

# Penile ring entrapment – A true urologic emergency: Grading, approach, and management

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**Abstract** Penile rings are used to sustain erection in order to enhance sexual pleasure. They work by reducing the outflow of blood from the cavernosal tissue. However, if left for extended periods of time severe edema, urethral fistula, gangrene, and even complete loss of the distal penis can ensue, this is known as penile ring entrapment (PRE). Management poses particular challenges due to its rarity. Herein, we report our experience with three patients from our institution that presented with PRE and include a review of the approaches others have taken. We also propose a simpler and more effective grading scale to allow for easier communication between providers, as the current grading scales do not do so.

**Keywords:** Ischemia, penis, scrotum, trauma, urethra

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## INTRODUCTION

Since ancient times, penile rings have been used to enhance sexual pleasure. They work by constricting the outflow of blood from the penis, prolonging erection.<sup>[1-3]</sup> Different materials such as rubber bands, wedding rings, hammerheads, bullrings, and plastic bottlenecks have been used.<sup>[3,4]</sup> Regardless of the material used, constriction should be no longer than 30 min.<sup>[5]</sup> Prolonged constriction leads to severe ischemia and edema. If left unresolved, the penis will become necrotic and will eventually self-amputate. Urgent intervention is vital. Different treatment options have been elaborated. We report our experiences, treatment methods others have taken, and propose a newer grading scheme that will allow clinicians to swiftly and efficiently communicate the severity of this condition.

## METHODS AND PATIENTS

We performed a retrospective review of charts from our institution from September 2012 to September 2018, identifying patients who presented with penile ring entrapment (PRE). We looked at patient characteristics, pattern of presentation, type of entrapment, and treatment. We also did a review of the literature to identify other treatment approaches for PRE.

## RESULTS

We identified three patients who presented at our institution with PRE.

The first patient is a 60-year-old Caucasian male who presented with a ring around his scrotum and penis for 48 h. He had excessive scrotal and penile edema with minimal

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bruises at the ring location. Initial attempts to reduce scrotal and penile swelling by compression (in order to slide the ring off easier) failed. Next, we gave anesthesia for comfort and then applied olive oil around the penis and scrotum as lubrication to help with sliding. A tongue blade was inserted between the ring and penis to protect underlying tissues during sliding. Continuous compression was applied until the edema decreased enough for the ring to slide off. We were successful and all soft tissues appeared viable.

The second patient is a 28-year-old Caucasian who presented with a thick and wide wedding ring around the base of his penis for >12 h [Figure 1]. Several attempts to remove the ring in emergency department at two different hospitals failed, and finally, he was referred to our institution. He had extensive bruising and edema of the penile shaft distal to the ring. The shaft of his penis was Number on examination. Our initial attempt (with the patient under conscious sedation) to slide the ring off with compression and lubrication failed. The patient experienced such discomfort, for which general anesthesia was then induced. We then attempted needle aspiration and a release incision to decompress the corpora and decrease the swelling; however, this was not enough. Ultimately, we used a diamond-tipped Midas drill from the hospital engineering department to split the ring in half. During this procedure, a metal ruler and cold-water irrigation were used to protect soft tissues and prevent thermal injury. After ring removal, we performed flexible cystoscopy to rule out urethral injury. It revealed extensive urethral bruises, for which we placed 16 French Foley catheter [Figure 2]. The patient recovered and showed improvement at follow-up.

The third patient is a 42-year-old Caucasian male who presented with a metal washer pushed to the base of the penis. There were extensive bruises and edema distal to the washer. Attempts at twisting the ring off with lubrication were unsuccessful. Next, a vice clamp and Dremel tool were obtained from hospital maintenance. The ring was

meticulously sawed in half as wet gauze and a tongue depressor were used as a barrier to protect the skin. Vice clamps were used to stabilize the ring. There was not any evidence of nother tissue injuries.

