



A case report of a woman with Fournier's gangrene and morbid obesity

Key words:

Fournier's Gangrene, necrotizing fasciitis, obesity, VAC system.

Palabras clave:

Gangrena de Fournier, fascitis necrotizante, obesidad, sistema VAC.

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ABSTRACT

Fournier's gangrene is a necrotizing fasciitis of the male and female perineum and genitalia, of pathogen etiology and rapid evolution, which can affect the abdominal wall and thighs, usually with complications and high mortality. A case of a 51-year-old female patient with multiple diseases is presented. Ten days prior to consultation, she developed fever, malaise, increased volume and pain of the crural area and external genitalia, erythema, necrotic area and crepitus, as well as a bloody and very foul-smelling ulcer secreting pus. *Escherichia coli* and *Bacteroides fragilis* were isolated. Metabolic control was applied, with antimicrobial therapy, surgery, dressings and a vacuum-assisted closure system, which lead to resolving the Fournier's gangrene and controlling the comorbidities.

RESUMEN

La gangrena de Fournier es una fascitis necrotizante del periné y genitales masculinos y femeninos que puede afectar la pared abdominal y muslos, de etiología polibacteriana, rápida evolución, con complicaciones y alta mortalidad. Se presenta el caso de una paciente de 51 años con múltiples enfermedades; desarrolló un cuadro de 10 días de evolución con fiebre, ataque al estado general, dolor y aumento de volumen en la región crural y los genitales externos, eritema, área necrótica y crepitación; úlcera que secretaba material purulento, sanguinolento, muy fétido. Se aislaron *Escherichia coli* y *Bacteroides fragilis*. Se manejó con control metabólico, tratamiento antimicrobiano, cirugía, curaciones y sistema VAC de succión negativa; se logró resolución de la gangrena de Fournier y control de las comorbilidades.

BACKGROUND

Fournier's gangrene, also called «necrotizing fasciitis» or «flesh-eating bacterial infection», has a historical background dating from the Hippocratic era. Later, in the eighteenth century, Baurienne, and in 1871, Joseph Jones made descriptions of this pathology. In 1883, Jean Alfred Fournier reported a type of fulminant gangrene through his experience with five male patients with lesions in their genitals. It is after this author that Fournier's gangrene was named. In the early nineteenth century, it was called «malignant ulcers» or «putrid gangrene». In 1952, Wilson called it «necrotizing fasciitis», based on a detailed description of the infection and fascial necrosis.

Fournier's gangrene is a necrotizing fasciitis of the perineum and genitals, both male and female, which can affect the abdominal wall and thighs; it occurs in men and, to a lesser extent, in women. Its etiology is bacterial and

usually comes from an initial infectious focus in the genitourinary tract, anorectal region or the soft tissues of the genital region.¹⁻⁴ This disease develops in an acute and aggressive manner, and evolves rapidly, with mortality rates of up to 73% and complications such as sepsis, respiratory, renal or multi-organic failure.⁵ The prognosis depends on early recognition and treatment, as well as appropriate isolation of the causative germs, and consequently, directing an antimicrobial therapy.^{6,7}

CASE REPORT

Female, 51, primary school teacher, Mexican. The patient had a diagnosis of morbid obesity, type II diabetes mellitus with an insulin-based treatment, poorly controlled hypertension; she was a smoker with chronic bronchitis and restrictive lung disease data.

Ten days prior to consultation, her condition started with progressive fever up to 39 °C, fol-

lowed four days later by an abscess located in the genital area; from that day on, dressings and warm compresses were applied at home. Two days later, a treatment with 1 g ceftriaxone every 24 hours and 500 mg oral metronidazole every eight hours was started. Fever and malaise increased, with intense pain in the lower abdomen, right groin, and external genitalia, as well as progressive stench.

On physical examination, the patient was seen with malaise, difficulty in mobilizing herself, could not walk due to pain in the bilateral femoral area. Weight: 159 kg, height: 155 cm, body mass index: 66, temperature: 38.6 °C, heart rate per minute: 88, blood pressure: 120/75, and capillary glucose: 420 mg/dL. The presence of *acanthosis nigricans* on the neck and chest was observed, with diminished respiratory movements, very globose abdomen, fatty tissue build-up like a globose tumor in the pubic region covering the genitals, erythema and intertrigo in the fold between the abdominal gauze and pubis fat (Figure 1).

