Aggressiveness - the key to a successful outcome in Fournier's Gangrene

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Abstract

Nine patients with Fournier's gangrene were managed during last five years in various service hospitals. Mean age was 51 years (range 21-81 years). Most of these patients were from middle and upper class. Common predisposing factors included diabetes mellitus, alcohol abuse and poor personal hygiene. *Streptococcus haemolyticus*, *Staphylococcus aureus* and *E coli* were the commonest organisms cultured in most of these patients. Our experience indicates that the lower gastrointestinal tract should be considered as a possible cause of infection in all patients with Fournier's gangrene as 5 patients developed this condition following anorectal abscesses. All these patients were treated with a common approach of resuscitation, broad spectrum antibiotics, immediate surgical excision of all necrotic tissue, nutritional therapy and early skin coverage without any mortality. The surgeon should be more aggressive in the initial therapy and make the first surgery more definitive. There is no place for conservative management. The patients with perianal sepsis in elderly should be referred early for surgery.

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Key Words : Aggressive; Fournier's gangrene; Idiopathic; Scrotum

Introduction

Fournier's gangrene is a vascular disaster of infective origin [1]. An explosive onset in an otherwise healthy person, rapid progression to gangrene and total absence of the usual causes of gangrene are its characteristic features. It is more common in developing countries like India. Here, patients present late when gangrene has spread causing extensive damage to scrotum, perineum and even abdominal wall in some patients. This is mainly due to late presentation and relative inaccessibility to medical care in rural areas [2]. The disease affects all ages and both sexes and is more common in males. It is now named as an infective necrotizing fascitis of the perineal, genital or perianal regions. Aggressive, effective and early treatment of this condition is imperative to prevent a fatal outcome. Urgent radical exploration by the most experienced surgeon available is essential and includes wide excision of all necrotic tissue (Fig 1) and adequate drainage of the deep fascial planes until apparently healthy tissue is exposed (Fig 2). The surgeon must be prepared to proceed to a laparotomy, diverting colostomy or a suprapubic cystostomy where there exists any element of doubt. Aggression is also of significance in resuscitation, early institution of broad spectrum antibiotics, hydrogen peroxide irrigations and elaborate repeated daily dressings, to allow further frequent operative debridement till the process is controlled. Pus, tissues and blood samples for bacteriological culture should always be sent. A strong index of suspicion aids

early diagnosis which ensures a favourable outcome.

Material and Methods

Nine patients of Fournier's gangrene were treated in various service hospitals from April 1996 to April 2000. All patients were managed by aggressive management protocol consisting of early and effective resuscitation, broad spectrum antibiotics, wide surgical excision, repeated debridement and frequent dressings. All underwent debridement and wide excision within 24 to 48 hours of presentation. Most of the wounds healed by secondary intention, two patients required split skin grafting. All patients were males, age group 22-82 years. Common predisposing factors included diabetes mellitus, alcohol abuse and poor personal hygiene. Five patients developed synergistic gangrene of scrotum secondary to colorectal disease. Five patients had involvement of perineum and scrotum, while gangrene spread to abdominal wall in 2 patients, in rest of patients gangrene was localized to scrotum (Fig 3). None of the patients required hyperbaric oxygen therapy after debridement.

Results

Nine patients of Fournier's gangrene were managed in service hospitals. The average age was 52 years. Five of the patients were between the age of 20-40 years. Seven patients belonged to upper middle class socioeconomic group. All the patients presented with scrotal pain, swelling, ulceration and high grade fever. The presenting signs and symptoms are shown in Table 1. The extent of ulceration and gangrene is shown in Table 2. The gangrene was confined to scrotum in 2 young serving soldiers in good health. Two elderly patients in whom gangrene extended from the scrotum to the perineum and lower abdominal wall looked toxic and one of

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Fig. 1 : Fournier's gangrene involving scrotum

Fig. 2 : Wide excision of gangrenous part

Fig. 3 : Denuded testes exposed after debridement

them was found to be diabetic for the first time. Five patients had ischiorectal infection or perianal sepsis, 2 cutaneous and rest idiopathic. Anatomical source of sepsis is shown in Table 3.

