**DEFINITIONS**

Ulcer:

- Is a break in the continuity of an epithelial surface (skin, mucous membrane).
- In general they have a fibrotic margin and the ulcer base which may be seen as clean, healthy granular tissue or slough (necrotic tissue).
- It is a chronic wound. It usually fails to heal. It is characterized by progressive destruction of the surface epithelium. Are usually caused by internal causes. They have a number of different etiological factors for delayed wound healing, including infection, local mechanical irritation, arterial insufficiency (ischemia), venous insufficiency, impairment or loss of normal skin innervation. Are common in patients with metabolic disorders like diabetes and rheumatoid arthritis.

**CLASSIFICATION**

A. **Nonspecific ulcers:** Are due to infection of wounds, physical or chemical agents
   1. *Secondary infected ulcers (Inflammatory ulcers):* Operative wound infection
      Drainage of abscess
   2. *Physical agents:* Pressure sore (Decubitus ulcer)
      Traumatic ulcers (occur in patients with prolonged steroid therapy)
      Local irritation (Dental ulcer)
   3. *Chemical agents:* Peptic ulcer
   4. *Gravitational ulcer (Venous ulcer, venous stasis ulcer):*
      - Majority are associated with varicose veins (varicose ulcers)
      - Following DVT, leading to recanalization and incompetence of veins, increase venous pressure, ulceration (postthrombotic ulcer)
   5. *Trophic ulcer (due to impairment of nutrition of the tissue)*
      - Ischemic ulcer (Arterial ulcer), due to impairment of blood supply as in chronic arterial occlusion (atherosclerosis) and Beurger's disease.
      - Neuropathic ulcer (Perforating ulcer), due to loss of sensation, occur in diabetic neuropathy (diabetic ulcer- ischemia is also a factor in diabetic ulcer), it also occur in tabes dorsalis and leprosy
   6. *Aphthous ulcer*
   7. *Iatrogenic:* Intravenous fluid extravasation
   8. *Ulcer (Dermatitis) artifacta:* Induced by the patient

B. **Specific (Primary infective) ulcers:**
   1. Viral: Herpes simplex ulcer
   2. Tuberculous ulcer
   3. Syphilitic (Gummatous) ulcer
   4. Fungal ulcer

C. **Malignant ulcers:**
   - Skin, GIT
   - Marjolin ulcer- there is carcinomatous changes at the edge of any longstanding benign ulcer, irrespective of its cause, and should always be considered a possibility, e.g. in chronic venous ulcer and in postburn scars.
Ulcers pass through 3 stages:

1. The stage of extension:
   - The floor is covered with exudate and slough
   - The base is indurated
   - The discharge is purulent and even blood stained

2. The stage of transition:
   - It prepare the ulcer for healing
   - The floor become cleaner, the slough separates
   - Induration of the base diminished
   - The discharge become more serous
   - Small redness area of granulation tissue appears on the floor, and these link up until the whole surface is covered with granulation tissue

3. The stage of repair:
   - The granulation tissue will become changed to fibrous tissue, which gradually contract to a scar
   - The epithelium will gradually extends from the edge to the cover the floor (shelving), at rate of 1mm/day

This healing edge consist of 3 zones:

- The outer zone- appear white, consist of epithelium
- The middle zone- bluish in color, consisting of granulation tissue coverd by a few layers of epithelium
- The inner zone- reddish, consisting of granulation tissue coverd by a single layer of epithelium

**CLINICAL FEATURES**

**HISTORY:**

In any ulcer ask about:

