

Surgical Management of Fournier's Gangrene: A Seven-Year Experience at the Philippine General Hospital

Marc Gil DL. Marcelo, M.D.; Lawrence Irving Bernardo, Marc Paul Lopez, M.D., F.P.C.S.; Marie Dione Sacdalan, M.D., F.P.C.S. and Manuel Francisco Roxas, M.D., F.P.C.S.

Division of Colorectal Surgery, Department of Surgery, Philippine General Hospital, University of the Philippines Manila

Introduction: Fournier's gangrene is the development of a progressive necrotizing infection in the genital and perianal region with findings of gangrenous and necrotic tissue involving the skin and subcutaneous tissue down to the fascia. This study aims to review cases of Fournier's gangrene in the Hospital from 2004 up to 2010 and to provide a profile of patients afflicted with the disease and describe its surgical management in this institution. **Methodology:** A retrospective chart and database review was performed involving patients with a diagnosis of Fournier's gangrene treated at the Hospital from 2004-2010. The following variables were analyzed: 1) total number of cases; 2) gender; 3) age range, distribution and mean age; 4) source of infection, whether the initial lesion started from the urogenital or perianal area; 5) associated co-morbid conditions; 6) the extent of infection, whether it's confined to the urogenital or perineal area or has involved adjacent areas; 7) the time between initial symptoms to the first hospital consult; 8) number of debridement done at the operating room for each patient; 9) the presence of other surgeries aside from debridement; 10) outcome (recovered or expired). **Results:** The incidence of Fournier's gangrene is 8.7 patients per year in our institution. There were 36 patients included in this study. There is a male preponderance, affecting 4 males for every 1 female. The mean age is 49.5 years with a range of 18-73. Sixty four percent had infection starting from the perianal area while the rest had an initial lesion from the urogenital area. Seventy two percent had lesions confined to the perianal/urogenital areas while the rest had extended infections. Diabetes mellitus was the most common comorbid condition, involving 47 percent of the cases. Majority of the patients (70%) underwent just a single debridement. Our institution mortality rate is 11 percent. No statistical significance was established between number of debridement and time of consult with mortality. **Conclusion:** The optimal management of Fournier's gangrene include all the ff: 1) appropriate anti-microbial therapy; 2) intensive pre and post-operative resuscitation; 3) aggressive and timely surgical intervention. While this disease may be rare, it always presents a challenge to the surgeon and the intensivists, requiring a more thorough understanding of its presentation and treatment outcomes.

Fournier's gangrene has been reported in literature as early as 1764. It was initially documented by Baurienne as an idiopathic, rapidly progressive soft-tissue necrotizing process that led to gangrene of the male genitalia.¹ However, its name was taken from the French physician Jean Alfred Fournier who, in 1883, had a series of 5 patients who suffered from a rapidly progressive gangrene of the penis and scrotum.² At present, there is no universal case definition in diagnosing Fournier's gangrene. However, this condition is widely regarded as a fulminant necrotizing fasciitis of the perianal, perineal or genital areas. Although originally described as idiopathic, Fournier gangrene has an identifiable cause in approximately 95 percent of cases.³ The necrotizing process commonly originates from an infection in the anorectum, the urogenital tract, or the skin of the genitalia.⁴

Paty, et al. in 1992, estimated that approximately 500 cases of the infection have been reported in the literature since Jean Alfred's Fournier's 1883 report, yielding a prevalence of 1 case in 7500 persons.⁵ Ayumba, et al. on the other hand, have reported approximately 600 cases of Fournier's gangrene in the world literature up to 1996.⁶ The frequency of Fournier's gangrene generally has been constant; the increasing number of reported cases is more likely due to improved documentation of cases. No seasonal variation occurs, and Fournier's gangrene is not indigenous to any region of the world.⁷

Uncommon as it may seem, this disease is life-threatening and is a surgical emergency. The reported mortality rate remains high despite the development of

newer antibiotics, intensive pre and post-operative care, and aggressive surgical management.⁸ Death usually results from sepsis and its complications. Survivors, meanwhile, face significant morbidity. Concerns include prolonged postoperative wound care, the need for fecal and/or urinary diversion, reconstructive surgery, penectomy and/or orchiectomy.

