

A three-year review of the management of Fournier's gangrene presented in a single Saudi Arabian institute

Atif Katib, Mohammad Al-Adawi, Bassem Dakkak, Amani Bakhsh

Department of Urology, King Abdul-Aziz Hospital, Makkah, Saudi Arabia

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Correspondence

Atif A. Katib

Department of Urology
King Abdul-Aziz Hospital
Makkah, Saudi Arabia
phone: +966 505 507 623
atifkatib@gmail.com

Introduction. Fournier's gangrene (FG), is a rare life threatening urologic emergency that requires immediate admission of metabolic stabilization and surgical debridement. The mortality rate ranges from 16% to 40%. This study was conducted to investigate the reasons behind the excellent survival rate in our center.

Materials and method. A retrospective analysis of the medical records of 20 FG cases from January 2010 to January 2013 was conducted. Data was collected on patients' comorbidity, survivals, Fournier's severity index (FSI) at presentation, length of hospital stay (LOS), the number of intensive care unit (ICU) and operating room (OR) entries, the total phalli and testes removed, colostomies created, and cystostomies performed.

Results. All 20 cases (100%) collected for the study survived. All patients were male. The median age of the patients was 55.95 years (39–78 year). Only one patient (5%) was admitted to ICU post-operatively. Penile amputation was carried out in three of the 20 cases (15%). The total number of OR entries was 34 (average of 1.7). A majority of 12 patients (60%) were diabetic. A total of six testes were extirpated from the study group. None of the patients required colostomy creation. Only one patient (5%) required a cystostomy tube insertion. FSI was 5.65 ranging from 0 to 14. The average length of hospital stay was 22.3 days.

Conclusion. In contrast to what is published in the literature, FG is not rare in our center. Perfect survival rate owes to the moderate severity of the cases treated, but mostly to the urgent surgical intervention with extensive debridement.

Key Words: Fournier's gangrene ◊ debridement ◊ FSI ◊ necrotizing fasciitis ◊ urologic emergency

INTRODUCTION

FG was first described by Baurienne in 1764 and is named after a French venereologist, Jean Alfred Fournier, who in 1883, described a rapidly progressive gangrene of the penis and scrotum without apparent cause [1]. Fournier's gangrene (FG) is a potentially life-threatening progressive infection of the perineum and genitalia [2]. Despite aggressive modern management, the mortality of FG ranges from 16% to 40% [3]. Anatomically, the disease affects male external genitalia at the level of the superficial and deep fascial plains, often sparing the deep muscular structures and to variable degrees internal organs. Branches from the inferior epigastric and deep circumflex iliac arteries supply the lower aspect of the anterior abdominal wall. Moreover, branches of the external and internal pudendal arter-

ies supply the scrotal wall. With the exception of the internal pudendal artery, each of these vessels travels within Camper's fascia and can therefore become thrombosed in the progression of Fournier's gangrene. Pathologically, the condition is a polymicrobial necrotizing fasciitis of the perineal, perianal, and external genitalia that might extend up to the anterior abdominal wall skin, superficial and deep structures. The testes are seldom involved as they are primarily supplied by direct branches of the abdominal aorta.

Diagnosis is clinically based as patients present with intense pain and tenderness in the genitalia. The affected area is swollen, dusky and covered by macerated skin and presents with a feculent odor. Patients frequently present with systemic symptoms of early septic shock. Management entails treating sepsis, stabilizing medical parameters, and urgent surgical debridement.

METHOD

The medical and operative records from January 2010 to January 2013 were reviewed for those pertaining to FG at our hospital. They yielded 20 cases with complete records. Incomplete records were eliminated from the study. Data was collected on patients' demographics, comorbidity, survivals, FSI at presentation, the source of infection, length of hospital stay (LOS), the number of ICU and operation room (OR) entries exclusively for urologic service, the total phalli and testes removed, colostomies created, and cystostomies performed. As the infection is polymicrobial, we standardized the antibiotic protocol to cover gram positive, gram negative, and anaerobic bacteria; providing Tazocin (piperacillin sodium and tazobactam sodium) 4.5 g intravenously, every eight hours, plus Dalacin C (clindamycin) 600 mg intravenously, every six hours.

King Abdul-Aziz hospital at holy Makkah, is a general hospital based on the high-traffic junction between Jeddah and Al-Madenah highways. All pilgrims (Hajji's) and citizens are eligible for treatment. It is the prime destination for Red Crescent clients throughout the year.

The human geography of the hospital put a special emphasis on our study; as the number of Hajji's, and the admission dates in relation to Hajj season were considered.