1. Duration of the ulcer
2. Any symptoms caused by the ulcer
   - Pain:
     - Painful ulcer
       - Ischemic (arterial) ulcer, is extremely painful
       - Venous ulcer- (postthrombotic ulcer), causes constant pain if a/w infection
       - (Varicous ulcer), is painful if associated with Infection
       - Traumatic ulcer
       - Vasculitic ulcer (leg ulcer of rheumatoid arthritis)
       - Tubercuous ulcer of the tongue
       - Syphilitic ulcer of the anus (Anal chancre)
       - Viral ulcers e.g. caused by herpes simplex is often painful
       - Nonspecific ulcer in the extension and transition stage
     - Painless ulcer
       - Neurotrophic ulcer (Trophic ulcer, Perforating ulcer) as in diabetic ulcer
       - Tuberculous ulcer, except in the tongue
       - Syphilitic ulcer, except anal chancre
       - Venous ulcers if not infected

- Parasthesia
- Claudication
- Discharge: Type, color, smell, consistancy
3. Change in size:
   - Inflammatory ulcer shows slow increase in size
   - Carcinomatous ulcer shows rapid increase in size
   - Basal cell carcinoma shows slow increase in size

4. Numbers: Any other ulcers in the body

5. Past history: of trauma, diabetes, hypertension

**CLINICAL EXAMINATION:**

**General examination:**

- Evidence of debility, anemia, heart failure, diabetes

**Local examination:**

**INSPECTION:**

1. **Site:** 95% of basal cell carcinomas occur in the upper part of the face, but ca typically affect the lower lip.
2. **Shape:** Circular round in BCC. Square shape ulcer is suggestive of dermatitis artifacta, with straight edge
3. **Floor (Surface):** Is the part that is seen.
   - Covered by granulation tissue- in non-specific ulcer
   - Watery or apple jelly floor- in tuberculous ulcer
   - Slough (dead soft tissue ie. skin, fascia, tendons)
   - Wash leather slough- in gummatous ulcer
   - Discharge- Purulent discharge indicate active infection
     - Blue green in pseudomonas infection
     - Watery discharge is typical of tuberculosis
     - Blood stained (sanguinous) in the extension phase of non-specific ulcer
     - Serous- clean granulating ulcer
     - Serosanguinous
   - Crust- Is dry discharge
   - Scab- Is dried blood clot
4. **Edge:**
   - Everted edge- In carcinomatous ulcer (Squamous cell ca.) of skin, intestine, bladder, bronchus.
   - Raised (Heaped up, rolled) edge- Basal cell carcinoma, Rodent ulcer), is almost diagnostic
   - Slopping edge (Shelving) - Healing nonspecific ulcer
     - Septic ulcer (Varicous and venous ulcer)
     - Primary syphilitic chancre
   - Undermined edge: - Tuberculous ulcer, often bluish
     - Pressure sore (Bedsore, Decubitus ulcer)
     - Tropical ulcer of the leg
   - Punched out (Square cut) ulcer - Gummatous ulcer
     - Trophic ulcer, esp. in perforating ulcer of foot (diabetic ulcer)
     - Varicous ulcers, sometime
5. **Surrounding skin:**- Redness, dilated veins, pigmentation, scars, hairs

6. **Number**

7. **Any other ulcers elsewhere in the body**
PALPATION:

1. Size: Length, width, depth
2. Base: Is the part felt by palpation. It gives information about the relation of the ulcer to the surrounding structures. It is- indurated (hard, firm) as in carcinoma, -attached to the deeper structures as in varicous ulcer on the tibia.
3. Temperature.
4. Tenderness.
5. Mobility and fixity to the deeper structures
6. Examination of the surrounding structures
   - Skin and subcutaneous tissue: signs of inflammation
   - Circulation: -arteries, - veins, -lymphatics and lymph nodes, e.g. the lymph nodes are not enlarged in rodent ulcer unless due to secondary infection, in carcinomatous ulcer the lymph nodes may be enlarged, hard and even fixed to the deeper structures, in syphilitic ulcer the lymph nodes are firm and shooty.
   - Nerve supply
   - Musculoskeletal system

