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Case Report

Isolated Fournier's Gangrene of Anterior Scrotal Wall and Penis: A Rare Case Report

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ABSTRACT

BACKGROUND: Fournier's gangrene (FG) is a rare and severe necrotizing fasciitis affecting the external genitalia, perineal, or perianal regions. Isolated penile along with sectoral anterior scrotal wall FG is an exceptionally rare clinical occurrence, with only a few cases documented in the literature.

CASE DESCRIPTION: We present an unusual case of isolated penile FG in a 78-year-old man without any co-morbidity except post- hospitalisation CKD. The patient presented with blackish discoloration and painful swelling of the shaft of the penis and sectoral anterior scrotal wall, without fever or any sign of sepsis. He was promptly treated with broad-spectrum antibiotics, followed by immediate surgical debridement. Once the wound bed was healthy, scrotal and penile reconstruction was performed using an unexpanded, meshed, split-thickness skin graft. The recovery was uneventful, resulting in satisfactory cosmetic outcomes.

DISCUSSION: FG is a rare, rapidly progressing necrotizing infection of the perineum and genital area, with a high mortality rate of up to 50%. It is often caused by polymicrobial infection. Diagnosis is typically clinical, although radiologic studies can be useful for assessing the extent of the disease. Clinical features of FG include sudden onset of pain, swelling in the scrotum, and wound discharge. Isolated penile FG is rare, with the corpora cavernosa often remaining unaffected. Its occurrence is generally related to sexual habits or traumatic injuries. The primary treatment approaches include rapid and aggressive surgical debridement of necrotized tissue, administration of broad-spectrum antibiotics, and early resuscitation.

CONCLUSION: Isolated sectoral anterior wall and penile FG is an exceptionally rare condition with only a few reported cases. Early and thorough debridement of all necrotic tissue is crucial for successful treatment.

INTRODUCTION

Fournier's gangrene (FG) is an uncommon necrotizing fasciitis that affects the genital, perineal, and perianal regions. It was first described by the French dermatologist Jean Alfred Fournier in 1883 as idiopathic gangrene of the penis and scrotum in five young men.[1] The infection is usually caused by a combination of aerobic and anaerobic microorganisms, with the most commonly isolated being E. coli, Bacteroides, and Streptococcus. The mortality rate is high, reaching up to 50% in some cases.[2]

Predisposing factors include diabetes, alcohol abuse, extremes of age, malignancy, chronic steroid use, cytotoxic drugs, lymphoproliferative diseases, malnutrition, and HIV infection. Due to the rich blood supply to the penis, isolated penile involvement in Fournier's gangrene is uncommon, and almost all cases are associated with penile trauma and prolonged urinary catheterization. Clinical features of FG vary and can include fever, sudden pain, swelling in the scrotum, and purulence or wound discharge.[3] Diagnosis is primarily clinical.[2,3] Early recognition, fluid-electrolyte resuscitation, and aggressive surgical debridement are crucial in managing FG. Isolated gangrene of the anterior scrotal wall along with the penis is a very rare occurrence.

CASE REPORT:

A 78-year-old male patient presented to the outpatient clinic with a 45-day history of redness and blackish discoloration of the anterior scrotal wall, as well as blackish discoloration of the penile shaft associated with tenderness and scanty, foul-smelling purulent discharge from the lesion without fever or any sign of sepsis. The patient reported no recent history of sexually transmitted diseases, genitourinary trauma, or urethral instrumentation. He is a non-smoker and non-alcoholic, with no recent sexual activity. His past medical history was unremarkable.

Upon admission, his temperature was 97°F, and his vital signs were stable. Physical examination revealed mild edema, mild tenderness, slight induration along the margin of the gangrene, no skin breaks, a normal glans, and blackish discoloration of the V-shaped anterior scrotal wall symmetrical around median raphe and entire penile shaft skin, except for an island of skin near the meatus and base of the penis (Fig. 1& 2).

Fig 1

Fig 2

Both testicular and digital rectal examinations were normal, and the patient reported no dysuria, nocturia, frequency, or hematuria.

Laboratory tests revealed a total leukocyte count (TLC) of 4650/mm³ without neutrophilia or left shift. Urinalysis showed 1–2 white blood cells (WBC) per high power field. Blood urea and serum creatinine levels were elevated (urea: 60.81 mg/dL, creatinine: 2.23 mg/dL). Hemoglobin was measured at 6.1 g/dL.

After removing the dry gangrene eschar (fig 3), pus collected .

Fig 3

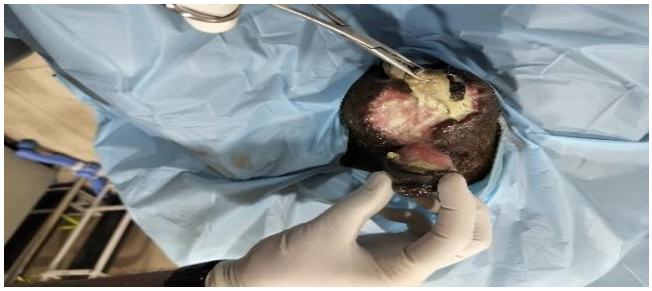

Fig 4

Fig 5

The necrotic tissue (fig 4) was debrided to bleeding edges, and samples were sent for culture and sensitivity testing. HIV and sexually transmitted disease (STD) panels were negative. A nephroprotective broad-spectrum antibiotic course, guided by culture sensitivity results, was initiated post Foley's catheter insertion, along with adequate hydration. Following nephrology consultation, erythropoietin and other nephroprotective medications were administered. Debridement revealed necrosis of the tissue below the skin on the ventral and dorsal aspects of the penis, involving the penile dartos layer up to the corpora spongiosa and the dartos layer of the anterior scrotal wall. Aggressive debridement with excision of all necrotic tissue was performed (Fig. 5).

