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Original Research Article

Fournier's gangrene: a clinical profile of 30 cases

Kavya T.*, Rajashekara Babu G., Santhosh C. S.

Department of General Surgery, Bangalore Medical college and Research Institute, Bengaluru, Karnataka, India

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***Correspondence:**
Dr. Kavya T.,
E-mail: kavyat15@gmail.com

ABSTRACT

Background: Fournier's gangrene is a rapidly progressive synergistic infection involving the perineal region and the scrotum and/or the penis. This study was conducted to know about the etiology and mode of presentation of Fournier's gangrene and the impact of early and aggressive multimodality treatment in reduction in morbidity and mortality associated with this condition which is still considered to be significantly high.
Methods: The medical records of 30 patients of Fournier's gangrene who presented to the hospital between May 2014 to June 2017 were retrospectively reviewed to analyze the presentation, progression and the outcome of the disease.
Results: The study included a total of 30 male patients. The mean age was 57 years (range 38-72 years). The most common etiology was secondary to anorectal pathology (40%). The most common predisposing factor was noticed to be diabetes mellitus (73.34%). Pain and tenderness in the perineal region was present in most of the patients and scrotal involvement was seen in 66.67% of the patients. Fever was the most common prodromal condition seen in 93.33% all of which in turn were associated with tachycardia. Hyperleukocytosis was seen in 93.33% of patients except for one patient who was diagnosed to be retropositive on admission. The microbiological profile yielded polymicrobial culture report in 80% of the patients and monomicrobial in the rest with Escherichia coli being the most common organism isolated from 80% of the patients. All patients underwent adequate resuscitation, primary emergency debridement with parenteral antibiotic therapy. All the patients recovered after a mean hospital stay of 16.93 days (range 9-30 days). The mortality rate in present study was found to be 6.67%.
Conclusions: In spite of the advancements in the field of medicine Fournier's gangrene still remains a disease with questionable degree of morbidity and mortality and early detection and treatment with aggressive debridement seems to be the only way of obtaining a good prognosis in these patients.

Keywords: Debridement, Fournier's gangrene, Hyperleukocytosis, Polymicrobial

INTRODUCTION

Fournier's gangrene is a rapidly progressive necrotizing fasciitis of the perineal, genital or perianal regions with obliterative endarteritis and necrosis of the adjacent skin. It has a history of male preponderance but is also known to occur in women and in children.[1] Though it is very rarely found in children most of the cases are reported in infants.[2] According to a study conducted by Eke the lower incidence in women is attributed to under repoting.[3] Baurienne in 1764 and Avicenna in 1877 had described the same disease earlier.[4] It was noticed that those cases were neither idiopathic nor fulminant. In 1883, Jean Alfred Fournier (1832-1914) gave the first clinical description of idiopathic rapidly progressive gangrene of the male external genitalia.[5]

Authors reported four cases which were idiopathic in origin with rapid progression and high morbidity. Both fulminant and overwhelming were the words used by Fournier to describe the disease which was also identified

as genitoperineal gangrene but was more commonly known as gangrene of the scrotum.

Table 1: Lists some of the causes of Fournier's gangrene.

Urogenital
Urethral stricture
Indwelling transurethral catheter
Prolonged or neglected use of condom catheter
Urethral calculi
Prostatic biopsy
Urethritis
Transurethral surgery
Infection of periurethral glands and paraurethral abscess
Urogenital tuberculosis
Urethral carcinoma
Prostate biopsy
Prostatic massage
Prostate abscess
Insertion of penile prosthesis
Constriction ring device for the management of ed
Iatrogenic trauma
Cauterization of genital warts
Circumcision
Manipulation of longstanding paraphimosis
Animal, insect or human bite
Scrotal abscess
Infected hydrocele
Hydrocoelectomy
Vasectomy
Balanitis
Phimosis
Anorectal
Ischiorectal or perianal or intersphincteric abscess
Rectal mucosal biopsy
Banding of haemorrhoids
Anal dilatation
Cancer of sigmoid or rectum
Diverticulitis
Rectal perforation by a foreign body
Ischaemic colitis
Anal stenosis.
Cutaneous
Hidradenitis suppuritiva
Folliculitis
Scrotal pressure sore
Post-scrotal surgery wound infection
Cellulitis of scrotum
Pyoderma gangrenosum
Femoral access for intravenous drug users
Retroperitoneal causes
Psoas abscess
Perinephric abscess
Others
Inguinal hernia repair
Filariasis in endemic areas
Strangulated richter's hernia

Over the years several terms have been applied to Fournier's gangrene including *Streptococcus gangrene*, *Necrotising fasciitis*, *Periurethral phlegmon*, *Phagedena*, and *Synergistic necrotising cellulitis*.[6,7] But in contrast to Fournier's initial description, the disease is now not limited to young people or to males, and a cause is now usually identified.

