Fatal Electrocution of a Child During Kite Flying: A Case Report

Śmiertelne rażenie prądem dziecka podczas puszczania latawca: opis przypadku

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Abstract

Introduction: Kite flying is generally perceived as a harmless recreational activity, particularly among children. However, under certain environmental and physiological conditions, it may pose unexpected hazards. We present an unusual case of fatal pediatric electrocution that occurred during kite flying with a standard nylon thread, illustrating how specific circumstances can overcome the insulating properties typically attributed to such materials.

Case Report: A previously healthy nine-year-old boy was flying a kite near a suburban roadway under adult supervision when the kite became entangled in an overhead 33,000-volt power line. While attempting to retrieve the kite, the child collapsed suddenly and became unresponsive. He was transported to the hospital, where he was pronounced dead on arrival. There was no reported history of direct contact with the electrical infrastructure other than through the kite string. Postmortem examination revealed localized burn injuries on the dorsal aspects of the right thumb and index finger, consistent with an electrical entry site. No definitive exit wounds were identified. Internal examination was unremarkable. Histopathological analysis of palmar skin demonstrated dermo-epidermal separation, elongation and streaming of epidermal nuclei, and homogenization of dermal collagen, findings characteristic of electrical injury. A history of longstanding palmar hyperhidrosis was obtained from the parents, raising the possibility that sweat saturation may have increased the electrical conductivity of the nylon thread.

Conclusions: This case demonstrates a rare mechanism of fatal pediatric electrocution involving a sweat-saturated nylon kite thread, underscoring the complex interaction between physiological factors, environmental conditions, and material properties. It further highlights the need for increased public awareness regarding the hidden risks associated with kite flying in proximity to overhead power lines.

Keywords

Accidental electrocution, child, electrical injury, hyperhidrosis

Ethics approval and consent to participate

The presented autopsy case was conducted for medico-legal purposes and the findings are available in public domain. However, we used this information for academic purposes, including teaching and publication, according to the institutional guidelines with informed consent of the next of kin and without divulging the identity of the individual.

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Consent for publication
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Availability of data and material
Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

Competing interests
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Authors' contributions
ANV: Conception and design of the work; the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. PS: Conception and design of the work; the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. KBE: Conception and design of the work; the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. NKE: Conception and design of the work; the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. CUW: Conception and design of the work; the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. BS: Conception and design of the work; the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Introduction

Kite flying is a globally popular childhood pastime, often perceived as harmless and joyful. However, in urban environments where unprotected overhead power lines intersect recreational spaces, unforeseen hazards may arise. Electrocution incidents associated with kite flying are rare and usually involve conductive threads, such as those reinforced with metal or carbon [1, 2].

We present a tragic case of pediatric death caused by electrocution transmitted through a standard nylon kite thread, a material generally regarded as electrically insulating. To our knowledge, this mechanism has not been previously documented in medical or forensic literature. This case highlights the complex interplay of physiological factors (such as palmar hyperhidrosis), environmental conditions (including ambient humidity, moisture), and material properties that can unexpectedly transform a seemingly benign recreational activity into a fatal event.

Case Report

A nine-year-old boy with no prior history of cardiac, neurological, or developmental disorders was flying a kite on a weekend afternoon near a busy suburban highway under the supervision of his grandfather. He was barefoot, and the kite was attached to a standard nylon thread. During the activity, the kite became entangled in a nearby overhead power line carrying 33,000 volts of alternating current. While holding the thread and attempting to retrieve the kite, the child suddenly

collapsed and became unresponsive. Passersby assisted in transporting him to the emergency department of a local base hospital. Despite immediate resuscitative efforts, he was pronounced dead on arrival.

