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Working as a team, surgeon and hospital administration with nursing care can influence outcome of Fornier's Gangrene

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Abstract
Background: Fournier's gangrene (FG) is one of the life threatening sicknesses. It is also called as necrotizing fasciitis. It is the fast deteriorating condition which becomes lethal as it progresses fast. It is a fatal form of mixed infection of soft tissues.
Methods: Four cases were treated with our method of a team work consisting of experienced surgeons, dedicated nursing staff and helping hospital management.
Results: All patients were saved. No patient died or developed permanent debilitating complication.
Conclusions: Quick treatment with early debridement of dead tissues and strong multi-antibiotic combination is the main factor in reducing mortality and morbidity. Inspite of recent development in patient care, antibiotics and diagnostic techniques the FG still remains a high mortality diseases. Infections causing FG usually come from skin, urinary tract and gastrointestinal tract. Delay in start of treatment is the main reason for high mortality of FG. Multidisciplinary approach to treat FG is the way to improve outcome. We treat FG with multidisciplinary approach including surgical team, nursing team and hospital administration as a treating force. Hospital administration can help a lot by providing best of their nursing facility and isolation. Proper environment at the hospital can help to heal the disease fast. Patient care is also helped by hospital administration and management by providing quality patient support in the form of nutritional aid, nursing, counseling, pharmacy and other medical supplies etc.

Keywords: Fournier's gangrene, infection, lethal disease, mortality, multidisciplinary approach, necrotizing fasciitis, surgical debridement.

Introduction

Fournier's gangrene is a rare and lethal infective disease of soft tissues specially of perineum, groin and external genitalia. FG is caused by mixed infection which spreads fast like a hurricane infection leading to soft tissue gangrene and even death. FG is named after Dr. Jean-Alfred Fournier who was a famous French venereologist in 1883 but the first case of FG was reported in 1784 by an Arab physician, Avicenna. Though In 1764, Baurienne originally described an idiopathic, rapidly progressive soft-tissue necrotizing process that led to gangrene of male genitalia [1].

FG affects both males and females, more males than females. It is most common after the age of 50 years. There are many significant factors related to the prognosis of FG patients, including early diagnosis, waiting period to surgery and comorbidity [2]. Though the early recognition and surgical debridant are the main stay of treatment but nursing patient care and timely providence of all necessary requirements are also important. If diagnosed and treated early, mortality can be minimized but morbidity can still be important with extensive soft tissue defects affecting form and function. [3]

Diabetes mellitus is reported to be present in 20-70% of patients with FG [4] and chronic alcoholism 25-50% [5] patients. Any condition with decreased cellular immunity may predispose to the development of Fournier's gangrene theoretically [6]. The emergence of HIV into epidemic proportions has opened up a huge population at risk developing FG.

Etiology of fournier's gangrene

An infection of urinary, genital, anorectal and skin origin or a local trauma are usually the entering door for the subcutaneous tissue [7, 8]. The most common foci include the gastrointestinal tract (30%-50%), followed by the genitourinary tract (20%-40%), and cautaneous injuries (20%) [9].

In the early days of FG recognition it was thought to be an idiopathic sickness, but diligent search will show the source of infection in the vast majority of cases, as either perineal and genital skin infections. Anorectal or urogenital and perineal trauma, including pelvic and perineal injury or pelvic interventions are other causes of FG [10].

Most Urogenital, anorectal and cutaneous infections can be the origin of gangrene. Many conditions may predispose of FG, with impairment or loss of immunity and microcirculation as common denominator [11, 12].

Common causes of FG are infection of perineum, abscess formation (perineal abscess, perianal abscess and ischiorectal abscess) haemorrhiodectomy, fissure-in-ano surgery, rectal or anal canal biopsy, urethral catheterization, urethral dilatation from uretheral stricture, chronic urinary tract infection, septic abortion, episiotomy, scrotal boil, and idiopathic.

Low immunity and diabetes mellitus are common risk factors for FG. Patients with comorbidities such as diabetes and alcoholism, atherosclerosis, peripheral arterial disease, malnutrition, prostate cancer, human immune deficiency virus (HIV) infection, leukemia and liner disease are likely to develop into FG [13, 14].

