

Necrotizing Fasciitis (Fournier's Gangrene) as a Result of Vesical Catheterization

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Citation

F Afonso, J Gómez Pavón, J Balaguera. *Necrotizing Fasciitis (Fournier's Gangrene) as a Result of Vesical Catheterization*. The Internet Journal of Surgery. 2007 Volume 16 Number 1.

Abstract

Necrotizing fasciitis (Fournier gangrene) is an uncommon fulminant soft-tissue infection characterized by extensive fascial necrosis and constitutes a true surgical emergency with potentially high mortality. Diagnosis is essentially clinical with evolution as insidious skin lesions associated with intense pain and multiorgan failure. We present a case of necrotizing fasciitis in a 83-year-old man after vesical catheterism, with affection of perineum, external genitalia and left inguinal region. In spite of medical and surgical treatment, the patient's condition became critical, and he died due to multiorgan failure four days after admission. There are very few previous reports on necrotizing fasciitis following urethral catheterization. Clinical manifestations, etiologic pathogens, diagnosis and management of this disease in an elderly patient are discussed.

INTRODUCTION

Severe skin and soft-tissue infections (SSTIs) are often life-threatening emergencies that need a rapid diagnosis.

Fournier's gangrene (necrotizing fasciitis), is one of the most fulminant types of SSTI. The Center for Disease Control and Prevention of Atlanta (CDCP) estimates that this pathology represents about 10-15% of the 10.000-15.000 annual infectious processes caused by group A invasive streptococcus, although most of them have a poly-microbial etiology. The hospital incidence is 14.2/100.000 admissions/year. Patients of any age or sex are affected, mainly immunocompromised patients and those with an important comorbidity associated. This disease is an uncommon illness in geriatric practice but not rare (1,2). There are few previous reports on necrotizing fasciitis (NF) following traumatic urethral catheterization (3,4,5).

We present a case of necrotizing fasciitis secondary to urinary traumatic catheterization with the aim to discuss epidemiologic aspects, clinical manifestations, etiologic pathogens, diagnosis and treatment of this entity in the elderly patient.

CASE REPORT

An 87-year-old male presented to the emergency department with initial symptoms of a lung infection. Treatment with oxygen, antibiotics, corticoids, beta-adrenergics and vesical catheterism was started. He was admitted to the acute-care

geriatric unit 24 hours later. The abnormalities of physical examination were fever (38°C), diffuse wheezing in both hemithoraces and a distended abdomen with hypogastric pain at deep palpation. A purple edema with crepitation and painful palpation in the scrotum (Fig. 1), perineum (Fig. 2) and left intercostal area was noted. We decided to carry out an urgent abdominal computed tomography (Fig. 3) that showed gas in subcutaneous tissues and muscular planes of the scrotum, perineum and anterior abdominal wall musculature. A displaced rectal wall thickening existed with an abscess in the obturator space and an air bubble that dissected from the collection toward the pelvic region. The gas extended to the scrotum and left ischio-rectal space dissecting areas around the penis root, with more intense affection of the left testicle. After the evaluation, a necrotizing fasciitis of the perineum (Fournier's Gangrene) of possible iatrogenic source (urethral injury by vesical catheterism) was diagnosed.

Figure 1

Figure 1: Photography of the scrotum showing severe inflammation.



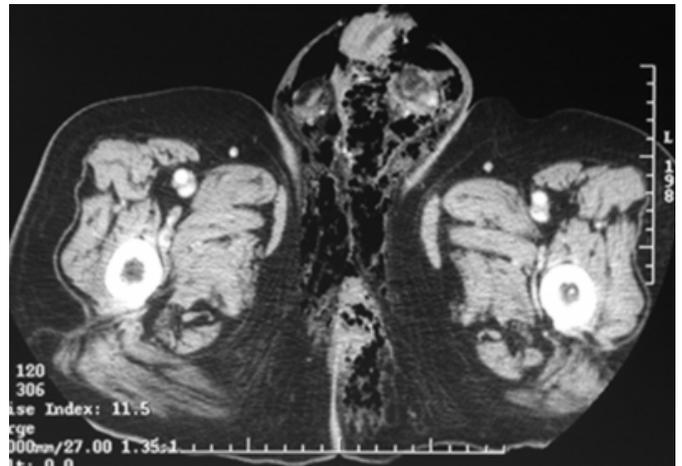
Figure 2

Figure 2: Photography of the perineum showing inflammatory signs.



