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Fournier Gangrene in an Immunocompetent Woman Following Minor Perineal Manipulation: A Case Report

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Data Collection B
Statistical Analysis C
Data Interpretation D
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Patient: Female, 40-year-old
Final Diagnosis: Fournier's gangrene
Symptoms: Left labial pain and swelling extending to the suprapubic region, associated with vomiting and lower abdominal pain
Clinical Procedure: —
Specialty: Obstetrics and Gynecology
Objective: Rare disease
Background: Fournier gangrene is a rare, life-threatening necrotizing fasciitis involving the perineum and external genitalia. It predominantly affects men, while cases in women are uncommon and often underrecognized, leading to delays in diagnosis and treatment. Although Fournier gangrene is frequently associated with immunocompromised states and diabetes mellitus, cases occurring in immunocompetent individuals remain exceptional.
Case Report: We report a 40-year-old woman with obesity (BMI 39 kg/m²) and without immunodeficiency who presented with severe left labial pain and swelling 1 week after perineal shaving and topical herbal application. On examination, she had tachycardia, with marked tenderness and swelling extending to the suprapubic region. Laboratory investigations revealed significant inflammatory response. Computed tomography demonstrated extensive subcutaneous gas and fascial involvement of the vulva and perineum, consistent with necrotizing fasciitis. The patient underwent urgent surgical debridement followed by multiple re-explorations and negative-pressure wound therapy. Cultures identified extended-spectrum β-lactamase-producing *Escherichia coli*, *Klebsiella pneumoniae*, and *Enterobacter cloacae*. Empirical broad-spectrum antibiotics were initiated, and subsequent culture-guided therapy allowed step-down from meropenem to amoxicillin-clavulanate. Definitive wound closure was achieved by secondary intention after prolonged inpatient care.
Conclusions: This case highlights that Fournier gangrene can occur following minor perineal manipulation in women without immunodeficiency. Obesity may mask early clinical signs and contribute to diagnostic delay. Early recognition, prompt imaging, aggressive surgical debridement, and multidisciplinary management remain essential for favorable outcomes, even in patients without classical risk factors. These findings reinforce the need to maintain a high index of suspicion in atypical presentations.
Keywords: fasciitis, necrotizing • Fournier gangrene • perineum • vulvar diseases
Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/953136>

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Introduction

Fournier gangrene (FG) is a rare, rapidly progressive necrotizing infection of the perineum and external genitalia caused by synergistic bacteria, leading to microvascular thrombosis and gangrene. FG accounts for less than 0.02% of hospital admissions [1]. It predominantly affects men, especially those aged 50 to 79 years, with comorbidities such as diabetes, alcohol abuse, or organ disease. However, up to 30% of cases occur in otherwise healthy individuals. FG has a high mortality rate of about 40%, which increases sharply with delayed diagnosis but improves with early surgical intervention. FG has reported male-to-female ratios of 10: 1 to 40: 1 [2]. Recent studies have also highlighted the role of immunonutrition and the host inflammatory response in modulating disease severity, particularly in immunocompetent individuals [3-5]. Nonetheless, much of the available literature is based on small retrospective case series, which limits the precise estimates of disease burden and outcomes. Importantly, when FG occurs in women, it may be initially misdiagnosed as a gynecologic condition, which can delay definitive management. Several comorbidities are recognized as risk factors, including diabetes mellitus, immunosuppression, malnutrition, intravenous drug use, peripheral vascular disease, renal impairment, malignancy, and obesity [6]. In addition, local perineal trauma, skin disruption, or invasive or cosmetic procedures can serve as portals of entry for polymicrobial infection. In terms of management, urgent surgical intervention and broad-spectrum antibiotic therapy remain the cornerstone of treatment. Survivors often require prolonged hospitalization, multiple procedures, and complex wound care.

We report the case of an immunocompetent woman with obesity who developed FG following perineal shaving and topical herbal application, a presentation that challenges the conventional association of FG with male sex and immunosuppression, underscoring the risk of severe infection after minor perineal trauma.

