

Management and Outcome of Fournier Gangrene in a Nigeria Hospital

Najeem Adedamola Idowu, MBBS¹

Stephene Oluwatosin Ilori, MBBS²

Peter Olalekan Odeyemi, MBBS¹

Stephen Ishola Adedokun, MBBS¹

¹ Division of Urology, Department of Surgery, Ladoke Akintola University of Technology Teaching Hospital Ogbomoso, Nigeria

² Department of Surgery, Plastic and Reconstructive Surgery Unit, Ladoke Akintola University of Technology Teaching Hospital Ogbomoso, Nigeria

Abstract

Background: Fournier gangrene is a polymicrobial soft tissue infection of the genito-perineal region of the body. It is relatively rare but life-threatening.

Objective: This study aimed to discuss the management and outcome of Fournier gangrene.

Materials and Methods: The records of patients managed as cases of Fournier gangrene between 2020 and 2024 were retrieved from the hospital medical record department. The information collated from these files includes socio-demographic data, clinical features, modality, and treatment outcome. Descriptive analysis was done using SPSS version 23.

Results: Although 15 patients were admitted and managed as Fournier gangrene, only 13 patients had complete data and were analyzed. The age distribution was between 21-80 years, with a mean of 41.1 ± 15.7 SD. All the patients were male, and all of them presented in emergency with clinical features of sepsis identified in 3 patients. The wound culture of the remaining 7 patients (53.8%) could not be retrieved. The investigated subjects' Fournier gangrene severity index (FGSI) score showed a range of 2-12 with a mean of 7.6 ± 3.1 SD. Concerning definitive wound care, six patients (46.2%) had spontaneous wound closure due to the relatively small size of the defect. Five patients (38.5%) had primary wound closure under spinal anesthesia. The remaining two patients with FGSI scores of 9 and 11 underwent reconstructive procedures: scrotal advancement flaps + gracilis muscle flap + split-thickness skin graft.

Conclusion: The average FGSI score was 7. There was no mortality. The most commonly involved part was the scrotum, while the rarest was the penis. Prompt response and adequate resuscitation are required for good outcomes, as observed in this study.

Keywords: Fournier gangrene, Management, Mortality

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Corresponding author: Najeem Dowu, MBBS, Urology Division, Department of Surgery, Ladoke Akintola University of Technology Teaching Hospital Ogbomoso, Nigeria; E-mail: idowunajeem0@gmail.com; Telephone: 08025974216

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INTRODUCTION

Fournier gangrene is a polymicrobial soft tissue infection of the genito-perineal region of the body. It is relatively rare but life-threatening.¹ It affects both genders and is commonly seen in adults. This disease process involves necrosis of the subcutaneous tissues and the fascia of the genito-perineal region. It may spread along the fascia plane of this region up to the superficial fascia of the anterior abdominal wall.² Although it is essentially caused by the synergistic effect of both aerobic and anaerobic bacterial infections, some risk factors have been implicated. These include uncontrolled diabetes mellitus, chronic hypertension, chronic alcohol intake, chronic steroid use, retroviral infection, cutaneous infection, and all causes of bladder outlet obstruction, among others.³ The common causes of Fournier gangrene are perineal abscess and periurethral abscess. Patients with Fournier gangrene are often present in emergencies with sepsis and open genito-perineal wounds as focus. The diagnosis of Fournier gangrene is clinical. Diagnosis may be challenging in some cases, especially if it is seen early in the hospital. The severity of this disease and extent of tissue involvement is determined following complete blood count, electrolyte urea and creatinine, urinalysis, urine culture and sensitivity, blood culture, wound swab culture, and fasting blood sugar, among others.⁴ Ultrasound and computed tomography may support these investigations. Other specific investigations may also be needed depending on the suspected background etiology.⁵ Fournier gangrene severity index score has been established as one of the predictors of morbidity and mortality of Fournier gangrene. A score of > 9 has been strongly correlated with high mortality.⁶ It has a mortality rate of 20-30%.⁷ The initial care of Fournier gangrene includes aggressive fluid resuscitation, administration of broad-spectrum antibiotics, and thorough wound evaluation. Definitive wound care may consist of healing by secondary intention, primary closure, or reconstructive procedures using either skin graft or muscle flaps. This is critical in the principle of management to achieve good outcomes. The outcome of patients with Fournier gangrene depends on rapid diagnosis and the promptness of this care. This study aimed to discuss the management and outcome of Fournier gangrene, and our objective was to determine the pattern of presentation, diagnosis, treatment, and outcome of this clinical condition.

