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CLINICAL VIGNETTE

Penile Incarceration in Metallic Ring

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Introduction

Penile incarceration due to a foreign body is usually a consequence of applying a constricting object, usually a ring, to the penis and/or scrotum. These objects are commercially available and are colloquially known as “cock ring,” “C ring,” “penis ring,” or “shaft ring.” Penis rings are most commonly used to enhance sexual performance and for erectile dysfunction. Other reported motives include psychiatric disorders¹ and the prevention of enuresis in children.² The ring is typically applied when the penis is flaccid. During an erection, the ring blocks venous outflow of the penis, leading to a longer and more satisfying erection. However, if the ring is left in place too long, secondary edema of the penis can occur, leading to incarceration of the penis within the ring. If this phenomenon is allowed to progress, it can lead to penile compartment syndrome where venous and lymphatic congestion impedes arterial blood flow, leading to ischemia and eventual necrosis of penile tissue.

Penile incarceration, and in some cases penile strangulation, has been reported after use of a wide variety of foreign objects, including nuts, washers, bottles, rubber bands, ball-bearings, wedding rings, and commercially purchased cock rings.³ Materials that are used include leather, rubber, silicone, wood, plastic, and metal (including aluminum, steel, titanium, silver, and platinum). The metal ring poses a particular challenge for medical providers because it cannot be easily cut and removed. There are some rings that include a safety valve that allows for a portion of the ring to be detached and the ring to be subsequently removed. Unfortunately, this feature is often not available, posing a safety hazard to its consumers.

Because of the variation in clinical presentation and lack of provider experience, there is no standard treatment. Management is largely individualized based on the clinical presentation, medical provider, and the equipment and materials available at the facility. However, penile incarceration is a urologic emergency that must be treated promptly and properly to prevent progression to penile strangulation and necrosis. We present a case of penile incarceration within a metallic ring and its subsequent management, as well as a discussion of treatment strategies that have been reported in the literature.

Case Presentation

A 55-year-old male with a history of HIV on anti-retroviral therapy and methamphetamine use disorder, presents with swelling of the penis and scrotum resulting from the use of a metallic ring for pleasure. He reports that two days prior to presentation, his partner applied a metal ring to his penis and scrotum. Subsequently, his penis and scrotum became more swollen, rendering it impossible for him to remove the ring on his own. He came to the emergency department in order to have the ring removed. He stated that he did not have significant penile or scrotal pain, although it was uncomfortable. He was able to void an hour prior to presentation. On physical exam, there was significant edema of the penis and scrotum with no signs of ischemia or necrosis. There was no paraphimosis or blood at the meatus.

Due to the extent of swelling of the penis and scrotum, urology was consulted. Ice packs and a pressure dressing was applied to the penis and scrotum to reduce the edema. The patient was then given pain medications before pressure was applied to the penis and scrotum in an attempt to reduce it through the ring. Unfortunately, this initial attempt failed due to the extent of the swelling. Subsequently, a penile block was performed with 500mg of lidocaine before a second reduction was attempted and failed. At that point, further attempts for reduction were aborted, and it was decided that the metal ring would have to be cut in order for it to be removed. The material of the metal ring could not be ascertained, so it was difficult to determine optimal instrument. A ring cutter with a diamond saw blade was initially used, however, the ring material was too hard and the width was too thick. No surgical service had tools that could cut the steel ring. After discussion Facilities and Maintenance department were able to provide industrial bolt cutters that were felt adequate to cut the circular ring.

For the procedure, the patient was given approximately 1 mg/kg of intravenous ketamine for sedation. The perineal area was chosen as the location to cut the ring given that it was the furthest away from neurovascular structures. Two tongue depressors were placed between the penis and the metal ring in order to protect the skin. With two guides to place the cutter on the ring and the combined effort of three men, the ring was successfully cut. The ring was then rotated 180° and a second cut was made using the same technique. The ring was separated in half and successfully removed. There were no skin lacerations.

tions, bleeding, or necrosis of the penis or scrotum. After the procedure, scrotal ultrasound showed thickened and hyperemic overlying skin, but no evidence of testicular ischemia.

Discussion

Varying degrees of trauma can result from penile incarceration within a foreign object. Penile incarceration can be graded based on the severity of neurovascular compromise. According to one grading scheme,⁴ Grade I is classified as the presence of distal edema of the penis with no evidence of skin ulceration or urethral injury. Grade II is injury to the skin and constriction of the corpus spongiosum with no evidence of urethral injury, with distal penile edema and decreased sensation. Grade III is injury to the skin and urethra but no urethral fistula, with loss of distal penile sensation. Grade IV is complete division of corpus spongiosum leading to urethral fistula and constriction of corpus cavernosum, with loss of distal penile sensation. Grade V is gangrene, necrosis, or complete amputation of distal penis. Our patient was classified as Grade I injury.

Management strategies vary based on the severity of the injury.⁵ For all patients, the priority should be removal of the foreign object as quickly as possible. In patients with low-grade injury, precautions should be taken to preserve the integrity of the penile tissue and neurovascular structures. Four types of management techniques have been reported, including the string technique, aspiration techniques, cutting devices, and surgical procedures. Depending on the invasiveness of the treatment strategy, the use of anesthesia can vary from none to general or spinal anesthesia.

The string technique was originally developed to remove a ring that was incarcerated on a finger. For mild, low-grade injuries, it has been shown to be successful in the removal of a metallic ring from an incarcerated penis.⁶ One end of the string is threaded through the ring while the other end is used to encircle the shaft of the penis tightly. Then slowly unwind the end of the string that was threaded through the ring so that the ring moves with it. Until it is successfully loosened and removed. Aspiration can be used in isolation or conjunction with the string method, with aspiration of blood and/or lymph from the penis.⁵

A wide variety of cutting devices have been reported. Non-electric devices include hammer and chisel,⁴ ring cutter,⁷ hack saw,⁸ and metal saw.⁴ For thick metals, electric cutting devices like a dremmel rotary tool,⁹ heavy drills,⁴ and high-speed electrical steel saw⁷ have been reported. Although electrical devices are more effective in cutting through metal, there is a higher risk of injury to the patient and provider. Shielding devices that can be used include laryngoscope blade,¹⁰ metal tongue depressor,⁷ wooden tongue depressor,¹¹ and poly vinyl chloride plaques.¹² Drilling through the metal, can create heat and thermal injury. Some report using water irrigation or water sprays to mitigate this risk.⁴

For severe penile trauma, surgery is required. Degloving of the penis with subsequent skin grafting has been reported.^{13,14} Failure to debride ischemic tissue can lead to infection, urethral fistulas, and progression penile amputation.⁵

Conclusion

Penile incarceration in a foreign object is a rare but serious condition that is most commonly seen by urology or in the emergency department. Although patients are often embarrassed by the situation, it is crucial that they receive timely treatment, as prolonged incarceration can lead to strangulation and penile necrosis. Evaluation should assess the severity of injury to the penis, the foreign object material incarcerating the penis, and tools that are readily available to be used to remove the object. Most cases resolve using a combination of aspiration, the string technique, cutting devices, and rarely urologic surgery. For severe cases, penile amputation may be necessary.

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