PLASTIC &RECONSTRUCTIVE SURGERY (1)

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Lecture time : 50-60 min

The scope of plastic surgery

trauma: soft-tissue loss (skin, tendons, nerves, muscle).

- hand and lower limb injury.
- faciomaxillary.

cancer: skin, head and neck, breast, soft tissue sarcoma.

congenital: clefts and craniofacial malformations.

- skin, giant naevi, vascular malformations.
- urogenital. hand and limb malformations.

Burn

miscellaneous: Bell's (facial) palsy.

- ressure sores.
- aesthetic surgery.
- chest wall reconstruction.

Scope of Plastic Surgery

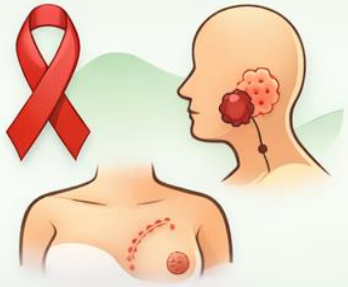
Restoration – Reconstruction – Enhancement

1. TRAUMA

- **Soft-Tissue Loss**
  (Skin, Tendon, Nerve, Muscle)
- Hand & Lower Limb Injuries
- Faciomaxillary Trauma
- Burns & Reconstruction

2. CANCER (RECONSTRUCTION)

- Skin Cancer
- Head & Neck Tumors
- Breast Reconstruction
- Soft Tissue Sarcoma



3. CONGENITAL

- Cleft Lip & Palate
- Craniofacial Anomalies
- Giant Naevi, Vascular Malformations
- Urogenital & Limb Defects

4. MISCELLANEOUS

- Facial Palsy
- Pressure Sores
- Aesthetic Surgery
- Chest Wall Reconstruction

CORE PRINCIPLES

- ☑ Replace "Like with Like"
- Function → Then Form
- ☑ Reconstructive Ladder
- Reconstructive Ladder
- Multidisciplinary Approach

