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## Case Report

# Fournier's gangrene in obese patient with COVID-19: a case report

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**SUMMARY:**

Fournier's gangrene (FG) is a necrotizing fasciitis affecting the superficial planes. It occurs frequently in men between 50 and 79 years old with a high mortality rate, which increases with the presence of risk factors including diabetes and obesity. We report the case of an obese patient diagnosed with COVID-19 before admission and treated with corticosteroids, who presented with apparent scrotal cellulitis evolving to GF, which was diagnosed 2 days after hospitalization. He underwent immediate surgical intervention, after antibiotic coverage. COVID-19 had no clinical relevance in the evolution and prognosis of GF; however, it was the excessive therapies that had a negative influence. In spite of this, the patient evolved favorably until full recovery.
Key Words: Fournier's gangrene, obesity, COVID-19 (MeSh)

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## INTRODUCTION

Fournier's gangrene (FG) it's a rapidly progressive form of necrotising fascitis that affects the surface planes on the genital, perineum, and anal regions, with fascia being its depth limits.(1) It is more frequent in men than women with a 10 to 1 proportion, and the most affected age group is between 50 and 79 years old. In Peru some isolated cases have been reported, but there are no studies reporting information about the incidence in the country. This pathology is frequently developed in immunosuppressed adults with diabetes, obesity, HIV, alcoholism among others (2) that speed the early hospitalisation. They significantly increase the death risk in COVID-19 patients because of the immune system's great compromise.(3) The disease prognosis is somber and lethality reaches 90%;(4) for that, it requires an early diagnosis and a prompt treatment based on three principles: a surgical intervention, haemodynamic support with reanimation and antibacterial therapy and detox.(5) A case of Fournier's gangrene in a patient with obesity and COVID-19 is reported here.

## CASE REPORT

A 61-year-old male patient from Otuzco, with a medical history of alcoholism, obesity and type 2 Diabetes Mellitus during hospitalization. Four months before admission he noted the presence of a bump that protrudes and retracts in its right groin region. He did not pay much attention to it because there was no pain. One month before admission he went to a private practice office because of dyspnea and low oxygen saturation. There he received oxygen therapy and corticosteroids (IM Dexamethasone) and NSAID (Dyclophenac) because of a positive SARS-Cov 2 rapid test IgM. After that he experienced an apparent improvement and he was discharged; however because the dispnea persisted he decided to self-medicate himself. A week before admission he observed another lump on the distal portion of the scrotal raphe. Three days before admission the lump increases in volume, protrudes when he coughs or lifts weight and is associated to a moderate intensity pain. One day before the admission the symptoms persisted and the pain intensified with a reddening of the affected area; that is why he decides to go to hospital. The next day he was referred to the teaching hospital because of a "hernia" and a high severity pain. At admission the physical examination revealed stable vital signs, regular general state, but poor nutritional condition and the presence of a ballooned, soft and depressible abdomen. Genitourinary: an increased in volume scrotum was observed, predominantly on the right side, with a +++/+++ oedema and ++/+++ pitting, eritematous, tender on superficial palpation, and a soft non painful area; his penis was completely oedematous and the preputium was difficult to retract. There was a mass in the superior area of his right groin (figure 1). The rest of the physical examination had no alterations.

His lab work showed haemoconcentration (haemoglobin/hematocrit: 17,5/53,1), Leucocytes: 20340/mm3 with neurophilia (Segmented 84%, Banded 8%) and Lymphopenia (5%), Platelets 230 000/mm3, Creatinine: 0,6 mg/dl, urea; 50 mg/dl. Urinalysis, pH: 5, Leukocyturia (40-45/HPF), Haematuria (1-2/HPF) and Proteinuria (1,02 g/24 h). In accordance to all the collected data, the possible diagnostics are established: hydrocele, scrotal cellulitis, and uncomplicated inguinal hernia.

Days after his admission he was transferred to the urology department where a direct Gram stain of the scrotal secretion was performed, observin gram positive proxy and a few gram negative bacilli furthermore, the automatized culture from the same secretion found Extended-spectrum beta-lactamase-producing Escherichia coli, specifically to meropenin and he is significantly medicated with one vancomycin. Four days after admission, and because the evolution was unfavorable, with the increasing of his scrotum volume, apparent purulent secretions in this region and facing a possible Clinic of 4 years gangrene; it was decided to prepare the patient for surgical exploration in the operating theater.

During surgery, the surgical wound at the scrotum level was full with serohematic secretion and bleeding edges, in which necrotic tissue, sloughs and devitalized tissue were excised. On exerting digital pressure from both flanks to the inguinal region, a foul-smelling purulent discharge of 40 cc was observed through the right inguinal canal and 20 cc through the left. Finally, a surgical wash with 0.9% NaCl was performed, Mupirocin cream was applied over the entire open area and covered with sterile dressings (Fig. 2).

