

# A Case Report On Electrical Burn: Below Elbow Amputation Of Left Upper Limb

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## Abstract

**Introduction:** These injure result from contact with faulty electrical wiring g or high voltage power lines passing over the residences. Lighting is also an electrical injure the extent of injuring is influenced by the duration of contact, current-voltage, type of current (direct or alternate) the path of current and the resistance offered by tissues. **Case Presentation:** A case of a 25-year-old male admitted in the burn unit on the date 22 October 2019 with complaints about he came in contact with the electric pole due to electrical shock on 12/10/2019. He had wound over left hand up the wrist, wound over over the left axilla, inner part of both thighs, head and back. The wound over the left hand was associated with pus discharge, which was foul-smelling and scanty in amount, blood-stained. **Interventions:** Generally, the burn victims with major burns are hospitalized and care is providing the burn unit or ward. The goals during this phase are saving a life, maintaining and protecting the airway, restoring hemodynamic stability and promoting healing and preventing or correcting the complication. **Outcomes:** Over the short course of treatment, the patient significantly improved in functional mobility, transfers, ambulation, and bed mobility. Progress even further towards his goal of returning home. **Discussion:** The patient responded well to treatment, however additional interventions could be utilized in the future to aid in greater improvements

**Keywords :** amputation, electrical burn, hemodynamic, upper limb, wound

## Introduction:

These injure result from contact with faulty electrical wiring g or high voltage power lines passing over the residences<sup>1</sup>. Lighting is also an electrical injure the extent of injuring is influenced by the duration of contact, current-voltage, type of current (direct or alternate) the path of current and the resistance offered by tissues<sup>2</sup>.

According to the latest statistics, females have marginally higher death rates from burns compared to males. This is contrary to the normal injury trend, where injury levels for the different injury mechanisms tend to be higher for males than for females.

WHO reports that about 265 000 deaths occur per year from fires alone worldwide, with more deaths from electrical burns, scalds, and other causes of burns for which statistics are not available. Many of

these deaths occur in low- and middle-income nations, with approximately half occurring in the South East Asia Region of the WHO.

The burn is the 5<sup>th</sup> most common leading cause of non-fatal childhood injuries, 11<sup>th</sup> leading cause of death. Burns happen primarily in the workplace and at home.

**Case history: Patient information**

A case of a 25-year-old male admitted in the burn unit on date 22 October 2019 with complaints about he came in contact with the electric pole due to electrical shock on 12/10/2019. He had wound over left hand up the wrist, wound over over the left axilla, inner part of both thighs, head and back. The wound over the left hand was associated with pus discharge, which was foul-smelling and scanty in amount, blood-stained. The wound over the left hand was the point of contact electric burn .patient is now referred to our hospital for further management.

**Medical/Surgical History:**He was operated on date 24/10/2019 below elbow amputation of left upper limb done. Radius and ulna bone of length around 2.5 cm gogly saw. Subcutaneous tissue separated from the skin around the stump and flap prepared.

**Psychosocial history:** He maintains good interpersonal relationships between the family member, neighbors, friends and relatives.

**Environmental history:** Patient home surround environment is good. There is a facility of a closed drainage system and proper disposal of waste.

**Physical examination**

General parameter :Height : 166 cm , weight : 76 kg , BMI : 27.63

Vital sign : temperature : 98.8 °F , pulse : 100 beat / min , respiration : 30 breath/min , blood pressure : 120/80 mmof Hg

Mental status: He was conscious and he had a Glasgow Coma Scale of 15. Pulmonary/cardiovascular: He was tachycardic and tachypnoeic with a respiratory rate of 30 breaths per minute with no evidence of airway compromise.

Musculoskeletal system: She was obese and a BMI of 27.36. The range of motion (ROM) is normal.

Speech: ability to talk. Sound is present

Significant medical timeline

Significant medical timeline			
Time	Problem	Place	Action /progress
12 October 2019	Electrical burn,	Nursing home	Symptomatic treatment Infection present in burn part
22 October 2019 (present history )	Foul-smelling, pus formation	Hospital	Amputation and skin grafting

### **Diagnosis assessment :**

Blood investigation : In CBC Hemoglobin is 13.9 mg/dl(13-16mg/dl) , mean corpuscular hemoglobin concentration is 33.5 g/dl , Mean corpuscular volume (MCV) is 93 fl (78-98 fl ) , total RBC count is 4.46 m/ul, WBC is 9800 (4500-11,500 k/ul) ,platelet count is 242,000/ml (150,000 to 450,000 ) , Hematocrit (Hct) Levels is 41.5 % (37 %-47 %) , monocytes is 04 %(00-15%) , Granulocytes is 76 % ,Lymphocytes is 18 %(20%-40%) , red cell distribution width (RDW) is 11.9 (11.6-14.8) ,Eosinophils is 02 % (1-5 %) basophils is 00 % (0-1 % ) .

In KFT urea is 18 (9.81 – 20.1 mg/dl) , creatinine is 0.87mg/dl (0.7-1.4 mg/dl ) ,sodium is 144meq/ l (135-145meq/l) , potassium 4.5(3.5-5.5 meq /l) ,.

In LFT alkaline phosphates is 47 (32-45g/l), Alanine transaminase (ALT) is 29 IU/L (0-50IU/L), aspartate aminotransferase,( AST) is 26 IU/L (10-40 IU/L) ,total protein ia 6.0 (23-38 g/dl) ,total bilirubin is 0.4 g/dl (1-1 g/dl ) ,conjugated bilirubin is 0.2 mg/dl (0-0.25 mg/dl ) ,unconjugated bilirubin is 0.2 mg/dl (0.2-0.7mg/dl) , globulin is 2.9 .

RBS is 180,non reactive HBSAG and HCV.