A detailed history provided by the grandfather indicated that there was no direct contact between the child and any electrical infrastructure other than the entangled kite thread. Postmortem examination revealed that the child was of Caucasoid origin with a body mass index of 20 kg/m^2 and a normal physique. Localized burn injuries were present on the dorsal aspects of the right thumb and index finger, consistent with an electrical entry site (Figure 1). No additional injuries were identified, and no lesions suggestive of electrical exit marks were observed on the lower limbs, including the soles and toes.. Internal examination was unremarkable. Histopathological analysis of palmar skin demonstrated dermo-epidermal separation (Figure 2), elongation and streaming of epidermal cell nuclei, and focal homogenization of dermal collagen (Figure 3).

The parents further reported that the deceased had experienced excessive palmar sweating since early childhood. Despite this, the condition did not significantly interfere with daily activities, including writing, and he commonly used a piece of cloth to wipe away excess moisture. The condition has not been medically investigated, as the family believed it would improve with age. No similar symptoms were noted among other family members. At the inquest, the cause of death was certified as electrocution, and the manner of death was determined to be accidental.

Discussion

Electrocution in the pediatric population is uncommon but often fatal, most frequently resulting from faulty household electrical equipment, overhead power lines, or contact with conductive materials [3-6]. This case is unusual in that it involved a standard nylon kite thread, a material generally regarded as a poor electrical conductor, in a child with no predisposing cardiac or neurological conditions.

High-voltage injuries can produce relatively small but well-demarcated entry burns at the point of contact [6-8]. Entry sites are typically located on the hands or head, whereas exit wounds are often found on the soles. However, exit marks may be atypical in location, subtle, or even absent [7, 9]. When electrical current travels from the hands to the lower limbs, there is a significant risk of fatal arrhythmias [6]. In this case, the presence of localized entry marks on the right hand, the absence of identifiable exit wounds, and unremarkable toxicology findings support the conclusion that a high-voltage electrical pathway occurred despite the presumed insulating properties of the nylon thread.