Case Report

Patient History and Clinical Findings

A 40-year-old woman with obesity (body mass index 39 kg/m²), 4 prior cesarean deliveries, prior laparoscopic appendectomy, and a history of solitary rectal ulcer syndrome presented with a 1-week history of progressive left labial pain and swelling extending to the suprapubic region, associated with vomiting and lower abdominal pain. Importantly, 1 week earlier, she had undergone perineal shaving and topical application of an herbal preparation to the vulva by an alternative practitioner. She had received no antibiotics or other topical treatments before admission.

On admission, she had tachycardia, with a heart rate of 140 beats/min, but had no fever and was normotensive (131/74 mm Hg). She had a respiratory rate of 19 breaths/min and oxygen saturation of 98% on room air. Laboratory test results showed leukocytosis ($22.36 \times 10^3/\mu\text{L}$), markedly elevated C-reactive protein (314.9 mg/L), and elevated erythrocyte sedimentation rate (67 mm/h), with normal renal function. The calculated Fournier's Gangrene Severity Index (FGSI) was 7, and the Uludag FGSI was 8, both below the thresholds associated with increased mortality [7]. Examination revealed marked left labial swelling with erythema, induration, and disproportionate tenderness extending to the suprapubic region.

Diagnostic Assessment

Contrast-enhanced computed tomography demonstrated subcutaneous emphysema and fascial involvement of the vulva, perineum, and anterior abdominal wall without intra-abdominal extension, consistent with necrotizing fasciitis (Figure 1).

Management and Surgical Course

The patient underwent emergent surgical debridement to viable bleeding margins. Histopathology confirmed necrotizing fasciitis. Following this, a negative-pressure wound therapy was applied, with serial dressing changes and additional debridement under anesthesia over 5 weeks. During one of these procedures, a simple anal fistula was identified and treated with fistulotomy. It was unclear whether this represented the primary source or a complication of the infection. After 5 weeks, negative-pressure wound therapy was discontinued, and wound care transitioned to specialized dressings.

Wound cultures grew polymicrobial flora, including extended-spectrum β -lactamase (ESBL)-producing *Escherichia coli*, *Klebsiella pneumoniae*, and *Enterobacter cloacae*. In contrast, blood cultures were negative. Consequently, the patient was started empirically on meropenem, clindamycin, and vancomycin. However, based on the absence of methicillin-resistant *Staphylococcus aureus* (MRSA) in cultures, clindamycin and vancomycin were discontinued. Empirical meropenem was selected in line with established recommendations for severe necrotizing soft tissue infections, given the high likelihood of polymicrobial involvement including gram-negative and anaerobic organisms, alongside the patient's extensive fascial involvement and systemic inflammatory response. Although ESBL-producing organisms are generally associated with resistance to β -lactam/ β -lactamase inhibitor combinations, susceptibility in vitro together with clinical improvement following adequate surgical source control supported cautious de-escalation in this case under close monitoring [8,9].