Pus cultures revealed the presence of S. aureus, E. coli, and Pseudomonas aeruginosa. The Pseudomonas aeruginosa was sensitive to levofloxacin, piperacillin-tazobactam (piptaz), and meropenem. Staphylococcus aureus was sensitive to linezolid, clindamycin, and cotrimoxazole. E. coli was sensitive to meropenem, amikacin, and gentamicin. The patient completed a further three-week course of antibiotics according to the sensitivity test, and regular wound dressings were done twice daily.

The scrotal wound was closed primarily after nine days, the scrotal wound bed had granulated and was healthy (Fig. 6)

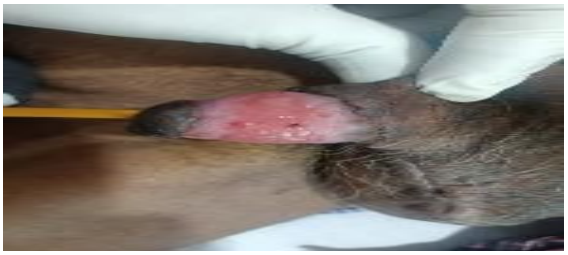

Fig 6

Penile reconstruction was performed using a meshed, unexpanded split-thickness skin graft was placed on the ventral and dorsal aspects of the penis after subsequent cultures of the penile granulation tissue were negative for Pseudomonas, following the completion of the antibiotic course. The patient was discharged on the 21st postoperative day. Serum creatinine level fall to 1.98 mg/dl at time of discharge. At the follow-up visit one week after discharge, the patient showed marked improvement with no signs of infection or flap necrosis. The patient provided written consent for the publication of this clinical case.

DISCUSSION:

Fournier's gangrene is a synergistic necrotizing fasciitis that affects the genitalia, perineum, and abdominal wall. It is a rare, rapidly progressing, and potentially fatal soft tissue infection, constituting a urological emergency with a high mortality rate [4]. Risk factors for its development include diabetes, alcohol abuse, advanced age, malignancy, renal failure, and immunodeficiency.

Typically, the scrotum is the primary site of gangrene, with potential spread to other parts of the perineum or anterior abdominal wall. Isolated penile involvement along with sectoral dry gangrene of anterior scrotal wall in Fournier's gangrene is very rare due to the rich vascular

supply from the bulbourethral artery and sectorial blood supply by other scrotal artery.

The underlying causes of Fournier's gangrene are mostly idiopathic. However, penile Fournier's is thought to be initiated by a traumatic or vascular insult to the penis [5,6]. Known predisposing factors for Fournier's gangrene of the scrotum, such as diabetes and urethral stricture, have also been reported in some cases of isolated penile Fournier's gangrene [8]. Specific factors to the penis include penile abrasion during oral sex, anal intercourse in homosexuals, and penile self-injection of cocaine [7]. Calciphylaxis of the penis, characterized by intravascular calcification of small and medium-sized blood vessels, focal thrombosis, and intimal fibroblastic proliferation with luminal narrowing, has also been reported as a rare cause of penile gangrene, especially in patients with end-stage renal disease and diabetes [5]. Penile edema, which impairs venous and lymphatic drainage, as seen in patients with congestive cardiac failure, may predispose to infection of the subcutaneous tissues [7]. In this case, penile gangrene appeared to be associated with end-stage renal disease (ESRD).

The initial clinical presentation of penile gangrene includes a prodromal period of genital pain and fever, followed by genital swelling, necrosis, ulceration, and foul odor. Diagnosis is primarily clinical [8]. Examination typically reveals purulent discharge, areas of necrosis, and crepitus, and computed tomography (CT) may be used to evaluate the extent of the disease [8]. Despite the continuity of the superficial fascial planes of the penis and scrotum, we did not observe an extension of gangrene beyond the V sector of the anterior scrotal wall and penile skin. This could be attributed to the separate blood supply of the corporal cylinders from the internal pudendal artery, while the skin, dartos, and Buck's fascia are supplied by the external pudendal arteries [7].

The primary management of Fournier's gangrene of the penis involves intravenous fluids, parenteral broad-spectrum antibiotic therapy, early surgical debridement, and reconstruction surgeries [4,7,8]. Broad-spectrum antibiotics typically include a triple therapy: third-generation cephalosporins or aminoglycosides, plus penicillin, and metronidazole, adjusted according to culture results [8]. Fournier's gangrene necessitates aggressive debridement of necrotic tissue [7,8]; however, excessive removal of healthy penile tissue should be avoided to preserve structures necessary for reconstruction [6]. Serial debridement's can be useful when tissue viability is in doubt, allowing time to accurately differentiate between viable and gangrenous tissues [4]. In this case, it was a dry gangrene with well-demarcated healthy and dead tissue, likely due to chronic changes in the blood vessels supplying the affected area.

After wound bed cleaning, the challenge is to cover the defective penile skin cosmetically without compromising erectile function. While remnant foreskin or scrotal skin can be used for penile skin loss coverage, split-thickness skin grafts are considered the best approach [7]. After developing healthy granulation tissue, we approximated and closed the wound. Penile coverage was performed after a three-week course of antibiotics based on culture results, and the last culture report was negative.

CONCLUSION:

Isolated penile Fournier's gangrene is a rare urological emergency. While its causes are largely idiopathic, specific predisposing factors, such as penile trauma and calciphylaxis, have been documented. The primary treatment involves antibiotic therapy and surgical debridement. For cosmetically covering the affected skin without compromising erectile function, split-thickness skin grafts are the preferred approach. For scrotal wound it is always better to to closed it primarily if loss of tissue is one-third.

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