Wound Care and Wound Healing

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- Incision wound
- Abrasion wound
- Crush wound
- Degloving wound
- Gunshot wound
- Burn

Phases of Wound Healing

A. Inflammation (Lag): 2 – 3 days

inflammatory response

 B. Fibroplasia (Proliferative, incremental): < 3 weeks fibroblast migration, capillary ingrowth (granulation), collagen synthesis, wound contraction
 C. Meturation (Demodeling, Distance): < 6 months

C. Maturation (Remodeling, Plateau): < 6 months organization of scar

Mechanisms of Wound Closure

- **1. Epithelialization**—*Epidermal continuity is established in* <u>24 – 48 hours</u> *after primary closure of surgical wound*
- 2. Wound contraction



*"Keep wound dry and clean"*To protect the wound from bacterial invasion
To absorb wound discharge
Psychologic benefit

Types of Wound Closure

Primary closure Delayed primary closure Secondary or spontaneous wound closure

Infected Wound before Wet-dressing



Infected Wound before Wet-dressing





Infected Wound before Wet-dressing











Healthy Granulation after Wet-dressing



Wound Closure after Wet-dressing



Wet-dressing by BetterIodine Gauze



Wet-dressing by Normal Saline Gauze



Abdominal Binder to Protect Wound and Fix Dressings







Wound Infection after Cleansing the Better-Iodine



Healing byWound Contracture



FIGURE 11-15 Suggested mechanisms of wound contraction. A, The "purse string" effect, produced by the ingrowing epithelium. B, The "picture frame" model, with the force of contraction located in the periphery, pushing tissues inward. C, As wound contraction proceeds, myofibroblasts become more uniformly distributed, allowing for a centrally located "pull" mechanism. D, Schematic representation of the final appearance of a contracted wound.



Healing by Wound Contracture 3 Weeks after Wet-dressing



Healing by Wound Contracture 3 Weeks after Wet-dressing





Factors Influencing Wound Healing

- Blood supply
- Infection
- Age
- Site of wound *(tension, blood supply...)*
- Nutrition (Protein, vitamines-C, A, B6, B2, Zinc, copper...)
- Intercurrent diseases (DM, bleeding diathesis, obstructive airway disease, steroid therapy, immunosuppressive therapy, radiotherapy, chemotherapy...)
- Surgical technique (aseptic, skin edge approximation...)

Classification of Surgical Wound

- 1. Clean wound: GI, GU & respiratory tract not entered.(*infection rate at 30 days < 1.5%*)
- 2. Clean-contaminated wound: GI or respiratory tract entered without significant spillage; oropharynx, vagina, or noninfected GU or biliary tract entered. *(infection rate at 30 days < 3%)*
- **3. Contaminated wound: gross spillage from GI** tract; entrance into infected GU or biliary tract. *(infection rate at 30 days < 5%)*
- 4. Infected wound



Wound Infection

紅, Erythema 腫, Swelling (edema) 熱, Heat 痛, Pain

usually 3 – 4 days after surgery

Predisposing Factors for Wound Infection

- Contamination with potential pathogens
- Foreign body in the wound
- Devitalized tissue
- Edema/pressure/constriction
- Impaired blood supply
- Hematoma/seroma/dead space
- Host factors lowering resistance: debility, obesity, uremia, immunocompromised states, dabetes, alcoholism.
- Poor antiseptic technique

Prevention of Wound Infection

- Meticulous aseptic technique
- Minimizing tissue necrosis
- Adequate hemostasis
- Eliminating dead space
- Avoiding foreign body
- Delayed primary closure
- Antibiotics (?!)

Treatment of Wound Infection

- Wet-dressing
- Adequate drainage
- Debridement of necrotic tissue
- Removal of foreign body
- Antibiotics(?)





Dirty Discharge in Wound Infection



Open and Debride the infected Wound



Wet-dressing for the Wound Infection





Tapes in Fixation of Gauzes



Blister after removing the improper use of Tapes



Blister after removing the improper use of Tapes







Fixation of Draining Tubes





Fixation of Draining Tubes



Judicious Use of Colostomy Bags in High Output discharge



Care of Open Drain

T



Care of Open Drain

X

Tensile Strength of Wounds

By 3 weeks after wounding: % of original strength

Skin*	30%
Fascia	20%
Intestine	65%
Urinary bladder	95%

*At best, the skin wound reaches only about 80% that of unwounded skin eventually.

blood supply wound tension cosmesis nutritional status prior radiation concurrent chemotherapy exogenous steroid administration persistence of sepsis

Timing of Suture Removal

Anatomic location	Removal days
Eyelid	2 - 3
Face	4 - 5
Neck	3 - 5
Scalp	7
Trunk	6 - 14
Extremities	10 - 21
Joint	14