

# Burn

## Types of burns:

1. Contact burns: Contact with hot object.
2. Flame burns: Contact with flam.
3. Scald burns: Contact with hot liquids.
4. Radiant heat burns: Caused by heat waves; a type of electromagnetic wave.
5. Ionizing radiant burns: Caused by x-ray, radium, or UV rays.
6. Chemical burns: Caused by acids or alkalis.

## Classification of burns:

	First degree	Second degree	Third degree
Depth	Epidermis	Epidermis & dermis	Deeper to dermis
Color	Red or pink	Dark red	Whit, gray, black
Pain to stimuli	Painful & tender	Very painful	Painless
Blanching	Yes	Yes, but slow	No
Appearance	Dry	Moist	Dry/lethargy
Blisters	Not present	Present	May or may not
Healing time	3-6 days	3 weeks	Skin grafting
Scar	No	Yes	Yes
Medico-legally	Simple	Grievous	Grievous

## Causes of death:

### Immediate causes:

1. Primary or neurogenic shock due to pain or fright.
2. Asphyxia.
3. Smoke-or heat-induced laryngospasm, respiratory arrest, Vaal reflex-caused cardiac arrest.

### Delayed causes:

1. Sepsis (death within 4-5 days), pseudomonas, S.Aureus. **The most important.**
2. Hypovolemic shock (death within 24-48h); multi organ failure.
3. Acute edema of glottis, respiratory failure (death within 3 days); due inhalation injury, pneumonia, or ARDS.
4. Toxemia (death within 3-4 days).
5. Infective complications; bronchitis, bronchopneumonia, enteritis.

## Sequelae of burns:

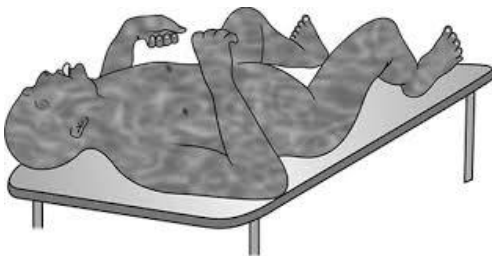
- ❖ Scars, keloid, marjolin's ulcers, curling ulcer, joint deformity, ankylosis.

❖ Corneal capacity, obliteration of external auditory meatus.

### External findings of burns:

1. Examination the presence of any inflammable substance.
2. Site, distribution, and extent of burning are recorded.
3. Face: distorted and swollen, protruding tongue
4. Skin: veins stand out, giving a marbled appearance.
5. Blisters: may be ruptured or filled with fluid.
6. Hair: may be singed or burnt.
7. Degloving/ destocking.
8. Pugilistic attitude (boxing, fencing or defense attitude), not medico-legally significant
9. Heat ruptures: splits in the skin due to tissue contraction.

This result in incised or lacerated wounds.



#### Pugilistic attitude

Happens due **heat stiffening**; due to coagulation of proteins of the muscles and dehydration which cause muscle contraction >> may lead to heat rupture (splits in the skin).



Skin findings



Marbled skin



Blisters



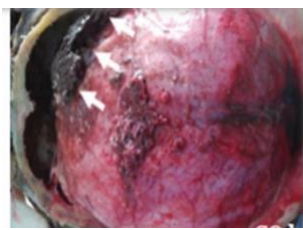
Degloving



Lacerated wounds



Escharotomy



Heat hematoma



Heat rupture

Differentiation between heat ruptured and lacerated wound:

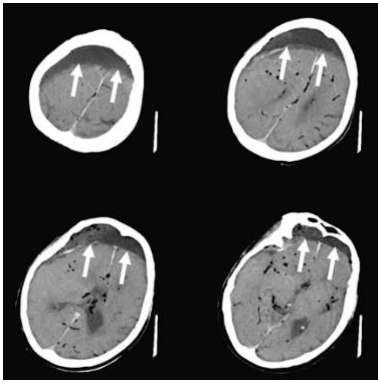
	<b>Heat rupture</b>	<b>Lacerated wound</b>
Cause	Exposure to heat	Blunt force
Site	Fatty tissue	Anywhere
Vessels and nerves	Intact	Torn
Bruising around the margins	Absent	Present

**Internal findings of burns:**

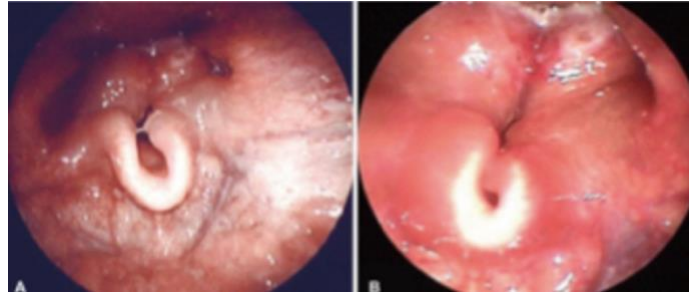
1. Skull: Heat hematoma, fracture.
2. Brain: Congested, swollen with widening, and flattening of guri and obliteration of the sulci.
3. Neck: Hemorrhage in the root of the neck and tongue.
4. Larynx, trachea and bronchioles: Frothy mucus secretion I is the surest sign of antemortem burns.
5. Pleural: Congested and inflamed with serous effusion.
6. Lungs: Congested and edematous, may be shrunken.
7. Heart: Full chambers, cherry red in color due to CO inhalation.
8. Spleen: Enlarged and softened.
9. Liver: Cloudy swelling, fatty liver, cell necrosis, jaundice may occur.
10. Kidney: Nephritis, thrombosis, infection.
11. Adrenal: Enlarged and congested.

Differentiation between epidural hematoma (EDH) due to burns and blunt force:

	<b>Epidural hematoma</b>	<b>Heat hematoma</b>
Cause	Intense heat	Blunt force
Situation	Anywhere	Usually adjacent to Sylvian fissure
Position	Usually bilateral	Usually unilateral
Distribution	Diffuse	Localized
Characteristics	Evenly distributed or sickle-shaped; honeycomb appearance; soft, granular, foamy, friable clot; chocolate brown in color (pink, if CO is present)	Disc shaped; uniform, smooth, rubbery; reddish-purple color
Skull fracture	Eggshell fracture, elliptical or circular defect seen above temple not radiating lines	Fracture line radiating from a skull defect present in temporal area
Crossing suture lines	May cross	No
Injury to CNS	Absent	Maybe
<b>CarboxyHb level</b>	<b>Absent</b>	<b>Present</b>



**Heat hematoma**



**Laryngospasm**

Differentiation between antemortem and postmortem burns:

	<b>Antemortem burns</b>	<b>Postmortem burns</b>
Line of redness	Present	Absent
Vesicles	Serous fluid rich in albumin, <b>chloride</b> , polymorphs	Air, if fluid is present, it contains little albumin
Base of vesicles	Red & inflamed	Dry, hard, yellow
Soot in URT	May be present	Absent
Inflammation & repair	Present along with pus and slough	Absent
Healing	Present	Absent
Carboxyhemoglobin	Present	Absent
Enzyme reaction	Increase at periphery of burn	No such increase

### **Scaled burns**

Result from application of liquid  $>60\text{ C}$ , involve only superficial layers of skin.

#### **Types:**

1. Immersion burns: Accidental, homicide or deliberating (like child abuse).
2. Splash or spill burns: Usually accidental.
3. Steam burns: Superheated steam.

#### **Classification (3 degrees):**

1. Erythema by vasoparalysis.
2. Blister formation.
3. Necrosis if deeper layers are involved.



**Done by Shahed Atiyat**