

Forunier's Gangrene: A Replaine Disease

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ABSTRACT

Introduction: Fournier's gangrene is a rare disease that is defined as the infection of soft tissues and muscle fascia that are specifically necrotic, potentially fatal, of polymicrobial cause and of specific topography. **Objective:** presentation of a case. **Method:** A 59-year-old male with type 2 diabetes mellitus without treatment, with 14 days of evolution, the diagnosis of Fournier's gangrene is made, he undergoes immediate surgical management with drainage, debridement and aggressive surgical lavage and exploratory laparotomy, which despite due to the relentlessness of the infection and necrosis, his evolution was satisfactory. **Discussion:** the triggering factor or cataclysm of Fournier's gangrene is not known, but it is associated with its own elements that converge and create a synergy of the infectious event in the patient. Early surgical care reduces mortality by up to 16%, otherwise it increases by up to 68%. There are multiple treatment options, without leaving aside the aggressive surgical management essential in the first line but associated with sitz baths, or daily dressings, consecutive surgical washings, use of wet dressings, or negative pressure therapy. **Conclusions:** Fournier's gangrene is a fatal disease, which as science advances, the essence of its treatment does not change. It's surgical! where early aggressive debridement, drainage and surgical lavage is the turning point in having or not having a good prognosis.

Keyword: Gangrene, Fournier, Infection, Necrotizing fasciitis, Necrosis, Debridement, Sewer system.

INTRODUCTION

Fournier's gangrene (FG) is a rare disease that is defined as the infection of soft tissues and muscle fascia that are specifically necrotic, which is why it is also called Necrotizing Fasciitis (NF), it is potentially fatal., of polymicrobial cause and specific topography. [1] In 1764 the first case of FG was published, in the article “Sur une Plaiecontu-fequis'eftermminée par le fphacele de tout le fcrotum”, however, it was not until 1883 when the French doctor Jean Alfred Fournier mentioned in detail a certain number of patients with this disease and coined the term “fulminant gangrene” for the first time. [2, 3] FG is somewhat aggressive and fulminant, rapidly progressive, and predominantly in the male sex, although not exclusive, with a characteristic topographic infection of the fascia of the necrotizing tissue of the perineal, perianal, and genital regions, which can extend continuously up to the abdominal and thoracic wall between the fascial planes, as well as in both inguinal regions and both thighs. [4] Likewise, the incidence of FG has been found in the pediatric population, as demonstrated in a study of 355 cases, which indicates that it is scarce and limited: but with a very low mortality. [5] The incidence of FG is not known, but its mortality ranges between 20 to 70%, even in these times. [6, 7] There is such a variable number of sequelae, disabilities, and consequences of FG in terms of morbidity, that

it evokes significant decreases in quality of life in patients' general functional domains. [8] The real etiology of FG is unknown, it is falsely believed that the virulence or pathogenicity of the microorganism(s) of the infectious process is the cause of this aggressiveness, such a rare and fatal pathology, [9] although the medical literature says otherwise. since there are cases of FG with opportunistic biota infestation and there is also, on the other hand, a lack of identification of the so-called causative microorganism(s). [10, 11]

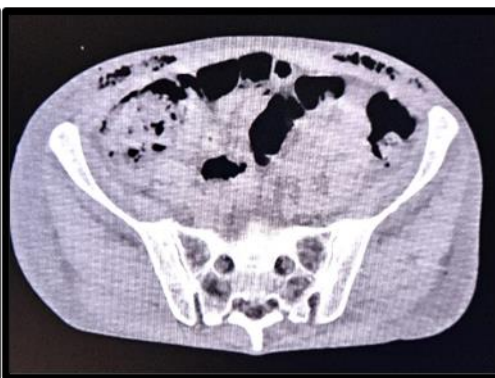
OBJECTIVE

Case report and literature review.

METHOD

This is a 59-year-old male who is in the emergency department, referred from another hospital. He denies allergies, denies surgery, has long-standing type 2 diabetes mellitus without prior treatment, as well as systemic arterial hypertension without any control. Heavy smoking for 30 years and moderate alcoholism. He denies drug addiction. It started 14 days ago, where he perceived mild stabbing pain initially, which gradually increased in presentation and intensity, until now it was continuous and disabling in the scrotal and perineal region with a gradual increase in volume, as well as around the pubis and lower abdomen. Accompanied by asthenia, adynamia, general malaise, unquantified fever, and inability to walk. On physical examination, vital signs were found with a heart rate of 110 x', respiratory rate of 26 x', temperature of 38.3° C. Blood pressure of 88/56 mm Hg. O2 saturation of 85%. Conscious, calm, cooperative, with a Glasgow score of 13 points, with abdominal and cardiopulmonary facies without any compromise, abdomen with moderate pain in the hypogastrium and both iliac fossae, with edema, erythema in those areas, as well as in the suprapubic region; scrotum with increase in size with edema, erythema, and hyperthermia with involvement of the perineum. Crepitation "subcutaneous emphysema" of the skin (due to the presence of air under it) from the perineal, scrotum, bilateral inguinal region, pubis, lower abdominal wall, and thorax. A rectal examination is performed in the Sims position, with an anus closed, asymmetrical folds, ajar, sphincters of good tone and good intensity, with a puborrectal tract of good mass and low contractility, there is no anoscope or recto sigmoidoscope.

