

A Rare Case of Fournier's Gangrene caused by *Helcococcus kunzii*

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ABSTRACT

Fournier's gangrene is an acute rapidly progressing form of necrotizing fasciitis involving the genitalia and perianal regions. Trauma and local infection are the most common risk factors especially in the setting of diabetes. It is usually a polymicrobial infection caused by skin flora of the genital area. The most commonly isolated aerobic microorganism are *Escherichia coli*, *Klebsiella pneumoniae*, and *Staphylococcus aureus*, while *Bacteroides fragilis* is a common culprit from the anaerobic group. We report a patient with Fournier's gangrene caused by *Helcococcus kunzii*; an aerobic gram positive coccus not known to be associated with Fournier's gangrene before.

Keywords

Fournier's gangrene, necrotizing fasciitis, *Helcococcus kunzii*.

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INTRODUCTION

Fournier's gangrene (FG) is a rapidly progressing infection of skin and soft tissue involving the genital, perineal and perianal area. It has a high mortality rate, up to 40% especially in the context of *diabetes mellitus* or immunosuppression^[1]. Rapid diagnosis and appropriate management of this life threatening disease is very important to reduce the mortality and morbidity. Empirical treatment with broad-spectrum antibiotics and aggressive debridement are the main principles of therapy. Both aerobic and anaerobic microorganisms may be responsible, common causes include *Escherichia coli*, *Klebsiella pneumonia*, *Staphylococcus aureus* and *Bacteroides fragilis*. In this article, we report FG associated with *Helcococcus kunzii* (*H. kunzii*). This microorganism is an aerobic coccus commonly found as flora living on the lower limbs^[2]. To our knowledge, this is the first reported FG case due to *H. kunzii*.

CASE REPORT

An 80-year-old man with uncontrolled diabetes was admitted to King Abdulaziz University Hospital with a 6-day history of diffuse scrotal pain, redness and swelling. He also had dysuria and constipation. There was no fever. He denied having a preceding local infection, trauma or surgery. Apart from diabetes, he had no history of medical conditions. He received amoxicillin-clavulanic acid as an outpatient with no improvement.

Upon arrival to the emergency room, he was afebrile and was not in distress. He was hemodynamically stable. Local examination revealed a necrotic area on the inferior aspect of the scrotum measuring around 5 cm in diameter with minimal pus discharge. There was no crepitus. He had leukocytosis and elevated creatinine level. His blood culture was collected, and it was found later to be negative. Necrotizing fasciitis of the groin (Fournier's gangrene - FG) was diagnosed based on the clinical picture, as scrotal ultrasound findings were non-specific.

The patient was started empirically on piperacillin/tazobactam and he also received one dose of metronidazole. Surgical exploration was performed and the diagnosis was confirmed by the intraoperative appearance of pus and necrosis. Debridement with excision of all the necrotic tissue was performed until healthy tissue was found. Gram stain performed on excised soft tissue showed numerous polymorphonuclear leukocytes and gram-positive cocci in pairs and clumps. The sample was inoculated onto 5% sheep blood agar and chocolate agar plates and were incubated at 36°C in a CO₂-enriched (5%) atmosphere for 24 hrs. A pure and heavy growth of pinpoint, greyish, nonhemolytic colonies appeared on both agars and it was negative for catalase. *Helcococcus kunzii* was identified by VITEK® 2 microbial identification system (bioMérieux, Inc., Craponne, France) and was confirmed by Vitek MS matrix-assisted laser desorption ionization-time of flight (MALDI-TOF) mass spectrometry (bioMérieux, Inc., Craponne, France). The isolated strain was sensitive to

penicillin but resistant to clindamycin and erythromycin. Susceptibility testing was performed by disc diffusion and Etest in reference to that of *Staphylococcus aureus* in Clinical and Laboratory Standards Institute guidelines^[3].

The patient improved clinically over the subsequent two weeks and required a skin graft to cover the remaining scrotal defect. He had no fever throughout his hospital stay.

DISCUSSION

Helcococcus kunzii is a facultative anaerobic, non-motile, catalase-negative gram-positive coccus whose cells are arranged in pairs and clumps. It is known to have phenotypic resemblances to *Aerococcus viridans*. It was first discovered in 1993 by Collins *et al.*^[2]. *Helcococcus kunzii* was the first species to be characterized, followed by *Streptococcus pyogenes*, *Helcococcus sueciensis*, *Helcococcus bovis*, and *Helcococcus seattlensis*^[4].

Helcococcus kunzii is a part of normal skin flora usually found in the lower limbs^[2,5,6]. It can cause opportunistic infections mostly in immunocompromised patients. Published cases include skin and soft tissue infections (wound infections, cellulitis in diabetic patients, superficial and deep abscesses and plantar phlegmons) as well as deep infections such as empyema, bacteremia, infective endocarditis, prosthetic joint infections and osteomyelitis^[2,4,5,7-10]. To our knowledge, there are no reported cases of FG caused by *H. kunzii* yet.

In many cases, *H. kunzii* is isolated from infected samples as part of a polymicrobial infection^[7,8]. In our case, the tissue culture grew *H. kunzii* only. One potential explanation is the fact that the patient received an oral antibiotic for a few days before admission.

There is not much known about the virulence factors of this opportunistic organism. Suggested mechanisms include a role of hemagglutinin and lectin^[11]. In our case, the finding of extensive fascial necrosis might indicate the presence of a specific exotoxin that facilitates tissue destruction.

Host risk factors are also important; diabetes and vascular insufficiency are associated with colonization of lower limbs with *H. kunzii*^[5,6]. A study on the incidence of skin colonization demonstrated that 10% (12/120) of the foot specimens collected from podiatry patients, two-thirds of whom were diabetic, were positive for *H. kunzii*^[6]. In our patient we believe that uncontrolled diabetes was the major risk factor.

Most strains of *H. kunzii* are found to be susceptible to β -lactam antibiotics. Resistance to aminoglycosides, macrolides, trimethoprim-sulfamethoxazole, clindamycin, third and fourth generation quinolones resistance is noted^[4,7,9,10].

This case adds to what is recently recognized that this microorganism probably possesses greater pathogenic potential than previously believed.

Conflict of Interest

The authors have no conflict of interest.

Disclosure

None of the authors received any type of commercial support either in forms of compensation or financial for this study. They have no financial interest in any of the products or devices, or drugs mentioned in this article.

Ethical Approval

Obtained.

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حالة غرغرينة فورنيير نادرة ناشئة عن بكتيريا هيلكوكوكس كونزياي

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المستخلص.

تعد غرغرينة فورنيير نمطاً سريع التفاقم من أنماط التهاب اللقافة الناخر والتي تصيب منطقة ماحول الشرج والأعضاء التناسلية. وتعتبر الإصابات والإنتانات الموضعية من أهم الأسباب المؤدية إلى ذلك، خصوصاً لدى المصابين بمرض السكري. في العادة، غالباً ماتكون الإصابة ببكتيريا متعددة متعايشة أصلاً على جلد منطقة العانة. من أشهر البكتيريا الهوائية المتسببة في ذلك: ايشريشيا كولاي، كليبيسيلا نومونيا وستافيلوكوكس أوريوس. ومن البكتيريا اللاهوائية تعتبر بكتيريا باكتيرويديس فراجيليس الأكثر شيوعاً. في هذا التقرير نورد إصابة مريض بغرغرينة فورنيير تسببت بها بكتيريا هيلكوكوكس كونزياي، وهي بكتيريا هوائية موجبة الجرام لا يعرف عنها التسبب في نشوء هذا المرض قبلاً.