



## E6 A Unique Case of Death by Electrocutation in Water in an Abandoned Building

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**Learning Overview:** The goal of this presentation is to provide the attendees with a case study that includes several variables that need to be taken into account in order to properly rule on a cause and manner of death while investigating a high-voltage electrocution in water death.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing those involved in investigating electrocution deaths the tools and information necessary to provide a ruling on cause and manner of death.

Electrocution deaths are a rare occurrence in the field of death investigation and account for approximately 1,000 deaths in the United States per year.<sup>1</sup> The mechanism of death in electricity-related fatalities is most commonly ventricular dysrhythmia. The single most important factor to consider while investigating these deaths is the number of amperes involved, which is derived from the voltage and resistance of the electrical conduction system.<sup>2</sup> Oftentimes, high-voltage electrocutions result in readily apparent thermal injuries; however, no electrical burns or autopsy findings may be present to support electrocution in approximately one-half of low-voltage electrocutions, creating a diagnostic challenge for investigators and pathologists alike.<sup>3</sup> Additionally, in wet conditions, cutaneous burns can be rare because water provides an energization of the body that is too diffuse to cause focal electrothermal skin damage while also decreasing the resistance of the skin surface.<sup>2,4</sup>

The case presented here is a of a male found deceased in an abandoned building. The decedent was found by police lying in a pool of water in an electrical room. Initial assessment indicated the need for immediate inquiry to the local electrical company to assess for the presence of live electrical current provided to the building. The electrical company responded to the scene and reported a reading of 11,000 volts in two exposed wires. After the electricity had been safely disconnected, the scene was thoroughly investigated and photographed. Exposed wiring was noted in the room, along with tools indicating the decedent had been scrapping for material. A piece of black electrical tape was noted on the decedent's finger. In addition, paraphernalia consisting of two burnt glass pipes were found in his jacket pocket, suggestive of possible recent drug abuse. Apparent injuries noted to the body included lacerations of the forehead. At autopsy, additional minor injuries were noted, including a focal geographic, pale lesion of the right thumb, adjacent to the aforementioned electrical tape; samples of skin were taken for histological examination. Significant natural disease consisted of moderate cardiovascular and pulmonary disease. Results revealed microscopic characteristics consistent with electrothermal injury of the skin sample submitted; toxicological analysis was positive for cocaine and ethanol.

In electricity-related fatalities, a careful examination of the circumstantial data and a thorough scene investigation are essential. In this unique case, multiple alternative causes of death had to be considered due to the presence of illicit drug paraphernalia with positive toxicological results, significant natural disease, standing water (drowning), and external trauma. After thorough investigation and postmortem examination, the cause and manner of death was determined to be accidental high-voltage electrocution. This rare and unique case study reviews the key steps and investigative methods necessary to safely conduct a vital scene investigation and properly rule an electrocution death.

### Reference(s):

1. Zemaitis M.R., Foris L.A., Lopez R.A., et al. *Electrical Injuries*. <https://www.ncbi.nlm.nih.gov/books/NBK448087/>. Accessed July 3, 2019.
2. DiMaio V., DiMaio, D. *Forensic Pathology*, 2nd ed. Boca Raton, Florida: CRC Press, 2001.
3. Wright R.K., Davis J.H. The investigation of electrical deaths: A report of 220 fatalities. *J Forensic Sci*. 1980;25(3):514-21.
4. Anders A., Matschke J., Tsokos M. Internal current mark in a case of suicide by electrocution. *Am J Forensic Med Path*. 2001;22(4):370-3.

### Electrocution, Water, Accidental