Biochemical results were within normal limits except in one diabetic who had hyperglycaemia and glycosuria. None of the patients tested HIV positive. Organisms isolated from the wound were *E coli* and *Streptococci*. Common organisms isolated are shown in Table 4. Faecal and urinary diversion in form of colostomy and suprapubic cystostomy was not required. Urinary catheterization was done in 5 patients for acute urinary retention. The method of local reconstruction after surgical debridement is shown in Table 5. In most patients the wound healed spontaneously by second

Table 1**Clinical presentation of patients**

Signs and symptoms	Number (%)	Others (%)
Pain	9 (100)	100
Fever	9 (100)	72
Edema	7 (77)	86
Erythema	9 (100)	100
Skin necrosis	9 (100)	46
Tachycardia	8 (88)	70
Crepitus	3 (33)	62
Leucocytosis	9 (100)	100
Hyperglycemia	6 (66)	47
Shock	4 (44)	40

Table 2**Extent of ulceration**

Extent of involvement	Number (%)
Confined to scrotum	2 (22)
Extending to perineum	5 (55)
Extending to penile shaft	-
Extending to abdominal wall	2 (22)
Total	9 (100)

Table 3**Anatomical source of sepsis**

Source of sepsis	Number (%)	Others (%)
Urogenital	-	45%
Anorectal		
Perianal abscess	5 (56)	33%
Cutaneous		
Nonspecific scrotal itch	2 (22)	21%
Unknown source	2 (22)	-
Total	9 (100)	

Table 4**Common organisms isolated**

Organisms	Number (%)	Others (%)
<i>Staphylococci</i> + <i>E coli</i>	2 (22)	27
<i>Streptococci</i> + <i>Bacteroids</i>		
<i>Proteus</i> + <i>Pseudomonas</i>	2 (22)	40
<i>E coli</i> + <i>Klebsiella</i>	3 (34)	50
No growth	2 (22)	-
Total	9 (100)	

Table 5**Management of Fournier's gangrene**

Method	Number (%)	Others (%)
Wound debridement	9 (100)	100
Reconstruction		
No additional surgery	1 (11)	-
Secondary suturing	2 (22)	-
Split skin grafting	2 (22)	56
Delayed closure	5 (55)	44
Total	9 (100)	100

intention. All patients had uneventful recovery. The hospital stay varied from 2 weeks to 6 months. The longest hospital stay was of 178 days in a patient in whom gangrene involved perineum and abdominal wall.

Discussion

Fournier's gangrene was first reported by Baurienne in 1764 and Hebler in 1848. It is also known as idiopathic gangrene of the scrotum, gangrenous eryseplas of the scrotum, streptococcal gangrene of scrotum and spontaneous fulminant gangrene of scrotum [3]. A J Fournier in 1883 described in Paris, the abrupt onset of a rapidly fulminating genital gangrene of idiopathic origin in previously healthy young males with resultant gangrenous destruction of the genitalia. However, several cases occurred without apparent cause. In spite of newer diagnostic techniques, the etiology remains unclear in one fourth of cases [4]. More than 1726 cases have been described in literature so far [5]. Overall incidence of the disease is 1 in 7500 [6].

Today the infection is not only limited to young individuals or to men and the cause of infection can almost always be identified. Fournier's gangrene is generally defined today as a synergistic necrotising fascitis of the perineal, perirectal or genital area which leads to thrombosis of small subcutaneous vessels and results in development of gangrene of the overlying skin. The vascular thrombosis results from an obliterative endarteritis caused by spread of micro-organisms in the subcutaneous plane. Mortality remains high despite correct and timely treatment. Current estimates being 21% but ranging from 7% to 75%, when compared to the 22% mortality in a large series from the pre-antibiotics era by McCrea in 1945 [7]. This suggests that modern surgeons need to be more aggressive in their initial therapy and make the first surgery more elaborate and definite. Certainly there is no place for wait and watch or conservatism, and early management or referral of patients with perianal sepsis is desirable for saving life.

Fournier's gangrene, is a life threatening urosurgical emergency. Fournier in his original description considered synergistic gangrene of the scrotum as an idiopathic illness, though now the etiological factors can be identified in most of the patients, like urethral stricture with proximal extravasation of urine, recent trauma and genitourinary tract instrumentation. The average age of patients ranges from 51 to 65 years as seen in our study. There is an increasing age of patients suffering from this disease, contrary to Fournier's description, probably due to increasing longevity [8]. Common predisposing conditions include lower socioeconomic status, state of uncleanness and poor personal hygiene, generalised debilitating diseases, alcoholism, steroid use,

cancer chemotherapy or presence of diabetes [9]. Fournier's gangrene has also been found as the presenting sign in an undiagnosed human immunodeficiency virus infection [10]. Basic cause is reduced immunity in most patients. In this study, most of the patients belonged to middle class or higher socioeconomic background. A similar infection can occur in women with necrotising infection of the vulva or perineum, and sometimes may be secondary to Bartholin's cyst or abscess [11]. Vulvar phacomycosis occurs in diabetics and mimics necrotising fascitis [12]. One female diabetic patient with this presentation responded to broad spectrum parenteral antibiotics.