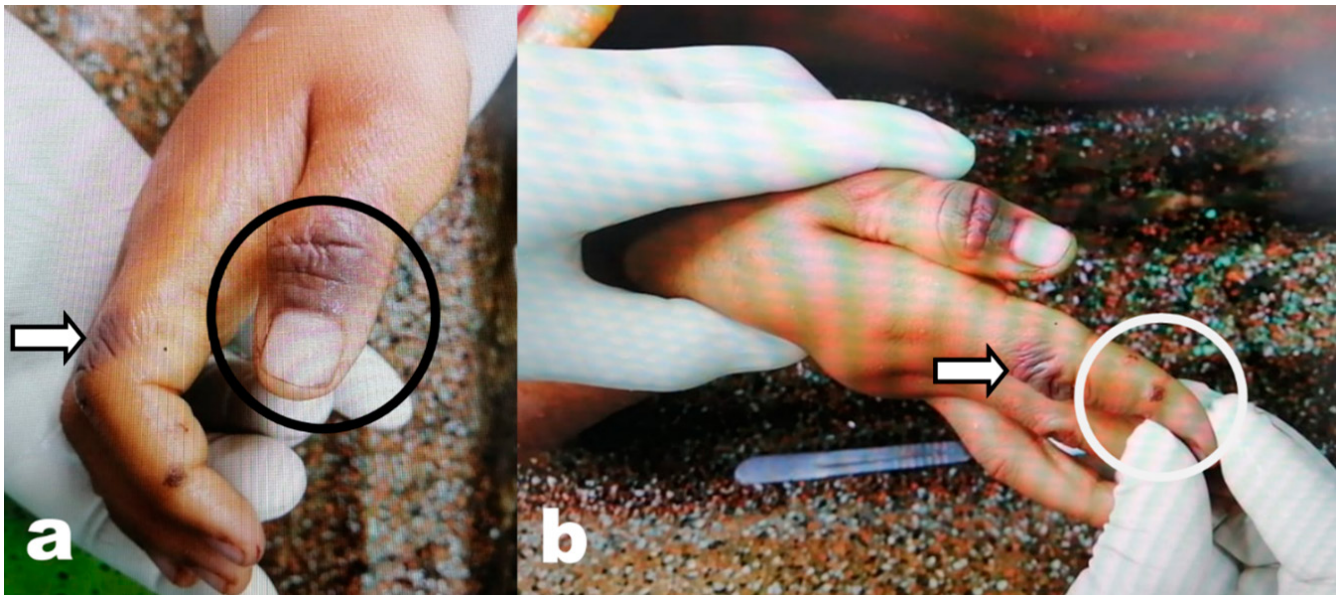

Fig. 1. Dorsal aspect of the right thumb (dark circle) and adjacent middle phalanx (arrow), and the outer aspect of the distal interphalangeal joint of the index finger (light circle) showing dark, thickened and raised skin with surrounding pallor

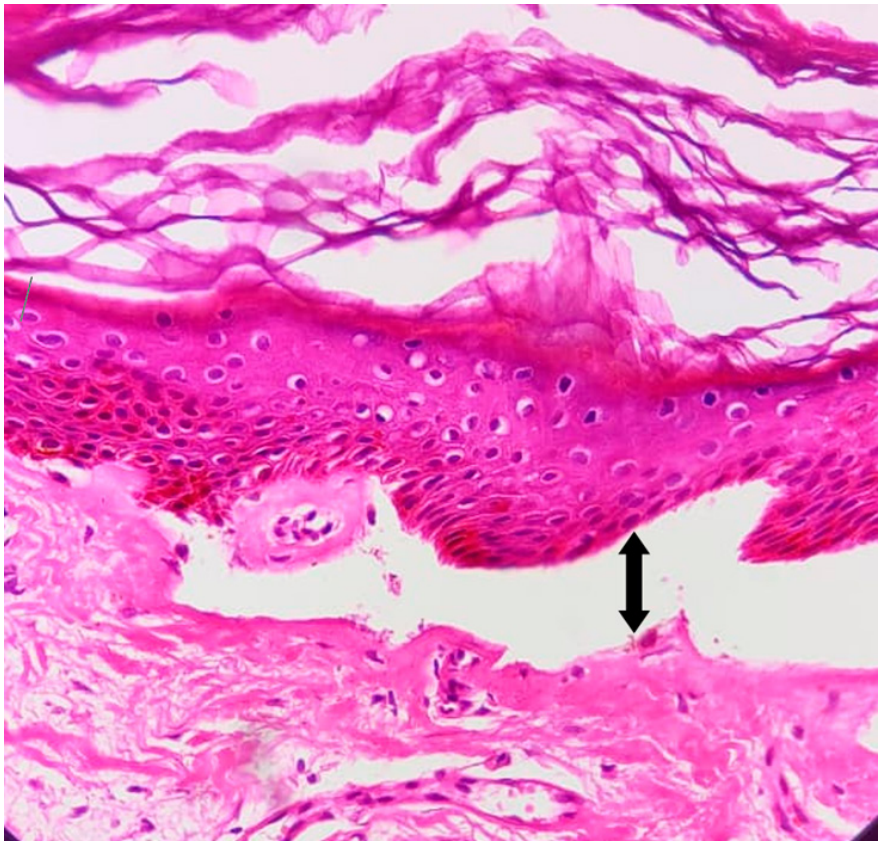

Fig. 2. Histopathology of palmar skin from the electrocution site demonstrating dermo-epidermal separation (arrow) (H&E ×10)

