Penile strangulation; a study of 15 cases

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ABSTRACT

Objectives
To report penile strangulation injuries, their management and outcome.

Patients and Methods
Fifteen consecutive cases of penile strangulation admitted in our department from January 2002 to December 2009 are reviewed. All were assessed by thorough history, clinical examination and baseline investigations, when required. Management and outcome was recorded.

Results
The mean age was 10.6 years (range 4-50). Eight patients had hair coil injury, two had tied the shaft of penis by thread, two by nala-entrapment, one had strangulation by stitch during circumcision, one had strangulation by wheel bearing and one due to nylon coil injury. In eight patients only skin was constricted without urethral involvement (grade 0 injury) and were managed by removal of the constricting agent. Strangulation lead to grade 1 injury (urethro-cutaneous fistula) in five patients which were repaired with normal voiding. One patient
developed dry gangrene of the glans resulting in almost auto amputation, so refashioning of the penile shaft with meatoplasty was performed with acceptable results. One patient who had strangulation with wheel bearing absconded from the unit before treatment.

Conclusion
Penile strangulation is an uncommon injury that requires urgent management, because if unrelieved, may lead to penile engorgement, ulceration, necrosis of the spongiosum and cavernous tissue, urinary extravasation, fistula and even gangrene. (Rawal Med J 202;37:30-33).

Key words
Penile strangulation, penile gangrene, penile amputation.

INTRODUCTION
Penile strangulation, an uncommon urologic emergency, if not treated early can lead to serious consequences including gangrene and amputation of penis.\(^1\) It was first reported in 1755.\(^2\) Various objects used for strangulation can be metallic (ball bearings, rings) or non metallic objects, (strong rubber band, condom ring, plastic bottle neck, hairs, thread etc) which are placed around the penis to enhance sexual performance or for some auto erotic intention.\(^3,4\) Penile strangulation by a thread or hair is also called penile tourniquet syndrome. All ages are vulnerable and these injuries may be accidental, incidental or intentional in nature.\(^5\) The aim of this study was to determine outcome of penile strangulation seen at our institution.

PATIENTS AND METHODS
Fifteen cases of penile strangulation were admitted in our department through Emergency/OPD from January 2002 to December 2009. In this non-interventional descriptive study, all patients were completely assessed by thorough history, particularly the type of strangulating object and
duration of strangulation, clinical examination and baseline investigations, when required. All injuries were assessed by the grades already described\(^6\) (Table 1).

**Table 1. Grades of penile injuries.**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>Grade 0</td>
<td>Constriction of skin without urethral injury.</td>
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<tr>
<td>Grade 1</td>
<td>Partial division of corpus spongiosum with urethro-cutaneous fistula.</td>
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<tr>
<td>Grade 2</td>
<td>Complete division of corpus spongiosum and constriction of corpus cavernosum.</td>
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<tr>
<td>Grade 3</td>
<td>Gangrene, necrosis and amputation of the glans.</td>
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Management in all patients and their outcome were recorded.

**RESULT**

The mean age was 10.6 years (range 4-50). Duration of strangulation was from 48 hours to 7 yrs. In eight patients, the duration of injury was short (mean duration 2.6 days; range 2-4 days). In five patients, the mean duration of injury was five years (range 1-7 years) and they all developed urethro-cutaneous fistulae (grade 1 injury) due to prolonged strangulation. These fistulae were repaired with normal voiding.

**Fig 1. Hair coil injury involving shaft.**
One patient, despite short duration of injury (seven days) developed dry gangrene of the glans (grade 3 injury) due to tying by thread and this was so tightly applied that it resulted in vascular compromise of the glans. In this case penile refashioning and meatoplasty was performed.

**Fig 2. Thread entrapment leading dry gangrene of glans.**

The outcome was satisfactory with acceptable cosmetics and normal voiding. One 15 yrs. old boy applied wheal bearing (from the last 06 months) at base of penile shaft just for fun and developed dry gangrene/ necrosis of penile shaft skin. He left against the medical advice.

**Table 2. Type of injury, management and outcome (n=15).**
Patients profile, duration, grades of injury, management and the outcome are shown in Table 2.

**DISCUSSION**

Penile strangulation is a rare phenomenon that can lead to a wide range of vascular and mechanical impacts if strangulating object is not removed early. The various case reports illustrated that patients can present either acutely or over a period of time after the strangulation has occurred. The usual presentation of this constriction syndrome ranges from penile swelling, phimosis, stricture at the base of penis, lymphedema and signs of vascular insufficiency, necrosis (urethocutaneous fistula), to a gangrene (partial or complete amputation of the penis).
Systemic complications are less well documented and one such complication resulting from penile strangulation was obstructive uropathy. In adults the strangulating objects are used for fun, erotic purposes or to prolong erection and in adolescents, they are used to increase erotic sensation during masturbation or sexual curiosity. Occasionally psychotic patients, having self destructive behavior, apply constrictive agents on penis.

In infants and children the common cause of penile strangulation is hair or thread tourniquet syndrome which may be accidental or more commonly to prevent nocturnal enuresis. Barton et al reported a case of hair thread tourniquet syndrome as result of child abuse. Penile strangulation secondary to human hair was first reported by Morgenstern in 1883. Human hair is extremely thin and therefore easily overlooked, especially when there is a foreign body reaction and swelling and it stretches when wet and contracts and tightens as it dries and has tensile strength of greater than 29,000 pounds per square inch. These characteristics make it an excellent agent for accidental or intentional constriction.
Bashir and EL Barbary reviewed important anatomical properties of penile shaft and correlated them to the progressive nature of the injury. The skin devoid of subcutaneous tissue and located most superficially, is affected first. The corpora spongiosum and urethra are covered by relatively thin layer of fibrous tissue and therefore are most susceptible to injury rather than corpora cavernosa which are covered by the tunica albuginea, a dense fibrous layer. As hair cut through ventral aspect of the penis the urethra may be transected, producing an urethrocutaneous fistula. The neurovascular bundle also may be injured.

The management of penile strangulation consists of two steps: safe removal of the strangulating object and management of the complications which occurred due to strangulation. All grade 0 injuries are managed by simply removing the strangulating object followed by conservative management. In our study all cases, except one, the strangulated object was non-metallic (i.e. hair, thread, stitch, nala or nylon). The removal of these objects is easy and does not require any special instrument. But for metallic objects special equipment and heavy armamentarium is required for their removal. Equipment used for metallic objects included an iron saw, pliers, a high-speed diamond-tipped dental drill and orthopaedic equipment. In a few cases, the corpus cavernosum had to be aspirated so that the tumescence could be reduced to allow for the easy removal of the foreign body. In the report by Gupta et al, the penis was compressed by an intravenous drip set tube applied circumferentially, starting from the tip of the penis to its base in order to act as an even compressive tourniquet, eventually allowing for the removal of the strangulating object.

CONCLUSION

Strangulating penile injuries are uncommon but can lead to grave consequences if not removed early. The resulting injuries may range from minor swelling to gangrene/ loss of the organ.
leading to permanent disability. Therefore, their early and safe removal should be the objective to prevent serious complications.

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