External genitalia and the right crural region were deformed by an increase in volume; the right labia majora grossly enlarged, erythematous, with increased local temperature, and areas of necrosis of about 12 by seven centimeters; with an ulcer crackling in the labia majora and right inguinal region, and output of purulent, very foul-smelling bloody material from the ulcer. In the lower extremities, she presented an ochre dermatopathy and edema in both legs from the malleolus to the knee, white and semi-hard, with normal osteotendinous pulses and reflexes (Figure 2).

The following laboratory and consultancy studies were reported: 18,700 cel/dL leukocytosis, 90% polymorphonuclear leukocytes and 3% bands, glucose: 380 mm/dL, creatinine: 1.1 mg/dL, uric acid: 9.3 mg/dL, creatinine clearance: 100.13 mL/min, cloudy urine with positive nitrites, moderate number of epithelial cells, 10 leukocytes per field and numerous bacteria. Thyroid testing: 2.46 mg/dL TSH, free T4: 1.47 mg/dL, free T3: 2.89 mg/dL. Pulmonary function tests by spirometry showed a restrictive pattern in FV1 2.23 (normal: 2.50) and FEV1 1.86 (normal: 2.12).

The urine culture reported *Escherichia coli* isolation with over 100,000 colony-forming units; from the ulcer culture, *Escherichia coli* and *Bacteroides fragilis* were isolated.

The following diagnoses were established: morbid obesity, hypothyroidism, systemic arterial hypertension, pneumonia with respiratory restriction; uncontrolled, decompensated and complicated type II diabetes mellitus; urinary tract infection, and abscess of the genital region.

An intensive medical management to ensure metabolic control was started, based on antimicrobial treat-

ment with intravenous ertapenem; urgent surgery was scheduled. During surgery, all necrotic tissue was withdrawn, so that a large amount of tissue was removed; along with the removal of necrotic tissue, abundant purulent and serosanguineous material was drained; a vigorous washing was performed and the surgical area was left open for closure in second intention (Figure 3). Subsequent to the surgical approach, it was noted that this was a necrotizing fasciitis of the genital area; therefore, a diagnosis of Fournier's gangrene was considered. After surgery, dressings were laid and a permanent negative suction vacuum assisted closure system (VAC) was placed. Dressings were changed every 24 hours and the VAC system was continuously monitored. Abundant purulent material was obtained for seven days; then, it gradually decreased until the VAC system was removed after 19 days. Dressings were changed daily for two more weeks, after which they were gradually spaced until complete wound closure was achieved. During all this time, a strict metabolic control was kept. Figure 4 shows the affected area and the scar two years after the surgery.

DISCUSSION

Our case corresponded to a woman in an age at which most often necrotizing fasciitis in this area is seen, between 50 and 70 years. Factors favoring its development were a poorly controlled diabetes mellitus and morbid obesity. The etiology is generally polymicrobial, with microorganisms in the genitourinary and anorectal tract, and on the skin of the genital area. Also described as causes are abscesses in the Bartholin's gland and vulva, or it can appear as a complication of episiotomy, hysterectomy or septic abortion. The patient developed a lesion on the right labia majora, apparently originating from Bartholin's gland, and *Escherichia coli* and *Bacteroides fragilis* were isolated, which correspond to usually involved aerobic (10% of cases) and anaerobic (20 to 70%) bacteria.⁶ Some of the gram-negative aerobic bacteria involved in this condition are *Escherichia coli*, *Pseudomonas aeruginosa*, *Proteus mirabilis*, *Klebsiella pneumoniae*, *Providencia stuartii*; of the aerobic gram-positive cocci: *Enterococci*, *Staphylococcus aureus*, *Staphylococcus epidermidis*; of the anaerobic bacteria: *Bacteroides fragilis*, *Bacteroides melanogenicus*, *Clostridium*, and, in much lower proportion, some opportunistic fungi such as *Rhizopus arrhizus* and *Mucor*. Bacterial involvement in the patient was with *Escherichia coli* and *Bacteroides fragilis*, which correspond to the most frequent microorganisms in this condition, as shown in the literature.^{6,7}



Figure 1. Abdominal and pelvic fat.



Figure 2. Necrotic lesion on the right side of the greater lip.



Figure 3. Postsurgical wound.



Figure 4. Scar at two years.