Locally, there is a paucity of studies involving Fournier's gangrene. A search using the term Fournier's gangrene utilizing HERDIN and Acta Medica did not yield any paper. The only study found was a retrospective study about cases of necrotizing fasciitis in a tertiary hospital which was published in January 2010 in the Asian Journal of Surgery (Consunji, et al. 2007). It describes the clinical characteristics, bacteriology, and risk factors for mortality of patients with necrotizing fasciitis seen in a university medical center. This study stated that 45 percent of subjects with necrotizing fasciitis had primary lesions in the perianal area. Diabetes mellitus was the most common co-morbid condition, and truncal involvement, leukocytosis, acidosis, hypoalbuminaemia, hypocalcaemia, hyponatraemia were significantly associated with mortality. The most frequent isolates were *Escherichia coli* (44%), *Acinetobacter baumannii* (19%), *Staphylococcus aureus* (15%) and *Enterococcus faecium* (15%).¹⁰

The cornerstones of management of Fournier's gangrene include: 1) appropriate anti-microbial therapy; 2) intensive pre and post-operative care; 3) aggressive and timely surgical intervention. The study of Consunji, et al. focused on the bacteriology and intensive care aspects of therapy for necrotizing fasciitis. It provided significant data regarding the more common organisms involved. It also provided information about the risk factors associated with mortality so that high-risk patients can be identified, monitored, and treated more aggressively.⁹

This study aimed to review cases of Fournier's gangrene in the Philippine General Hospital from 2004 up to 2010 and to share the institution's experience in the surgical management of Fournier's gangrene. Specifically, this paper aims to provide a profile of patients with Fournier's gangrene in terms of age and gender; source of infection; extent of infection; duration of illness prior to initial consult; and co-morbid conditions.

This study also would like to describe the surgical management of the disease in terms of the following: number of debridement done at the operating room and its association with mortality (single or multiple debridement); length of time from onset of symptoms to first hospital consult and its association with mortality; the presence of other surgery aside from debridement; and outcome in terms of in-house mortality.

Methods

A retrospective chart and database review was performed involving patients with a diagnosis of Fournier's gangrene treated at the Philippine General Hospital from 2004-2010. The population sample included all subjects who fulfilled the inclusion criteria within the designated period of time. The working definition of Fournier's gangrene used in the Philippine General Hospital Division of Colorectal Surgery is the development of a progressive necrotizing infection, initially appearing in the genital and perianal region, with surgical findings of gangrenous and necrotic tissue, with purulent discharge, involving the skin and subcutaneous tissue down to the fascia and fascial spaces.

The inclusion criteria were: 1) patients with a final diagnosis of Fournier's gangrene, or Fournier's disease 2) adults or age >18 years, 3) admitted at the Philippine General Hospital 4) registered within the Integrated Surgical Information System (ISIS) from the period of 2004-2010. Pediatric patients, patients with necrotizing fasciitis in areas not primarily involving the urogenital and perianal areas, patients with incomplete data in charts, as well as patients who did not undergo surgery in UP-PGH for any reason were all excluded.

The following variables were analyzed: 1) total number of cases; 2) gender; 3) age range, distribution and mean age; 4) source of infection, whether the initial lesion started from the urogenital or perianal area; 5) associated co-morbid conditions; 6) extent of infection, whether it's confined to the urogenital or perineal area or has involved adjacent areas such as the inguinal, thigh, and abdomen; 7) time between initial symptoms to the first hospital consult; 8) number of debridement done at the operating room for each patient; 9) presence of other surgeries aside from debridement (colostomy,

orchiectomy, cystostomy); 10) outcome (recovered or expired).

