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Penile Constrictive Band Injury

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Abstract

Penile strangulation caused by a thread or human hair is an uncommon cause of urethral injury described in pediatric practice. Five children presented with this entity to the Aga Khan University Hospital, Karachi between August, 1991 and August, 1992. Three children had uneventful recoveries after removal of the constricting agent. Two patients developed urethrocutaneous fistulae and partial amputation of the penis because of late presentation. Early recognition and removal of the constricting agent is necessary to prevent serious complications (JPMA 43: 135, 1993).

Introduction

Penile tourniquet or constrictive band injury caused by an encircling object has been described periodically in all ages. The constricting bands are placed on the penis for a variety of reasons and the objects used have been diverse. In children rubber bands, threads and human hair have been reportedly used to prevent nocturnal enuresis or incontinence and sometimes as childhood experimentation. Severe damage to the erectile tissue and urethra can result, requiring major reconstructive procedures. The purpose of this report is to call attention to this injury in young children and to stress the importance of early recognition and management.

Patients and Methods

Between August, 1991 and August, 1992 five children presented to the pediatric surgery service at The Aga Khan University Hospital, Karachi, with penile constrictive band injury. The medical records were reviewed retrospectively for age at presentation, circumcision, history of nocturnal enuresis, nature of constricting agent, duration before diagnosis, presenting symptoms and signs, treatment and the outcome. The injuries were graded as described by Bashir and El-Barbary (Table I).

| Grade 0 - Constriction of skin without urethral injury. |
| Grade 1. Partial division of corpus spongiosum with urethrocutaneous fistula. |
| Grade 2. Complete division of corpus spongiosum and constriction of corpus cavernosum. |
| Grade 3. Gangrene, necrosis and amputation of the glans |

Illustrative Case Report

S.I.U., a seven year old circumcised boy (patient 4 in Table II)
with a history of nocturnal enuresis, tied a thread around his penis to control bed wetting and avoid paternal punishment. Fle concealed the swelling of the glans until one week later, when he was seen by a local physician for progressive penile swelling and circumferential inflammation at the coronal sulcus. The child was placed on systemic antibiotics with no response. In the third week following the episode, the physician discovered an encircling thread, buried in the coronal sulcus. Following its removal, the patient developed an urethrocutaneous fistula and was referred to The Aga Khan University Hospital. Examination under anaesthesia revealed complete division of the corpus spongiosum, leading to a urethral fistula and partial amputation of the corpus cavernosum (Grade 2 injury). The glans was markedly swollen (Figure 1a and ib).

<table>
<thead>
<tr>
<th>No.</th>
<th>Age at presentation</th>
<th>Circumcised</th>
<th>History of enuresis</th>
<th>Constricting agent</th>
<th>Delay in diagnosis</th>
<th>Marked erosion of coronal sulcus</th>
<th>Glans edema</th>
<th>Retention of urine</th>
<th>Urethral fistula</th>
<th>Injury grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6 months</td>
<td>Yes</td>
<td>-</td>
<td>Human hair</td>
<td>2 weeks</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>4 years</td>
<td>Yes</td>
<td>No</td>
<td>Cotton thread</td>
<td>4 weeks</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>6 years</td>
<td>Yes</td>
<td>No</td>
<td>Human hair</td>
<td>2 weeks</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>7 years</td>
<td>Yes</td>
<td>Yes</td>
<td>Polyester thread</td>
<td>3 weeks</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>9 years</td>
<td>Yes</td>
<td>Yes</td>
<td>Polyester thread</td>
<td>2 weeks</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
</tbody>
</table>

**Figure 1a.** Marked edema of glans and partial amputation of corpora cavernosum.
Results
The salient features of the patients are summarized in Table II. The average age of the patients was 5.2 years, with a range of 6 months to 9 years. All children had been circumcised at birth. Two patients admitted to tying polyester thread around the penis to control nocturnal enuresis. In one patient the cotton thread was tied by an elder sibling. The mean time interval between occurrence of the event and recognition of the constricting agent was 2.6 weeks (range 2 to 4 weeks). The physical and mental development in all children was normal for age.

Discussion
If unrecognized, penile constrictive band injury can result in serious sequelae. The first case of such an injury secondary to human hair was reported by Morgenstern in 1888g. Since then occasional reports have appeared in medical literature describing mostly adult patients, some of whom were mentally disabled1-3. In children, penile strangulation may occur accidentally by the hair of the caretaker or may be an intentional act by the patient, a sibling, or family members. This injury has been occasionally reported as a form of child abuse5. As in previous reports, all the patients in our series were circumcised. Circumcision makes the coronal sulcus more accessible to the constricting agent and may be a reason why this injury has never been reported in uncircumcised children6. The extent of the damage is related to the duration of constriction and the nature of the constricting agent. The corpus spongiosum and the penile urethra are covered by a thin layer of fibrous tissue, and therefore, are more susceptible to injury than the corpus cavernosum which is enveloped by the dense tunica albuginea2,6. Progressive compression of the penile vessels is responsible for distal oedema and gangrene. The
neural bundle may be injured effecting the sensation of the glans. If the constricting agent cuts through the ventral aspect of the penis, the urethra is transected resulting in a urethrocutaneous fistula. Human hair and thread can be easily over-looked once the swelling of the glans ensues, resulting in extensive injury. Two patients in the present series had a delay in diagnosis of 3 and 4 weeks and developed urethral fistulae. Unexplained edema of the glans with a marked erosion of the coronal sulcus and surrounding inflammation in a young child should be viewed with a high index of suspicion. An underlying circular constricting agent should be included in the differential diagnosis of penile swelling beside local infection (balanitis) paraphimosis, trauma, contact dermatitis and insect bites. Confirmation of the diagnosis may require a thorough examination under general anaesthesia. If diagnosed early, removal of the constricting agent and local care of the wound is all that is necessary (Figure 2).

![Reconstruction of the transected urethra should be delayed until the inflammation has resolved and the tissues have healed. Long term follow-up may be necessary to detect urethral strictures and possible sexual dysfunctions.](image)

**Figure 2. Constricting cotton thread removed from patient 2 (Table II). Note pronounced coronal sulcus.**

Reconstruction of the transected urethra should be delayed until the inflammation has resolved and the tissues have healed. Long term follow-up may be necessary to detect urethral strictures and possible sexual dysfunctions.

**References**