



## FOURNIER'S GANGRENE –ETIOLOGICAL FACTORS, COMPLICATIONS AND ITS MANAGEMENT -OUR 5 YEARS EXPERIENCE.

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**ABSTRACT** **BACKGROUND.** Fournier's gangrene (FG) is a serious surgical emergency. An early diagnosis including evaluation of predisposing and etiological factors, metabolic and physiological parameters with prompt resuscitation, aggressive surgical debridement, broad-spectrum antibiotic coverage, and continuous monitoring of all the parameters is essential for a good outcome, therefore reducing the high mortality and morbidity.

**AIMS & OBJECTIVES:** The aim is to study the etiology, complication and management of Fournier's gangrene

**METHODS:** This prospective study was conducted on 47 patients who were diagnosed with Fournier's gangrene and managed in our hospital from July 2014-July 2019. Patients were subjected to careful history taking, complete clinical examination, and managed and followed up for 30 days.

**RESULTS:** In our study, out of 47 patients admitted with Fournier's gangrene 34 patients had unconditional diabetes, 8 patients are immunocompromised and 5 patients had no co-morbidities. Out of 47 patients 11 patients came to the hospital with severe sepsis and one patient had severe sepsis with extensive involvement up to anterior abdominal wall. All patients underwent extensive debridement and reconstruction with adjacent flaps /split skin graft. 3 patients died of sepsis and 1 patient died on postop day 15 due to aspiration pneumonia. Most patients managed aggressively and discharged on postoperative day 14.

**CONCLUSION:** Fournier's gangrene is a rare, rapidly progressive, necrotizing fasciitis of the external genitalia and perineum with high mortality rates. Uncontrolled diabetes mellitus and immunocompromised states found to be most common cause predisposing to Fournier's gangrene. Proper resuscitation with aggressive treatment reduces the morbidity and mortality and complications of Fournier's gangrene.

**KEYWORDS :** Fournier's gangrene, Necrotising fasciitis, Mortality.

### INTRODUCTION

Fournier's gangrene (FG) is a serious surgical emergency first described by Jean Alfred Fournier (1832–1914), a dermatologist and venereologist in 5 young male patients, who had presented with a rapidly progressing fulminating infection of the superficial tissues of scrotum and penis without any definite etiological factor<sup>[1,2]</sup>. Fournier's gangrene (FG) is a rare, rapidly progressive, fulminant form of necrotizing fasciitis of the genital, perianal and perineal regions, which may extend up to the abdominal wall between the fascial planes<sup>[3]</sup>. Hippocrates first mentioned necrotizing fasciitis in 500 B.C. as a complication of 'erysipelas', an acute and often recurring bacterial infection<sup>[4]</sup>. It is secondary to polymicrobial infection by aerobic and anaerobic bacteria with a synergistic action<sup>[5-7]</sup>. Predisposing factors such as diabetes and Immunosuppression lead to vascular disease and suppressed immunity that increase susceptibility to polymicrobial infection. The clinical features and relevant investigations are the mainstay of diagnosis of the disease. This gangrene apparently shows vast heterogeneity in clinical presentation from insidious onset and slow progression to rapid onset and fulminant course, the latter being the more common presentation<sup>[8]</sup>. Necrotic patches start to appear on overlying skin and progress to extensive necrosis if subcutaneous inflammation worsens. Sepsis and multi organ failure are the common causes of death in these patients if not aggressively treated. The treatment consists of urgent resuscitation, use of broad spectrum parenteral antibiotics, aggressive surgical debridement, tetanus prophylaxis and supportive care followed by subsequent reconstruction of the residual defect<sup>[9]</sup>. Despite modern intensive care unit (ICU) management the mortality rate of Fournier's gangrene remains high (3–67%)<sup>[10]</sup>. The present study was conducted to identify etiology, complication and management of Fournier's gangrene.

