



### **H156 The Importance of Histopathology in Cases of Sudden Death Due to Alleged Electrocution With Inconclusive Autopsy Findings: A Report of Three Cases**

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**Learning Overview:** After attending this presentation, attendees will understand the importance of histopathological examination of suspected skin wounds and the heart in cases of sudden death due to alleged electrocution where autopsy findings are inconclusive.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community as attendees will understand the importance of histopathological examination of suspected skin wounds and the heart in sudden death due to alleged electrocution, especially in those cases where the autopsy findings of electrocution are not clear and specific.

The pattern of injuries noted in high-voltage electrocutions is appreciable during autopsy examination. But such clear-cut findings are not found in many cases of low-voltage electrocution. Though joule burns are classically described as the entry wound feature of low-voltage electrocution, they are not seen in many cases. In such cases, doubt may persist in the mind of the forensic pathologist regarding whether to designate them as electrocution entry wounds or not. Similarly, the exit wound may either be absent or else not clearly appreciable via naked eye examination in many cases. In all such cases, histopathologic examination of a suspected entry and exit wound is essential. Ventricular fibrillation is the most common cause of cardiac arrest in electrocution. This most typically occurs when current enters through the right hand and exits through the feet. Hence, histopathologic examination of the heart is also required where death occurs immediately after electrocution.

**Case 1:** A do-it-yourself electrician was repairing a faulty motor pump meant to drain water from a swimming pool. He was accidentally electrocuted and died within few minutes. Suspected electrocution entry and exit wounds were noticed on the right index finger and the heel of the right foot. Tissues from these sites and samples from control sites and the heart were submitted for histopathology. Tissues from the entry and exit wounds showed microscopic features of electrocution. The heart showed features of myofibre breakup. Control site samples were histologically within normal limits.

**Case 2:** A brick kiln laborer was accidentally electrocuted when the metallic rod he was using came into contact with overhead electric wires. Suspected electrocution contact wounds were noticed on the left thumb and the adjoining hypothenar area. No exit wounds were appreciated. Tissues from the suspected entry site and heart were submitted for histopathology. Features of electrocution were observed on microscopic examination of both.

**Case 3:** A welder was electrocuted while at work. A suspected electrocution contact wound in the form of skin reddening was noticed in the hypothenar area of the right hand. A suspected exit wound in the form of a crater 0.3cm in diameter was noticed on the dorsal aspect of the medial right foot about 15cm behind the tip of the great toe. Tissues from the suspected entry wound showed intra-epidermal separation with a dense eosinophilic appearance of the keratin layer. The suspected exit wound had features of sub-epidermal separation and coagulative necrosis of both the epidermis and dermis. A section of the heart showed features of myofibre breakup.

These three cases will be reviewed individually. In alleged electrocution cases, where death is sudden and autopsy findings are unclear, histopathologic examination of the heart and the suspected skin wounds should be mandatory. A final opinion regarding cause of death can be given after collectively considering the history, autopsy findings, circumstantial evidences, and the histopathologic findings.

#### **Alleged Electrocution, Suspected Skin Wounds, Heart Histopathology**