MATERIALS AND METHODS

This was a retrospective hospital-based study. This study was conducted in the Urology Division, Department of Surgery, Ladoke Akintola University of Technology Teaching Hospital Ogbomoso, Nigeria. The hospital is a tertiary health center located in the southwestern part of Nigeria. The record of patients that were managed as cases of Fournier gangrene as defined by necrotizing fasciitis of the perineum and/or genitalia between 2020-2024 was retrieved from the hospital medical record department. The information collated from these files included socio-demographic data, the pattern of presentation, vital signs and status of the wound at presentation, and investigations done, which included complete blood count, electrolyte urea, and creatinine wound swab culture, among others. Other information gathered was initial care at presentation and definitive wound care, including the outcome of the patients. Fournier gangrene severity index score was estimated. Patients with incomplete data and those discharged against medical advice were excluded from the study. A descriptive analysis was done using SPSS version 23. The information was presented in a tabular form.

RESULTS

Although 15 patients were admitted and managed as Fournier gangrene, only 13 patients had complete data and were analyzed. The age distribution was between 21-80 years, with a mean of 41.1 ± 15.7 SD (Table 1). All the patients were male, and all of them presented in emergency with clinical features of sepsis. The wound evaluation at presentation showed an open scrotal wound (8 patients, 61.5%), perineal wound (3 patients, 23.1%), and scrotal wound plus perineal wound (2 patients, 15.4%). All the patients reported an antecedent history of scrotal itching and/or perineal boil with subsequent development of an ulcer, which later progressed to a full-thickness open wound. Predisposing factors identified in 76.9% (10 patients) of the study group were diabetes mellitus (5 patients), perineal boil (3 patients), and urethral stricture (2 patients), while no factor was identified in 3 patients. Results of wound culture in 46.2% (6 patients) of the study group showed a mix of *Escherichia coli* + *Staphylococcus aureus* in 3 patients while *Pseudomonas* spp, *Klebsiella*, and *Enterococcus* were isolated in 3 patients. The wound culture of the remaining 7 patients (53.8%) could not be retrieved. The investigated subjects' Fournier gangrene

severity index (FGSI) score showed a range of 2-12 with a mean of 7.6 ± 3.1 SD. The initial urgent care of all the patients included adequate fluid administration based on the level of dehydration and administration of broad-spectrum antibiotics, which were a combination of third-generation cephalosporin and metronidazole. All of them had successful urethral catheterization except the patients with urethral stricture who had suprapubic urinary diversion. These were continued following sensitivity results. The patients with an FGSI score of 12 had 3 pints of fresh whole blood on account of a packed cell volume of 15%. All the patients had serial wound debridement, honey dressing, and sitz baths. Debridement was majorly by the bedside with the use of a surgical scalpel under the administration of pentazocin. This surgical debride-

ment's frequency depended on the depth of the devitalized tissues. The lowest frequency of debridement was three times. Concerning definitive wound care, six patients (46.2%) had spontaneous wound closure due to the relatively small size of the defect. Five patients (38.5%) had primary wound closure under spinal anesthesia. The remaining two patients with FGSI scores of 9 and 11 underwent reconstructive procedures: scrotal advancement flaps + gracilis muscle flap + split-thickness skin graft. The basic data of these cases, including risk factors, site of involvement, FGSI scores, and type of wound care, are shown in Table 2 and the treatment algorithm used in our patients (Figure 1). The average duration of hospital stay was 10-21 days. There was no mortality. The outcome was satisfactory.

