Hair-Tourniquet Syndrome: An Unusual Cause of Digital Ischemia

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INTRODUCTION

Hair Tourniquet Syndrome (HTS) is an uncommon clinical event. The largest single-center review, conducted by The Children's Hospital of Chicago, included 81 diagnosed cases of HTS over a ten year period. There are several published case reports describing HTS since the 1970's with a case report of hair-tourniquet induced ischemia published in The Lancet as early as 1852. Despite its documentation in the medical literature, many clinicians are unaware of the existence of HTS and its potential for devastating clinical consequences. HTS occurs when a strand or strands of hair, or any type of fiber, become circumferentially bound around an appendage leading to vascular compromise. These events are more common among children, with a mean age of 5.5 years ± 4 months. HTS involving the digits is seen between the ages of 4 days to 19 months, while involvement of external genitalia and head and neck is seen between the ages of 4 months to 6 years. Associated risk factors for the development of HTS include telogen effluvium (hair loss experienced by post-partum women), chemotherapy, wearing mittens and frequently washed clothing.

Clinicians aware of this condition agree that timely evaluation, recognition, and treatment are paramount in avoiding serious complications; classifying this as a clinical condition requiring urgent assessment. HTS that is unrecognized and untreated can lead to necrosis and gangrene of the affected appendage secondary to inhibition of perfusion. Given that this condition typically is found among children, it is critical that pediatric providers are aware of its existence. As frantic parents identifying an edematous appendage may bring their child for evaluation to the emergency department, and as this condition may require surgical intervention, multidisciplinary awareness is crucial for appropriate management.

CASE REPORT

An eight-month-old male infant was transferred from an out-of-state emergency department for persistent swelling and erythema of the first and third digits of the right foot. On the day of presentation the patient’s grandmother had noticed what appeared to be strands of hair circling the first and third digits. She was able to partially remove the strands using scissors. After multiple failed attempts at complete removal, the decision was made by family to bring the child to the emergency department for evaluation. The emergency room physician was unable to remove the strands using scissors and, despite attempting a digital block, the patient was unable to remain immobilized for adequate intervention. It was at this point that the decision to transfer the patient to a facility with surgical capability was made.

Upon arrival to the University Medical Center of El Paso trauma center, the patient’s first and third digits were significantly edematous but appeared to be perfused. The digits demonstrated adequate capillary refill of less than two seconds. There was an unsuccessful attempt at bedside incision and removal of the hair utilizing a digital block. Much of the hair binding the appendages was removed but there were retained strands causing continued constriction (Figure 1). The decision was made to perform a formal operative exploration of the digits where complete removal of the strands was achieved (Figure 2). The patient was admitted for observation of the digits and discharged home the day after presentation.

DISCUSSION

The diagnostic dilemma presented by HTS is that the most commonly affected appendages (digits or genitalia) are covered and therefore unavailable for immediate evaluation. In cases in which binding of the digit occurred many days prior to presentation, re-epithelialization of the wound may obscure visualization of the offending strands. Children will typically present with nonspecific signs, such as persistent irritability, which should prompt the caregiver or clinician to perform a thorough physical exam ensuring no evidence of strangulation.

Conservative measures for treatment of HTS include hair removal with fine scissors and forceps or depilatory creams. Failure of conservative management requires invasive means for removal. Placement of the incision on the digit is done to avoid damage to the neurovascular bundles and is recommend at the 3 o’clock or 9 o’clock positions. The incision is made longitudinally along the digit down to the bone to ensure complete release of constricting bands. An alternate incision can be made on the dorsal surface of the digit with the risk of possible injury to the extensor tendon. The advantage of this incision is avoidance of neurovascular structures and improved healing without long term sequelae. The direction of the incision must be perpendicular to the circumferentially located strands in order to effectively release the constriction (Figure 3).

Reperfusion of the adequately released digit will become evident shortly after removal of the offending strands. The appendage

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age should be reassessed over the next 24 hours to ensure return of normal perfusion. These simple maneuvers can be performed at the bedside and result in the prevention of major morbidity. While this condition can primarily be managed by pediatric or emergency care providers, concern for incomplete release warrants surgical consultation. Surgical evaluation should be requested by any clinician uncomfortable with performing these techniques.

HTS represents a clinical entity that requires prompt recognition and treatment. Once this condition is identified, appropriate treatment is crucial in preventing significant morbidity. It is important that clinicians maintain a high index of suspicion when children present with persistent inconsolable irritability. A thorough physical exam and early intervention will avoid the debilitating effects of appendage necrosis and gangrene.

**Figure 1.** Appearance of Hair Tourniquet Syndrome affecting the first and third digits of the right foot. A dorsal incision was made on the first digit without adequate release of constricting strands prompting surgical exploration.

**Figure 2.** Appearance of the first and third digits after complete release of the hair tourniquet.

**Figure 3.** Recommended incision sites for avoidance of neurovascular structures. Incisions are placed longitudinally with the scalpel blade perpendicular to the constricting strands.

**REFERENCES**


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