Fournier’s Gangrene — Taiwan Experience

Methods

The records of 8 patients diagnosed with Fournier’s gangrene were reviewed between 1988 and 2000. The sex, age, etiology, associated diseases, bacteriological studies and treatments were analyzed.

Results. The 8 patients were all males, with an average age ranging from 42 to 78 years old, with average 55.1 years. Six patients were due to perianal abscess, one patient was a complication of hemorrhoidectomy, and one patient had traumatic injury of scrotum. Six patients had poor controlled diabetes mellitus, and there were two patients with cirrhosis of the liver and hepatoma, respectively. Even with aggressive treatments, two patients died; the other 6 recovered completely. The mortality rate was 25%.

Conclusions. Fournier’s gangrene is a not uncommon but life-threatening disease which needs radical debridement and effective antibiotics to control the infection and early reconstruction with skin graft and myocutaneous flaps. Mortality is usually due to delayed diagnosis.

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Necrotizing fascitis is a process that received descriptive attention in the writing of Hippocrates, Galen and Avicenna. In 1883, Fournier decribed an idiopathic rapidly progressive necrotizing fascitis of the penis and scrotum in five healthy young males. Fournier three findings characterized the syndrome: 1. abrupt onset in healthy young male; 2. rapid progression to gangrene; and 3. absence of specific causative agent. To day, in most cases of Fournier gangrene (Fig. 1) a cause can be found. The age groups affected ranges from in fancy to old age; the disease has also been described in woman. The gangrene is now recognized as a synergistic polymicrobial necrotizing fascitis of the scrotum, penis and perineum, usually from genitourinary or colorectal sources.

In an attempt to assess the clinical manifestation and results of therapy, we reviewed 8 cases with Fournier gangrene which were evaluated and treated during a 12-year interval. The results of the study were reported.

Methods

The records of 8 patients diagnosed with Fournier gangrene between 1988 and 2000 were reviewed. The sex, age at onset of disease, predisposing factors and bacteriological studies were recorded. The meth-
ods of surgical treatment and outcome were also reviewed.

**Results**

During a 12-year period, 8 patients with necrotizing fasciitis of penis, scrotum were treated in our hospital (Table 1). They were all males, ages ranging from 42 to 78 years old and averaging 55.1 years. Six patients had poorly controlled diabetes mellitus, one patient had cirrhosis of the liver and one had hepatoma. An associated disease could be identified in all 8 patients: 5 patients were due to perianal abscess, one patient developed infection 2 days after hemorrhoidectomy, one patient had a traumatic injury to the scrotum, and one patient had prolonged urinary catheterization and poor perineal hygiene. The wound cultures of the first five patients presented with mixed organisms, like Pseudomonas, Klebsiella, *E. coli*, Enterococci, Bacteroides and *Staphylococcus epidermidis*. These organisms could be effectively treated with aminoglycosides or 2nd or 3rd generation cephalosporins. However, *staphylococcus aureus* was the predominant organism in the last 3 patients; only vancomycin could control their infectious processes.

The surgical procedure was aggressive radical debridement; the skin and subcutaneous tissue overlying the infected fascia were excised and the wound was left wide open. Most patients needed 2 to 3 excisions to achieve adequate debridement to control the infectious process. Once the infection was under control, reconstructive procedures were performed as soon as possible to cover the exposed surface, such as split-thickness skin graft (Fig. 2) and myocutaneous flap (gracilis flap, inferior rectus abdominis flap) (Fig. 3). No urinary diversion or diverting colostomy were performed in this series.

Two patients died. One patient (case 5) died of sepsis due to delayed diagnosis. The infection extended to his whole back and abdomen, even though aggressive debridement was performed. He expired 5 days after admission. In the other patient (case 4), the infection was under control, but hepatoma made the situation complicated; he died 7 days after admission.

**Fig. 1.** The Fournier’s gangrene had extended to groin and lower abdomen (case 4).

**Fig. 2.** Split-thickness skin graft covered the wound, even the testis (case 6).

**Fig. 3.** The inferior rectus abdominis myocutaneous flap to protect the exposed femoral vessels and testis. Split-thickness skin graft to cover perineal region (case 4).
**Discussion**

Fournier’s gangrene is a rare but serious genital or urinary infection. It is the result of highly lethal and rapid progressive necrotizing fascitis over peri-neal and genital fascia, which causes necrosis of overlying skin. The infection is generally polymicrobial and probably synergistic in nature. The syndrome does not appear to be idio pathic as Fournier originally described. In our eight patients, all had recognizable colorectal or urinary disorders (Table 1).

