Surgery – General Surgery

Hx and PEx of "Burns"

A. Overview about burns

The skin can be burnt by heat, irradiation, electrical or chemical noxious stimuli. A 'heat' burn is usually caused by direct flames, an explosion, contact with a hot object, steam or hot fluid. Burns caused by **steam or hot water** is called scalds. Most burns are the result of accidental household injuries, but previously rare causes such as self-immolation and torture are becoming more common.

B. Types of burns

Thermal burns: (heat)

- Dry such as flames
- Wet such as hot water (called scalds)

Chemical burns:

- Acids: gives coagulation necrosis (limited)
- Alkalis: gives liquefaction necrosis, which is more destructive.
- Worst chemical burn is HFL (hydrofluoric acid) has the characteristic of both acid and alkaline.

Electrical burns:

- <1000 v considered low voltage. (may cause arrhythmias)
- >1000 v considered high voltage. (massive tissue damage, respiratory and cardiac arrest)
- They may be minimal on the surface, we should check the muscles and bones for any injuries.
- Damage mostly affects the small bones (fingers, feet, hands, and forearms)

Irradiation burns:

The initial skin injury caused by radiation often resembles a standard thermal burn. The clinical evidence of the commonly associated lung and bowel damage and bone marrow depression appears later. Many patients exposed to high doses of radiation die from pulmonary complications or aplastic anemia.

Inhalation injury:

Such as (Carbon monoxide poisoning, upper airway obstruction which is common in head and neck burns, and pulmonary injury from chemical inhalation)

C. Complications of burns

- Infection
- Dehydration (due to third spacing)
- Inhalation injury (such as carbon monoxide poisoning)
- Compartment syndrome (due to circumferential burns of extremities)
- Acute tubular necrosis of the kidney (due to myoglobinuria)
- Metabolic acidosis
- Arrhythmia (due to hyperkalemia)

D. HISTORY of burns

Questions
There is no standardized history for burns, but you can apply the same order and components of general history
How did it happen?
When did it happen (time)?
Where did it happen? (It's important to know whether it was in an open or closed area) (Closed area more prone to have inhalation injury)
Cause **Thermal, chemical, electrical, or physical (sun or radiation)**
What have been done so for the burnt area? (Ask the patient if he/she did anything to burnt area, such as using ointments or drugs)
Associated symptoms
Past medical history (asking about liver or heart diseases, to asses treatment)
Past surgical history
Medication and Allergies (**mainly to sulfa because Flamazine contains it) (Flamazine is topical antibiotics, that is used to treat and prevent infection of skin wounds.**
Bleeding disorders
Smoking (smoking delays wound healing)
Immunization (tetanus)
If the patient was burned by hot liquid (scald) (we need to ask him about the type of liquid that was spilled) > to determine the boiling degree of the liquid > asses treatment and severity.

Physical Examination

A. IN EXAMINATION

You will be given a picture of a burn and you will be asked about:

1. **Types of burn (as mention earlier)**
2. **Degrees of burn**
3. **Surfaces % of both adult and child**
4. **The ten criteria of admission to burn unit**

B. Degree of burn (depth):

First-degree burn (superficial): these types of burns cause superficial erythema (redness) and swelling and maybe quite painful, here the outermost layer of skin is affected and the epidermis still intact. Ex: (sunburns)

Second degree burns (Partial- Thickness Burns): this type of burn affect both epidermis and the dermis to varying degree, it is divided to superficial (which affect the epidermis and upper parts of dermis, no scarring) and deep (which affect epidermis and most of the dermis with skin appendages like hair follicles and sweat glands, lead to scarring), in this type there will be blisters (usually superficial type) + white skin (usually deep type). Ex: (spilled hot water) (any shiny and oozy skin indicates second degree burns)

Third degree buns (Full- Thickness Burns): affect all layers of skin and appear white and black/ charred and leathery with coagulated vessels visible just below the skin surface, it is painless due to destruction of nerves, require skin graphing and causes severe scarring. Ex: (flame burns)

Fourth degree burns: it is a burn that extends deeply into the subcutaneous tissue, it may involve (muscle, fascia, or bone) and may give compartment syndrome.