In Urine examination urine albumin is nil, urine sugar is nil, an epithelial cell is 1 cell /hpf . Urine ketone is absent

In peripheral smear, RBC's - normocytic normochromic platelets are adequate on smear, no hemiparasite seen.

ECG done

In computed tomographybrain :calcified granuloma in the left perisylvian frontal lobe.

### **Therapeutic intervention**

General measures: To check the vital sign (Temperature pulse respiration and BP. ) airway, fluid and electrolyte balance and prevention of complications like a bacterial infection, fluid loss, hypothermia. Health management includes ahealth diet.

### **In Pharmacological management**

Generally, the burn victims with major burns arehospitalized and care is providing the burn unit or ward. The goals during this phase are saving a life, maintaining and protecting the airway, restoring hemodynamic stability and promoting the healing and preventing or correcting the complication

**Monitor the airway and breathing:** same interventions, as discussed during the resuscitation phase, be continued in the hospital during this phase as well. The head- end of the bed should be elevated and the patient is positioned in high fowler's position to facility breathing O<sub>2</sub> should be administered.

**Fluid replacement to prevent burn shock:** The patient given e.g intravenous fluids based on the Parkland formula (Ringer's Lactate).

**Monitoring of laboratory parameters:** baseline parameters of blood glucose, urea, creatinine, hematocrit and electrolytes should also be repeated after the 24 hr.

**Tetanus immunization:** administer tetanus toxoid to prevent tetanus.

**Pain relief:** pain relief can be achieved by small doses of I.V. morphine infusion given.

**Wound care:** cleaning and debridement: burn wound should be washed with a mild soap and rinsed with warm water. Loose devitalized tissue should be trimmed away and hair should be shaved within one-inch margin around the burn wound,

Remove the damaging agent; chemical or tar; if this has not already been done during the pre-hospital phase.

Application of appropriate topical antibiotics.

**Control the infection;** infection control is a major component of burn management, therefore an infection control policy is necessary.

### **Surgical management**

**1<sup>st</sup> operation:** Below elbow amputation of the left upper limb: under general anesthesia given, parts and draped. A circumferential incision was taken .about 5cm above the wrist joint. Incision deepened and deeper tissues including muscles are cut. Radial artery and ulnar artery identified and ligated radius and ulna. Bone amputated using Gigli saw. Bone wax applied, a stump kept open, dressing done and slab applied.

**2<sup>nd</sup> operation : skin grafting:** under general anesthesia has given parts pained and draped and ulna bone of length around 2.5 cm has been using gigli saw , subcutaneous tissue separated from the skin around the stump and flap prepared. Tissue approximated using a simple interrupted suture. Skin closed using ethilon 2.0RC with simple interrupted sutures following of hemovac negative suction drain. Hemostasis well achieved.

The patient progressed satisfactorily without outbreaks of fever or changes to other organs or structures with a marginal decrease in mobility features for the lower and upper right extremities. Preoperative care: the routine care given the client undergoing surgery should be continued.

Postoperative care: assessment of bleeding and pain control. Skin grafted sites must be immobilized to promote adherence of the graft to the wound bed. Various techniques used include suture, staples, tape, splints and dressing.

### **Nursing management**

#### **Nursing diagnosis**

1.Fluid volume deficit related to evaporation.

Goal: To maintain the fluid volume

Intervention; procure a larger born vein access. Administer I.V. ringer's solution .replace the electrolytes and monitor them.

Evaluation: to improve the fluid volume and to maintained vital signs.

2. Acute pain related to burn injure.

Goal: level of pain is reduced as the wound starts healing

Intervention: administer I.V.morphine. Keep the patient warn to give comfort .reposition the patient.

#### **Rehabilitation**

Rehabilitation of the client, he has suffered burn injures, involves more than the dressing change and physical therapy. It is also important to consider the psychological stress of initial injury, scarring, surgical treatment other procedures as well as the financial burden due to loss of work, time and lengthy recovery period. Vocation rehabilitation may also be required if the burns involve hands arms.

### Discussion:

The injuries caused by electric burns come from the inside out, and this is why serious skin injuries are typically not evident. In this case, was direct contact with a high source of voltage, the patient skin becomes injured. To maintain the normal peripheral vascular resistance within the vital sign is normal. To maintain the infection.

Generally, electrical accidents entail high mortality and morbidity with a chance of death of up to 40%<sup>3</sup>. Electrical burns differ greatly from injuries sustained along with chemical and thermal burns<sup>4</sup>. I got many opportunities to observe the cases and provide nursing care according to their needs. I selected care who was diagnosis is electrical burn. During the whole period of hospitalization, I provided holistic nursing care, considering his physical, mental, social, cultural aspects.

High-voltage accidents cause high morbidity and mortality; For an extended stay in the hospital. We found Parkland employing Burned body surface structure useful for initial resuscitation And restoration of the water-electrolyte balance, and burn-depth stratification according to the Benaim Categorized. Related conditions were mentioned in Global Burden of disease studies<sup>6,7,8</sup>. Global Burden of 87 risk factors in 204 countries and territories was reported by Murray et al<sup>9</sup>. Similar study on Global Burden of 369 Diseases and Injuries in 204 Countries and Territories was reported by Vos et al<sup>10</sup>.

### Conclusion

High-voltage accidents cause high mortality and morbidity; for an extended stay in the hospital. According to Parkland formulation, Burned body surface structure useful for initial resuscitation and restoration of the water-electrolyte balance; And the restoration of the water-electrolyte balance. After all the investigation and management, the patient was discharged. Vocational rehabilitation may also be given.

Over the short course of treatment, the patient significantly improved in functional mobility, transfers, ambulation, and bed mobility. Progress even further towards his goal of returning home.

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