EVALUATION OF FOURNIER'S GANGRENE IN FEMALE PATIENTS

Siba Prasad Dash[1], Subhasis Roy[2]

[1]Associate Professor, Department of General Surgery, MKCG Medical College and Hospital, Berhampur, Odisha.
[2]Resident, Department of General Surgery, MKCG Medical College and Hospital, Berhampur, Odisha.

ABSTRACT

BACKGROUND

Fournier's gangrene is a rapidly progressive necrotising fasciitis of the perineal and genitourinary region. The pathological process progresses rapidly through the fascial planes to the buttock, abdominal wall, back, pelvis and retroperitoneum. USG, CT and MRI provides early detection in clinically indolent cases. Resuscitation of the patient, appropriate antibiotics, multiple incisions, surgical debridement and fecal diversion was done depending on severity of cases.

Purpose- Fournier's gangrene is predominantly a disease of males. The present study reviews our 2 year experience with Fournier's gangrene in female patients.

MATERIALS AND METHODS

A retrospective review of 16 consecutive female patients with Fournier's gangrene was performed. Demographic characteristics, bacteriology study and treatment results were recorded.

RESULTS

Mean age was 74.5 years (range, 54-96 years). Most cases of Fournier's gangrene originated from anorectal infections. Diabetes was the most common co-morbid condition. Polymicrobial infection occurred in most patients. No predominant organism was found. Half of the patients had infection extending beyond the perianal and perineal regions. Fourteen (87.5%) patients received fecal diversion. The mortality rate was 25%.

CONCLUSION

Fournier's gangrene occurred in females with a pattern similar to that in males. However, most female patients received fecal diversion.

KEYWORDS

Fournier's Gangrene, Female, Mortality.

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BACKGROUND

Fournier's Gangrene (FG) is a rapidly progressive necrotising fasciitis of the perineal and genitourinary region.[1] Most patients have underlying medical problems, which cause a variable degree of immunosuppression. These medical problems include diabetes mellitus, alcohol abuse, renal insufficiency and steroid use. It has been proposed that the pathogenesis of Fournier's gangrene involves synergistic polymicrobial infection. Most patients initially present with perianal or perineal pain. Diagnosis is based on clinical findings. Swelling, tenderness and black dermal necrosis are typical cutaneous manifestations. Crepitus represents the presence of gas-forming bacteria.[2] Once an infection is established, it progresses and extends rapidly through fascial planes to the buttock, abdominal wall, back, pelvis and retroperitoneum. Radiological evaluation including CT and MRI, provides early detection in clinically indolent cases.[3] Recently reported mortality rates are still high ranging from 14% to 45%. Aggressive management including surgical debridement, parenteral antibiotics and treatment of underlying conditions can improve survival.

Most series of Fournier's gangrene have reported a 10:1 male-to-female ratio.[4] In order to describe characteristics of Fournier's gangrene in female patients, we retrospectively reviewed the medical records of 16 female patients within a two year period.

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Corresponding Author:
Dr. Siba Prasad Dash,
Lingaraj Nagar, Near New Bus Stand,
Berhampur-760001, Ganjam, Odisha.
E-mail: drsibapdash@gmail.com,
pintu321989@gmail.com
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MATERIALS AND METHODS

A retrospective review was performed of 16 consecutive female patients who had undergone surgical interventions for Fournier's gangrene at M.K.C.G. Medical College and Hospital, Berhampur, Odisha, from April 2015 to March 2017. Diagnoses were made on clinical grounds. Only patients with Fournier's gangrene that initially involved urogenital, perineal or perianal regions were included. This criterion was designed to exclude severe localised infections such as anal abscess, pararectal abscess, etc., which were difficult to differentiate from Fournier's gangrene.

All data were retrieved from retrospective review of medical records. A detailed assessment of demographics, including age, sources of infections and predisposing factors was obtained. All patients were treated with antibiotics immediately upon diagnosis. After adequate resuscitation, all patients underwent prompt surgical debridement under general anaesthesia. Multiple small incisions within the involved area were performed with excision and debridement of nonviable tissue. Subsequent debridement was performed in the operating room if the wound condition had deteriorated. Primary fecal diversion was through a colostomy created in the initial operation. A secondary colostomy was defined as a colostomy created in a subsequent operation. The indications for fecal diversion were based on severity of the disease. The area of involvement was recorded from operation notes. The extent of involvement was categorised as localised or extensive. Infections limited to urogenital, perineal or perianal regions were classified as localised Fournier's gangrene, whereas infections extending beyond these regions were classified as extensive Fournier's gangrene. The extended area was also recorded as were the period of hospitalisation and outcome.

