

Fournier's Gangrene: 13-Year Experience in a Tertiary Center, North Eastern Nigeria

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Abstract

Background: Fournier's gangrene is a fulminant infection of the genitourinary tract characterized by progressive necrosis of the skin and subcutaneous tissue of the external genitalia. Initially mainly seen involving the scrotum of elderly men with different moods of occurrence each unpleasantly lethal. With varying types of presentation only one thing has remained constant; the poor prognosis of this condition. **Purpose/Aim:** Thus, it's important to study the trends of the presentation of this condition laying emphasis on the challenges in the management of these patients; both the negative and positive prognostic factors. **Materials and Methods:** Urology ward record books, clinic record books and operating theater records were used to identify patients managed for Fournier gangrene in ATBUTH Bauchi. A retrospective study of the medical files of all the patients managed from January 2011 to January 2024 was done. Data was analyzed using SPSS version 29. **Results:** Data from 47 patients seen during the period of study were carefully collected and analyzed. The age range is 2 weeks to 97 years. There were two neonates, one at 2nd week of life and the other at 3rd week. Mortality rate is 36%. The average time duration before presentation for patients that died was two weeks, a minimum of 9 days prior to presentation and a maximum of 21 days, about 10 of which came in septic shock and the remaining presented with fever and very extensive necrotizing fasciitis of the perineum. All the patients that died had diabetes mellitus as a comorbidity except the neonate. All the patients that survived were much younger, all were below 60 years of age (2 weeks - 53 years). **Conclusion:** Here, we share our experience managing patients with Fournier's gangrene in our facility in the past 13-year period from January 2011 to January 2024.

Keywords

Fournier's Gangrene, Prognosis, Elderly, Presentation, Treatment

1. Introduction

Jean Alfred Fournier in 1883 described a disease phenomenon among 5 patients which will go on to become eponymous to him. What he described was a fulminant gangrene involving the male genitalia characterized by its sudden onset, a rapidly progressive pattern of presentation without an apparent cause [1] [2]. Fournier gangrene is a urological emergency that is potentially life threatening because of its rapid progression that leads to a high level of mortality [3]. It is a synergistic, polymicrobial (involving both aerobic and anerobic bacteria) infection of the skin and subcutaneous tissue of the scrotal and perineal region [4] [5]. Early diagnosis and urgent extensive surgical excision are necessary in order to lower the burden of infection and remove dead and dying tissues which act as a nidus for bacterial proliferation [3]. A lot of studies have been done on this disease over the years that explain the etiopathogenesis of the condition. And, many risk factors have been established both systemic and local amongst which included diabetic mellitus, HIV/AIDs, malnutrition, cancer, chronic liver disease and other immunosuppressive illness, trauma to the perineum, urethral catheterization, urethral stricture [6] [7]. Progress has also been made in its management since the advent of antibiotics and more so with vacuum assisted wound care recently introduced into its management strategy [8]. Despite all these progresses however, this condition has remained very lethal and its mortality indices haven't really changed much [9]-[12]. So, it has become paramount to look closely at the various experiences in the management of this condition and learn from such diversities. Ours is the review of all the patients we managed for Fournier's gangrene over a 13-year period and a closer look at the challenges in care and factors that affect morbidity and mortality in this condition.

2. Materials and Method

Urology ward record books, clinic record books and operating theater records were used to identify patients managed for Fournier gangrene in ATBUTH Bauchi. A retrospective study of medical files of all the patients managed from January 2011 to January 2024 was done, folders were retrieved and the medical records were reviewed. The data of each patient was collected in detail, including information on the patient's biodata and demographics, presenting complaints and their duration, previous interventions done, family history, history of comorbidities, and medical history. Symptoms at presentation, general physical examination and examination of the status localis also noted and recorded. All available investigation results were also recorded for all the patients. Treatment information was collected including surgical intervention(s). However, 3 patients were excluded from the study due to inadequate data after leaving against medical advice. All collected data were analyzed using SPSS version 29.

