Case – Emergent management of severe penile and scrotal edema due to prolonged metallic ring entrapment

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Cite as: Berjaoui MB, Nguyen DD, Al-Daqqaq Z, et al. Case – Emergent management of severe penile and scrotal edema due to prolonged metallic ring entrapment. *Can Urol Assoc J* 2024 November 4; Epub ahead of print. http://dx.doi.org/10.5489/cuaj.8874

Published online November 4, 2024

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KEY MESSAGES

Penile ring entrapment is a rare but serious urologic emergency that can lead to severe complications if not promptly treated. This case report highlights the effective use of an electrical grinder by the firefighting department for the safe removal of a metallic penile ring causing severe edema. The importance of a multidisciplinary approach and swift intervention is emphasized to prevent long-term damage and ensure favorable outcomes.

INTRODUCTION

Penile constriction devices, historically used for enhancing sexual pleasure, have been documented since 1755. This method involves constricting blood outflow from the penis, prolonging erections.[1-4] Penile entrapment can lead to varying degrees of vascular obstruction, ranging from mild, edematous cases to severe gangrene. Materials, such as rubber bands, wedding rings, hammerheads, bullrings, and plastic bottlenecks, have been employed,[4-5] with application advised not to exceed 30 minutes.[6] Prolonged constriction can result in severe ischemia and edema, potentially leading to necrosis and self-amputation. Urgent intervention is vital, and different treatment options have been elaborated. This article presents a recent case and reviews management options.

CASE REPORT

A 40-year-old gentleman with previously known erectile dysfunction presented with severe penile and scrotal edema due to entrapment by a metallic penile ring. The patient had the penile ring applied and forgot to remove it before going to sleep. When he awoke, he had significant penile and scrotal edema that prevented the removal of the penile ring. The patient delayed seeking medical attention due to embarrassment. Twenty-four hours after penile entrapment, he began to experience significant pain and presented to the emergency department when the pain progressed and became intolerable.

After 48 hours, the patient presented to emergency department who directly called in urology. On our assessment, the patient had significant penile and scrotal edema with no ecchymosis or surface necrosis to the penis or the scrotum. The metallic penile ring was found to be entrapping both the scrotum and the penis. (Figures 1 and 2). An initial attempt at manually decompressing the edema failed. Another attempt to manually decompress the scrotal and penile edema was performed under sedation. The penile edema responded relatively well to manual decompression, but the scrotal edema persisted without significant change. At that point, both orthopedic team and maintenance department were called for assistance but were not able to aid with useful tools to remove the entrapped ring due to the significant edema preventing the passage of any of the available tools between the scrotal skin and penile ring.

Ultimately, firefighting department was called into the emergency department. Following thorough deliberation between our medical team and the firefighters, a decision was made to employ an electrical grinder metal cutter for the extraction procedure. Plastic cards and a tongue depressor were passed under the penile ring in order to shield the skin from potential electric sparks and heat, as illustrated in Figures 3 and 4. Manual irrigation with water was consistently applied throughout the procedure to facilitate the cooling down of the metals. An infrared thermometer was utilized to monitor and ensure the temperature remained at or below body temperature, as depicted in Figure 5.

DISCUSSION

Penile ring entrapment, a rare urological emergency, poses risks of edema, strangulation, ischemia, gangrene, and urethral injury, especially when applied for longer than 30 minutes.[7-8] Cases often result from attempts at sexual enhancement, or self-treatment of erectile dysfunction. Delayed medical attention due to embarrassment is common.

In our case, the patient presented 48 hours after penile ring was inserted. He presented with edema and there was no evidence of skin ulceration or urethral injury which makes it a grade I injury according to Bhat penile strangulation classification system.[9] (Table 1)

Healthcare professionals may select diverse approaches contingent upon the composition of the penile ring, severity of injury, and duration of entrapment. Previous case reports have outlined favorable outcomes achieved through compression, lubrication, and the implementation of fasciotomies, either individually or in combination, for the removal of penile rings.[10,11]

However, in cases characterized by pronounced penile edema, conventional methods may prove inadequate, as evidenced in our patient's scenario. Notably, Kyomukama et al. have documented the effective utilization of an angle grinder metal cutter, complemented by accessories, offering an alternative technique for ring extrication.[12]

The primary objective of intervention is the expeditious restoration of arterial inflow, venous, and lymphatic drainage to avert further damage. Delay in reinstating proper blood flow and drainage has been associated with instances of penile amputation.[11]

Trivedi et al. emphasise the diverse clinical presentation and management approaches encountered with penile constriction devices.[13] Consequently, individualized judgment on case-by-case basis has proven instrumental in enhancing the surgical outcomes for these patients.[10,14] Presently there exists no universally agreed-upon follow-up protocol, with post-treatment plans typically contingent on the severity of the case and the preferences of the attending surgeon. We suggest the following algorithm (Figure 8) to be followed when similar cases present to the emergency department. This algorithm is based on our review of the existing literature and clinical judgement.

