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Case Report

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Genital Necrotizing Fasciitis: Fournier's Gangrene

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ABSTRACT

Necrotizing fasciitis is characterized by a rapidly progressive infectious disease affecting skin and soft tissue, usually accompanied by severe systemic toxicity. In fact, it is considered the most serious expression of soft tissue infection, by its rapid destruction and tissue necrosis, reaching more than 30% of patients checkered shock and organ failure. In recent years, its incidence is reported at 1: 100,000. This entity in the case of perineal and genital tract involvement, it is called Fournier's gangrene. In the specialty of Obstetrics and Gynecology is a rare infectious complication.

INTRODUCTION

Necrotizing fasciitis is a term that describes a disease condition of rapidly spreading infection, usually located in fascial planes of connective tissue necrosis. Fascial planes are bands of connective tissue tha surround muscles, nerves and blood vessels.

When this condition affects the perineal area and genital tract, it is known as Fournier's gangrene, rare process, with an incidence in males of 1 in 75,000.[1] It presents greater predisposition towards males with a ratio of 1 woman for every 10 men.[2]

Despite its rarity, high morbidity and mortality, accompanied by the speed of disease progression make the process a medical emergency that must be diagnosed quickly to allow adequate treatment to combat its fatal consequences.

The percentages of secondary death itself, are around 22-40%[3] although there is a wide range depending on the series ranging from 6 to 76%.[4]

Below, we are going to introduce a case which it was addressed in our Department of Gynecology of the Clinical Hospital of Santiago de Compostela; case whose primary source is rare, within the rarity of the entity in question.

CLINICAL CASE

Female, 60 years old; as personal history included diabetes mellitus type II, hypercholesterolemia, alcoholism and smoking of 10 cigarettes a day. It presents a previous admission in 2014 in general surgery for cholelithiasis with mild acute pancreatitis, hepatic steatosis and acute exacerbation of underlying disease. Her regular treatments are: 850 mgr metformin, 1000 mg paracetamol, aspirin 100 mgr, ursobilane 500 mgr, enalapril 5 mgr.

The patient comes to the emergency room for mild infectious process, a left side Bartholinitis. She is evaluated in gynecology's emergency, where they proceed to drain the abscess and antibiotic coverage begins with amoxicillin-clavulanate 875 mgr orally, was discharged home.

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Ten-days after the diagnosis the patient comes to the emergency room with a severe case of hemodynamic inestability; entering the emergency room under the diagnosis of diabetic hyperosmolar decompensation, as a result of the suspension of their usual medication (metformin) with a superimposed sepsis caused in the genital area.

At this time, resuscitation equipment is necessary to stabilize the patient, correcting her diabetic hyperosmolar descompensation and initiate and antibiotic coverage with amoxicillin clavulanate 1 g intravenously every eight hours and a single dose of intravenous tazobactam.

The patient is explored by the gynecology service, it highlights a fecaloid odor whose origin is in the genital area. That area is explored, and soft tissue infection is observed with a large necrosis area located at about 4 cm of the left lower and higher around the lip area before drainage. The area of erythema and induration beyond, reaching mons pubis, without reaching inguinal region and later affects the whole perineal area and buttocks, reaching inside of his left thigh. Throughout the process, the patient never reached a fever.

Laboratory data were diagnosed with their diabetic hyperosmolar descompensation: glycemia of 591 mg/dl and 324 mOsm/kg osmolarity, severe sepsis with metabolic acidosis; acompanied of 46830 leukocytes x10e^3/mm^3, 87.3% neutrophils, 17% of staffs, 1% metamyelocytes and GSA pH 6.92, pCO2 15 3 mmHg, pO2 140 mmHg, 3.1 mmol/L Real bicarbonate, lactate 2.25 mmol/L and incipient renal failure with creatinine 1.04 mg/dl, 103 urea mg/dl, sodium 132 mmol/l, potassium 3.5 mmol/l.

Once the patient is stabilised, after electrolyte replacement and insulin infusion pump; gynecology service in conjunction with general surgery service, immediately proceed to surgical repair process. A first incision over the area of skin necrosis in left lip, that should be extended to the perineum to verify that the necrotic area includes it is done, proceed to resection and extensive debridement of affected tissue, during which, it is evident that fasciitis goes reaching beyond the left buttock. Is required again to extend the incision to correct excision of the entire affected area. Intraoperative H_2O_2 disinfection is carried out. The open wound is allowed to close by secondary intention. Currently cures are made with clostridiopeptidase, topical neomycin sulfate in the morning and nitrofurazone topical at night.