Diagnosis

Early diagnosis leads to early treatment so early diagnosis is the most important factor for FG. One must suspect FG as soon as possible as the prodromal symptoms develop few days before the onset of the gangrene. The common prodromal symptoms are perianal or perineal itching, redness and pain, tachycardia, fever, nausea and vomiting. These symptoms are common in various other non-lethal diseases that's why the suspicious is not there and the disease is diagnosed late.

If not suspected and so neglected at early stage then full blown FG appears which is a life threatening condition as septic shock and multiple organ failure quickly develop and lead to death eventually. According to David/Arcaniolo, Urology Unit, Department of Woman, Child and General and Specialized Surgery, University of Campania Luigi Vanvitelli, Naples, Italy, gangrene in FG spreads about 2-3 cm/hour. It is a hurricane infection which spreads quickly and fast becomes lethal.

We are treating the patients of FG with early diagnosis and debrident with proper patient care by experienced nursing staff. And help of management of the hospital specially helping in well trained staff to deal with such conditions. Proper treatment, isolation and limitation of infection are the main approaches of nursing team barring patient care.

Case Reports

Case 1

I 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. Tandon 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 Tazobactum and Piperacillin with Amikancin and Metronidazole. All antibiotics were given intravenously. Mr. Tandon signed the consent form. I 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, I 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 was done under general anaesthesia and she was shifted to Gurgaon with septicemia and deteriorated general condition. She was febrile with 101oF temperature; her pulse was 110/mt 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 medical 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 19000cells/cumm. A pus swab taken from the wound showed heavy growth of the deadly bacteria Pseudomonas aeriginosa.

We first did the surgical toilette with debridement under general anaesthesia. As both wounds started oozing blood, there margins were trimmed and irrigation performed with a 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. I changed Amoxicillin to Tazobactum and Piperacell in. Metronidazole and Amikacin continued. All antibiotics were given intravenously. I 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 causality 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/mt; 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 tazobactum and piperacillin. He was also given metronidazol intravenously along with antibiotics. He was on dressing and intravenous antibiotic for two weeks. After two weeks intravenous antibiotic were 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/minute; blood pressure was 94/56 mmHg. He was very week and respiration was shallow and fast. He was in unstable condition. He was delirious and not well responding to questions. His scrotum and surrounding perineal area was 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, salbactum and metronidazol) 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 mglL, 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 anesthesia. 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 etal 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's i.e. aerobic and anaerobic. Straight radiography, ultrasound and C T scan are the main ways of investigation in Fournier's gangrene. C T 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, [14], but in our four cases we did not require VAC dressing.

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 there patients were in septic shock.

In our experience we have noticed that a team work of experienced surgeons, dedicated nursing staff and ever ready management of the hospital definitely improve the outcome of this deadly disease. The mortality and morbidity can be reduced considerably by such team work. FG is one of few deadly diseases which are still persisting and taking away lives. Agony of patient can be felt by the treating doctor and team and can stress the team to work extra hours to give relief to the suffering patient. Good coordination between team members of treating force can really make a visible difference. Name of the disease, Fournier's gangrene, is in itself a scary thing. Inspite of modern technology and advancement in the mode of treatment mortality and morbidity of Fournier's gangrene has not changed much.

A dedicated treating team of surgeon, nursing staff and the management of the hospital with quick and right treatment can help to reduce morbidity and mortality considerably. Each member of the team must have experience in treating Fournier's gangrene and such other fatal diseases. There is no substitute to the experience. The experienced staff of the treating team really makes a difference which has been conveyed to us by several patients. The relief in pain by medicines and soothing behavior of the treating team is appreciated by the suffering patient. The extra surgical management approach if kind and helpful makes a remarkable change in the patient's behavior and feeling.

In 20-70% of patients 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 hospital, 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, U. S. A., 80 percent of patients……. The majority of whom reported high levels of spirituality and religiousness [17].

Conclusion

Fournier's gangrene is a fatal disease and should be treated quickly without wasting much time. The treatment should be aggressive and supported by the team of surgeon, nursing staff and management of the hospital. We presented here four cases of Fournier's gangrene who were in severe septic shock. All four cases were treated quickly and aggressively with the team work of dedicated nursing staff, experienced surgeons and helpful hospital management. All lives were saved. It happened due to team work. A coordinated team really makes a difference.

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