Figure 3

Figure 3: Pelvic CT showing a marked increase in the size of scrotum and inguinal area (due to gassy collection dissecting scrotum and left inguinal area).



Treatment with broad spectrum antibiotics, corticoids and urgent débridement was released. In cultures of the surgical wound *Streptococcus epidermidis*, *Echericha coli* and *Staphylococcus aureus* were grown. The patient suffered multiorgan failure during his stay in the Intensive Care Unit and died four days later.

DISCUSSION

Fournier's gangrene was initially described by Baurienne in 1764 and throughout 100 years has raised an important controversy in its study. Alfred Fournier definitively defined it in 1883 as a fulminating idiopathic genital gangrene in previously healthy young men (1). At present, necrotizing fasciitis (NF) is defined as an infectious disease, quickly progressive, generally polymicrobial, potentially lethal and of difficult diagnosis, that can affect both sexes, all age groups and any anatomical region (1). Usually, the disease appears in adult patients between 20 and 50 years, males (53.2%) are affected more often than females (46.8%). Description and studies of this illness in the elderly patient are poor (6,7). Associate diseases as diabetes (30%), especially with bad metabolic control, immunodeficiency (11%), leukemia, chronic renal failure, perineal disease (hemorrhoids, fistula), obesity, and alcoholism are risk factors (1,8).

The commonest anatomical region involved is the trunk (37.1%), followed by perineum and buttocks, lower limbs, upper limbs, retro-peritoneum, and head and neck (1). The infectious process habitually begins in urogenital or colorectal structures or wounds of the area, in some occasions the agent gains entry through intact skin and in

some cases the source is unknown (9).

Among the urogenital affections, renal abscesses, urethral stone, orchitis, epididymitis, phimosis, vesical carcinoma, urogenital surgery and urethrostenosis have been described as responsible of the fasciitis. Colorectal carcinoma, gallbladder carcinoma perforation, appendicitis, retroperitoneal abscess, blunt trauma, muscular effort, hernia repair, cesarean section, modified radical mastectomy (Gehlen et al.) or diverticulitis (Piedra et al.) have also been described as possible causes (10,11,12,13,14,15,16,17). Among the iatrogenic causes have been published: urinary traumatic catheterization (as in our case) (3,4,5), prostatic massage, prostatic biopsy, percutaneous cardiac revascularization (18), transthoracic percutaneous biopsy (19), liposuction (20), and intramuscular injection of non-steroidal anti-inflammatory agents (21). In the case that we describe, the door of entrance of the infection possibly has been the loss of continuity of the urethral mucous after the vesical catheterization.

Karim (3) published the first case of scrotal and perineal Fournier gangrene following urethral necrosis by indwelling catheter. The fact that an inflated catheter balloon can slip down into the urethra and produce necrosis was demonstrated. The pathogenic agents proposed for necrotizing fasciitis of urethral origin are bacteria coming from urethral gland infects. In non-treated infections or in immunologic depression, the infection can extend toward the spongy body, crosses the scrotal tunica albuginea and reaches the fascia of Buck. If this it is damaged, the dissemination takes place through the fascia of Dartos committing the scrotum and the penis. It can also spread from this fascia toward the fascia of Colles and the perineal region or toward the fascia of Scarpa and the anterior abdominal wall. More uncommon is the extension from the fascia of Colles to the ischioanal groove reaching the retroperitoneum and the pararectal space, increasing the graveness of the process. The testicles and the cavernous bodies are not usually involved in the infectious process, due to their independent vascularization (4,6,22).