Blood cultures were performed if patients were initially febrile. Wound cultures were obtained during the operation. The results of cultures were recorded. Monomicrobial infection was defined as the isolation of only a single species from both aerobic and anaerobic cultures.

RESULTS

The mean age of the 16 patients was 74.5 years (range, 54-96 years). Predisposing factors were identified in 14 patients (Table 1). Diabetes mellitus was identified in 6 patients, iatrogenic Cushing's syndrome in 2, leukaemia in 2, liver cirrhosis in 2 and bedridden status due to hydrocephalus in 2. The aetiology of the necrotising infections was identified in all 16 patients. Fourteen patients had anorectal infections and 2 patients had an infection, which was caused by sacral pressure. Twelve patients survived and 4 patients died of Fournier's gangrene for an overall mortality rate of 25%. As would be expected, the patients who died had a shorter hospital course (average, 8 days). Hospital stay among the survivors averaged 32.2 days.

Blood cultures were performed in 10 patients (Table 2). All were negative. Data for wound cultures were available in 14 patients. Two patients had a monomicrobial staphylococcal infection. Twelve patients had a mixed aerobic and anaerobic polymicrobial infection. The average number of cultivated species was 4. Distribution of organisms was even. No predominant species was noted.

Half of the patients had extensive Fournier's gangrene (Table 1). The affected area included the flank, abdominal wall, thigh or retroperitoneum. Surgical debridement was performed from 1 to 3 times (average, 2.1 times). A primary colostomy was created in 6 patients and a secondary colostomy in 8 patients. The stoma creation rate was 87.5%. Only two patients avoided fecal diversion. We chose loop sigmoid colostomy for diversion.

Patient	**1,2**	**3,4**	**5,6**	**7,8**	**9,10**	**11,12**	**13,14**	**15,16**
Age in Yrs.	84,96	54,56	72,75	69,70	79,81	82,84	67,72	75,76
Predisposing factors	None	Diabetes	Diabetes	Diabetes	Iatrogenic Cushing's syndrome	Leukaemia	Hydrocephalus	Liver cirrhosis
Aetiology	Anorectal infection	Anorectal infection	Anorectal infection	Anorectal infection	Anorectal infection	Anorectal infection	Pressure sore	Anorectal infection
Extent of lesion	Extensive (right flank through subcutaneous fascia)	Localised	Localised	Extensive (retroperitoneum pelvis)	Localised	Localised	Extensive (thigh, abdominal wall)	Extensive (retrorectum)
Numbers of debridement	1	2	3	1	2	3	3	2
Fecal diversion	Primary loop sigmoid colostomy	None	Secondary loop sigmoid colostomy	Primary end sigmoid colostomy	Secondary loop sigmoid colostomy	Secondary loop transverse colostomy	Primary loop sigmoid colostomy	Secondary loop transverse colostomy
Hospitalisation duration (days)	34	20	24	35	25	12	55	4
Outcome	Alive	Alive	Alive	Alive	Alive	Dead	Alive	Dead

Table 1. Clinical Features, Treatments and Outcome of Female Patients of Fournier's Gangrene

Patient	**1,2**	**3,4**	**5,6**	**7,8**	**9,10**	**11,12**	**13,14**	**15,16**
Blood culture	-	-	N	N	-	N	-	-
Escherichia coli					V			
Klebsiella pneumoniae				V				V
Enterococcus				V		V		
Morganella	V				V	V		
Pseudomonas	V					V		
Streptococcus	V						V	

Staphylococcus		V						
Proteus	V			V				
Bacteroides spp.	V				V	V	V	V
Peptostreptococcus					V	V	V	V
Prevotella	V			V				V
Clostridium difficile					V			

Table 2. Bacteriology of 8 Female Patients of Fournier's Gangrene

'-' No growth of bacteria; N: Not performed; V: Positive wound culture.