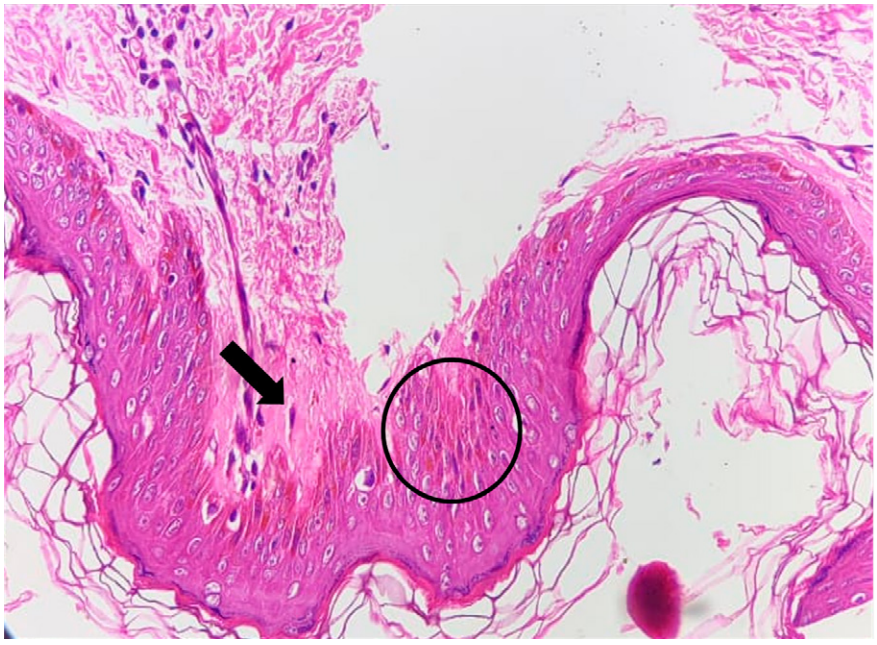

Fig. 3. Histopathology of skin (H&E ×10) showing elongation and streaming of the nuclei of the epidermal cells (circle) and homogenization of dermal collagen (arrow)

Several factors must be considered when explaining how electrical conduction occurred through the nylon thread. Hyperhidrosis, defined as excessive sweating beyond physiological requirements or environmental demands, can increase the electrical conductance of the skin [10, 11]. In this case, palmar hyperhidrosis likely facilitated electrical transmission by saturating the thread with sweat, thereby enhancing its conductivity along the hand–thread contact surface. Additional factors, such as ambient humidity, surface contamination of the thread, or the presence of metallic components within the

string, may also have played a role in enabling electrical conduction [1, 2].

The high-voltage arc phenomenon provides another possible mechanism, as alternating current can generate micro-arcs across small gaps, allowing electrical current to jump from the power line to a nearby conductor, such as a moisture-laden string [6, 12].

Additionally, factors such as metallic accessories, moisture-soaked clothing, or grounding through the absence of footwear may have further facilitated electrical conduction into the child's body.

Histopathological examination of the palmar skin in this case demonstrated features characteristic of electrical and thermal injury, supporting electrocution as the mechanism of injury. The presence of dermo-epidermal separation reflects disruption at the dermo-epidermal junction, a change commonly described in electrical burns. In addition, elongation and streaming of epidermal cell nuclei, together with homogenization of dermal collagen, indicate directional thermal coagulation of the epidermis and dermis, findings consistent with current flow through the tissue rather than a purely superficial contact burn [6]. This case further highlights the value of histopathological assessment in suspected electrocutions, particularly when external or internal autopsy findings are limited or inconclusive [13, 14].

This case underscores the relationship between physiological conditions, environmental factors, and material properties in transforming a benign recreational activity into a lethal event. It also highlights the forensic challenge of identifying electrical pathways when entry and exit wounds are subtle or absent. Eyewitness testimony and environmental assessment were essential for establishing the cause of death [7].

From a public health perspective, this case emphasizes the need for awareness campaigns, urban safety planning, and parental supervision in areas with overhead high-voltage lines [15]. Pediatric patients with conditions such as hyperhidrosis, though generally considered low-risk, may be vulnerable under specific environmental conditions. Educating caregivers about such hidden hazards and implementing preventive measures, such as avoiding recreational areas near power lines and using insulated kite strings, may help prevent similar tragedies.

Conclusions

This case illustrates a previously undocumented mechanism of fatal pediatric electrocution involving a potentially sweat-saturated nylon kite thread. Although palmar hyperhidrosis served as a key physiological risk factor, the findings underscore the need for heightened awareness among caregivers, clinicians, and public health authorities regarding hidden electrocution hazards in children.

