

Fournier's gangrene: Experience of the Department of Plastic and Reconstructive Surgery at Moulay Ismail Military Hospital, Meknes—A Report of Three Cases

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Abstract

Introduction: Fournier's gangrene is a rapidly progressive polymicrobial necrotizing fasciitis of the perineal, genital, and perianal regions. Despite advances in resuscitation and antibiotic therapy, this condition remains a medical and surgical emergency associated with substantial morbidity and mortality. Management relies on early resuscitation, appropriate antibiotic therapy, and aggressive, repeated surgical debridement, followed by reconstruction of the resulting tissue defects once the infection has been controlled.

Case Reports: We report a series of three patients managed in the Department of Plastic and Reconstructive Surgery at Moulay Ismail Military Hospital, Meknes, for Fournier's gangrene. All patients received multidisciplinary management combining resuscitation, broad-spectrum antibiotic therapy, repeated surgical debridement, and local wound care. Reconstruction was performed once a healthy tissue bed had been obtained, using techniques tailored to the extent of the tissue defect. In one patient, extension of the necrosis to the urethra required urethral reconstruction using a tubularized split-thickness skin graft over a silicone urethral catheter, protected by local advancement flaps. Anatomical and functional outcomes were satisfactory in all three patients.

Conclusion: Fournier's gangrene constitutes a therapeutic emergency whose prognosis depends essentially on the timeliness of diagnosis and the speed of management. The plastic surgeon plays a major role in the reconstruction of genitoperineal tissue defects, restoring cutaneous coverage, protecting vital structures, and improving functional and aesthetic outcomes.

Keywords: Fournier's Gangrene; Necrotizing Fasciitis; Reconstructive Surgery; Perineoscrotal Reconstruction; Skin Graft; Local Flaps.

1. Introduction

Fournier's gangrene is a rare, rapidly progressive form of necrotizing fasciitis affecting the perineal, genital, and perianal regions. Despite advances in resuscitation and antibiotic therapy, it remains a medical and surgical emergency associated with high mortality, estimated at more than 20% in contemporary series [1,2]

This condition most often results from a synergistic polymicrobial infection, favored by comorbidities such as diabetes, immunosuppression, obesity, or anorectal and urogenital infections. Management relies on early diagnosis, appropriate resuscitation, broad-spectrum antibiotic therapy, and aggressive surgical debridement. Once the infection has been controlled, reconstruction of the tissue defects constitutes an essential step to restore coverage of the genitoperineal structures and to achieve a satisfactory functional and aesthetic outcome [1,3]

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Through this series of three cases, we report the experience of the Department of Plastic and Reconstructive Surgery at Moulay Ismail Military Hospital, Meknes, in the reconstructive management of Fournier's gangrene. We focus on the reconstructive strategies used according to the extent of the tissue defects, as well as on an exceptional case complicated by urethral discontinuity requiring specific reconstruction [3,4]

2. Case 1: Fournier's Gangrene Complicated by Urethral Discontinuity in a Diabetic Patient

A man aged 75 ans, with type 2 diabetes treated with oral antidiabetic agents for approximately ten years, was under follow-up for progressively worsening paraparesis. Neurological work-up, including brain and spinal cord imaging, revealed no abnormality that could account for the neurological deficit. Prolonged bed rest was complicated by a stage IV sacral pressure ulcer, treated in our department by excision followed by coverage with gluteal rotation flaps, with an unfavorable outcome.

A few months later, the patient was admitted emergently with septic shock secondary to extensive Fournier's gangrene. Clinical examination revealed marked deterioration of the general condition with hemodynamic instability. The necrotic lesions involved the perineum, scrotum, penis, and suprapubic region. Surgical exploration revealed extension of the necrosis to the urethra, resulting in urethral discontinuity.

Multidisciplinary management was initiated from admission. After intensive resuscitation, correction of electrolyte imbalances, anemia, and malnutrition, together with tight glycemic control, empirical broad-spectrum antibiotic therapy was started and subsequently tailored according to the results of bacteriological samples. Initial surgical treatment consisted of extensive debridement of all necrotic tissue, followed by repeated debridements and daily local wound care until a clean, well-vascularized tissue bed was obtained.



Figure 1 Appearance after debridement, showing perineoscrotal and urethral tissue loss.

The patient was then transferred to our department for reconstruction of the extensive perineogenital tissue defects. Because of the urethral discontinuity, urethral reconstruction was performed using a tubularized autologous split-thickness skin graft over a silicone urethral catheter, used as a stent. This reconstruction was protected with local advancement flaps, providing well-vascularized coverage. The testes were buried in subcutaneous pouches created on the medial aspects of the thighs. Coverage of the penis and suprapubic region was achieved with an autologous split-thickness skin graft.