The infection extends from its origin to deep planes and progresses quickly toward the characteristic obliterating endarteritis (small vessel thrombosis), causing ischemia, hypoxia and vascular cutaneous and subcutaneous necrosis. The hypoxia determines the gangrene because the drop of soft-tissue oxygen pressure allows the proliferation of anaerobic microorganisms. The local consumption of oxygen by part of the aerobic microorganisms combines

with a smaller vascular supply secondary to local inflammation and edema (4,6,22).

Identification of the implicated microorganisms is very import to determine the type of antibiotics and support need (9). The majority of wound cultures are polymicrobial and the single-culture rate is 18.6% (23). Facultative organisms are most frequently recovered. Commensal bacteria of the gastrointestinal tract and perineum area like group A and B Streptococcus (24,25), group D Enterococcus (23), E. coli (23), Proteus (23), anaerobic bacteria (Clostridium perfringens) (26), Pseudomonas aeruginosa (27), Klebsiella (28), Salmonella group C (29) or Staphylococcus aureus (30) are usually implicated in the infection. Habitually, there is polymicrobial infection (Streptococcus, Enterococcus and anaerobes) in the necrotizing fasciitis of the urogenital and perineum area. Although NF caused by methicilin-resistant Staphylococcus aureus is exceptional, an increasing prevalence has been published in male patients, with a high number of complications throughout the process with increasing mortality associated to the infection (30).

Early diagnosis and aggressive treatment determine prognosis in the cases of necrotizing soft-tissue infections. The study of Rieger et al. (31) showed that the overall survival was 81.3% for tissue infections, 84.6% for necrotizing fasciitis and 66.7% for necrotizing myositis. The main goal of the clinician must be to establish the diagnosis as early as possible and to begin treatment as soon as possible. Among the clinical manifestations, there may be severe abdominal pain, diarrhea and fever, signs of sepsis or toxic shock. However, in the elderly patient, the symptoms usually are not specific; therefore, the diagnosis in these patients is more difficult. The skin lesions are erythema, cellulites, tenderness, swelling, hemorrhagic bullae, gangrene and necrosis within 24-48 hours (8,22), as in our case.

Although the diagnosis of NF is often made clinically, emergency computed tomography (CT) can lead to early diagnosis with accurate assessment of the disease, help evaluate the structures that can become involved by NF and assess the retroperitoneum. Findings at CT include fascial thickening, subcutaneous emphysema, fluid collections and formed abscess. CT provides a higher specificity for the diagnosis of NF than conventional radiology and ultrasonography (32). Magnetic Resonance can be of utility the diagnosis of this illness.

The management of NF must be fast and intravenous

application of fluids; oxygen, electrolytes, systemic broad-spectrum antibiotics and an early extensive debridement of all necrotic tissue are the pillars of the treatment (33,34,35,36,37). Other therapies for necrotizing fasciitis are described, the use of which is controversial, especially in elderly. In retrospective studies, the use of hyperbaric oxygen (HBO₂) has shown an advantage, inhibiting the growth of anaerobes, limiting the necrosis and increasing survival (38). Also, specific immunoglobulines have shown benefits, modulating the immunity in severe infections, with decrease of the mortality (33). This disease can revert even several years after treatment.

The mortality of NF varies between 30%-50% (39,40). Malnutrition, heart failure and APACHE II score of 13 or higher are implicated in a higher mortality (41). Probably, the main responsible factor for the elevated mortality in the elderly patient is the delay in diagnosis and treatment; because in these patients, clinical manifestations are usually atypical and therefore, NF is not suspected (39).

CONCLUSION

In necrotizing fasciitis, precocious diagnosis and opportune treatment with wide-spectrum antibiotics, radical debridement and complete urologic evaluation are necessary. We believe that urethral catheterization should be done by expert people due to the severity of possible complications.

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