Table 1 Age distribution of the studied group

S/N	Age group	Frequency n = 13	Percentage (%)
1	20-29	2	15.3
2	30-39	4	30.7
3	40-49	4	30.7
4	50-59	1	7.6
5	60-69	1	7.6
6	70-79	0	0
7	80-89	1	7.6

Table 2 Shows the study patients' basic data, risk factors, sites, FGSI scores, and definitive wound care.

S/N	Sex	Risk Factor	Site	FGSI scores	Wound care	Hospital stays
1	Male	Diabetes mellitus	Scrotum	9	Secondary intention	3 weeks
2	Male	Diabetes mellitus	Perineum	9	Primary closure	4 weeks
3	Male	Diabetes mellitus	Scrotum	11	Tissue reconstruction	3 weeks
4	Male	Diabetes mellitus	Scrotum	4	Primary closure	3 weeks
5	Male	Diabetes mellitus	Scrotum	12	Primary closure	3 weeks
6	Male	Urethral stricture	Scrotum & Perineum	2	Secondary intention	5 weeks
7	Male	Perineal boil	Perineum	9	Primary closure	3 weeks
8	Male	Urethral stricture	Scrotum	6	Primary closure	6 weeks
9	Male	Perineal boil	Perineum	8	Secondary intention	4 weeks
10	Male	Perineal boil	Scrotum & Perineum	2	Secondary intention	5 weeks
11	Male	Idiopathic	Scrotum	8	Secondary intention	-
12	Male	Idiopathic	Scrotum	9	Tissue reconstruction	-
13	Male	Idiopathic	Scrotum	10	Secondary intention	-

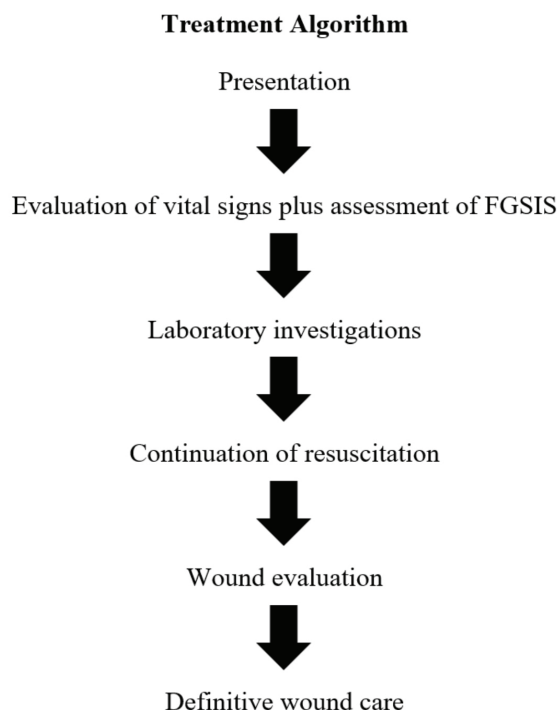


Figure 1 Flow of the treatment protocol

DISCUSSION

This study illustrated our experience in successfully managing some cases of Fournier gangrene seen in our center. A review of only 13 instances managed throughout five years points to the rarity of this pathology. This has further supported the rarity of this clinical condition, as stated in the medical literature. The disease's global incidence has been estimated to be 1.6 in 100,000.⁸ In a similar study conducted at Port-Harcourt and Zaria, 22 and 31 cases were seen, respectively, over the same period as ours.^{9,10} The gender distribution observed in this study is not different from that observed in other similar series. Although all our patients were male, the disease can also occur in females. Although, this is a rarity. In a similar retrospective review of 27 cases by Mesut Garidal et al. in an article titled Predisposing Factors and Treatment Outcome in Fournier Gangrene.¹¹ All of them were male except one. The male-to-female ratio, as reported in the literature, is 10:1. The age distribution of patients discovered in this study was not dissimilar to the findings from previous studies on Fournier gangrene.