Debridement was defined as the surgical removal of a patient's dead, damaged, or infected tissue done at the operating room under anesthesia. Daily change of dressing and other beside intervention postoperatively were not included.

Data collection tools included patient records in the Integrated Surgical Information System [ISIS] database of the Department of Surgery in the University of the Philippines-Philippine General Hospital using the search word fournier's gangrene or fournier's disease; and patient charts that were retrieved from the Medical Records Section.

Data were encoded into Microsoft Excel. The variables were evaluated by estimating the odds ratio (OR) and 95% confidence interval (CI). A p value of <0.05 was considered significant.

Results

Using the search word fournier's gangrene in the Integrated Surgical Information System database, there resulted a total of 61 patients, from 2004 - 2010. The charts were then retrieved from the Medical Records Section. Patients whose charts were not located or with incomplete data, and patients who did not undergo surgery at our institution were excluded.

A total of 36 patients were included in the study. Of these, 32 were males (88.88%) and 4 were females (11.11%). Figure I shows the age distribution of cases. Three patients were less than 30 years of age (8.3%), 10 were from the age group of 30-49 (27.28%), 21 were aged 50-69 (58.3%) and 2 were at least 70 years old (5.56%). (Figure 1) The mean age is 49.5 years with a range of 18-73. Twenty three patients (64%) had infection starting from the perianal area while 13 patients (36%) had an initial lesion from the urogenital area. Twenty six patients (72%) had lesions confined to the perianal/urogenital areas while 10 patients (28%) had infections spreading to the thigh (4), inguinal area (1), and abdomen (5) (Tables 1 & 2). Looking at Figure 3, there were no patients who consulted during the first 24 hours of onset of symptoms. Eight patients consulted

from days 1 to 3 since onset of symptoms (22%); 11 patients from days 4-6 (31%); while 17 patients (47%) sought consult at least a week from the time of onset of symptoms. The mean time to consult was 9 days with a range of 1 - 56 days. For the comorbid conditions (Figure 2), diabetes mellitus was the most common, involving 47 percent of the cases. Thirteen patients were known hypertensive (39%). Four patients had pre-existing renal insufficiency (11%), two patients had previous cerebrovascular disease (5.6%). Two patients had pre-existing malignancies (5.6%). One patient had colon carcinoma and another had bladder carcinoma. One patient has Hepatitis B (2.8%) and one patient has hypothyroidism (2.8%)

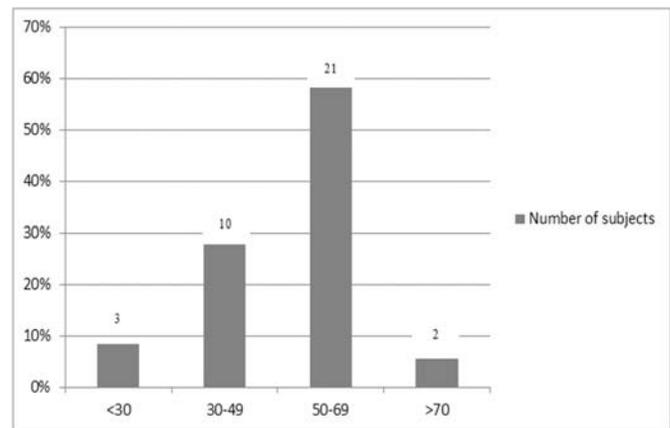


Figure 1. Age distribution of cases.

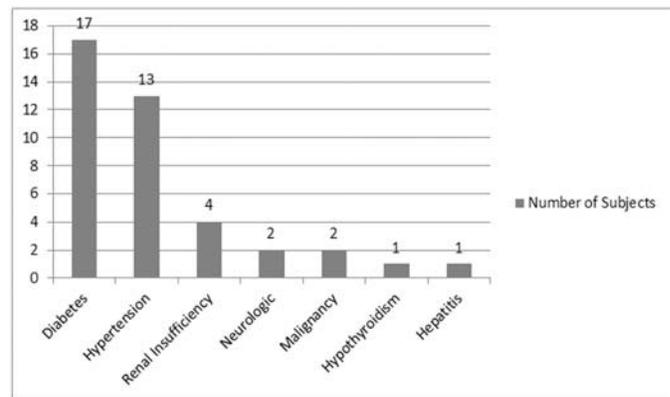


Figure 2. Co-morbid conditions.

