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Streptococcus dysgalactiae-associated penile bacterial disease in an elderly man acquired by fellatio: case report and literature review of penile and perianal *Streptococcus dysgalactiae* in men acquired by anilingus and fellatio

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Abstract

Streptococcus dysgalactiae subspecies *equisimilis* (SDSE) is a gram-positive, beta-hemolytic, large-colony-forming bacterium belonging to group C and G streptococci. It can be isolated in the normal flora of human skin, nasopharyngeal cavity, genitourinary, and gastrointestinal tracts. However, SDSE has been the cause of perianal bacterial infections associated with sexual practices. A 67-year-old man developed a penile bacterial infection secondary to SDSE. The infection presented as a painful erythematous patch on his penile distal shaft. He was successfully treated with oral cephalexin 500mg and topical mupirocin 2% ointment twice daily, for ten days. The infection resolved within ten days of treatment. Penile and perianal SDSE bacterial disease has been reported in five men, including the patient in this report. The perianal area was involved in 80 percent (4/5) of men; concurrent infection in the gluteal area was present in two men. The probable route of transmission was oral-anal (two men) or oral-genital (one man). All of **the men's SDSE infections completely resolved after treatment with antibiotics.** In conclusion, SDSE can cause penile and perianal bacterial disease, perhaps more frequently in individuals that receive unprotected fellatio and anilingus from asymptomatic or symptomatic carriers of the organism in their oropharynx.

Keywords: bacterial, dermatitis, disease, *dysgalactiae*, *equisimilis*, group, infection, perianal, penile, streptococcal, streptococcus

Introduction

Perianal bacterial disease typically occurs in children and is generally caused by group A beta-hemolytic streptococci [1]. However, this infection can also occur in adults and affect the penis. A man who had sex with other men and developed penile bacterial disease secondary to *Streptococcus dysgalactiae* subspecies *equisimilis* (SDSE) is described. The features of SDSE-associated penile and perianal bacterial disease in men who have sex with other men, including our patient, and in heterosexual men are reviewed.

Case Synopsis

A 67-year-old man presented for the evaluation of a tender rash in his distal penile shaft. There was no fever or associated systemic symptoms. His medical history was significant for asymptomatic guttate psoriasis that would periodically recur and subsequently resolve following treatment with topical clobetasol 0.05% cream.

The patient's symptoms began three weeks after having a one-time sexual encounter with another man. The patient stated that during the sexual encounter he massaged his partner's prostate and then promptly masturbated vigorously with same fingers. In addition, he received unprotected fellatio and anilingus from his partner. He denied entry of his penis into his partner's anus.



Figure 1. Penile bacterial disease presenting as a painful circumferential erythematous patch on the distal penile shaft of a 67-years-old homosexual man.

Cutaneous examination showed circumferential erythema with peripheral scaling on his distal penile shaft (Figures 1, 2); the morphology of his penile rash was not similar to that of his psoriasis plaques and had persisted after twice daily application of clobetasol 0.05% cream. His perianal examination was normal; no other cutaneous or mucosal lesions were present. Bacterial culture of the distal shaft of the penis was performed and grew SDSE.

His creatinine was slightly elevated at 1.33 mg/dL (normal: 0.67 to 1.17 mg/dL). Therefore, oral cephalexin 500mg (at a reduced administration) and topical mupirocin 2% ointment, twice daily for ten

days, were initiated. The infection completed resolved within the ten days of treatment (Figure 3).

Case Discussion

Perianal streptococcal dermatitis was initially described by Amren et al. in 1966 [2]. Subsequently, the condition was commonly referred to as perianal streptococcal cellulitis. In contrast to a typical lesion of bacterial cellulitis which is tender and warm and has ill-defined advancing borders, perianal streptococcal cellulitis is usually characterized by a well demarcated, erythematous and pruritic, lesion [1, 3-5]. Hence, authors often describe the condition as perianal streptococcal dermatitis. However, not only streptococci bacteria, but also other organisms can cause this infection [1, 6, 7]. Therefore, the condition has been renamed as perianal bacterial disease [6], which is the designation we shall use in this paper.

