

Case Series

Our experience in treating Fournier's gangrene at Max Hospital, Gurugram

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ABSTRACT

French venereologist Jean-Alfred Fournier described this gangrene as a fulminant gangrene of the penis and scrotum in young men. He reported five cases in his clinical lectures in 1883 though it was first described by Baurienne in 1764. Fournier's gangrene is a form of necrotizing fasciitis that affects the genital and surrounding perineal and perianal areas. It's a life-threatening disease leading to 20 to 80 percent mortality. It destroys tissues quickly and infection progresses to septic shock which kills patient if prompt and aggressive treatment is not started. Common symptoms of Fournier's gangrene are pain in scrotum and or perineum, redness, fever and weakness. Advanced cases have foul smelling discharge from infected tissues. It is due to polymicrobial infection, both aerobic and anaerobic. Fournier's gangrene is usually diagnosed clinically but imaging investigations such as X-rays, Ultrasound and CT scan help a lot to reach the diagnosis early. Treatment mainly consists of resuscitation, intravenous antibiotics and debridement. We have treated successfully four cases of advanced Fournier's gangrene with team work of surgeons, anaesthesiologists, physicians and critical care specialists. Full recovery is possible due to a good team work and understanding the disease.

Keywords: Antibiotics, Debridement, Fournier's gangrene, Necrosis, Necrotizing fasciitis, Polymicrobial infection

INTRODUCTION

French venereologist Jean-Alfred Fournier described this gangrene as a fulminant gangrene of the penis and scrotum in young men.¹ He reported five cases in his clinical lectures in 1883 though it was first described by Baurienne in 1764. Fournier's gangrene is a form of necrotizing fasciitis that affects the genital and surrounding perineal and perianal areas. Fournier's gangrene is defined as a polymicrobial necrotizing fasciitis of the perineal, perianal or genital areas. It's a life-threatening disease. It quickly destroys soft tissues. It is a medical emergency. Fournier's Gangrene is also called as idiopathic gangrene of the scrotum, periurethral phlegmon, streptococcal scrotal gangrene, phagedena, and synergistic necrotizing cellulitis.^{2,3} Fournier's gangrene occurs about one per 62,500 males per year.

Males are affected about 40 times more often than females.⁴ Quick and aggressive treatment saves the life. Fournier's gangrene is usually due to a mixed infection i.e., combined aerobic and anaerobic. It is so dangerous that it can kill a person within few hours. Mortality usually ranges between 20 to 40 percent but it may be as high as 80 percent.⁵ Stephens et al also reported 80 percent mortality.⁶ It commonly affects men more than women. Though it usually affects men but it can also occur in women and children.⁷ It is more common and having more morbidity and mortality in persons with diabetes, HIV, and alcohol abuse.

Common symptoms of Fournier's gangrene are pain and redness in scrotum and or perineum. Fever and weakness are common. Advanced cases have foul smelling discharge from infected tissues. Fournier's gangrene is

usually diagnosed clinically but imaging investigations such as X-rays, Ultrasound and CT scan help a lot to reach the diagnosis early. Most cases present in mild form but can progress very fast even in few hours. Fifty percent cases have air in subcutaneous tissues.

Fournier's Gangrene is usually after perinial or genital infections or trauma. Common causes of Fournier's gangrene are perianal abscess, perinial and perianal operations, anal dilatation haemorrhoidectomy, urethral stricture dilatation, urethral catheterization, prostatic biopsy and septic abortion

In Fournier's gangrene, suppurative bacterial infection results in micro thrombosis of the small subcutaneous vessels leading to the development of gangrene of the overlying skin.⁸ Culture from wounds of Fournier's gangrene shows mixed infection by more than one variety of organisms, both aerobic and anaerobic bacteria such as streptococci, staphylococci, coliform, klebsiella etc. *E coli* is the most common organism in this infection. If patient's immune response is compromised then destruction of tissues happens in hurricane way. It is a synergistic infection by aerobes and anaerobes which produces various tissue destroying toxins leading to fast spread of infection, tissue destruction, platelet aggregation, micro vascular thrombosis and dermal necrosis.⁹

All patients were treated with intravenous antibiotics and repeated surgical debridement. Every time the dead tissues were excised and a thorough surgical toilet with povidone-iodine and hydrogen peroxide irrigation was done till healthy and blood oozing tissues found. Unnecessary deep exploration was avoided, when healthy tissue plane met further dissection was stopped. No patient required orchidectomy. No patient required vacuum assisted closure (vac) system dressing. No case received hyperbaric oxygen therapy.

Early surgical debridement of dead tissue is main line of treatment to reduce mortality and morbidity. Due to initial fascial and subcutaneous involvement, clinician can miss this disease because the overlying soft tissue can look unremarkable. Therefore, early diagnosis of this potentially fatal disease is key as it can often get misdiagnosed.⁹

CASE SERIES

Case 1

The author was called one night to see an emergency case at about 11:30 pm in the casualty department of a hospital in Gurgaon.

