Fournier's Gangrene: Case Series Study, in Baghdad

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Abstract:
Objective: The aim of this study was to determine the efficiency of urgent surgical treatment of Fournier's gangrene and how it prevented and reduced greatly the disease morbidity and mortality.
Methods: The study was carried out on 11 cases of genital and perineal gangrene presented between January 2005 and December 2007. At diagnosis, treatment of all patients was initiated with broad spectrum antibiotics and urgent surgical debridement of all obviously necrotic and doubtfully viable tissues.
Results: Escherichia coli and Staphylococcus aureus were the most frequently isolated organisms in tissue cultures. An average of 2.6 operations was required per patient. The average hospital stay was 14.3 days. The mortality rate was 18.1% due to system failure.
Conclusion: Fournier's gangrene is a urologic emergency associated with high morbidity and mortality. Operative debridement remains the definitive treatment that should be performed early to ensure the best possible out come.

Keywords: Fournier's gangrene, Debridement, Penis, Scrotum.

Introduction:

Fournier's gangrene (Perineal necrotizing Fasciatis) is a fulminant necrotizing infection of the perineum and genitalia that constitutes a surgical emergency and can rapidly progress to sepsis and death.[1,2]

Localized infection adjacent to a portal of entry is the inciting event in the development of Fournier's gangrene. Wound cultures from patients with this gangrene reveal that it is a polymicrobial infection, [1] the source of which is anorectal, genitourinary and cutaneous.[1,3,4] Men with alcoholism, diabetes mellitus, leukemia, morbid obesity and immune system disorders e.g. (HIV, Crohn's disease), and intravenous drug users are at increased risk for developing Fournier's gangrene. The condition also can develop as a complication of surgery. [3, 4, 5]

Men are ten times more likely than women to develop Fournier's gangrene & may occur at any age, but most reported cases occur in patients aged 30-60 years.[1]

The classical signs are pain, swelling and erythema of scrotum in addition to fever. As the infection progress, cyanosis, blistering and brousing of the skin evolve into the formation of black or green plagues of frank dermal necrosis in up to 100% of cases. [2,4] A feculent odor may be present secondary to infection with anaerobic bacteria and crepitus is present in up to 60% of patients & is pathognomonic of Fournier's gangrene.[2]

Diagnosis of Fournier's gangrene primarily is based on clinical findings and blood tests.

Treatment with early broad spectrum parentral antibiotics (often triple drug therapy) should be initiated,[1] along with aggressive surgical debridement and removal of all non-viable tissue, which may require multiple surgical procedures.[2] Despite such measures, the case mortality rate overall is 40 %, but 78% if sepsis is already present at the time of initial hospital admission.[6]

Patients & method:

The study included 11 male patients with ages ranged from 35 to 69 years. They attended the emergency department at Al-Yarmouk Teaching hospital in the period between January 2005 and December 2007. All presented with genital and perineal gangrene which necessitate admission to the hospital.

A thorough review of systems was obtained including history of diabetes, alcohol abuse, cancer, colorectal or urogenital disease or surgery, steroid use and sexual history. Details of past or recent trauma to the pelvis or genitalia were noted.

A complete physical examination was done for each patient with special emphasis on genital and perineal regions to detect potential portal of entry. The following laboratory investigations were performed; Full blood count, blood urea, serum creatinine, and electrolytes, blood glucose level, liver function tests, coagulation profile, blood, urine and tissue cultures.

Diagnosis of Fournier's gangrene was made in all patients based on history and physical examination findings, ultrasonography of the scrotum was needed in few questionable cases to rule out other acute scrotal pathologies.

At diagnosis we initiate early broad spectrum antibiotics for all patients providing coverage for gram positive, gram negative, aerobic and anaerobic bacteria using an aminoglycoside with metronidazol and either ampicillin or cefotaxime.

Correction of hypovolemia, anemia and electrolyte imbalance performed.

Urgent surgical treatment was required in all cases, consisting of wide excision and debridement of all obviously necrotic or doubtfully viable tissue from the medial buttock into the base of the scrotum. Local dressings were done frequently with hydrogen peroxide, normal saline solution followed by povidone iodine soaks. Antibiotic treatment was continued postoperatively. Other surgical procedure such as diverting colostomy, suprapubic cystostomy, bilateral orchidectomy and split thickness skin graft were performed in some of our patients as necessary.

Results:

The ages ranged from 35 to 69 years(mean 52). Prodromal symptoms usually lasted 1-2 days. In all patients the onset was dramatic and they were soon overwhelmed by fetid odor, penoscrotal pain, erythema, oedema , fever and gangrene.

Nine patients had an identifiable portal of entry of infection and most cases have had some potentially important predisposing or associated lesions; including paraplegia, diabetes mellitus, alcoholism, severe anemia, atherosclerotic arterial disease and renal failure (Table 1).

Tissue cultures obtained at various intervals during the course of the disease revealed numerous Gram's positive and gram negative bacteria, of these Escherichia coli and Staphylococcus aureus were most frequently found (Table 2). Blood cultures were negative. Histological examination in all cases confirmed extensive acute inflammatory cells with foci of necrosis and acute vasculitis of arteries and veins with thrombus formation in both.

Table (1): Etiology and associated conditions.