If we analyze her clinical evolution, first she developed a fever that probably corresponded to the development of a local infection in the genital glands, most likely Bartholin's gland; four days after, a physician identified a genital abscess. In the following days, fever and malaise increased, but in the last three days, the evolution was faster, with severe pain, progressive stench and data of sepsis. This was due to the development of progressive cellulite with diffuse inflammatory reaction, which quickly compromises deep fascia with obliterative endarteritis necrosis caused by microorganisms, along with vascular thrombosis, which favors changes in tissue oxygen concentrations. From cellulitis, it turns into fasciitis, and later, into tissue and skin⁸ necrosis. We do not have a description of how local data of the patient developed, but it is expected that in the beginning, it was a cellulitis with pain, erythema, edema; blisters with thick, pink or purple liquid were also present, with intense pain in the affected area; sometimes, blisters lead to local anesthesia due to nerve destruction, which was not the case of the patient, since the pain was always progressive until the day of surgery. Upon exploration, crepitus areas were identified, with sites of necrosis with ulceration and fetid purulent material, as described in the classic Fournier's gangrene.^{9,10}

The diagnosis in our case was initially clinical, and before this suspicion, the patient underwent surgical treatment, as proposed in several studies in the literature. During the hours prior to surgery, preoperative and metabolic studies were performed showing leukocytosis, altered numbers of glucose, creatinine, uric acid, creatinine clearance, as well as the urinalysis. Also recommended is to take imaging studies to determine the

extent of the gangrene, abscesses, fistula, incarcerated hernia or some other abdominal process, and through the use of contrast, differentiate necrotic tissue from viable tissue. It is considered that computed tomography allows to better plan surgery, with a better prognosis.¹¹⁻¹³ However, given the severity of this patient, the imaging studies were omitted, due to the need to provide prompt surgical care.

In order to start the surgery samples for the microbiological study, secretion, blood and urine were taken, and tissue was obtained during the procedure. Bacteriological results showed the isolation of *Escherichia coli* in the urine culture; in secretion and tissue culture, *Escherichia coli* and *Bacteroides fragilis* were isolated; the blood culture was negative. This behavior corresponds to the microbiological development of this infection, as published; the causal foci comes from the genital and urinary tracts, from the anal and rectal areas, or the genital skin. In our patient, the origin was from a Bartholin's gland, with the presence of two bacteria, one Gram-negative, *Escherichia coli*, and anaerobic *Bacteroides fragilis*. It is important to note that there weren't more organisms, which happens on many occasions: some authors report that an average of four bacterias is involved.⁸⁻¹⁰

Treatment of Fournier's gangrene is based on radical surgical debridement,¹⁴⁻¹⁶ antimicrobial management, metabolic and hemodynamic stabilization, along with supportive measures. In this case, as recommended, extensive debridement was done, a large amount of very fetid necrotic tissue was withdrawn, subsequent dressings were applied and the wound was handled with the VAC system.¹⁷⁻¹⁹ The VAC system uses constant negative pressure and it is applied by sealing the wound with a polyurethane sponge with constant negative pressure, which induces increased vascularization and deoxygenation of the area; it also reduces tissue edema, which favors rapid healing. This system is changed every 48-72 hours. The VAC system reduces the number of surgical dressings of the wound, as well as the days of hospitalization. Our patient did not undergo any other surgery and she was taken care of at home during the first two weeks, where dressings and change of the VAC system were applied; then, she went to the institution for her dressings.¹⁷⁻¹⁹

The development of Fournier's gangrene in men and women is favored by alcoholism, diabetes, kidney or liver disease, old age, steroid use, chemotherapy, radiotherapy, severe malnutrition, drug addiction, injury and rectal biopsies, hemorrhoids ligation with rubber bands, anal dilatations, anorectal and urological surgical procedures, scrotal abscess, carcinomas, pilonidal cyst, diverticulitis

and hemodialysis. It may also be due to other causes such as terminal renal disease, secondary hyperparathyroidism, priapism, venous thrombosis, anticoagulant therapy and injection of heroin in femoral vessels. The patient under study had diabetes mellitus for many years, with inadequate control, impaired renal function, morbid obesity and urinary tract infection. Surely, these conditions led to the development of synergistic gangrene from an obliterative endarteritis caused by the spread of microorganisms, which produced secondary ischemic vascular thrombosis, which in turn facilitated anaerobic bacteria proliferation.^{6,7,10,20-23}

From the experience of this case and information from other authors, we consider Fournier's gangrene to still be a very aggressive disease, with an unacceptably high morbidity, despite the information available on the disease process. The key to providing better prognosis is to achieve a timely diagnosis with early surgical intervention, and specific antimicrobial management, along with dressings and general care, as well as treatment of the patient's comorbidities. We consider that the use of the VAC negative constant pressure system offers the patient less surgical trauma, allowing permanence at home, with evident economic and psychic advantages for the individual and relatives. Our patient was able to combine these aspects, which allowed us a good performance with a successful outcome.

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