



### H11 The Role of Crime Scene Investigation and Judicial Inspection in Bath-Related Deaths: A Case Report With Forensic Implications

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After attending this presentation, attendees will understand the role of the forensic pathologist in determining the dynamics of bath-related deaths.

This presentation will impact the forensic science community by describing the procedure performed and the issues encountered in solving a case of bath-related death.

In Italy, more than four million domestic accidents happen every year, of which 8,000 are fatal. Such accidents can occur in the bathtub. In the literature, cases of drowning, sudden deaths, frequently associated with hyperthermia, and electrocution are described. The judicial inspection plays a decisive role in bath-related deaths, providing forensic evidence that could be lost if not immediately collected, especially in cases in which autopsy may not provide sufficient data to clarify the dynamics.

The case of a girl found dead in her home is presented. During the inspection, the girl was found on the couch. From the testimonies of the family, it emerged that the victim was found dead in the bathtub, then the body was moved by her father. An analysis of the rooms of the house, especially the bathroom, was conducted. Every object in the bathroom was cataloged and photographed. The bathtub was placed next to a sink on which an extension cord connected to a charging cell phone was found. An assessment of the electrical installation of the home was then performed. Subsequently, an external examination of the victim was conducted. The corpse had cutis anserine with pilo-erection on the dorsal area and the presence of a large area of skin burns (II and III degree) extended from the right shoulder to the left and caudally to the right gluteus. An impression of a rectangular shape (12cm x 3cm) from contact with an energy source on the dorsal region was found. Two burns on the right arm and a likely electrical mark with the exit point on the third finger of the right foot were collected. Samples of the skin, subcutaneous tissue, and muscle of all injuries were taken. The histological investigation was performed according to a protocol of paraffin-embedded formalin-fixed samples and preparation of slides. The microscopic examination exhibited: (1) the presence of small cavities or air bubbles (alveolus by high temperature) in the stratum corneum of the epidermis, which also presented carbonate residues on the surface; (2) polarization and elongation in clumps of cells of the stratum basale and stratum spinosum; and, (3) coagulative necrosis of the dermal connective.

In bath-related deaths, the judicial inspection and careful evaluation of the circumstantial data are crucial. The forensic pathologist must investigate whether the body has been moved from the bathtub, if it contains water, and measure its temperature. External examination of the victim allows an evaluation of the injuries and determines their nature, shape, dimensions, and microscopy to determine the histopathological features. It is also essential to conduct a toxicological investigation to exclude other causes of death. In this case report, there were difficulties because the victim was found far from the bathtub; however, the correlation of circumstantial data with autopsy data clarified that the burns present were generated by direct contact with an electrical power source, compatible with the extension cord found during the inspection. Plausibly, the girl, during her bath, used a charging cell phone connected to an extension cord near the bathtub. After the accidental fall of the extension cord, the latter was in contact with the water and the skin, causing death by electrocution. Therefore, there was also an increase in temperature on the contact surface of the skin, causing burns by Joule effect. In these cases, the pathologist must examine the electrical system, the current type, and the presence of automatic locking mechanisms. In this case, the electric current had a voltage of 220V and there wasn't any safety device. The comparison of the collected data allowed for the identification of the cause of death and, above all, the clarification of the dynamics of the event as well as the responsibility of other people in the accident. This case also emphasizes the importance of home security systems and using life-saving devices to prevent deaths associated with such accidents.

#### Forensic Science, Bath-Related Death, Crime Scene