After the intervention the antibiotic regimen with a higher microbial coverage, as meropenem and metronidazole combination is changed.

At 24 hours post-operatively the patient reoperation is decided, to ensure proper excision of the affected areas to prevent the disease's progression, they observed right lip's edema, without fluctuations or emphysema, presence of fibrin and necrosis towards lower edge of the resection left buttock, which dries and verified that there are no more plates or apparent progress of necrotic fasciitis.

After surgery the patient is stable, with a gradual improvement in their biochemical parameters, eliminating mechanical ventilation on the 6th day. By the 8th day of admission, the patient was conscious, oriented, collaborative, without neurological deficit, hemodynamically stable, with good peripheral perfusión, with sinus rhythm and eupneic. Correct renal function and a good reaction to a normal diet started on the 7th day of admission.

Prior to resuscitation room's discharge, analytical parameters clear evidence correction process: 11790 leucos ×10e^3/mm^3 with 81.2% neutrophils, not crooks. Creatinine 0.3 mg/dl, 163 mg/dl glucose, albumin 2.4 g/dL, PCR 6502 mg/dl.

Given the stability of the patient the anesthetist decides to move her to a general hospital Ward, with positive progress.

Microbiological data showed positive for *Streptococcus agalactiae* cultures and *Escherichia coli* in the material of the surgical wound and *streptococcus sp.* sensitive to penicillin and levofloxacin, and clostridium in the purulent material Bartholinitis. The remaining urine cultures, blood, and nasorectal sputum were negative.

DISCUSSION

Necrotizing fasciitis, is part of necrotizing soft tissue infections (cellulitis, myositis, fascitis). In the perineal area is called Fournier's gangrene, in honor of Jean Alfred Fournier, 1883, who described the first case.

The process by which it takes place can be explained by poor patient's immune system response to an infectious aggression due to some type of debilitating disease (such as diabetes) or an infection with a highly virulent. In both situations a subcutaneous cellulitis that quickly evolves skin and subcutaneous tissue necrosis occurs. Local ischemia, favored by arterial and arteriolar thrombotic processes, facilitates the creation of a vicious cycle, where by the body is unable to oxygenate tissues and favor the arrival of cells and substances responsible in combating the infectious process, so infection is extending up to superficial and deep muscle fascia, producing purulent necrotizing fasciitis characteristic of the disease.

In gynecology, obstetrics is a rare infection. Donald et al wrote one of the longer series (case studies) with 23 cases over 14 years, and the literature review performed, we found isolated cases reported by different authors.

Although uncommon, this type of infection has a high morbidity and mortality rates ranging from 6-76% according to different authors. The last reported cases, describe a figure that is around 22-40%. The reduction in morbidity and mortality is subject to rapid and aggressive treatment. Also described as more severe perianal necrotizing fasciitis tracking as many germs in-

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volved to treat than those found in other locations.[4]

It has partnered developing Fournier's gangrene with certain debilitating condition, such as diabetes mellitus, chronic alcoholism, cancer, some rheumatic diseases (which require prolonged treatment with corticosteroids). Of these, diabetes mellitus is the most common risk factor associated with the condition of Fournier's gangrene. We can say that the prevalence of diabetes mellitus in patients with Fournier's gangrene is higher than in the general population. However, when we reviewed the literature, we found some controversy at the time to discern whether the coexistence of diabetes mellitus influences the prognosis. Nisbet et al[5] show that diabetic patients require more surgical debridement with more extensive resections of tissue.

As the source of the infectious process, you may find a urogenital, colorectal or skin cause, with or without recent previous surgical procedures. Colorectal origin is usually the most frequently described, 35.5%[5]; and frequently it described associated with a worse prognosis as noted above.

Other risk factors may be obesity, cytotoxic drug abuse, malnutrition and extreme ages.