3. Result

Of the 13-year period of study, we saw and managed 50 patients with Fournier's gangrene in our facility, however 3 patients were excluded from the study due to

inadequate data, all of which signed against medical advice and abandoned treatment. Data of all the 47 patients seen during the period of study were carefully collected and analyzed. The age range of patients is 2 weeks to 97 years. There were two neonates, one at 2nd week of life and the other at 3rd week, but the majority of the patients were elderly. 17 patients died including one neonate and 30 patients survived, mortality rate of 36%. The average time duration before presentation for patients that died was two weeks, a minimum of 9 days prior to presentation and a maximum of 21 days, about 10 of which came in septic shock and the remaining presented with fever and very extensive necrotizing fasciitis of the perineum. The average duration of presentation for patients that survived was 5 days, a minimum of 2 days and a maximum of 7 days. All the patients that died had diabetes mellitus as a comorbidity except the neonate. All the patients that survived were much younger; all were below 60 years of age (2 weeks - 53 years). There was a single female patient who had multiple immunosuppressive illnesses including diabetes and HIV and was not regular with either of her medications. The commonest symptom was darkening and or ulceration of the scrotal and or perineal skin, which is also the clinically defining symptom of the disease, 100% of patients presented with it. The next common presentation was fever, 21 patients (44.6%) had fever at presentation. Other symptoms include; weight loss, vomiting, loss of appetite, lethargy, foul smelling perineal/scrotal discharge **Figure 1**. Most of the patients were farmers, businessmen and civil servants, that's middle- and low-income earners. The systemic predisposing factors include; diabetes in 26 patients (55%), HIV in 2 (4.3%), 5 patients were HBV positive, 24 have hypertension (51%), and 13 (27.7%) patients have no identifiable systemic predisposing factors **Table 1**. None of the patients was offered faecal diversion, although, 6 patients had suprapubic cystostomy for urinary diversion.

Table 1. Predisposing factors.

Predisposing factors	n	%
Urethral stricture/watering can perineum	3	6.38%
Perineal trauma/injury	7	14.89%
Infected perineal burns/scald	1	2.12%
Post hydrocelectomy	4	8.51%
Perineal abscess	6	12.76%
Anorectal cancer	2	4.42%
Orchitis	4	8.51%
Fistulotomy	2	4.42%
Hemipelvectomy	1	2.12%
Unknown	17	36.17%
Total	47	100

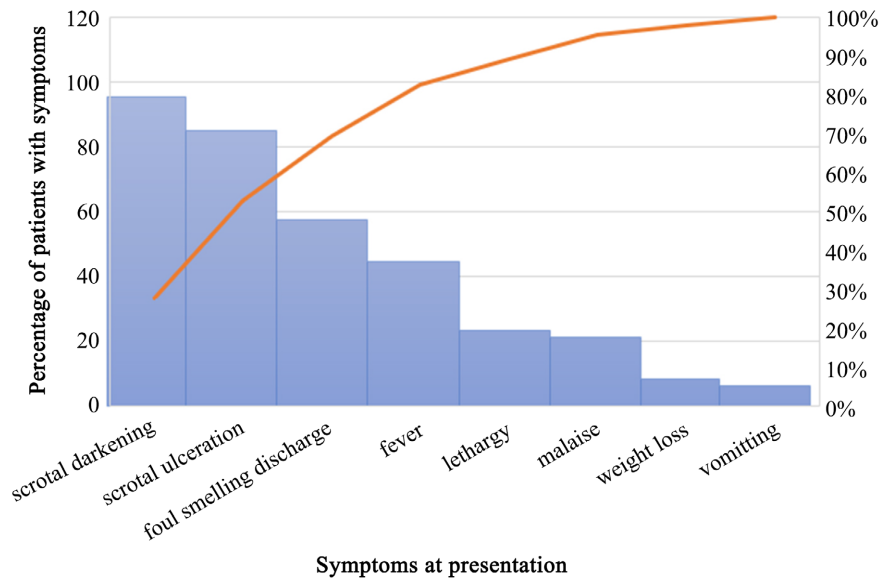


Figure 1. Common symptoms at presentation.

Figure 2 and **Figure 3** show Fournier’s gangrene at presentation and after serial debridement and wound care.



Figure 2. Scrotum and phallus skin necrosis in Fournier’s gangrene.

