

An unusual case of severe electric burn of the skull: A rare incident

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ABSTRACT

Deep burns on the scalps and skull are causing due to high-voltage electrical injuries. Illegal handling of the line while working electrocution can occur. We report 42 years male with severe scalp and skull burn injury caused by the high-tension electric current. He was working in the industry as an electrician, and due to some error, the wire broke and fell on his head, causing a fourth-degree burn inpatient. Emergency management of the burn was given to the patient, and duraplasty and transportation of the scalp flap procedure were done.

Keywords: electrical injuries, fourth degree burn, emergency, duraplasty, scalp flap

1. INTRODUCTION

An electric burn is an injury of tissue caused by contact with live wires or lightning. It is categorised into Low voltage injury (< 1000 V) versus high voltage injury (> 1000 V) (Gümüs, 2012). It is considered a severe medical emergency with an incidence rate of 4% to 6% of all admitted burns each year. Electrical injuries usually occur at home with low voltage current, whereas at workplaces with high voltage current in adults. These burns result from work-related injuries and even cause occupation-related death. A severe electrical burn causes catastrophic injury with the highest morbidity and lifelong scars at the burned site. In children, the injury takes place at home and in nearby environments. Two-thirds of all electrical injuries occur in electrical and construction workers (Benito-Ruiz et al., 1994).

Primarily electrical injuries can be associated with visceral injuries in rare cases. That's why there are high morbidity and mortality rates in such conditions. Evaluation and stabilisation in such patients play a vital role in controlling the potential sources of sepsis and accelerating transfer to the multidisciplinary burn care centre for successful outcomes in challenging cases with high voltage injuries (Luce And Hoopes, 1974). The treatment for 4th-degree burns depends on the burn's severity, the extent of the skin damage, and overall health. 4th-degree burns are severe, and they affect more deeply than skin. It is necessary to focus on this aspect because it can damage the potential nerve. Severe burns may not be painful due to nerve damage. If there is a delay in seeking treatment, the risk of complications is higher.



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Complications can be life-threatening, such as loss of circulation and even organ damage (Singh et al., 2011).

Intracranial injury is challenging to treat in the case of an electric burn, blunt and piercing trauma and thermal and high voltage electrical injury. In such cases, the reconstruction can be challenging, such as face and around the skull; debridement is done to treat 4th-degree burn where firstly, the dura is exposed during debridement, prompting a dural patch. Latissimus dorsi free flap can be done for effective management of burn (Wright et al., 1997).

2. CASE PRESENTATION

A 42 years male comes to the emergency department with the complaint of a burn over the head. He was followed by an industrial accident while performing his daily work in the industry. There was an accident due to the broken high voltage wire on the skull due to some manual error. The patient was working as an electrician in the industry. He met with a fire accident and got a severe four-degree head burn. According to the rule of nine, the surgeon consultant did a physical examination; the patient was diagnosed with a 2% right frontal and parietal area head burn. The patient had burned about 14 X 10 cm with foul odour and fungating of brain matter and scalp loss with the charred area on the vertex bone (Fig 1). There were no clinical manifestations of meningitis or any other neurological illness.



Figure 1 Clinical picture of the patient showing an exposed right-sided frontal and parietal side of the head followed by an industrial accident.

He underwent surgery to debride the wound and remove necrotic brain tissue using duraplasty and scalp flap transportation. The skin and bone defects were identified after a thorough cleansing of the wound, with the charred borders of the skull bone and fungating brain tissue apparent. The bone's dura was debrided, and the contaminated section of the dura mater was removed before sutures were applied. Followed by the hemostasis, the fungated brain matters were excised. Using the fascia lata, duraplasty was done. A transposition flap covered the skin defect, and a split skin graft covered the defect caused by the flap. After an uncomplicated phase, the patient was discharged on the seventh postoperative day.

3. DISCUSSION

Result from high-voltage electrical trauma can be a deep burn to the scalp and head. Electrocutation can occur while working, as can improper handling of power lines. As these lines cross through the fields where most of our population works, there is a risk of coming into touch with high tension cables (Benito-Ruiz et al., 1994). Workers who operate with electric lines are more vulnerable to

injury. If such injuries occur, they should be treated as soon as possible because rapid treatment reduces morbidity substantially (Wright et al., 1997). As a precautionary step, high voltage lines should be installed and handled in such a way that they are handled with safety precautions.

4. CONCLUSION

Multiple factors influence the intensity of burn damage resulting from electric current, which should be considered while detecting and treating individuals with electrical burns. Many injuries could be avoided with sufficient knowledge and preventative actions, which frequently entail a common-sense approach. On the other hand, preventive measures should educate personnel on how to handle electrical lines safely.

Author Contribution

Authors have equally contributed in the study.

Informed consent

Written & oral informed consent was obtained from the patient.

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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