

## Do not underestimate fournier's gangrene: report of 8 cases in 10 month survey

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### Abstract

**Background:** Fourniers gangrene caused by synergic aerobic and anaerobic organism is a life threatening disorder.

**Methods:** The medical records of 8 among 839 patients admitted to imam ali general hospital Zahedan university of Medical Sciences with fourniers gangrene during the 10 months period between 2012 and 2013 were reviewed.

**Results:** The most common etiology and presentation were abscess and perianal pain respectively. Mixed bacterial flora was common finding in patient. Single debridement was carried out in 2 patients and repeated procedure was needed in 6.

**Conclusion:** This disease is characterized with high mortality of up to 75% but in our study the rate was 37.5%. In other studies diabetes mellitus was found to be the common condition related to fourniers gangrene but in our study the common etiology was perianal abscess. Fourniers gangrene should be rule out in any patient with perianal pain and flulike, swelling skin.

**Keywords:** Fourniers gangrene, Mortality, Debridement.

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### Introduction

Fournier's gangrene, caused by synergistic aerobic and anaerobic organisms, is a life-threatening disorder in which infectious agent of the perineum and scrotum spread along fascial planes, leading to soft-tissue necrosis. Majority of infections arise from anorectal, genitourinary and cutaneous sources. These patients usually present with erythema, pain and swelling. There is often crepitus, areas of gangrene or blister formation at the skin (1-3).

Factors that benefit onset in all variants of this disease are: diabetes mellitus, alcoholism, drugs, immunological deficiencies,

and malignant diseases, renal and hepatic insufficiency.

Pathogenesis of this disease is still not completely known. Infection advances through genital fascia (Buck and Dartos), perineal fascia (Colles) as well as fascia of abdominal wall (Scarpa), in all directions, and can even reach up to armpit. Although it is evident that the combination of microorganisms play role in the development of this infection, but would cultures are usually negative (4).

The common bacteria found are: E. Coli, Pseudomonas aeruginosa, Streptococcus putridis, Staphylococcus, Klebsiella, along

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with several anaerobic bacteria like *Bacteroides*, *Clostridium perfringens* and *Bacillus fragilis*.

The infection initiates under normal-looking skin. Although the symptoms usually are redness and edema of the skin of scrotum and perineum (and occasionally on penis), but it can also be discrete.

It is more often in cases where deeply hidden abscesses (such as ischiorectal) are observed. Suspected diagnosis is based on clinical presentation in up to 80% of cases.

Due to potential severe complications, it is important to diagnose the disease as soon as possible. Mortality rate of Fournier gangrene can be reduced by intensive care and appropriate antibiotic therapy with the consideration of both aerobic gram-positive and negative bacteria as well as anaerobic microorganisms contaminant introduced during surgical treatment (5-6).

### Methods

The medical records of 8 (among total 832) patients admitted to Imam Ali general hospital, Zahedan University of Medical Sciences, with a diagnosis of Fournier's gangrene during the 10 months period between 2012 and 2013 were reviewed.

The diagnosis of Fournier's gangrene was established clinically on the basis of the patient's history and physical examination and by radiological imaging in selected cases.

The inclusion criteria included patients who underwent an invasive surgical excision of scrotal and/or perineal necrosis along with other involved areas with a postoperative diagnosis of Fournier's gangrene. Solitary perianal, scrotal and periurethral abscesses were excluded, if no extension of cellulites and necrosis to surrounding tissues was existed.

Before the operation, all patients underwent aggressive fluid resuscitation and treated with parenteral broad-spectrum of antimicrobial agents, using a third-generation cephalosporin with an aminoglycoside and/or metronidazole, with dose adjustment according to renal status and

received haemodynamic support if needed.

Prolonged mechanical ventilation, invasive monitoring and inotropic support were conducted in patients with cardiopulmonary failure due to sepsis.

Coagulopathy was treated aggressively by blood component therapy. Following the optimum radical and aggressive debridement, all necrotic skin, subcutaneous tissue, fascia and obviously non-viable muscle were removed and sent for microbiological and histological examination. The areas of debridement were packed with dressings soaked in hydrogen peroxide and povidone iodine. After the initial surgery, the wound was closely monitored, and adequate nutrition was ensured to support wound healing in addition to enteral or parenteral supplementation.

Due to a high risk of ongoing progression of the infection or the significant necrotic wound margins, patients underwent repeated debridement.

The number of debridements defined as it was carried out in operating room under general anaesthesia, not those applied at bedside with local anaesthesia.

Closure of wounds was commenced as soon as healthy, viable tissue allowed reapproximation. Whenever it was necessary, split-thickness skin graft or rotational cutaneous flaps were also used to repair large defects. If debridement resulted in exposure of the testes, the testes were temporarily implanted into a medial thigh pouch until healing or until reconstruction completed.



Fig.1. Patient no.3: 68 years old male with history of scrotal swelling from 4 days ago, at emergency ward

Colostomy was carried out for fecal diversion when the source of infection originated from the anorectum and the sphincter was infected. Furthermore, evidence of a rectal perforation and a large rectal wound or persistence of systemic sepsis were indications for performing colostomy, in spite of optimal radical debridement. Suprapubic cystostomy was required when there was gross urinary extravasation or periurethral inflammation. Orchidectomy was not necessary unless testicular gangrene was present. If penile skin was affected, split-thickness skin graft was carried out with skin from the inguinal area.

Mortality was defined as disease-related death during the hospital stay and survival was measured in days.

## Results

All patients were men, with the mean age of 44 years (range, 26 to 68 years).

