

CASE REPORT

Irritable Infant: A Rare and Easy to Miss Case for Strangulated Toe

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ABSTRACT

Background: Hair-thread tourniquet syndrome (HTTS) is a rare condition and it refers to the strangulation of a distal appendage by thread or hair, leading to impairment of blood flow and ischemia which if left untreated becomes a surgical emergency. It is usually misdiagnosed due to its infrequent presentation in a hidden part of the body.

Case Presentation: A 3-months-old-female infant presented to a governmental institute with a history of irritability, restlessness, and continuous crying without an obvious cause. The diagnosis of HTTS was made as the third digit of the left foot was swollen and red. A surgical incision was made, and hair tourniquet was removed. The follow-up had satisfactory results.

Conclusion: HTTS is a rare condition and it is vital to recognize it and provide immediate treatment. Delay of treating this medical issue can lead to strangulation of a distal appendage which may lead to impairments of blood flow and ischemia.

Keywords: Hair thread tourniquet syndrome, HTTS, hair tourniquet management, hair tourniquet removal, irritable infant, restless infant.

Introduction

Hair thread tourniquet syndrome (HTTS) refers to a rare condition in which a distal appendage, such as a finger, toe, clitoris and penis, is wrapped and constricted by a thread-like hair or strand of silk, leading to the impairment of venous return and carrying the potential risk of permanent tissue damage [1]. HTTS occurs most frequently in the first few months of infancy [2] and should be included in the differential diagnosis of an irritable and restless infant. The clinical manifestation of HTTS varies from mild edema to deep ulceration, or even total amputation [2]. The surgical approach to the management of HTTS is discussed in this paper.

Case Presentation

A 3-months-old-female infant presented to a governmental institute with a history of irritability, restlessness, and continuous crying without an obvious cause. There was no history of fever. A couple of days back, the patient was diagnosed with infantile colic and was discharged. The patient returned the next day with the same complaint. The parents were referred to the Tertiary Care Center, King Fahad Medical City, Riyadh (KFMC), Saudi Arabia. General examination was unremarkable, followed by a local examination in which the third digit of the left foot was found to be swollen, red with marked edema and ecchymosis distal to the metacarpophalangeal (MP) joint,

with no obvious presence of hair but there was a groove encircling the digit. There was no sign of ischemia, capillary refill was 3 seconds, and oxygen saturation 100% at the affected digit (Figure 1). The suspicion of a hair thread distal to the MP joint, and the possibility that it had become wrapped around the toe several times, causing strangulation, and delayed capillary perfusion was considered. Consent was obtained from the parents to remove it and to take photographs for medical purposes. The procedure was performed by pediatric emergency consultant, which is considered as a privilege in the present institution. Digital block with local anesthesia was done and a dorsal cut maneuver was performed; a hair was found to be wrapped around the toe (Figure 2). The infant's irritability and crying subsided immediately following the intervention. The outcome was satisfactory in follow-up visit at the plastic surgery clinic (Figure 3).

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Discussion

HTTS is the strangulation of an appendage in small infants, such as a finger, toe, penis, and clitoris, as these are exposed and uncovered areas. The third toe digit is the most frequently affected [6]. In conducting a full examination of an irritable and restless infant, it is important to exclude HTTS. It can affect many other body parts, including the tip of the tongue, ear pinna or uvula, seen in long-standing, bedridden, or mentally retarded patients [3,4]. The mean age for



Figure 1. The third digit of the left foot was observed to be swollen, red and inflamed.



Figure 2. A dorsal cut maneuver was performed to release the toe and remove the hair.



Figure 3. The outcome was satisfactory when the patient returned for a follow-up visit at the plastic surgery clinic.

HTTS involving toes and fingers is 5 months [5]. HTTS is not very common in Saudi Arabia, in each case, it needs high index of suspicion and should not be missed [12].

There is an increase in the incidence of HTTS during the first 6 months of life because of excessive postpartum hair loss by the mother secondary to hormonal changes (telogen effluvium) [7]. The risk of HTTS also increases during winter as excessive clothing makes it difficult to notice loose strands of hair [6]. HTTS is commonly caused by hair threads but can also occur with fibers or silk threads. Hair contains hydrogen ion on its surface and when it becomes dry, it shortens in length, tightens, and coils around the appendage several times [3,4]. If left untreated, greater strangulation and deeper penetration are resulted.

HTTS is an emergency situation, requiring urgent intervention and removal. Most emergency physicians prefer the intervention to be carried out by specialists, such as Plastic or Orthopedic Surgeons or Pediatric Urologist to ensure that it is executed easily and safely. Many management modalities have been described in the literature in this regard. The dorsal cut maneuver should be conducted if the hair has penetrated deeply, causing strangulation and ecchymosis. Prior to commencing the procedure, the area should be disinfected with povidone-iodine or chlorhexidine solution, digital block with local anesthesia to minimize the pain. A tourniquet should be applied to the digit, proximal to the hair tourniquet to avoid excessive bleeding after the incision. An incision may be made away from the neurovascular bundles after carrying out a digital block with lidocaine injection.

The dorsal maneuver is performed through the application of a perpendicular incision with blade size 15 proximal to the hair tourniquet at "12 o'clock" [9]. The incision should be deep and reach the bone because the hair may have penetrated deeply. The blade should then be swept distally to ensure the complete release of the digit from strangulation [9–11]. It is considered safe and associated with a good outcome. The tendon may become injured during this procedure, but generally, this is followed by rapid healing within a few days without complications [11]. The same maneuver can be applied by performing an incision at "3" or "9 o'clock" as this area is free from neurovascular contents [1]. After tension has been released, the application of pressure is important to stop the bleeding. Once the bleeding has ceased, the patient can be discharged. Ideally, follow-up should occur within a week. The appropriate antibiotic coverage should be provided [6]. If the skin is not intact, the incision must be away from the neurovascular bundles after carrying out a digital block with lidocaine injection. A less invasive approach can be used if the digit is minimally swollen and superficial and clear hair involvement is obvious.

A blunt probe should be inserted between the hair and the skin [1]. Alternatively, a depilatory agent with a thioglycolate base can be applied, after waiting for 3–10 minutes, the hair can be easily broken [8]. The application of a depilatory agent is not preferred in the case of deep hair tourniquet with obvious swelling or deep penetration of the hair thread, owing to associated complications, such as an allergic reaction and local skin irritation [8]. The wound should not be sutured and left to heal by secondary intention.

Conclusion

HTTS refers to a rare condition and it needs high index of suspicion. It is vital to recognize it and treat it. The delay of treating this medical issue can lead to strangulation of a distal appendage which may lead to impairments of blood flow and ischemia.

List of Abbreviations

HTTS Hair thread tourniquet syndrome

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent for publication

Written informed consent was obtained from the parents to publish this case report and any accompanying images.

Ethical approval

Ethical approval was granted by Ethics Committee King Fahad Medical City, Riyadh, IRB: 16-422, March 2, 2017.

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