

A Case Report

Penile Hair Thread Tourniquet Syndrome in an Older Child: A Case Report and Review of Clinical Variability Across Age Groups

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ABSTRACT

Penile Hair Thread Tourniquet Syndrome (PHTTS) is a rare pediatric urological emergency caused by constriction of the penis by a hair or thread, resulting in edema, ischemia, tissue necrosis, and, in severe cases, urethral injury or penile amputation. Most reported cases occur in infants and young children. We report a rare case of a 10-year-old circumcised boy who presented with penile swelling, redness, and pain caused by a circumferential thread tightly wrapped around the penoscrotal junction. The condition was initially misdiagnosed at a primary healthcare facility. Careful urological examination revealed a constricting thread causing localized infection and edema without urethral involvement. The thread was removed surgically, followed by debridement, catheterization, antibiotic therapy, analgesia, and wound care. The patient demonstrated excellent recovery with complete healing at three-week follow-up and preservation of urinary function. This case highlights the importance of maintaining a high index of suspicion for penile tourniquet syndrome in older children presenting with unexplained penile swelling and emphasizes the need for prompt diagnosis and timely intervention to prevent serious complication.

INTRODUCTION

Penile Hair Thread Tourniquet Syndrome (PHTTS) is a rare but potentially devastating pediatric urological emergency caused by circumferential constriction of the penis by a strand of hair or thread. The condition predominantly affects circumcised infants and young children because the exposed coronal sulcus facilitates entrapment of constricting materials [1-3]. Progressive constriction initially impairs lymphatic drainage and venous return, resulting in distal edema and swelling. If unrecognized, continued pressure may compromise arterial blood flow, leading to ischemia, tissue necrosis, urethrocutaneous fistula formation, urethral transection, gangrene, and even penile amputation [1,3]. Hair-thread tourniquet syndrome can affect multiple body parts, including fingers, toes, clitoris, labia, and penis, but penile involvement remains particularly concerning because of the potential impact on urinary and sexual function [2,4]. Most reported cases involve maternal hair, often associated with postpartum telogen effluvium, which increases the availability of loose hair capable of acting as a constricting agent [1,5]. Thread-induced cases are considerably less common but may produce similar or even more severe tissue injury because synthetic fibers are often difficult to identify during clinical examination [5,6]. The diagnosis may be challenging, particularly in older children, because symptoms are frequently nonspecific and may mimic allergic reactions, infections, insect bites, balanitis, or traumatic injury [3,5]. Delayed recognition remains a major contributor to adverse outcomes. Early diagnosis through careful genital examination and prompt removal of the constricting material are essential to prevent irreversible tissue damage [4,6]. Although the majority of published cases involve infants and toddlers, reports involving older children remain uncommon [5,7]. We present a rare case of thread-induced penile tourniquet syndrome in a 10-year-old boy with localized infection and edema but without urethral injury. This case highlights the clinical variability of the condition across age groups and emphasizes the importance of maintaining a high index of suspicion when evaluating unexplained penile swelling in children [7,8].

CASE PRESENTATION

A 10-year-old circumcised boy presented to the Emergency Department of Ayub Teaching Hospital, Abbottabad, with penile swelling, redness, and mild pain. The swelling had been noticed by his parents while changing his clothes. The patient did not initially report symptoms and was unaware of the underlying cause. Detailed history revealed no trauma, insect bite, foreign body exposure, or previous similar episodes. Urinary voiding was normal. The patient had initially been evaluated by a local general practitioner

and treated for a presumed allergic reaction. However, symptoms failed to improve and he was referred to our institution. On examination by the urology team, a tightly wrapped thread was identified at the penoscrotal junction, producing circumferential constriction, edema, localized tissue injury, and purulent discharge suggestive of secondary infection. The patient underwent immediate removal of the constricting thread and surgical debridement under local anesthesia. A urinary catheter was inserted, and no urethral injury was identified. Daily wound care with normal saline and povidone-iodine dressings was initiated. Intravenous antibiotics and analgesics were administered. The patient's condition improved progressively. He was discharged with oral antibiotics, analgesics, and instructions regarding wound care. At three-week follow-up, complete wound healing was observed, the catheter was removed successfully, and the patient voided normally without evidence of infection or functional impairment.

Figure Postoperative appearance following removal of the constricting thread and surgical debridement demonstrating circumferential soft tissue injury with localized edema and infection.



Postoperative appearance following removal of the constricting thread and surgical debridement, demonstrating circumferential soft tissue injury with localized edema and infection.

