A Clinico-Pathological Study Of Fournier's Gangrene (Necrotizing Fasciitis): Review of 13 Cases
P Rajpal Singh, G Sukant, B Amanjit, M Harsh, K Robin

Citation

Abstract
Background: Fournier's gangrene is a life threatening infective necrotizing fasciitis of the perineal region and lower abdomen. The disease is more common in immunocompromised patients. If surgery is delayed, the disease results in shock and multiorgan failure.

Aim: To study the clinico pathological profile of patients of Fournier's gangrene.

Setting and Design: A prospective study conducted over period of six years in a tertiary care institute.

Results: In our study of 13 cases, all the patients were males with age range of 20-95 years. In 8 patients, there was a history of immunosuppression (5 cases of diabetes mellitus and history of surgery in 3 cases) while in 5 patients we could not identify any underlying cause. Surgical debridement was done in all the cases, 5 cases developed acute renal failure which was managed while one patient died.

Conclusion: Fournier's gangrene is an abrupt, rapidly progressive, gangrenous infection of the external genitalia and perineum and a real urologic emergency. Prompt diagnosis and early surgical intervention is required for a better outcome of these patients.

INTRODUCTION
Fournier's gangrene is a fulminant synergistic necrotizing fasciitis of the scrotum, penis, perineum and, at times, the lower abdomen, first described by French venereologist Jean A. Fournier in 1883. The infection can also be seen in the women; often beginning in the vulva. This is more commonly seen in middle aged having immunosuppressive disorder like diabetes mellitus, malignancy and chronic alcoholism. Despite aggressive treatment, it has high mortality rate.

MATERIAL AND METHODS
The study was conducted in the Department of Pathology and Surgery over a period of six years. Thirteen cases of Fournier's gangrene were retrieved. Clinical files and histology slides were available in all the cases. H&E slides were examined. Special stain (Gram's stain) was done in these cases.

OBSERVATIONS
The age of the patients ranged from 20 to 95 years with majority of patients in 50-60 years of age. All the patients were males. There was history of diabetes mellitus in 5 cases, history of surgery in 3 cases while 5 cases had no such predisposing factors. In 3 patients less than half of the scrotum was involved while in 10 patients more than half of the scrotum was involved. Two patients showed extension of the disease in perineal and abdominal wall. On histological examination, there was ulceration of the epidermis. The dermis and subcutaneous tissue showed oedema, necrosis, bacterial colonies, acute inflammatory cell infiltrate in all the cases while thrombotic capillaries were observed in 3 cases. On culture, 3 cases showed pseudomonas aeruginosa, 4 cases E.coli, and mixed flora in 2 cases while it was sterile in 5 cases (TABLE 1).
Figure 1