The postoperative course was uneventful. The skin grafts showed excellent take, the flaps remained fully viable, and no infectious complications were observed. Healing was achieved under good conditions, with a satisfactory anatomical result and stable coverage of the genitoperineal structures. The patient underwent regular follow-up confirming a favorable clinical course. The postoperative course was uneventful. The skin grafts showed excellent take, the flaps remained fully viable, and no infectious complications were observed. Healing was achieved under good conditions, allowing stable coverage of the genitoperineal structures. The patient underwent regular clinical follow-up confirming a favorable local course.



Figure 2 Favorable wound healing after skin grafting and urethral suture.

3. Case 2: Fournier's Gangrene Secondary to an Anal Fistula in an 83-Year-Old Patient

A man aged 83 ans, with no significant medical or surgical history, had undergone surgical treatment of an anal fistula a few weeks earlier. The clinical course was marked by the onset of severe perineal pain associated with rapidly progressive swelling of the scrotum and penis, prompting emergency admission.

Clinical examination revealed impairment of the general condition with Fournier's gangrene involving the scrotum and penis. After initial management combining resuscitation, empirical broad-spectrum antibiotic therapy, and extensive surgical debridement of necrotic tissue, the patient received daily local wound care and further debridements until a satisfactory granulation bed was obtained. Antibiotic therapy was subsequently adjusted according to the results of bacteriological samples.

After control of sepsis and of the local infection, the patient was referred to our Department of Plastic and Reconstructive Surgery for management of the extensive genitoperineal tissue defects. The initial debridement, which had been particularly extensive, had resulted in complete loss of the scrotal envelope, necessitating a two-stage reconstruction.

In the first stage, scrotal coverage was achieved using two medial thigh fasciocutaneous flaps, pedicled on branches of the internal pudendal artery, allowing complete burial and coverage of the testes. After satisfactory healing and tissue stabilization, a second surgical stage was devoted to penile reconstruction using an autologous split-thickness skin graft.

The postoperative course was favorable, with good flap vitality, complete graft take, and satisfactory healing at all operative sites. Long-term clinical follow-up demonstrated a satisfactory anatomical and functional result, with no local complications or infectious recurrence.



Figure 3 Sequential surgical management of a penile tissue defect: from debridement to the final result after complete healing.

4. Case 3: Fournier's Gangrene Secondary to an Anal Abscess in a 56-Year-Old Patient

A 56-year-old man, with no significant medical or surgical history, was initially treated for an anal abscess managed by surgical incision and drainage. The clinical course was marked by rapid extension of the infection to the genitoperineal tissues, resulting in Fournier's gangrene involving the perineum, scrotum, and penis, prompting emergency admission. On admission, the patient presented with severe sepsis and impairment of the general condition. Laboratory work-up showed a marked inflammatory syndrome with C-reactive protein (CRP) of 190 mg/L, anemia with hemoglobin of 9 g/dL, and severe hypokalemia of 2 mmol/L. Multidisciplinary medical and surgical management was initiated from admission, combining fluid and electrolyte resuscitation, correction of the hypokalemia, blood transfusion to correct the anemia, empirical broad-spectrum antibiotic therapy, and appropriate nutritional support. The clinical and biological course became favorable after approximately ten days of treatment. Initial surgical treatment consisted of extensive debridement of all necrotic tissue, followed by repeated debridements according to the local course. Daily local wound care was performed with povidone-iodine and hydrogen peroxide irrigation, followed by regular dressing changes until a clean, well-vascularized granulation bed favorable for secondary reconstruction was obtained. Antibiotic therapy was subsequently adjusted according to the results of bacteriological samples.

Multidisciplinary medical and surgical management was initiated from admission, combining empirical antibiotic therapy subsequently adjusted according to bacteriological results, fluid and electrolyte resuscitation, blood transfusion to correct the anemia, and nutritional support aimed at correcting the hypoalbuminemia. Daily local wound care with dressing changes was continued to ensure infection control, progressive wound cleansing, and optimization of local conditions in preparation for reconstruction.

After clinical and biological stabilization and satisfactory control of the infectious process, the patient was transferred to our Department of Plastic and Reconstructive Surgery for management of the genitoperineal tissue defects. Because the initial debridement had been limited in extent, part of the scrotal envelope remained viable, allowing a conservative reconstruction. This consisted of burying the testes after undermining the residual scrotal tissue to achieve sufficient mobilization of the wound edges without tension. Closure was performed in two layers after rigorous hemostasis, with placement of Delbet drains in the undermined spaces to ensure effective postoperative drainage.