Plastic Surgery ≠ Cosmetic Only

Trauma, Cancer, Congenital & Functional Restoration

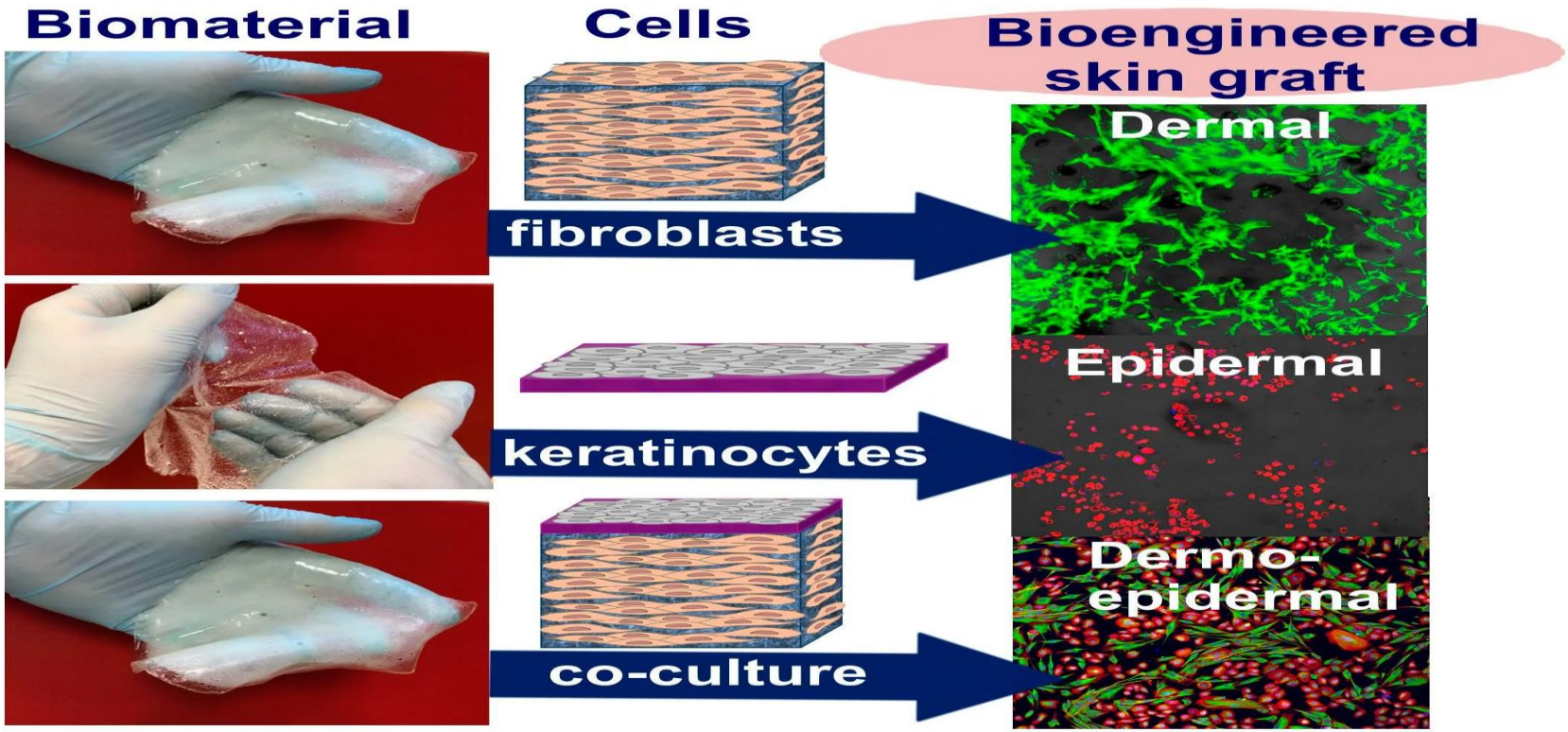
Plastic surgery principles

- Optimise wound by adequate debridement or resection.
- Wound or flap must have a good blood supply to heal.
- Place scars carefully ‘lines of election’.
- Replace defect with similar tissue.
- Observe meticulous surgical technique.
- Remember donor site cost.

Skin substitutes: Using of artificially engineered skin substitutes to replace major skin loss when there is inadequate skin donor sites.

-It is either thin sheets of **autologous keratinocytes** or artificial **collagen matrices** with embedded fibroblasts and a keratinocyte sheet covering.

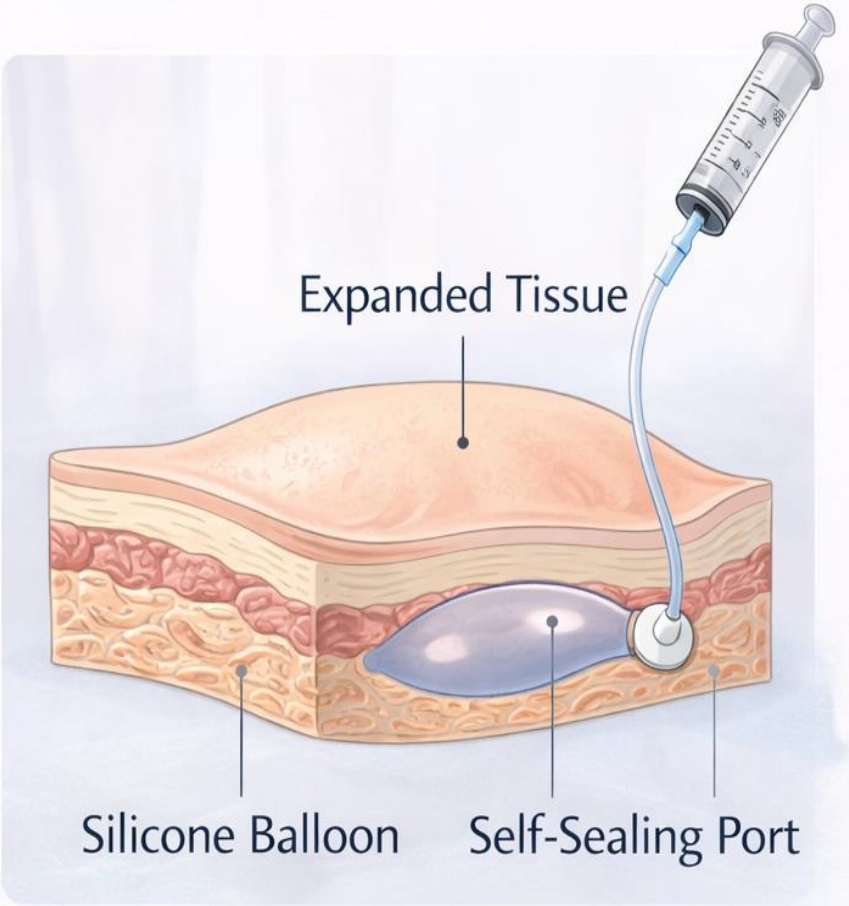
-They are becoming widely used but are costly.