CONCLUSIONS

The exigency of removing constriction devices causing penile strangulation underscores the importance of a prompt and suitable intervention involving mechanical or electrical tools within an emergency context. This article underscores the merit of adopting a case-specific strategy, particularly when distal tissue edema is evident. The absence of a standardized follow-up protocol highlights the imperative for personalized care, emphasizing its tailoring to the severity of the case and the surgeon's discretion.

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FIGURES AND TABLES

Figure 1. Patient presentation.

Figure 2. Patient presentation.

Figure 3. Plastic cards used to protect skin.

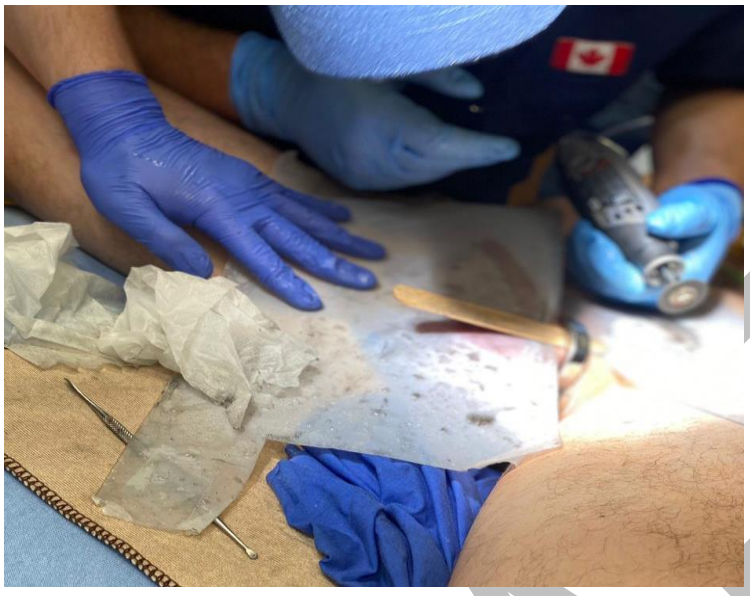

Figure 4. Tongue depressor under the penile ring to protect skin.

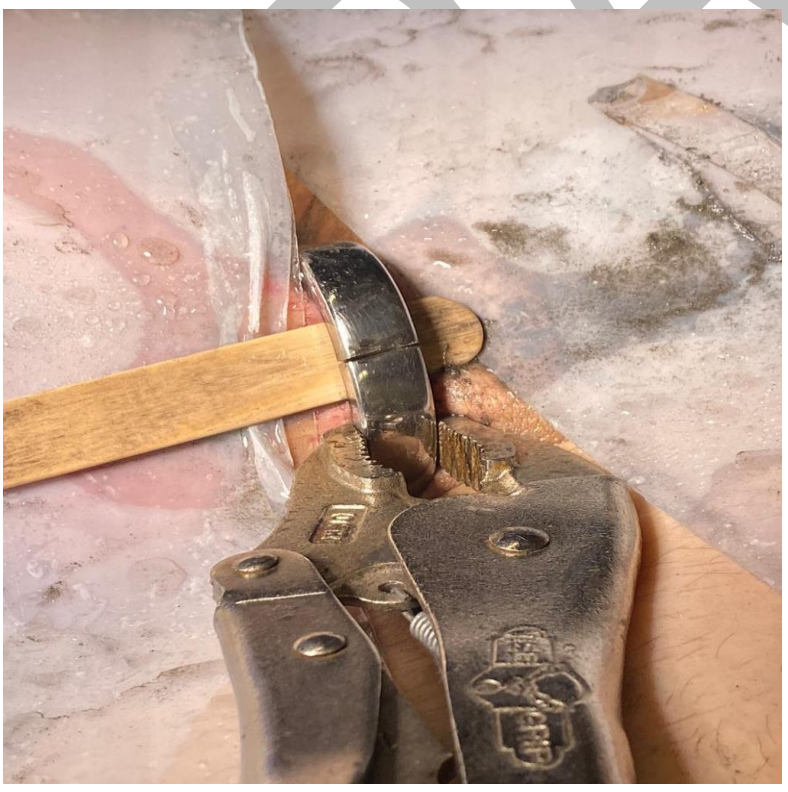

Figure 5. Electrical grinder metallic cutter used to cut penile ring.

