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Observational Study on Fournier's Gangrene and Usefulness of Fournier's Gangrene Severity Index in Predicting the Outcome

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Abstract

Fournier's gangrene was first described by Fournier in 1764 as extensive necrotizing soft tissue infection of the perineum. It also involves areas like lower urinary tract, anus, rectum, and colon. It is a fulminating, rapidly spreading infection which causes thrombosis of blood vessels which results in gangrene of the external genital organs. It affects all age groups and has been reported in both males and females and various etiological factors have been described. It is more commonly seen in middle age groups with immuno-compromised status like diabetes mellitus, malignancy, alcoholism, chronic renal disease. The basic treatment involves resuscitation, prompt excision of all non-viable tissue, limiting any infective process, antibiotics and occasional anatomical reconstruction. Orchidectomy may rarely be required. A method of reconstruction of scrotum includes burying the testes in thigh or in the abdomen, split skin graft or wide surgical debridement with delayed suturing. Early recognition with urgent surgical debridement and antibiotics form the mainstay in managing these cases. The course of disease is very rapid and the disease can be lethal if presented lately.

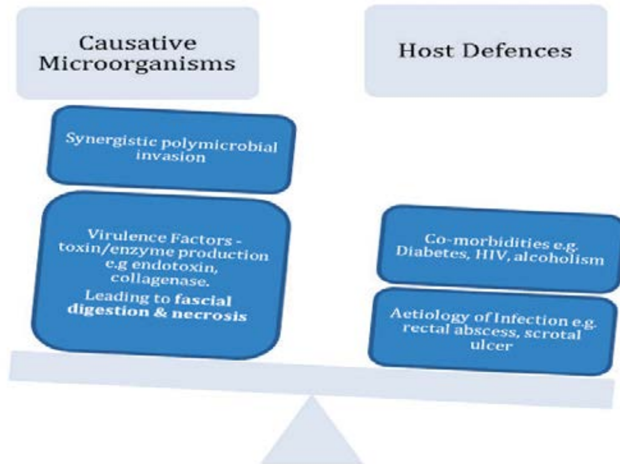
Objectives

- To study the incidence and prevalence of Fournier's gangrene
- To assess predisposing factors, etiological factors and duration of symptoms of Fournier's gangrene
- To analyze the need for repeated surgical debridement and the interval between them will be recorded and assessed
- To ascertain the usefulness of Fournier's gangrene severity index in predicting the outcome

Review of Literature

In 1764 Baurienne described an idiopathic, fatal, necrotizing process with resultant gangrene of the male genitalia. However, the Parisian venereologist, Jean Alfred Fournier is more commonly associated with the eponymous condition. In his 1883 manuscript, he described a fulminant gangrene of idiopathic nature and abrupt onset, of the scrotum and penis, in a series of 5 young males. Since then our understanding of the aetiology and Pathophysiology of this condition has grown to reveal a more indolent nature and identifiable cause in the majority of cases. Contrary to the earlier descriptions, the disease is not restricted to young males, but has been reported to occur in women and children,

although at a lower incidence. Basic management of Fournier's gangrene employs a multi-disciplinary team approach and the three fundamental principles of urgent haemodynamic stabilization and crucial surgical debridement with or without plastic reconstruction, under the cover of antibiotic therapy. Fournier's gangrene is a type I necrotizing fasciitis of the perineal, perianal or genital areas.



Over the years, Fournier's gangrene has been referred to by several names, such as "streptococcus gangrene", "synergistic necrotizing cellulitis" and "peri-urethral phlegmon", all of which describe a soft tissue disease that is infective, destructive and fatal. J.A. Fournier described the condition as an idiopathic process, however, Fournier's gangrene is rarely truly idiopathic and with diligent observation and investigation an underlying cause can be identified in the majority of cases. The necrotizing fasciitis frequently stems from an infection of the ano-rectum (30-50%), uro-genitalia (20-40%) or genital skin (20%). Trauma to these regions, whether intentional or accidental has been reported in the literature as a possible source of infection. Fournier's gangrene has been shown to be strongly associated with diabetes, chronic alcoholism, human immunodeficiency virus (HIV), lympho- proliferative diseases, chronic steroid abuse and cytotoxic drugs. The underlying principle of all these conditions being compromised host immunity creating a favourable environment to establish infection. Malnutrition and lower socio-economic status have also been shown to be associated with the development of Fournier's gangrene. These two factors potentially associated with poor perineal hygiene and lower immunity accounting for their association with the development of Fournier's gangrene.