Interpretation of Abnormal Findings:

Abnormality	Indicates
Erythema (redness)	First degree burn
Blisters + white skin+ shinny skin	Second degree burn
White skin + black/charred skin + leathery skin	Third degree burn
Involves (muscle, fascia or bone)	Fourth degree burn

C. Compartment syndrome:

It's the compression of nerves, blood vessels, and muscle inside a closed apace (compartment) within the body, this lead to tissue damage due to lack of oxygenation. You must always look for circumferential burns around the chest, abdomen, limb, etc… to release the pressure preform an Escharotomy. Escharotomy is making an incision in the eschar tissue (it' s the tissue that is formed after burns), while fasciotomy is an incision in the fascia of normal skin.

Circumferential burns: It is a burn that goes all the way around a body part. For example, it is a burn that is fully around a finger, around a leg, etc., instead of only on one side or one spot on the limb or digit.

Size of burn: (using rule of 9)

(Adult)

Head = 9% (front = 4.5%, back = 4.5%)

Chest = 9%

Abdomen = 9 %

Upper/ mid/ low back and buttocks = 18%

Each arm = 9% (front = 4.5%, back = 4.5%)

Each leg = 18% (front = 9%, back = 9%)

Groin = 1%

Palm = 1% (Used to measure scattered burns)

(Child)

Head = 18% (front = 9%, back = 9%)

Chest = 9%

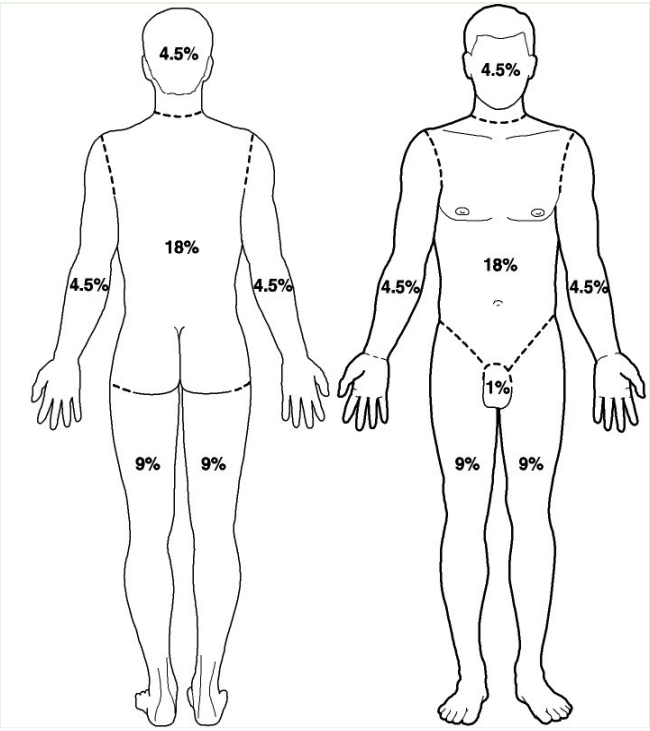
Abdomen = 9%

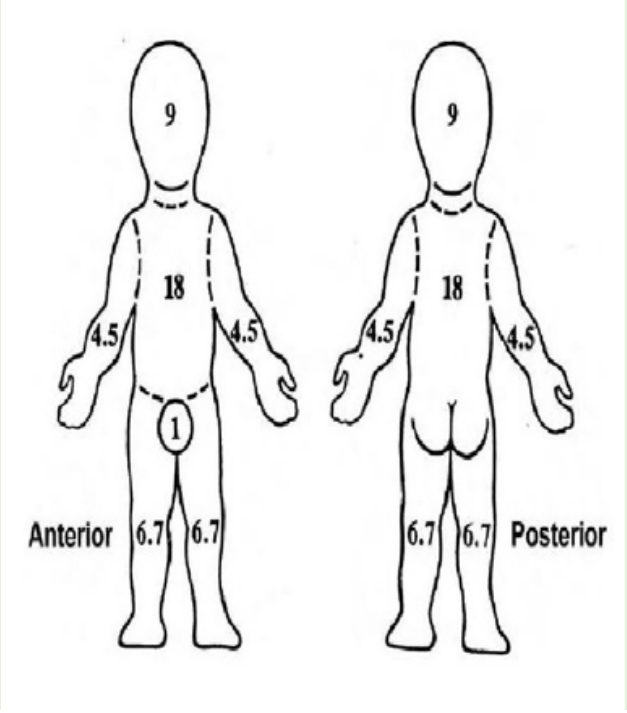
Upper/ mid/ low back and buttocks = 18%

Each arm = 9% (front = 4.5%, back = 4.5%)

Each leg = 13% (front = 6.5%, back 6.5%)

Groin = 1%





D. Referral criteria:

It may come as a question why do you want to admit this patient to the burn unit?