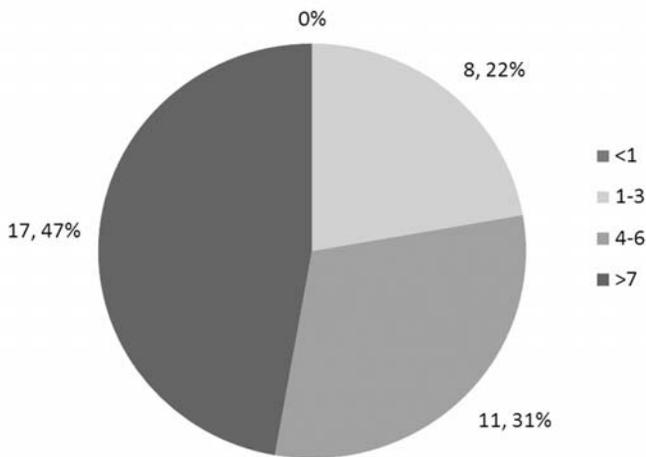


Figure 3. Duration of illness prior to initial consult/admission in days.

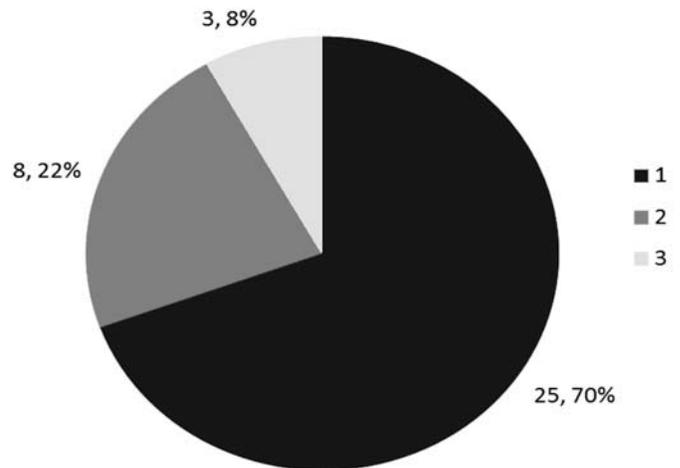


Figure 4. Number of debridement done at the operating room per patient.

Table 1. Extent and site of infection.

| Extent of infection | No of subjects | Percentage |
|--------------------------------|----------------|------------|
| Confined to perineum/genitalia | 26 | 72 |
| Extended | 10 | 28 |
| | 36 | 100 |

Table 2. Site of extension of infection.

| Extent of infection | No of subjects | Percentage |
|---------------------|----------------|------------|
| Abdomen | 5 | 14 |
| Thigh | 4 | 11 |
| Inguinal | 1 | 3 |

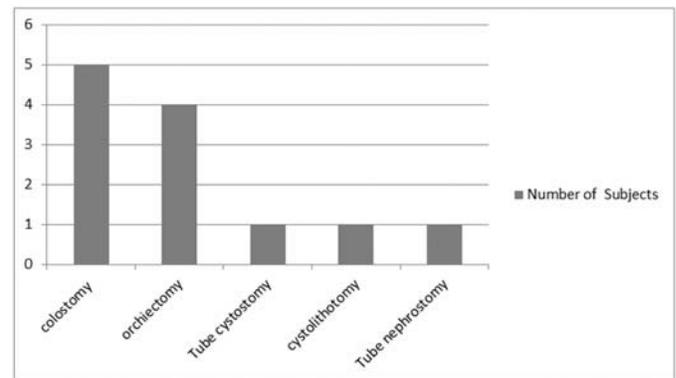


Figure 5. Other surgical procedures.

