CLINICAL VIGNETTE

A Case of Shewanella Algae Bacteremia

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Case Presentation

A 65-year-old man with a history of hepatitis C induced cirrhosis; chronic bilateral venous insufficiency; and a chronic, non-healing ulcer of the medial malleolus presented to the Emergency Department with 3 days left lower extremity swelling, subjective fever, and pain. He had been in his normal state of health until 3 days prior to admission when he noticed onset of left lower extremity swelling. His leg became increasingly red and painful to the point of having difficulty walking. The day prior he reported feeling like he had a fever but had not taken his temperature. He went to see his primary care provider who documented vital signs of temperature 103.1 degrees F, blood pressure 133/77, and heart rate 108. In clinic, blood cultures were drawn, and he received 1 gram of vancomycin and a liter of normal saline. He was then sent to the Emergency Department.

During questioning in the Emergency Department, the patient reported no recent antibiotic use and no sick contacts. He reported fishing in the ocean 2-3 times a week. Although he used waterproof boots and clothing while fishing, he stated that his feet often get wet with seawater when he fishes. Physical exam was significant for left lower extremity erythema, significant edema, and tenderness to palpation from the mid-shin down. There was a scab over the chronic wound of the medial malleolus. The skin between his toes was extremely macerated, moist, and putrid, with slight purulence. Otherwise, his exam was unremarkable and was without stigmata of endocarditis. Labs were remarkable only for a white blood count of 12.7, AST 102, and an ALT of 11. CT scan of the leg showed subcutaneous edema and skin thickening around the ankle and overlying the anterolateral leg, which, while nonspecific, was thought to represent cellulitis. There was no evidence of necrotizing fasciitis or osteomyelitis. An ultrasound of the left leg showed no evidence of a deep vein thrombosis.

The patient was started on empiric vancomycin and pipercillin-tazobactam. His initial blood culture eventually returned positive for *Shewanella algae* that was pan-sensitive to all antibiotics tested. Podiatry took the patient to the Operating Room where they performed extensive debridement of necrotic tissue of the dorsum of the patient's foot. Intra-operative cultures subsequently grew *Shewanella algae* as well. Based on sensitivities and after consultation by Infectious Disease, he was switched over to ciprofloxacin. The patient remained afebrile on ciprofloxacin and subsequent blood cultures remained negative. The patient was discharged with a wound vac in place to finish a 14-day course of oral ciprofloxacin.

Discussion

Shewanella algae is a gram negative marine organism that rarely causes infection in human beings. The genus was originally named after James Shewan.[1] Found in both sea water and fresh water, it is now known that *Shewanella* infections tend to occur more frequently in warmer summers with warmer water temperatures.[2] For instance, in Denmark the bacteria can only be isolated between July and October when the water temperature is warm enough.[3] In the past, the majority of human infections were thought to be caused by *Shewanella putrefaciens*. However, new diagnostic techniques now make it possible to better subspeciate *Shewanella* organisms, and it is now thought that prior reported cases of *Shewanella putrefaciens* infections may actually have been caused by *Shewanella algae*.[4] In humans, most common infections are of the skin, soft tissue, and ears, and bacteremia has been reported as well.[2] The classic reported presentation is that of a patient with a chronic skin wound, very often of the leg, which was reported to be as high as 51% in one case series.[4-6] It appears that this wound acts as an initial portal of entry into the body. However, there are case reports where a pre-existing wound was not present including presentations of gastroenteritis and a clinical mimic of *Vibrio vulnificans* with necrotizing fasciitis after raw seafood ingestion.[5,7]

Interestingly, in one case series from Taiwan, all patients with *Shewanella* bacteremia had underlying liver or hepatobiliary disease, as with the presentation of our patient.[8] In our case, the *Shewanella algae* isolated was pan-sensitive, but it is reported that *Shewanella* is inherently resistant to penicillin (the lab did not test for Penicillin sensitivity in our case). In the Taiwan case series, most patients got either ceftriaxone or ceftazidime, both reported at 100% sensitivity. Given the sensitivities on testing by our lab and ease of administration, Infectious Disease ultimately recommended ciprofloxacin for his treatment. The patient has done well post-discharge and has remained infection free.

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