Laboratories with leukocytosis of 17,730 / mm³, neutrophilia of 88.62%, lymphopenia 1.37%, hemoglobin 12.46 g/dl, hematocrit 35.56%, thrombocytosis of 415,000 U/L, hyponatremia of 131 meq/L, potassium 3.73 meq/L, calcium 6.9 mg/dl, total bilirubin 1.3 mg/dl, urea 24 mg/dl, creatinine 0.3 mg/dl, severe hypoalbuminemia 1.9, hyperglycemia 204 mg/dl, C-reactive protein 19.9 U/L, glutamic oxalacética transaminase 11 U /L, alkaline phosphatase 98 U/L, gamma-glutamyl transferase 74 U/L. Arterial blood gases: pH 7.56, PCO₂ 26 mm Hg, PO₂ 64 mm Hg, lactate 3-6 mmol/L, SO₂ 95%. Glycosylated hemoglobin in 18%. It can be seen in a simple CT scan of the abdomen, with the presence of a moderate amount of collection in the pelvic cavity. It is not possible to discern the type of content because it is simple and cannot evaluate Hounsfield units. In addition, the presence of emphysema is evident in the soft tissues above the muscular fascia of the abdomen and both coastal regions to the eleventh right rib and the costal or lateral region of the thorax. See figures 1, 2 and 3.

**Figure 1****Figure 2****Figure 3**

Figures 1, 2 and 3. Simple computed axial tomography study, where a collection of abnormal fluid is seen in the pelvic cavity, as well as the presence of subcutaneous emphysema in the soft tissues from the first cut presented ascending to the abdominal wall and part of the thorax.

Given the above evidence, the diagnosis of FG is integrated, with involvement of the abdominal cavity with suprapubic abscess or pelvic abscess. He underwent immediate surgical treatment, where exploratory laparotomy was performed, finding 150 cc of purulent content in the pelvic cavity, which was drained, cultured, and vigorous surgical lavage was performed with 5 liters of sterile solution. We proceed to extensive debridement of the perineum, scrotum with exposure of both testicles, resecting testicular tissue and fascia, bilateral inguinal regions, and abdominal wall, draining 300 cc of purulent material, necrotic tissue of muscular fascia of both rectus and transverse muscles is cultured and debrided. abdomen bilaterally and pyramidal, until healthy tissue is found. Surgical scrubbing is performed with surgical soap, povidone-iodine, and oxygen peroxide, separately. See figures 4 and 5.



Figures 4



Figure 5

Figures 4 and 5. Images of the patient with Fournier's gangrene with destruction of muscle fascia, tissue necrosis, no blood circulation, with ischemia and muscle hypotrophy in the abdominal wall, scrotum, and perineal region.

Povidone-iodine impregnated dressings are placed. Its evolution was slow and/or late but satisfactory, despite the relentless extension of continuity of the **FG**. After 14 days of stay, he was discharged home with the use of water-soluble patches and strict control in the surgery consultation, so a reconstruction will be planned in conjunction with reconstructive plastic surgery, on a scheduled basis.

DISCUSSION

The triggering factor or cataclysm of FG is not known, but it is associated with its own elements that converge and synergize the infectious event in the patient. Furthermore, there is often an overdiagnosis or an underdiagnosis. Early surgical care reduces mortality by up to 16%, otherwise it increases by up to 68%. [12, 13] The problem of isolating the causal agent when anaerobes exist, since they are only diagnosed clinically or radiologically; it is then too much of a challenge due to the lack of installed infrastructure in public hospitals; it creates a statistical bias in diagnosis and treatment, which consequently directly affects the patient's prognosis. [14, 15] This perhaps explains why the most frequently isolated microorganism is *Escherichia coli*, in most published series. [16] The presentation of the topographic origin or origin is the source of the infection or the primary focus due to incidence in decreasing frequency, it has been detected to be urogenital (45%), anorectal (33%) or cutaneous (21%). [17] Diabetes mellitus is a determining risk factor in FG and it is typical for these patients to have this disease, but not all diabetic patients suffer from it; the pathogenesis could be explained that in diabetic patients who present NF, they already have endothelial dysfunction that plays a crucial role and is closely associated with nitric oxide deficiency, promoting insulin resistance and cardiovascular diseases, mediated by hyperglycemia, coupled with a prothrombotic state, which leads to platelet aggregation, vasoconstriction and inflammation, not to mention chronic neuropathy where the pain threshold (pressure) increases, causing a delay in

diagnosis/treatment due to the lack of symptoms on the part of the patient. patient (not seeking immediate surgical care) and then the FG clinically masks like an iceberg the real magnitude and extent of the problem. [18, 19]

