Inflammation and infection

Massive necrotizing Fournier’s gangrene

Fernando Rivera-Alvarez\textsuperscript{a}, Andrew George\textsuperscript{b}, Latha Ganti\textsuperscript{a,c,*}

\textsuperscript{a} HCA Healthcare University of Central Florida Graduate Medical Consortium Emergency Medicine Residency Program of Greater Orlando Author Contributions, USA
\textsuperscript{b} Brown University, Providence, RI, USA
\textsuperscript{c} Envision Physician Services, Plantation, Florida, USA

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A B S T R A C T

Despite its rarity, Fournier’s gangrene remains a potentially deadly disease. Rapid assessment and treatment is absolutely critical for patient survival. We present herein a classic case of Fournier’s gangrene in an older male with uncontrolled diabetes mellitus and hypertension, including ultrasonographic and computed tomography imaging. The necrotizing infection involved the patient’s entire scrotum and spread to the perineum as well, necessitating scrotectomy, and partial colostomy in addition to extensive debridement and skin grafting.

Introduction

Fournier’s gangrene is a rare form of necrotizing fasciitis occurring around the external genitalia, perineal, or perianal regions, primarily affecting males. While relatively uncommon, the disease is fulminant and can potentially extend up to the abdominal wall.\textsuperscript{1} It carries a mortality upwards of 40%. Various factors have been shown to be associated with Fournier’s gangrene. Diabetes remains the leading systemic factor predisposing and individual to the disease.\textsuperscript{2} Trauma to the genitals also can potentially lead to this as a vector for the introduction of infectious bacteria to the region.\textsuperscript{2}

The outcome of Fournier’s gangrene remains highly dependent on timing. While adequately early treatment does mitigate significant risks of unfavorable outcomes, delayed treatment is strongly associated with high lethality secondary to septic shock and related complications of bacterial infection.\textsuperscript{3} Consequently, it is imperative to quickly recognize signs of the disease and rapidly activate needed medical teams and interventions in order to ensure patient survival.

Case presentation

A 65-year-old man presented to the Emergency Department with a chief complaint of testicular pain and swelling, which had been going on for four days. The patient also had been experiencing an abscess in his right gluteal fold at the same time, for which he was taking clindamycin. For four days. The patient also had been experiencing an abscess in his right gluteal fold at the same time, for which he was taking clindamycin. He denied any loss of consciousness, dizziness, shortness of breath, chest pain, or any other symptoms. The patient’s history was significant for uncontrolled type 2 diabetes mellitus and hypertension.

An initial examination of the affected area was conducted, revealing tenderness and swelling of the testicular area with erythema involving the perineum and buttocks [Fig. 1]. The sepsis bundle was immediately activated, and the patient was started with piperacillin-tazobactam, vancomycin, and clindamycin. Laboratory analyses revealed a WBC of 18.7 K/mm\textsuperscript{3}, hemoglobin of 11.6 g/dL, Na of 123 mmol/L, K of 4.2 mmol/L, Cl of 90 mmol/L, BUN of 45 mg/dL, creatinine of 1.7 mg/dL, glucose of 427 mg/dL, and magnesium of 1.7 mg/dL.

Urology department was consulted immediately for evaluation of emergent concerns.

Urological evaluation was completed within 15 min, and emergent abdominal and pelvic computed tomography (CT) scans (to determine extent of infection) were ordered. The operating room was prepared following evaluation showing potential extension to perineum and buttocks.

Testicular ultrasonography showed bilateral scrotal wall edema with the right testis measuring 4.2 x 3.3 x 2.2 cm and the left one measuring 4.0 x 3.0 x 1.7 cm. A right-sided hydrocele was also noted [Fig. 2]. Blood flow to both testes was intact, without evidence of any torsion. CT of the abdomen and pelvis [Fig. 3] with contrast revealed extensive subcutaneous emphysema along right perineal region, with the...
appearance of free air within the right scrotal sac and fluid in the right testicle, likely secondary to Fournier abscess. It should be noted that extensive imaging is not necessary given the clear physical exam; in our case imaging was obtained promptly while en route to the operating room which was being readied. Thus no additional time was wasted.

The patient was immediately admitted to the medical team and urology for intervention, including emergent debridement of Fournier’s gangrene of genitalia and perineum.

He also underwent a complete scroctectomy with a thigh pouch for testicles, and a sigmoid colostomy with a rectal Hartman stump. Would cultures grew *E. Coli, E. Faecalis*, and *Bacteroides* species.

**Discussion**

Undoubtedly, the quick activation of the urology team and rapid assessment of the patient to determine extent of infection and necessary
interventions was critical for patient survival. The need for a quick recognition and response has been affirmed in multiple reviews of the literature surrounding Fournier’s Gangrene, with even a few hours delay being correlated with significantly worsened outcomes and increased mortalities. A scale, the Fournier’s gangrene severity index (FGSI), exists to quantify the extent of disease progression, and has been found to be useful and relatively effective in doing so, with those scoring above a 9 on the index having a roughly 75% risk of mortality, while those scoring at or below 9 had a roughly 75% chance of survival.

One analysis of 72 patients with Fournier’s gangrene found significant differences between survivors and nonsurvivors on a molecular level, with nonsurvivors having elevated urea (90), creatinine (1.7), and WBC (21) and lower bicarbonate (17), sodium (136), potassium (3.5), and albumin (2.5) when compared to survivors. In the same study, patients with risk factors significant for Fournier’s gangrene (primarily diabetes mellitus, also including chronic alcoholism, hypertension, and malnutrition, among others) tended to fare slightly better when compared to patients without significant risk factors.

Management of the disease requires broad spectrum antibiotic treatment, and surgical debridement is often required. The first debridement to resect nonviable tissue is typically the most important for patient survival, with recommendations in the literature to conduct extensive debridement on this initial pass, including a small margin of healthy tissue surrounding the nonviable tissue. Continued monitoring following this first debridement is similarly critical, as some reviews have found an average of 3.5 debridement operations being necessary per patient. Various methods of plastic reconstruction exist to mitigate some of the cosmetic damage caused by the disease and any necessary debridement procedures.

Conclusion

Continued awareness of Fournier’s gangrene, both on the patient level and the provider level, is extremely important, as the early diagnosis and initiation of treatment is vital to patient survival. Recognizing the classic symptoms of the disease, as well as being able to recognize hallmarks of more severely progressed disease, is a necessary skill for any emergency physician.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

FR-A and LG saw the patient in the Emergency Department. FR-A, AG and LG conducted literature review, and prepared the manuscript. All authors approved the final version of the manuscript.

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Declaration of competing interest

None of the authors have any conflict of interest.

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