The pathogenesis of Fournier's gangrene requires the presence of an infective focus on or around the scrotum and a portal of entry for the micro-organism. Fournier's gangrene involves multiple Gram positive and Gram negative organisms causing cryptoglandular or periurethral infections. These organisms are of low to moderate virulence but synergism causes them to progress to severe infections with tissue necrosis and gangrene. Most of these organisms are commensals below the pelvic diaphragm [13]. The common organisms implicated are shown in Table 4. The scrotum readily develops dermal gangrene because it has virtually no subcutaneous fat between the epidermis and dartos muscle [14]. Aerobes and anaerobes produce enzymes heparinase, hyaluronidase, streptokinase, collagenase, DNAase, coagulase, liposaccharide endotoxin. Prognosis depends primarily on local tissue compromise, extent of involvement, type and dose of contaminant, the nature of inciting event and the underlying status of the host.

The pathology includes necrosis of superficial fascial layers and surrounding tissues, the deep fascia however is not involved. A black spot in the perineal skin surrounded by erythema is considered pathognomonic of Fournier's gangrene and is seen in most of the patients if carefully examined and was seen in two patients in this study. From this focus in the perineum, the disease may spread to the lower abdominal wall, loins, thigh, thorax, axillary fossae and upper limbs. Plain X-ray of the abdomen and pelvis helps to localise subcutaneous emphysema, which may be present before crepitus is palpable. Scrotal ultra sonography is helpful in differentiating Fournier's gangrene from other causes of acute scrotum [15]. The testis is usually normal in Fournier's gangrene. CT scan [16] and magnetic resonance imaging [17] can be useful in defining the tissue planes involved, but no investigation can undermine the importance of early diagnosis and prompt surgery. These tests were not done in this study.

The management of Fournier's gangrene includes

vigorous fluid resuscitation, broad spectrum antibiotics, blood transfusion and the management of the underlying cause, are adjunct to the only definitive management-early aggressive surgery. 'Look and see' should be the policy and not 'wait and see'. Fournier's gangrene has been noted to progress at the rate of one inch per hour. The infection can spread widely within just a few hours. The goal of surgical management is to remove all non-viable tissue, halt the progression of infection and to alleviate systemic toxicity. Triple antimicrobial treatment was used which included penicillin, metronidazole and third generation cephalosporin with or without gentamycin. At surgery there was profuse ooze of 'dishwater' fluid. As long as the skin and subcutaneous tissue could be easily separated from fascia, fascitis is present. If the testes are necrosed, it implies thrombosis of the testicular artery and suggests an intra-abdominal or retroperitoneal nidus of infection, exploration of abdomen or retroperitoneum is indicated. None of the patients in this study required orchidectomy. The testes were found viable, were prevented from dessication by frequent wet dressings. Eventually they can be covered with remaining scrotal skin or implanted in the subcutaneous tissue of the thigh or abdomen. Two patients required skin grafting as there was not enough scrotal skin due to extensive involvement of scrotum including perineum and abdominal wall. Hyperbaric oxygen decreases the spread of myofascial necrosis and gangrene, facilitates wound healing and hastens recovery after debridement [18]. None of the patients required hyperbaric oxygen therapy in this study. Survival can be further improved by combining aggressive surgical and medical management. Mortality is higher in those who present late and in those who undergo debridement after 48 hours. High mortality is usually due to uncontrolled septicaemia, multiple organ failure and pulmonary embolism. Patients with severe underlying diseases, abdominal and perineal infections have increased mortality. There was no mortality in this study due to aggressive surgical and medical management.

Fournier's gangrene includes all patients with necrotising fascitis of perineum including the genitalia and occurs in both sexes at all ages worldwide. Diagnosis is usually clinical. The key to successful outcome includes early diagnosis, prompt fluid resuscitation, rapid

initiation of broad spectrum antibiotics, early surgical intervention in form of radical debridement and frequent, repeat and elaborate dressings. Medical officers should refer the patients with perianal sepsis at the earliest. Unfamiliarity with this condition results in delayed diagnosis, inadequate treatment and high mortality.

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