



H17 Death by Fractal Art: A Tale of Beauty and Electrocutation

*Tasha Zemrus Greenberg, MD**, Tarrant County Medical Examiner's Office, Fort Worth, TX 76104-4919; *Nizam Peerwani, MD*, Tarrant County Medical Examiner's Office, Fort Worth, TX 76104-4919; *Stephen P. White*, Tarrant County Medical Examiner's Office, Fort Worth, TX 76104

Learning Overview: After attending this presentation, attendees will understand the importance of a thorough scene investigation in determining the cause of death in cases of suspected electrocution.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by educating medical examiners and forensic investigators about the features of deaths by electrocution and, specifically, the dangers involved in fractal art, as well as stressing the necessity of a thorough investigation of the scene to aid in the determination of cause of death.

On March 19, 2018, a 50-year-old male with a history of hypertension and methamphetamine use was found unresponsive in the garage at a private residence. He was taken to a local hospital where he was pronounced. The Tarrant County Medical Examiner's Office was notified of this death by a nurse at the hospital due to suspected electrical burns.

On March 20, 2018, at 11:00 a.m., the forensic investigator met with the decedent's mother. The decedent had been found supine near a homemade wood-burning craft machine plugged into an electrical socket, with a jumper cable clamp near his right hand and another lying across his chest. The mother had received a shock when she tried to remove the device and had thrown it into a trash bag, which was retrieved. The decedent had made the device himself for the hobby of wood burning. No water was seen on the concrete floor near the decedent.

The device was known as a "Lichtenberg Fractal Art wood-burning device," fashioned from a pair of six-foot-long jumper cables that were attached to what appeared to be a transformer out of a microwave oven that had a label stating: "JMOT-N 60A2-61T 120V/60Hz JI YUNG SA CO LTD # 9905111 DANGER HIGH VOLTAGE." The transformer was used to increase the power output to high voltage electricity. The handles of the jumper cables were wrapped in black electrical-type tape, with one of the cable's clamps having a bent/scorched nail in its teeth. The transformer had attachment points that were soldered on, then attached to a section of three-pronged electrical cord marked "14 AWG 12.09mm 105 deg C 300 V VW-1 -- LINETEK—" on the rubberized shielding. The device had been plugged into an older-style toggle switch power strip mounted to a wall. The power strip was found marked "MAX TOTAL RATING 12AMP 125V AC/DC." All the electrical breakers were on, had not tripped, nor had they been reset.

The decedent had been making fractal art for a few months and there were multiple examples in the garage. The art is created by making a circuit in the wood and using a slurry mixture of baking soda mixed with water; the water is used to complete the circuit and the baking soda to control the extent of the burn.

On July 24 2017, as reported in *Woodworking Industry News*, The Safety Committee of the American Association of Woodturners issued a policy against fractal burning, banning it from the American Association of Woodturners (AAW) -sponsored events.¹ This came after it was reported that in May 2017, an experienced woodworker in Walla Walla, WA, was electrocuted while making a picture frame using the Lichtenberg fractal burning technique. The coroner said the process was very dangerous.

Findings at autopsy included pulmonary congestion and edema, cerebral edema, mild fatty metamorphosis of liver, and thermal injuries of the chest with multiple deep troughs with blackened rims across the chest, present in a discontinuous, obliquely oriented line from the right upper to left lower chest. There was burning of the palmar surface of the right index finger extending toward the thenar eminence. There was also a faint area of brown discoloration on the sole of the left foot near the heel, suggestive of burn injury. Toxicology was positive for methamphetamine and amphetamine. The cause of death was ruled high voltage electrocution and the manner of death accident.

This case illustrates not only the danger of the fractal woodworking technique with regard to electrocution, but also the importance of thorough scene investigation to ensure an understanding of the circumstances surrounding the death and to ensure an accurate ruling of cause and manner of death.

Reference(s):

¹. Sampson, W. Death Prompts Ban on Fractal Burning, *Woodworking Industry News*, July 24, 2017.

Fractal Art, Electrocutation, Wood Burning