

DEFINITION

Damage to tissues due to the passage of electrical current is called electrical injury’.

The injury is also commonly called as

‘ELECTROCUTION’

GENERAL

The current **enters** at one point and then **leaves** the body at an exit point

Most dangerous pathway is with entry through right hand, exit through the feet.

FACTORS AFFECTING ELECTRIC INJURY

VOLTAGE

DEATH IS UNCOMMON BELOW 100 V

AMPERAGE:

50-80 mA ACROSS HEART IS FATAL IN FEW SECONDS.

RESISTANCE:

THE MAJOR BARRIER TO ELECTRIC CURRENT IS SKIN

- **DURATION OF CONTACT**
- **DIRECTION OF PATHWAY OF CURRENT**
- **ANTICIPATION OF SHOCK**

VENTRICULAR FIBRILLATION is the most common mode of death in electric injury

RESPIRATORY ARREST due to spasm of muscles of respiration.

Rarely **BRAIN-STEM ARREST** also occurs.

- **INJURIES**

- Due to falls from height
- Extensive burns
- Fractures due to muscle spasm

- **'HOLD ON' EFFECT**

TYPES OF ELECTRICAL INJURIES

- **CONTACT BURNS OR JOULE BURNS**
- **SPARK BURNS**
- **FLASH BURNS**
- **'GROUNDING' OR 'EXIT' INJURIES**
- **VASOSPASM**
- **CONVULSIONS: (MUSCLE SPASM)**

CONTACT BURNS OR JOULE BURNS

The mark of blister will be with raised grey or white edges, an area of blanching around it which is pathognomonic of electric injury, and an outer hyperemic border.

Fatal electrocution may occur without any skin mark.

SPARK BURNS

There is no actual contact

Temperature is very high which causes the keratin to melt **lesion**'.

Over a small area which gets the shape of a hard brownish nodule usually raised above the surrounding skin surface.

The surrounding area is blanched or pale.

FLASH BURNS

These occur due to arcing (jumping) of current from high tension wires. All types of burn may occur.

Typical lesion is “ Crocodile skin” lesion

GROUNDING' OR 'EXIT' INJURIES

- . Not seen commonly
- Exit injury may have a split or lacerated appearance

VASOSPASM

GANGRENE OF THE AFFECTED LIMB

POSTMORTEM APPEARANCES

EXTERNAL CONTACT MARKS/BURNS

INTERNAL APPEARANCES;

- Brain

- Focal petechial hemorrhage around small blood vessels
 - Tear in white matter

- Heart

- Wavy appearance of myocardial fibers and fragmentation
- Contraction bands within fibers

- Muscle

- Zenker's degeneration
- Heat coagulation of muscles
- Spiralling and fragmentation of muscle

MEDICOLEGAL SIGNIFICANCE

- **GENERALLY ACCIDENTAL**
- **OCCASIONALLY SUICIDAL**
- **RARELY HOMICIDAL OR AS TORTURE**

**LIGHTNING IS ELECTRICAL
DISCHARGE OF A HIGHLY
CHARGED THUNDER CLOUD TO
THE GROUND. IF ANYTHING
COMES IN THE PATH WILL BE
DAMAGED.**

**ELECTRIC CURRENT IS DIRECT
WITH MILLIONS OF VOLTS.**

INJURIES/EFFECTS OF LIGHTNING

**PHYSICAL DAMAGE IN FATAL
CASES MAY VARY FROM
VIRTUALLY NIL TO GROSS
BURNING, FRACTURES, AND
TISSUE DESTRUCTION.**

BURNS:

First degree burns (i.e. Redness) may follow skin ceases along the path.

FERN LIKE OR ARBORESCENT MARKS

Also called as Lichtenberg Figures
Keraunographic markings

HEAD INJURY

Due to Lightning Strike or Due to Fall on Ground.

DAMAGE TO CLOTHING AND SHOES

(FROM INSIDE TO OUTSIDE)

FUSION AND MEGNATIZATION

Of metals of wrist watch, spectacles etc.

MOLTEN NYLON ARTICLES

BUTTONS ETC

FORENSIC SIGNIFICANCE

- **VIRTUALLY A NATURAL DISASTER**
- **cases may be confused with homicide**
 - Evidence of thunderstorm**
 - Death of some other animal in vicinity**
 - Characteristic features.**