

Case Report

Septic shock caused by the under-recognized bacterium *Eggerthella lenta* in a 61-year-old male with a periurethral abscess: a case report

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Abstract

Eggerthella lenta is a gram-positive anaerobic bacillus that has been associated with life-threatening infections. Bacteremia is always clinically significant and is mostly but not always associated with gastrointestinal disease. We present a unique case of abrupt deterioration and rapid development of septic shock secondary to periurethral abscess caused by *E. lenta* infection. This case highlights the atypical clinical presentation, risk factors, uncommon source of infection, challenges in therapy, and outcome of this infrequent infection. There is still a gap in the understanding of *E. lenta* pathogenicity, and more literature is needed to establish clear management recommendations.

Keywords: Sepsis. *Eggerthella lenta*. Periurethral abscess.

INTRODUCTION

The authors report a case of septic shock caused by *Eggerthella lenta*. This previously under-recognized bacterial strain has been reported sporadically, mostly but not always associated with gastrointestinal pathology, as in the largest cohort study to date¹. To the best of our knowledge, this is the first report of *E. lenta* septicemia related specifically to periurethral abscess. *E. lenta* is an anaerobic, nonsporulating gram-positive bacilli (ANSGB) and should always be considered pathogenic when found in the blood. It is considered the most common genus of the (ANSGB) group associated with clinically significant bacteremia (sepsis), accounting for 63% of cases².

CASE REPORT

61-year-old Hispanic male, with no past medical history presented to the emergency department complaining of subjective fevers, burning on urination, penile and testicular pain for four days. On arrival, the patient was vitally stable

without criteria for sepsis. The blood pressure was 120/82 mmHg, heart rate was 75/min and temperature was 99.3°F. Initial work up was remarkable for 16000 leucocytes with differential of 88.8% neutrophils, hemoglobin of 14.0g/dl, platelets of 130,000, lactic acid of 1.3 mmol/L, creatinine of 1.0mg/dl, glucose levels of 249 mg/dl and electrolytes were within normal limits. The urinalysis was cloudy, showing +20 WBC's, large blood, trace leukocyte esterase and negative nitrites. Physical examination was positive for tenderness to palpation at the base of the penis and testicular area with no appreciable masses. Scrotal ultrasound had shown several indeterminate nodular lesions in the left testicle but no other major findings. CT of pelvis (**Figure 1**) with contrast revealed a dilation of proximal portion of urethra, possible fluid collection suggestive of a congenital urethral cyst, possible subcutaneous edema of the penis and anterior wall of scrotum and small soft tissue gas in the head of penis as well. Urology team was consulted and based on the clinical stability and nonspecific findings in the patient, the diagnostic impression was a possible urinary tract infection. They considered that the findings of small soft tissue gas found in the CT scan were likely secondary to the uncircumcised foreskin. After four hours, the patient developed acute onset of hypotension with a blood pressure of 95/58mmHg, heart rate of 130/min and temperature of 102.1 °F. The first blood culture was obtained and immediately

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CT abdomen/pelvis with contrast revealed a collection of fluid within or adjacent to the proximal portion of the urethra approximately 4.8 by 1.1 cm in size. There is subcutaneous edema of the shaft and base of the penis compatible with cellulitis.

FIGURE 1: Computed tomography (CT) abdomen and pelvis.

started on aggressive fluid resuscitation and broad-spectrum antibiotics. Specifically, with Vancomycin, Cefepime and Metronidazole. Despite interventions, blood pressure continued dropping and vasopressor therapy by central access was started. The patient was admitted to the intensive care unit for septic shock. Fortunately, after 24 hours a good clinical response to empiric antibiotic therapy was noted, leading to stabilization of vital signs and discontinuation of vasopressors. The first blood culture was positive at 72 hours with the identification of the organism *E. lenta*. The identification was completed through API 20 A® Kit, which is a system used to identify anaerobes. However, no antibiotic susceptibilities were obtained because our laboratory does not perform susceptibilities for anaerobic bacteria. Despite the clinical improvement, persistent leukocytosis was noted during the first week while receiving intravenous antibiotics. Repeated CT with contrast revealed a periurethral abscess where initially a urethral cyst was suspected. A cystourethrogram was performed to evaluate for a possible fistula, urethrocele, diverticulum, or any other structural abnormalities that could explain the formation of the abscess.

The results were all negative, and no clear source that could explain the formation of the abscess was identified. Subsequently, a decision to perform an incision and drainage of the abscess was made. Cultures of the drainage were obtained with the isolation of organisms as *Streptococcus anginosus* and *Klebsiella pneumoniae*. The drainage led to complete resolution of the leukocytosis. On day nine the patient was switched to oral therapy with Augmentin and Ciprofloxacin to complete a total of sixteen days. The medications were selected based on sensitivities of the bacterial strains obtained from the abscess drainage.