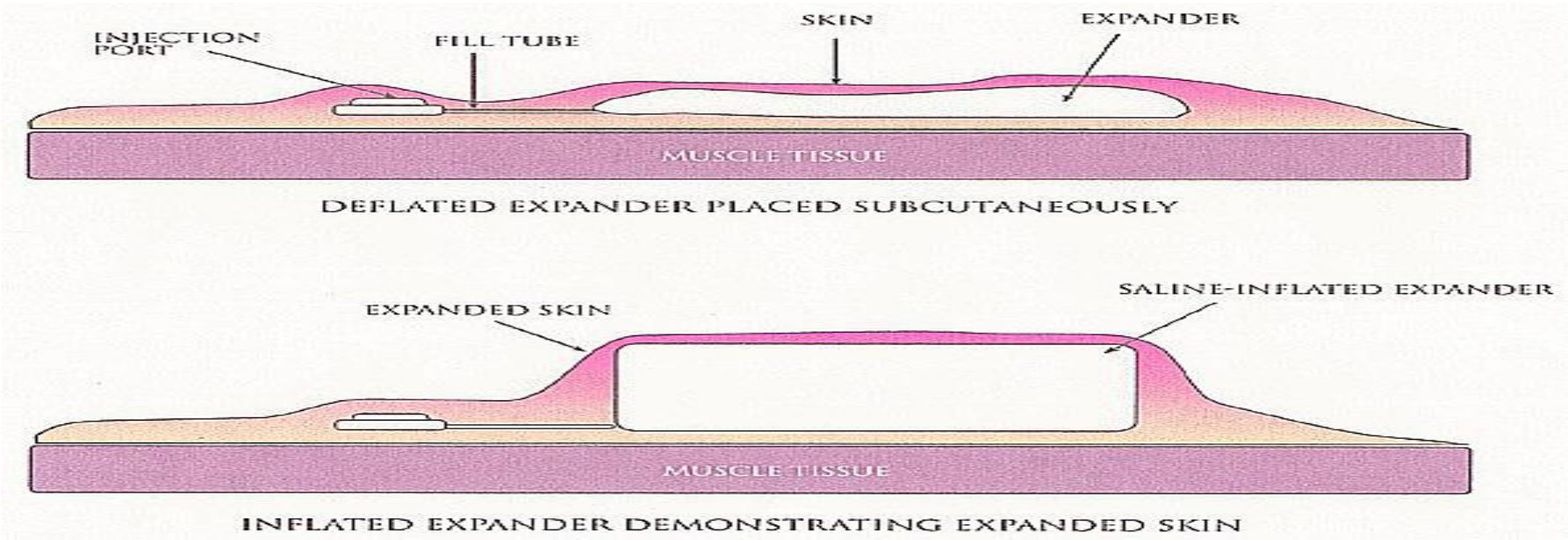
Tissue Expansion

Using local tissue for reconstruction

- A device (expandable silicone balloon) is placed beneath tissue to be expanded.
- Volume is progressively enlarged with sterile saline.
- Fluid is introduced via self-sealing port attached to filling tube.
- Tissues are stretched until used for reconstruction.
- It may be introduced as *frequencly* as can be tolerated by the patient until the tissues are stretched enough.



Tissues do not hypertrophy, but collagen structure is altered.


INJECTION PORT
FILL TUBE
SKIN
EXPANDER
MUSCLE TISSUE
DEFLATED EXPANDER PLACED SUBCUTANEOUSLY
EXPANDED SKIN
SALINE-INFLATED EXPANDER
MUSCLE TISSUE
INFLATED EXPANDER DEMONSTRATING EXPANDED SKIN

