CASE BASED LEARNING POINTS DOI: https://doi.org/10.18502/fem.v7i2.12775

Emergency department management for an unusual case of penile entrapment and strangulation

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1. Case presentation

A 11-year-old boy was seen at our pediatric emergency department (PED) for evaluation of a swollen and painful penis. He had placed a glass ring over his penis fourteen days prior. This resulted in straining with micturition and a fleshy circumferential non healing wound at the base of the penis with serosanguinous discharge. The glass ring eroded into the deep subcutaneous layer of the skin at the base of the penis (Figure 1). The distal penis was swollen and tender with no changes in skin color, texture or blurring of sensation. The glans was viable with appropriate capillary refill. Urine stream was unaffected, and the amount of serosanguinous discharge was not related to the act of voiding.

Emergency measures were conducted including administration of analgesia, antiemetics, active immunization against tetanus, systemic antibiotic therapy (cefazolin), and urology consultation. Due to extensive damage, urology deferred ring removal in the PED and recommended removal in the operating room to control the probable damages better, post removal of ring.

The patient was transferred as our facility did not have an inpatient unit for post operative management. The ring was successfully removed using a bone cutter under general anesthesia. Surgical exploration revealed minimal erosion into the cavernosal bodies without any injuries to the dorsal veins, dorsal and deep artery, and nerves. Intra-op cystoscopy showed no injuries to the urethra. Primary closure was done circumferentially in two layers (Buck's fascia and skin) with an absorbable vicryl 5-0 interrupted suture, followed by pressure bandage.

The case was presented to a social worker considering the clinical features of the case. The social service experts and providing physicians were reassured there was no concerns for child abuse, sexual abuse, neglect, behavioral or psychiatric disorders. The patient was discharged with Bactrim and analgesics for one week after he was able to void independently. One month follow up at the urology clinic revealed that the patient had good skin preservation, wound healing, and micturition. The patient had no difficulties with anxiety, depression, or post-traumatic stress at his follow up appointments with a behavioral health therapist.

2. Learning points

Penile entrapment and strangulation occur when an object is placed around the base of the penis or behind the penoscrotal junction and cannot be removed (1). This causes increasing venous stasis leading to edema, pain, bruising and necrosis progressing to ischemia, infarction, gangrene and eventual auto-amputation (2). Therefore, penile ring entrapments are considered an emergency and should be dealt with promptly. Most affected patients are adults, yet we report the case of an 11-year-old boy who had a ring on his penis for 14 days resulting in entrapment, strangulation, and erosion.

Figure 1 Penile entrapment, strangulation, and erosion by glass ring upon arrival to the emergency department

Table 1 Grading of penile strangulation injuries

Grade I	Distal edema only without evidence of ulcerations
Grade II	Distal edema with skin ulceration; No injury to the urethra
Grade III	Injury to the skin and urethra with loss of distal penile sensation; No urethral fistula
Grade IV	Transection of the corpus spongiosum, urethral fistula, corpus cavernosum and loss of distal penile sensation
Grade V	Gangrene, necrosis, or distal penile amputation

Circumferential constriction of the penis by ring-shaped objects may cause penile strangulation injuries with devastating consequences. Penile strangulation is a urological emergency warranting prompt removal of the ring to prevent compartment syndrome and restore the normal functions of the penis (3). Although it occurs mostly in adults, penile strangulation has also been reported in the pediatric population with rubber bands and hair tourniquets. One of the most extensive series of pediatric penile trauma reported only ten cases of penile strangulation injuries over twenty years (4).

Pediatric patients present a unique challenge as they delay seeking medical attention due to embarrassment or fear of their parents' reaction. Pediatric penile strangulation requires more complex emergency and surgical management due to the smaller organs and vessels (5). Injury is also more pronounced due to the presence of thin fibrous tissue that covers the corporal bodies and urethra compared to the thick tunica albuginea present in adults (6).

The management of penile strangulation depends on the degree of injuries, onset of injury and the type of constricting objects. Metallic objects are the most difficult to manage as they require industrial cutting devices that may not be available in the hospitals (3). Bhat et al. describes graded penile strangulation injuries (Table 1) based on the degree of penile injury (7).

Prompt diagnosis and treatment are essential to avoid any complications. During this time, it is also critical to rule out any conditions that may appear to be a result of any form of abuse or neglect. Evaluation starts by assessing the extent of the injury, penile temperature, sensation, and voiding ability. Doppler scan can be used to assess arterial flow if there are concerns for absent pulses in the penis (8).

The constricting agent can be removed in the emergency room if the injuries are grade I-II. Care should be taken while removing constricting agents to prevent injuries to the penis. Removal of such devices are challenging especially in children and requires a multidisciplinary approach. Different methods have been used to remove penile constrictor, such as ring cutters, dental drills, or bone cutters, etc. (8). Aspiration of the corpus cavernosa to alleviate edema can also be performed to facilitate the removal (8). Severe cases with violation of deep structures (grade III-V), degloving or amputation warrants an emergent urology evaluation for surgical management (9). In cases of amputation caused by strangulation, attempts should be made to salvage the organ. The penis should be cleaned, placed in normal saline, and then place in ice to slow down biological demands of the tissue until reimplantation (9). If patients are being discharged from the emergency room, long term follow up with a urologist for micturating cysto-urethrogram (MCU) is recommended (2). Psychosocial assessment and therapy can be helpful with preventing recurrence of dangerous behaviors. Finally, a physician must maintain a healthy suspicion for abuse or neglect in most pediatric non-accidental traumas and provide the appropriate psychiatric and/or social services before discharge.

3. Declarations

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3.2. Authors' contribution

The authors meet the four criteria for authorship based on the recommendations of the International Committee of Medical Journal Editors (ICMJE).

3.3. Conflict of interest

All authors have declared that they have no conflict of interests.

3.4. Funding

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3.5. Consent for publication

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