

Penil Entrapment with A Steel Nut and Its Treatment with A Dental Micro Motor

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Abstract

Entrapment or strangulation of the penis is an uncommon condition that requires prompt medical intervention to avoid mechanical and/or vascular injuries. Severe complications such as edema, necrosis, skin infection, penile amputation, and urethral fistula may occur. There is no universally accepted method for treatment, and medical treatment can be delayed due to feelings of humiliation or self-attempt to release the entrapment. Intracavernosal aspiration is a surgical procedure used to evacuate blood from the obstructed corpus cavernosum. This procedure reduces penile size making it easier to remove the ring. However, it does not alleviate the inflammatory idea in the interstitial spaces and penile skin. This paper describes a case study of a 34-year-old male patient who was evaluated in the department of emergency with penile entrapment in a thick steel ring that was placed for prolonged erection. Removing the ring manually was attempted in the emergency department but failed, causing more engorgement in the distal part of the penis. The following admission, the patient was expeditiously transferred to the operating room where the surgical team interposed a wooden tongue depressor between the penile shaft and the ring. Subsequently, a manual hacksaw was used to excise the constriction device. Nevertheless, owing to the substantial diameter of the ring, the hacksaw became fractured and subsequently, a micromotor was employed for the ring removal procedure. Throughout the cutting process involving the micromotor, the ring was continuously cooled with an iced isotonic solution. Within thirty minutes, the ventral and dorsal sides of the steel ring were cut, and it was removed in two pieces.

Keywords: Steel ring, penil entrapment, treatment, micro motor

Introduction

Entrapment of the penis with metal or nonmetal objects is a rare condition that needs immediate treatment to prevent mechanical and/or vascular injuries. Due to prolonged entrapment, the anatomical integrity of the penis in addition to the voiding and erectile functions would be damaged. The first case was reported by Gauthier (1) in the 18th century. These objects are used to prolong the erection duration and increase the sexual pleasure of adults. In the pediatric population, the strangulation of the penis is generally caused by occult materials like long pieces of hair and treads (2).

Penile strangulation causes edema distally to the constricting object due to the obstruction of the venous and lymphatic flow. In hours, compartment syndrome of the penis, which would cause ischemia and tissue necrosis, occurs because of arterial obstruction. Skin ulceration, urethral injury, damage to the corpus spongiosum, cavernosum, and urethral fistulas are the

long-term consequences of this condition. The duration and the severity of the constriction are the major factors that affect the complications (3).

This paper presents the treatment process of a young male with penile entrapment in a thick steel ring.

Case Presentation

The patient was 34-year-old circumcised male, and he was admitted to the emergency service with penile entrapment in a metallic nut that had been placed for a prolonged erection. After sexual practice, the steel nut could not be removed from the penile shaft due to swelling of the distal part. Approximately 4 h later, the patient attended the hospital. He had no co-morbidities and no history of earlier surgeries. Also, his laboratory values were within the normal range.

Genital examination revealed stuck thick (6 mm) steel ring surrounding the shaft of the penis. The penis was ecchymosed

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Received: 23.04.2023 **Accepted:** 21.05.2023

Cite this article as: Akarken İ, Karaöz F, Tarhan H, Deliktaş H, Şahin H. Penil Entrapment with A Steel Nut and Its Treatment with A Dental Micro Motor. J Urol Surg 2024;11(1):55-57.

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and swollen at the end of the metal ring secondary to the congestion (Figure 1). At first, manually removing the ring was attempted by the emergency staff with the aid of lubricants and blood aspiration with two 16-gauge needles, but failed. This attempt caused more engorgement in the distal part of penis (Figure 2). After that, the patient was immediately transferred to the operating room, which was prepared for ambulatory patients. The patient was placed in a supine position and dorsal penile block with lidocaine was used for anesthesia. The surgical team interposed a wooden tongue depressor between the penile shaft and the steel ring, in addition, the ring was stabilized with a wrench to prevent accidental damage to the penile tissue. After that, a manual hacksaw was used to cut through the steel ring; however, after one hour of hard labor and two broken pieces of the hacksaw, little progress could be made. The search for a more effective and faster method resulted in the discovery of a micromotor that is used for shaping dental prosthesis. The ring was cooled with an iced isotonic solution while cutting with a micromotor. Within thirty minutes, the ventral and dorsal sides of the steel ring were cut, and it was removed in two pieces



Figure 1. The 6 mm steel ring surrounding the penile shaft



Figure 2. The engorgement of the penis after the failed attempt of blood aspiration with two 16-gauge needles

(Figure 3). After the ring was successfully removed, the penile color returned to its normal state, and after being monitored for 6 h, the patient was discharged.