Tissue Expansion

Using local tissue for reconstruction

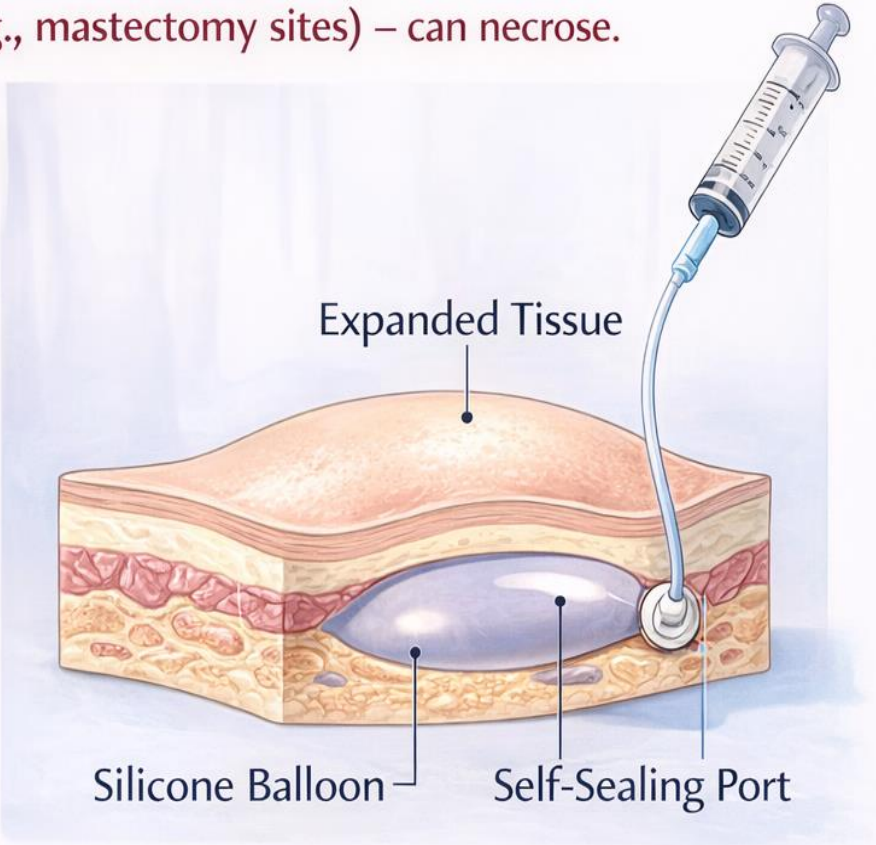
Must never be used under irradiated tissues (e.g., mastectomy sites) – can necrose.

Advantages

- Well-vascularised tissue
- Tissue next to defect so likely to be of similar consistency
- Good colour match

Disadvantages

- Multiple expansion episodes *(sometimes painful)*
- Cost of device
- High incidence of infection and extrusion *(especially limbs)*



Tissues do not hypertrophy, *but collagen painful)*

Tissues do not *hypertrophy*, but collagen structure is altered.

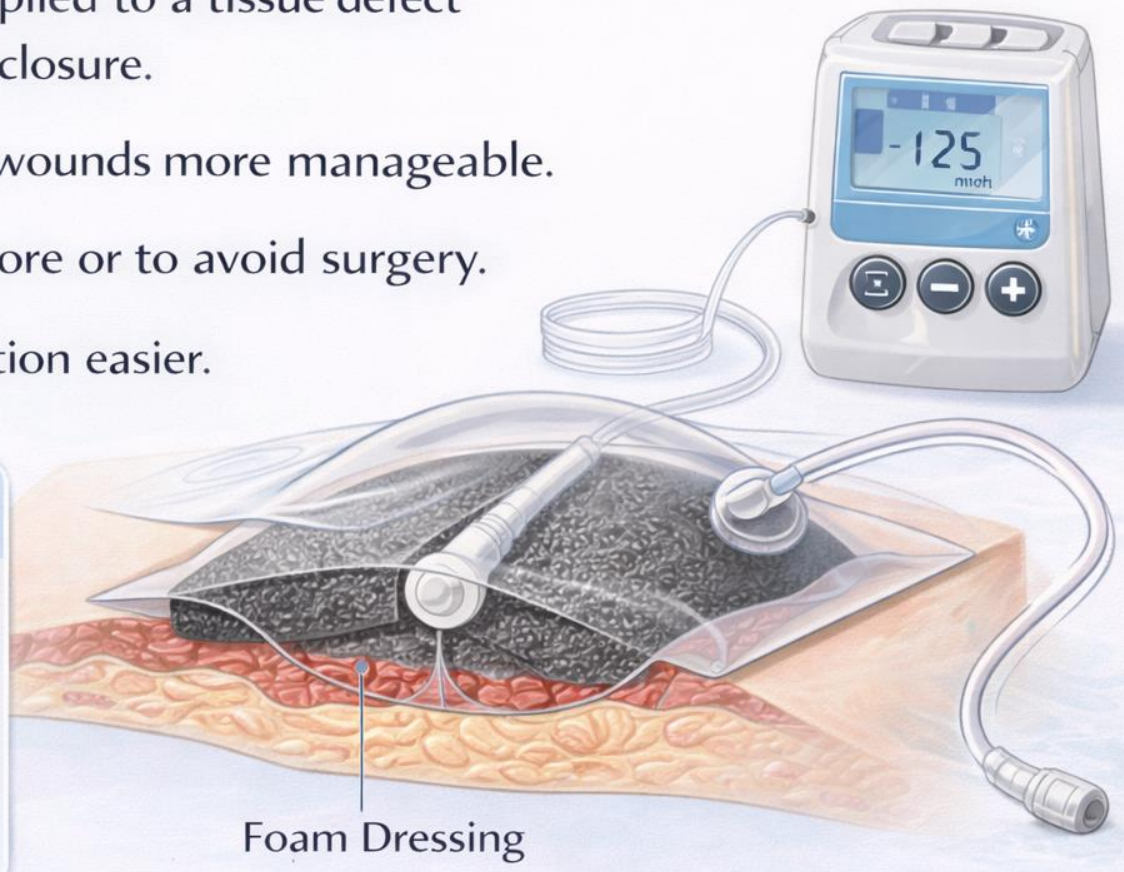
Vacuum-Assisted Closure (VAC)