- Partial thickness burn **greater than 10%** as TBSA (total body surface area)
- Burn in **special areas** like (face, hands, feet, genitalia, major joints)
- **Third degree** burn (full thickness) in any age group
- **Electrical burn** including lightning injury (**because of the electrical abnormalities**)
- **Chemical burns** (**needs special care**)
- **Inhalation injury** (needs intubation and special care)
- If the patient have **preexisting medical problem that may affect the management** or prolong recovery or affect mortality in any way
- If the burned patient have **other injury** like fracture
- Burned **children with no one to take care of them**
- Patient with **circumferential burns who need escharotomy**
- Burn injury in patients who will **require special social, emotional or long term rehabilitation intervention**

E. Management:

ABC: (airway bronchial circulation), early intubation in a patient with a head and neck injury and check the oxygen saturation.

Circulation: In addition to monitoring the airways, the state of the circulation must be repeatedly assessed, as burns are associated with massive losses of electrolytes and protein from their surface, and red cell damage or destruction. The pulse, blood pressure, central venous pressure, urine output and haematocrit must be carefully monitored in all patients with major burns. Failure to maintain an adequate circulation may be followed by renal failure and eventually multi-organ failure.

Urine output: A urinary catheter should be inserted and urine output measured hourly to assess effectiveness of resuscitation **(Fluid administration should be titrated to achieve desired urine output)**

Adults: 0.5 - 1.0 ml/kg/hr Children <30kgs: 1ml/kg/hr

Fluid resuscitation: use ringer lactate as fluid resuscitation in the parkland formula pattern (4 x weight in kg x body surface area that is burned) it will give you the amount of fluid to be delivered in the first 24 hours (give half of this amount in the first 8 hours since the time of the burn and the other half in the next 16 hours)

F. Treatment of burns important

First degree:

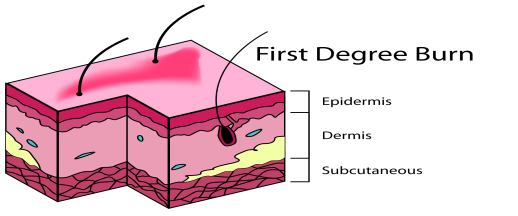
- ✓ Antibiotic ointment (fucidine, flamazine, and silver nitrate)
- ✓ In case of sunburns use sunblock

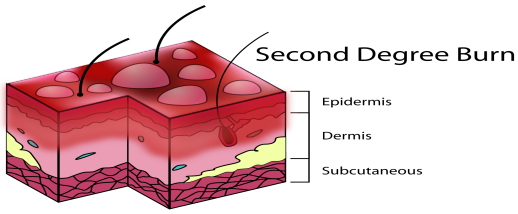
Second degree:

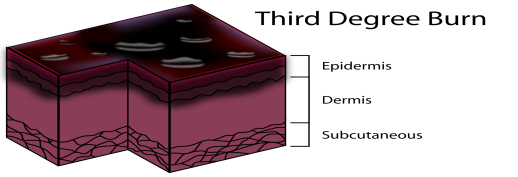
- ✓ Superficial (daily dressing and antibiotic ointments)
- ✓ Deep (assessment and experience) wait up for 3 weeks, either it will heal within 3 weeks or it won't. If it didn't heal instantly do debridement and skin graft.

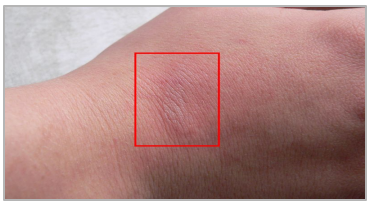
Third degree:

- ✓ Debridement and skin graft.







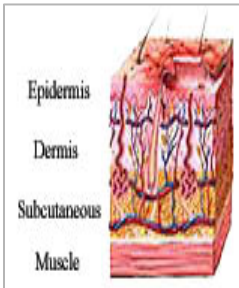


First degree burns

(Note the erythema)

Second degree burns (All of them)

(Note the Blisters)



Second degree burns

(White skin)

Third degree burns

(White and black/charred skin)

*For extra knowledge look up pictures of fourth degree burns and radiation burns..

432 OSCE TEAM

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