

Mycobacterium Marine Infections: Shark Bite

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Introduction:

Shark bite wounds pose a high risk for infection due to exposure to marine environments, which often harbor unusual pathogens. Repeat procedures and wound wash-outs can make it difficult to distinguish osteomyelitis from post-operative inflammation. Marine pathogens such as mycobacterium can be difficult to culture and may take 2-6 weeks, PCR should be considered.

Case:

This is a 15-year-old female who underwent a right lower extremity below-knee amputation (BKA) following a shark bite in Belize. She initially received a right guillotine BKA at a local hospital, which was later formalized. After stabilization, she was transferred to Miami, where she required a revision amputation due to a methicillin-sensitive *Staphylococcus aureus* (MSSA) infection.

Upon returning to Colorado she developed a fever and visited the emergency department. An orthopedic washout was performed, revealing *Enterococcus faecalis* in the cultures, for which she received antibiotic treatment. However, due to ongoing purulent drainage and persistent fevers, she was transferred to Children's Hospital Colorado.

A review of her last washout in Aspen revealed slow-growing *Mycobacterium marinum*, which had been overlooked due to the lengthy culture time. Additional imaging raised concerns for osteomyelitis. Following discussions between the orthopedic and infectious disease teams regarding the imaging findings, the patient was started on long-term antibiotics, including Amikacin, Imipenem, Tigecycline, and Linezolid, and is currently undergoing rehabilitation.

Discussion:

This patient experienced several infectious complications, including methicillin-sensitive *Staphylococcus aureus* (MSSA), *Enterococcus faecalis* and *Mycobacterium marinum*. Following the initial surgery, the patient had a MSSA infection requiring a revision surgery, underscoring the significant risk of post-operative infections in traumatic amputations (1). The subsequent identification of *Enterococcus faecalis* during the washout in Aspen highlights the importance of monitoring for polymicrobial infections in post-amputation patients.

One challenging component of this case was the delayed identification of *Mycobacterium marinum*, a non-tuberculous mycobacterium found in aquatic environments. Studies have shown that *M. marinum* infections can be difficult to manage, often requiring extended courses of antibiotic therapy, as was necessary for this patient (2). Recent guidelines also suggest that combination antibiotic therapy, such as the regimen used in this case (Amikacin, Imipenem, Tigecycline, and Linezolid), is critical for addressing resistant or deep-seated infections (4,5).

Conclusion:

Polymicrobial infections with rare environmental pathogens following post-traumatic amputations require a multidisciplinary approach. Early detection and continued surveillance of wound cultures is integral to optimal treatment and outcomes.