Negative pressure therapy for wound management

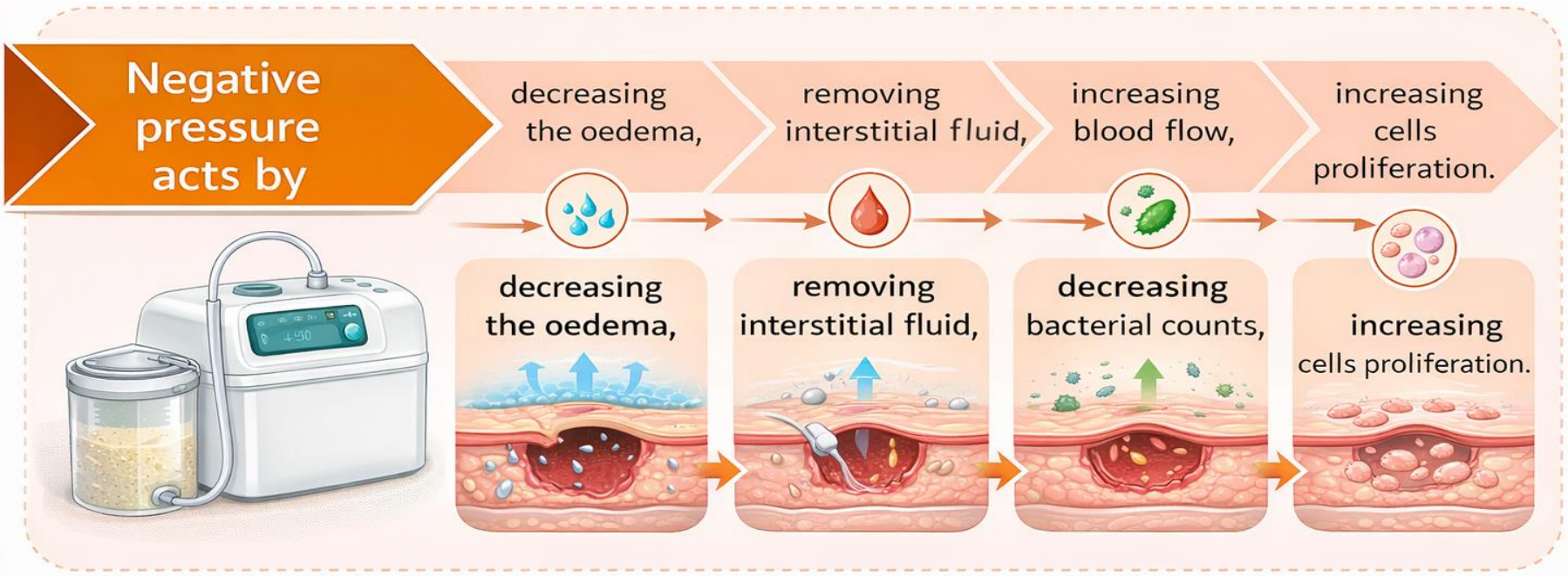
- Usage of negative pressure applied to a tissue defect has positive effects on wound closure.
- Helps make difficult, complex wounds more manageable.
- Early wound management before or to avoid surgery.
- Makes early stages of granulation easier.

Advantages:

- Well-vascularised tissue
- Tissue next to defect so likely to be of sinillar consistency
- Good colour match



Vacuum applied to drain via negative pressure pump (*white*), giving


Negative pressure acts by
decreasing the oedema,
removing interstitial fluid,
increasing blood flow,
increasing cells proliferation.
decreasing the oedema,
removing interstitial fluid,
decreasing bacterial counts,
increasing cells proliferation.