Figure 6. Metallic penile ring after being removed.

Figure 7. Penile ring measured.

Figure 8. Proposed treatment algorithm for acute penile entrapment.

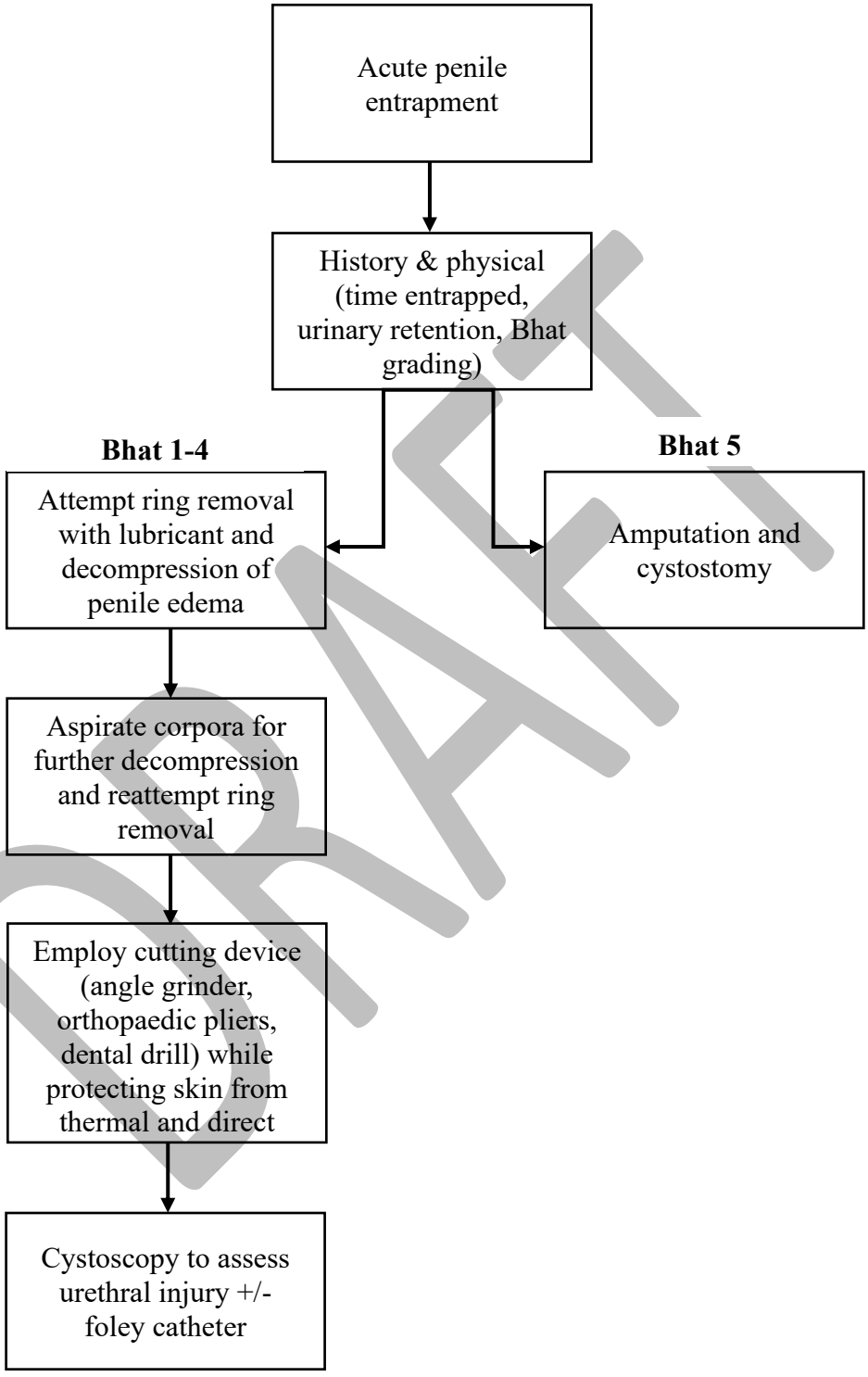

Table 1. Penile strangulation classification system by Bhat et al	
Grade I	Distal penis edema. No evidence of skin ulceration or urethral injury.
Grade II	Distal penile edema with decreased sensation. Injury to skin, constriction of corpus spongiosum. No urethral injury.
Grade III	Injury to skin and urethra, without urethral fistula. Loss of distal penile sensation.
Grade IV	Complete division of corpus spongiosum leading to urethral fistula and constriction of corpus cavernosum with loss of distal penile sensation.
Grade V	Gangrene, necrosis, or complete amputation of penis.