DISCUSSION

Jean Alfred Fournier in 1883 described rapidly progressive gangrene of the genitourinary area in 5 healthy males.[1] The disease was characterised by abrupt onset in healthy young men, rapid progression to gangrene and absence of specific causative agents. Thereafter, Fournier's Gangrene (FG) has been the diagnosis applied to similar clinical conditions. However, the definition was not quite correct. In subsequent reports, many predisposing factors were determined and it was definitely not unique to men as the same phenomenon has also been described in women. The syndrome is now defined as synergistic, polymicrobial, necrotising fasciitis of the perianal and perineal region occurring in both genders. Fournier's gangrene in female patients has been reported to be associated with infection from episiotomy wounds and Bartholin's abscess. Our series demonstrated that anorectal infection was also an important cause of Fournier's gangrene in female patients.[5]

Most of the patients in our series had underlying medical problems. Diabetes has been the most frequent co-morbid condition in most series being present in 20% to 70% of patients.[6] Alcoholism infection and other conditions with immunocompromised status also have been associated with Fournier's gangrene.[4,7] Six of our patients had diabetes. Eight others had iatrogenic Cushing's syndrome, leukaemia, hydrocephalus or liver cirrhosis, respectively. All of these co-morbid conditions caused a state of relative immunosuppression.

Decreased defence mechanisms may explain why fulminant infection prevails.

Synergism of different microorganisms is responsible for fulminant infection. Collagenase and heparinase produced by anaerobes combined with platelet aggregation and complement fixation induced by aerobes, causes microvascular thrombosis with subsequent dermal necrosis. Hyaluronidase, streptokinase and streptodornase produced by Streptococcus and Staphylococcus contribute to tissue damage.[8] In our patients, an average of 4 species were isolated. Most patients had a mixed aerobic and anaerobic infection.[9,10] Our data further support the importance of synergism in the establishment, progress and spread of infection.

The anatomical aspect of extensive extension in Fournier's gangrene has been well documented in male patients. The most important fascial plane was Colles' fascia, which surrounds the penis. It continues superiorly with Scarpa's fascia of the abdominal wall. Laterally and inferiorly, it connects with the fascia lata of the lower limbs. Posteriorly, it is limited by the levator ani muscle. If the anal sphincter is damaged, infections gain access into the retroperitoneum through pararectal spaces. The extent of infections in our female patients also corresponded to these fascial planes, which was to the abdominal wall, flank, thigh and retroperitoneum. The anatomical basis for extension can be applied to female patients as well.

Patients with Fournier's gangrene are treated by giving parenteral antibiotics and by surgical debridement.[11] Numbers of debridement were not related to the extent of diseases in our patients. Fecal diversion is indicated when the anal sphincter is grossly contaminated or to facilitate wound management.[12] The primary colostomy rate has been reported to be 16% to 17%, whereas the secondary colostomy rate has been reported to be 35% to 40%. In total, a colostomy was created in 52% to 56.7% of patients. In our series, a colostomy was created in 87.5% of patients. Among these patients, 37.5% had a primary colostomy and 50% a secondary colostomy. Our data showed a higher stoma creation rate in female patients. Surgeons' judgment, patients' performance status, sphincter condition and extent of lesions all influenced the decision to perform fecal diversion. The focus of these concerns was on facilitating wound care. The average age of our female patients was 74.5 years, which was two decades older than female patients in previous reports (54-55 years). As would be expected, older patients were considered to have poorer anal function and were more prone to be afflicted by morbidities. The high stoma creation rate therefore seems reasonable in our female patients.

CONCLUSION

Despite the advances in medical and intensive care, Fournier's gangrene remains a serious condition because of rapid progression leading to sepsis and death. Previously reported mortality rates range from 0% to 80%. The overall mortality rate was 16% in a retrospective study of 1726 cases. Many factors have been found that contribute to increased mortality. These include older age, primary anorectal infections and delayed treatment.[13,14] Controversy exists about the role of diabetes. Our data showed a comparable mortality rate in female patients (25%). Age and diabetes showed no influence on mortality in our series. Interestingly, all deaths occurred in the secondary colostomy group. Delay of fecal diversion might be attributed to persistent poor wound condition and in turn cause prolonged sepsis resulting in the death of the patients.

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