

The Shadows of Normal Flora on Minor Wounds: A Case Report of an Uncommon Pathogen With Potentially Lethal Consequences

Review began 04/25/2024
Review ended 05/01/2024
Published 05/04/2024

© Copyright 2024

Arshad et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Khurram Arshad ¹, Farman Ali ², Yazan Alamro ³, Rabia Latif ⁴, Antoine Egbe Bessong Tabot ⁵

1. Internal Medicine, Corewell Health East Dearborn, Dearborn, USA 2. Medicine, St. John Hospital and Medical Center, Detroit, USA 3. Internal Medicine, Beumont Hospital Dearborn, Dearborn, USA 4. Internal Medicine, McLaren Hospital, Flint, USA

Corresponding author: Rabia Latif, rabialatif181@yahoo.com

Abstract

Staphylococcus lugdunensis is a gram-positive, coagulase-negative organism, typically found in the normal skin flora, predominantly colonizing the perineal region. It has gained recognition as an opportunistic pathogen capable of causing severe infections.

This manuscript presents a case study of a 75-year-old female with multiple comorbidities, including hypertension, hyperlipidemia, atrial fibrillation on Xarelto, type 2 diabetes mellitus, hypothyroidism, and a bioprosthetic aortic valve. The patient exhibited symptoms of fever, chills, and lethargy following a dog scratch that resulted in wounds on the left lower extremity. Despite initial negative findings in the drug screen and unremarkable workup for other infectious etiologies, the patient's clinical course revealed the presence of *S. lugdunensis* in the blood cultures. Timely intervention with broad-spectrum intravenous antibiotics and a six-week course of cefazolin led to significant improvement without recurrence.

Staphylococcus lugdunensis, previously considered a relatively benign microorganism, has become a significant player in infectious diseases, particularly causing skin and soft tissue infections and infective endocarditis (IE). It is considered an aggressive pathogen, especially in chronic immunocompromised personnel, with a high potential for morbidity and mortality. *S. lugdunensis* was found to be the fourth most common cause of IE. The manuscript discusses the epidemiology, clinical presentation, and management of *S. lugdunensis* infections, emphasizing the importance of early recognition and treatment to prevent potentially fatal outcomes.

Categories: Internal Medicine, Medical Education, Infectious Disease

Keywords: case report, mortality rate, intravenous antibiotics, antimicrobial resistance, infective endocarditis, *staphylococcus lugdunensis*

Introduction

Staphylococcus lugdunensis, identified as a gram-positive, coagulase-negative organism [1], typically found in the normal skin flora, predominantly colonizing the perineal region [2,3], has gained recognition as an opportunistic pathogen capable of causing severe infections. While part of the normal skin flora, particularly in the perineal region, its ability to lead to life-threatening conditions such as infective endocarditis (IE) highlights the need for increased awareness and understanding of this microorganism [4]. This case aims to provide an overview of *S. lugdunensis*, its prevalence, and the potential clinical implications associated with its infections.

Case Presentation

A 75-year-old female with a medical history encompassing hypertension, hyperlipidemia, atrial fibrillation managed with Xarelto, type 2 diabetes mellitus, hypothyroidism, and a bioprosthetic aortic valve presented with symptoms of fever, chills, and lethargy. The onset of these symptoms followed a dog scratch to her left lower extremity two weeks prior, resulting in wounds near the shin region (Figure 1). Despite a negative drug screen and an exhaustive workup for other potential infectious causes, the patient's blood cultures unexpectedly revealed the presence of *Staphylococcus lugdunensis*.

How to cite this article

Arshad K, Ali F, Alamro Y, et al. (May 04, 2024) The Shadows of Normal Flora on Minor Wounds: A Case Report of an Uncommon Pathogen With Potentially Lethal Consequences. *Cureus* 16(5): e59648. DOI 10.7759/cureus.59648



FIGURE 1: Two acute healing scratch wounds measure approximately 1 and 3 cm with no evidence of exudates or soft tissue infection.

The interdisciplinary care team closely monitored the patient throughout her hospitalization, including cardiology, infectious disease, and endocrinology. A transesophageal echocardiogram (TEE) revealed a mobile density attached to the tricuspid valve, measuring 0.4 cm, indicative of vegetation (Figure 2) without any abscess or tricuspid regurgitation. Subsequent blood cultures returned negative, and the patient exhibited improvement without any recurrence of symptoms. Following a thorough assessment, she was discharged with a prescription for intravenous antibiotics, to be administered over a six-week period. This comprehensive approach to management proved effective in the patient's recovery. After six weeks of the antibiotic course patient was followed by repeat TEE which came out unremarkable and showed resolution of vegetation.