## DISCUSSION

A penile ring is typically used to restrict the outflow of blood from the penis to prolonged erection and enhance sexual pleasure.<sup>[1-3]</sup> Wearing the ring for extended periods of time will lead to penile ischemia and strangulation. Eventually, the patient will experience severe edema, necrosis, urethral fistula, gangrene, penile amputation, and even death.<sup>[6,7]</sup>

Patients tend to present late in their condition due to embarrassment.<sup>[6]</sup> Our experience was similar; unfortunately, delaying clinical intervention results in increased risk of the aforementioned complications of PRE.<sup>[8]</sup>

The primary goal of management in these cases is to restore blood supply to the penis while preserving the integrity of penile and urethral tissue. Success depends on what method is used to remove the ring. There are multiple treatment approaches (sliding, cutting, and surgery) that have been reported in the literature; surgeons have used different tools depending on what is at their disposal and their experience [Table 1]. Cystoscopy may be performed after the intervention to assess the level or urethral injury.

## Treatment options

1. Sliding: Sliding should be used as an initial approach. This is the safest way to preserve underlying tissue. Various lubricants have been reported such as Salvon and even olive oil. If the ring is slid, the surgeon must first compress the edematous tissue and then provide traction. This method was reported to be successful by



**Figure 1:** Patient 2 before treatment



**Figure 2:** Patient 2 after treatment

**Table 1: Summary of case reports on penile ring entrapment**

Reference	Age	Description of penis	Duration, ring material	Treatment method
Our patient-1	60	Penis and scrotum, with edema	2 days, metal	Olive oil was applied and ring was slid off
Our patient-2	28	Penis, marked edema with bruise	12 h, metal	Ring was cut by diamond tip Midas drill
Our patient-3	42	Penis, edema	Metal	Ring was cut via dermal tool using
Sawant <i>et al.</i> <sup>[3]</sup>	70	Penile edema without gangrene	2 months, rubber	Rubber band was cut
Sawant <i>et al.</i> <sup>[3]</sup>	23	Penis, with distal edema and circumferential ulcer	24 h, rubber	Band was cut
Sawant <i>et al.</i> <sup>[3]</sup>	42	Mid penile shaft band with distal edema	18 h, metal	Ring was cut using stout scissors
Sawant <i>et al.</i> <sup>[3]</sup>	35	Base of penis, with marked penile edema	4 days, metal	Ring was cut by K-wire cutter
Alkhureeb <sup>[1]</sup>	30	Base of penis, penile edema, urinary retention	8 h, metal	Bone cutter- fail Lateral corporotomy (surgery) to reduce edema, then ring was slid distally to the glans, then using proline 0 on glans, ring was removed
Nuhu <i>et al.</i> <sup>[2]</sup>	60	Penis, complete penile gangrene	1 day, metal nut	Cystotomy and penile amputation with perineal urethrostomy (surgery)
Paonam <i>et al.</i> <sup>[9]</sup>	47	Penis, marked edema	2 days, metal	Ring was cut by micrometer wheel-shaped bur
Nason <i>et al.</i> <sup>[10]</sup>	Not specified	Penoscrotal edema	7 h titanium	Bone cutter - fail Fire brigade department used an electric axel driver to cut the ring
Liu <i>et al.</i> <sup>[11]</sup>	Not specified	Preputial edema	Unknown time, PET bottle	Bottle removed with persistent suture traction and lubrication (sliding)
Sharma <i>et al.</i> <sup>[4]</sup>	37	Edema, areas of discoloration near base of penis	5 days, metal	Ring was slid over penis by applying gentle traction over skin
Patel <i>et al.</i> <sup>[12]</sup>	43	Edema of penis and scrotum	1 day, metal	Industrial bolt cutters to cut the ring
Agu <i>et al.</i> <sup>[6]</sup>	26	Penile shaft edematous, mildly tender, cold, sensate, and engorged	23 h, stainless steel ring	Penile shaft made slippery with salvon and advanced forward via sliding
Wu <i>et al.</i> <sup>[13]</sup>	45	Ring placed at base of genitalia, extensive penoscrotal edema	48 h, metal ring	Ring slide off with vascular slings
Sathesh-kumar <i>et al.</i> <sup>[14]</sup>	50	Root of scrotum, penoscrotal edema	2 days, metal ring	Ring cut with pedal cutter from fire department
Patel <i>et al.</i> <sup>[15]</sup>	45	Not mentioned	6 months, 2 metal-ringed hose clamps	Wire cutters from the orthopedic set were used to cut the metal clamps
Baruah <i>et al.</i> <sup>[16]</sup>	17	Gross penile edema with impaired penile sensation distal to ring	17 h, metallic ring made of alloy	Ring was slide off
Geraniotis <sup>[7]</sup>	45	Penis was incarcerated at base of penis	1 week, Barbell retaining (steel) ring	Gas driven nonsurgical drill used to cut the ring