Diagnosis and timely surgical intervention are essential elements to improve the outcomes of patients suffering from FG; a diagnostic omission of any infectious process, remnant, an undetected abscess or undebrided, undrained or persistent necrotic muscular fascial tissue causes septic shock and/or death of the patient. [20] The clinical history, with a detailed physical examination, allows the evaluation of the origin, extension, and management. A complete genital examination, a diagnostic rectal examination and a minimum management protocol are necessary, which demonstrate the dissemination or extension of the infectious process or identify its limits. [21] Computed tomography has become the ideal tool with high sensitivity and specificity, since it allows confirming FG in all anatomical areas such as genital, anal, perineal, pubic, abdominal, thoracic, retroperitoneal, even extremities, evaluating the source of infection and its spread in the tissues effectively and efficiently, becoming a guide for surgical management. Furthermore, it is essential to rule out diabetes mellitus with a single glycosylated hemoglobin laboratory since it is essential in FG for a comprehensive therapeutic vision. [22, 23]

Standard treatment for this FG condition usually includes immediate surgical removal of necrotic tissue and administration of antibiotics. Or some authors report that conservative treatment with broad-spectrum antibiotics can be used to improve the patient's condition. [24] On the contrary, it must be considered that antibiotic therapy alone is not an effective therapeutic resource, it is completely null in the situation of ischemia and tacit necrosis that the tissues suffer and where the route of action of the medications is through blood circulation does not exist with dead tissues. This is why aggressive surgical treatment is the only way to achieve a certain favorable prognosis and use antibiotics as an adjuvant strategically in the treatment, synergizing what was done in surgery or somehow paralyzing the FG. [25]

The treatment of the patient with FG in general can be divided into initial resuscitation, surgical debridement, continued ward treatment with antibiotic therapy and wound reconstruction, as well as rehabilitation; this requires the experience of a multidisciplinary team to obtain optimal results and in Mexico this does not happen. [26] There are multiple treatment options for FG, without leaving aside the essential aggressive surgical management in the first line, but it can be associated with sitz baths, or daily dressings, consecutive surgical washings, use of wet dressings, or therapy of negative pressure wound instillation is associated with higher rates of wound closure without increasing complication rates, among many more reported therapeutic actions. [25, 27, 28]

Special Considerations from The Authors:

- The origin of the infection or **NF** must be thoroughly investigated: anorectal, urogenital, soft tissues, hematomas, trauma, or abdominal pathology and resolved.
- Perform contrast-enhanced computed tomography and glycosylated hemoglobin by protocol in all patients with **FG**, as a first order.
- Avoid diverting colostomy, since the risk increases exponentially, it presents multiple complications that the patient was not going to have and the social, family, psychological,

economic impact and of a new reintervention, is projected with much more and greater morbidity; with the exclusive exceptions that if the patient presents severe fecal incontinence or if there is limitation of movement (Karnofski < 50%), spinal cord injury such as hemiplegia, quadriplegia or brain damage.

- Encourage the patient to eat food, move to seat washing, incorporating them into the therapy of their illness and stimulating a sitz baths and faster recovery, as well as self-rehabilitation.
- Avoid anemia, malnutrition, depression, and nosocomial infections, typical of a prolonged stay, unnecessary rest and delayed or overprotective overtreatment.
- At the time of diagnosis, exercise aggressive surgical conduct, preferably single and decisive (not leaving any infected or necrotic tissue), which allows limiting the infection as well as broad-spectrum empiric antibiotic therapy for gram-negative and anaerobes.
- Antibiotic synergy must be used, the maximum dose thereof, when having cultures, adjust the medications and determine the change only by cultures or due to poor evolution (greater than 72 hours), not following schedules or periods, but evaluating the clinical-evolutionary condition of the patient.

CONCLUSIONS

FG is a deadly disease, and as science advances, the essence of its treatment does not change. It's surgical! where early aggressive debridement, drainage and surgical lavage is the turning point in having or not having a good prognosis. Mortality is very high, and morbidity is exhausting and disabling, with very high costs for the patient, for the family and even for the Health Institutions themselves; that is why the reason for this manuscript is to share this experience.

Conflict of interests

There is no conflict of interest to disclose.

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