With regard to gynecological obstetric origin, we can find infectious origin as the Bartholin gland abscesses, vulvar abscesses, episiotomy 3-4 degree, post-abortion endometritis, pudendal and paracervical blocks, cesarean section, hysterectomy and even laparoscopy by surgical wound infection. Less than ¼ of the processes are considered idiopathic.[2]

If we focus on the etiological agent, two diagnostic entities are defined. The first is type I or NF poly microbial, in 2/3 cases caused by anaerobic germs (*Bacteroides, Clostridium* and *peptoestreptocosos*) and one or more facultative anaerobes (*Streptococcus* not A) and enterobacteria, the synergistic action causes the infection. Agents such as s. *pneumoniae, Aeromonas* and *Vibrio*, are rare, causing the latter a fulminant course of this entity with high mortality especially in patients with co-morbidity such as chronic liver disease or diabetes mellitus. The origin is mainly located in the genitourinary tract, gastrointestinal tract and skin beneath. The other type is the type II necrotizing fasciitis or streptococcal, caused by a single principal agent. Generally found SBH group A, as *Streptococcus pyogenes* (to a lesser extent C and G) and less frequently, other species such as *S. aureus* (MRSA) that can produce syndromes such as SSTS, of great gravity.

Our patient had several clear risk factors for the process, such as diabetes, alcoholism and history of local surgery; the latter, considered the primary source of the infectious process. In view of the positive microbiological results for *Streptococcus agalactiae* Group B, *Escherichia coli* and *clostridium sp.* can be classified here as a polymicrobial NF type I.

The diagnosis of Fournier's gangrene is initially clinical, always confirmed by surgical, histological and microbiological findings. It can be difficult, especially in cases of Type II NF (which in our field usually occurs in obstetric patients), since the initial clinical signs are bland and scarce. There is often a mismatch between the clinic patient, who refer severe pain in the affected area where physical signs and mild erythema and induration which does not differ from a banal cellulite will be appreciated.

There are 4 main clinical signs must be suspected of a necrotizing infection: swelling and induration beyond the erythematous area, existence of blisters (especially if your content is hemorrhagic), crepitus or gas in imaging tests and absence of lymphangitis or lymphadenitis associated. However, the rapid progression of inflammation to adjacent areas in hours (progression 2-3 cms per hour), with a significant clinical deterioration in patients; with fever, tachycardia, hypotension, leukocytosis, and coagulopathy or hydroelectric alterations, we will think of this process. In later stages, the skin is tough, tense and may even appear black and crackling areas are ominous signs of subcutaneous necrosis points. It should be noted the feculent smell of this injuries attributed to anaerobic participation in infection.

Other findings that help us diagnosis can be among others, laboratory results, such as: anemia, leukocytosis, hyperglycemia, elevation of serum Cr, hypoalbuminemia, azotemia. Wong and Khin[6] proposed in 2004 an index to establish the diagnostic probability of NF early, but has not yet been validated in prospective studies; it is the Laboratory Risk Indicator for Necrotizing fasciitis (RLINEC Score), in which an index >=6 would establish the suspicion of NF or a value >=8 would be highly predictive of the disease.

Variable	Values	Score
PCR (mg/L)	<50	0
	>=150	4
Leukocytes (x10³/mm³)	<15	0
	15-25	1
	>25	2
Hemoglobin (g/dL)	>13,5	0
	11-13,5	1
	<11	2
Sodium (mmol/L)	>=135	0
	<135	2
Creatinine (mg/dL)	<1,6	0
	>=1,6	2
Glucose (mg/dL)	<=180	0
	>180	1

Table 1: Laboratory risk indicator for necrotizing fasciitis (RLINEC Score).

In our patient, at the arrival to the emergency room, the RLINEC score was 9.

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When the clinical suspicion is high it should not be delayed surgical debridement by performing an imaging test; however, could be carried out complementary techniques such as TC or MRI, which false negative rate is high. They allow to identify asymmetric fascial thinning fluid collections, abscesses, subcutaneous emphysema and even get to determine the cause of the NF as would perineal abscess, fistula tracts or perineal or retroperitoneal infection process. You can even differentiate less aggressive processes such as edema or cellulite affecting superficial fascia, the more aggressive NF which also affects the deep fascia. Ultrasonography and plain radiography are less useful.

In the case of our patient the diagnosis was clinical, supported by laboratory data, and imaging tests, it was performed an abdominal ultrasound which result was non-specific.

