

A Rare Case of Empedobacter Brevis Cutaneous Infection Treated Successfully with Oral Sarecycline



Susuana Adjei, MD¹; Austinn C. Miller, MD ¹; Laurie A. Temiz, BA² ; Stephen K. Tyring, MD, PhD, MBA ^{1,3}

¹Center for Clinical Studies Webster, TX; ²Meharry Medical College, Nashville, TN; ³UT Houston Department of Dermatology, Houston TX

INTRODUCTION

Empedobacter brevis, as a part of the Flavobacteriaceae family, is a non-motile, strictly aerobic, gram negative, yellow colony-forming bacterium that typically resides in soil, plants, water sources, and hospital environments.^{1,2}

The first reported case of a human infection was in **2002** when 11 out of 12 patients were diagnosed with **endophthalmitis** from an *E. brevis* infection post cataract surgery.³

More cases of *E. brevis* infections have since been reported ranging from **meningitis** to **cellulitis**.^{3,4,6} Treatment can be complicated by the **bacteria's beta lactamase gene**, which results in resistance to extended cephalosporins and carbapenems.⁵ There have been a few dermatologic manifestations of *E. Brevis* infections reported in the literature that warrant further evaluation.^{6,7}

We present a case of an *E. brevis* infection in a 61-year-old male who presented with a persistent right mid-thigh lesion.

DISCUSSION

Thought to be an environmental pathogen, increasing cases of human *E. brevis* infections are now being reported as portrayed in Table 1. There have been cases ranging from **neonates** to the **elderly**, namely those who are **immunocompromised**. Exposure of *E. Brevis* can be from hospital facilities to soils, water sources, and plants--as also depicted in some of the reported cases.

While human *E. brevis* infections increase, its dermatologic manifestations are also emerging. *E. brevis* is not found on normal skin flora, so skin infections tend to stem from **environmental exposure from breaks in the skin** such as the knee laceration with cellulitis and foot lesion with **anaphylactoid purpura and blisters**.

Treatment of infections due to *E. brevis* is by antibiotics that have activity against gram-negatives. However, this is only complicated by resistance to certain beta-lactams due to ***E. Brevis'* beta-lactamase gene**, conferring resistance to extended cephalosporins and carbapenems, as demonstrated by the sensitivities from our patient.

Patient Information	Case Details	Sensitivity Results/Treatment
65 YO female with PMH of COPD, Brown Sequard syndrome	Right knee cellulitis & bacteremia due to <i>E. brevis</i> 6 weeks post right knee replacement & subsequent fall with knee laceration	- Sensitive to most antibiotics - Treated with Levaquin for 10 days
83 YO female	Presented with anaphylactoid purpura, erythema, blisters, and erosion of the right foot. <i>E. Brevis</i> was cultured from the lesion. Biopsy showed leukocytoclastic vasculitis.	- Sensitive: minocycline HCl - Treated with minocycline HCl

Table 1. Reported cases of skin infections due to *E. Brevis*

CASE PRESENTATION

A 61-year-old male with a past medical history of hypertension, actinic keratoses, history of valve replacement (chronically on Warfarin) and prior knee replacement surgery presented with a lesion that persisted for 6 weeks after doing yard work. He reported using hydrogen peroxide and antibiotic bandages with no improvement.

Physical Exam

A non-painful right mid-thigh red, crusted linear erosion with honey-yellow crusting.

Culture

- *Empedobacter brevis* was identified by DNA sequencing.
- Resistant to **meropenem** and **tobramycin**

Treatment

Patient was initially treated with mupirocin with no improvement. 15-day course of 150mg once-daily. Sarecycline was added after the results returned and the lesion healed well over the upcoming weeks.



Figure 1.
Lesion at initial visit



Figure 2.
Lesion after a week of Seracycline



Figure 3.
One-month post-treatment

Conflict of Interest

Dr. Stephen K. Tyring is a Principal Investigator for a Clinical Trial for one of Almirall's trials.

ACKNOWLEDGEMENTS

We would like to thank the patient for providing permission to report his case.

REFERENCES

- Vandamme P, Bernardet JF, Segers P, Kersters K, Holmes B. New Perspectives in the Classification of the Flavobacteria: Description of *Chryseobacterium* gen. nov., *Bergeyella* gen. nov., and *Empedobacter* nom. rev. *International Journal of Systematic and Evolutionary Microbiology*. 1994 Oct 1;44(4):827-31
- Jooste PJ, Hugo CJ. The taxonomy, ecology and cultivation of bacterial genera belonging to the family Flavobacteriaceae. *International journal of food microbiology*. 1999 Dec 15;53(2-3):81-94.
- Janknecht P, Schneider CM, Ness T. Outbreak of *Empedobacter brevis* endophthalmitis after cataract extraction. *Graefes Arch Clin Exp Ophthalmol*. 2002 Apr;240(4):291-5. doi: 10.1007/s00417-002-0435-5. Epub 2002 Mar 12. PMID: 11981643
- Sharma D, Patel A, Soni P, Sharma P, Gupta B. *Empedobacter brevis* Meningitis in a Neonate: A Very Rare Case of Neonatal Meningitis and Literature Review. *Case Rep Pediatr*. 2016;2016:7609602. doi:10.1155/2016/7609602
- Bellais S, Girlich D, Karim A, Nordmann P. EBR-1, a novel Ambler subclass B1 beta-lactamase from *Empedobacter brevis*. *Antimicrob Agents Chemother*. 2002 Oct;46(10):3223-7. doi: 10.1128/AAC.46.10.3223-3227.2002. PMID: 12234848; PMCID: PMC128804
- Raman S, Shaaban H, Sensakovic JW, Perez G. An interesting case of *empedobacter brevis* bacteremia after right knee cellulitis. *J Glob Infect Dis*. 2012;4(2):136-137. doi:10.4103/0974-777X.96783
- Nishio E. [A case of Anaphylactoid purpura suggested to *Empedobacter* (flavobacterium) *brevis* infection concerned]. *Arerugi*. 2010 May;59(5):558-61. Japanese. PMID: 20502105.]