

Fournier gangrene with extensive necrosis of urethra and bladder mucosa: A rare occurrence in a patient with advanced prostate cancer

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Abstract

Fournier gangrene (FG) is polymicrobial necrotizing infection of subcutaneous tissues and deep fascia, commonly involving the perineum, external genitalia, anterior abdominal wall and medial aspect of thighs. Urethral pathology, although often the inciting factor for FG, extensive involvement with urethral necrosis is very rare. This is the first report in English literature, describing complete sloughing of the bulbar urethra with ischemic necrosis of the bladder mucosa from FG. Such extensive disease is associated with high mortality, despite higher antibiotics, through debridement and intensive care. Urethral involvement needs extensive debridement and temporary or permanent urinary diversion.

Key Words: Fournier gangrene, indwelling catheter, ischemic necrosis of bladder mucosa, urethral necrosis

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INTRODUCTION

Fournier gangrene (FG) is a polymicrobial necrotizing fasciitis usually involving the perineal, perianal or genital areas.^[1] Localized infection adjacent to a portal of entry is often the inciting event for FG; colorectal, genitourinary and dermatologic sources are implicated in the pathogenesis. Trauma, instrumentation, recent surgery, presence of foreign bodies, inadequate perineal hygiene and long term indwelling catheters may also lead to FG.^[2-6]

Fournier gangrene extensively involves subcutaneous tissue and deep fascia of the perineum, external genitalia, anterior abdominal wall and medial aspect of thighs.^[5] Urethral

pathology, although often the inciting factor of FG, its extensive involvement with necrosis is very rare.^[6]

Only one case of partial necrosis of urethra from FG has been reported until date.^[7]

We describe a case of necrosis of entire bulbar urethra and urinary bladder mucosa from extensive FG, in a patient of prostate cancer on indwelling catheter.

CASE REPORT

A 65-year-old male with refractory urinary retention from metastatic prostate cancer was on indwelling catheter for 2 months. He presented with fever, altered sensorium, periurethral abscess, and genital gangrene extending to the suprapubic region.

Catheter was being changed every fortnightly, without symptoms of urinary infection. He presented to the emergency with history of fever, altered sensorium, perineal pain and septicemic shock. There was periurethral abscess with penile necrosis [Figure 1] and gangrene of the scrotum extending to the suprapubic region. There was no anorectal pathology.

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After resuscitation with intravenous fluids and broad spectrum antibiotics, trocar cystostomy was performed at the bedside under ultrasound guidance, and per urethral catheter was removed.

Then he was taken up for debridement under anesthesia. Scrotum and penile skin were gangrenous involving subcutaneous tissues. Entire bulbar urethra was necrosed [Figure 2a and b], and was excised.

Cystostomy initially drained turbid urine, followed by whitish tissues blocking the catheter.

Therefore urinary bladder was explored and to our utter surprise bladder mucosa was found to be necrosed and friable; a 15 cm × 20 cm whitish necrotic membrane was gently removed [Figure 2c-e]. Bladder was closed over a suprapubic catheter. Although testicles were not involved with FG, the



Figure 1: Tense periurethral abscess with gangrene of penile skin

patient underwent bilateral orchidectomy for metastatic prostate cancer.

The patient had a stormy postoperative course requiring ventilatory support. *Escherichia coli*, *Enterococcus* and anaerobes grown in per operative tissues and pus cultures were treated with appropriate broad spectrum antibiotics. The patient recovered with nursing care and daily wound dressing.

Histopathology of sloughed bulbar urethra and bladder mucosa revealed ischemic necrosis.

After 5 weeks, secondary closure of the wound was performed. The penile shaft was covered with remaining scrotal skin flaps [Figure 3a and b]. Patient's serum prostate specific antigen (PSA) decreased from 160 ng/ml to 7.0 ng/ml at 4 weeks. During 12 months of follow-up serum PSA is <1 ng/ml, and he is on suprapubic cystostomy.

DISCUSSION

Fournier gangrene originally described by Baurienne (1764) and Fournier (1883) as abrupt onset of a rapidly fulminating genital gangrene of idiopathic origin in previously healthy young patients, is no longer “idiopathic” since the pathogenesis and entry of causative organisms are well defined.^[1,2]

Trauma results in access of infectious organisms to subcutaneous tissues. Organisms from urinary tract (most commonly periurethral gland infection) extend along fascial planes to involve the penis and scrotum. Perianal infection can (less commonly) extend through the retropubic space and along fascial planes to penis and scrotum.^[2,5] Urethral obstruction,