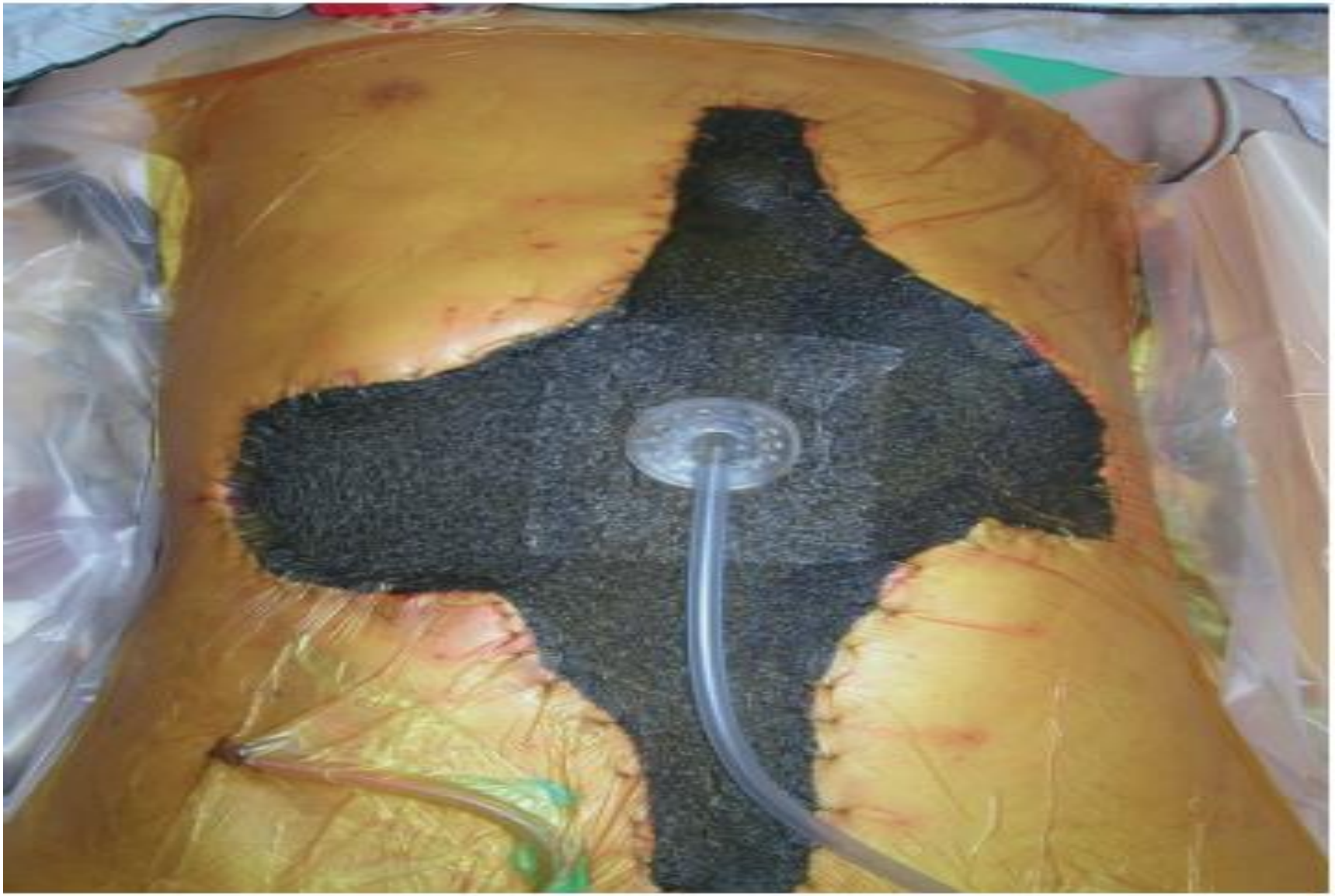


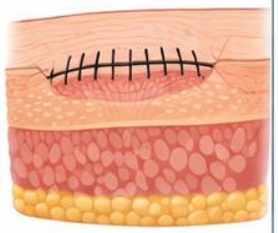
Figure 47.6 Negative-pressure wound therapy to promote wound healing in an open abdomen. The system consists of a non-adherent dressing overlaid by a sponge that is sealed with an airtight membrane and connected to a suction device.

WOUND HEALING

The process by which the body repairs injured tissue.
Plastic surgeons optimize healing to improve function and minimize scarring.