Since the patient had hyperglycemia with level of 249 mg/dl on initial presentation, the glycated hemoglobin was ordered and reported with a value of 8.7 mg/dl, patient was diagnosed with diabetes mellitus. Chlamydia, gonorrhea, RPR and HIV tests were all negative.

Four weeks after, the patient had followed up as outpatient with repeated CT imaging showing complete resolution of the abscess.

DISCUSSION

This case is unique due to the abrupt and unpredictable deterioration in the clinical status of the patient as well as the sporadically documented bacteria *E. lenta*.

Septic shock is usually a stepwise process with compensatory mechanisms before the development of profound hypotension. An abrupt drop in the blood pressure is an uncommon presentation for sepsis due to more common organisms, but perhaps an intrinsic characteristic of sepsis due to (ANSGB), as it was with *E. lenta* in this case.

Since our patient presented with very subtle urinary symptoms and the first CT of pelvis with contrast failed to clearly identify the abscess, the diagnosis was initially overlooked. As a learning point, we should always consider periurethral abscesses as uncommon and unpredictable infections that can lead to severe complications. The early diagnosis of a corpus cavernosum abscess is usually difficult, and a high index of suspicion, as well as careful examination of the perineum and penis, is necessary³.

Considering that *E. lenta* is part of the healthy human digestive tract⁴, and that the cystourethrogram failed to elicit urethral fistulation, it remains unclear how the bacterium infected the urethra. A possible explanation would be a false negative report in the cystourethrogram test.

After one day of antibiotic therapy a good response was observed clinically. However, the surgical drainage was necessary for complete resolution of leukocytosis and abscess. Currently, there is no clear consensus on when to proceed with surgical drainage and it seems that this decision should be individualized for every patient⁵.

The virulence and pathophysiological features of this group of organisms (ANSGB) are poorly understood. This lack of understanding is likely explained by the difficulty in culturing and identifying these organisms since they are slow growing in specialized media and require specific laboratories. These limitations have delayed the study and understanding of *E. lenta*. However, clinicians should consider *E. lenta* in blood cultures always pathogenic, and the evaluation for a source should include abdominal, skin and soft tissue infection⁶.

It has been 83 years since the first description of *E. lenta* by Arnold Eggerth in 1935⁷. Initially, it was part of the Eubacterium species, but it has now been reclassified under the bacterial genus Actinobacteria in the family Coriobacteriaceae⁸. Recently, the emergence of 16S ribosomal RNA gene sequencing techniques has led to more rapid and accurate identification of bacteria. Newer methods, such as automated phenotypic identification

systems and molecular sequencing techniques (MALDI-TOF MS), are capable of rapidly identifying *E. lenta* and are more readily available at a relatively low cost⁹.

The risk factors related to the development of *E. lenta* infection include mainly gastrointestinal diseases, as reported in 82% of the patients in the largest cohort study to date. In the same study, 27% of patients had diabetes¹. Detection of diabetes mellitus in our patient is likely an incidental finding, and further studies need to be performed to determine if there is an association between diabetes and *E. lenta* infection.

Regardless of the positive outcome in our case, the most recent retrospective population-based study of invasive *E. lenta* infections in 2018 with 107 patients revealed a 23% overall mortality rate for bloodstream infections related to *E. lenta*¹⁰. Currently, there is no definitive consensus regarding the precise antibiotic therapy for this infection, and almost always, the first antibiotic choice is empirical. In one study applying the Clinical and Laboratory Standards Institute (CLSI) interpretive criteria, all isolates of *E. lenta* were susceptible to amoxicillin-clavulanate, cefoxitin, metronidazole, ertapenem, piperacillin-tazobactam and meropenem. Furthermore, susceptibility to clindamycin was 91%, moxifloxacin 74%, and penicillin 39%; all isolates were resistant to ceftriaxone¹. Therapy with amoxicillin-clavulanate, ampicillin-sulbactam, metronidazole or carbapenems would be an acceptable option for empirical treatment of *E. lenta*. Most hospitals do not perform antimicrobial susceptibility testing on anaerobic organisms on a regular basis; however, for successful treatment of serious, life-threatening infections such as in this case, clinical specimens ideally must be sent to other centers able to perform the appropriate testing. In a recent review, there was an association of increased mortality with the use of empirical piperacillin-tazobactam in *E. lenta* infections. It is important to have improved antimicrobial guidelines against these types of infections¹⁰.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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