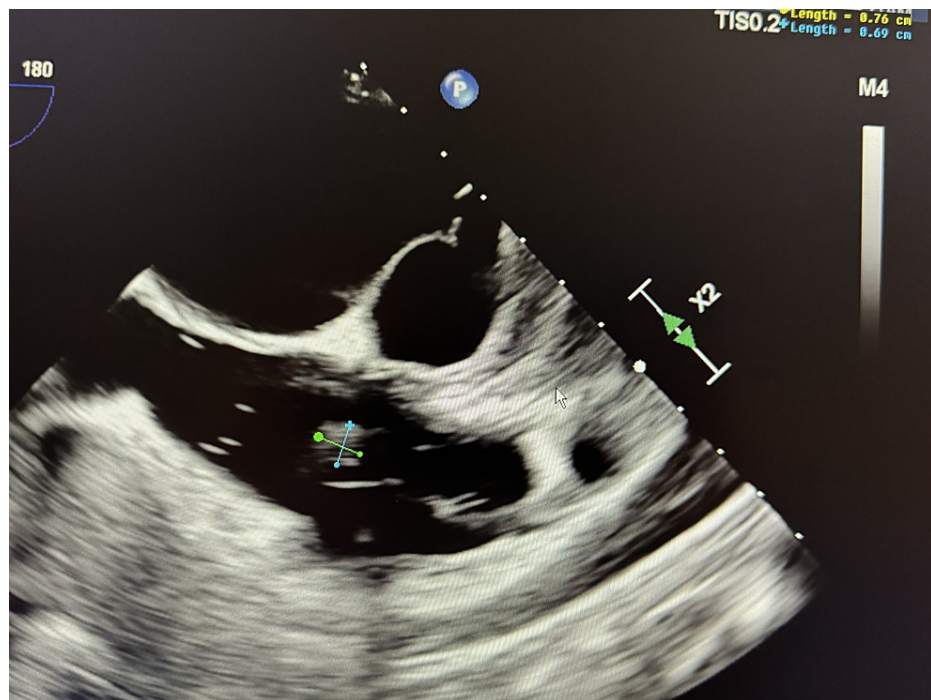


FIGURE 2: Transesophageal echocardiogram; the marked area shows vegetation in the tricuspid area that is pathognomonic for infective endocarditis.

Discussion

Staphylococcus lugdunensis, previously considered a relatively benign microorganism, has become a significant player in infectious diseases, particularly causing skin and soft tissue infections and infective endocarditis [4]. It is considered an aggressive pathogen, especially in chronic immunocompromised personnel, with a high potential for morbidity and mortality. *S. lugdunensis* was found to be the fourth most common cause of IE [5]. The infection can occur in native and prosthetic valves and can be associated with large vegetations, with a higher prevalence for mitral valves than other valves [6]. This case delves into the epidemiology of *S. lugdunensis*, its clinical presentation, and the challenges associated with its diagnosis and management.

The presented case of a 75-year-old female with multiple comorbidities illustrates the diverse clinical manifestations of *S. lugdunensis* infections. The patient's history of a dog scratch leading to wounds on the left lower extremity is noteworthy, as it emphasizes the potential for this pathogen to cause severe infections even through seemingly minor skin breaches [4]. While most of the reported cases have been reported in patients with vascular access, in our case, the infection resulted from a minor wound.

In the presented case, *Staphylococcus lugdunensis* was identified in blood cultures, prompting immediate intervention with broad-spectrum intravenous antibiotics and a six-week course of cefazolin. This favorable outcome highlights the critical significance of early detection and targeted antimicrobial therapy in effectively managing *S. lugdunensis* infections. Despite its susceptibility to a wide range of antibiotics compared to other coagulase-negative staphylococci, *S. lugdunensis* is resistant to penicillin due to β -lactamase production. Although the emergence of methicillin resistance is rare in the USA, documented cases emphasize the need for vigilance. Clindamycin and erythromycin serve as viable alternative treatments, boasting low resistance prevalence in cases of *S. lugdunensis* infection [7,8].

The discussion also highlights the potential complications associated with *S. lugdunensis* infections, including fatal myocarditis, osteomyelitis, and central nervous system infections leading to cerebrovascular accidents [9,10]. Valvular pathology involving *S. lugdunensis* typically results in bulky leaflet vegetations, predominantly affecting left-sided heart valves [4]. A systematic review revealed that 94.7% of all IE cases due to this organism were left-sided, with the mitral valve being most commonly affected (52.5%), followed by the aortic valve (37%) [9].