INVESTIGATIONS

GENERAL INVESTIGATIONS:
- Hb, WBC, ESR, FBS, B urea, GUE

SPECIFIC INVESTIGATION:
- Incisional biopsy from the ulcer edge
- Serological test is of value if specific infection is suspected

MANAGEMENT

This includes:

1. Diagnosis, finding the cause and accurate assessment of the ulcer by:
   - History
   - Clinical examination
   - Investigations
2. Treatment of the ulcer: which includes

GENERAL TREATMENT:
- Identification and treatment of any coexisting diseases, like anemia, malnutrition.
- Determination and treatment of any underlying causes, like infection, diabetes, venous or arterial insufficiency. Recurrence is inevitable if the underlying cause is not corrected.

SPECIFIC TREATMENT:
- The ulcer is treated either by dressing to allow healing by second intension, or by surgical excision of the granulation tissue and covering the defect by partial thickness skin graft or
- This means treatment of the ulcer.
1. Adequate drainage and desloughing of the base of an ulcer is essential for ulcer healing.

- **Ulcer debridement:** Many agents have been advocated for softening and removing slough, but the most cost-effective method is by removal by excision of any dead tissue. This may expose any secondary extensions of the main ulcer cavity and wound bridging that will require opening to allow adequate drainage.

- **Antibiotic treatment:** is usually not required in healthy granulating wound, as these wounds form an effective natural barrier against microbial invasion and are virtually impermeable to both topical and systemic antibiotics. But antibiotic is indicated if the ulcer is infected and surrounded by cellulitic tissue and in ulcers of specific bacterial origin such as tuberculosis.

- **Ulcer dressing:** Ideally a clean ulcer with healthy granulation tissue exuding serous discharge, should be dressed at least twice daily and more often if there is copious discharge.

The use of woven cotton or cellulose gauze dressing soaked in antiseptic solutions should be discouraged. Antiseptic solutions impairs capillary circulation and are toxic to granulation tissue. Wounds can be cleaned more safely with normal saline solution. Furthermore the use of gauze dressing as packs often causes patient discomfort as these expand into a hard mass on absorbing fluid. The dressings also shed fibers, which may delay wound healing if not removed at the time of dressing change. In addition the dressing become adherent to the granulation tissue, avulsing the superficial layer of the wound and thereby causing further delay in healing.

**Basic requirement of the ideal ulcer dressing:**

- Soft
- Absorbent, remove excess exudates
- Nonadherent, allowing easy removal without trauma at dressing change
- Nonallergic, safe and acceptable to the patient
- Permit gaseous exchange but impermeable to microorganisms
- Costeffective

**The ideal ulcer dressing for granulation tissue don't exist, there are agroup of dressing providing a compromise:**

- Hydrocolloid gels: Like Granuflex and Hydrogel, some of which some of which may have a polyurethane base, provide good wound protection. The compound forms a gel when it comes in contact with wound exudates and expands to fill the wound. It is thought to provide a good environment for wound healing and is an effective barrier against microorganisms. They can be used in a wide variety of granulating wounds including leg ulcers and pressure sores.

- Alginates: Such as Kaltostat or Sorbsan, consist of an absorbents fibrous fleece composed of a mixture of sodium and calcium salts of alginic acid. The fibers absorb fluid to form a gel-like substance that promotes healing when the fibers come in contact with exudates and other body fluids. They are suitable for the management of a wide range of lesions, including those with moderate to heavy exudates.

- Microporous polyurethane films: Like Tegaderm, Lyoform, are suitable for relatively shallow lesions. They are permeable to gases and water vapour but are impermeable to microorganisms. This means that they can be left in place for several days and are suitable for the management of minor burns, skin graft donor sites, pressure areas and postoperative wound, they have also been shown to reduce epithelial healing times compared with gauze dressings. However they should not be used where there is established infection or excess exudates.

2. Other surgical intervention is often necessary in some types of ulcer such as large pressure sore that may require excision of the ulcer, skin graft or flaps