

Thermal injuries

THERMAL INJURIES (BURNS)

**“TISSUE DAMAGE DUE TO APPLICATION
OF HEAT IS TERMED AS A THERMAL
INJURY”**

TYPES OF THERMAL INJURIES

- **DRY HEAT BURNS. (Direct Heat Application)**
- **MOIST HEAT BURNS. (Hot Fluid Application)**
- **RADIATION BURNS. (Due to different radiations)**
- **ELECTRIC BURNS.**
- **CHEMICAL BURNS. (Acid/Alkali burns)**

Duty of the doctor

- Sec 174-A CrPc

Makes it binding on the medical doctor who attend a burn victim to record the victim statement, which becomes admissible as "DYING DECLARATION" if victim dies.

FORENSIC SIGNIFICANCE

- **Identity of deceased?**
- **Whether the burns are postmortem?**
- **Whether the burning is actual cause of death?**
- **Accident? Suicidal? Or homicidal?**

Corrosive burns

- Discoloration and staining of skin
- Singeing of hairs absent
- Vesicles rarely found
- Followed by keloid scar and disfigurement

Radiations burns

- Sunlight
- X-ray
- Laser
- Microwave

– Degenerative changes

- Sun burns varies from erythema to vesication

DRY HEAT BURNS

Classification

- DUPUYTREN'S
- HEBA'S
- WILSON'S

(WILSON'S THREE – STAGE CLASSIFICATION)

- **FIRST DEGREE BURNS: (Epidermal):**
- **Erythema and blistering without loss of dermis. Healing is excellent without scarring.**

- **SECOND DEGREE BURNS: (Dermo-epidermal):**
- **Destruction of full thickness of the skin. Injury does not heal without scarring**

- **THIRD DEGREE BURNS: (Deep tissues involved):**
- **Tissues deep to skin are also burned.**
- **In children 20% body surface burns are considered life threatening, whereas in adults 40% or more are generally fatal.**

Burnt surface area

- Rule of nine
- Lund and Browder chart for children
- More than 15% in adults
 - 10% in children resulting in loss of blood volume

Burn index

- To calculate prognosis and treatment
- At 45 points mortality rate is 50%.
 - Burn on head, neck ,trunk and gentilia are more dangerous
 - Infants ,young children and elderly

EXTENT OF THERMAL INJURIES
MAY RANGE FROM MILD ERYTHEMA (REDNESS) TO
TOTAL INCINERATION OF BODY TISSUES.

SEVERITY OF THERMAL INJURIES
DEPENDS UPON

CAUSES OF DEATH IN BURNS

IMMEDIATE CAUSES

LATE CAUSES

Age of burns

- Redness
- Vesication
- Purulent inflammation
- Superficial slough of third degree burn thrown off
- Deeper slough
- Granulation tissue
- Scar

Fatal period

POSTMORTEM **APPEARANCES**

depend upon

THE DEGREES OF BURNS

SURVIVAL OF PERSON DURING FIRE

DURATION OF BURNING

EXTERNAL POSTMORTEM FINDINGS

- Burnt area may be reddened, blistered or charred.
- Blisters contain albuminous fluid with high chloride content and RBCs.

EXTERNAL POSTMORTEM FINDINGS

- Deposits of carbonaceous material on the body
- Hypostasis
- 'Pugilistic' attitude
- Heat 'splits' of skin
- Heat 'fractures'

Skull fractures

- Due to heat skull fracture may occur
- Affecting outer table of skull
- Above the temples consist of several lines which radiate from a common center
- Outward bursting of bone flaps and protrusion of brain tissue

Heat hematoma

- Soft friable and spongy clot
- Light chocolate brown in color
 - Traumatic fracture
 - Intracranial hematoma related to fracture line
 - Free from carbon monoxide in ante mortem injury

- Microscopically

INTERNAL POSTMORTEM FINDINGS

Blood is thick and cherry red

Internal organs resist burning

Evidence of injury

Soot and smoke residues in trachea

MOIST HEAT BURNS

(SCALDS)

- **The responsible liquid may be seen over clothes or body**
- **Skin is soddened and bleached**
- **Vesication is an important feature**
- **Scars are thin**
- **Less contraction and disfigurement**

MOIST HEAT BURNS

(SCALDS)

No singeing of hair, charring seen

Three degrees

Reddening of skin (erythema)

blister formation

necrosis of dermis

Usually accidental but may be caused by intent.