

# The Fournier Gangrene - A Life-threatening Disease

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## Abstract

**Introduction and Objectives.** Necrotizing fasciitis (NF) of the perineum or Fournier Gangrene (FG) is a rare disease, but associated with increased mortality, especially in diabetic and immunosuppressed individuals. The paper proposes a retrospective analysis of the 14 cases of Fournier Gangren in the last 5 years.

**Materials and Methods.** During the period 2012-2017, 14 patients (p) with FG were admitted the Department of Urology Sibiu. The most common association was urethral stricture in 6 p (42.8%), with no detectable cause. Comorbidities: diabetes in 8 p (57.1%), and one patient (7.1%) with digestive neoplasm. Aggressive surgical debridement, necrosectomy and fasciotomy are the main points of surgical treatment. Usually, debridement is repeated during the next 24 h or later, depending on the clinical course and patient's general condition. Debridement was extended until healthy tissue is found.

**Results.** All patients were submitted to surgery in the first 24 hours of onset. Repeated debridement was needed after 2-3 days in 8 p (57.14%). Unilateral orchidectomy was performed at 2 p (14.28%). 6 p (42.85%) presented post-operative complications. 3 p (21.42%) presented acute bleeding due to coagulation disorders. 3 p (21.42%) have developed septic shock and died 10 days postoperative. Cutaneous graft or graft cut was imposed on 8 p (57.14%). The mean hospital stay was 35 days (between 21 to 42 days).

**Conclusions.** FG is a rapidly progressive disease, a real urological emergency not by incidence, but by its gravity. FG is requiring prompt diagnosis and complex medical and surgical therapy. Age, diabetes and immunosuppressive diseases are the most important risk factors along with specific urological pathology.

**Key-words:** Fournier Gangrena, necrotizing fasciitis, gas formation.

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## Introduction

Necrotizing fasciitis of the perineum or Fournier Gangrene is a rare disease, but associated with increased mortality, especially in diabetic and immunosuppressed individuals. Although originally described as idiopathic scrotal gangrene, a cause can be found in 95% of cases<sup>1,2</sup>. This disease occurs especially in men in decades 6 and 7 of life. Periurethral abscess, ischio-rectal abscess, perineal abscess, anal sphincter abscess, or locoregional skin infections have been described as the source of infection, the most common cases having periurethral and anorectal origin<sup>3,4</sup>.

The FG is usually described as a genital infection characterized by obliterary endarteritis of the subcutaneous vessels resulting in necrosis of the subcutaneous tissue and the overlying skin. This infection can spread from perineum to the penis, buttocks and thighs, abdominal wall and chest<sup>5</sup>.

Tissue ischemia favors the proliferation of anaerobic microorganisms. Anaerobic metabolism results in an accumulation of hydrogen and nitrogen in the gaseous state at the tissues, causing the characteristic crepiness at the palpation of the affected area.

Although Fournier's disease has a low incidence, it may have a progression and serious prognosis if it does not intervene efficiently and on time. Precise diagnosis and effective treatment is essential for healing patients.

The recent findings on the treatment of this disease, both surgically and medically, increase year-on-year in the rate of ad-integrum healing, also leading to a decrease in the incidence of subsequent complications, implicitly death rates.

The mortality rate is variable and is reported in the international specialized literature between 7 and 75%. Mortality is higher in diabetic patients or patients with other immunosuppressive comorbidities<sup>6</sup>.

This study aims to analyze the causes, diagnosis, treatment and complications of the Fournier gangrene.

## Materials and Methods

During the period 2012-2017, 14 patients (p) with FG, perineal pain, swelling and scrotal redness were admitted in the Department of Urology Sibiu, followed by a short time interval of skin necrosis with the tendency to extend to the lower abdomen. The most common association was urethral stricture in 6 p (42.8%), with no detectable cause. Morbid associations: diabetes in 8 p, and one patient with digestive neoplasm.

Patients presented at the clinic accused acute genital and / or perineal pain which increased over time. At

the clinical examination, all patients had subcutaneous cramping on palpation, and erythematous and gangrenous enlargement on various surfaces were found (Fig. 1).



Fig. 1 Clinical aspect of FG

Aggressive surgical debridement, necrosectomy, and fasciotomy are the main points of surgical treatment. Usually, debridement is repeated during the next 24 h or later, depending on the clinical course and patient's general condition. Debridement was extended until healthy tissue is found (Fig. 2-4).



Fig. 2  
Intraoperative  
aspect of FG



Fig. 3  
Aspect of secondary  
sutures



Fig. 4  
Aspect of healing  
surgical wounds

## Results

All patients presented to their physician after the outgrowth of the gangrene, ignoring pain and erythema in the initial stages of the disease, and administering empirical antibiotic treatment. From the rural background 8 p, and 6 p from the urban environment. The age of patients in the study presented ranges between 42 and 76 years of age, with the highest prevalence in the seventh decades of life. Predisposal factors were identified 12 p (85.71%): the infection from the periurethral abscess concomitantly with urethral strictures in 6 p (35.71), perianal abscesses in 3 p (21.42%) and due to grinding injuries in 3 p (21.42%). The etiology was not identified at 2 p (14.28%). Aerobic pathogenic germs were identified in cultures in 10 p (71.48%).