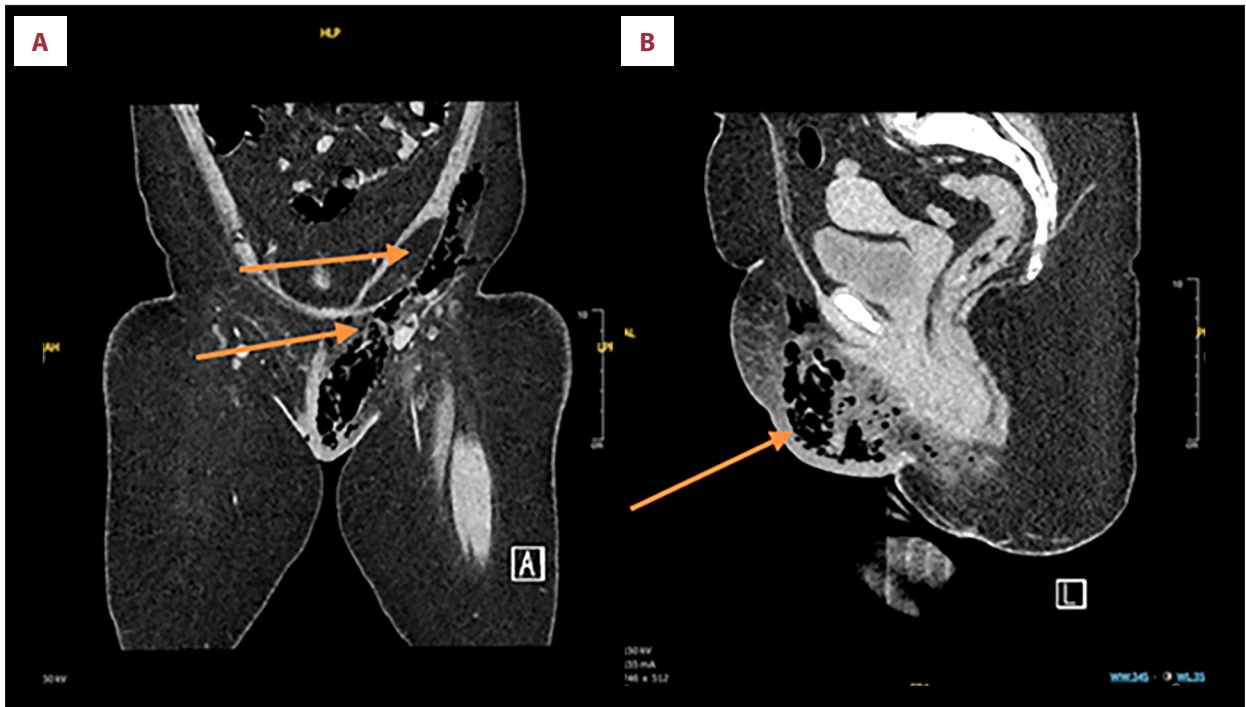


Figure 1. Contrast-enhanced computed tomography scan showing extensive subcutaneous emphysema and fascial involvement of the vulva and perineum. (A) A coronal image and (B) a sagittal image.

Table 1. Chronology, rationale, and modification of antimicrobial therapy during management of Fournier gangrene.

Treatment phase	Antimicrobial regimen	Rationale	Duration/modification
Initial empiric therapy	Meropenem, clindamycin, and vancomycin	Broad-spectrum empirical coverage for suspected polymicrobial necrotizing infection, including gram-negative, anaerobic, and resistant gram-positive organisms	Initiated on admission
Early de-escalation	Discontinuation of clindamycin and vancomycin	Tissue cultures showed no methicillin-resistant <i>Staphylococcus</i> or streptococcal species, and no clinically significant anaerobic growth was identified	After 48 hours
Targeted therapy	Meropenem continued	Tissue cultures identified extended-spectrum β -lactamase-producing <i>Escherichia coli</i> , <i>Klebsiella pneumoniae</i> , and <i>Enterobacter cloacae</i> susceptible to carbapenems	Continued for 10 days
Culture-guided escalation	Addition of linezolid	Added following culture growth of resistant gram-positive organisms, including <i>Enterococcus faecalis</i> and coagulase-negative staphylococci	Administered for 14 days
Oral step-down therapy	Amoxicillin-clavulanate	Initiated after adequate surgical source control, sustained clinical improvement, and intermediate in vitro susceptibility, with close monitoring for relapse	Additional 14 days