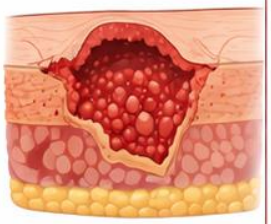
PRIMARY HEALING
(Healing by Primary Intention)

- Wound edges are reapproximated and closed soon after injury
- Closure with sutures, staples, glue, or tape
- Faster healing, minimal scarring
- Incisions placed along lines of relaxed skin tension (Langer's lines) to improve cosmetic outcome



SECONDARY HEALING
(Healing by Secondary Intention)

- Wound left open to heal from the base
- Kept clean with sterile, non-adherent dressings
- Healing occurs over days–weeks via:
  - Granulation tissue
  - Contraction
  - Epithelialization
- Used for wounds with poor healing potential (e.g., ulcers, pressure sores)



ROLE OF PLASTIC SURGEONS

- Optimize cosmesis and healing conditions
- Balance intervention vs. risk, especially in fragile conditions *e.g., Ehlers–Danlos syndrome, Epidermolysis bullosa*
- Primum non nocere (First, do no harm)
- Reconstruction: "rob Peter to pay Paul" – creating wounds to heal other wounds

FACTORS AFFECTING WOUND HEALING

Diabetes
(Poor glycemic control impairs healing)

Poor Circulation
(Peripheral vascular disease, ischemia)

Renal Failure
(Uremia, metabolic disturbances)

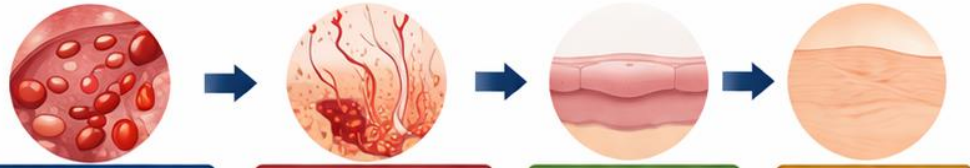
Corticosteroids
(Immunosuppression, delayed healing)

Immunodeficiency
(↑ risk of infection, poor repair)

Smoking
(Vasoconstriction, ↓ oxygen delivery)

Nutrition
(Protein & vitamin deficiencies)

STAGES OF WOUND HEALING



1. INFLAMMATION
Hours–Days
Hemostasis, immune cell recruitment, debris removal

2. PROLIFERATION
Days–Weeks
Granulation tissue forms, angiogenesis, epithelialization, wound contraction

3. MATURATION
Weeks–Months
Collagen remodeling, strength increases

4. REMODELING
Months–Years
Scar maturation, tissue reorganization

➡ OPTIMIZE HEALING (PREOPERATIVE)

Control Diabetes
(Optimize glucose)

Improve Circulation
(e.g., angioplasty)

Nutritional Support
(Protein, vitamins)

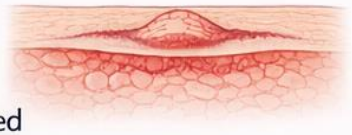
Quit Smoking ≥ 6 weeks pre-op

ABERRANT HEALING

Abnormal scarring and wound healing complications

HYPERTROPHIC SCARS

- **Elevated, within original borders,** common on areas of tension *(e.g, flexflexor surfaces)*
- Develop soon after injury
- Improve over time
- Up to 15% of wounds affected
- Responsive to silicone sheets, corticosteroids



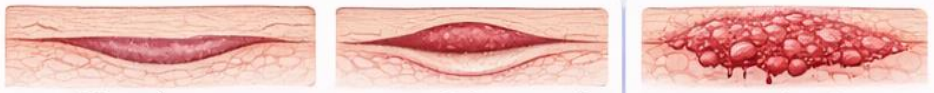
Silicone sheets | Corticosteroid injection | Compression therapy | Compression therapy

KELOID SCARS

- **Extend beyond wound borders,** common in darker skin types and certain areas *(e.g, earlobes, chest)*
- Appear months after injury
- May enlarge progressively
- Locally destructive, recurrent
- May require multiple treatments **and radiotherapy**

Corticosteroid injection | Pressure therapy | Surgical excision | Radiotherapy

Scars Widened, Depressed, or Unstable



Widened scars | **Thin and depressed** | **Overgranulated tissue**

Wounds prone to breakdown often seen at *mobile sites (e.g, major joints, neck)*

Surgical excision | Flap Coverage

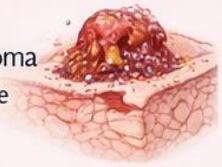
Wounds prone to breakdown often seen at *mobile sites (e.g, major joints, neck)*

Surgical excision | Flap Coverage

Chronic Wounds & Malignancy

- **Overgranulated tissue**

  Aggressive form of squamous cell carcinoma developing in chronic wounds (e.g, pressure sores, burns)
- Requires biopsy & excision