Discussion

Penile entrapment and/or strangulation, which would require immediate intervention, is a rare urological condition. The reason behind this condition varies according to age groups. The leading cause in adult males is the intention to increase sexual pleasure, self-treating of erectile dysfunction and psychiatric diseases (4). The most common object that is used for enhancement is a metal ring in elderly males. However, the strangulation is usually accidental in the pediatric population, and the objects that cause the entrapment could be hair, string, tread or a rubber band (5,6). The medical treatment could be delayed because of feeling humiliation or self-attempts of release of the entrapment. The patient in this report used a thick steel ring to enhance sexual pleasure and promptly sought medical attention.

There is a wide range of complications caused by penile strangulation, which could be affected by factors such as the object that is used, the level of compression, and especially the duration of the entrapment. A study conducted by Koifman et al. (4) demonstrated that following penile entrapment with a foreign body, complications such as edema, necrosis, and skin infection, decreased/lost penile sensation, abscess/cellulitis, penile amputation, and urethral fistula may occur. However, in the presented case, no complications were observed after treatment, likely due to early intervention and prompt medical attention. A classification scheme comprising five categories has



Figure 3. The penis and the parts of the steel ring after the cutting with a dental micro motor

been established to grade penile strangulation injuries by Bhat et al. (7). In addition, a simplified grading system with just two distinct categories was proposed by Silberstein et al. (8) in 2008. In that system, decreased penile sensation, penile edema, and even skin ulceration (without urethral fistulae) were included in the low-grade injuries. The high-grade category consisted of injuries that usually need surgical correction.

Intracavernosal aspiration is a surgical procedure used to evacuate blood from the obstructed corpus cavernosum. This procedure reduces penile size making it easier to remove the ring. However, it does not alleviate the inflammatory edema in interstitial spaces and the penile skin, and thus should be used in conjunction with different methods. In a case study published by Simlawo et al. (9) in 2018, a 10-year-old patient who had a 3 cm metal ring attached to his penis was treated with intracavernosal aspiration and removal of the ring by lubricating it with povidone-iodine.

In addition to medical devices, assistance from different fields of expertise may be required to use tools to remove a foreign body. Furthermore, when using electrical devices, it is recommended to use a barrier between the penis and the foreign object to prevent injuries caused by medical intervention. Although cutting poses a risk of penile injury, it is the most common method used for removal of foreign bodies. Using an orthopedic cutting tool under the ring can be the quickest way of removal, but it may not be the safest method, particularly when dealing with a thick metal ring. The use of an iron saw, angle grinder, or gigli saw for cutting the ring has been reported. Insufficient protection within the limited operating space and heat production can result in potential injuries. Using ice-filled normal saline can help minimize heat production and mitigate the risk of thermal injury (10). In a case report published by Patel et al. (11) in 2018, lubrication and cutting with a gigli saw were attempted to remove a ring around the scrotum and penis. When these methods failed, an attempt was made to cut the ring with an electric saw, but burn damage occurred due to the high heat despite continuous normal saline irrigation. As a result, an industrial bolt cutter was brought in, and the ring was cut and removed (11).

Conclusion

In conclusion, in the rare occurrence of penile constriction caused by a foreign object, there are different treatment options available for the preservation of penis structure and function. However, what matters most is the prompt application of the available treatment option. Acquiring skill in possible treatment options will accelerate the application.



Video 1.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Authorship Contributions

Surgical and Medical Practices: İ.A., H.T., H.Ş., Concept: İ.A., F.K., H.T., H.D., H.Ş., Design: İ.A., H.T., H.Ş., Data Collection or Processing: İ.A., H.T., H.D., Literature Search: İ.A., F.K., H.T., H.D., H.Ş., Writing: İ.A., F.K., H.T., H.Ş.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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