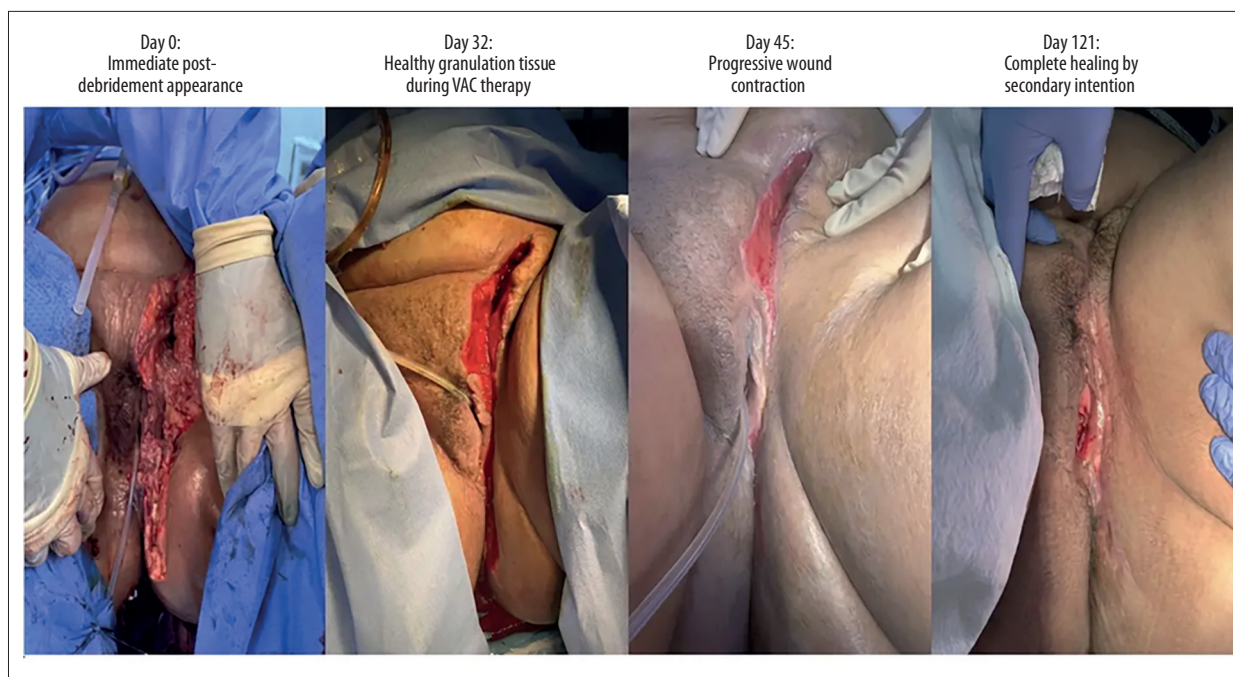


Figure 2. Serial wound progression following debridement and negative-pressure therapy. Day 0: Immediate postdebridement appearance. Day 32: Healthy granulation tissue during negative-pressure wound therapy. Day 45: Progressive wound contraction. Day 121: Complete healing by secondary intention.

Vancomycin was added to ensure coverage of potential resistant gram-positive pathogens pending microbiological confirmation. Furthermore, linezolid was added for 2 weeks, as the tissue cultures showed resistant gram-positive organisms. This was administered as targeted therapy following culture results indicating resistant gram-positive organisms, in accordance with culture-guided escalation principles in complex necrotizing infections. The chronology, rationale, and modifications of antimicrobial therapy are summarized in **Table 1**.

Outcome and Follow-Up

Given the patient's obesity and the high risk of wound dehiscence, wound closure was achieved by secondary intention. As a result, she remained hospitalized for 12 weeks for wound care and healing (**Figure 2**). Additionally, she was provided nutritional counseling focused on high-protein supplementation. She was also referred to rehabilitation services for gait disturbances due to perineal scarring. At the 6- and 12-week follow-up visits, she remained infection-free with good functional recovery, although mild cosmetic deformity persisted. Consequently, scar revision surgery was planned 1 year after complete healing.

Discussion

FG has a persistent mortality rate of 30% to 40% despite advances in early diagnosis and treatment [10]. Although FG

occurs less frequently in women, several studies have shown higher mortality in female patients. The reasons for this difference are not fully understood, but proposed mechanisms include anatomical and drainage-related factors, in which pelvic anatomy may facilitate rapid cephalad spread of infection to the trunk and abdominal cavity, increasing the risk of multi-organ failure and peritonitis [11]. Consequently, female sex appears protective for incidence but may be associated with worse outcomes once FG develops. Our patient was immunocompetent, without diabetes or systemic immunosuppression. Few cases of FG in immunocompetent women have been reported, and this case adds to that limited literature by highlighting the specific clinical context of minor perineal manipulation in a patient with obesity [12].

Obesity significantly complicates both the diagnosis and management of FG. Excess subcutaneous adipose tissue can mask classic clinical signs such as crepitus and woody induration and can limit reconstructive options [13]. This is clinically relevant because obesity has been reported in nearly half of women with FG and is an independent risk factor for disease development [13]. Diabetes mellitus is present in more than 60% of cases in large series [14], and when combined with obesity and poor glycemic control, the risk of rapid disease progression is tripled due to synergistic immune dysfunction and microvascular compromise [15]. Although our patient was euglycemic, obesity alone likely contributed to disease severity and complexity of wound management.

