

Penile Strangulation by Foreign Bodies - Varied Presentations, Unique Management Strategies and Outcomes - A Case Series with Review of Literature

Yabancı Cisimlerle Penil Strangülasyon- Çeşitli Sunumlar, Benzersiz Yönetim Stratejileri ve Sonuçlar- Literatürün Gözden Geçirildiği Bir Vaka Serisi

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Abstract

Penile strangulation by foreign bodies is a true urological emergency causing varied outcomes based on the degree and duration of the strangulation. Irrespective of the presenting age and cause, disruption of blood flow to the penile tissues is the consequence leading to outcomes ranging from simple penile oedema to total penile gangrene. We hereby report five cases of adult penile strangulation, all of them presenting in the emergency department with variable intervals of strangulation after foreign body application. Three patients were managed by cutting the metallic rings by a motorized metal cutting device borrowed from the hospital electrical maintenance department as a desperate measure while one was managed with the thread unwinding method. The last case being plastic bottle neck strangulation was managed with disruption by heavy scissors.

Keywords: penile, strangulation, metallic ring, bottle neck, silk winding, foreign body

Özet

Yabancı cisimlerle penil strangülasyon, strangülasyonun derecesine ve süresine bağlı olarak çeşitli sonuçlara neden olan gerçek bir ürolojik acil durumdur. Yaş ve nedenden bağımsız olarak, penis dokularına giden kan akışının bozulması, basit penis ödeminden total penis kangrenine kadar değişen sonuçlara yol açar. Burada, hepsi yabancı cisim uygulamasından sonra değişen boğulma aralıklarıyla acil servise başvuran beş yetişkin penis boğulması vakasını bildiriyoruz. Üç hasta, acil bir önlem olarak hastane elektrik bakım bölümünden ödünç alınan motorlu bir metal kesme cihazıyla metal halkaları keserek tedavi edilirken, biri iplik çözme yöntemi ile tedavi edildi. Son vaka olan plastik şişe boynu boğulması, ağır makaslarla kesilerek tedavi edildi.

Anahtar kelimeler: penis, stangülasyon, metalik halka, şişe boynu, ipek sarma, yabancı cisim

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Introduction

Penile strangulation by foreign bodies is one such rare occasion that requires the urologist to rush to emergency for immediate intervention. Both motives and materials of strangulation have a long list ranging from application for sexual gratification by metallic rings to pranks gone wrong using threads [1]. Penile strangulation is seen over a varied age group of the population with cases even noted in the paediatric age group termed the penile tourniquet syndrome [2]. Irrespective of the cause, strangulation causes disruption of blood flow to the penile tissues leading to outcomes ranging from simple penile oedema to complete gangrene based on the duration and degree of strangulation. We here depict 5 cases of penile foreign body strangulation, their management and final outcomes with a brief review of scarce available literature on the subject.

Case Presentations

Case 1

A 60-year-old man came to emergency with complaints of penile pain and swelling secondary to a metal ring applied to the root of the penis 1 day back for sexual gratification. Physical examination revealed an oedematous, swollen penis with blistering of the shaft skin with a metal ring of approximately 8-10 mm thickness. As per institutional protocol and Medico legal concern, Penile Doppler was done which revealed preserved flow in both corpora cavernosa distal to the ring. Removal of the ring was initially attempted using more conservative measures like lubricants, corporal aspiration and threading but was unsuccessful due to the oedematous and engorged state of the penis. The patient was then immediately taken up under short sedation and removal of the ring was done using an electrical motorised cutting device [Figure 1]. Following removal of the ring, the penile oedema began to subside and at 30-day follow up, the patient had normal distal penile sensations and voiding function with an optimal Erection Hardness Score (EHS) of 4.

Case 2

A 45-year-old man came to emergency with complaints of penile pain and swelling secondary to a metal ring applied to the root of the penis 10 days back under alcohol influence. Physical examination revealed an oedematous penis with blackening of skin at the shaft region and pressure ulceration noted at the site of metal ring application. Penile Doppler revealed high resistance flow seen in both cavernosal arteries with normal flow on the dorsal arteries and deep dorsal vein. After failure of initial conservative manoeuvres, the patient was taken up under short sedation and removal of the ring was done using an electrical motorised cutting device [Figure 2]. Following removal of the ring, the penile oedema began to resolve and at 30-day follow up, the patient had normal distal penile sensations and voiding function with an EHS of 4. The region of pressure ulceration granulated and healed well with regular wound care.