For microbiological testing, tissue obtained in the surgical debridement (ideally peripheral necrosis zone), will be studied primarily. Blood cultures may not accurately reflect the microorganisms involved in local infection (may be positive in 29% of patients *vs* 76%[2] positive surgical cultures) as well as the cultivation of vesicular exudate or skin surface that is unprofitable. This fact is confirmed in our patient where blood cultures are negative against the positive cultures of the resected surgical material.

One of the most important and what else has insisted on the management of NF, is the need for early surgical treatment and empirical antibiotics.

Since many patients are in septic shock at the time of diagnosis is essential hemodynamic stabilization (especially hypotension or evidence of organ dysfunction), sometimes even being necessary the vasoactive amine's administration in cases with refractory shock to volume replacement.

In a first-line treatment with empirical antibiotic therapy should be started as soon as possible, being the most used guidelines: triple therapy with penicillin or cephalosporins 3ª G, an aminoglycoside (gentamicin) and metronidazole or clindamycin. Many have suggested adding penicillin for the treatment of *streptococcus*, especially *Clostridium* suspected. Alternatively, clindamycin and chloramphenicol, may be substituted empirically to cover Gram-positive cocci and anaerobes. In patients infected with MRSA, vancomycin should be used. Amphotericin B or caspofungin should be empirically added when fungi are detected in tissue culture.

In our patient's case, after the first surgery it was performed antibiotic coverage with meropenem and metronidazole instead of amoxicillin clavulanic unique pattern. The microorganisms *Streptococcus agalactiae* and *Escherichia coli* were sensitive to amoxicillin clavulanate and levofloxacin; and the *Clostridium sp*. that came in Bartolino's drained culture, was sensitive to penicillin and levofloxacin. In this case meropenem is used, a broad spectrum antibiotic, covering the three microorganisms (gram positive, gram negative) and metronidazole (covering anaerobes) is added for possible secondary infection.

Surgical treatment should not be delayed in time. Its objectives are necrosectomy, extensive surgical debridement, drainage of possible existing collections and obtain material for histological and microbiological diagnosis. Although, studies have found that there is not significantly different mortality if surgery is done before or after the first 24 hours.[2] It should be undertaken as soon as possible to preserve as much healthy tissue as possible.

It is advisable the surgical revaluation of patients with in 24 hours of the first intervention, to ensure no disease progression. In fact, all necessary interventions must be performed to remove all necrotic tissue and local infection control. For larger defects can reach appropriate to each case needed reconstructive surgery.

After surgery, regarding local therapy, it has been seen that Dankin solution (sodium hypochlorite) has greater antimicrobial effect for aerobic and anaerobic agents than povidone-iodine. It is to emphasize the use of topical unprocessed honey for healing of these injuries because of its ability to inhibit microbial growth by its osmotic effect (because of their high sugar concentrations). In a study reach to compare its effectiveness with radical surgical debridement.[2]

In cases of severe perineal affectation, colostomy can be needed to prevent fecal contamination. Amounts to 15% of patients requiring these techniques.[2]

In overall, despite early intensive treatment, NF mortality is high. Type I NF sets around 21%, and type II between 14-34%. In the case of Fournier's gangrene, increased from 22 to 40% of cases as we discussed previously.[3]

The prognosis gets worse according to certain factors, which are: the volume of necrosis (<3% body surface area affected is a low mortality, but if it exceeds 5%, the prognosis worsens substantially),[2] associated comorbidities (ischemic heart disease, renal failure hemodialysis dependent).

With regard to the analytical parameters already mentioned above, the RLINEC Score, plays a prominent role in the prognosis of this disease, since scores greater than 9 suggest a high probability of death and lower scores, 78% chance survival.[2]

Fournier's gangrene has a high mortality rate despite aggressive treatment with intravenous antibiotics and a large surgical approach, aiming to achieve a complete resection of the affected area. The older people and those suffering some debilitating disease, qualities that are usually associated, have a worse prognosis. It is a disease that requires early diagnosis, because of its rapidly advancing in adjacent tissues. It's known

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that a greater extent of disease worse prognosis. Therefore, rapid diagnosis of the process, with the immediate application of therapeutic measures are the key to minimize the morbidity and mortality of the case.

CONFLICTS OF INTEREST: None.

CONSENT: No consent required.

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