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Genitourinary

Occlusion of bilateral dorsal penile arteries resulting in glans necrosis in an obese male truck driver

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ABSTRACT

Ischemic penile gangrene is an uncommon urologic condition associated with significant morbidity. Etiology of the disease is due to vasculogenic ischemia of the penile tissue. Presented are a series of images from a case of a 51-year-old morbidly obese male truck driver with idiopathic ischemic penile gangrene. The patient was evaluated with penile angiography and treated with urinary diversion via suprapubic catheter placement and serial debridement of the necrotic tissue.

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Introduction

Ischemic penile gangrene is a rare and understudied urologic condition associated with significant morbidity. The disease has been associated with diabetes mellitus, renal insufficiency, paraphimosis, priapism, tourniquet syndrome, venous outlet obstruction, and IV drug use [1–3]. Our knowledge of the condition remains limited, and it still occurs in patients without any clear cause.

Blood flow to the penis originates from the paired internal pudendal arteries, which are branches off the internal iliac arteries. The internal pudendal arteries further branch into the bulbourethral arteries, which supply the bulb and penile urethra, the dorsal penile arteries, which supply the glans, and the cavernosal arteries, which play an integral role in the process of tumescence and erection. This complex arterial network is

important in maintaining the physiological function of the penis [2].

Few cases have been published in the literature, and the reported workup and treatment for this condition is inconsistent. We report a case of a 51-year-old morbidly obese male truck driver who presented with isolated penile glans dry gangrene of unknown origin while driving across the country. This case is one of a few cases of isolated glans necrosis and includes penile angiography that emphasizes the unusual pattern of diminished blood flow consistent with the clinical findings for this patient. Although performed later in this particular patient's clinical course, penile angiography recognized the obstructed blood vessels and helped guide treatment decisions. Angiography could also have the potential to guide revascularization in early states of acute penile ischemia in certain cases.

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Case presentation

The patient is a 51-year-old morbidly obese male truck driver who presented with loss of sensation and dark discoloration to the tip of his penis and difficulty with urination. His symptoms started approximately 1 week earlier while he was driving across the country for a work-related job. His only co-morbidity was morbid obesity with a body mass index of 42, and he denied any history of diabetes mellitus, renal disease, atherosclerotic disease, vasculopathy, tobacco use, and/or illicit drug abuse.

The physical examination demonstrated a black, insensate glans (Fig. 1A). His complete blood count and blood chemistries were unremarkable. His hemoglobin A1C was noted to be 5.6. He had no evidence of uncontrolled hypertension and also denied tobacco use. A random urine drug screen was also negative for illicit drug use.

Bilateral angiography of the internal pudendal arteries (Fig. 2A and B) was performed during this patient's workup. This study revealed diminished flow through the corporal and bulbourethral arteries and complete occlusion of the dorsal penile arteries bilaterally (Fig. 2A and B). Because the patient

was about 1 week out from his onset of symptoms and the penile glans was determined to be nonviable, endovascular revascularization was not attempted.

The patient was managed surgically with suprapubic tube placement for urinary diversion and serial wound debridements (Fig. 1B). Intraoperatively, it was noted that the penile necrosis was limited to the glans, with sparing of the corporal bodies. Cystoscopy demonstrated urethral necrosis extending only into the fossa navicularis, with sparing of the remainder of the anterior and posterior urethra. Two wound debridements were required to remove the affected tissue and once the wound appeared stable, the patient's suprapubic catheter was removed and exchanged for a transurethral catheter. Final pathology of the debrided tissues revealed nonviable necrotic tissue. The patient was discharged from the hospital in stable condition.

Discussion

Gangrene comes in different types: dry, wet, or gas gangrene. Dry or ischemic gangrene, which is demonstrated in this case,



Fig. 1 – Isolated ischemia of the penile glans. (A) Preoperative image. (B) Postoperative image showing residual glans and preservation of the corporeal bodies.



Fig. 2 – Bilateral internal pudendal artery angiography. (A) Angiography of the right internal pudendal artery (1) showing diminished flow through the cavernosal and bulbourethral arteries and no flow through the dorsal penile artery (2). (B) Angiography of the left internal pudendal artery (1) showing diminished flow through the cavernosal and bulbourethral arteries and no flow through the dorsal penile artery (2).

is associated with vascular insufficiency. It is well established that uncontrolled diabetes and hypertension have a large association with dry gangrene as end-stage renal disease leads to calciphylaxis of smaller arteries resulting in tissue ischemia and death [3].

To date, only a limited number of cases of dry penile gangrene have been reported, and this is the first case we have discovered where the only patient risk factors were morbid obesity and prolonged immobility. We postulate that the patient's morbid obesity combined with prolonged sitting required for this patient's profession as a truck driver caused arterial stasis and occlusion, which resulted in this patient's condition.

Diagnosis and management for dry penile gangrene is based on anecdotal evidence. Workup for vasculogenic penile necrosis relies largely on history and physical examination. Utilization of penile ultrasonography and angiography has been reported but only in limited cases. Very few cases have demonstrated the use of angiography in the diagnosis of vasculogenic penile gangrene. Our case reports an innovative way to use angiography in the diagnosis of penile gangrene and highlights the delicate nature of the blood flow to the penis.

Dry penile necrosis is typically managed conservatively, allowing for autoamputation or surgery with serial wound debridements [4]. To our knowledge no case of penile revascularization via endovascular means has been performed specifically for dry penile gangrene. However, angioplasty has been shown to be a viable and safe option for select cases of vasculogenic erectile dysfunction [5]. Similar methods of endovascular treatment may be beneficial in preserving glans tissue and preventing ischemia if performed earlier in the disease process.

Conclusion

In summary, this report demonstrates a rare case of penile necrosis. In this particular case, angiography successfully identified the pathologic lesion and could possibly help as a guide for revascularization if used earlier in the diagnosis of such cases. Of note was this patient's reluctance to seek treatment at first sign of symptoms and penile changes, when intervention could have improved outcomes.

REFERENCES

- [1] Raman SR, Kate V, Ananthakrishnan N. Coital paraphimosis causing penile necrosis. *Emerg Med J* 2008;25(7):454. doi:10.1136/emj.2007.054601.
- [2] Kharbach Y, Tenkorang K, Bouchikhi A, Mellas S, Ammari JE, Tazi MF, et al. Elective gangrene of the corpus spongiosum of idiopathic origin: a case report. *Can Urol Assoc J* 2014;8(11–12):E934–7. doi:10.5489/cuaj.2316.
- [3] Haider I, Siddiqui M, Naji W, Sheikh M, Waqar A. Calciphylaxis leading to penile necrosis. *J Pak Med Assoc* 2014;64(6):711–13.
- [4] Chiang IN, Chang SJ, Kuo YC, Liu SP, Yu HJ, Hsieh JT. Management of ischemic penile gangrene: prompt partial penectomy and other treatment options. *J Sex Med* 2008;5(11):2725–33. doi:10.1111/j.1743-6109.2008.00894.x.
- [5] Wang TD, Lee WJ, Yang SC, Lin PC, Tai HC, Liu SP, et al. Clinical and imaging outcomes up to 1 year following balloon angioplasty for isolated penile artery stenoses in patients with erectile dysfunction: the PERFECT-2 study. *J Endovasc Ther* 2016;23(6):867–77.