RESULTS

All 20 cases (100%) collected for the study survived, despite the known fatality of the condition. All patients were male and belonged to 11 different nationalities. The median age of the patients was 55.95 years (39–78 years) on the day of admission. Only one patient (5%) was admitted to intensive care unit (ICU) post-operatively because the operation aimed to track and cleanse the offensive discharge up to the left renal fossa. Penile amputation was carried out in three out of the 20 cases, accounting (15%) of the total, in where the pathology was limited to the phallus. The total number of OR entries for wound debridement by a urologist was 34 entries making an average of 1.7 entry per patient. Remarkably, half of the candidates involved in the study, (ten victims) were Hajji's. Furthermore, the total number of patients admitted in Al-Hajj months (the month 11 and 12 of Hijri Islamic calendar) was 14 (70%), constituting a noticeable seasonal peak. A majority of 12 patients, forming (60%) of the total, were diabetic and admitted with poorly controlled type II DM and sepsis. A sum of six testes extirpated from the whole study group were due to unusual involvement

of testes in the gangrene process, as testes blood supply are derived separately from the abdominal aorta via paired gonadal arteries (also called the internal spermatic arteries in older texts). Abdominal wall debridement was done in two cases (10%). None of the patients required colostomy creation. Only one patient constituting (5%) required a cystostomy tube insertion to divert the urine suprapubically in an attempt to deal with a cleaner wound. The source of the infection was identified only in 11 cases. The sources were anorectal in five cases, dermal in three cases and urologic in three cases. In remaining nine cases, the source could not be identified. Fournier's severity index (FSI) was calculated [4]. The average FSI was 5.65, ranging from 0 to 14. The average length of hospital stay was 22.3 days ranging from 1 to 76 days (Table 1). The most common microbes recovered from wound cultures were *Acinetobacter* species.

DISCUSSION

Although FG is a rare life threatening disease [5], it is not uncommon for a practitioner in our hospital to share FG management on the surgical floor, critical care unit, operating theater, or emergency room.

Table 1. Tabulated results of the twenty FG cases

	Absolute figures	Percentages %	
Overall survival	20	100	
ICU entries	1	5	
Cystostomies inserted	1	5	
Colostomies created	0	0	
Testes removed	6	--	
Penises amputated	3	15	
Abdominal wall debridements	2	10	
Plastic reconstructions	3	15	
OR entries (exclusively for urologic purpose)	34	*	
Pilgrims (hajji's)	10	50	
Admission at hajj months	14	70	
FSI score	113	**	
Diabetics	12	60	
Males	20	100	
Source of infection	Anorectal	5	25
	Dermal	3	15
	Urologic	3	15
	Unidentified	9	45

* The mean OR entries is 1.7

** The mean FSI is 5.65



Figure 1. Case 1. FG showing black gangrenous penis preoperatively.



Figure 4. Case 4. FG where penis is involved.



Figure 2. Case 2. FG shows dusky scrotum with macerated penile skin.



Figure 5. Case 6 FG severe perineal and scrotal gangrene.



Figure 3. Case 5. FG at 4th day post op. before bedside debridement.



Figure 6. Case 3 FG when partial penectomy is performed.

As FG is a urologic emergency, the sufferer will be booked for urgent surgical debridement at day one of the admission. These patients will often require a second-look operation after 24 to 48 hours to exclude further disease progression [6]. We believe that the excellent survival rates together with the low number of debridement attempts are attributed to aggressive initial debridement shortly after admission and to the daily or twice daily bedside dressing coupled with the comprehensive intravenous antibiotic coverage. The standard of antibiotics we set was Piperacillin 4 g (an extended spectrum beta-lactam antibiotic of the ureidopenicillin class) coupled with Tazobactam 0.5 g (beta-lactamase inhibitor) in a single formula; in combination with Clindamycin (a lincosamide antibiotic used to treat infections with anaerobic bacteria). Our antibiotics standard therefore, prevent gram negative and positive bacteria including *Pseudomonas aeruginosa* and anaerobes. We do not use hyperbaric oxygen, nor vacuum assisted closure; we would rather use povidone-iodine 10%, anti-septic solution after excising visibly dead tissue tags as a daily bedside wound refreshment procedure under narcotic injection. We save both testes in the inguinal canal marked by a long silk tie in order to bring them down later in the plastic reconstruction operation. Cases where the infection started anorectally were more difficult, as general surgeons had to share in the initial debridement procedure to secure the anal sphincter and to create a colostomy if needed.

It is worth mentioning that the FSI calculation did not add a significant value to our study, as FSI pa-

rameters are focused on the acuity of the case upon admission regarding vitals and electrolytes imbalance; in other words, no tangible reflection or clue to surgical morbidity. No case was sent for plastic reconstruction prior to having clean wound with three negative wound-swab cultures and normal albumin value. Although in 1924 Meleney attributed necrotizing infections to mainly *Streptococcal* species [6], in our study *Acinetobacter* species recovered. Despite the fact that FG is not exclusive for males, there were no female patients in our study. The multinationality of the candidates and the seasonal peak of the disease occurrence were striking features. Nowadays, Al-Hajj season corresponds to October and November in Gregorian months when the weather is modest. We expect to face more FG cases if the study was to be conducted in summer months; as in Al-Hajj dynamic, heat and strenuous physical activities demand more cleanliness and better hygiene (Figures 1–6).

CONCLUSIONS

In comparison to what is published in literature, FG is not considered rare for a practitioner in King Abdul-Aziz hospital, holy Makkah. The excellent survival rate recorded is believed to be due to the moderate severity of the cases treated, the comprehensive antibiotic coverage and mostly, to the surgical intervention timing and the extensive initial surgical debridement of dead and marginally viable tissues. The figures presented do not reflect Saudi nationals, as the study candidates were multinational.

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