American Journal of Medical Case Reports, 2022, Vol. 10, No. 4, 110-112
Available online at http://pubs.sciepub.com/ajmcr/10/4/6
Published by Science and Education Publishing
DOI:10.12691/ajmcr-10-4-6

Staphylococcus lugdunensis Bacteremia Accompanying Staphylococcal Scalded Skin Syndrome like Skin Lesions

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Received March 10, 2022; Revised April 12, 2022; Accepted April 23, 2022

Abstract A 75-year-old man with unconsciousness in supine position was found in his garden by a local welfare officer in summer season. His clothes were normal with long pants. He had diabetes mellitus, cerebral infarction, and prostate hypertrophy treated by drugs. His activities of daily living was independent and lived alone. His mother died of stroke and father died of heart disease. When emergence medical technicians checked him, he was in coma, shock and hyperthermic state so that he was transported to our hospital after undergoing tracheal intubation and rapid infusion of cooled lactated Ringer fluid by a dispatched physician. On arrival, he had multiple blisters and erosions on bilateral medial side of thighs and front side of legs. He underwent diagnosis of septic shock, aspiration pneumonia and unknown cause of bilateral leg skin lesions after examinations. He underwent antibiotics and vasopressor in intensive care unit. All skin lesions were managed by ointment. His unstable circulation and respiratory failure improved and was extubated in the day 6. Result of blood culture on arrival was *Staphylococcus lugdunensis*. He complained legs pain after extubation. All skin lesions in bilateral legs became eschar. He underwent escharotomy and skin draft on day 20 and became temporally septic shock again during operation. He underwent antibiotics again. After control of skin lesions, he was transferred to the other hospital for rehabilitation. The present study demonstrated a case of *Staphylococcus lugdunensis* bacteremia accompanying staphylococcal scalded skin syndrome like skin lesions. Further study is needed to understand the skin lesions induced by *Staphylococcus lugdunensis*.

Keywords: *Staphylococcus lugdunensis, septic shock, staphylococcal scalded skin syndrome*

Cite This Article: Ken-ichi Muramatsu, Hiroki Nagasawa, Kouhei Ishikawa, Soichiro Ota, Hiromichi Ohsaka, Kei Jitsuiki, and Youichi Yanagawa, "*Staphylococcus lugdunensis* Bacteremia Accompanying Staphylococcal Scalded Skin Syndrome like Skin Lesions." *American Journal of Medical Case Reports*, vol. 10, no. 4 (2022): 110-112. doi: 10.12691/ajmcr-10-4-6.

1. Introduction

Staphylococcal Scalded Skin Syndrome (SSSS), also known as Ritter disease is a disease characterized by denudation of the skin caused by exotoxin producing strains of the *Staphylococcus (S)* species, typically from a distant site [1,2]. It usually presents 48 hours after birth and is rare in children older than six years. It may also present in immunocompromised adults or those with severe renal disease. The disorder is characterized by significant exfoliation of skin following cellulitis. The severity may vary from a few blisters to system exfoliation leading to marked hypothermia and hemodynamic instability [1,3,4].

While, *S. lugdunensis* is a species of coagulase-negative *staphylococci* (CNS) that induces a variety of infectious diseases, including skin and soft tissue infection (SSTI), infective endocarditis (IE), and bone and prosthetic joint infection [5,6,7]. Though less common than SSTIs caused by other CNS and *S.aureus*, it produces a more virulent clinical picture in contrast to the CNS and more closely resembling that of S. aureus [5,6,7]. *S. lugdunensis* infections commonly affect the middle-aged to elderly patient populations, with greater prevalence in females. Anatomically, *S.lugdunensis* SSTIs tend to be distributed predominantly below the pelvic girdle or in the inguinal area [5]. *S. lugdunensis* remains highly susceptible to a wide gamut of antibacterial therapies. We herein report a case of *S. lugdunensis* bacteremia accompanying SSSS like blister.