Etiology	Number of patients	Percentage
Urethral Strictures	6	42.8%
Perianal abscesses	4	28.5%
Gravel injuries	2	14.2%
Etiology unspecified	2	14.2%

Tabel 1 Predisposing factors for Fournier Gangrena

From 8 diabetic p, 4 p were newly diagnosed with diabetes the disease in the hospitalization time, diabetes mellitus being the most common morbid association of the Fournier Gangrene. A patient had chronic ethanolic hepatitis and another previously operated gastric neoplasm.

Comorbidities	Number of patients	Percent
Diabetes mellitus	8	57.1%
Chronic hepatitis	1	7.1%
Operated gastric neoplasm	1	7.1%
No associated diseases	4	28.5%

Tabel 2 Comorbidities associated with Fournier Gangrena

Emergency lab tests have evolved: haemoleucograms with leukocytosis, thrombocytopenia and low hematocrit in the context of the septic process. Urea and creatinine were slightly elevated as a result of hydroelectrolytic disorders following dehydration or by chronic renal failure. Glycemia and elevated glycosylated hemoglobin HbA1c confirm the diagnosis of diabetes. Tests for acute inflammation (reactive C protein, fibrinogen) are present and their tracking in dynamics provides information on disease progression. Although blood culture results are not always available in an emergency basis, the empirical usage of antibiotics is based on the suspected microbiological type.

All patients were submitted to surgery in the first 24 hours of onset. Surgical treatment consisted in multiple incisions with purulent secretion drainage, debridement of necrotic and suppurated tissues, underlying subcutaneous tissue, fascia and muscle to the point that viable tissue was evident, numerous drainage probes, especially at the scrotal levels. Suprapubic cystostomy was done to all patients (Fig. 2).

Concomitant intensive care treatment was applied, consisting in antibiotics in combination and metabolic rebalancing therapy. The parenteral antibiotic treat-

ment consisted of the combination of cephalosporins of the third generation with aminoglycosides and metronidazole.

Repeted debridement was needed after 2-3 days in 8 p (57.14%). Unilateral orchidectomy was performed at 2 p (14.28%).

6p (42.85%) presented postoperative complications. Three p (21.42%) presented acute bleeding due to coagulation disorders. Blood transfusion and surgical haemostasis were needed. Three p (21.42%) have developed septic shock and died 10 days postoperative. They were older than 70 years with decompensated diabetes.

Secondary suture was performed in all patients after a period of time between 2 and 4 weeks (Fig. 2, Fig. 3). Cutaneous graft or graft cut was imposed on 8 p (57.14%). The mean hospital stay was 35 days (between 21 to 42 days).

## Discussions

The Fournier Gangrene is a rare clinical entity, with an annual incidence of 1000 cases annually, and global prevalence of 0.040 cases per 1000 person-years<sup>7</sup>. There is no age predilection for this disease; however, middle-aged and elderly patients (over 50 years of age) are more likely to be infected [8]. We noted a statistically significant correlation between advanced age and mortality, and this is in accordance with large clinical studies that have shown that advanced age is a strong, independent predictor of mortality<sup>9</sup>.

Patients with NF, mainly due to their advanced age, usually have at least one comorbidity. The most frequent comorbidity is diabetes mellitus<sup>10</sup>. In our series, there was no statistically significant correlation between diabetes and mortality. Chronic renal failure is also a frequent comorbidity in patients with necrotic fasciitis, which seems to be a decisive risk factor for mortality. Elevated serum creatinine, along with elevated blood urea, is strongly associated with high mortality rates<sup>11</sup>. Other common comorbidities include pre-existing hypertension, obesity, liver cirrhosis, chronic heart failure, alcohol abuse, immunodeficiency, systemic lupus erythematosus, Addison's disease, and peripheral vascular disease<sup>12,13</sup>.

The clinical onset of patients with Fournier Gangrene is not always evident, leading usually to misdiagnosis. The most common symptoms are local pain, swelling, and erythema; however, the simultaneous presence of these three symptoms is not a common phenomenon<sup>14</sup>. Local skin changes consist of tenderness, crepitus, skin necrosis, and hemorrhagic bullas.

The laboratory tests can provide information regarding the diagnosis of Fournier Gangrene may also indicate its severity of the disease<sup>15</sup>.

The presence of crepitus suggests infection from anaerobic bacteria, which is useful for treatment strategy. Regularly, these symptoms combine with tachycardia and fever, followed by hypotension and tachypnea indicates development of systemic inflammatory response syndrome<sup>15</sup> and can develop sepsis, and when hypotension is resistive to fluid resuscitation and anti-biotherapy patients may develop septic shock, which is a risk factor for mortality. In our series, all patients who developed septic shock did not manage to survive. This strong correlation between septic shock and mortality has been repeatedly reported in the literature<sup>16,17,18</sup>.

All patients who died belonged to the older age group, which confirms that older organisms resist less and they have a reserved prognosis. The FG is a life-threatening disease with mortality rate of 21.4% in our series of patients.

### Conclusions

The Fournier Gangrene is a rapidly progressive disease, a real urological emergency not by incidence, but by its gravity.

The Fournier Gangrene is requiring prompt diagnosis and complex medical and surgical therapy.

Once the diagnosis has been established, emergency surgery is mandatory, consisting of extensive tegumental incisions for evacuating and releasing gas and purulent subcutaneous collections, necrosectomy and fasciotomy plus suprapubic urinary drainage.

Effective fluid resuscitation, balancing diabetes mellitus and the administration of broad spectrum antibiotics are therapeutic measures that are urgently needed.

Age, diabetes and immunosuppressive diseases are the most important risk factors along with specific urological pathology.

It is a strong correlation between septic shock and mortality in Fournier Gangrene.

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