The majority of cases of Fournier gangrene are seen in an emergency with sepsis, thus life-threatening. Some studies have reported severe sepsis at presentations;

however, in our cases, none of the patients was noted with severe sepsis. The reason for this observation may not be unconnected to early presentation, although the duration of symptoms was not determined in this study. We observed that the scrotum was the most common focus of this infection. This conforms with a previous similar study. The reason for this may be a result of the anatomical location of the scrotum and the possibility of repeated frictional wounds between the thigh and subsequent bacterial infection. Some other series have reported Fournier gangrene of the penis and anterior abdominal wall.

No predisposing factor was identified in some patients, which may explain why some pathogenesis has been termed idiopathic in literature. This review showed that the most common predisposing factor was diabetes mellitus.³ Although the profile of the blood sugar variation and glycemic index were not determined, however poor glycemic control has been strongly correlated with the risk of development of Fournier gangrene. In fact, uncontrolled diabetes is the most common predisposing factor. Other predisposing factors reported in the literature are alcohol abuse, renal insufficiency, and spinal cord injury, among others.

The wound culture report of less than half of the study population was known. Others were missing in their case files. Polymicrobial infection was noted in half of them. This is a consonance with a similar series, although some have reported polymicrobial infections in the entire study group. This study may not adequately establish the distribution of isolated microorganisms due to the relatively small number of patients with complete wound culture; however, *Escherichia coli* + staph aureus was seen in most of the cultures done, which is in tandem with the existing literature. Other previous studies had established streptococcus as the most common isolate.¹²

One of the major predictors of the severity of this clinical condition, which is established in medical literature, is the Fournier gangrene severity index score. A score of > 9 is well correlated with mortality.¹³ The majority of the study group had a score of < 9 . This score indicated that most of the patients had good prognoses at presentation. The observation of a score of more than 9 in others reflects the life-threatening risk of this condition. Some of the similar series have alluded to this fact. In a study conducted by Cem Ozden et al.,¹⁴ It was observed that pathology survivors had an FGSI score of 3, while non-survivors had an average score of 12.

All the patients did well and were discharged satisfactorily, as there was no mortality. This contrasts with several other studies that have reported some rate of mortality. A mortality rate of 20-88% has been reported globally, while 16.1% and 9.5% were reported in Zaria and Port-Harcourt, respectively.⁸ Also, E-Villanueva et al. reported a mortality of 10 out of 28 cases in a retrospective series titled Experience in the Management of Fournier Gangrene.¹⁵ This better outcome may be due to less severe disease at presentation, as evidenced by the lower average FGSI score and prompt aggressive management.

Wound healing by secondary intention was observed in the majority of the study subjects, while some of them underwent primary closure. This was due to the relatively small size of the defect. This is usually the situation in this clinical condition, as seen in the existing report. A large wound defect may necessitate some reconstructive procedures, such as the use of skin grafts and or muscle flaps. This was the situation with two of our patients. We preferred the gracilis muscle flap because it is pliable, versatile, and reflects the natural feeling of the scrotum, and the result was satisfactory.¹⁶ It must, however, be stated

that there is no general consensus on the best method of wound reconstruction in Fournier. Other adjuncts of wound care that have been stated in the literature are hyperbaric oxygen therapy and negative pressure wound therapy, among others. There was no need for any of these in our patients.

CONCLUSION

This study reviewed the management outcome of 13 cases of Fournier gangrene retrospectively. The average FGSI of patients was 7. There was zero mortality. The most commonly involved part was the scrotum, while the rarest was the penis. All the patients had serial wound debridement, honey dressing, and sitz baths. The outcome of this study further demonstrated the efficacy of honey as a good dressing agent.

RECOMMENDATION

Fournier gangrene is a urological emergency with reported high morbidity. Prompt and adequate resuscitation is critical in the management of Fournier gangrene to achieve a good outcome, as observed in this study.

CONFLICT OF INTEREST

All authors have declared no conflict of interest.

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AUTHORSHIP CONTRIBUTION

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