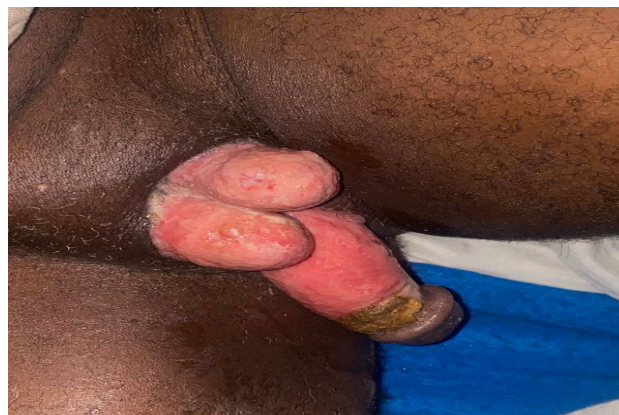


Figure 3. Clean granulating wound after serial debridement and wound care.

4. Discussion

Since it was first described by Alfred Fournier's, several other terms have been used to describe this condition, including idiopathic gangrene of the scrotum, periurethral phlegmon, streptococcal scrotal gangrene and synergistic necrotizing cellulitis [11].

The present study demonstrated male preponderance, the majority (98%) of patients being male. This is in keeping with previous reports including Shyam *et al.* from India and Eke *et al.* from Port Harcourt Nigeria that have consistently demonstrated a significant male preponderance [11] [12].

However, contrary to Fournier's initial description of the condition in male youth, our study demonstrates a wider range of ages, consistent with previous reports 13 - 16. Some authors have attempted to explain this increasing incidence with advancing age by highlighting the presentation of most of the factors associated with Fournier's gangrene such as lower urinary tract symptoms in later life [12]. Other possibilities are lowered immunity seen among elderly patients who are more likely to have illnesses such as diabetes, hypertension and other chronic diseases which are important predisposing factors to this condition than their younger counterparts. Two (2) cases were seen in neonates; One of the neonates had a traditional scarification mark done on the lower abdomen which got infected and necrotizing fasciitis ensued involving the phallus and scrotum, he was maintained on traditional care and delayed hospital visit, at presentation the patient was septic and died during resuscitation. The second neonate had an insect bite on the scrotum which activated a cascade of events from inflammation, cellulitis and subsequently Fournier's gangrene, he had extensive debridement of all the dead and necrotic tissues and broad-spectrum antibiotics, did well and was subsequently discharged home. Though very rare among neonates and young children, other studies have also corroborated this report [11]-[13].

The commonest symptom was darkening plus or minus ulceration of the scrotal/perineal skin, which was seen in almost all the patients at presentation. This finding is in keeping with other previous studies [6] [7]. Other symptoms include but are not limited to fever, foul smelling scrotal discharge, weight loss, vomiting, lethargy and malaise; though other features such as rash, erythema and features of sepsis have also been reported [6].

The presentation was found to be typically late among most of the patients, a finding similar to others done in the developing world like *Oyelowo et al.* [14]. This may be due to initial unwillingness to report issues concerning the external genitalia which may stretch until it cannot be hidden anymore, also delay is seen among patients who patronize traditional caregivers and other unorthodox healers [15] [16].

Serial debridement is done urgently and early institution of broad-spectrum antibiotics has shown tremendous improvements in this condition among patients, most especially those that presented early without features of sepsis. We

often used a third-generation cephalosporin (ceftriaxone) with metronidazole or a combination of quinolones (ciprofloxacin) and metronidazole. The importance of debridement and broad-spectrum antibiotics has also been emphasized by other studies [17] [18].

Thirteen (13) patients had no obvious predisposing factors, but for those that had, diabetes, HIV, hepatitis and hypertension were identified, similar to earlier reports [3] [17] [18]. Diabetes has been proposed by some authors to be associated not only with increased incidence of the condition, but with increased risk of mortality [19] [20]. Other risk factors that have been reported include malignancy, genitourinary trauma and renal disease, and immunosuppression (post-transplant) most of which were present in our patients as depicted in **Table 1**.

The overall mortality rate was 36%, higher than other studies done in Nigeria such as those reported by *Aliyu et al.* (15.79%) [18] and *Oyelowo et al.* (16%) [14], although, our study has a larger number of patients and longer duration than both studies.

All patients that died were older than 60 years of age. Other previous studies have also reported increasing mortality with increasing age. [10] [21]-[23] other factors that increase the risk of mortality include Fournier's gangrene severity score > 9, long hospital stay, septicemia/septic shock, an extension of gangrene to abdomen, hematocrit and serum potassium level [24]-[26].