The typical etiology associated with perianal bacterial disease is group A beta-hemolytic streptococci. However, other streptococci organisms, such as group B beta-hemolytic streptococci [8] and SDSE [3, 9], can cause the disease. In addition, other gram positive (*Staphylococcus aureus*) [7] and gram negative (*Escherichia coli*) [6] bacteria can cause the infection [1].



Figure 2. Right (A) and left (B) views of the stretched distal shaft of the penis of a non-heterosexual man with bacterial disease of the penis shows tender erythema that approaches the corona and encircles the penile shaft.



Figure 3. Post treatment views of the right (A) and left (B) sides of the stretched distal penile shaft of a non-heterosexual man show complete resolution of the *Streptococcus dysgalactiae*-associated penile bacterial disease. The distal shaft of the penis is asymptomatic and the infection-related erythema is absent following ten days of twice daily treatment with oral cephalexin 500mg and topical mupirocin 2% ointment.

Perianal bacterial disease is commonly observed in children [1, 10, 11]. However, it has also been described in adults [4, 8].

Perianal bacterial disease is often characterized by the presence of a pruritic, sharply demarcated erythematous patch around the anus; infrequently it may be accompanied by signs of inflammation including superficial edema, infiltration and tenderness [1, 3, 4]. In addition, mucopurulent blood-stained discharge, painful defecation (which can lead to constipation), blood streaking on the stool, anal fissures, and less frequently, proctocolitis can occur [1, 4, 10]. The extent of the signs and symptoms can last for weeks to months [4]

Group A beta-hemolytic streptococci are the most common cause of perianal bacterial disease. Streptococcal organisms are generally sensitive to penicillin antibiotics. Therefore, a drug belonging from this class of antibiotic is often considered as first line treatment [1].

For patients who are allergic to penicillin, or if drug resistance is present, erythromycin or newer macrolides are suggested [1]. Alternatively, the antibiotic regimen can be adjusted if antimicrobial susceptibility tests are available. In addition to systemic antibiotic therapy, topical treatment with either mupirocin 2% ointment or erythromycin 2% gel have been recommended [12, 13].

Perianal bacterial disease may not only be restricted just to the rectum and perianal area. The disease has been described in association with periumbilical, vulvovaginal, and penile involvement [1, 3, 10, 11]. In addition, perianal bacterial disease can be associated with guttate psoriasis [14].

Our patient had his disease restricted only to the distal penis without perianal involvement. He also had a less commonly associated virulent subtype of streptococcal organism, SDSE. This organism, belongs to the Lancefield groups C and G antigens and was first described in 1996 [15].

Group C and G streptococci are broadly distributed in animals and humans [16]. There are many species of streptococci that can harbor the Lancefield group C and G antigens including *Streptococcus anginosus* group bacteria, *Streptococcus canis*, *Streptococcus dysgalactiae* subspecies *dysgalactiae*, SDSE, *Streptococcus equi* subspecies *equi*, *Streptococcus equi* subspecies *zooepidemicus* [17]. Streptococci from human isolates harboring the Lancefield group G serogroup are generally considered to belong to the single subspecies SDSE [15, 18].

Streptococcus dysgalactiae subspecies *equisimilis* is a gram positive, beta-hemolytic, and large-colony-forming bacteria [18]. It can exist as component of the human normal flora in the pharynx, skin, and gastrointestinal and genitourinary uterine tracts [16].

SDSE shares some of the same virulence factors as *Streptococcus pyogenes* (*S. pyogenes*), a group A streptococcus, including the anti-phagocytic M protein, streptolysin S and O, streptokinase, and pyrogenic exotoxins [17, 18].

Shimomura et al. [17] sequenced the entire genome of SDSE from a patient with streptococcal toxic syndrome and performed genome wide comparisons with group A streptococci. This study suggested SDSE shares 72 percent sequence similarity to group A streptococci. SDSE can also cause a myriad of diseases similar to group A streptococci: from minor skin infections and pharyngitis to severe sepsis and streptococcal toxic shock-like syndrome [18].