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References | Piśmiennictwo

1. Wankhede AG, Sariya DR. An electrocution by metal kite line. Forensic Science International. 2006;163(1-2):141-3. doi: https://doi.org/10.1016/j.forsciint.2005.09.011.
2. Tiwari VK, Sharma D. Kite-flying: a unique but dangerous mode of electrical injury in children. Burns. 1999;25(6):537-9. doi: https://doi.org/10.1016/S0305-4179(99)00015-7.
3. Byard RW, Hanson KA, Gilbert JD, James RA, Nadeau J, Blackbourne B, et al. Death due to electrocution in childhood and early adolescence. Journal of Paediatrics and Child Health. 2003;39(1):46-8. doi: https://doi.org/10.1046/j.1440-1754.2003.00070.x.
4. Akçan R, Hilal A, Gülmen MK, Cekin N. Childhood deaths due to electrocution in Adana, Turkey. Acta Paediatrica. 2007;96(3):443-5. doi: https://doi.org/10.1111/j.1651-2227.2007.00152.x.
5. Mashreky SR, Rahman A, Khan TF, Svanström L, Rahman F. Epidemiology of childhood electrocution in Bangladesh: findings of national injury survey. Burns. 2010;36(7):1092-5. doi: https://doi.org/10.1016/j.burns.2010.01.008.
6. Zemaitis MR, Guirguis M, Cindass R. Electrical Injuries. StatPearls. Treasure Island (FL): StatPearls Publishing; 2025.
7. Mathew D, Thakral S, Setia P. The investigation of an accident site with an atypical electrocution exit wound and burn in an unusual location: A rare case report and review of literature. Academic Forensic Pathology. 2023;13(3-4):110-5. doi: https://doi.org/10.1177/19253621231214293.
8. Sumangala CN, Patil VR. Profile of Electrocution Deaths-A 3-Year Retrospective Study. Journal of Indian Academy of Forensic Medicine. 2023;45(4):368-70. doi: https://doi.org/10.48165/jiafm.2023.45.4.13.
9. Shobhana SS, Raviraj KG. "Pattern of electrocution deaths autopsied in South India"–A 16 year retrospective study. Sri Lanka Journal of Forensic Medicine, Science & Law. 2022;13(1):1-7. doi: https://doi.org/10.4038/sljfmsl.v13i1.7872.
10. Strutton DR, Kowalski JW, Glaser DA, Stang PE. US prevalence of hyperhidrosis and impact on individuals with axillary hyperhidrosis: results from a national survey. Journal of the American Academy of Dermatology. 2004;51(2):241-8. doi: https://doi.org/10.1016/j.jaad.2003.12.040.
11. Günther AC, Bottai M, Schandl AR, Storm H, Rossi P, Sackey PV. Palmar skin conductance variability and the relation to stimulation, pain and the motor activity assessment scale in intensive care unit patients. Critical Care. 2013;17(2):R51. doi: https://doi.org/10.1186/cc12571.
12. Kumar SS, Narayan AR, Gopal S, Kumar JG, Agrawal A. High voltage electrical shock with multiple life-threatening injuries. International Journal of Critical Illness and Injury Science. 2015;5(4):266-8. doi: https://doi.org/10.4103/2229-5151.170847.
13. Das S, Toi PC. Skin and heart histopathology in fatal electrocution with otherwise inconclusive autopsy findings: A case series. Journal of Indian Academy of Forensic Medicine. 2021;43(4):393-6. doi: https://doi.org/10.5958/0974-0848.2021.00099.3.
14. Walia DS, Kaur R, Gargi J, Singh D, Aggarwal AD. Histopathological changes in skin after electric current injury: An autopsy study. Journal of Clinical and Diagnostic Research. 2018;12(1):1-4. doi: https://doi.org/10.7860/JCDR/2018/32173.11065.
15. Western Area Power Administration. Living and Working around High-Voltage Power Lines2021. Available from: https://www.wapa.gov/wp-content/uploads/2023/04/living-around-powerlines.pdf.