5. Conclusions

Fournier's gangrene is a very devastating urologic emergency with a high mortality rate. Cases though rare, are also seen in women and neonates, but prompt treatment with broad spectrum antibiotics and serial debridement done early offers a promising lead in its management.

Further studies to delineate risk factors for mortality and useful steps for improving the outcome of management are necessary.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Corman, M.L. (1988) Jean-Alfred Fournier 1832-1914. *Diseases of the Colon & Rectum*, **31**, 984-988. <https://doi.org/10.1007/BF02554904>
- [2] Jones, R.B., Hirschmann, J.V., Brown, G.S. and Tremann, J.A. (1979) Fournier's Syndrome: Necrotizing Subcutaneous Infection of the Male Genitalia. *Journal of Urology*, **122**, 279-282. [https://doi.org/10.1016/s0022-5347\(17\)56367-3](https://doi.org/10.1016/s0022-5347(17)56367-3)
- [3] Omisanjo, O., Bioku, M., Ikuero, S., Sule, G. and Esho, J. (2014) Clinical Characteristics and Outcome of Management of Fournier's Gangrene at the Lagos State University Teaching Hospital, Ikeja, Lagos, Nigeria. *Annals of African Medicine*, **13**, 174-178. <https://doi.org/10.4103/1596-3519.142287>

- [4] Altarac, S., Katušin, D., Crnica, S., Papeš, D., Rajković, Z. and Arslani, N. (2012) Fournier's Gangrene: Etiology and Outcome Analysis of 41 Patients. *Urologia Internationalis*, **88**, 289-293. <https://doi.org/10.1159/000335507>
- [5] Mallikarjuna, M.N., Vijayakumar, A., Patil, V.S. and Shivswamy, B.S. (2012) Fournier's Gangrene: Current Practices. *ISRN Surgery*, **2012**, Article 942437.
- [6] Yanar, H., Taviloglu, K., Ertekin, C., Guloglu, R., Zorba, U., Cabioglu, N., *et al.* (2006) Fournier's Gangrene: Risk Factors and Strategies for Management. *World Journal of Surgery*, **30**, 1750-1754. <https://doi.org/10.1007/s00268-005-0777-3>
- [7] Ozturk, E., Ozguc, H. and Yilmazlar, T. (2009) The Use of Vacuum Assisted Closure Therapy in the Management of Fournier's Gangrene. *The American Journal of Surgery*, **197**, 660-665. <https://doi.org/10.1016/j.amjsurg.2008.04.018>
- [8] Morpurgo, E. and Galandiuk, S. (2002) Fournier's Gangrene. *Surgical Clinics of North America*, **82**, 1213-1224. [https://doi.org/10.1016/s0039-6109\(02\)00058-0](https://doi.org/10.1016/s0039-6109(02)00058-0)
- [9] Thwaini, A., Khan, A., Malik, A., Cherian, J., Barua, J., Shergill, L., *et al.* (2006) Fournier's Gangrene and Its Emergency Management. *Postgraduate Medical Journal*, **82**, 516-519. <https://doi.org/10.1136/pgmj.2005.042069>
- [10] Singh, A., Ahmed, K., Aydin, A., Khan, M.S. and Dasgupta, P. (2016) Fournier's Gangrene. A Clinical Review. *Archivio Italiano di Urologia e Andrologia*, **88**, 157-164. <https://doi.org/10.4081/aiua.2016.3.157>
- [11] Shyam, D.C. and Rapsang, A.G. (2013) Fournier's Gangrene. *The Surgeon*, **11**, 222-232. <https://doi.org/10.1016/j.surge.2013.02.001>
- [12] Eke, N. (2000) Fournier's Gangrene: A Review of 1726 Cases. *British Journal of Surgery*, **87**, 718-728. <https://doi.org/10.1046/j.1365-2168.2000.01497.x>
- [13] Adama, D., Elmouloud, C.M., Pierre, T., Koureissi, T., Belco, M., Djeneba, K., *et al.* (2023) Fournier's Gangrene in a Child Hospitalised in the Paediatric Emergency Department of the Gabriel Touré Teaching Hospital. *Open Journal of Pediatrics*, **13**, 214-219. <https://doi.org/10.4236/ojped.2023.132027>
- [14] Oyelowo, N., Ahmed, M., Lawal, A., Sudi, A., Adetola Tolani, A.M., Fidelis, L., *et al.* (2021) Fournier's Gangrene: Presentation and Predictors of Mortality in Zaria, Nigeria. *Annals of African Medicine*, **20**, 105-110. https://doi.org/10.4103/aam.aam_23_20
- [15] Ugwumba, F.O., Nnabugwu, I.I. and Ozoemena, O.F.N. (2012) Fournier's Gangrene—Analysis of Management and Outcome in South-Eastern Nigeria. *South African Journal of Surgery*, **50**, 16-19.
- [16] Corrêa Neto, I.J.F., Sia, O.N., Rolim, A.S., Souza, R.F.L., Watté, H.H. and Robles, L. (2012) Clinical Outcomes of Fournier's Gangrene from a Tertiary Hospital. *Journal of Coloproctology (Rio de Janeiro)*, **32**, 407-410. <https://doi.org/10.1590/s2237-93632012000400008>
- [17] Alekz, A.A., Williams, H., Vivian, A. and Adams, Y. (2021) Fournier's Gangrene: Experience with Two Severe Cases. *Open Journal of Urology*, **11**, 273-281. <https://doi.org/10.4236/oju.2021.117025>
- [18] Huayllani, M.T., Cheema, A.S., McGuire, M.J. and Janis, J.E. (2022) Practical Review of the Current Management of Fournier's Gangrene. *Plastic and Reconstructive Surgery-Global Open*, **10**, e4191. <https://doi.org/10.1097/gox.0000000000004191>
- [19] Aliyu, S., Ibrahim, A.G., Ali, N. and Waziri, A.M. (2013) Fournier's Gangrene as Seen in University of Maiduguri Teaching Hospital. *ISRN Urology*, **2013**, Article 673121. <https://doi.org/10.1155/2013/673121>

