Staphylococcus lugdunensis
gluteal abscess in a patient
with end stage renal disease
on hemodialysis

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Abstract

A 57-year-old end stage renal disease patient
on hemodialysis (HD) presented with sepsis
secondary to right buttock abscess and overly-
ing cellulitis. She was started on broad-spe-
trum antibiotic therapy and underwent inci-
sion and drainage with marked improvement.
Her cultures grew methicillin-resistant
Staphylococcus lugdunensis. This bacterium is
more virulent than other coagulase negative
staphylococci and has been implicated in caus-
ing a variety of serious infections but it has
been underreported as a cause of skin infec-
tions in HD patients and possible other patient
populations.

Introduction

Traditionally, Staphylococcus aureus and
streptococci have been the most common cul-
prits in skin and soft tissue infections.1 Neverthe-
less, gram-negative bacteria and anaerobes can play a role in certain patient
pulations.2 Wider use of immunosuppression,
bacterial resistance and newly emerging
pathogens are changing the landscape of skin
and soft tissue infections.3 We report a case of
methicillin-resistant Staphylococcus lug-
dunensis skin abscess in a hemodialysis (HD)
patient. This bacterium has been rarely impli-
cated in causing skin infections in end stage
renal disease (ESRD) patients. The patient
provided her consent to publish this case
report.

Case Report

A 57-year-old white female with a past med-
ical history significant for ESRD on HD admit-
ted with right buttock abscess with overlying
cellulitis. One-week prior, she presented to a
local emergency room with right buttock boil.
No intervention was undertaken and she was
sent home on oral trimethoprim/sulfamethoxa-
Zole (TMP/SMX). She did not fill her prescrip-
tion nor sought further care till this admission.
In the emergency room, she complained of
fever, chills and throbbing pain at the abscess
site. She had no other skin lesions or com-
plaints. The patient’s past medial history is
significant for hypertension, which led to her
ESRD. She has been on HD for 16 years. She
did not have recent hospitalization within the
past 6 months nor she had history of methi-
cillin - resistant S. aureus colonization or
infection.

On examination, she was awake and orient-
ed but in obvious pain. She had an oral temper-
ature of 38.6°C. Her heart rate was 112
beats/min and her blood pressure was 118/62
mmHg. Her heart, lung and abdominal exami-
nation were unremarkable. She had a right-
sided femoral arterio-venous graft with a
strong thrill and no overlying redness. This
arterio-venous graft was placed 2 years ago,
after she ran out of upper body HD access
sites. Her right buttock showed a warm, ten-
der, fluctuant area with surrounding redness.
There were no other skin lesions. She was
admitted with sepsis secondary to a complicat-
ed right buttock skin infection. She was start-
ed empirically on ceftaroline (600 mg intra-
venously once then 200 mg every 12 h) for her
complicated skin infection and the surgical
service consulted.

Blood testing showed a white blood cell
count of 36.9×10^9/L, hemoglobin of 11.1 g/dL
and creatinin of 4.8 mg/dL. Electrolytes and
liver function tests were within normal limits.
Non-contrast computed tomography scans of
the pelvis showed right buttock cellulitis with
few gas bubbles in the soft tissues (Figure 1).

The patient underwent incision and drainage of the right buttock abscess. Her
blood cultures were negative but purulent
secretions from the right buttock grew S. lug-
dunensis. Transthoracic echocardiography was
negative for valvaral vegetations. The bacteri-
um was methicillin-resistant but was suscepti-
able to vancomycin, ciprofloxacin, clindamycin,
erythromycin, TMP/SMX, tetracycline,
rifampin and linezolid. Bacterial identification
was performed by Microscan WalkAway plus
system (Siemens, Berlin-Munich, Germany).
Her condition improved markedly with the sub-
sequent initiation of negative pressure wound
therapy (Figure 2). On the 11th hospital day,
she was discharged home to finish 2 more
weeks of oral doxycycline (100 mg every 12 h).
The patient was followed in the outpatient
clinic and showed complete healing of her
infection.

Discussion

We presented a case of skin abscess caused
by S. lugdunensis in a HD patient. Although
this bacterium belongs to coagulase negative
staphylococci (CoNS), its role in this infection is
indispensible given the fact that it was the
only bacterium grew in the surgical cultures.
ESRD patients have impaired immunity and
are at risk for different types of infections
including skin infections.4 S. aureus is a no-
torious pathogen causing skin infections in
ESRD patients meanwhile S. lugdunensis skin
infections have been rarely reported in this
patient population.

S. lugdunensis, described first in 1988, is a
CoNS and part of the normal skin flora.5 It is
much more virulent than other CoNS and has
been implicated in causing multiple infections
including infective endocarditis, osteomyelitis,
septic arthritis and skin and soft tissue infec-
tions.5,6

S. lugdunensis virulence is of notice and in
many ways it mirrors that of S. aureus.7
Although it doesn’t carry the genes for produc-
ing enterotoxins A, B and C or toxic shock syn-
drome toxin or exfoliative toxin, it produces
other types of toxins that account for its path-
ogenicity.8 To date, the full spectrum of mecha-
nisms by which it causes severe infections is
not completely understood and is still being
investigated.

Identifying S. lugdunensis in the clinical
microbiology lab can be challenging.13 The

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Underlying diseases were present in 13 of 20 specimens (65%). The frequency of isolating *S. lugdunensis* among CoNS from clinical specimens varies from one locale to another and ranges between 1% and 7%. The largest case series described 16 patients with skin infections caused by *S. lugdunensis*. In that hospital, CoNS was isolated in 1100 clinical specimens, of which 25 (2.27%) were identified as *S. lugdunensis* and 16 of the latter were incriminated pathogens in skin infections. The mean age of that cohort was 48.5 years (range 29-65 years); 7 were female (43.8%). Most commonly reported risk factors in this group were diabetes and breast disease. None of the patients was on HD. Breast, abdomen, perineum and lower limbs were the most commonly involved areas. None of the 16 isolates was methicillin-resistant.

Of note, *S. lugdunensis* was rarely implicated in causing HD and peritoneal dialysis catheters’ exit-site and tunnel infections. Unlike our case, neither bacterium was methicillin-resistant and both infections developed in the presence of hardware, the catheter.

Upon reviewing the above literature the following was noticeable: i) *S. lugdunensis* causes a variety of suppurative skin infections including abscesses and surgical site infections; ii) patients’ ages varied and there was no gender predilection; iii) diabetes, obesity and breast disease were the most commonly reported risk factors. Of note, none of the reported patients in the above case series was on HD; iv) breast, abdominopelvic area and lower limbs were the most commonly involved areas; v) like *S. aureus*, *S. lugdunensis* skin infections are monomicrobial in many cases; vi) methicillin-resistant *S. lugdunensis* skin infections are uncommon. The prevalence of methicillin-resistance among *S. lugdunensis* isolates of all sources is less than 10%. Other CoNS, especially *S. epidermidis*, are notorious for being methicillin-resistant and we speculate that this mechanism of resistance was acquired from these bacteria given they are all skin colonizers; vii) none of the reported cases died.

**Conclusions**

Our case underscores the potential emergence of *S. lugdunensis* as a cause of skin infections in HD patients. Unexpectedly severe infection caused by CoNS should trigger further testing to ascertain the exact species of that bacterium. Further work is needed to identify this bacterium mechanism of transmission, virulence factors, spectrum of disease and best antimicrobial therapy.

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