Although historically Fournier's gangrene was described to be idiopathic an identifiable case can be obtained in 75-95% of the cases. Most of the times the source of infection is in the anorectum, the urogenital tract or in the genital skin.[1] Theoretically any condition with depressed cellular immunity such as extremes of age, malignancy, cytotoxic drugs, chronic steroid usage, malnutrition and HIV infection may predispose to the development of Fournier's gangrene. Diabetes mellitus was reported in 20-70% of the patients with Fournier's and chronic alcoholism was seen in 25-50% of the patients.[9,10] The emergence of HIV into epidemic proportions has opened up a huge population at risk for developing FG.[11]

The disease has a varied presentation ranging from slow and insidious onset to a rapid and progressive course although most of the cases belong to the latter category. Ersay et al found that the most common presentation was perianal/scrotal pain (78.6%) followed by tachycardia (61.4%), purulent discharge from the perineum (60%), crepitus (54.3%), and fever (41.4%).[12]

Early and thorough surgical debridement of necrotic tissues and intravenous antibiotics are fundamental in the treatment of FG. Despite advanced management mortality is still high and averages 20-30%.[8] The aim of this study is to present a general overview of this fatal and fulminant disease and to stress on the importance of early detection and appropriate surgical intervention which may have an impact on the overall mortality and morbidity associated with this condition.

METHODS

A retrospective study was carried out on 30 patients who presented to Victoria Hospital, Bangalore between the time period of May 2014 to June 2017. Patients were studied keeping age, aetiology, comorbid conditions, extent of tissue involvement, clinical features, microbiological profile, length of stay and mortality.

Inclusion criteria

All patients with necrotizing fasciitis of the perineal, perianal and genital regions confirmed by histopathological examination.

Exclusion criteria

- Patients with alternative diagnosis other than necrotizing fasciitis.
- Patients who did not give consent.

All the subjects were subjected to the following investigations.

- Complete blood count
- Blood glucose levels
- Blood urea and serum creatinine
- Serum electrolytes
- Arterial blood gas analysis
- Bacterial culture from the wound

RESULTS

Out of the 30 cases that presented to the setup 14 (46.67%) patients had developed Fournier's gangrene secondary to perianal abscess, 6 (20%) patients developed the disease secondary to urogenital infections such as epididymitis and/or orchitis. Six (20%) cases were found to be the result of post-perineal trauma and in one case no significant cause was elicited, and this was labelled as idiopathic Fournier's gangrene (6.67%) (Figure 1).

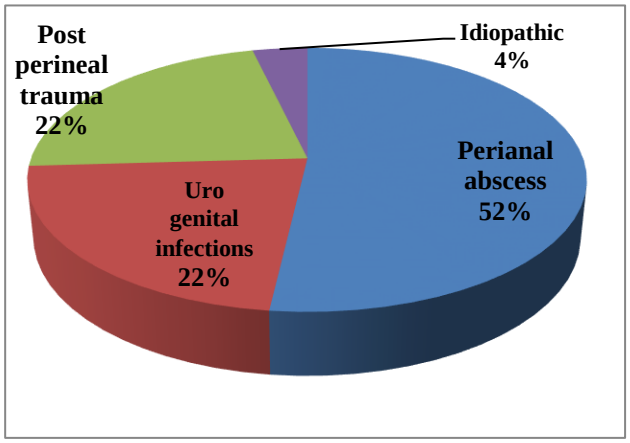

Figure 1: Distribution of etiology of Fournier's gangrene.

In all the cases that presented to us patients were noticed to have one or more comorbidities. Twenty-two (73.33%) were found to be diabetics indicating that it is a major predisposing factor and 10 (33.33%) were found to be chronic alcoholics with one patient being retropositive.

The patients presented to us majorly with chief complaints of pain and tenderness in the perianal region with prodromal symptoms such as fever, malaise, perianal discomfort, nausea and vomiting. Crepitus over the involved skin is a common feature and as the disease progresses necrotic patches will appear over the skin which later on leads to extensive necrosis of the skin.

On examination, perineal involvement was seen in 14 (46.67%) of the cases, scrotal involvement was seen in all the 20 (66.67%) cases that presented to us in the form of scrotal edema and erythema. Penile involvement was seen in 14 (46.67%). Abdominal wall involvement (below the level of umbilicus) was seen in 4 of the patients at the time of presentation (Figure 2).

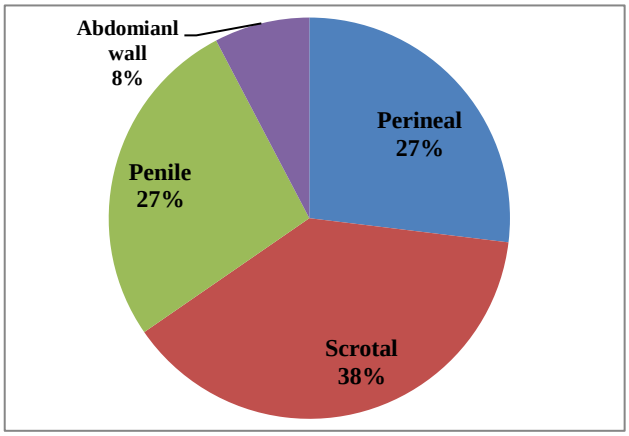

Figure 2: Regions affected by the disease process.