### MATERIALS AND METHODS

This prospective study was conducted over 5 years from July 2014 to June 2019 on patients diagnosed with Fournier's gangrene. Patients were subjected to careful history taking, including age, sex, occupation, duration of the symptoms and its progression and investigated with blood and microbiological testing of blood and tissue/discharge from the wound.

Eligibility criteria include clinical features consistent with rapidly progressive fulminating infection arising primarily from the perianal,

perineal and genital region and presence of necrotic tissue on surgical exploration. Excluded were patients who had a local superficial inflammation of the perianal or urogenital regions. Initial resuscitation was done with crystalloids or colloids and whole blood; as per requirement. Broad spectrum parenteral antibiotic was started on empirical basis. After resuscitation aggressive debridement of all dead tissues, followed by irrigation of the wound with hydrogen peroxide and normal saline. The wound was covered with betadine soaked gauze. Tissue was taken and sent for histopathological examination. Urethral catheterization was done aseptically in all patients. Wound inspected on regular basis and dressing done. Few patients needed further multiple debridement. When wound started to heal, closure of wound was done by the secondary suturing technique and in some cases, partial thickness skin graft and local pedicle flap graft was done. The patients were followed until the date of discharge and in their further visits.

### RESULTS

In our study, 47 patients who presented with Fournier's gangrene were evaluated. The age of the patient in the study group ranged from 40 to 74 years, with the mean age of 53 years. The commonest source of sepsis was the scrotal/perineal lesions. Poor personal hygiene associated with the over-all debilitated state was presumed to be the causative factor. Diabetes mellitus (DM) was the most common comorbidity associated with FG and was present in 34 patients (72%) at the time of admission followed by immunocompromised state in 8 patients (17%) and in 5 patients with no comorbidities. The most common symptoms at the time of admission were pain, Oedema, erythema, and scrotal skin necrosis and fever which were found in almost all the cases and sepsis (25%) in 12 patients. In all patients area of necrosis is confined to scrotum and in perineum and in one patient there was an extensive involvement of inner thigh and anterior abdominal wall along with scrotum and perineum. Pus was taken from the wound of all the cases for culture and sensitivity and yielded mixed growth of many types of organisms. The most common organism isolated during the culture is *Escherichia coli* followed by *Klebsiella*. All patients underwent radical surgical debridement and regular dressing. Along with the initial radical debridement, 1 patient (2%) underwent Orchidectomy for necrosis of testis. Out of 47 patients, 40 patients secondary suturing (85%) of wound done after healing of wound, 2 patients needed localized flap reconstruction (4%) of scrotum and perineum and 5 patients needed split skin grafting (10%). The

patients were discharged on post-operative day between 7 to 30 days, with an average of postop day 14. Of the 47 patients studied, 8 died-all 8 patients were above the age of 52. Among 8 patients, 7 patients died of sepsis and one patient died of aspiration pneumonia on post op day 14 and 39 survived; the overall mortality rate was 17%.

## DISCUSSION

Fournier's gangrene was a relative rare life-threatening emergency with an overall incidence rate of 1.6 in 100 000 and male predominance. Typical clinical manifestations included fever, pain and swelling over the perineal, genital and anorectal areas. In our study the patients were between the age group of 40-74 years with maximum patients were between the age of 45 -55 years, and the mortality is more among the patients with older age groups. There are so many predisposing factors described by various authors as seen in literatures and in our study the most common predisposing factor is diabetes mellitus and immuno-compromised states (Human immune deficiency state). The disease occurs in affluent as well as in the poor community<sup>[11]</sup> In our study most of the patient with Fournier's gangrene were from poor socio economic status. Most of the patients usually present with a delay of 4-10 days from the onset of the disease.<sup>[12]</sup> Fournier's gangrene is commonly a polymicrobial infection of genitourinary or perianal source. The multiplicity of organisms isolated from cases of Fournier's gangrene suggests that, none of them could be properly regarded as the cause of the disease. Mixed types of organisms were isolated from culture of pus taken from the wound, such as E. coli, streptococci, staphylococci, pseudomonas and peptostreptococci. E. coli is the most common organism isolated. Early diagnosis, prompt and aggressive management is the most important aspect of treatment of Fournier's gangrene. The removal of all the devitalized tissue is important to stop the progress of the infection and simultaneous elimination of systemic effects of toxins and bacteria. Multiple sittings of surgical debridement may be required to achieve adequate local control of infection. Local wound care after surgical debridement is very important. With proper surgical debridement, local wound care, and antibiotic therapy, healthy granulation tissue appears, and secondary suturing can be done, as seen in most of our cases. However in significant tissue loss, any of the reconstructive procedure including various flap covers and split skin graft may be considered depending on the case. The mortality rate varies from 0-67% in different studies and mortality rate in our study is 17% which is less when compared with other study. The duration of stay at the hospital for Fournier's gangrene ranged between 2-278 days in previous studies. In our study the most patients are discharged on postoperative day 14.