Case 3

A 36-year-old man presented with complaint of diffuse penile swelling due to a metal ring applied at the base of the penis 4

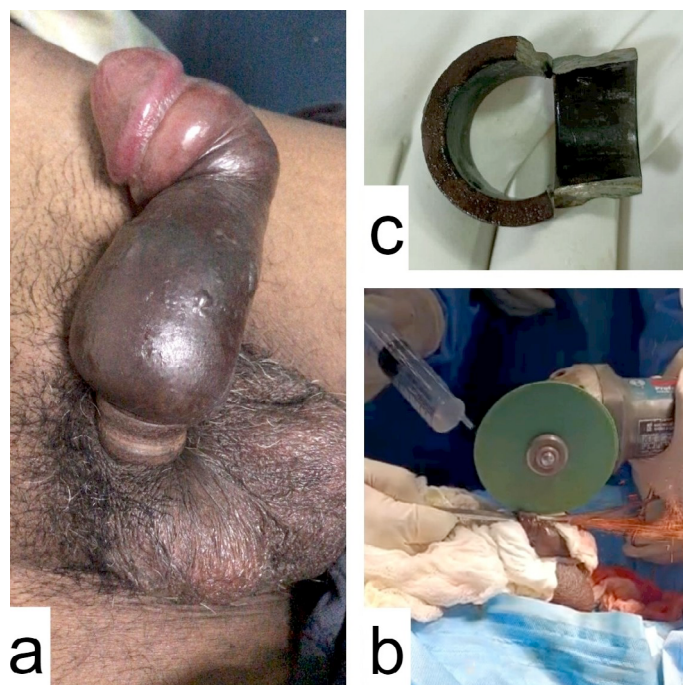


Figure 1. Clinical photograph of the 1st case. a: Preoperative presentation; b: Representative intraoperative photograph; c: Retrieved metallic ring



Figure 2. Clinical photograph of the 2nd case. a: Preoperative presentation; b: Retrieved metallic ring; c: Post-operative photograph

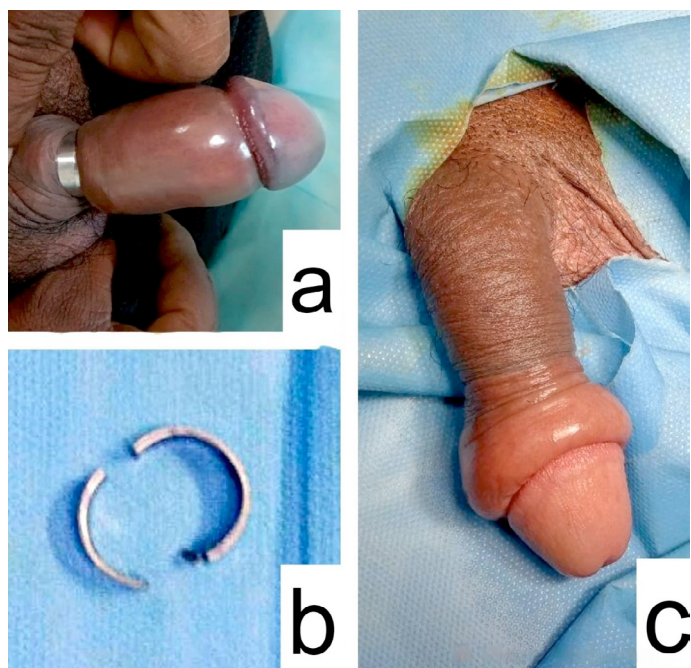


Figure 3. Clinical photographs of the 3rd case. a: Preoperative presentation; b: Retrieved metallic ring; c: Post-operative photograph

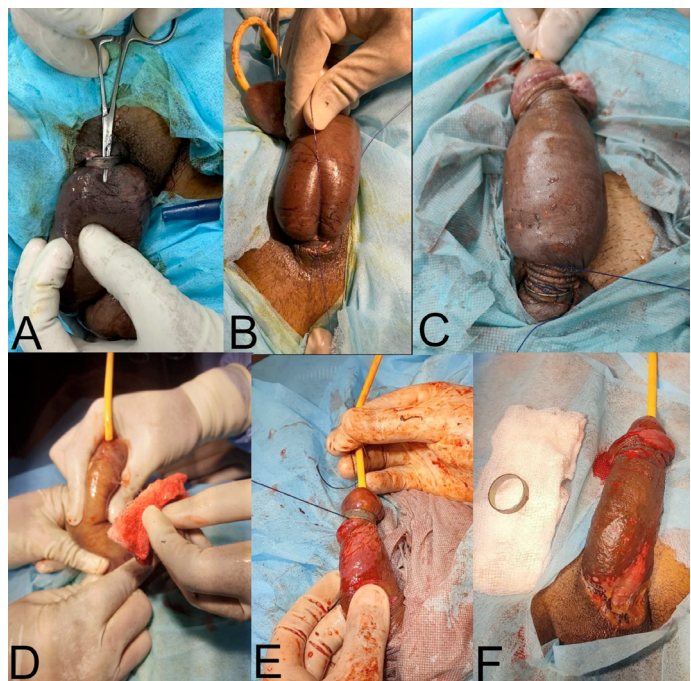


Figure 4. Steps of the silk winding technique. a-b: Suture string is passed proximally through the metallic ring; c: The suture material was circumferentially wound around the penis just distal to the metallic ring followed by unwinding of the suture material from the proximal end causing distal sliding of the ring; d: Distal sliding of the ring facilitated by multiple subcutaneous punctures over the penile skin causing exudation of serosanguineous fluid and decompression of edema; e-f: The ring gently slid over the glans and removed intact

