



“VOLTAGE TRAGEDY” AN AUTOPSY BASED CASE REPORT OF AN ACCIDENTAL ELECTROCUTION INJURY

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ABSTRACT

Background and objectives Electricity has become the most important part of our lives and also an important cause of morbidity and mortality. As per the NCRB data, nearly 11,000 electrocution deaths happen every year in India. The present case includes a 15-year-old male who died due to electrocution at his working site. We are addressing issues such as liability, negligence, and safety standards. We will explore both clinical and legal facts and understand the electrocution involving the minor by highlighting the medico-legal ground, which will help forensic professionals and legal experts in solving the case of electrocution. Although electrocution injuries are mostly accidental in nature¹ **Methods** We are reporting a case of a 15-year-old male, a painter by profession, who was brought and admitted to the emergency department of SNMC Medical College Agra with suspected injuries due to electrocution and died after 5 days of hospital admission. A postmortem was conducted in the mortuary of our institute. This study focuses on autopsy examination findings in such a case. **Result** On postmortem examination, the cause of death was reported as death due to septicemic shock with multiple organ involvement as a result of an ante-mortem electrocution injury. **Conclusion** Electric deaths are usually accidental; this case highlights the importance of safety measures, proper training, and the installation of high-voltage electric lines to avoid such incidents.

KEYWORDS : Electrocution, Negligence, Medico-legal, Septicemic Shock.

INTRODUCTION

Fatalities due to complications of electrocution is rare and which becomes challenge for forensic expert. Electrocution has been a major cause of death in India, with the numbers rising every year. According to NCRB data, almost 1.1 lakh people have lost their lives due to electrocution from 2011 to 2020, the last year for which figures are available. This translates to nearly 11,000 deaths every year, or 30 fatalities every day. Such injuries are common both at the workplace and the house. Low-voltage current (from 60 to 1000 V, usually 220 or 360 V) usually in the household installation whereas, high-voltage (more than 1000 V) current, lightning, and voltaic arc are commonly in the Commercial installation.² Body can get electrocuted only if part of the body came into contact with unprotected electric source. The electric current will flow through tissues with higher resistance results in generating heat which result in burn of that body surface area³. There were 1st and 2nd degree burns also with flash effect over the back of the body and singeing of hairs due to the short-range flashes. Intra-epidermal Separation and sub-epidermal separation are common in Electrical lesions. Tissue fluid evaporation caused by heat Results in the separation of epidermal cells⁴. The most common presentation in electrocution is presence of entry and exit wounds. The degree of burn or electric injuries and appearance of wounds depends on the amount of electric current and type of electric current. There are many incidents where secondary injuries and infection of wounds are also present in electrocution deaths. So it becomes necessary to rule out injuries due to electricity and due to secondary causes. This case report is an attempt to understand the electrical injuries in death due to septicemic shock as a result of ante mortem electrocution.

Case Report

The victim was a 15 year old boy referred to our casualty department with history of sustaining electric shock while painting at his work place which is about 10 feet height from

the ground level. Initially he was conscious, oriented and his vitals were stable and admitted in emergency department, He died after 5 days of conservative treatment. Autopsy revealed burn injuries on both the thighs and legs, anterior and posterior surface of left arm, lower back, and left side of lower chest. Entry wound on left leg of size 12cm × 5cm bone deep (figure 1), exit wound is on lower back of size 28 cm × 4cm muscle deep (figure 2), upon opening the body. All organs were congested and pus was present in lungs with congestion, right side of heart was full and left side was empty. Semi digested food and gases were present in small intestine, fecal matter and gases are present in large intestine. Cause of death is septicemic shock due ante mortem electrocution.



Fig 1 Entry wound on the anterior surface of the leg from knee to upper ankle of size 12cm x 5cm bone deep



Fig 2. Exit wound on lower back iliac crest of size 28 cm x 4 cm muscle deep

DISCUSSION

The factors that can cause an electrical injury include voltage, current flow, contact area, and contact time. The production of electrical injury depends on voltage, Amount of current flow, the area of the contact and duration of contact. An electrical burn occurs only if the temperature of the skin is raised enough for a sufficiently long period to produce damage. The pathognomonic features of electrocution are the electric marks and joule burn when low Or medium voltage current is involved⁵. An arc produces considerably more burn than a contact that readily transmits The current and the greater the

resistance offered by the Individual tissue, the greater the damage⁶. Though the Incidence of high voltage electrocution is considerably low Compared to the other types of electrical injuries, the fatality rate is very high with direct contact or indirect arcing or Flashover effect. Instead of the internal organs, an autopsy typically displays an electrical burn mark on the skin. Thicker layers of skin such as greater resistance can be seen on the back, haunch, palm, and sole, whereas thinner epidermal parts have less resistance. Greater protection is provided by intact skin; after an electric damage, burned skin's resistance almost completely disappears, thus diminishing skin's protective value⁶.

CONCLUSION

On postmortem examination, the cause of death was reported as death due to septicemic shock with multiple organ involvement as a result of an ante-mortem electrocution injury. We concluded that Electric deaths are usually accidental; this case highlights the importance of safety measures, proper training, and the installation of high-voltage electric lines to avoid such incidents.

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