2. Case Report

A 75-year-old man with unconsciousness in supine position was found in his garden by a local welfare officer in summer season. His clothes were normal with long pants. He had diabetes mellitus, cerebral infarction, and prostate hypertrophy treated by Sitagliptin, Glimepiride,

valsartan, aspirin, Cilostazol, Lovastatin, Fenofibrate, Fursultiamine, Silodosin, Dutasteride, Solifenacin. His activities of daily living was independent and lived alone. His mother died of stroke and father died of heart disease. When emergence medical technicians checked him, he was in coma, shock and hyperthermic state so that dispatch of a physician staffed helicopter was requested. He was transported to our hospital after undergoing tracheal intubation and rapid infusion of cooled lactated Ringer fluid. On arrival, his vital signs were as follows: Glasgow Coma Scale, E1VTM1; blood pressure, 90/60 mmHg under 8 μg/kg/min of dopamine use; heart rate, 130 beats per minute; respiratory rate, 30 breaths per minute, and bladder temperature, 41.5 Celsius. He had multiple blisters and erosions on bilateral medial and frontal side of thighs and front side of legs (Figure 1). Other physical signs were negative.

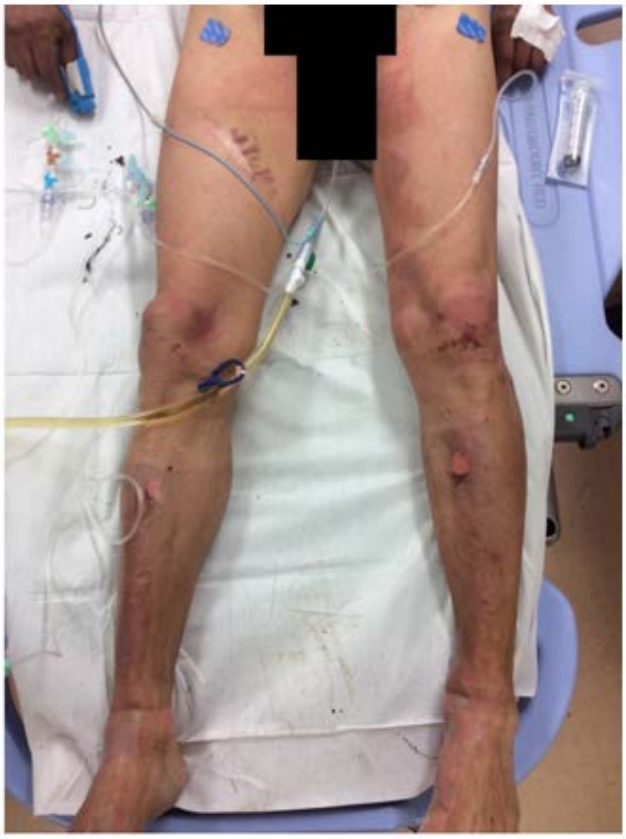

Figure 1. Bilateral lower extremities on arrival (He had multiple blisters and erosions on bilateral medial and frontal side of thighs and frontal side of legs)

Arterial blood gas under 1.0 of PaO_2/ FiO_2 were as follows: pH, 7.28; pCO_2, 26.9 mmHg; pO_2, 76.4 mmHg; HCO_3^-, 12.2 mmol/L; base excess, 12.9 mmol/L, and lactate, 2.1, mmol/L. Whole body computed tomography for detecting septic focus suggested bilateral aspiration pneumonia. Results of blood test were as follows: white blood cells, 14000/μL; hemoglobin, 14.9 g/dL; platelets, 25.6 x 10^4/μL; total protein, 7.7 g/dL; albumin, 4.7 g/dL; total bilirubin, 1.2 mg/dL; aspartate aminotransferase, 201 IU/L; alanine aminotransferase, 55 IU/L; amylase, 59 U/L; blood urea nitrogen, 29.6 mg/dL; creatinine, 1.88 mg/dL; sodium, 145 mEq/L; chloride, 103 mEq/L; potassium, 4.4 mEq/L; glucose, 129 mg/dL; HbA1c, 6.8%; creatine phosphokinase, 10784 IU/L; C-reactive protein, 9.41 mg/dL; prothrombin time - international normalized ratio, 1.19; activated partial thrombin time, 24.1 sec; fibrinogen, 372 mg/dL; fibrin degradation products, 26.8 μg/dL, urinary protein, (3+), and urinary occult blood (3+). He underwent diagnosis of septic shock, aspiration pneumonia and unknown cause of bilateral leg skin lesions. Differential diagnosis was heat stroke with burn, or toxic epidermal necrolysis. He underwent cooling therapy and infusion of Sulbactam/Ampicillin, Noradrenalin and Vasopressin to control unstable circulation in intensive care unit. All skin lesions were managed by daily Dimethyl Isopropylazulene ointment. His unstable circulation and respiratory failure improve gradually and he was extubated in the day 6 after all supportive therapies were ceased. Result of blood culture on arrival was *S. lugdunensis*. He complained legs pain after extubation. All skin lesions in bilateral legs became eschar (Figure 2).

