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## CORRESPONDENCE

## *Shewanella putrefaciens* bacteremia in a uremic patient receiving hemodialysis



To the Editor,

*Shewanella putrefaciens* is rarely responsible for clinical syndromes or bacteremia,<sup>1,2</sup> but it is a potential pathogen for patients with immunocompromised conditions.<sup>1,3</sup> Recently Wu et al<sup>4</sup> reported that a comparison between patients under hemodialysis with community-onset bacteremia caused by community- and health care-associated methicillin-resistant *Staphylococcus aureus* strains. Despite *Staphylococcus* spp. being the most common pathogen of catheter-related bacteremia in patients receiving hemodialysis for end-stage renal disease,<sup>4</sup> the nonfermentative Gram-negative bacilli also play an important role. Here, we are reporting a uremic patient who was diagnosed as *S. putrefaciens* bacteremia associated with permanent catheter-related bloodstream infection.

An 82-year-old woman was admitted to the ward with fever and chills for 2 days. The patient had a history of chronic renal failure undergoing regular hemodialysis for the past 5 years. She had cervical cancer with bladder invasion, stage 4, complicating with bilateral hydronephrosis. Initially, she was diagnosed as complicated urinary tract infection, and the urine culture showed the growth of *Proteus mirabilis*. She received cefuroxime 1 g intravenously every 6 hours. Defervescence was noted and urine analysis yielded no pyuria after she received a 7-day course of antibiotic therapy. Unfortunately, she suffered from fever again at the 14<sup>th</sup> admission day. The blood cultures from both peripheral vessels and intrapermanent catheter both yielded a Gram-negative bacillus. The isolate was identified as *S. putrefaciens* by conventional method and Phoenix NID card (Becton Dickinson Diagnostic Systems, Sparks, MD, USA). The isolate was further analyzed by matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF) using Bruker Biotyper (Bruker Daltonik GmbH, Bremen, Germany) and identified as *S. putrefaciens* (score value, 2.249; Fig. 1).<sup>2</sup>

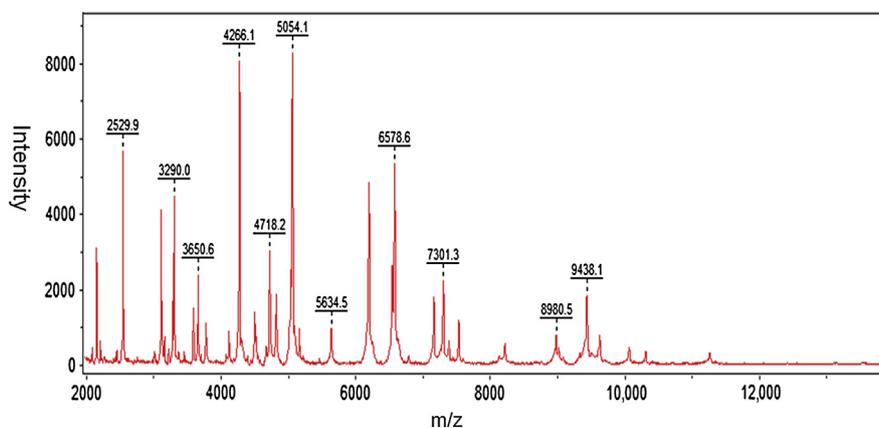
Minimum inhibitory concentrations (MICs) of the isolates to antimicrobial agents were determined using the E-test (AB Biodisk, Solna, Sweden) according to the manufacturer's guidelines. The isolate was resistant to cefazolin (MIC, 64 mg/L), cefmetazole (64 mg/L), ciprofloxacin (8 mg/L), and imipenem (4 mg/L), and susceptible to cefotaxime (0.5 mg/L), doripenem (0.25 mg/L), meropenem (0.5 mg/L), and amikacin (8 mg/L). The patient received doripenem 500 mg intravenously every 24 hours, supplemented with 500 mg intravenously after hemodialysis. The patient was discharged home after a complete 14-day therapy of doripenem.

*S. putrefaciens* is a nonfermentative Gram-negative facultative rod that produces hydrogen sulfide and reduces iron metabolically.<sup>1,3,4</sup> It is a ubiquitous saprophyte and can be isolated from the marine environment, contaminated water, and food.<sup>1,3</sup> *S. putrefaciens* was initially classified as a *Pseudomonas* sp., and it has become a pathogen for clinical infections in recent years.<sup>1,3,5,6</sup> *S. putrefaciens* is often resistant to penicillin, and first- and second-generation cephalosporins, but susceptible to 3<sup>rd</sup>- and 4th-generation cephalosporins, carbapenem, and aminoglycosides. The risk factors of *S. putrefaciens* infections include malignancy, chronic renal failure, and immunosuppressed patients.<sup>1,3–5</sup> The clinical outcome is often benign, except in rare uremic patients,<sup>1,5,6</sup> which may be due to immunologic dysregulations, poor nutrition, iron overload, or hemodialysis. Our patient also had a permanent catheter *in situ* for hemodialysis, which was associated with bloodstream infection. Liu et al<sup>6</sup> reported that the increasing catheter-related infection rate was associated with a poor compliance of the care bundle, because most cases were due to inadequate barrier precautions and inappropriate hand hygiene.<sup>6</sup>

Clinicians should perform bundle-care for decreasing catheter-related infection, and be aware that *S. putrefaciens*

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**Figure 1.** Spectra generated by MALDI-TOF Bruker Biotyper for *Shewanella putrefaciens*. The absolute intensities of the ions are shown on the y axis and the mass-to-charge ratios (m/z) of the ions are shown on the x axis. MALDI-TOF = matrix-assisted laser desorption ionization-time of flight mass spectrometry.

can probably be regarded as an emerging opportunistic pathogen in patients receiving hemodialysis.

### Conflicts of interest

All authors declare no conflicts of interest.

### References

1. Tsai TH, You HY. Necrotizing fasciitis caused by *Shewanella putrefaciens* in a uremic patient. *J Microbiol Immunol Infect* 2006;**39**:516–8.
2. Ford BA, Burnham CA. Optimization of routine identification of clinically relevant Gram-negative bacteria by use of matrix-assisted laser desorption ionization-time of flight mass spectrometry and the Bruker Biotyper. *J Clin Microbiol* 2013;**51**:1412–20.
3. Pagani L, Lang A, Vedovelli C, Moling O, Rimenti G, Pristerà R, et al. Soft tissue infection and bacteremia caused by *Shewanella putrefaciens*. *J Clin Microbiol* 2003;**41**:2240–1.
4. Wu HS, Kuo SC, Chen LY, Chiang MC, Lin YT, Wang FD, et al. Comparison between patients under hemodialysis with community-onset bacteremia caused by community-associated and healthcare-associated methicillin-resistant *Staphylococcus aureus* strains. *J Microbiol Immunol Infect* 2013;**46**:96–103.
5. Brink AJ, van Straten A, van Rensburg AJ. *Shewanella (Pseudomonas) putrefaciens* bacteremia. *Clin Infect Dis* 1995;**20**:1327–32.
6. Liu WL, Chen HT, Lai CC, Hsueh PR. Intervention to reduce catheter-related bloodstream infections in an intensive care

unit at a regional hospital in southern Taiwan. *J Microbiol Immunol Infect* 2013;**46**:243–4.

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