days back applied for sexual gratification. Physical examination revealed the oedematous shaft of penis distal to the constriction ring. Urgent Penile Doppler revealed high resistance monophasic flow in both cavernosal arteries proximal to the ring with no flow in cavernosal arteries distal to the ring. The patient was taken up for removal of the ring under sedation with an electrical motorised cutting device after failure of initial local manoeuvres [Figure 3]. Following removal, the penile oedema resolved and at the 30 day visit voiding function and distal penile sensation was normal with an optimal EHS of 4.

Case 4

A 45-year-old man presented with complaints of inability to micturate and penile swelling due to a metal ring applied at the base of the penis 8 hours back applied for sexual gratification. Physical examination revealed the oedematous shaft of penis distal to the constriction ring with skin erosion at the site of ring application. Penile Doppler was suggestive of preserved flow in both corpora cavernosa distal to the ring. Initial conservative measures such as lubricant application, multiple skin punctures or corporal aspirations failed and then patient was taken up for removal of the ring under local anaesthesia with the silk unwinding technique [Figure 4]. Following removal of the ring, resumption of normal voids was observed and at 30 day follow up complete penile oedema resolution with normal voiding function and distal penile sensation was observed with an EHS of 4.

Case 5

A 60-year-old man presented with complaint of diffuse penile swelling and pain due to application of plastic bottle neck at the base of the penis 6 hours back for sexual gratification [Figure 5]. Physical examination revealed the oedematous penile shaft with bluish discoloration with corporal gas analysis revealing signs of ischemia. The patient was managed by disruption of the bottle neck by heavy scissors under sedation. Following removal, the penile oedema resolved and at 30 day follow up, normal voiding function and an optimal EHS of 4 was documented.



Figure 5. Clinical photograph of plastic bottle neck penile strangulation

Discussion

Penile strangulation is an urological intervention necessitating immediate intervention by the urologist. Sexual gratification is the most common desired outcome for which penile strangulation is attempted in most cases. Penile strangulation is done by a large list of objects including heavy metal rings, plastic pipes, plastic bottle necks, sprockets or plumbing cuffs with metallic rings being the most troublesome of all these objects to device a removal strategy [1]. Patients usually present immediately or relatively early after their futile attempts at removing these objects fail, but chronic strangulation as late as 1 month post

application has also been reported in literature [3]. Attempts to grade the severity of such injuries have been made by a number of authors in an attempt to judge prognosis. The most popular of them all was described by Bhat et al. who classified penile strangulation injuries as described below [4].

Grade I: Distal edema only.

Grade II: Distal edema, skin & urethral trauma, corpus spongiosum compression, decreased penile sensation.

Grade III: Skin & urethral trauma, no distal sensation.

Grade IV: Separation of corpus spongiosum, urethral fistula, corpus cavernosum compression, no distal sensation.

Grade V: Gangrene, necrosis or distal penile amputation.

Harouchi et al. had devised a four-grade classification ranging

from superficial skin loss (Grade I) to loss of glans (Grade IV) [5]. Silberstein et al. developed a two-tier grading system which categorised injuries into either low or high grade with the latter defined to be those ones that are likely to require a secondary surgical procedure post removal of the strangulating agent [6].

Irrespective of the aetiology, treatment involves prompt decompression by removal of the constricting ring. Various techniques have been described for removal of the constricting ring with cutting methods being the most commonly described. An account of published similar reports on foreign body penile strangulation has been summarised in **Table 1** [7–18] along with the various different techniques used in their management. Management strategies for metallic constricting foreign bodies

Table 1. Summary of published literature on foreign body penile strangulation and management