Mr. R. T., 48, a middle-aged senior executive, was a well-built gentleman with pleasant manners. He was accompanied by his wife. He was running high fever of 103 degrees Fahrenheit; his pulse was 114/min and blood

pressure was maintained at 110/70 mmHg. He had a foul-smelling discharge from the scrotum, which was swollen enormously and gangrene was clearly present. His RBS (Random Blood Sugar) was 340 mg/dl. He was quite toxic. He was not a known diabetic. He was diagnosed as a case of Fournier's gangrene.

We discussed the treatment and prognosis with Mr. and Mrs. T and made them aware of his serious condition. His scrotum, as well as his life, was in danger. I told them that I would try to save both but couldn't promise anything. They were quite upset but agreed for an operation. I started him on an antibiotic combination to cover deadly aerobic as well as anaerobic bacteria. It was a combination of tazobactam and piperacillin with amikancin and metronidazole. All antibiotics were given intravenously. Mr. T signed the consent form. The author operated upon him the same night. A thorough surgical debridement (removal of dead tissue) was done trying to remove every bit of dead tissue from the scrotum. Tissue with a gray, dead look was removed until the normal red and blood oozing tissue was seen. It took 2 hours to finish the debridement. A surgical toilet was performed within 3-4 liters of normal saline after irrigating with Povidone iodine solution mixed with hydrogen peroxide to wash out dead tissues and to remove bacteria. The grey necrotic tissue and muddy discharge are a surgeon's nightmare as he knows this gangrene can spread very fast and can resist all antibiotics.

The next day, author took him to the operation theatre to review the infection and a further debridement and surgical toilet was performed. The testes were exposed as the overlying skin was removed. A padded dressing was done. This was done under general anaesthesia. The patient was dressed in the operation theatre daily. Debridement and surgical toilet were done regularly. In the second week of treatment, he became very toxic and infection increased. We felt his gangrene was spreading again to surrounding tissues and that it would be difficult to save him. The wound was still bad and further debridement was performed with surgical toilet. The same process was repeated daily. Visible signs of healing could be seen. Gradually, his toxic symptoms started to subside, the infection came under control and the healing process began. It took eight weeks for Mr. Tandon to become fit for discharge from hospital. Skin grafting was done after the infection subsided completely.

Case 2

A lady from Switzerland, aged 30, was admitted to a Hospital in Gurgaon, with necrotizing fasciitis of the left leg and foot. She was flown from Nepal to Gurgaon by air ambulance. When in Nepal, she experienced pain in her left foot along with oedema and she was admitted to a private hospital there. She developed discoloration in her left foot and the lower part of her left leg. She was operated in Nepal. Debridement and surgical toilet were done under general anaesthesia and she was shifted to

Gurgaon with septicemia and deteriorated general condition. She was febrile with 101F temperature; her pulse was 110/min and BP 100/60 mmHg. There was an infected wound on the dorsum of the left foot, almost covering the whole foot and another on the medial aspect of the left ankle, almost covering the entire medial side. Both wounds were full of pus, with a foul smelling, dirty white discharge. She was in pain. Her white cell count was 19000 cells/cumm. A pus swab taken from the wound showed heavy growth of the deadly bacteria *Pseudomonas aeruginosa* (Figure 1).



Figure 1: Necrotizing fasciitis of the left leg and foot.

We first did the surgical toilette with debridement under general anaesthesia. As both wounds started oozing blood, their margins were trimmed and irrigation performed with the mixture of povidone-iodine solution and hydrogen peroxide. The wounds were washed with an oxum solution (oxygen liberating solution) and wrapped with ribbon gauze soaked in the same solution. She was on I.V. amoxicillin, metronidazole and amikacin. Author changed amoxicillin to tazobactam and piperacillin in. metronidazole and amikacin continued. All antibiotics were given intravenously. Author performed the dressing in the operation room daily. The dressing was done under intravenous sedation as it was a painful process.

The treatment saved her leg as well as life. She gradually improved and went to Switzerland.

Case 3

A 34 years old male patient attended casualty department of Max Hospital Gurgaon with pain and swelling in scrotum with mild discharge for last 2 days. He was a known case of prolapsed and bleeding haemorrhoids. For last 5 days his haemorrhoids were causing discomfort, pain and bleeding. He took tab paracetamol for pain but pain did not subside. There was no history of diabetes mellitus, HIV, alcohol abuse or any other chronic disease.