Despite its susceptibility to a broad range of antibiotics compared to other coagulase-negative staphylococci, *S. lugdunensis* exhibits resistance to penicillin due to β -lactamase production. The chosen antibiotic for the presented case was intravenous nafcillin. Although methicillin resistance is rare in the

USA, documented cases highlight the importance of alternative treatment options such as clindamycin and erythromycin, which exhibit low resistance prevalence [7,8]. A prospective cohort study underscores the gravity of *S. lugdunensis* IE, revealing mortality rates of up to 42% in native valves and 78% in prosthetic valves. Early surgical intervention, along with an aggressive intravenous antibiotic regimen, is recommended to reduce mortality in these patients significantly [4].

Conclusions

The presented case underscores the importance of recognizing *Staphylococcus lugdunensis* as a potential pathogen capable of causing severe infections, especially in individuals with predisposing comorbidities. As demonstrated in our case, early diagnosis and intervention are crucial for successful management and prevention of adverse outcomes. This manuscript raises awareness among healthcare professionals about the clinical significance of *S. lugdunensis* and advocates for vigilance in its detection and appropriate therapeutic strategies.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Khurram Arshad, Farman Ali, Yazan Alamro, Rabia Latif, Antoine Egbe Bessong Tabot

Acquisition, analysis, or interpretation of data: Khurram Arshad, Farman Ali, Yazan Alamro, Rabia Latif, Antoine Egbe Bessong Tabot

Drafting of the manuscript: Khurram Arshad, Farman Ali, Yazan Alamro, Rabia Latif, Antoine Egbe Bessong Tabot

Critical review of the manuscript for important intellectual content: Khurram Arshad, Farman Ali, Yazan Alamro, Rabia Latif, Antoine Egbe Bessong Tabot

Supervision: Khurram Arshad, Farman Ali

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

Khurram Arshad and Farman Ali contributed equally to the work and should be considered co-first authors.

References

1. Heldt Manica LA, Cohen PR: *Staphylococcus lugdunensis* infections of the skin and soft tissue: a case series and review. *Dermatol Ther (Heidelb)*. 2017, 7:555-62. [10.1007/s13555-017-0202-5](https://doi.org/10.1007/s13555-017-0202-5)
2. Bellamy R, Barkham T: *Staphylococcus lugdunensis* infection sites: predominance of abscesses in the pelvic girdle region. *Clin Infect Dis*. 2002, 35:E32-4. [10.1086/341304](https://doi.org/10.1086/341304)
3. van der Mee-Marquet N, Achard A, Mereghetti L, Danton A, Minier M, Quentin R: *Staphylococcus lugdunensis* infections: high frequency of inguinal area carriage. *J Clin Microbiol*. 2003, 41:1404-9. [10.1128/JCM.41.4.1404-1409.2003](https://doi.org/10.1128/JCM.41.4.1404-1409.2003)
4. Anguera I, Del Río A, Miró JM, et al.: *Staphylococcus lugdunensis* infective endocarditis: description of 10 cases and analysis of native valve, prosthetic valve, and pacemaker lead endocarditis clinical profiles. *Heart*. 2005, 91:e10. [10.1136/hrt.2004.040659](https://doi.org/10.1136/hrt.2004.040659)
5. Bayer AS, Bolger AF, Taubert KA, et al.: Diagnosis and management of infective endocarditis and its complications. *Circulation*. 1998, 98:2936-48. [10.1161/01.cir.98.25.2936](https://doi.org/10.1161/01.cir.98.25.2936)
6. Kyaw H, Raju F, Shaikh AZ, Lin AN, Lin AT, Abboud J, Reddy S: *Staphylococcus lugdunensis* endocarditis and cerebrovascular accident: a systemic review of risk factors and clinical outcome. *Cureus*. 2018, 10:e2469. [10.7759/cureus.2469](https://doi.org/10.7759/cureus.2469)
7. Taha L, Stegger M, Söderquist B: *Staphylococcus lugdunensis*: antimicrobial susceptibility and optimal treatment options. *Eur J Clin Microbiol Infect Dis*. 2019, 38:1449-55. [10.1007/s10096-019-03571-6](https://doi.org/10.1007/s10096-019-03571-6)
8. Kleiner E, Monk AB, Archer GL, Forbes BA: Clinical significance of *Staphylococcus lugdunensis* isolated from routine cultures. *Clin Infect Dis*. 2010, 51:801-3. [10.1086/656280](https://doi.org/10.1086/656280)

9. Kuzhively J, Patel SA, Abraham H: A case of staphylococcus lugdunensis endocarditis with cerebral and coronary embolism. *J Med Cases*. 2014, 5:535-7. [10.14740/jmc1903w](https://doi.org/10.14740/jmc1903w)
10. Ngan AT, Lee S, Liu T, et al.: A rare case of Staphylococcus lugdunensis septicemia associated with myocarditis and atrioventricular block. *J Geriatr Cardiol*. 2019, 16:63-6. [10.11909/j.issn.1671-5411.2019.01.009](https://doi.org/10.11909/j.issn.1671-5411.2019.01.009)