Streptococcus dysgalactiae subspecies *equisimilis* has been frequently associated with skin and soft tissues infections, particularly in older adults, and streptococcal toxic shock-like syndromes [18]. Penile and perianal streptococcal infections secondary to SDSE, have been observed in two men who have sex with men, including our patient [19]. In addition, perianal bacterial disease secondary to SDSE has been observed in three other men [9,20] and one woman [3].

The men's ages ranged from 23 years to 69 years and the median age was 46 years (Table 1), [9, 19, 20, current report]. Our patient, a 67-year-old non-heterosexual man, was diagnosed with penile bacterial disease secondary to SDSE. He had a sexual encounter with another man within three weeks prior the onset of his symptoms. During the **interaction, he inserted his fingers into his partner's anus and vigorously rubbed his prostate; soon after, he masturbated with the same fingers.** He also received unprotected fellatio and anilingus from his partner. However, he denied anal entry of his or his **partner's penis.**

Another patient with perianal bacterial disease secondary to SDSE, a 23-year-old man, also received unprotected fellatio and anilingus from his female partner [9]. **The patient's female partner had a concurrent acute episode of exudative tonsillar-pharyngitis during their sexual encounter.** She had not been diagnosed microbiologically and had not

been treated when they were having their sexual encounter.

In addition, a 26-year-old non-heterosexual man was also diagnosed with perianal bacterial disease secondary to SDSE [19]. The man received unprotected fellatio and anilingus from three men within two months prior to his diagnosis. A pharyngeal swab and bacterial culture was performed for all three of his prior partners. One of **his partner's pharyngeal bacterial culture grew SDSE.** However, he was asymptomatic not only during the sexual encounter, but also when the culture was subsequently taken.

Furthermore, a German report from Scheiba and Hartschuh [20], described both a 46-year-old and 69-year-old man, who were diagnosed with perianal bacterial disease secondary to SDSE. The 46-year-old man had ankylosis spondylitis and was receiving immunosuppressant therapy at the time of diagnosis. The sexual orientation of these individuals was not described in the report.

Streptococcus dysgalactiae subspecies *equisimilis* can be a component of the normal flora of the nasopharyngeal cavity in humans and may cause pharyngitis [16]. **The bacterial culture of our patient's penile and the other men's perianal lesions grew SDSE.** The postulated route of transmission for perianal disease in these individuals was through oral-to-anal sexual practices [9, 19]. We hypothesize **that the route of transmission of our patient's penile bacterial disease, secondary SDSE, was oral-to-penis contact.**

Conclusion

Streptococcus dysgalactiae subspecies *equisimilis* is a component of the human normal flora in the skin, nasopharyngeal cavity, and genitourinary and gastrointestinal tracts. However, SDSE can also cause significant infections that mirror those caused by group A streptococci: minimal skin infections and pharyngitis to life-threatening sepsis and streptococcal toxic shock-like syndrome. Perianal bacterial disease typically affects children and is commonly associated with group A streptococci. However, perianal bacterial disease can be caused by

Table 1. Characteristics of men with perianal and penile bacterial disease due to *Streptococcus dysgalactiae* ssp. *equisimili*^a.

