Noninfectious glans gangrene in a diabetic male

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INTRODUCTION

Gangrenous lesions of the penis are an uncommon urological condition, primarily due to abundant blood supply.[1] In rare cases of extreme morbidity, it can be afflicted with distal necrosis like ischemic gangrene of digital extremities.[2] Literature shows around 35 such cases that include two case series of seven cases each, along with sporadic reports of solitary cases. Most patients had diabetes and end-stage renal disease (ESRD) and were on renal replacement therapy. Systemic effects of these diseases with widespread vascular occlusion led to repeated hospitalization.[3] The majority of cases were associated with poor outcomes and high mortality.[3,4] Penile calciphylaxis due to secondary hyperparathyroidism contributes significantly in the development of such lesions. The other causes include penile prosthesis, tourniquet effect created by condom appliances, priapism, pyoderma gangrenosum, and thromboembolic phenomena.[5]

Isolated noninfectious glans gangrene is an even rarer subset of penile gangrene, especially in nonmoribund patients. We present the case of a well-preserved diabetic male with normal renal functions who developed limited glans gangrene with no demonstrable infective etiology. To the best of our knowledge, it is the second such case report in literature following Vijayan, who reported a similar case in 2009.

CASE REPORT

On September 16, 2018, a 64-year-old male presented with mild dull aching pain at the tip of the penis for the past few days and lower urinary tract symptoms of several months. He was a long-standing poorly controlled diabetic and hypertensive patient with a history of bilateral great toe amputations. There was no history of ischemic heart disease. He had erectile dysfunction for many years. The patient chewed tobacco...
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80% neutrophils, serum creatinine 1.08 mg/dl, and serum electrolytes within normal limits. Urine routine and microscopy showed 2–6 pus cells/HPF and 2 red blood cell/hpf with negative test for leukocyte esterase and nitrite. Urine culture was sterile after 48 h. Serum prostate-specific antigen was 1.4 ng/ml. Serum calcium was 9.6 mg/dl, phosphate was 3.6 mg/dl, and parathyroid hormone was 41.4 pg/ml.

Ultrasound of the abdomen showed a 38 g prostate with normal urinary bladder wall thickness and otherwise normal study. X-ray of the pelvis revealed diffusely calcified outlines of bilateral common iliac arteries with calcifications extending into distal branches [Figure 2].

After proper glycemic control, debridement under the penile block with antibiotic cover was planned. The penis was degloved, line of demarcation identified all around the lesion, and debridement was done [Figure 1b]. Most of the dorsal glans was resected. Underlying corpora cavernosa was uninvolved, and the urethra was well-vascularized and healthy. Reconstruction was done with preputial flaps. The penile stump length achieved was 3.5 cm. The patient had an uneventful postoperative period with a healthy wound on discharge. The catheter-free trial was successful after 2 weeks on alpha-blockers. Histopathology showed extensive necrosis of the glans with acute and chronic inflammation. No evidence of atypia/malignancy was seen [Figure 1c]. Tissue culture was sterile, and no fungal hyphae were seen.

No further debridement or amputation was required. The patient was kept in a close follow-up with regular penile status examination. A comprehensive cardiac evaluation was also carried out and found normal. He remains without any complication at 6 months after the surgery [Figure 1d].

His blood investigations showed hemoglobin 10.2 g/dl, elevated total leukocyte count of 12,200 with until 3 years back. On examination, he was afebrile with a blood pressure of 146/80 mmHg and a regular right radial pulse rate of 92 beats/min. All peripheral pulses, except the dorsalis pedis, were palpable bilaterally. An abdominal examination revealed a palpable bladder. There was no inguinal lymphadenopathy. Local examination revealed poor hygiene with a large right hydrocele. On retracting the prepuce, the glans tissue was in a well-circumscribed white slough-like necrotic condition. There was a sharp line of demarcation, just distal to coronal sulcus, with sparing of a 1.5 cm strip of ventral tissue. The meatal opening was visible. There was no tenderness, surrounding induration, or any other sign of inflammation [Figure 1a]. On reexamining the history, the patient said that the lesion was present for the last 8–10 months and was not bothersome in any way till presentation. Normal-sized prostate gland with firm feel was found on the rectal examination. The patient was admitted and initial treatment started. He was catheterized with 14 F Foley catheter which drained approximately 800 ml of clear urine. His random blood sugar was found to be 332 mg/dl, for which insulin was started under the guidance of a physician.

**Figure 1:** (a) Necrotic slough-like lesion on the dorsal glans limited till coronal sulcus with sharp line of demarcation. (b) Debridement of necrotic lesion. (c) Biopsy showing extensive necrosis with inflammatory changes. No atypia/malignancy. (d) The appearance of the stump after 3 months

**Figure 2:** X-ray of the pelvis showing calcifications in bilateral common iliac arteries and their branches
DISCUSSION

Penile necrosis is a hallmark of severe systemic vascular disease and carries a poor prognosis. Stein et al. in their series of seven ESRD patients reported a 71% mortality at 6 months and observed no advantage of aggressive surgical treatment.\cite{4} Case reports of similar patients by Agarwal et al. also reported patients succumbing to their disease before the intervention.\cite{1} While observing a high 57% mortality at 6 months, Weiner and Lowe reported the success of early distal penectomy in three of their patients and wound complications in two others in whom the surgery was delayed. They concluded that early intervention was beneficial in the appropriate patient with observation reserved for moribund cases.\cite{3} In the case report of isolated glans penis necrosis by Vijayan, there was further progression of the disease requiring a partial amputation.\cite{2}

Our patient had normal renal functions with normal electrolyte levels. Although there was radiological evidence of large and small vessel calcification, his \((\text{Ca}^{2+}) \times (\text{PO}_4^{3-})\) product was 34.56 mg\(^2\)/dl\(^2\), which is well below the 70 mg\(^2\)/dl\(^2\) levels associated with metastatic calcification and calciphylaxis. He had normal parathormone levels. Active bacterial or fungal infections were also not found. Patient’s uncontrolled diabetes, history of tobacco consumption, and vascular insufficiency are likely to have caused a state of reduced blood supply in the index case. A further insult in the form of local inflammation/infection due to poor hygiene could have resulted in the localized area of gangrene.

Limited glans gangrene in nonmoribund patients can be treated successfully with early surgical debridement. Further close follow-up for the observation of the stump for any progression along with surveillance for other systemic manifestations of the disease is required.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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