On the first postoperative day, a foul-smelling purulent collection drainage of approximately 50 cc was obtained, total debridement of the remaining necrotic tissue was carried out, and all scrotal content was left exposed. There was no immediate complication or bleeding. Upon entering hospitalization, the patient had normal vital signs and was hemodynamically stable. On the ninth postoperative day, the patient remained stable and received daily cures and dressings, which showed improvement of the surgical wound. In subsequent days, oxygen was gradually withdrawn, observing that the patient tolerated oxygen weaning for 18 hours. Similarly, around 1500 cc of urine were excreted, pain reduction and stationary evolution with persistence of wound abscess. At the third postoperative week, the patient underwent reconstructive surgery with a gluteal flap and pudendal artery. In addition, there were no signs of phlogosis and it presents a favorable evolution (Fig. 3). Daily cures and washing were done every 6 hours or after each stool. The patient gave his consent to obtain data and photographs.

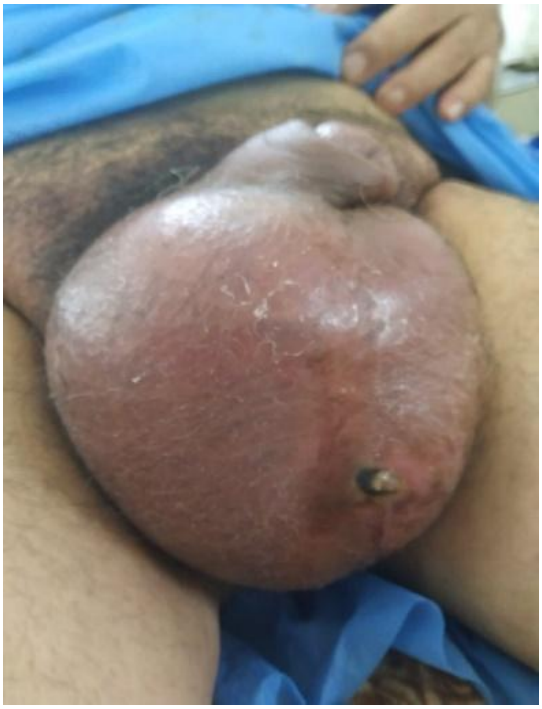

**Figure N° 01: Scrotal region, with oedema and erithema, predominantely on the right.**

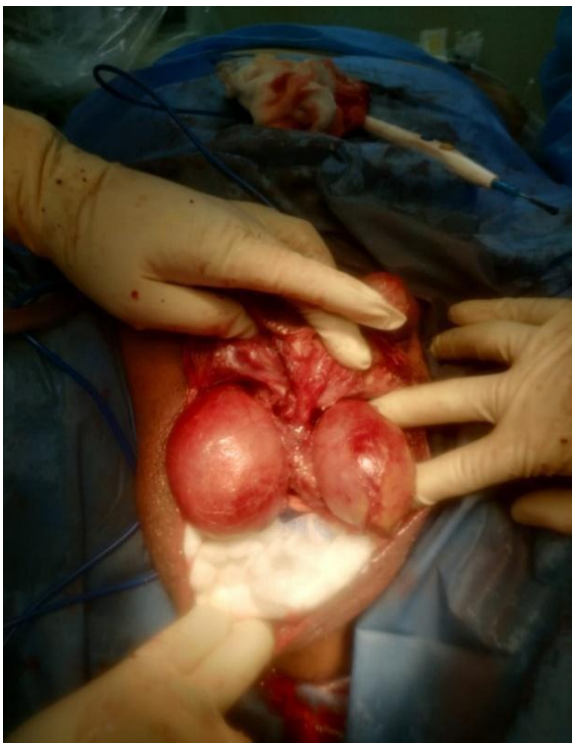

**Figure N° 02: Cleaning of the postsurgical woud. A medial open incision is showing secretions.**

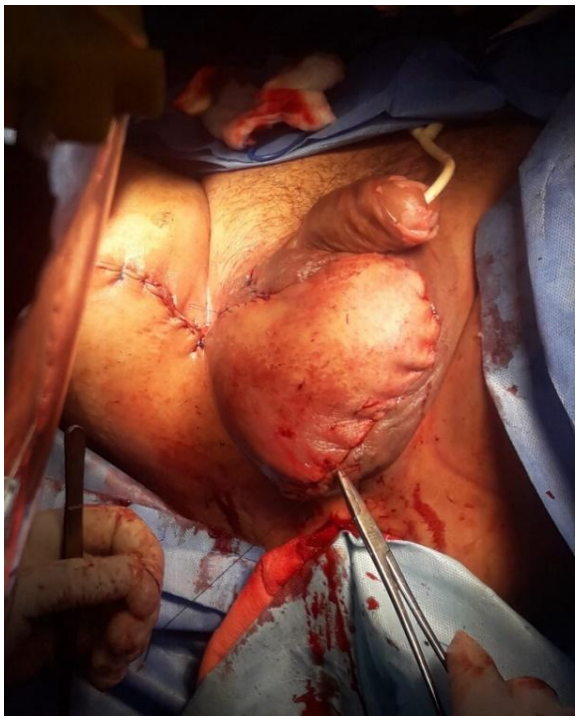

**Figure N° 03: Reconstructive surgery showing a secondary closing of the scrotal wound with a gluteal flap and pudendal artery.**