Only constipation was there for several years. He used to take laxatives off and on. He took a readymade enema 3 days back to get relief. On examination he was found in severe pain and could not walk. His pulse was 145/min; BP was 78/40 mmhg, SPO₂ was 90 percent. Skin was cold and clammy. Perineum and genitalia were discoloured with oedematous skin, the oedema was also gone to left inguinal region and left thigh. He was admitted in ICU and put on oxygen nasal tube with four liters oxygen per minute and intravenous antibiotics. Quickly radical debridement was done. Copious amount of grey foul swelling pus was removed along with necrosed soft tissue. Patient was treated with inotropic drugs also. Next day again debridement was done. Pus from wound showed polymicrobes sensitive to tazobactam and piperacillin. He was also given metronidazole intravenously along with antibiotics. He was on dressing and intravenous antibiotic for two weeks. After two weeks intravenous antibiotic was changed to appropriate oral antibiotics. He gradually improved and was discharged after 3 weeks of stay in hospital with advice to be dressed daily till wounds heal.

Case 4

A 30 years old male patient presented in emergency room with pain in perineum and scrotum with discharge from scrotum for last 3 days. He was getting treated at a local clinic but the pain and discharge did not reduce and his condition deteriorated. He was a young man with no history of obesity, diabetes or HIV. He was an occasional consumer of alcohol and not an alcoholic. Examination revealed dehydration and pallor. His pulse was 134/min; blood pressure was 94/56 mmHg. He was very weak and respiration were shallow and fast. He was in unstable condition. He was delirious and not well responding to questions. His scrotum and surrounding perineal area were tender, oedematous and there were multiple wounds with foul smelling dirty discharge. Patient was admitted in ICU in isolated room. He was thoroughly investigated. He was resuscitated with intravenous fluids, oxygen inhalation, intravenous broad-spectrum antibiotics (piperacillin, salbactam and metronidazole) and other life saving measures. His hemoglobin was 12.5 gm%, leucocytes count was 21,000/cmm, blood urea was 32 mg%, random blood sugar was 128 mg%, CRP was 9.6 mg/l, LFT was within normal limits with only borderline high alkaline phosphatase.

Patient was diagnosed as a case of Fournier's gangrene. Emergency surgical debridement was done in operation theatre under general anaesthesia. The dead tissues were removed and pus was sent for culture and antibiotic sensitivity test. Samples of excised tissues were also sent for histopathology. Repeated the debridement was done several times. Regular dressing was done with Eusol after surgical toilet with hydrogen peroxide mixed with povidone iodine solution. He improved gradually and was discharged on 28th days after admission.

All four cases asked for their beliefs and spiritual dimension to tackle their stress, panic and anxiety. All cases were explained about spiritual practice and relaxation techniques such as meditation, deep abdominal breathing and visualization. Patients were also taught these techniques.

DISCUSSION

Fournier's gangrene is a life-threatening surgical emergency. It is more common in males than females. In our series of four cases, one was female and three were males. It is also found in children.¹⁰ There are several factors helping Fournier's gangrene to occur such as obesity, diabetes, alcohol abuse, HIV and immunity lowering conditions. Vick et al stated that no cause is found in 30-50% patients.¹¹ Infection in Fournier's gangrene most commonly arises from gastrointestinal tract (30%-50%) and less commonly from urogenital tract (20%-40%). In some cases, infection is due to minor injuries in scrotum or perineum or perianal areas. Infection in Fournier gangrene is usually a mixed type i.e., aerobic and anaerobic. Straight radiography, ultrasound and CT scan are the main ways of investigation in Fournier's gangrene. CT scan has great value.¹²

Quick and thorough surgical debridement is the key to save the life. Initial treatment is prompt resuscitation, intravenous fluids and intravenous broad-spectrum antibiotics. The removal of all the devitalized tissue is important to stop progress of infection.¹³ Multiple debridement sessions are required. Though vacuum assisted closure device (VAC) dressing has shown enhanced granulation tissue and reduction in wound size as compared to wet to dry dressing, but in our four cases we did not require VAC dressing.¹⁴

When there is significant tissue loss then primary wound closure, reconstructive procedures such as graft and or flap can be done. In our all-cases primary wound closing after granulation tissue formations was done, one case required skin grafting and no case required other reconstructive procedure. Though the mortality is high in Fournier's gangrene but in our series no patient died even though these patients were in septic shock.

In 20-70% of patient's diabetes mellitus is present. In our series no one was diabetic or alcoholic while alcohol abuse is found in 25-50%.¹⁵ With best facilities in hospitals, the mortality has now reduced to 10-20%.¹⁶

We have found that spiritual practices reduce the stress, anxiety and panic due to fear of death or long-term morbidity in life threatening diseases such as Fournier's gangrene. In a study of 100 terminally-ill patients at the M.D. Anderson palliative care outpatient clinic in Houston, Texas, USA, 80 percent of patients, the majority of whom reported high levels of spirituality and religiousness.¹⁷

CONCLUSION

Fournier's gangrene is a serious condition like an emergency. One has not to lose time. It requires aggressive and prompt treatment with multidisciplinary approach. We presented a series of four cases of Fournier's gangrene with severe infection leading to septic shock. All four cases were treated quickly and aggressively and all lives were saved. It happened due to team work. Stress, anxiety and panic also to be handled with the help of stress busting measures which we did in all four cases and found the positive effect on recovery and wound healing.

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