- [20] Korkut, M., İçöz, G., Dayangaç, M., Akgün, E., Yeniay, L., Erdoğan, Ö., *et al.* (2003) Outcome Analysis in Patients with Fournier's Gangrene. *Diseases of the Colon & Rectum*, **46**, 649-652. <https://doi.org/10.1007/s10350-004-6626-x>
- [21] Taken, K., Oncü, M.R., Ergun, M., Eryılmaz, R., Demir, C.Y., Demir, M., *et al.* (2016) Fournier's Gangrene: Causes, Presentation and Survival of Sixty-Five Patients. *Pakistan Journal of Medical Sciences*, **32**, 746-750. <https://doi.org/10.12669/pjms.323.9798>
- [22] Furr, J., Watts, T., Street, R., Cross, B., Slobodov, G. and Patel, S. (2017) Contemporary Trends in the Inpatient Management of Fournier's Gangrene: Predictors of Length of Stay and Mortality Based on Population-Based Sample. *Urology*, **102**, 79-84. <https://doi.org/10.1016/j.urology.2016.09.021>
- [23] Sorensen, M.D., Krieger, J.N., Rivara, F.P., Klein, M.B. and Wessells, H. (2009) Fournier's Gangrene: Management and Mortality Predictors in a Population Based Study. *Journal of Urology*, **182**, 2742-2747. <https://doi.org/10.1016/j.juro.2009.08.050>
- [24] Sparenborg, J.D., Brems, J.A., Wood, A.M., Hwang, J.J. and Venkatesan, K. (2019) Fournier's Gangrene: A Modern Analysis of Predictors of Outcomes. *Translational Andrology and Urology*, **8**, 374-378. <https://doi.org/10.21037/tau.2019.03.09>
- [25] Tenório, C.E.L., Lima, S.V.C., de Albuquerque, A.V., Cavalcanti, M.P. and Teles, F. (2018) Risk Factors for Mortality in Fournier's Gangrene in a General Hospital: Use of Simplified Fournier Gangrene Severe Index Score (SFGSI). *International braz j urol*, **44**, 95-101. <https://doi.org/10.1590/s1677-5538.ibju.2017.0193>
- [26] Yilmazlar, T., Isik, O., Ozturk, E., Ozer, A., Gulcu, B. and Ercan, I. (2014) Fournier's Gangrene: Review of 120 Patients and Predictors of Mortality. *Turkish Journal of Trauma and Emergency Surgery*, **20**, 333-337. <https://doi.org/10.5505/tjtes.2014.06870>