Hair-Thread Tourniquet Syndrome: A Presentation of an Infant

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Introduction

Hair toe tourniquet syndrome (HTS) is an emergency constrictive injury. It is commonly diagnosed in children under one year of age, but infants under six months are particularly at risk, in which a hair or thread encircles a digit and results in acute digital necrosis. The syndrome is characterized by the presence of a hair coiled tightly around the fingers, toes or genitals. Fingers and toes are the most commonly affected parts with this entity. When the toes are involved, the encircling item is most likely a human hair. Prompt diagnosis and rapid removal of the constricting material is crucial, and can save the digit from irreversible tissue damage and the loss of the digit. Awareness of HTS is essential for early diagnosis and prompt treatment to protect against the development of serious complications to the toe and other body parts [1-7]. We present here clinicopathologic aspects of a case of possible recurrent encirclement of a toe by a hair coil.

Case

A 3-month old male infant was referred to Adiyaman University research and education hospital emergency department (ED) by his mother with complaints of unrelieved crying episodes, swelling and redness on the left 5th toe for 4 hours duration. The same event emerged a few days earlier on the opposite foot but resolved spontaneously, mother reported. Past medical history revealed that he was born to a 19 year old primigravida via normal spontaneous vaginal birth in 2014. She noted that there was no history of baby sitter, recent trauma or injury, but he was wearing footed pajamas or footgear regularly. On physical examination he appeared clinically irritable, and had no fever and discharge but there was gross swelling of the left 5th toe, with purple discoloration. Capillary refill time, which is an indicator of perfusion status (normal is two seconds) was four seconds, and digital pain sensation was increased. There were not nail abnormalities or skin lacerations detected (Figure 1). A diagnosis of hair entrapment was made and a hair coil was removed easily by a clamp and scissors from the digit in ED. After a period of observation the baby’s crying episodes resolved and the patient was discharged from ED with outpatient follow up by the orthopedic surgeon.

Discussion

In the literature, this syndrome was first described in 1971, presenting with redness and swelling of the affected toe. Various names are used for definition of this condition such as Hair-thread Tourniquet Syndrome, hair tourniquet syndrome, hair coil strangulation syndrome, toe tourniquet syndrome, tourniquet syndrome, or acquired constriction ring syndrome. The average age of presentation is six months, the peak incidence emerges in newborns, infants and young children, and however, they may be also noted in adolescents. The etiology consists of various causes such as sociocultural practices, nonaccidental injuries, maternal telogen effluvium, Munchausen’s syndrome, learning disabilities, same rare psychiatric disorders and child or elderly abuse (1,2,7-9).

Figure 1: Figures show gross swelling of 5th toe with purple discoloration and circumferential tissue cleft (black arrow) caused by hair coil following removal of hair coil.

Most of the infants are clinically irritable which provides the impetus for presentation and search for a specific etiology. Most parents give a history of a 3 to 4 day delay from the onset of symptoms to the diagnosis. The hair may be so deeply embedded that it can escape easy recognition [4].

Although the majority of HTS seems to be accidental in nature, professionals from the fields of medicine, nursing and child welfare have indicated that more than 50% of children with typical cases are abuse. A prompt, attentive and subtle investigation for some other signs of abuse in the patient should be made before establishing a judgment related to the probability of abuse [1]. HTS is unusual and the consequences can be catastrophic. Failure to timely recognize the injury can result in ischemia and amputation of the limb [2]. Coiling material leads to an obstruction to venous return or directly arterial blood flow from the digit, followed by swelling and reduction of the arterial inflow. Delay in diagnose of this condition can result in tissue ischemia and potential loss of the digit [7].
Prompt recognition of cases by emergency doctors, healthcare workers, general practitioners or other health care professionals is important to prevent function loss or toe amputation [2,9].

Differential diagnosis of HTS includes Streeter’s dysplasia, infection, contact dermatitis, allergic reaction, insect bites, foreign bodies, ainhum, pseudoainhum, paronychia, and child abuse. Paronychia is a fairly common occurrence in this age group, and encirclement over the distal phalanx could cause difficulty in diagnosis [4].

Treatment begins with the recognition of the condition and removal of constricting material urgently that is the critical first step in management. If complete removal of the constraining material is achieved in the ED and provides normal perfusion to the toe, surgical exploration may be avoided. Most authorities recommend surgical deconstriction with the infant under general anesthesia in order to permit further exploration, retrieval of all the foreign matter, and release of any constricting bands in the operating room. The use of depilatory agents to dissolve the hair has been recommended by some authors [4,7].

Once the part has been decompressed, ultraconservative management is indicated in order to give the best chance for survival. Adequate time for recovery should be allowed before making the decision to debride or amputate. Prophylactic antibiotics directed at Staphylococcus aureus should be considered [4]. The prognosis for survival may actually be very good in spite of the initial presentation.

**Conclusion**

Infants are more susceptible to digital ischemia if a toe is encircled by a strand of hair or some other similar material. An early diagnosis and prompt removal of material is important in order to prevent loss of the part. The emergency doctors should keep in mind that hair thread tourniquet syndrome is unusual but the consequences can be severe.

**Conflict of Interest**

No conflict of interest was declared by the authors.

**References**