Fournier's Gangrene Severity Score

	High abnormal values				Normal	Low abnormal values			
Physiologic variable/Point assignement	+4	+3	+2	+1	0	+1	+2	+3	+4
Temperature (°C)	>41	39-40.9	-	38.5-38.9	36-38.4	34-35.9	32-33.9	30-31.9	<29.9
Heart rate	>180	140-179	110-139	-	70-109	-	55-69	40-54	<39
Respiratory rate	>50	35-49	-	25-34	12-24	10-11	6-9	-	<5
Serum sodium (mmol/L)	>180	160-179	155-159	150-154	130-149	-	120-129	111-119	<110
Serum potassium (mmol/L)	>7	6-6.9	-	5.5-5.9	3.5-5.4	3-3.4	2.5-2.9	-	<2.5
Serum creatinine (mg/100/mLx2 for acute renal failure)	>3.5	2-3.4	1.5-1.9	-	0.6-1.4	-	<0.6	-	-
Hematocrit	>60	-	50-55.9	46-49.9	30-45.9	-	20-29.9	-	<20
WBC (total/mm^3x1000)	>40	-	20-39.9	15-19.9	3-14.9	-	1-2.9	-	<1
Serum bicarbonate (venous, mmol/L)	>52	41-51.9	-	32-40.9	22-31.9	-	18-21.9	15-21.9	<15

Materials and Methods

Place of Study: Govt Stanley Medical College Chennai

Type of Study: Observational

Period: January 2018 To December 2018

Sample Size: 35

Inclusion Criteria: All patients diagnosed to have Fournier's gangrene between the age 20 to 80 and both sexes

Exclusion Criteria: Age < 20 years and patients who had initial treatment elsewhere

Method of Data Collection

- Patients of Fournier's gangrene admitted to emergency surgical ward were included in the study after obtaining informed consent. Data's of those patients were drawn and analyzed statistically.
- The following data were collected:

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- Detailed history including onset and duration of symptoms, predisposing and etiological factors.
- Vital parameters include Heart rate, respiratory rate and temperature.
- Basic investigations include Complete hemogram, sugar, renal function test, serum sodium, potassium and bicarbonate.
  - Based on that Fournier's gangrene severity index score is calculated and score was obtained to each patient.
  - All patients were treated routinely by immediate surgical debridement and administration of broad spectrum antibiotics.
  - All patients were followed up during the hospital stay and details regarding number of debridement were noted.
  - The need for diversion procedure to eliminate fecal and urinary contamination in extensive wounds are observed and analysed.
  - Once the infection is controlled the method adopted in reconstruction of the wound is noted.
  - The final outcome of the patient is compared with the clinical score and its usefulness in detecting the morbidity and mortality will be analyzed.

Results

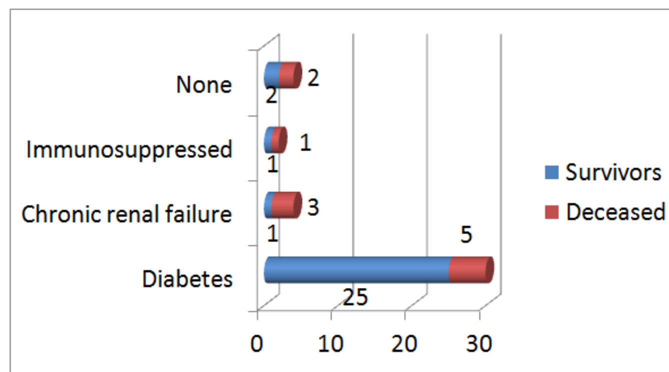
Age And Sex

The following table shows number of survivors and deceased according to age (all were men)