| C Ref ^a | Age Y | SO | Signs & Symptoms | Site | Morphology | Pr of A | Culture | Treatment | Oc |
|---------------------|-------|----|--|--------|--|---------------------------|-------------------|---|----|
| 1 [19] | 23 | NH | 10 days hx of painful anal, ulcers with light brown st discharge. Perianal skin was tender and no Imp was noted | Pa | Two ulcers with purulent discharge (1 cm x 2 cm; 1 cm x 1 cm) without vesicles and other lesions | Oral-anal ^b | SDSE | PO amoxicillin-clavunate 3 grams daily for 14 days | R |
| 2 [9] | 26 | H | 21 days hx of rash, irritation, intense pruritus and discomfort | Pa | Sharply demarcated perianal erythema, approximately 5 cm around the anus. | Oral-anal | SDSE | PO pcnV 40 mg/kg/day TID for 14 days | R |
| 3 ^d [20] | 46 | NR | 1-4 episodes in the past year 2- Few days prior to diagnosis reddening and itching in the gluteal area with fever | Pa, Ga | NR | NR | SDSE ^e | 1-PO pcnV 900mg TID for 10 days, then 2-PO pcnV 900mg TID for 2-3 days when symptoms reappeared | R |
| 4 CR | 67 | NH | 21 days hx of sore, red, raw distal penile shaft proximal to the corona | DPS | Circumferential erythema with peripheral scale | Oral-genital ^f | SDSE | PO cefalexin 500mg BID for 10 days | R |
| 5 [20] | 69 | NR | Reddening with moderate itching, intermittently for 15 years | Pa, Ga | NR | NR | SDSE ^g | 1-PO pcnV 720mg TID for 10 days then; 2- IV bpcn for 10 days; then 3- PO cefaclor 500mg TID for 5 days. | R |

^aBID: two times daily; bpcn: benzylpenicillin; C: case; cm: centimeters; CR: current report; DPS: distal penile shaft; Ga: gluteal area; IV: intravenous; H: heterosexual; hx: history; kg: kilograms; Imp: lymphangitis; mg: milligrams; NH: non-heterosexual; NR: not reported; Oc: outcome; Pa: perianal; pcnV: penicillin V; PO: orally; PR of A: probable route of acquisition; R: resolved; Ref: reference; SDSE: *Streptococcus dysgalactiae* subspecies *Equisimilis*; SO: sexual orientation; st: semi-translucent; TID: three times daily; y: years.

^bThe patient's three partners during the previous two months were called for examination and did not report any complaints; there was no anal or urethral discharge, no previous symptoms of pharyngitis or pneumonia in the last three months. Pharyngeal swabs and bacterial cultures were performed in the three partners. The bacterial culture from one of them grew SDSE.

^cThe patient had protected vaginal intercourse; however, he had unprotected fellatio and anilingus from his female partner. The patient's female partner had a concurrent acute episode of exudative tonsillar-pharyngitis that was neither diagnosed microbiologically nor treated at the time of sexual activity.

^dThe patient was receiving immunosuppressant therapy (prednisone) and infliximab at the time of diagnosis. However, the patient had symptoms prior to starting this therapy.

^eOther organisms, in addition to SDSE, grew in the bacterial culture: coagulase negative Staphylococcus, Corynebacterium species and Enterobacteriaceae.

^fThe patient received unprotected fellatio and anilingus from his partner. He also massaged his partner's prostate and then masturbated vigorously with same fingers. He denied anal entry of his penis.

^gOther organisms, in addition to SDSE grew in the bacterial culture: anaerobic flora, Corynebacterium species, Enterobacteriaceae and Enterococcus species.

other organisms, including SDSE, and may affect adults. In addition, perianal bacterial disease presents clinically analogous to penile bacterial disease with low grade, pruritic or tender, erythematous lesions. Perianal and penile bacterial disease secondary to SDSE has been described in five men, including our patient. Three patients specified receiving anilingus and fellatio from their partners two to three weeks prior the onset of their symptoms. One of the patients had a partner whose pharyngeal bacterial culture grew SDSE. Another patient had a partner with unconfirmed pharyngitis during their sexual encounter. Therefore, the hypothesized route of transmission of penile and perianal bacterial disease secondary to SDSE is oral-

to-anus or oral-to-penis contact. All of the men's SDSE infections completely resolved after treatment with antibiotics. Since, perianal and penile bacterial disease can present with the same clinical features and may be caused by the same etiologies, they should be considered variants of the same disease. Also, in both heterosexual and non-heterosexual men, the new onset of persistent penile shaft or perianal erythema — whether the affected area is painful, minimally tender, or asymptomatic — should prompt the consideration of penile or perianal bacterial disease secondary to SDSE or another bacterial pathogen, especially in patients who have been the recipient of fellatio or anilingus and whose partner had pharyngitis.

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