Trauma Mon. 2017 May; 22(3):e33104. doi: 10.5812/traumamon.33104.

Published online 2016 August 2. **Case Report**

Case Report: Impending Gangrene of Finger Secondary to Constriction Caused by Mother's Hair

Zameer Ali,[1,*] Naseer A Mir,[1] Shabir A Dhar,[1] Suhail M Vakil,[1] and Saheel Majeed[1]

[1]SKIMS Medical College Srinagar, Bemina Jammu and Kashmir, India

[*]*Corresponding author*: Zameer Ali, SKIMS Medical College Srinagar, Bemina Jammu and Kashmir, India. Tel: +94-19008254, E-mail: drzameeraliortho@gmail.com

Received 2015 September 12; **Revised** 2015 October 25; **Accepted** 2015 November 16.

Abstract

Introduction: Impending gangrene of the thumb in infants is rare.
Case Presentation: A two-month-old baby was brought to our hospital with swelling and redness in the thumb of the left hand for one day. The child was irritable and febrile, but a systemic examination of the child was unremarkable. The thumb was swollen, with considerable redness and a small concentric band at the base of the thumb. A pulse oximetry probe could not detect oxygen saturation in the thumb. An intraoperative examination revealed a hair as the cause of the constriction band. All hair was meticulously removed. Oxygen saturation improved to 98% immediately after surgery, and the postoperative period was uneventful. A complete healing of the ulcer was seen after three weeks.
Conclusions: Impending gangrene secondary to the mother's hair is extremely rare. Fortunately, the prompt use of measures and the timely removal of the hair causing constriction in our case prevented established gangrene that would have led further to amputation.

Keywords: Impending Gangrene, Mother's Hair, Infant

1. Introduction

The impending gangrene of the thumb in infants is rare. Our case was interesting because there is a paucity of literature about gangrene secondary to the constriction of a finger caused by the mother's hair.

Finger and toe gangrene is uncommon in the pediatric age group (1-3). Acute limb ischemia is most commonly caused by thromboembolic phenomena, and although there are several predisposing factors, in the majority of cases, no etiological factor can be found. The extent of gangrene is also variable, ranging from one or more fingers or toes to the whole upper or lower limb (4-6).

Treatment when gangrene is developing is different from the treatment of established gangrene. As the old saying goes, prevention is better than cure. Fortunately, in our case, the use of prompt measures designed for the timely removal of the hair causing the constriction prevented any further establishment of gangrene that could have led to amputation.

2. Case Presentation

We are reporting a very unusual case of impending gangrene of the thumb of the left hand in a two-month-old infant. Born at 39 weeks to a 21-year-old primigravida, the child was first in the birth order and was the product of a non-consanguineous marriage. The child was admitted to our hospital, the SKIMS medical college, a tertiary care hospital located in the Srinagar region of the Kashmir Valley.

Because of the rarity of the case, we are reporting this case of a baby who was brought by her parents to the emergency department of the hospital during a cold night on January 21, 2015, when the outside temperature was 0°C. The parents had managed to get their child to the hospital despite the fact that snow was falling heavily and the roads were blocked (Figure 1).

There was swelling and redness in the thumb of the left hand, and the child was not feeding properly. The duration of these complaints was one day, but the parents of the child were very worried.

There was no history of injury or local application of any medicine on the thumb. Neither the history of the child nor of the parents was significant; there was no history of peripheral gangrene in the family. The case was initially seen by a pediatrician and was then referred to Orthopedics.

2.1. General Physical Examination

The child was irritable weighting was 4 kg, and a pulse rage of 120/minute and BP of 100/60. The baby was febrile with a fever of 101°F. The baby was covered, and both hands were protected in feather gloves. A systemic examination

Figure 1. Early morning view of the hospital, with snow falling heavily, hardly any open roads, and stranded cars. However, the parents managed to reach the hospital to obtain treatment for their child

Figure 2. Impending Gangrene Secondary to Constriction Band and Red Swollen Thumb

Figure 3. Impending Gangrene With Constriction Band and Red Swollen Thumb

of the child was unremarkable. The cardiovascular system/chest was within normal limits.

We had difficulty in taking off the child's gloves, as the baby was irritable and was in considerable pain. After a short struggle, however, we removed the gloves from both hands. We initially thought we were dealing with a case of frostbite, but we later realized that the problem was a mechanical obstruction.

