

Ciprofloxacin-Resistant *Aeromonas* Infection Following Leech Therapy for Digit Replantation: Report of 2 Cases

Nickolas A. van Alphen, MD, Alexandra Gonzalez, MS, Maureen C. McKenna, MD, Theresa K. McKenna, MD, Brian T. Carlsen, MD, Steven L. Moran, MD

Medicinal leeches are commonly used after finger replantation to treat surgically unsalvageable venous congestion. Infection from *Aeromonas hydrophila* is a recognized complication of leech therapy that can be underestimated by the medical community. Ciprofloxacin and trimethoprim-sulfamethoxazole are the most commonly recommended prophylactic antibiotics used to prevent *A. hydrophila* infections during leech therapy. Here, we report 2 cases of ciprofloxacin-resistant *Aeromonas* infections, occurring within 4 months of each other. Both cases developed after leech therapy for unsuccessful digital replantation. These infections were successfully treated with ceftriaxone. Ciprofloxacin-resistant *Aeromonas* should be recognized when determining prophylactic antibiotic protocols for replant centers when leech therapy is used for finger replantation. (*J Hand Surg Am.* 2014;39(3):499–502. Copyright © 2014 by the American Society for Surgery of the Hand. All rights reserved.)

Key words Replantation, leeches, antibiotic resistance, antibiotic prophylaxis, *Aeromonas*.

MEDICINAL LEECH THERAPY HAS BEEN effectively used in the salvage of venous congested tissue after digit replantation surgery.¹ The most noteworthy risk of leech therapy is infection in the treated part, usually involving *Aeromonas hydrophila*.^{2,3} Reported incidences of infection range from 2% to 36% of cases.⁴

Aeromonas species, including *A. hydrophila*, live in the gut of the leech, where they play a symbiotic role in the digestion of blood.³ Complications due to *A. hydrophila* infection can range from minor wound

infection to major cellulitis, abscess, tissue loss, and sepsis.^{3,5,6} The most common *Aeromonas* species found in leeches produce similar clinical symptoms and have similar antibiotic sensitivities.⁷ A major infection can reduce the rates of flap or replant salvage with leech therapy from 80% to 30% or less.² The use of prophylactic antibiotics is recommended in patients receiving leech therapy because it may decrease the risk of *Aeromonas* infection.^{3,4,8}

Increasing levels of multidrug resistance have been reported in *Aeromonas*.⁴ Despite this, resistance to the most commonly recommended prophylactic antibiotics, fluoroquinolone and trimethoprim-sulfamethoxazole (TMP-SMX), has been reported to be low.^{4,9} Within 4 months, we encountered 2 cases of ciprofloxacin-resistant *Aeromonas* infections after digit replantation surgery arising from commercially available leeches. Here, we review these 2 cases and provide treatment recommendation for antibiotic prophylaxis when using leeches.

CASE 1

A 50-year-old man was transferred to our facility after a table saw amputation of 4 fingers through the

From the Department of Surgery, Division of Plastic & Reconstructive Surgery, Mayo Clinic, Rochester, Minnesota.

Received for publication July 30, 2013; accepted in revised form November 26, 2013.

We would like to acknowledge the diligent work of Division of Infectious Disease at Mayo Clinic for their help in identifying the resistant organisms presented within this paper.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

Corresponding author: Steven L. Moran, MD, Division of Plastic Surgery, Mayo Clinic, Mayo Building, 12th floor, 200 First St. SW, Rochester, MN 55905; e-mail: moran.steven@mayo.edu.

0363-5023/14/3903-0015\$36.00/0
<http://dx.doi.org/10.1016/j.jhssa.2013.11.041>

proximal phalanges. The patient had a past medical history relevant for tobacco dependency, poly-substance abuse including methamphetamine, and a previous methicillin-resistant *Staphylococcus aureus* skin and soft tissue infection not involving the upper extremity. The index, long, and ring fingers were successfully replanted. Only 1 vein could be repaired per finger. Perfusion and venous drainage were initially satisfactory; however, 48 hours after replantation, the patient was started on leech therapy and systemic anticoagulation for venous congestion. Ertapenem was administered for prophylaxis against the possibility of recurrent methicillin-resistant *S. aureus* during the leech therapy based on the infectious disease consultant's recommendation.

