



## Case report

## Fournier's gangrene in an eight-day-old male neonate, a case report

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## ABSTRACT

**Introduction and importance:** Fournier's gangrene is necrotizing fasciitis of the scrotum and perineal area. It is a polymicrobial infection of perianal origin characterized by rapid necrotizing spread along fascial planes to abdominal wall and flank area. The very rare nature of this illness in neonates makes it important to take a lesson in subsequent management of similar cases.

**Case presentation:** An eight days old male neonate come with complaint of high-grade intermittent fever, scrotal swelling, crying during urination and irritability of 3 days duration. Objectively he has temperature of 38.8 degree Celsius, pulse rate of 172 and blackish ulcerated scrotum with minimal puss discharge. Blood work showed leukocytosis and scrotal ultrasound ruled out other pathology.

**Clinical discussion:** Identifiable causes constitute about 80% of the cases. Culture from the puss in our case showed polymicrobial cause. Mortality is mainly due severe sepsis, coagulopathy and renal failure. Medical management include optimization of cardiorespiratory status with cautious resuscitation, respiratory support and inotropic support with severe cases. Prompt surgical debridement, incision and drainage help reduce ongoing infection and systemic toxicity.

**Conclusion:** The poor hygiene and immature immune response are the likely predisposing factors. Medical management with broad spectrum antibiotics and surgical debridement are cornerstones for good recovery.

## 1. Introduction

Fournier's gangrene is necrotizing fasciitis of the scrotum and perineal area. It is a polymicrobial infection of perianal origin characterized by rapid necrotizing spread along fascial planes to abdominal wall and flank area [1]. Since the description of the disease in 1883 by the French dermatology and venereal specialist, understanding of the pathophysiology of Fournier gangrene and other necrotizing soft tissue infections have been improved [2]. Despite this notion, the fatality of this disease remains high with reports ranging from 20% to 50% in different places and diverse patients [2,3]. The diagnosis capability and surgical procedures has been improved as well, these improvements couldn't change the bold fact that Fournier's gangrene still remains a management challenge [4].

The condition is extremely rare in neonates. Fournier's gangrene is rarely considered as part of the differential diagnosis in the clinical management of the acute scrotum [5,6]. It is also rare in the general population but more common in adult males peaking in the 3rd and 4th decade of life than women and children. It mainly affects those with

immunodeficiency, diabetes, chronic diseases and alcoholism. Patients with renal failure, diabetes and heart diseases demonstrate higher risk of mortality. Timely diagnosis and aggressive management have paramount importance in the prognosis of patients. If not treated early it can progress to sepsis and multi-organ failure [7,8]. Management with broad spectrum antibiotics and debridement are the norm of intervention [9]. The article was reported according SCARE 2020 guideline [19].

## 2. Case presentation

An eight-day old male neonate delivered with spontaneous vaginal delivery after full term pregnancy brought to primary hospital with complaint of scrotal swelling, irritability, crying during urination and high-grade intermittent fever of 3 days' duration. After he was admitted with diagnosis of scrotal cellulitis to a primary hospital and stayed for two days, the scrotum started to have grayish discoloration. He was referred to our hospital and upon examination, patient was irritable, had some dehydration, tachycardia of 172 beats/minute, febrile with temperature of 38.8 °C and there was suprapubic erythema. Scrotal

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examination revealed dead scrotal tissue with pussy discharge. Scrotal ultrasound excluded hernia and testicular torsion; complete blood count revealed leukocytosis with left shift adjusted for age. Serum bilirubin was elevated and other tests were in the normal range. Culture from puss showed growth of *E. coli*, *Staphylococcus aureus*, and *Bacteroides* species depicting its polymicrobial cause.

Then we rehydrate him and started on broad spectrum antibiotics (ceftriaxone and metronidazole). Subsequently the patient was taken to the operation theater for debridement which revealed darkish dead scrotal wall with puss discharge and exposed testis. There was no abdominal or perineal extension. Fever has subsided on the second postoperative day and patient become comfortable. Wound care was given in the subsequent days until the wound has granulated. Contracted scrotal skin was undermined and tension free wound closure was possible. The neonate was discharged home safely (Figs. 1-3).

### 3. Discussion and conclusion

Neonatal Fournier's gangrene is a rare entity characterized by necrotizing infection of the genital, perianal and perineal regions. It is a serious necrotizing infection which follows fascial planes to involve abdominal wall too [6]. Vascular thrombosis and lysis of connective tissues with bacterial enzymes will lead the overlying skin to be gangrenous. It is of a polymicrobial origin mainly Enterobacteriaceae species [9].

Culture from puss in our case showed growth of *E. coli*, *Staphylococcus aureus*, and *Bacteroides* species depicting its polymicrobial cause. Though originally the term was coined for idiopathic causes, currently most of the causes are identifiable. Genitourinary instrumentation or trauma, systemic infection, phimosis, perineal procedures, insect bites, poor perineal hygiene and strangulated hernia are some of the predisposing factors. In our case we didn't find predisposing factor except poor hygiene [6,9,10].

Low birth weight, preterm birth and depressed/immature cellular immunity are also associated with increased risk of predisposition. Presentation could be aggressive or indolent based on the causes.



Fig. 2. Postoperative granulating wound on 5th day.



Fig. 3. Immediately after closure.



Fig. 1. Preoperative appearance.

Aerobic microorganisms produce feculent odor discharge and crepitus may be seen in gas forming infections [11–14]. Our case showed aggressive progression of the disease.

Diagnosis is usually clinical although ultrasound helps to exclude other pathologies and laboratory workup helps determine degree of severity. Literatures showed mortality to be ranged up to 45% although it has decreased with the institution of early aggressive therapy. Mortality is mainly due to severe sepsis, coagulopathy and renal failure. Some authors suggested that the prognosis of Fournier's gangrene is more favorable in children than adults [11,15,16].

Management consists of administration of broad-spectrum antibiotics and debridement of devitalized tissue. Medical management include optimization of cardiorespiratory status with cautious resuscitation, respiratory support and inotropic support with severe cases [11,17,18].

Prompt surgical debridement, incision and drainage help reduce ongoing infection and systemic toxicity. Recent observation showed more conservative and selective surgical debridement to be successful compared to the previous myth of aggressive debridement [12,13].

We started on ceftriaxone and metronidazole covering both aerobic and anaerobic microorganisms. Two courses of debridement under general anesthesia supplanted with bedside wound care improved the patient condition. Most of the cases are amenable to delayed closure or healing by secondary union but few are subjected for skin graft or flap reconstruction.

The poor hygiene and the likely immature immune system of our patient considered as causative factor. Hence good hygiene and modifying other risk factors thru physical education for the parents may probably decrease event of neonatal Fournier's gangrene.

#### Consent

Written informed consent was obtained from the mother for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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#### Guarantor

Nebiyou Simegnaw will take the primary responsibility of the study.

#### CrediT authorship contribution statement

NSB contributed substantially from the patient evaluation to writing up, AAT contributed in revision of the paper.

#### Declaration of competing interest

The authors declare that they have no competing interests.

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