2.2. Local Examination of Right Thumb

The thumb was grossly swollen, with considerable redness (+) and a small concentric band at its base. A small ulcer had developed, with a minimal discharge present at the base of the thumb around the ulcer. There were several local signs of inflammation (+) and tenderness (++), and a small constriction band was observed at the base of the thumb (Figure 2 - 4).

Due to the swelling and pain in the thumb, examination of the base of constriction was not possible. The child did not allow anyone to touch the thumb and was crying continuously. The axillary, brachial, and radial pulses were normal on both sides. A pulse oximetry probe could not detect oxygen saturation in the thumb, but the rest of the fingers showed a saturation of 100%.

2.3. Blood Investigations

Blood investigations revealed the following:

- CBC: (WBC: 10.7 $\times$ $10^3/\mu$L, Hb: 13.5 g/dL, and platelets: 161 $\times$ $10^3/\mu$L).

- Coagulation profile (PT, APTT, INR) within normal limits.

- A negative sepsis screen +.

- KFT/LFT within normal limits.

- Normal X-ray of involved hand.

2.4. Treatment

A written informed consent was obtained, and the prognosis was explained. The patient was taken to the operating theater, and a complete preoperative anesthetic checkup was done by our anesthetist. Prophylactic antibiotics (cefotaxim + amikacin) were given, and IV fluid replacement was given as advised by the pediatrician.

After anesthetizing the patient, a meticulous examination revealed a small black thread-like structure causing constriction. Loop magnification was used, and further exploration of the ulcer revealed that it was a hair causing the

Figure 4. Gross Swelling of Thumb With Small Black Hair Visible, Causing Constriction, With Ulcer on Palmar Aspect of Thumb

constriction. The hair was meticulously removed (Figure 5).

An intraoperative pulse oximetry probe was applied to the thumb, revealing the oxygen saturation improving to 98%. Thorough washing was done, and ASD was applied. The limb was elevated.

The postoperative period was uneventful. The hair was sent for forensic examination in our hospital, and it matched the hair of the mother.

Postoperatively, the baby accepted feeding well. Intravenous antibiotics (cefotaxim + amikacin) were given for five days, and dressing of the involved areas with povidone iodine was carried out twice daily. Good improvement was seen in the postoperative period. After one week of hospital stay, the baby was discharged and sent home in good general condition.

The complete healing of the ulcer was seen after three weeks, and there were no signs of a constriction (Figure 6).

Figure 5. Hair, Causing the Constriction Band, Removed During Surgery

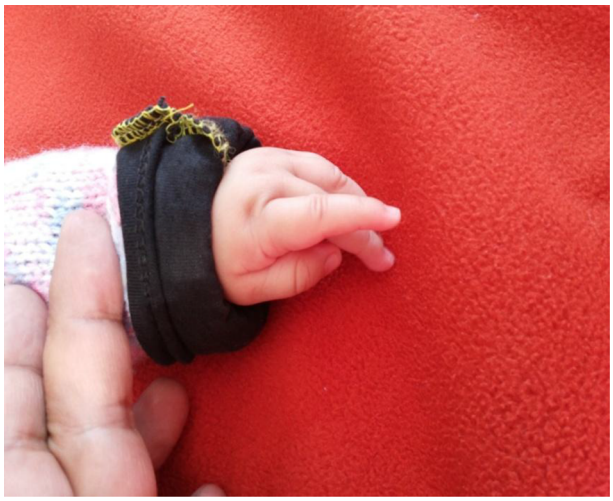

Figure 6. Four Weeks Post-Op, the Same Patient With a Normal Looking Thumb With Hardly Any Sign of Constriction

3. Discussion

Treatment when gangrene is developing is different from the treatment of established gangrene. Treatment of underlying cause is of foremost importance. Fortunately, in our case, the prompt use of measures designed for the timely removal of the hair causing constriction prevented established gangrene that could have led further to amputation.

Finger and toe gangrene in digits is uncommon in the pediatric age group (1-3). Acute limb ischemia is most commonly caused by thromboembolic phenomena, and although there are several predisposing factors: in the majority of cases, no etiological factor can be found. The extent of gangrene is also variable, ranging from one or more fingers or toes to the whole upper or lower limb (4-6).