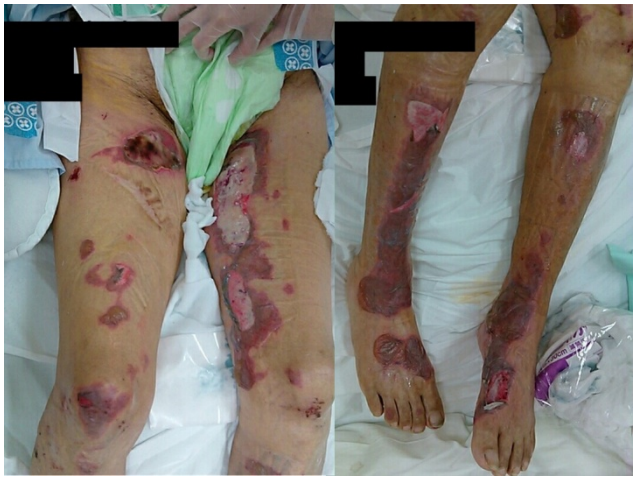

Figure 2. Bilateral lower extremities on day 8 (All skin lesions in bilateral legs became eschar)

He underwent escharotomy and skin draft on day 20 and became temporally septic shock again during operation. He underwent antibiotics again. Most of grafted skins dropped. He underwent conservative treatments for skin lesions after this event. After control of infection, he was transferred to the other hospital for rehabilitation.

3. Discussion

The present case was septic shock with bilateral leg skin blisters and erosions, whose blood culture indicated bacteremia of *S. lugdunensis*, resembling SSSS. All skin blisters and erosions were complicated for treatments. To our best knowledge, SSSS induced by *S. lugdunensis* has not been reported. Zaaroura et al reported clinical and microbiological properties of *S. lugdunensis* skin infections among 29 patients [8]. Mean age was 33.3 years, a state of immune suppression was present in five patients (17%). Folliculitis and cutaneous pustulosis were the most common presentations (55%), followed by secondary infection of hidradenitis suppurativa (17%). Other sources of isolation were infected molluscum contagiosum (6%), folliculitis decalvans (3%), dissecting cellulitis (3%), abscess (3%), cyst (3%), impetigo (3%e) and granuloma after trauma (3%). Heldt Manica et al also noted cellulitis, cyst formation, or pustules as a mode of presentation [9].

In addition, García-Malinis et al reported the most frequent site of infection was the inguinal-perineal region (37.5%), and pustules were the most common presentation (31.3%) among 16 patients [10]. The evidence of the present case that 1) skin lesions under pelvis, 2) elderly age, 3) legs covered under long pants under the sun light, 4) results of blood culture on arrival revealed only *S. lugdunensis*, and 5) previous report showed cyst formation by *S. lugdunensis*, strongly indicated SSSS like skin lesions was induced by *S. lugdunensis* infection. Possibility of heat stroke with burn or toxic epidermal necrolysis was minimized. This case obtained survival outcome, however, treatment of skin lesions were complicated. Further study is needed to understand the diversity, virulence, and population structure of SSTI induced by *S. lugdunensis*.

4. Conclusion

The present study demonstrated a case of *S. lugdunensis* bacteremia accompanying SSSS like skin lesions.

Further study is needed to understand the SSTI induced by *S. lugdunensis*.

Acknowledgements

This work was supported in part by a Grant-in-Aid for Special Research in Subsidies for ordinary expenses of private schools from The Promotion and Mutual Aid Corporation for Private Schools of Japan.

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