical analyses recorded reactive protein C 5.97 mg/dL (nv <0.5 mg/dL), hepato-renal function and blood count within the limits. Bac-

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terial positivity was reported in three out of four peripheral venous blood cultures. The microorganism was recovered in the BacT/Alert system blood culture bottles (bioMérieux, France) and grown on Columbia CNA agar plates (bioMérieux, France). The isolates appeared as Gram-positive, club-shaped, slightly curved rods. Identification by MALDI-TOF (bioMérieux, France) revealed a *Brevibacterium casei*.

Antibiotic susceptibility results were determined by E-test (AB Biodisk, Solna, Sweden) procedure on Mueller-Hinton agar (Becton Dickinson, Italy). The strain was sensitive to daptomycin, gentamicin, imipenem, linezolid, meropenem and vancomycin, based on the Clinical and Laboratory Standards Institute (CLSI) guidelines, applying susceptibility results to *Corynebacterium* species [13]. Being the blood cultures positive for Gram-positive bacteria, an empirical therapy with teicoplanin was intravenously administered for a week, at an initial loading dose of 400 mg twice on the first day (patient's weight 50 Kg), followed by a maintenance dose of 400 mg a day, before susceptibility testing results. During this time, the patient consistently recovered. Further control blood cultures performed in the first week of November were negative. Then, under suspicion of a port-a-cath infection, the device was removed and, on the basis of antimicrobial susceptibility data, a home therapy with linezolid (600 mg every 12 hours) was undertaken for a further week. In the clinical surveillance during the following months, the patient constantly remained afebrile and did not present further infectious complications or relapses.

■ DISCUSSION

Brevibacteria were described as pathogens for the first time in 1991 when McCaughey documented the first case of central venous catheter infection caused by *B. epidermidis* in a 40-year-old man [14]. Since then, relatively few cases have been reported with *Brevibacterium* spp. causing disease in humans [10, 12].

These organisms appear to be opportunistic pathogens, mostly involving patients with immunodeficiency or suffering from severe disease (endocarditis, cancer, acute urticaria) [2-5, 7-10, 14-16]. Several of these patients had indwelling

foreign material (CVC), prosthetic mitral and aortic valve, or continuous ambulatory peritoneal dialysis catheter as risk factors for infection [2-7, 9, 10, 15, 17, 18]. Indwelling foreign material can be a risk factor for catheter-related bloodstream infections (CR-BSI). All the reported cases were treated with a combination of various antibiotics, especially glycopeptides and quinolones; however, catheter removal should be the preferred concomitant treatment for *B. casei* associated bacteremia.

This case report is a further demonstration of how environmental bacteria, such as the brevibacteria, are uncommon, but important pathogens to be considered as a cause of opportunistic infections mostly in immunocompromised, but also in immunocompetent subjects.

The patient here reported was home-treated with linezolid and her device removed; no recurrence occurred in the following six months.

■ REFERENCES

- [1] Funke G., von Graevenitz A., Clarridge J.E. 3rd, Bernard K.A. Clinical microbiology of coryneform bacteria. *Clin. Microbiol. Rev.* 10, 125-159, 1997.
- [2] Lina B., Carlotti A., Lesaint V., Devaux Y., Freney J., Fleurette J. Persistent bacteremia due to *Brevibacterium* species in an immunocompromised patient. *Clin. Infect. Dis.* 18, 487-488, 1994.
- [3] Kaukoranta-Tolvanen S.S., Sivonen A., Kostiala A.A., Hormila P., Vaara M. Bacteremia caused by *Brevibacterium* species in an immunocompromised patient. *Eur. J. Clin. Microbiol. Infect. Dis.* 14, 801-804, 1995.
- [4] Reinert R.R., Schnitzler N., Haase G., et al. Recurrent bacteremia due to *Brevibacterium casei* in an immunocompromised patient. *Eur. J. Clin. Microbiol. Infect. Dis.* 14, 1082-1085, 1995.
- [5] Brazzola P., Zbinden R., Rudin C., Schaad U.B., Heininger U. *Brevibacterium casei* sepsis in an 18-year-old female with AIDS. *J. Clin. Microbiol.* 38, 3513-3514, 2000.
- [6] Wauters G., Van Bosterhaut B., Avesani V., et al. Peritonitis due to *Brevibacterium otitidis* in a patient undergoing continuous ambulatory peritoneal dialysis. *J. Clin. Microbiol.* 38, 4292-4293, 2000.
- [7] Dass K.N., Smith M.A., Gill V.J., Goldstein S.A., Lucey D.R.. *Brevibacterium* endocarditis: a first report. *Clin. Infect. Dis.* 35, e20-e21, 2002.
- [8] Ogunc D., Gultekin M., Colak D., et al. Bacteremia caused by *Brevibacterium* species in a patient with chronic lymphocytic leukemia. *Haematologia (Budap).* 32, 151-153, 2000.

- [9] Janda W.M., Tipirneni P., Novak R.M. *Brevibacterium casei* bacteremia and line sepsis in a patient with AIDS. *J. Infect.* 46, 61-64, 2003.
- [10] Bal Z.S., Sen S., Karapinar D.Y., Aydemir S., Vardar F. The first reported catheter-related *Brevibacterium casei* bloodstream infection in a child with acute leukemia and review of the literature *Braz. J. Infect. Dis.* 19, 213-215, 2015.
- [11] Gruner E., Steigerwalt A.G., Hollis D.G., et al. Human infections caused by *Brevibacterium casei*, formerly CDC groups B-1 and B-3. *J. Clin. Microbiol.* 32, 1511-1518, 1994.
- [12] 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* 34, 103-106, 2006.
- [13] Wayne P.A. Clinical and Laboratory Standard Institute. Methods for antimicrobial dilution and disk susceptibility testing for infrequently isolated or fastidious bacteria; approved guideline-second edition. M45-A2, vol. 30, no. 18. Clinical and Laboratory Standard Institute, 2010.
- [14] McCaughey C., Damani N.N. Central venous line infection caused by *Brevibacterium epidermidis*. *J. Infect.* 23, 211-212, 1991.
- [15] Castagnola E., Conte M., Venzano P., et al. Broviac catheter-related bacteraemias due to unusual pathogens in children with cancer: case reports with literature review. *J. Infect.* 34, 215-218, 1997.
- [16] Bonavila J.C., Michelena Bengoechea A., Zubeltzu Sese B., Goenaga Sánchez M.Á. Recurrent endocarditis due to *Brevibacterium casei*: case presentation and a review of literature. *Enferm. Infecc. Microbiol. Clin.* 35,127-128, 2017.
- [17] Beukinga I., Rodriguez-Villalobos H., Deplano A., Jacobs F., Struelens M.J. Management of long-term catheter-related *Brevibacterium* bacteraemia. *Clin. Microbiol. Infect.* 10, 465-467, 2004.
- [18] Antoniou S., Dimitriadis A., Polydorou F., Malaka E. *Brevibacterium iodinum* peritonitis associated with acute urticaria in a CAPD patient. *Perit. Dial. Int.* 17, 614-615, 1997.