PET: Polyethylene terephthalate

other authors.<sup>[4,6,11,13,16]</sup> We performed this method and were successful with one of our patients. However, we were unsuccessful in two of our patients. This method is safest and quickest but clearly is not suitable for all cases

2. Cutting: Cutting seems to be the next suitable option after sliding has been attempted. Cutting appears to be a highly sought out method by many surgeons.<sup>[3,9,10,12,14,15,17]</sup> Various tools have been used to cut the ring such as a micrometer wheel-shaped bur, stout scissors, K-wire cutter, DerMel, bone-cutting clamp, and an electric axel driver.<sup>[3,9,10]</sup> We successfully used a diamond-tipped Midas Drill and Dremel tool. However, if cutting is sought out, it is very important to protect the underlying tissue from mechanical and thermal injury. We used cold saline irrigation to prevent thermal injury and a tongue depressor to protect the skin and underlying tissue
3. Surgery: With failure of other approaches, surgical options may be needed. Lateral corporotomy to

release edema and facilitate subsequent removal with lubrication, as performed by Alkhureeb *et al.*, is one surgical approach.<sup>[1]</sup> We resorted to a limited surgical approach in order to drain fluid from the corpora and skin, our thinking was this would allow the penis to become more compressible. However, we found this to be of little help. Nuhu *et al.* experienced and extreme case of penile gangrene and performed a cystotomy and perennial urethrosotomy.<sup>[2]</sup> Fortunately, we did not experience such an intense and rare case.

### Grading of penile entrapment

There are different classifications of penile entrapment that have been reported [Table 2]. Sawant *et al.* embrace a grading system originally described by Bashir and El-Barbary, which focuses on the consequences of penile strangulation and urethral injury not easily visible by examination.<sup>[3,19]</sup> Another grading system published by Bhat *et al.* utilizes penile sensation in its classification. This, however, could be misconstrued by patient anxiety

**Table 2: Summary of grading system**

System	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Sawant <i>et al.</i> <sup>[3]</sup>	No urethral injury	Partial division of corpus spongiosum + urethrocutaneous fistula	Complete division of corpus spongiosum + constriction of corpus cavernosum	Gangrene and amputation		
Bhat <i>et al.</i> <sup>[16]</sup>		Edema distal to penis	Grade 1 + decreased distal penile sensation	Grade 1 + loss of distal penile sensation	Grade 3 + complete separation of corpus cavernosa	Gangrene or amputation
Ours		Superficial injury with distal edema	Injury to corpora or urethra	Gangrene, amputation, fistula, or separation of corpora		

and delivery of anesthesia by other providers prior to urologic assessment.<sup>[16]</sup> Regardless, both require detailed information that would be obtained accurately after the intervention.

We are proposing a revised grading system that is simpler to communicate, effective, and more pertinent to the problems surrounding PRE. Grade 1 is superficial tissue injury with distal edema. Grade 2 is any deep tissue injury involving the corpora or urethra assessed by examination, and Grade 3 is tissue loss, gangrene, separation of the corpora, or fistula. This grading scale is simple, depends mainly on clinical examination, and is easy to adopt by any emergency physician or urologist.