Silver nitrate | Corticosteroids | Excision | Flap Coverage

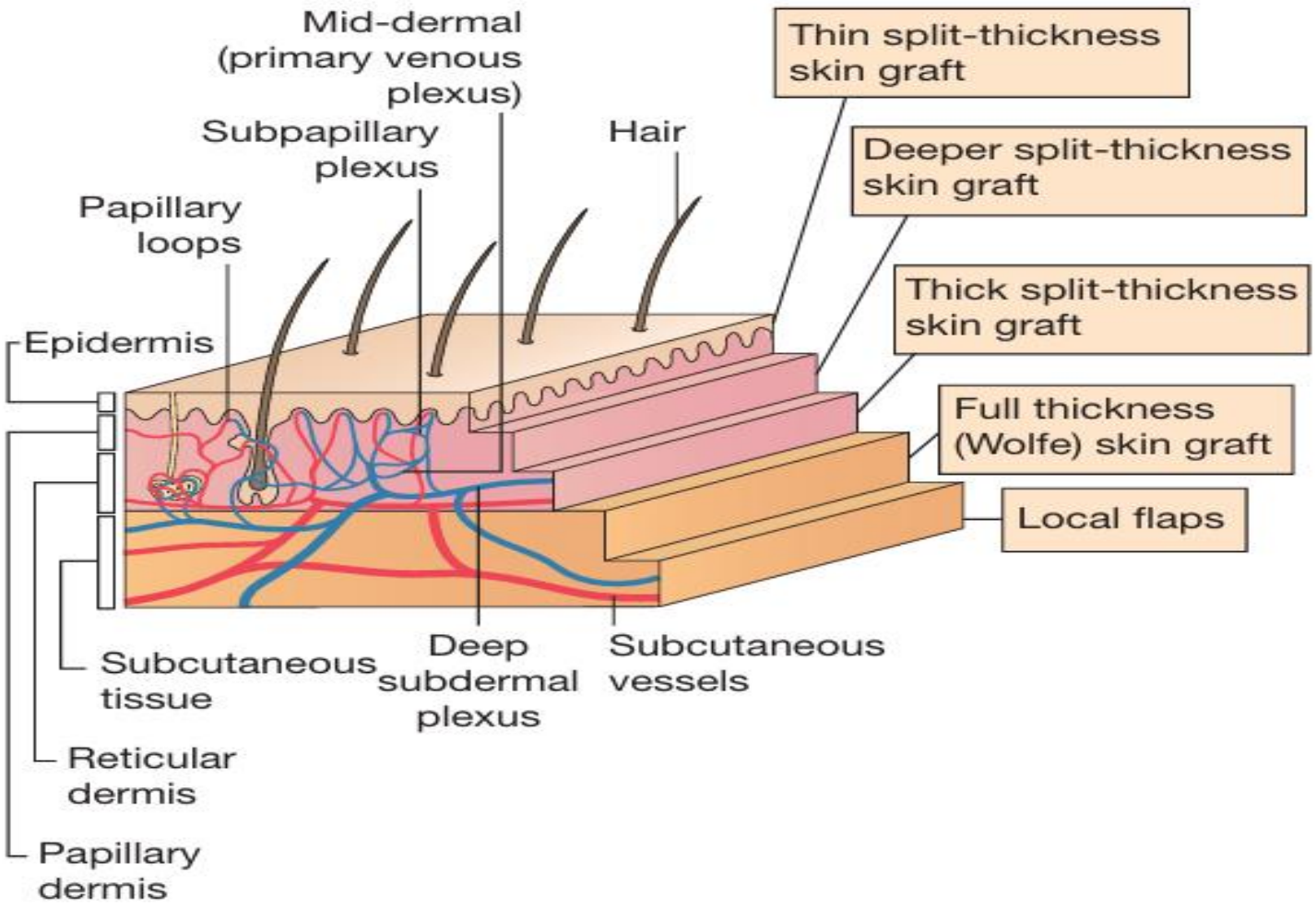


Figure 47.7 Schematic anatomy of the skin and its relationship to harvesting skin grafts (of varying thicknesses) and raising local flaps.

ASSESSMENT AND DIAGNOSTIC PLANNING

The initial assessment of wounds involves:

1. Adequate removal of devitalised tissue.
2. Assessment of which vital structures will need reconstruction immediately and which might be better reconstructed later.
3. Assessment of the degree of contamination involved which will require further cleaning.

-Further planning of treatment will include:

1-The definitive soft-tissue cover of the wound.

2-Functional rehabilitation with full psychosocial rehabilitation.

Thank You
for Listening

Your Attention is Appreciated