Figure 2: Follow up after 3 weeks of a wound healing



Clinical appearance three weeks after treatment showing satisfactory wound healing, complete resolution of infection, and preservation of penile anatomy.

DISCUSSION

Penile Hair Thread Tourniquet Syndrome is an uncommon pediatric urological emergency that requires prompt recognition and intervention to prevent potentially devastating complications. The condition occurs when a strand of hair or thread becomes tightly wrapped around the penis, producing progressive constriction and vascular compromise. A recent systematic review demonstrated that genital hair-thread tourniquet syndrome remains a rare but clinically significant condition, with delayed diagnosis frequently associated with tissue loss and urethral injury [9]. The majority of reported cases occur in infants and toddlers; therefore, presentation in an older child, as observed in our patient, represents an unusual clinical scenario. Age-related variability in presentation is an important feature of this condition. Younger children often present with irritability, unexplained crying, urinary symptoms, or marked penile swelling, whereas older children may present later because of embarrassment, reduced parental supervision, or failure to recognize the significance of symptoms [9,10]. In the present case, delayed identification contributed to localized infection and edema, although fortunately no urethral involvement or tissue necrosis developed. Another notable aspect of our case is the use of thread rather than hair as the constricting material. Hair accounts for the majority of reported penile tourniquet injuries, whereas thread-induced cases remain relatively uncommon [11]. Because thread fibers may become embedded within edematous tissue and are often less conspicuous than hair, diagnosis may be delayed. Several authors have emphasized the importance of meticulous genital examination under adequate lighting and magnification whenever penile swelling of unclear etiology is encountered [10,11]. The location of constriction in our patient also differs from many previously reported cases. Most reports describe entrapment at the coronal sulcus because of its anatomical configuration and tendency to retain hair strands [9,12]. In contrast, our patient developed constriction at the penoscrotal junction. Similar atypical presentations have been described only rarely in the literature and highlight that clinicians should not exclude the diagnosis solely because the constriction is located away from the coronal sulcus [12]. The differential diagnosis of penile swelling in children includes balanitis, allergic reactions, insect bites, trauma, paraphimosis, cellulitis, and less commonly child abuse or self-inflicted injury [13]. Previous reports have suggested that some older children may intentionally apply constricting materials in an attempt to control nocturnal enuresis or because of underlying behavioral disorders [14]. Although our patient had a history of nocturnal enuresis, there was no evidence of

intentional application or psychological disturbance. Careful assessment of the social and psychological context remains important in all suspected cases. Management depends on the severity of tissue injury and the duration of constriction. Early cases may be treated by simple removal of the constricting material, whereas advanced presentations often require surgical exploration, debridement, urethral reconstruction, or other reconstructive procedures [10,15]. In our patient, timely removal of the thread, debridement of devitalized tissue, catheterization, antibiotic therapy, and meticulous wound care resulted in complete recovery without functional impairment. This favorable outcome underscores the importance of early recognition and multidisciplinary management. This case contributes to the limited literature describing thread-induced penile tourniquet syndrome in older children. It highlights the need for heightened clinical awareness among emergency physicians, pediatricians, general practitioners, and urologists. Any child presenting with unexplained penile swelling should undergo a thorough genital examination to exclude a constricting hair or thread, thereby preventing avoidable complications and preserving long-term penile function [9-15].

CONCLUSION

Penile Hair Thread Tourniquet Syndrome is an uncommon but potentially devastating pediatric urological emergency. Although most cases occur in infants, this case demonstrates that older children may also be affected. Delayed diagnosis can result in significant morbidity, including urethral injury and tissue loss. Careful genital examination, prompt recognition, and timely intervention are essential for successful management and prevention of long-term complications.

CONSENT

Written informed consent was obtained from the patient's parents for publication of this case report and accompanying clinical images.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

FUNDING STATEMENT

No funding was received for this study.

DATA AVAILABILITY STATEMENT

All data supporting the findings of this case report are included within the article.

AI DISCLOSURE STATEMENT

Artificial intelligence tools were used solely for language editing, grammar correction, and manuscript preparation. All clinical interpretation, literature review, and final manuscript approval were performed by the authors.

AUTHOR CONTRIBUTIONS

Sadaqat Ullah Rehmat: Conceptualization, methodology, supervision.

Jawad Khan: Data collection, manuscript drafting, patient management.

Attia Mahmood: Literature review and investigation.

Asifa Irfan: Manuscript review and editing.

Aisha Habib: Manuscript review, editing, and final approval.

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