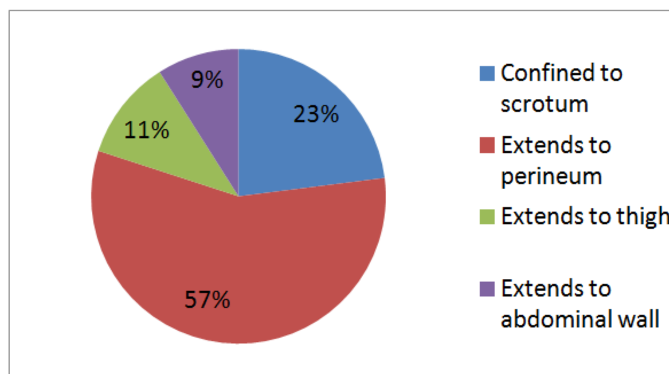
Age Group	Deceased	Survivors
40-45	NIL	4
45-50	NIL	6
50-55	NIL	9
55-60	1	2
60-65	3	2
65-70	1	3
70-75	0	2
75-80	1	1

The mean age group of survivors was 54.6 years and mean age of deceased was 65.8 years.

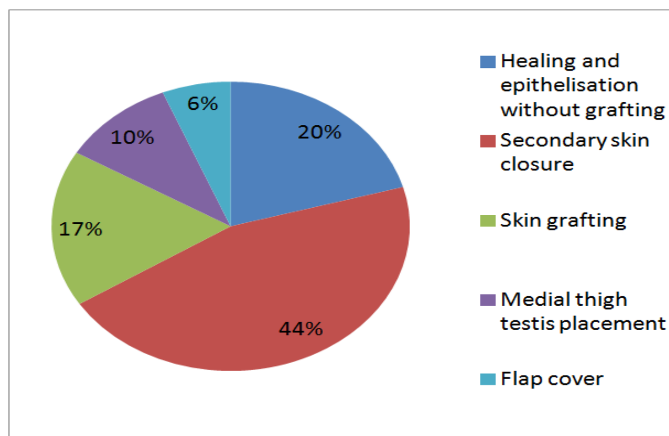
Predisposing Factors



Extent of Disease



Treatment



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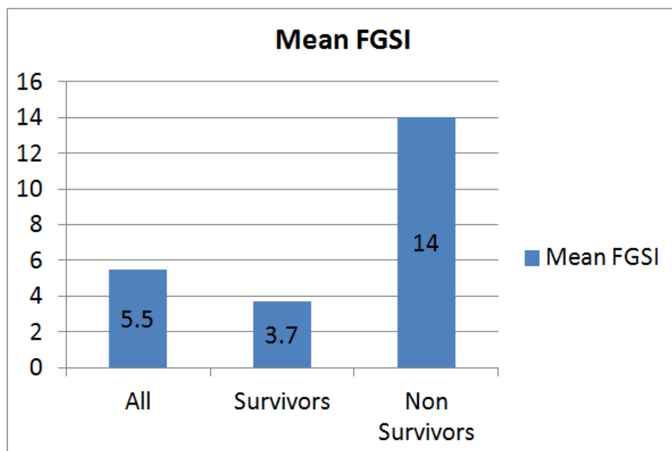
Fournier's Gangrene Severity Score

Fgsi Score	Mortality	N	Mean	SD	P Value
	No	29	3.72	2.763	<0.001
	Yes	6	14.00	2.966	



Conclusion

Fournier's gangrene is a notorious surgical emergency which requires early diagnosis and treatment.

Minor infection in predisposed individuals should be given due attention and treated promptly as negligence may lead to this life threatening complication. Proper education should be given to these individuals regarding warning symptoms and they should be advised to seek early medical help.

Once diagnosed, early stabilization of hemodynamic status and immediate debridement of whole necrotic tissues with appropriate antibiotic cover will certainly reduce the risk of morbidity.

Presence of diabetes, advanced age, primary colorectal source of infection, delayed presentation, sepsis on admission are individual risk factors to predict mortality.

FGSI score are very simple based on vital parameters and lab investigations. A FGSI score greater than 9 should alert the surgeon to carry out immediate measures who may require extensive area of debridement and multiple surgical debridement and diversion procedures.

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