In most cases of FG, a source of infection can be identified. Retrospective series report a cutaneous, anorectal, or perineal origin in approximately 58% of patients, while 17% remain idiopathic [16]. Reported triggers include vulvar abscesses, pelvic radiotherapy, post-hysterectomy wound infections, perianal abscesses, pressure ulcers, and Bartholin gland disease [17]. The contribution of solitary rectal ulcer syndrome in this patient is speculative and should be interpreted with caution. Solitary rectal ulcer syndrome is a rare benign condition characterized by constipation, incomplete evacuation, and bloody or purulent stools, with no previously reported association with FG [18]. Chronic inflammation and altered anorectal function may contribute to weakening of local tissue barriers, potentially facilitating translocation of enteric organisms such as *E. coli* to adjacent perineal and vulvar tissues [19]; however, this association has not been established. Furthermore, the most plausible portal of entry in this patient was skin barrier disruption related to non-sterile perineal shaving, potentially compounded by topical herbal application [20,21]. The patient's history of shaving and use of non-medical topical preparations suggests possible contamination from unsterilized instruments or herbal compounds, creating conditions favorable for polymicrobial invasion. Additional anorectal conditions, including solitary rectal ulcer syndrome with recurrent hematochezia and the anal fistula, may have contributed to local tissue vulnerability and bacterial translocation, although their direct causal role cannot be definitively established. This mechanism parallels reported cases of FG following ritual male circumcision, in which disrupted skin integrity facilitated invasion of commensal flora into deeper tissues [22]. The anal fistula identified during debridement may represent either a pre-existing infectious source or a secondary complication of the disease process, as both scenarios have been described in the literature, including reports of fistula formation secondary to rapid tissue necrosis in necrotizing fasciitis [23,24].

Wound healing following FG is prolonged and variable. In this case, healthy granulation tissue developed after 18 days, consistent with systematic reviews reporting a typical interval of 2 to 3 weeks [25]. Reconstruction options include primary closure, secondary intention, skin grafting, and loco-regional flaps. In a review of 593 patients, primary closure was used in 5.9% of patients, healing by secondary intention in 19.1%, skin grafts in 37.4%, and loco-regional flaps in 37.9% [26]. In our patient, flap or graft reconstruction was avoided due to morbid obesity and the associated 30% to 70% complication rate reported for tertiary perineal closure in this population [27]. Instead, secondary healing supported by negative-pressure wound therapy and advanced antimicrobial dressings was successful, consistent with studies showing negative-pressure wound therapy reduces dressing frequency and hospital stay and can serve as a bridge to reconstruction [28].

Prognostic scoring systems further contextualize the favorable outcome. Studies have addressed different scoring systems for predicting morbidity and mortality. The FGSI, introduced in 1995, is a complex prediction score designed specifically for patients with FG. Several studies have established that a score of 9 or lower indicates reduced mortality, with a sensitivity of 70% and a specificity of approximately 90% [29]. Our patient's score was 7, which aligns with this evidence. Fifteen years later, Yilmazlar et al proposed a new and reportedly more powerful scoring system, the Uludag FGSI, which adds points for age and the extent of disease to the original FGSI. A recent meta-analysis confirmed that the Uludag FGSI has better prognostic value than the conventional FGSI [30]. Our patient's Uludag FGSI score was 8, which falls below the threshold associated with increased mortality. Recent reports describing alternative management strategies for necrotizing fasciitis, including bedside interventions and negative-pressure wound therapy, further support our treatment approach [31-33].

Finally, this case highlights the technical challenges of managing FG in women with morbid obesity. Repeated negative-pressure wound therapy changes under anesthesia are often required to maintain an airtight seal, which is a known limitation of negative-pressure therapy. Although her 77-day hospital stay exceeded the typical 20- to 50-day range, it aligns with reports that repeated debridement is associated with prolonged hospital stay [29,34].

Conclusions

FG can occur in immunocompetent female patients and may follow seemingly minor perineal skin manipulation. In such patients, obesity can obscure early clinical signs and complicate both surgical and reconstructive management. Therefore, prompt recognition, early imaging, and aggressive surgical debridement with culture-directed antimicrobial therapy remain essential for favorable outcomes. When primary reconstruction is not feasible, negative-pressure wound therapy can support prolonged wound management. Clinicians should maintain a high index of suspicion for necrotizing infection in patients with rapidly progressive perineal pain and swelling, even without classic systemic risk factors.

Department and Institution Where Work Was Done

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Informed Consent

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

Declaration of Figures' Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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