Penile reconstruction was performed in a second surgical stage, one week after testicular burial. This interval allowed continuation of local wound care and the establishment of a clean, well-vascularized recipient bed free of any infectious focus, while limiting repeated mobilization of the penis during dressing changes, which could otherwise compromise the take of an early skin graft. An autologous split-thickness skin graft was then performed according to standard principles. The postoperative course was favorable, with complete graft take, satisfactory healing, and a functional and aesthetic result judged satisfactory.



Figure 5 Surgical sequence: from initial debridement to testicular burial

In all three of our patients, particularly strong family involvement was observed throughout management. The active participation of relatives in daily support, postoperative care, and adherence to medical recommendations promoted good treatment compliance. In parallel, postoperative management relied on meticulous local wound care, control of diarrhea to limit fecal contamination of the wounds, and urinary diversion by bladder catheterization to protect the reconstructed sites. This conservative strategy avoided the need for a diverting colostomy while ensuring satisfactory healing without increasing infectious risk.

5. Discussion

Fournier's gangrene is a fulminant necrotizing fasciitis of the genitoperineal region whose prognosis depends on the timeliness of diagnosis, the speed of resuscitation, and the aggressiveness of surgical treatment. Despite advances in multidisciplinary management, early and extensive surgical debridement remains the cornerstone of treatment and must be performed without delay to control sepsis and limit the progression of necrosis [5,6].

Debridement must be sufficiently wide to excise all necrotic tissue down to healthy, well-vascularized tissue. Because infection spreads rapidly along the superficial fascial planes, several surgical revisions are often required before a satisfactory granulation bed suitable for secondary reconstruction is obtained [7,8]. In our series, all patients underwent repeated debridements combined with appropriate antibiotic therapy, daily local wound care, and optimization of their general condition before any reconstructive procedure.

The timing of reconstruction remains a determining factor in management. Most authors recommend delayed reconstruction, performed only after complete control of the infection and improvement of the general condition, in order to reduce the risk of infectious complications and to optimize flap viability and skin graft take [9]. This strategy was adopted in all three of our patients and resulted in complete healing without infectious recurrence.

Reconstruction must be tailored to the extent of the tissue defect and to the tissue available. Limited defects can be managed by direct closure or mobilization of residual scrotal tissue, whereas more extensive defects require locoregional flaps or skin grafts [9,10]. In our series, reconstructive management was individualized: one patient underwent testicular burial made possible by preservation of part of the scrotal envelope, a second required scrotal reconstruction using medial thigh fasciocutaneous flaps pedicled on branches of the internal pudendal artery because of total scrotal loss, while the third presented with urethral discontinuity requiring urethral reconstruction combined with penile reconstruction.

Split-thickness skin grafting represents a treatment of choice for coverage of penile tissue defects when the corpora cavernosa are preserved. It provides pliable, durable coverage compatible with satisfactory functional recovery, provided the recipient bed is adequately prepared [10,11]. In our experience, penile reconstruction was deliberately performed in a second surgical stage after complete wound sanitation, which allowed complete graft take in all patients.

Medial thigh fasciocutaneous flaps pedicled on branches of the internal pudendal artery represent an excellent option for scrotal reconstruction in cases of extensive tissue loss. Their anatomical proximity, reliable vascularization, low donor-site morbidity, and satisfactory aesthetic and functional results account for their widespread use in the literature [12].

The systematic use of a diverting colostomy remains controversial. Current data suggest reserving it for patients with anorectal involvement, sphincter destruction, or major fecal contamination that is difficult to control [13]. In our series, no patient required a colostomy. Protection of the reconstructed sites relied on urinary diversion by bladder catheterization, rigorous control of diarrhea, daily local wound care, and substantial family involvement. The active participation of relatives in care, postoperative support, and adherence to therapeutic recommendations contributed considerably to continuity of care and treatment compliance.

The results obtained in our series are consistent with those reported in recent studies, confirming that early multidisciplinary management, combined with an individualized reconstructive strategy, allows complete healing with satisfactory anatomical and functional outcomes, even in the presence of complex genitoperineal tissue defects [9,14].

6. Conclusion

Our case series highlights the importance of early multidisciplinary management of Fournier's gangrene. Reconstruction performed in multiple surgical stages, after control of the infection and optimization of the general condition, allows the reconstructive strategy to be tailored to each patient and improves anatomical and functional outcomes. Locoregional flaps and split-thickness skin grafts constitute reliable solutions for the reconstruction of complex genitoperineal tissue defects.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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