



Inflammation and infection

Isolated Penile Fournier's gangrene: A very rare entity

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ARTICLE INFO

Keywords:

Fournier's gangrene
Penile
Isolated

ABSTRACT

Comparatively to scrotal gangrene, isolated penile gangrene is very rare due to the rich blood supply of the organ. It is thought to be initiated by a traumatic or vascular insult to the penis. This condition requires parenteral antibiotic therapy and serial debridement of necrotic tissue. Split thickness skin graft is thought to be the best approach to cover penile skin loss. We share our experience on the presentation of an isolated penile gangrene in a 35-year-old male. In the light of this case, we review the predisposing factors and the management of this entity.

Introduction

Fournier's gangrene is a necrotizing fasciitis involving the penis, scrotum or perineal region. It is a polymicrobial infection caused by a mixture of aerobic and anaerobic microorganisms.^{1,2} Due to the rich vascular supply from the bulbourethral artery, isolated penile involvement in Fournier's gangrene is not commonly seen; only few cases have reported in the literature.³ We present a case of Fournier's gangrene isolated to the penis in a young adult. In the light of this case, we review the predisposing factors and the management of this entity.

Case presentation

A 35-year-old male, with no past medical history, presented to the emergency room with 5 days of painful swelling and blackish discoloration of penis. There was no recent history of trauma, unprotected sexual intercourse, lower urinary tract symptoms nor alcohol abuse. Physical examination revealed a high-grade fever of 38.8 °C with stable vital signs. The penis was necrotic in the upper ventral midshaft with 2 ulcerated plaques on the glans; edema and tenderness were noticed in the other areas of penile shaft (Fig. 1). The scrotum, digital rectal, and inguinal lymph node examinations were normal.

Laboratory examination revealed white blood cell of 17,500/mm³, normal hemoglobin value, normal renal function and elevated C-reactive protein (CRP); random blood sugar and urine analysis were normal.

HIV and Syphilis tests were negative.

Fluid resuscitation and antibiotic treatment with intravenous Cefotaxime, Gentamicin and Metronidazole were initiated; urgent surgical intervention under general anesthesia was performed. Before the operation, a suprapubic catheter was inserted. After degloving of the penis, we noticed subcutaneous necrotic tissues on the ventral and some of the dorsal aspect of the penis involving penile dartos layer. The tunica albuginea and underlying corpora cavernosa and corpus spongiosum were spared. Necrotic tissues were debrided to bleeding edges (Fig. 2), and sent for culture and histopathological examination with samples collected from glans ulcerations.

After regular dressing, wound bed was granulated and healthy. Laboratory studies improved; leukocyte count and CRP decreased. The culture of the pus materials revealed *Staphylococcus aureus*. Histology revealed acute and chronic non-specific inflammation and necrotic tissue.

The patient was discharged on the 15th postoperative day with a scheduled hospitalization, one week later, for split thickness graft. Unfortunately, the patient was seen 3 months after discharge. A spontaneous re-epithelialization of defected penile skin was noticed (Fig. 3). There was no penis incurvation during erection.

Discussion

Fournier's gangrene is a fulminant polymicrobial infection of the

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<https://doi.org/10.1016/j.eucr.2021.101608>

Received 18 January 2021; Received in revised form 7 February 2021; Accepted 13 February 2021

Available online 17 February 2021

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Fig. 1. Penile shaft necrosis with ulcerated plaque on the glans (red arrow). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)



Fig. 2. Post debridement aspect with uninvolved tunica albuginea and corpora cavernosa.



Fig. 3. Spontaneous re-epidermalization of defected penile skin.

fascia resulted in a rapid progression to gangrene of the perineal, genital, and/or anorectal region. It is a rare urological emergency with high mortality rate.² Risk factors for development include diabetes, alcohol abuse, advanced age, malignancy, renal failure and immunodeficiency.

Usually, the scrotum is the primary site of gangrene with spread to other parts of the perineum or anterior abdominal wall. Due to the rich vascular supply from the bulbourethral artery, isolated penile involvement is a very rare form of Fournier's gangrene; only 22 cases have reported in the literature.¹

The underlying causes are mostly idiopathic; however, Penile Fournier's is thought to be initiated by a traumatic or vascular insult to the penis.^{3,4} Known predisposing factors for Fournier's gangrene of the scrotum have been reported in some cases of isolated penile Fournier's gangrene, like diabetes and urethral stricture.¹ Some predisposing

factors, specific to the penis, have been documented including penile abrasion during oral sex or following anal intercourse in homosexuals and penile self-injection of cocaine.⁵ Calciphylaxis of the penis has also been reported as a rare cause of penile gangrene³; it is characterized by intravascular calcification of small and medium sized blood vessels, associated with focal thrombosis, and intimal fibroblastic proliferation with luminal narrowing and occurs mainly in patients with end-stage renal disease and diabetes. Penile edema may predispose to infection of the subcutaneous tissues because of impaired venous and lymphatic drainage as seen in patients with congestive cardiac failure.⁵ In our case, penile gangrene was idiopathic and no cause was identified.

The clinical presentation of penile gangrene begins with a prodromal period of genital pain and fever followed by genital swelling, necrosis, ulceration and foul odor. The diagnosis is primarily clinical.¹ Examination reveals purulent discharge, area of necrosis and crepitus. Computed tomography (CT) is used to evaluate the disease extent.¹ Despite the continuity of the superficial fascial planes of the penis and scrotum, we have not observed an extension of penile Fournier's gangrene to the scrotum like in the other cases. This is probably due to the separate blood supply of the corporal cylinders arising from the internal pudendal artery while the skin dartos and bucks fascia are supplied by the external pudendal arteries.⁵

The mainstay of management of Fournier's gangrene of the penis still remains intravenous fluids, parenteral broad-spectrum antibiotic therapy, early surgical debridement and reconstruction surgeries.^{1,2,5} Parenteral broad-spectrum antibiotics includes a triple therapy: third-generation cephalosporins or aminoglycosides, plus penicillin and metronidazole then adjusted according to the result of the cultures.¹ Fournier's gangrene requires aggressive debridement of the necrotic tissue.^{1,5} However, we should avoid excessive loss of healthy tissue on penis that could be used for reconstruction.⁴ Serial debridement can be useful when in doubt, this allows time for tissues with doubtful viability to be correctly identified as gangrenous or not.² After cleaning the wound bed, the challenge is to cover defected penile skin cosmetically without compromising erectile function. Remnant foreskin or scrotal skin may be used for penile skin loss coverage; however, split thickness skin graft is thought to be the best approach.⁵

Conclusion

Isolated penile Fournier's gangrene is a rare urological emergency. It is mostly idiopathic; however, some specific predisposing factors have been documented, particularly penile traumatism and calciphylaxis. Antibiotic therapy and debridement are the mainstay of the treatment. Split thickness skin graft is preferred to cover defected skin cosmetically without compromising erectile function.

Section heading

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Sources of funding

No funding.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Declaration of competing interest

The authors declare that they have no conflict of interest.

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