



### D6 Burns by Electric Burner Plate: A Case Study

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The objective of this study is to characterize burns caused by an electric burner plate. This presentation will impact the forensic community and/or humanity by providing more information regarding burn injuries.

The case presentation involves a 30-year-old woman who was found unconscious in her kitchen at 8:00 p.m. She was lying supine on the floor in front of an electric cooker. A wide burn was observed on the left side of her face (from eyebrow to chin and from nose to cheek). Another “arborescent” burn was present on the anterior side of the neck. Severe burns involved also the extremities of the first and the second finger of the right hand. There was no evidence of any other burned areas neither on the body and clothes. All four plates of the electric cooker were incandescent when the woman was found. Empty rum bottles and blister pack of Temazepam pills were found in the living room.

The woman was carried in hospital where her blood tested positive for a large amount of alcohol and benzodiazepines. After the emergency treatment, she fully recovered from the coma but she did not remember what happened after 6:30 p.m. when she deliberately took pills and alcohol with the purpose to get a long sleep. The accident was initially considered a suicide attempt and investigations were not conducted.

Three months later, the case came to the attention of the public prosecutor. A man who had previously inflicted injuries to the victim and recently made threats against her was identified. The prosecutor asked the authors to reconstruct the circumstances of burn trauma, focusing their attention on the nature of injuring action. Were the burns accidental, self-inflicted, or inflicted by an assailant? At that point, the available evidence consisted of a few photographs of the victims taken in hospital two weeks after the trauma and the “crime scene,” taking into consideration that the flat had been well cleaned in the meantime.

Extensive testing was conducted on the etiology of burns and the mechanics of injury. These results were compared with those obtained from the crime scene analysis. The location of the cooker in the kitchen and its dimensions were incongruous both with an accidental fall or an intentional action. Against the first possibility, the electric cooker was not wide enough to allow a full and balanced support of the upper part of the body for a prolonged contact between face and plates. Further, as all four plates were found incandescent, this reconstruction was denied by the absence of any other burned area on the body or clothes.

Against the second hypothesis, the height of the electric cooker surface would require a deep flexion of the upper part of the body (more than 90°). The woman would be unable to balance in this position just holding the cooker, considering the elevated concentration of drugs and alcohol detected in her blood. Both substances have a well-known miorelaxant activity and they interfere with the ability to maintain her equilibrium.

In conclusion, the reconstruction strongly suggested an intentionally inflicted violence.

Indeed, despite the initial lack of disclosure, an inflicted etiology was supported by a multidisciplinary analysis involving the study of characteristics of unique burn pattern injuries, victim general conditions, and crime scene investigations.

#### **Burns, Electric Burner Plate, Piglet-Model Study**