

Comprehensive management and outcomes in female patients with Fournier's gangrene: A case report

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Abstract

Fournier's gangrene is a severe, life-threatening form of necrotizing fasciitis that predominantly affects the perineal, genital, and perianal areas. It is characterized by a rapid onset and progression, often developing from urogenital infections, diabetes, compromised immune function, or trauma. This report describes the case of a 64-year-old woman who presented with perianal pain and purulent discharge persisting for a week. Upon examination, a substantial necrotic wound was identified in her perineal region, necessitating urgent surgical debridement followed by aggressive postoperative management, including antibiotic therapy and meticulous blood sugar control. Despite initial signs of improvement, the patient's condition deteriorated due to complications from diabetes, acidosis, and pneumonia, ultimately leading to a fatal outcome. This case highlights the critical need for prompt recognition and comprehensive management of Fournier's gangrene, particularly in female patients exhibiting similar symptoms.

Keywords

Fournier's gangrene, necrotizing fasciitis, perineal infection, genital sepsis, polymicrobial infection, debridement, antibiotic therapy

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Introduction

Fournier's gangrene (FG) is a life-threatening bacterial infection characterized by rapid necrosis of the fascia and tissues in the genital, perianal, and perirectal areas. First described in 1883 by Jean Alfred Fournier, the condition primarily affects males, with a reported incidence of 1.6 per 100,000 and a male-to-female ratio of 10:1.^{1,2,4,5} It typically originates from infections in the genitourinary tract, anorectal region, or as a consequence of trauma.^{1,2,4,5}

The progression of FG involves both aerobic and anaerobic bacteria. These bacteria produce enzymes that facilitate the rapid spread of the infection, which can lead to severe systemic symptoms. FG is most common in older adults who often have other health conditions such as diabetes, alcoholism, or liver disease, which can complicate the infection and treatment outcomes.^{1–3}

Treatment of Fournier's gangrene requires urgent medical intervention, typically involving aggressive surgical debridement of necrotic tissues, broad-spectrum antibiotic therapy,

and supportive care for any underlying conditions. Despite these measures, the prognosis can be poor, especially in patients with significant comorbidities or delayed presentation.^{1–3} This case exemplifies the severe nature of FG in an elderly woman following perianal sepsis, who despite initial

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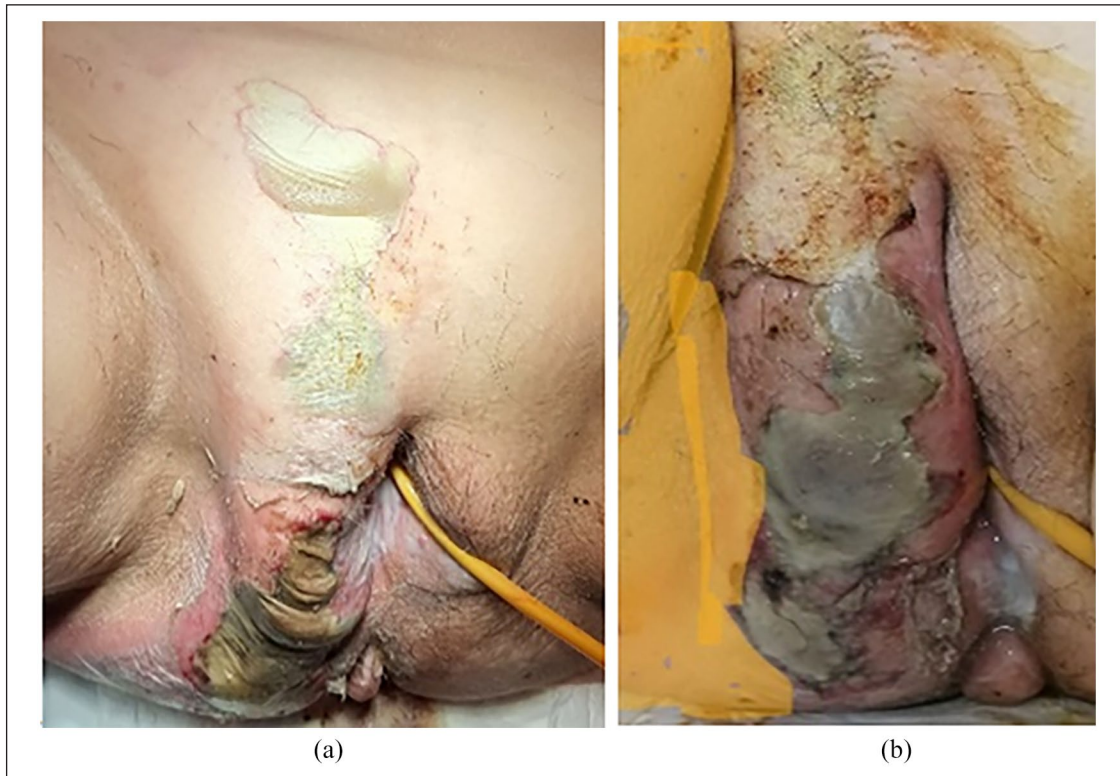