## CONCLUSION

Fournier's gangrene is still a very severe disease with a high mortality rate. However, with the advancement in diagnostic modalities, surgical technique, potent antibiotics, and critical care, the morbidity and mortality of this dreaded clinical entity has decreased. The most common presenting features are pain, fever, scrotal erythema, and sloughing of the perineo-scrotal skin with foul smelling discharge. The most common predisposing factor is uncontrolled diabetes mellitus and immunocompromised state. The advanced age, extension of infection to the abdominal wall, occurrence of septic shock and need for inotropic support are the main prognostic factors of mortality. The aggressive surgical debridement, broad spectrum parenteral antibiotics and intensive supportive care followed by secondary suturing or by closure of healing wound with flap or by skin grafting has reduced morbidity, mortality and long hospital stay.

## REFERENCES

1. J. A. Fournier, "Gangrene foudroyante de la verge," *Semaine Médicale*, vol. 4, pp. 589-597, 1883.
2. J. A. Fournier, "Etude clinique de la gangrene foudroyante de la verge," *Semaine Médicale*, vol. 4, pp. 69-74, 1884.
3. Corman JM, Moody JA, Aranson WL: Fournier's gangrene in a modern surgical setting: improved survival with aggressive management. *Br J Urol Int* 1999, 84:85-88.
4. Descamps V, Aitken J, Lee MG. Hippocrates on Necrotising Fasciitis [letter]. *Lancet*. 1994;344:556
5. Mörpurgó E, Galandiuk S: Fournier's gangrene. *Surg Clin North Am* 2002, 82:1213-1224.
6. Yanar H, Taviloglu K, Ertekin C, Guloglu R, Zorba U, Cabioglu N, Baspinar I: Fournier's gangrene: risk factors and strategies for management. *World J Surg* 2006, 30:1750-1754.
7. Korkut M, İçöz G, Dayangaç M, Akgün E, Yeniay L, Erdoğan O, Cal C: Outcome analysis in patients with Fournier's gangrene: report of 45 cases. *Dis Colon Rectum* 2003, 46:649-652.
8. Laor E, Palmer TS, Tolia BM, Reid RE, Winter HI. Outcome Prediction in Patients with Fournier's Gangrene. *J Urol*. 1995;154:89-92.
9. Singh G, Chawla S. Aggressiveness - The Key to a Successful Outcome in Necrotising Soft Tissue Infection. *MJAFI*. 2003;59:21-24.
10. Unalp HR, Kamer E, Dericci H, Atahan K, Balci U, Demirdoven C, et al. Fournier's Gangrene: Evaluation of 68 Patients an Analysis of Prognostic Variables. *J Postgrad Med*. 2008;54:102-105
11. Eke N. Fournier's Gangrene: A Review of 1726 Cases. *Br J of Surg*. 2000;87:718-28.

12. Paty R, Smith AD. Gangrene and Fournier's Gangrene. *The Urol Clin of North Am*. 1992;19:149-62.