On postoperative day 9, the index finger developed signs of poor inflow with sluggish capillary refill, and the index finger was removed. The middle and ring fingers were amputated 22 days post-replantation. The amputation sites were covered with a reverse-radial forearm flap. This procedure was complicated by a wound infection resulting in marginal flap necrosis. The wound was cultured and grew *Aeromonas* species resistant to ertapenem, fluoroquinolone, and ampicillin/sulbactam (Table 1). He was started on vancomycin (2,300 mg intravenously [IV] q12h) and piperacillin/tazobactam (3.4 g IV q6h) empirically. Based on susceptibilities, his antibiotic regimen was changed to ceftriaxone (2 g IV q24h) and TMP-SMX double-strength (2 tablets q12h). Double coverage was provided to cover any problems in the consistent administration of home intravenous ceftriaxone antibiotic therapy. One month after starting treatment with ceftriaxone and TMP-SMX, the surgical wound was well healed with no signs of infection.

CASE 2

A 35-year-old man amputated his left index and long fingers through the proximal interphalangeal joints on a table saw. He initially underwent closure of the index amputation site and ectopic replantation of the index finger in the long finger position. Two veins were repaired. The next day, leech therapy was started on the nail bed area for venous congestion. The patient was receiving ciprofloxacin (500 mg orally twice daily) as prophylaxis for *Aeromonas*. Leech therapy was continued for 7 days. On postoperative day 8, replantation failure was confirmed, and the replanted finger was removed. Four days after being discharged, the patient was

TABLE 1. Antibiotic Sensitivity and Resistance Profile of *Aeromonas* in Case 1

| Sensitive | Resistant |
|-------------------------|----------------------|
| Tobramycin | Ciprofloxacin |
| Ceftriaxone | Ertapenem |
| Amikacin | Ampicillin-sulbactam |
| Meropenem | Levofloxacin |
| Ceftaridime | |
| Piperacillin-tazobactam | |
| TMP-SMX | |
| Cefepime | |
| Gentamicin | |

seen at an outside facility for wound drainage and foul odor coming from the long finger amputation site. Culture swabs grew *A. hydrophila* that was resistant to TMP-SMX and partially resistance to ciprofloxacin (Table 2). Based on the sensitivity profile, the patient's antibiotic therapy was changed to cefepime (2 g IV q12h), metronidazole (500 mg by mouth [PO] 3 times daily) and vancomycin (1600 mg IV q12h).

The patient was seen back at our institution in 48 hours. At this time, swab cultures taken at our institution grew *Proteus vulgaris*, which was resistant to ciprofloxacin; *Morganella morganii*, which was resistant to ciprofloxacin; and *A. hydrophila*. Both *Proteus* and *Morganella* species were TMP-SMX resistant; however, they were found to be ceftriaxone susceptible, similar to the *A. hydrophila*. Antibiotic regimen was changed to a 14-day course of ceftriaxone (2 g IV daily). The wound then healed without complication, and there have been no signs of recurrent infection.

MICROBIOLOGICAL EVALUATION OF LEECHES

Following these 2 cases, our Microbiology Department conducted an investigation to determine the source of the antibiotic resistance. They processed cultures from 4 unused leech specimens from our leech tank. The leeches had been purchased commercially from multiple sources and then stored in the tank. Two of the leeches were ground and cultured to media. Using matrix-assisted laser desorption/ionization spectrometry, microorganisms recovered were identified as *Aeromonas* species with similar sensitivity profiles, including susceptibility to ciprofloxacin and TMP-SMX. *Aeromonas veronii*, which has a similar clinical presentation to *A. hydrophila*,⁴ was also growing in one of the specimens. Gut tissue was

Download English Version:

<https://daneshyari.com/en/article/4066680>

Download Persian Version:

<https://daneshyari.com/article/4066680>

[Daneshyari.com](https://daneshyari.com)