Figure 1. Right-sided vulvar bulge and green-black discoloration, necrotizing fasciitis from labia major since posterior glutea (a, b) perianal wound with necrotic patch and slough.

treatment success, succumbed to the condition due to her compromised health status

Case report

Patient presentation

A 64-year-old nulliparous woman with Type 2 Diabetes Mellitus, Hypertension, and Coronary Artery Disease presented with severe perianal pain and a week-long history of purulent discharge. Examination revealed a significant perineal wound extending from the gluteal area to the right labia majora, characterized by foul-smelling discharge and necrosis, suggestive of necrotizing fasciitis or gangrene (Figure 1(a) and (b)). Despite appearing well-nourished, she was pallor, disoriented, and uncooperative, with severe hypotension and bradycardia (Figure 1).

Initial management

Immediate management involved broad-spectrum antibiotics (vancomycin, amikacin, and meropenem) and norepinephrine to stabilize her condition. Laboratory tests indicated anemia, neutrophilic leukocytosis, and impaired kidney function, while a Computed tomography (CT) scan confirmed extensive inflammation and gas formation.

Surgical intervention

Emergency surgical debridement preserved the anal sphincter but revealed a deep fascial plane infection (Figure 2). Following surgery, the patient was admitted to the intensive care unit (ICU) for continued critical care. Initial empiric antibiotic therapy was adjusted based on culture results identifying *Escherichia coli* and *Staphylococcus aureus*, optimizing antimicrobial efficacy.

Intensive care management

In the ICU, continuous cardiovascular support with norepinephrine was necessary to maintain adequate blood pressure. Renal function was closely monitored due to acute kidney injury, and nephrotoxic drugs were avoided. Although dialysis was considered, conservative management, including fluid optimization and electrolyte monitoring, was initially preferred.

Chest physiotherapy was initiated early to prevent respiratory complications, given the patient's reduced mobility and the development of mild pleural effusion. Despite these preventive measures, the patient developed pneumonia, which was aggressively treated with targeted antibiotics and supportive respiratory care (Figure 3). Customized nutritional support was critical due to the patient's catabolic state, designed to meet her caloric and nutritional needs considering



Figure 2. Extensive debridement of the necrotic tissue preserving the anal sphincter. Intraoperatively, wound seen extending to the ischiorectal fossa.



Figure 3. Intensive dressing. Despite 24-h dressings, after 3 weeks of intensive management, granulation tissue started to appear on the wound site (Figure 4).

her diabetes and the metabolic demands of severe infection and surgical recovery.

Wound management and recovery

Upon admission, the patient underwent immediate surgical debridement to remove necrotic tissue, critical for reducing the load of infective material and preventing further spread of the infection. This procedure preserved the anal sphincter and prepared the wound for subsequent recovery phases. Negative pressure wound therapy (NPWT) was initiated shortly after stabilization to promote wound healing. This therapy helped maintain a clean wound environment, reduced edema, and enhanced granulation tissue formation over the



Figure 4. Granulation tissue started to appear on the wound site.

extensive perineal wound. Given the location and severity of the wound, fecal diversion via a temporary colostomy was performed to prevent fecal contamination and reduce secondary infection risks. This intervention was crucial for allowing undisturbed wound healing in the perineal area and was discussed with the patient to ensure understanding and consent.

Regular monitoring indicated fluctuating kidney function, suggesting acute kidney injury superimposed on pre-existing chronic kidney disease. Management strategies were adapted to avoid nephrotoxic medications and ensure adequate hydration. Dialysis was considered but deferred, opting for conservative management initially. The decision was based on a comprehensive assessment of fluid and electrolyte balance, and renal function trends, with dialysis equipment prepared for immediate use if required.

Outcome

Despite intensive management, the patient suffered recurrent infections and renal issues, complicating her recovery. Postoperative care included blood transfusions, tailored parenteral nutrition, and intensive metabolic management. Granulation tissue started forming at the wound site after 3 weeks (Figure 4). However, persistent wound issues and renal instability 5 weeks post-treatment complicated her recovery, ultimately leading to her demise. Histology confirmed Fournier's syndrome (Figure 5).