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## DISCUSSION

Fournier's gangrene is a rare disease, affecting more frequently the male sex, (male to female ratio 10:1). It mainly presents in patients between 50 and 79 years of age, with an incidence rate of 1.6 cases per 100,000 men (1). It has a mortality rate of 20 to 43%, which depends on the patient's condition at the time of diagnosis and the spread of the infection (6). There are multiple risk factors associated with the development of GF and some are related to the high mortality of this disease. The most common predisposing condition is diabetes mellitus (46-80%), which represents a higher fatality rate (7,8). Other conditions include being overweight, obesity, chronic alcoholism, smoking, cirrhosis of the liver, immunosuppression, peripheral vascular disease, poor toilet habits, among others (8,9).

FG is classified into four types, according to the causative microorganism: polymicrobial, monomicrobial (S. pyogenes, S. aureus), with a predominance of gas-producing bacteria (Bacillus) and produced by fungi (*Candida*, zygomycetes) (10).

The pathophysiological mechanism, depending on the type of GF, begins with the participation of various microorganisms such as Escherichia coli, Klebsiella spp. or others (11,12) that enter through an "entry point" in the skin produced by some type of previous injury, generating an imbalance between the host's immunity and the virulence of the pathogens. This causes the production of enzymes and exotoxins, causing a rapid multiplication of microorganisms and destruction of defensive barriers, with the consequent local spread of the disease. In addition, these enzymes stimulate the formation of subcutaneous vessel thrombosis (obliterating endarteritis), which leads to necrosis of the surrounding tissue. The low oxygenation of the tissue allows the colonization of more anaerobic bacteria, a higher production of enzymes and, consequently, an increase in tissue damage (13,14). In the present case, diabetes mellitus, obesity, and corticosteroid treatment for COVID-19 produced an immunosuppressive scenario in the patient that facilitated the invasion of microorganisms and the development of this disease. On the other hand, the respiratory condition was not influenced by the presence of COVID-19 (15).

Symptoms in GF patients include pain in the perineal or genital area. In addition, depending on when they occur, they can indicate swelling and redness of the genitals and perineum, hyperemia, signs of crepitus, discoloration of the skin and a putrid odor (1).

In relation to the aforementioned, the initial clinical diagnosis is based on the physical examination, where we can find tenderness, erythema and local swelling in most patients; However, these signs can simulate other less serious diseases such as cellulitis or erysipelas, but the intense pain, poorly defined erythema and systemic toxicity associated with multiple organ dysfunction, which are characteristic of necrotizing fasciitis, is what allows it to be distinguished from mentioned. Furthermore, in late stages, blisters are typical for GF, whereas they are not typical for cellulite and erysipelas (16).

On the other hand, laboratory tests are very useful in the diagnosis of FG. The LRINEC scale is an instrument that helps to decide if the infection of the soft tissues is a necrotizing fasciitis. This scale measures 6 variables such as C-Reactive Protein, white blood cell count, hemoglobin, sodium, creatinine, and serum glucose. In such a way that scores are assigned to identify the risk of necrotizing fasciitis in a range of 0-13, where scores ≤5 are low risk (≤50%), 6-7 are intermediate risk (50-75%) and those ≥8 correspond to high risk (> 75%) (17).

Treatment of patients with FG involves several modalities including broad-spectrum antibiotics, surgical treatment with rapid and aggressive debridement, and supportive measures (18). In addition, ultimately, any underlying comorbidity (diabetes, alcoholism) must be addressed, as the lack of proper management of these conditions can threaten the success of the surgery. Antibiotic treatment should be administered before surgery and coverage is established based on the results of culture analisis(14). The combined administration of a third generation cephalosporin, an aminoglycoside and metronidazole and / or the use of carbapenems is recommended (19) to cover all possible microorganisms. However, in the present case, E. coli was specifically found; despite this, polymicrobial therapy was maintained.

During debridement, all necrotic tissue must be removed and this procedure should be repeated if necrosis continues. After fighting the infection, healthy granulation tissue develops, indicating that reconstruction can begin, the options of which are primary skin closure, local skin flap coverage, partial-thickness skin grafts, or muscle flaps. (15).

In this report, the patient was admitted for apparent scrotal cellulitis and treatment for this clinical condition was started; But, it was his medical background and the disproportionate therapies against COVID-19, mentioned above, that led to the development of FG. Despite the torpid evolution of this patient´s disease, it could be treated early, achieving a satisfactory result without major postoperative complications. However, there was nocturnal oxygen desaturation and after abdominal tomography it was evidenced a pneumothorax at the lung bases. But it was not of clinical relevance in the evolution and prognosis of FG.

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