On general examination, fever (>38ºC) was recorded in 93.33% the patients. Tachycardia (pulse rate>100) was noted in the febrile patients.

Sepsis defined by fever, tachycardia and hypotension (systolic blood pressure <90mmHg) was found in four patients. Crepitus was noticed in 14 (46.67%) of the patients at the time of presentation indicating infection by a gas producing organism.

On analysis of the complete blood count of the 30 patients, anaemia (<13g/dl) was found in 20 (66.67%), leukocytosis with counts more than 11,000 cells/cumm was noted in 28 (93.33%) of the subjects except the retro positive patient who had leucopoenia at the time of presentation. Hyperglycaemia (>200mg/dl) was noted in 14 (46.67%). Glycosylated haemoglobin was also elevated (>7%) in the 14 (46.67%) patients who presented with hyperglycaemia. Serum creatinine levels were not grossly deranged except in the case of two patients who presented in septic shock in whom it was 3.7gm/dl and 4gm/dl at the time of presentation. Metabolic acidosis was noted in the subjects with shock.

All patients underwent extensive and thorough debridement at the earliest possible time including the two patients who presented with shock who were taken up for debridement immediately after stabilization of vital parameters. Patients underwent serial debridement's until there was healthy granulation tissue over the base of the wound. All the patients were empirically started on a third-generation cephalosporin, an aminoglycoside and metronidazole. And based on the culture and sensitivity report they were either continued on the same or appropriate changes were made.

Bacterial culture from the wounds yielded polymicrobial growth in 80% of the subjects and monomicrobial growth was seen in the rest. *Escherichia coli* was the predominating organism in 24 cultures. *Anaerobic*

streptococci, Klebsiella, Staphylococcus aureus, Pseudomonas aueroginosa, Bacteroides species and *Proteus mirabilis* were among the other organisms that were seen in a few of the cultures.

DISCUSSION

Fournier's gangrene is rapidly progressive necrotizing fasciitis of the perineal and genital region. Fournier's gangrene which was initially thought of as idiopathic in origin has now been disproven as a definitive source of infection can be picked up in most of the cases. In the study conducted in the setup perianal abscesses were found to be the most common cause followed by urogenital infections and trauma.

The presence of comorbidities which impair the immune system such as diabetes mellitus, chronic alcoholism, malignancies, chronic steroid usage, AIDS, renal failure predispose to the development of Fournier's gangrene.[3,13,14] Diabetes mellitus is found to be the most common co morbid condition predisposing to this disease with prevalence as high as 20-70% which was in consistency with present study followed by chronic alcoholism.[10]

The patient usually presents with pain and swelling in the perianal region if the disease was a progression of perianal abscess or they may present with pain and swelling of the scrotum if the source of infection is found to be in the genitourinary tract. Pain is usually described as out of proportion to the symptoms. Crepitus in the affected area if present is a hallmark of infection by gas producing organisms. The patients also usually present with systemic symptoms such as fever and malaise.

Fournier's gangrene is a synergistic gangrene caused by both aerobic and anaerobic bacteria. Consistent with other studies patients in the group had polymicrobial culture pattern (80%) and monomicrobial in the rest. The most commonly found pathogen is *Escherichiae coli*.

Patients are usually started off on a broad spectrum antibiotic coverage with a third-generation cephalosporin, an aminoglycoside and metronidazole for anaerobic coverage. Early and extensive debridement is the only key to achieve recovery in a patient with Fournier's gangrene. Whole of the necrotic tissue has to be excised until we reach the viable tissue. Multiple surgical debridement's are usually required usually about 3.5 debridement's per patient.[15] Orchidectomy is usually not required unless and until the testis is non-viable.

Some authors suggest that a colostomy maybe performed during the initial debridement only to prevent the fecal contamination of the debrided area however newer devices like flexi seal have been developed as an alternative to colostomy. But the need for fecal diversion with colostomy is still under dispute. Newer methods such as vacuum assisted closure have been developed to reduce the length of hospital stay and number of hospital dressings.[16,17]

In spite of all the medical advancements this disease is associated with a high rate of morbidity and mortality. The mortality rate is as high as 20-30% in the latest studies.[8]

Laboratory risk indicator for necrotizing fasciitis score and Fournier's gangrene severity index score can be utilized for early initiation of treatment as this seems to be the most effective method to reduce morbidity and mortality.

CONCLUSION

In spite of the advancements in the field of medicine Fournier's gangrene still remains a disease with questionable degree of morbidity and mortality and early detection and treatment with aggressive debridement seems to be the only way of obtaining a good prognosis in these patients.

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