This case underscores the complexity of managing Fournier's gangrene in patients with significant comorbidities, highlighting the challenges of surgical management, the critical need for timely intervention, and the importance of comprehensive postoperative care in improving outcomes.



Figure 5. The wound was not closed and recurrent infection on the buttocks.

Discussion

Fournier's gangrene, though uncommon in women, represents a severe medical emergency due to its rapid progression to sepsis if untreated, exhibiting a mortality rate of 20%–30% largely due to anatomical differences.^{5,6} In men, anatomical features provide some protection, limiting the spread of infection predominantly to the scrotum. Conversely, in women, while pelvic drainage reduces susceptibility, the anatomical layout of Colles' fascia can allow the infection to extend extensively to the abdominal wall, potentially increasing mortality to 70% if complications such as sepsis and organ failure ensue.⁷

Distinguishing Fournier's gangrene from other skin infections like cellulitis and gas gangrene is challenging, particularly in the early stages where necrotizing fasciitis is confined to the epidermis, making it difficult to differentiate from cellulitis.^{1,2} Diagnostic accuracy at initial presentation is notably low, ranging from 15% to 34%.³ The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score, proposed by Wong et al., serves as a crucial early differentiation tool, with scores ≥ 6 strongly indicating necrotizing fasciitis.⁹ In the described case, a LRINEC score of 9 affirmed the presence of necrotizing fasciitis from the outset.

Diabetes mellitus significantly heightens the risk of Fournier's gangrene, with the role of glycemic control in patient outcomes still debated. Insulin pumps are often preferred for managing glucose levels in the early disease stages to address severe inflammation and immune challenges.¹¹ Critical risk factors include perineal and perianal abscesses, hypertension, trauma, chronic catheterization, neoplasms, and notably, renal failure, all influencing disease incidence and mortality.^{12,13} The infection's polymicrobial nature, involving aerobic and anaerobic bacteria like *E. coli* and *Staphylococcus* species, emphasizes the complexity of its management, requiring a comprehensive approach that integrates metabolic control, antimicrobial therapy,

surgical debridement, and advanced wound care.^{6,14–16} This complexity is further heightened in females, where additional factors like diabetes and obesity increase susceptibility.¹⁷

Treatment strategies prioritize early surgical intervention, hemodynamic support, and broad-spectrum antibiotics. NPWT offers healing benefits, although it presents challenges.¹⁸ Techniques such as urinary and fecal diversion are crucial for preventing wound contamination, enhancing healing, and supporting nutritional well-being, necessitating careful evaluation of both patient and disease severity.¹⁹ The involvement of a wide range of microorganisms underscores the importance of precise culture and sensitivity analyses for effective antibiotic selection. Diagnostic imaging is pivotal in assessing the extent of the gangrene and guiding therapeutic decisions.^{20,21}

Additional considerations in treatment strategy include the potential use of hyperbaric therapy, silver dressings, frequency of surgical wound cleaning, and early imaging studies in clinical diagnosis uncertainties. Subsequent reconstructive surgery may be required. Comprehensive patient management is critical, particularly due to the frequent presence of multiple comorbidities in these patients, as meticulous care can significantly reduce mortality.

Conclusion

Fournier's gangrene, though rare in women, demands urgent attention for those showing necrotizing fasciitis symptoms. Its seriousness necessitates prompt diagnosis, rapid debridement, targeted antibiotics, and thorough wound care. Managing coexisting conditions like diabetes is crucial for prognosis. A collaborative care approach is essential for comprehensive treatment. Awareness among healthcare professionals is vital for quick intervention, aiming to improve survival rates and reduce complications.

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Author contributions

Dr. Kariman Ghazal and Georges Yared spearheaded this case report encompassing the conception and design, data acquisition, analysis, and interpretation. They played a pivotal role in drafting the manuscript and provided final approval for the version to be submitted. Dr. Charlotte El Hajjar, Dr. Jihad Al Hassan, Dr. Nour Madi, and Dr. Saad Abou Hammin further enriched the manuscript by critically revising it for significant intellectual content and also extended their approval for the final version to be submitted. Finally, Hamza Nakib played a crucial role in the editorial process of this manuscript, significantly enhancing its overall quality. His expertise not only improved the clarity and accuracy of the content but also ensured that the arguments presented were coherent and compelling. His contributions were instrumental in refining our paper and bringing it to publication standards.

Data availability

The data supporting the findings of this study are available from Rafic Hariri University Hospital.

Declaration of conflicting interests

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Ethical approval

Ethical approval to report this case was obtained from RAFIC HARIRI UNIVERSITY HOSPITAL BY DR. GEORGES YARED

Informed consent

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article

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