Based on these findings and anatomy of male genitalia and perineum (Fig. 4), it appears that Fournier’s gangrene can arise by either of two mechanisms: An infection of the lower urinary tract can spread and involve the periurethral gland. If the infection goes untreated, then it may spread to the corpus spongiosum. Once the infectious process reaches this vascular space, distal bacterial seeding or thrombosis with progression of the process occurs. The tough fibrous tunica albuginea eventually will be treated, resulting in spread beyond its confines to involve Buck’s fascia. Once the Buck’s fascia has become involved, the infection can spread rapidly to involve Dartos fascia. The Dartos fascia of the penis is a direct extension of Colles’ scrotal fascia which is the continuation of Scarpa’s fascia of the anterior abdominal wall. Thus, once the infection process involves Buck’s fascia, it can spread freely to the scrotum and the fascia of the abdominal wall. If Colles’ scrotal fascia is penetrated, the infection can spread to the testis, thigh, back, and ischiorectal space. If the infection is perirectal in origin, it can penetrate Colles’ fascia and in involve the perineum and scrotum by direct extension along the fascial plane. There is some evidence to indicate that Colles’ fascia is not a continuous layer but rather a condensation of fibrous tissue with interstices that could allow spread of a perirectal process to involve the scrotum and penis.

Although we could not demonstrate the presence of an aerobic bacteria in all 8 patients, their synergistic infections probably were based on the presence of both aerobic and anaerobic bacteria.

The surgical treatment of Fournier’s gangrene is extensive debridement, clearly, there is no room for incision and drainage without debridement. Carrell and Coworkers found that 100% of patients who did not receive debridement died, whereas only 6% of those debrided died. One cannot judge the severity of the

<table>
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<tr>
<th>Case</th>
<th>Age/sex</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>45/M</td>
<td>Perianal abscess</td>
<td>DM</td>
<td>Debt + STSG</td>
</tr>
<tr>
<td>2</td>
<td>60/M</td>
<td>Perianal abscess</td>
<td>DM</td>
<td>Debt + STSG</td>
</tr>
<tr>
<td>3</td>
<td>42/M</td>
<td>Trauma of Scrotum</td>
<td>Cirrhosis of liver</td>
<td>Debt + GM</td>
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<td>4</td>
<td>52/M</td>
<td>Prolonged urinary catheterization</td>
<td>Hepatoma</td>
<td>Debt</td>
</tr>
<tr>
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<td>78/M</td>
<td>Perianal abscess</td>
<td>DM</td>
<td>Debt</td>
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<td>6</td>
<td>45/M</td>
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<tr>
<td>8</td>
<td>56/M</td>
<td>Perianal abscess</td>
<td>DM</td>
<td>Debt + IRAM + STSG</td>
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Debt = debridement; STSG = split-thickness skin graft; GM = gracillis myocutaneous flap; IRAM = inferior rectus abdominis myocutaneous flap.
disease by cutaneous necrosis. Extensive unroofing of the involved area is needed. We and some au thors ad vo cate the use of a hemostat to sep a rate the loosely necrotic fas cia and stop the debridement where these tissues cannot be sep a rated eas ily. Gen er ally it is not nec es sary to per form an orchidectomy, as the blood sup ply to the tes ti cle and cor pus carvernosa dif fers from that to glans pe nis and scro tum.

There is con tro versy about the di ver sion pro ce dures. We and some au thors be lie ve that co los tomy or suprapubic cystostomy is vir tu ally never nec es sary, ex cept when the dis ease is due to per fo rated co lon or ure thral stric ture. No di ver sion pro ce dure was done in our 8 pa tients.

The ef fec tive ness of hyperbaric ox y gen is still not clear; there is no con clu sive ev i dence that sur vival is im proved with hyperbaric ox y gen ther apy, un less the in fec tion is caused by Clostridium perfringens. Tis sue that has be come ne crotic be cause of ischemia can not be sal vaged by hyperbaric ox y gen ther apy. Re con struc tion pro ce dures like split-thickness skin graft for cov er ing large raw sur face and myocutaneous flap to pro tect the ex posed tes tis and other or gans usu ally get good re sults. Healing the wound by sec ond in ten tion causes ex ces sive scar ring and de for mi ties, is not re com mended.

De spite aggres sive sur gi cal and med i cal man age ment, Fournier’s gan grene has a sig nif i cant mor tal ity rate (7-50%). Our mor tal ity rate was 25% de spite aggres sive sive treat ment in di cated the se ri ous ness of this condition.

References