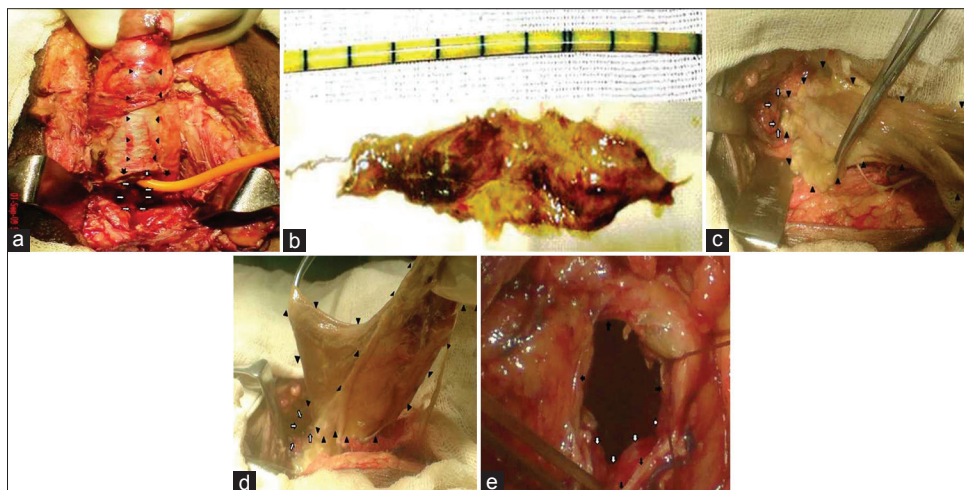


Figure 2: (a) Postdebridement of gangrenous skin and necrosed bulbar urethra (white arrows); black arrows showing healthy margin of urethra and penis. (b) Gangrenous bulbar urethral tissues. (c and d) Membranous cast of necrosed bladder mucosa removed by gentle traction. (e) Inflamed and friable bladder wall (black arrows) and mucosa (white arrows)

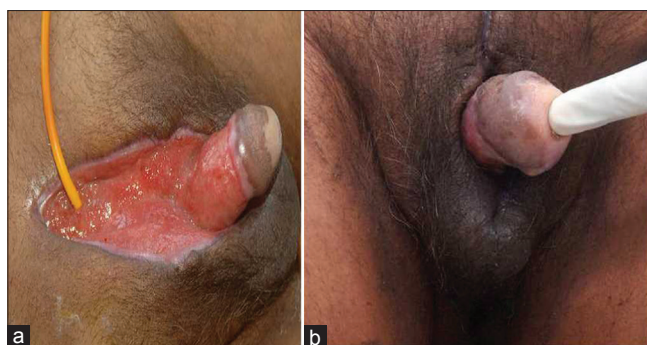


Figure 3: (a) Well healed granulation 4 weeks postdebridement. (b) Healed wound after 8 weeks following secondary closure and coverage of penile stump in scrotal skin flaps

instrumentations and urinary extravasation have been associated with the development of FG.^[1,5,6]

Diabetes mellitus, alcoholism, malignancy, immunosuppression, chronic debilitating illness and chronic steroid use are predisposing factors for FG.^[1-4]

Subcutaneous spread of microorganisms leads to obliterative endarteritis. Inflammation and edema in an enclosed space impair blood supply and resulting hypoxia permits further growth of facultative and obligatory anaerobes, such as *E. coli*, *Bacteroides fragilis*, and *Clostridium perfringens*.^[5] *Bacteroides* species inhibit the phagocytosis and killing of a variety of aerobic organisms. Thus, a destructive infection results from a combination of relatively nonpathogenic organisms.^[8]

Some of the aerobic organisms cause platelet aggregation and accelerate the coagulation by complement fixation, whereas certain anaerobes produce heparinase and promote clotting via different pathways. These factors may explain vascular thrombosis, a prominent feature in FG, and are probably responsible for the subcutaneous tissue necrosis and the dermal gangrene.

Urethra is supplied by multiple sources, like bulbar artery, perforating branches from corpora and retrograde branches from glans penis. Therefore urethral gangrene is very rare. Tough Bucks fascial cover prevents direct involvement of urethra from surrounding gangrene.

Gómez Pérez *et al.*, has reported a case of partial sloughing of urethra that was re-epithelized from native urethral

tissues.^[7] Lee and Hong has reported an unusual presentation of FG involving the bulbous urethra and forming free gas in the urinary bladder which was successfully managed by urgent, aggressive surgical debridement and urinary diversion.^[9]

This is the first report in English literature, describing necrosis of the bladder mucosa and entire bulbar urethra from FG. Such severe clinical spectrum of FG, although is very rare, should be kept in mind while treating sick patients with such predispositions and comorbidities.

CONCLUSION

Fournier's gangrene at times can be extensive and rarely can involve deeper structures. Urethral necrosis from FG is very rare, and such cases require management by extensive debridement and urinary diversion.

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