

# Treatment of Surgical Inflammation

## 15a - Treatment of surgical inflammation

### Inflammation:

part of biological response of vascular tissue to harmful stimuli, such as pathogens, damaged cells, irritants and in some cases, infection

- dolor, calor, rubor, tumor, function laesa
- protective attempt to remove the injurious stimuli and to initiate the healing process – innate immunity
- without inflammation, wounds and infections would never heal
- acute: increase movement of plasma and leukocytes from blood to injured tissue
- chronic: prolonged inflammation; simultaneous destruction and healing of tissue

### Therapeutic agents to optimize healing:

#### 1. Dressings:

- main goals : - the wound must be moist and exudate must be absorbed
- infrequent dressing changes (provided that the absorptive power is great enough and the dressing can remain adherent)
- protection of the surrounding skin from maceration
- minimization of skin injury from adhesive
- note : - traditional moist gauze and tape is inexpensive but requires frequent changes – limited absorptive capacity
- tape can irritate the skin, and the gauze can dry out
- traditional “wet to dry” dressings are actually a poor choice, because they allow wound dessication – delay healing
- gauze dressings, when combined with an antibiotic cream, can be useful in aggressively treating a highly exudative wound
- simplest occlusive dressing is a polyurethane film (Tegaderm, Opsite) facilitates moist healing and has no absorptive capacity particularly useful for superficial wounds with no exudate, such as skin-graft donor site.
- widely used dressings for open wounds are of hydrocolloid class (Duoderm, Ultrec) consist of hydrophilic materials combined with a special adhesive the surface is covered with a polyurethane film that protects the wound and allows moist healing. the adhesive adheres to skin only until the absorptive capacity is exhausted ideal for use on chronic wounds as well

other wound dressings:

1. hydrogels (Vigilon, Geliperm)
2. alginates (Sorbsan, Kaltostat)
3. foams (Allevyn, Lyfoam)
4. absorptive powders and pastes (Debrisan)
5. nonadherent gauze or cellulose combination (Telfa gauze)

#### 2. Topical antibiotics:

- Although can be useful but often inappropriately used as a substitute of wound care
- Reducing bacterial count in wound is beneficial, but without effectively removing the exudate, topical antibiotics will merely select resistant organisms without reducing the total bacterial load
- Allergic reaction can happen
- An ointment or cream base will help to maintain a moist wound environment
- Silver sulfadiazine is the most useful first-line (broad spectrum, inexpensive)

#### 3. Pharmacological debriding agents:

- Surgical excision of necrotic tissue is the fastest and most effective way to achieve a wound with healthy wound bed
- Enzymatic debriding agents (collagenases and proteases derived from bacteria) can accomplish objective without surgery over a longer period
- Is used only if wound sepsis is not a concern
- A semiocclusive dressing left in place for several days can speed up the patient's own autolytic processes- natural debridement but relatively inefficient and slow

#### 4. Growth factors:

- GH normally present in healing wounds
- Eg: PDGF (Regranex)

#### 5. Artificial skin equivalent:

- Consist of dermis like matrices with or without synthetic water barrier coverings
- Apligraf, which consists of a cultured-fibroblast-derived synthetic dermis

#### 6. Physical devices for use in treating open wound:

##### - Whirlpool treatment :

- The gentlest way of achieving a clean wound is by means of water irrigation
- Water under pressure from a shower head, dental water pick, or syringe with a catheter tip is effective in removing tenacious protein exudate
- Widely used on burn wounds

##### - Hyperbaric Oxygen :

- Many chronic wounds are ischemic
- HBO therapy, during which the patient lies in a hyperbaric chamber set at 2.0 to 2.4 atms and 100% O<sub>2</sub> concentration, can achieve high oxygen level in the most ischemic wounds

##### - Also is a signaling molecule for growth factor production and synthesis of other proteins

- Applied most in diabetic foot ulcer

#### 7. Electrical stimulation:

##### - Can stimulate cell proliferation and migration – faster healing