The mean delay between the onset of the symptoms and hospital admission was 13.8 days (range, 2 to 30 days). Five (62.5%), 1 (12.5%), and 2 (25 %) patients had colorectal, urologic, and cutaneous lesions, Of the 8 patients studied, 3 died and 5 survived and the overall mortality rate was 37.5%. 2 patients (25%) had type 2 diabetes mellitus

with a mean period of 4.7 years (range, 1 to 8 years) 1 (12.5%) was alcoholic. 1 (12.5%) was homosexual and 1 patient (12.5%) was IV drug abuser. None of the patients were immunocompromised. 3 patient (37.5%) had a history of the local trauma to perineum because of car accident. Hypocalcaemia was diagnosed in 3 cases (37.5%). Colostomy, suprapubic diversion, were performed in 4 (50%), 1 (12.5%), patients respectively.

The most common etiology of Fournier's gangrene was perianal abscess (71.4%) and primary scrotal abscess (12.5%).

Predisposing factors included diabetes mellitus (25%) and paraplegia (12.5%),

The most common presentation was perianal/scrotal pain (78.6%) The mean duration of symptoms at presentation was 11.8 days in survivor, and 17.3 days in non-survivors. The time from the onset of symptoms to presentation was not significantly different in survivor and non-survivors ( $p > 0.05$ ).

Among infectious agents,  $\beta$ -hemolytic streptococcus, *Enterococcus faecalis*, *Pseudomonas aeruginosa* and *Proteus* were isolated, but mixed bacterial flora was also a common finding. The anaerobic bacterial commonly found included *Bacillus fragilis*

Table 1. ???

Patient	1	2	3	4	5	6	7	8
Age (years)	55	27	68	26	53	42	30	50
Sex	M	M	M	M	M	M	M	M
Duration of disease before treatment (days)	30	5	4	6	30	20	2	14
Other factors	DM, HTN	DM, RF, HTN	NONE	Trauma	Paraplegia due to Trauma	Iv Drug Abuser	Hbv Positive, Homosexual	Trauma
Microbiology	<i>Enterococcus faecalis</i>	<i>Proteus</i> , <i>Pseudomonas</i>	<i>Proteus</i>	<i>Chlostridium</i> , <i>Enterococcus</i> , <i>Pseudomonas</i>	$\beta$ -hemol <i>Streptococcus</i>	$\beta$ -hemol <i>Streptococcus</i>	$\beta$ -hemol <i>Streptococcus</i>	<i>Enterococcus</i> , <i>Pseudomonas</i>
Antibiotics	Cefuroxim, Gentamicin, Metronidazole	Ciprofloxacin, Metronidazole	Gentamicin, Cefuroxim	Cefuroxim, Gentamicin, Metronidazole	Ampicillin, Gentamicin	Ampicillin, Gentamicin	Ampicillin, Gentamicin	Cefuroxim, Gentamicin, Metronidazole
Colostoma	+	-	-	+	+	-	+	-
Cystostoma	-	+	-	-	-	-	-	-
Outcome	Death	Cure	Cure	Cure	Cure	Death	Death	Cure



Fig.2. Patient no.3 at operation room after completed debridement and resection of necrotic tissue.

and *Clostridium perfringens*. However, the bacterial organisms cultured from the wounds were not significantly different in outcomes.

Single debridements were carried out in 2 (25%) patients and repeated debridements in 6 (75%).

### Discussion

Various studies have characterized this disease with a high mortality, ranging from 7% up to 75% (7-10), but in our study, only 3 patients (37.5%) died from this condition.

In other studies, diabetes mellitus was the most common condition associated with Fournier gangrene, up to 55.6% cases (11). But in our study the most common etiology of Fournier's gangrene was perianal abscess (71.4%). Although extremely rare, it has been described in females and children (12-13).

The clinical signs and symptoms of Fournier gangrene in our patients were similar to that explained in the literatures (14,15).

After a nondistinctive prodromal period consisting of local discomfort and fever, typical presentations including crepitus, swelling, and erythema were also developed.

In patients with severe clinical presentations, progression of the gangrenous process leading to malodorous drainage and sloughing in affected sites were present and resulted in the deterioration of the patients'

conditions. Considering rapidity of the spread of the gangrenous area that can occur at the rate of 2 cm/h to 3 cm/h, prompt diagnosis and appropriate emergent management seems to be vital (16).

Although in our and Laor et al studies the interval between the onset of the disease and the hospital admission does not play an important role in the prognosis and clinical outcomes, the mortality rate may increase in patients with a significant delay before the reference to the medical center (17,18).

In all patients died in our series the serum BUN level was higher than 30 mg/dL at presentation.

Seyed Jalil Hosseini et al and Clayton and coworkers found that survival of patients with necrotizing fasciitis was associated significantly with a BUN level of less than 50 mg/dL at presentation (19,20).

Prior investigators have stated that prompt diagnosis, wide-spectrum antibiotics, extensive debridement and surgery, as well as adequate nutrition could improve necrotizing fasciitis, patients' condition and reduce the mortality (21-23).

Some published series have emphasized that hyperbaric oxygen therapy can be helpful for the management of Fournier gangrene wound site. Limitations in the availability and transfer of the patients to the hospital units offering this service restrict treatment of the patients with Fournier gangrene (24,25). Consequently, we did not utilize hyperbaric oxygen therapy for our patients. The possibility of recurrence of this condition even several years after treatment has been described in various studies (26).

### Conclusion

based on other and our experience (8 cases in 10 months, among 832 patients), necrotizing fasciitis should be ruled out in any patient presented with pain, flu-like symptoms, swelling, blisters, and necrotizing appearance in skin, especially if it is associated with: diabetes mellitus, IV drug abuse or recent trauma. Prompt diagnosis, suitable antibiotic administration, and ex-

tensive operation could significantly reduce mortality as well as morbidity.

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