No	Author	Age*	Foreign Body	Duration	Local Examination	Management
1	Kim Y G, Shin Y S & You J H. Urogenit Tract Infect [7]	51	Metal ring	4 days	Penile edema	Corporal blood aspiration with I & D of penile skin to reduce subcutaneous Penile edema
2	Dong et al. Case Rep Urol. [8]	64 57	Metal ring	12 hours 8 hours	Penile edema Penile edema	Silk winding method
3	Vyas K N & Solanki M I. Int Surg J. [9]	45	Metal ring	2 days	Pressure ulceration under the ring with distal penile edema	Silk winding method
4	Destinval C et al. J Pediatr Urol. [10]	13	Metal ring	2 hours	Penile edema	Gigli saw
5	Paonam S, Kshetrimayum N & Rana I. Urol Ann [11]	47	Metal ring	2 days	Penile edema	Dental micro motor cutting device
6	Chen, Michael Y.& Rukin, Nicholas J. JCU [12]	42	Metal ring	4 weeks	Penile edema	Motorised electric ring cutting device
7	Singh I et al. BMJ Case Rep [13]	33	Metal ring	2 weeks	Penile edema & Pressure necrosis/ulceration of penile skin under the ring	Motorised electric ring cutting device
8	Ichaoui et al. Case Rep Urol [14]	42	Metal ring	10 days	Penile edema & Pressure necrosis/ulceration of penile skin under the ring	Motorised electric ring cutting device
9	Saroj J K et al. Int Surg J. [15]	48	Metal ring	6 days	Penile Gangrene	Total penectomy + PU
10	Magdum et al. J Sci Soc. [16]	60	Plastic pipe	NM	Penile edema	Dental drill
11	Agarwal AA et al. BMJ Case Rep. [17]	45	Plastic bottle neck	18 hours	Penile edema	Heavy scissors
12	Dar NR et al. Pediatr Dermatol. [18]	5	Hair coil	4 weeks	Oedema of glans penis	Removal by dissecting forceps
13	Present case 1	60	Metal ring	1 day	Penile edema and blistering of penile skin	Motorised electric ring cutting device
14	Present case 2	45	Metal ring	5 days	Penile edema & Pressure necrosis/ulceration of penile skin under the ring	Motorised electric ring cutting device
15	Present case 3	36	Metal ring	4 days	Penile edema	Motorised electric ring cutting device
16	Present case 4	45	Metal ring	8 hours	Penile edema	Thread unwinding technique
17	Present case 5	60	Plastic bottle neck	6 hours	Penile edema	Heavy scissors

Age*: In years; I & D: Incision and drainage; PU: Perineal urethrostomy; NM: Not mentioned

ranged from simpler measures like multiple subcutaneous needle punctures and corporal aspirations [7] to the more complex manoeuvres like the silk winding technique [8, 9] or disruption of the rings by cutting devices such as the gigli saw [10], dental drill [11] or the motorised cutting devices in extremely desperate situations [12–14]. Unlike the usual benign course in most of the above published literature, Saroj JK et al. described an unfortunate case of metallic ring penile constriction in a 48 year old patient which culminated in total penile gangrene and total penectomy [15]. Other foreign bodies that have been reported to cause strangulation include plastic pipes [16], plastic bottle necks [17] and human hair [18]. The human hair coil strangulation or the penile tourniquet syndrome is an unique but dangerous situation observed most often in circumcised children where strangulation occurs by the falling maternal hair that winds around the coronal sulcus and produces constriction leading to a wide variety of outcomes ranging from simple constriction to more severe consequences such as urethrocutaneous fistulas, partial penile transection or even an amputated glans penis [19]. Despite being a subject of constantly improving published literature, there exists no fixed protocol on management with most authors managing such cases with their own creative management techniques aimed at removing the constricting object with minimal morbidity. I Singh et al. [20] uniquely attempts to frame an algorithm based on different levels of injury encompassing all described methods on removal of strangulating penile foreign bodies that can be considered a prototype towards formation of more similar standardised management protocols in the future with collective review of available literature on the subject.

Campbell K et al. [21] reviewed long term sequelae of patients that underwent extrication of constricting penile foreign bodies. The authors reported long term sequelae in 24% of studied patients after removal of the constricting agent with the need for skin grafting and urethroplasties being the most commonly observed long term sequelae.

Conclusion

Penile strangulation by constricting foreign bodies is one of those rare situations demanding emergent intervention from an urologist. Despite being a topic of constant improvisation and newer techniques of management, major lacunae does exist in areas like fixed protocols of management and follow up for long term sequelae. Larger studies on the subject concentrated on formation of such standard protocols seem to be the need of the hour to gain further insights into the topic.

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Informed Consent: An informed consent was obtained from the patients.

Publication: The results of the study were not published in full or in part in form of abstracts.

Peer-review: Externally peer-reviewed.

Authorship Contributions: SK was the responsible consultant surgeon in-charge of the overall care of the patients and on whom the final decision on the patient management rested. SK and TKA wrote the first draft of the manuscript. TKA, S and HS were involved in day to day patient care and follow up. S

and HS provided insight and valuable inputs to the manuscript, collected references and were responsible for typography of the final manuscript draft.

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