## CONCLUSION

PRE is a rare, true urologic emergency that can lead to penile amputation. Management should be urgent and directed toward removing the ring while protecting underlying tissue. Treatment is based on the severity of the presentation and the tools at the physician's disposal. A grading system is helpful in communicating the degree of injury between health-care providers, but it is necessary that it is simple, quick, and easy to communicate. We feel we have achieved this goal.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Alkhureeb M. Case report of early release of penile strangulation by metallic rings. *Int J Sci Res* 2016;5:1442-4.
- Nuhu A, Edino ST, Agbese GO, Kallamu M. Penile gangrene due to strangulation by a metallic nut: A case report. *West Afr J Med* 2009;28:340-2.
- Sawant AS, Patil SR, Kumar V, Kasat GV. Penile constriction injury: An experience of four cases. *Urol Ann* 2016;8:512-5.
- Sharma PK, Vijay MK, Das RK, Tiwari P, Goel A, Kundu AK. Metallic ring used for autoerotic purpose leading to serious strangulating penile injury and its management. *UroToday Int J* 2011;4:1.
- How Do Erectile Dysfunction Rings Work? [03 43 13 3B 9F 56 66 A7 A4292CDE2B137E2A25CD]; 2013. Available from: <https://prostate.net/articles/how-do-erectile-dysfunction-rings-work>. [Last accessed on 2019 Feb 04].
- Agu TC, Obiechina N. Post coital penile ring entrapment: A report of a non-surgical extrication method. *Int J Surg Case Rep* 2016;18:15-7.
- Morentin B, Biritxinaga B, Crespo L. Penile strangulation: Report of a fatal case. *Am J Forensic Med Pathol* 2011;32:344-6.
- Xu T, Gu M, Wang H. Emergency management of penile strangulation: A case report and review of the Chinese literature. *Emerg Med J* 2009;26:73-4.
- Paonam S, Kshetrimayum N, Rana I. Penile strangulation by iron metal ring: A novel and effective method of management. *Urol Ann* 2017;9:74-6.
- Nason GJ, Abdelsadek AH, Foran AT, O'Malley KJ. Multidisciplinary emergent removal of a metal penoscrotal constriction device. *Ir Med J* 2017;110:536.
- Liu GM, Sun G, Ma HS. Extrication of penile entrapment in a polyethylene terephthalate (PET) bottle: A technique of suture traction and Dundee and literature review. *Int Urol Nephrol* 2012;44:1335-40.
- Patel NH, Schulman A, Bloom J, Uppaluri N, Iorga M, Parikh S, *et al.* Penile and scrotal strangulation due to metal rings: Case reports and a review of the literature. *Case Rep Surg* 2018;2018:4.
- Wu X, Batra R, Al-Akraa M, Seneviratne LN. Penoscrotal entrapment: A safe, innovative technique for removing metal constricting devices. *BMJ Case Rep* 2012;2012. pii: bcr2012006466.
- Sathesh-Kumar T, Hanna-Jumma S, De Zoysa N, Saleemi A. Genitalia strangulation – Fireman to the rescue! *Ann R Coll Surg Engl* 2009;91:W15-6.
- Patel C, Kim R, Delterzo M, Wang R. Prolonged penile strangulation with metal clamps. *Asian J Androl* 2006;8:105-6.
- Baruah SJ, Bagchi PK, Barua SK, Deka PM. An innovative surgical technique for treating penile incarceration injury caused by heavy metallic ring. *Indian J Urol* 2009;25:267-8.
- Geraniotis EG. Re: Penile incarceration with barbell retaining ring. *J Urol* 2002;167:2531.
- Bhat AL, Kumar A, Mathur SC, Gangwal KC. Penile strangulation. *Br J Urol* 1991;68:618-21.
- Bashir AY, El-Barbary M. Hair coil strangulation of the penis. *J R Coll Surg Edinb* 1980;25:47-51.