Table 1: Clinico-pathological data of 13 patients

<table>
<thead>
<tr>
<th>No.</th>
<th>Age (yr)</th>
<th>Site of involvement</th>
<th>Pathogenic factor(s)</th>
<th>P amplitude (kPa)</th>
<th>ESR (mm/hr)</th>
<th>PP (mmHg)</th>
<th>SIRS (max)</th>
<th>MOF (days)</th>
<th>Origins of infection</th>
<th>Treatment</th>
<th>Outcome</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>Perineum, genitalia</td>
<td><em>E.coli</em>, <em>K.pneumoniae</em></td>
<td>3000</td>
<td>45</td>
<td>130</td>
<td>3</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Resolved</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>Perineum, rectum</td>
<td><em>K.pneumoniae</em>, <em>E.coli</em></td>
<td>2800</td>
<td>30</td>
<td>100</td>
<td>2</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Improved</td>
<td>Developed sepsis later</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>Perineum, genitalia</td>
<td><em>S.epidermidis</em>, <em>E.coli</em></td>
<td>2500</td>
<td>25</td>
<td>90</td>
<td>1</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Resolved</td>
<td>Developed severe shock</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>Perineum, genitalia</td>
<td><em>E.coli</em></td>
<td>3000</td>
<td>45</td>
<td>130</td>
<td>3</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Resolved</td>
<td>Developed sepsis later</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>Perineum, genitalia</td>
<td><em>Pseudomonas aeruginosa</em></td>
<td>2800</td>
<td>30</td>
<td>100</td>
<td>2</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Resolved</td>
<td>Developed severe shock</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>Perineum, genitalia</td>
<td><em>Staphylococcus aureus</em></td>
<td>2500</td>
<td>25</td>
<td>90</td>
<td>1</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Resolved</td>
<td>Developed severe shock</td>
</tr>
<tr>
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<td>3000</td>
<td>45</td>
<td>130</td>
<td>3</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Resolved</td>
<td>Developed severe shock</td>
</tr>
<tr>
<td>8</td>
<td>85</td>
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<td><em>Pseudomonas aeruginosa</em></td>
<td>2800</td>
<td>30</td>
<td>100</td>
<td>2</td>
<td></td>
<td>Acute perineal infection</td>
<td>Surgical debridement, parenteral broad spectrum antibiotics</td>
<td>Resolved</td>
<td>Developed severe shock</td>
</tr>
<tr>
<td>9</td>
<td>90</td>
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<td>2500</td>
<td>25</td>
<td>90</td>
<td>1</td>
<td></td>
<td>Acute perineal infection</td>
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<td>Resolved</td>
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</tr>
<tr>
<td>10</td>
<td>95</td>
<td>Perineum, genitalia</td>
<td><em>K.pneumoniae</em>, <em>E.coli</em></td>
<td>3000</td>
<td>45</td>
<td>130</td>
<td>3</td>
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</tr>
<tr>
<td>11</td>
<td>100</td>
<td>Perineum, genitalia</td>
<td><em>Staphylococcus aureus</em></td>
<td>2800</td>
<td>30</td>
<td>100</td>
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<td></td>
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</tr>
<tr>
<td>12</td>
<td>105</td>
<td>Perineum, genitalia</td>
<td><em>Pseudomonas aeruginosa</em></td>
<td>2500</td>
<td>25</td>
<td>90</td>
<td>1</td>
<td></td>
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</tr>
</tbody>
</table>

DISCUSSION

Fournier's gangrene is a rapidly progressive bacterial infection of perianal, perineal and genital areas leading to obliterative endarteritis resulting in gangrene.

The disease is classified as Type 1 when caused by a mixed anaerobic flora and other bacteria, and Type 2 when caused by Group A Streptococcus alone or in association with Staphylococcus aureus. Predisposing factors include –chronic and malignant diseases, psoriasis, surgery, and opened or closed trauma, among others.

The cause of Fournier's gangrene can usually be traced to one of the following: (1) trauma to the groin area that allows organisms to enter subcutaneous tissues, (2) extension from urinary tract infection eg, one involving the periurethral glands or (3) extension from an infection of the perineal space or intestinal tract, with dissection along the fascial plane as far cephalad as the axilla or as far caudad as the thighs.

Clinical features are intense pain, severe edema, fast progress and poor antibiotic therapy feed back. The differential diagnosis includes cellulitis at initial stage. Both the conditions are painful and have same predisposing factors. The confirmation is mainly by histopathological examination of excised surgical material. The key feature in distinguishing necrotizing fasciitis from cellulitis is the location of the inflammation. In the former, the inflammation involves the subcutaneous fat, fascia, and muscle in addition to the dermis. Bacteriological tests from the wound exudates, blister fluid, excised tissue and aspirate material are essential for appropriate microbiologic diagnosis.

In our study, the culture was sterile in 5 cases. This could be attributed to inadequate antibiotic therapy received from outside before coming to our hospital or fastidious anaerobic organisms.

Radiologic examination may also be helpful for the establishment of early diagnosis, aiding in differential diagnosis and providing early surgical intervention. Approximately half of these patients develop septicaemic shock leading to thrombocytopenia, disseminated intravascular coagulopathy and/or multiple organ failure.

The treatment options include radical surgical debridement of the entire necrotic tissue, frequent wound dressings with hypertonic saline, hyperbaric oxygen therapy, broad spectrum parenteral antibiotic therapy, and general and aggressive patient support measures.

The prognosis of necrotizing fasciitis depends on age, co-morbidities and severity of the septic syndrome. For patients...
under the age of 35, the mortality rate is significantly lower (0%) when compared to mortality in patients over 70 years of age (65%). Mortality may reach 100% in surgically non treated patients.

In conclusion, Fournier's gangrene is an abrupt, rapidly progressive, gangrenous infection of the external genitalia and perineum and a real urologic emergency. Prompt diagnosis and early surgical intervention is required for a better outcome of these patients.

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