Etiology	**Associated conditions**	**No.**	**%**
Erosion of catheter	**Paraplegia**	1	9.09
Blocked catheter	**Diabetes mellitus**	1	9.09
Traumatic catheter insertion	**Severe anemia**	1	9.09
Perineal skin infection	**Diabetes, Alcoholism, Arteriosclerosis**	3	27.2
Epididymo-orchitis	**Paraplegia, Diabetes**	2	18.1
Perirectal abscess	**Renal failure**	1	9.09
Not defined	**Arteriosclerosis**	2	18.1

Table (2): Organisms isolated from tissue.

Patient No.	Tissue culture
1	***E.coli*, Proteus mirabilis, Bacteroides fragilis.**
2	**Staph. aureus, Klebsiella.**
3	**Enterococcus, E. coli.**
4	**Haemolytic Streptococcus, Pseudomonas, Proteus mirabilis**
5	**Staph. aureus, E. coli, Bacteroides fragilis.**
6	**Staph. aureus, Bacteroides fragilis.**
7	**Streptococcus, E. coli, Clostridium Perfringens.**
8	**Staph. aureus, Enterococcus, Pseudomonas, Bacteroides fragilis.**
9	**Staph. aureus, E. coli.**
10	**Staph. aureus, E. coli.**
11	**Staph. aureus, Streptococcus, E. coli.**

Treatment in all cases consisted of triple broad spectrum antibiotics and urgent surgical debridement. Five Patients required suprapubic urinary diversion because of the urethral etiology in three cases and the extensive periurethral disease in the remainder. Colostomy was needed in two patients while six patients required repeated surgery for further debridement of all necrotic tissues between 1and 7 days after the initial operation. Operative treatments are tabulated in **Table (3).** An average of 2.6 operations was required per patient and the average hospital stay was 14.3 days (range 10-21). Two patients died; the first one, who was paraplegic with poorly controlled diabetes, had developed adult respiratory distress syndrome and the other patient developed acute renal failure with pneumonia and gastrointestinal bleeding.

Table (3): Operative Treatments and outcome.

Patient No.	Surgery	Outcome
1	Debridement; debridement 1 week later.	Secondary closure & healed
2	Debridement; debridement 48 h later, suprapubic cystostomy	Secondary closure & healed
3	Debridement; medial thigh pouch, suprapubic cystostomy	Secondary closure & healed
4	Debridement; medial thigh pouch, debridement 48 h later, skin graft day 18	Healed
5	Debridement; suprapubic cystostomy, bilateral orchidectomy, skin graft day 21	Healed
6	Debridement	Complete healing
7	Debridement; bilateral orchidectomy	Secondary closure & healed
8	Debridement; suprapubic cystostomy, debridement 48 h later	Secondary closure & healed
9	Debridement; suprapubic cystostomy, debridement 24 h later, medial thigh pouch	Sepsis, renal failure & died
10	Debridement; debridement 48 h later, diverting colostomy, debridement 4 days later	Sepsis, respiratory failure & died
11	Debridement , diverting colostomy	Healed

Fournier's gangrene may be seen in the aged as well as in childhood. Rao et al.[7] and Adeyokunni[8] reported 9 cases in infants.

The comparatively older age at onset in most of our patients is consistent with the changing presentation noted previously by Jones et al.[9] and McGeehan et al.[10]

In our cases we had reported the occurrence of this disease as a complication of urethral catheterization and perineal sepsis. A similar finding had been noted by Flanigan et al.[11] and Spirnak et al.[12]

In this study the most common organisms found in tissue cultures were Escherichia coli and Staphylococcus aureus and these are the same typically seen in other studies reported by McGeehan et al.[10] Delepero et al.[13] reported the same organisms from 12 cases of necrotizing infections of the perineum with the exception of high incidence of Clostridium perfringens.

Treatment with multiple antibiotics is necessary in Fournier's gangrene because of polymicrobial nature of the infection. This therapy can be based on penicillin or cefotaxime for streptococci, metronidazole for anaerobes and an aminoglycoside for activity against the gram negative aerobes. In view of renal failure it is necessary to monitor carefully the dosage of antibiotics, particularly the nephrotoxic aminoglycosides.

To ensure a successful outcome it is essential that early debridement of the gangrenous area be performed. We debrided all frankly necrotic tissue and any further tissue where viability seemed doubtful but 6 patients still required further debridement. As has been noted in previous reports by Jones et al[9] the testes and spermatic cords are generally not affected by the disease, although 2 of our patients who appeared to have preexisting epididymo-orchitis did develop testicular abscesses and required orchidectomy. Any extensive tissue defect can be covered by a split thickness skin graft once infection has resolved and a base of healthy granulation tissue is present. This situation was achieved day 18 and 21 after initial debridement in the 2 patients who required grafting.

Mortality rate of 13 to 60% had been reported in spite of aggressive treatment. Lamb and Juler[14] had 33% mortality rate due to associated disease: metastatic cancer and liver failure. Spirnak et al[12] in 10 years review reported 45% mortality. Riegels-Nielsen et al [15] reported 20% (one out of five) due to septic shock. This is compared with 18.1% mortality rate in the present study. We reported these deaths due to respiratory and renal failure.

In conclusion Fournier's gangrene is a urologic emergency associated with high morbidity and mortality. The principles of management are early broad spectrum antibiotics, urgent surgical debridement and when necessary, reconstruction once sepsis has been eradicated and fitness permits.

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