Gangrene in neonates is a rare event. The etiology is not identified in most cases, and management is usually conservative, with the debridement and amputation of the gangrenous part involving toes. Gangrene results from diminished perfusion to a part of the body, usually the extremities. Known etiologies include a hypercoagulable state, in uteroarterial thrombosis, polycythemia, maternal diabetes, congenital bands, birth trauma, prematurity, congenital syphilis, umbilical artery cannulation, intravenous hyperosmolar infusions, and sepsis (7-10).

The management of neonatal gangrene is, in general, supportive. Close clinical monitoring of and the prevention of infection in the affected part allows the gangrenous portion to declare itself in order to optimize future reconstruction and rehabilitation (11).

Impending gangrene secondary to the mother's hair is an extremely rare condition. Our baby had accidently caught a hair in the left hand while the mother was carrying the baby on her back. We searched for this rare cause of impending gangrene in the literature, but we could not find such a case. The present case report assumes significance because of its rarity and unusual presentation.

Acknowledgments

A work such as this requires the cooperation and dedication of a large group of people. Foremost in our case were Dr. Naseer Mir and Dr. Javaid Bhat, who worked diligently in the midst of their busy schedules. Every word has been corrected and written in a legible manner by Dr. Dhar, without whose assistance and support this work would not have been possible. Deep and sincere appreciation and acknowledgement is given to Dr. Ajaz, Dr. Suhail, and Dr. Tarseem Lal, who untiringly and most efficiently devoted

practically all of their time in finding the literature. Gratitude is also given for the excellent technical help of the staff of Orthopedics, Anesthesia, and the operating theater.

Footnotes

Authors' Contribution: Development of the original idea and the protocol, Zameer Ali; abstraction and analysis of data, Shabir A Dhar; definition of intellectual content, Suhail M Vakil; manuscript review, Saheel Majeed; contribution to the development of the protocol, Naseer A Mir; abstract data, Suhail M Vakil; preparation of the manuscript, Zameer Ali.

Funding/Support: No money or funding in any form has been taken from any organization for completing this case report.

References

1. Turnpenny PD, Stahl S, Bowers D, Bingham P. Peripheral ischaemia and gangrene presenting at birth. *Eur J Pediatr.* 1992;**151**(8):550–4. [PubMed: 1505568].
2. Kothari PR, Gupta A, Kulkarni B. Neonatal lower extremity gangrene. *Indian Pediatr.* 2005;**42**(11):1156–8. [PubMed: 16340058].
3. Carr MM, al-Qattan M, Clarke HM. Extremity gangrene in utero. *J Hand Surg Br.* 1996;**21**(5):652–5. [PubMed: 9230955].
4. Kraus FT, Acheen VI. Fetal thrombotic vasculopathy in the placenta: cerebral thrombi and infarcts, coagulopathies, and cerebral palsy. *Hum Pathol.* 1999;**30**(7):759–69. [PubMed: 10414494].
5. Heffelfinger MJ, Harrison EJ. Neonatal gangrene with developmental abnormality of the femoropopliteal artery. *Arch Pathol.* 1971;**91**(3):228–33. [PubMed: 5541692].
6. Saxena R, Kannan M, Choudhry VP. Neonatal thrombosis. *Indian J Pediatr.* 2003;**70**(11):903–7. [PubMed: 14703231].
7. Musa AA. A review of diagnosis and modes of presentation of tropical idiopathic lower limb gangrene. *Afr Health Sci.* 2006;**6**(1):49–50. doi: 10.5555/afhs.2006.6.1.49. [PubMed: 16615828].
8. Krishnamurthy S, Singh V, Gupta P. Neonatal frostbite with gangrene of toes. *Pediatr Dermatol.* 2009;**26**(5):625–6. doi: 10.1111/j.1525-1470.2009.01002.x. [PubMed: 19840331].
9. Giannakopoulou C, Korakaki E, Hatzidaki E, Manoura A, Aligizakis A, Velivasakis E. Peroneal nerve palsy: a complication of umbilical artery catheterization in the full-term newborn of a mother with diabetes. *Pediatrics.* 2002;**109**(4):ee66. [PubMed: 11927739].
10. Ibrahim H, Krouskop R, Jeroudi M, McCulloch C, Parupia H, Dhanireddy R. Venous gangrene of lower extremities and Staphylococcus aureus sepsis. *J Perinatol.* 2001;**21**(2):136–40. [PubMed: 11324361].
11. Ozgenel GY, Akin S, Uysal A, Koksal N, Ozcan M. Gangrene of the upper extremity in the newborn. *Eur J Plast Surg.* 2000;**23**:429–31.