Twenty five patients (69.4%) underwent just a single debridement while the rest of the patients had 2 or 3 debridements (Figure 4). Figure V shows the summary of the surgical procedures undergone by the patient aside from debridement. Five patients underwent fecal diversion due to the involvement of the external sphincter muscles. Four of these were through a sigmoid loop colostomy and 1 was with a transverse loop colostomy. Four patients had a unilateral orchietomy due to non-viability of the testis. One patient had to undergo tube cystostomy and cystolithiasis due to a urethral fistula and a concomitant urinary bladder stone. Another patient had to undergo bilateral percutaneous tube nephrostomy for urinary diversion.

Of the 36 patients there were 4 reported mortalities during the same admission. This constitutes an institution mortality rate of 11 percent. All the reported mortalities were from multi-organ failure as a result of unrelenting sepsis.

Using the odds ratio to determine if the number of debridement had a relationship on mortality, the resulting ratio is 0.733 (95% CI=0.0676-7.9511, z value = 0.255, P= 0.7987). All four mortalities had consulted beyond 4 days after the initial onset of symptoms. Using the odds ratio to determine if a consult later than 4 days since onset of symptoms had a relationship on mortality, the resulting ratio is 0.323 (95% CI=0.015600-6.59, z value

= 0.738, P= 0.46). No statistical significance was established with both variables.

Discussion

The total number of patients with Fournier's gangrene (61) in a span of seven years translates to about an average of 8.7 patients per year in PGH. The number of cases (36) included in this study represents only 59 percent of the total population of patients. This study's sample size was limited by problems related to record-keeping.

Based from the data gathered, there is a male preponderance for this disease, (4:1). The majority of patients affected (58%) are in the age group of 50-69, with a mean age of 49.5 years. Sixty four percent of the cases had the initial lesions starting from the perianal area. Considering that the initial symptoms were nonspecific, it was expected that there were no patients who consulted during the first 24 hours of onset of symptoms. However, 47 percent of cases sought consult only after seven days of being symptomatic.

Among the patients with infection beyond/not limited to the perineal area/urogenital area, five out of ten were diabetic. Also, five out of ten had delayed consultation (at least 7 days). Three out of ten were mortalities. Six of them underwent only a single debridement, three among those who underwent a single debridement also belonged to the mortality group, which could mean that the patients may have succumbed to overwhelming sepsis even after the initial surgery or may not have been that stable to undergo additional surgery. The delay in consult and subsequent intervention, and the patient's immunocompromised state may have contributed to the extension of the lesion beyond the initial confines of the infection.

Among the four mortalities, only one patient underwent multiple debridements. All three patients who underwent the most number of debridements (3 times) have all recovered and been discharged.

The study's limitations include the dependency on the availability and accuracy of data in charts and the non-standardization of methods in gathering and recording data.

Conclusion

The incidence of Fournier's gangrene is approximately 8.7 cases per year with a 4:1 male to female ratio and a mean age of 49.5 years. The over-all mortality rate was 11 percent. Most patients required only one debridement, but 30 percent required more than one, all of whom had extensive disease. Extensive disease usually involved the inguinal area, abdomen, and thigh. The most common co-morbidity was diabetes mellitus. Forty seven percent of patient sought consult after seven days since onset of symptoms. No association was established between the number of debridement and the length of time from onset of symptoms to first hospital consult with mortality of patients with Fournier's gangrene.

The authors suggest the formulation of a standardized data sheet in patients with Fournier's gangrene. This should include the initial/prodromal symptoms, a standard diagram that will show the extent of the debridement and the estimated surface area involved, and the different methods of wound care in post-operative patients. While this disease may be rare, it always presents a challenge to the surgeon and the intensivist, requiring a more thorough understanding of its presentation and treatment outcomes.

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