

Soft tissue cover

- ✚ Plastic surgery is divided into:
 - a. aesthetic surgery: concerned with the beauty of clients
 - b. reconstructive surgery: concerned with repair of lost tissue.
- ✚ Causes of soft tissue defects that are dealt with by a plastic surgeon:
 1. **congenital:** cleft lip and palate, hypospadias, ...
 2. **Acquired:**
 - a. Inflammatory: defects following infections e.g. abscesses.
 - b. Neoplastic
 - c. Metabolic: e.g. diabetic foot.
 - d. Ischemic: following peripheral vascular diseases and pressure sores.
 - e. Traumatic: that follows burns, frost bites, ...
 - f. Iatrogenic: as in extravasation injury.
- ✚ Wound healing: replacement of lost tissue, happens through two mechanisms:
 - a. **Regeneration:** replacement of lost tissue with the same tissue, gives maximal functional and cosmetic recovery, so it's considered the **IDEAL mode of healing**. The epithelium, hepatocytes, and bone tissues are the only tissue that heal by regeneration in humans.
 - b. **Fibrosis:** replacement of lost tissue with fibrous tissue, it's a bad mode of healing as it doesn't give the function and form of the lost tissue. The role of a plastic surgeon; to reconstruct defects, by transferring tissues from donor sites of the same patient.
- ✚ Criteria for tissue transfer:
 1. It should be similar as possible to the lost tissue.
 2. It should achieve maximal benefit to the recipient area.
 3. It should achieve minimal donor site morbidity.
 4. It should be safe to the patient.
- ✚ Wounds are classified depending on the depth into:
 - a. **partial thickness:** epidermis + part of the dermis, heals by regeneration, doesn't need surgical intervention. (Conservative treatment).
 - b. **full thickness:** epidermis + whole dermis.

The result is better than fibrosis but less than the ideal regeneration.

Wounds vary in complexity, from simple (incised skin wound) to most complex three-dimensional defects (compound defect).

Wounds are closed only and only when they're **CLEAN**, meaning that they're **free of contamination** and **necrosis**. This depends on 2 factors: the mechanism of the injury and the instrument used, and time from injury to presentation: >6 hours -> contaminated, except for the face, within 24 hours.

- ✚ Classification of wounds based on contamination and necrosis:

	Incised wound	Lacerated wound	Crushed wound
Caused by	Sharp, clean instruments, e.g. knife	Blunt instruments (causes jagged edges)	Industrial, and severe road traffic accidents.
Necrosis & contamination	Minimal	Moderate	Severe
Management	Primary closure if <6 hours	If <6 hours -> wound excision, then direct closure.	Wound opening, cleaning, irrigation, and debridement. Repeat till clean, then close.

****Primary closure is contra-indicated in crushed wounds, as the dead tissue, contamination, and the tissue tension due to inflammatory edema will predispose to infection, especially gas gangrene and tetanus.**

✚ Methods of soft tissue coverage:

1. **Direct closure:** Used when there's no or minimal tissue loss, that we can approximate the wound edges without tension, by suture materials.
2. **Healing by secondary intention:** good for small defects, when the area is of no functional or cosmetic value, or when other operative methods like grafts or flaps are not safe.
3. **Skin graft:** Skin or part of it is harvested from a donor area and applied on the defected area.
4. **Flap:** Piece of tissue with its own blood supply, moved from its original site, to cover a defect.
5. **Prosthesis.**

✚ Graft types:

1. **Split thickness:** thin grafts formed of epidermis and a thin part of the dermis, the donor site heals by regeneration within two weeks, and the same donor area can be re-harvested after this period. Almost any area of the body may be used as a donor site, used in large areas of skin defects.
2. **Full thickness skin grafts:** consists of the whole skin (epidermis and dermis), it is taken from areas of loose skin, as the donor area is closed by approximation of the edges (direct closure), due to this fact, only small areas could be covered by FTSG.

FTSG is superior to STSG from functional and cosmetic aspects: better texture, better color matching with less pigmentation problems, more durable, less wound contraction, they have better sweat and sebaceous gland function, it grows with the child, and they have better final innervation. Although FTSG are better they have 2 drawbacks: they are less available to cover large areas¹, and they are more difficult to take².

- ✚ **Skin graft take:** The process by which the graft is integrated to the recipient site and acquires new blood supply. It passes through two stages:
- a. **Plasmatic circulation:** in the first 1-2 days, the graft is nourished from the underlying recipient site by the process of imbibition/ diffusion.
 - b. **Neovascularization:** within 2-3 days, the graft blood vessels are joined with the recipient site vessels.

✚ **Signs of graft take:** The graft is adherent to the recipient site, pink in color, and blanches with pressure denoting vascularity.

✚ Factors affecting take:

1. **Vascularity** of the recipient site (the most important factor). Skin graft take is poor on avascular areas, and over irradiated areas. Graft take does not take place on prosthesis.
2. **Bacterial load**, especially that is caused by group A strep.
3. Presence of **barriers** between the graft and the recipient area, e.g. hematoma.
4. **Immobilization**, the graft should be fixed to the recipient site, as graft mobility hinders imbibition and neovascularization.

✚ **What type of skin graft to use, STSG or FTSG?** When the area to be covered needs good quality of skin, i.e. good cosmesis, as on the face, or good durable skin as on the hand, FTSG is used, but if we are to cover large areas, as in major burns, then STSG is the logic choice.

✚ **FLAPS:** they vary in their composition to suit the need of the recipient area, it may be composed of skin and subcutaneous tissue (skin flaps), skin and muscle (myocutaneous flaps), muscle alone (muscle flaps), skin, fascia and bone (Osseofasciocutaneous flaps).

✚ Difference between skin grafts and flaps, and indications of their use:

	Graft	Flap
Composition	Skin	More bulky tissue
Vascularity	Depends on recipient site	Has its own blood supply
Example use	facial defect following excision of basal cell carcinoma, may be closed by FTSG.	The defect that follows excision of infiltrating oral tumor. Avascular beds or over prosthesis.

✚ **In summary,** flaps rather than grafts, are used when the latter are insufficient to cover the defect, or they would not be taken. Flaps may be raised locally to cover nearby defects (local) or may be brought from distant sites as free flaps, in the case of free flaps the flap with its vascular pedicle (its supplying artery and vein) are taken from the donor area to the recipient site where the artery and vein are connected by microvascular anastomosis to an artery and vein in the vicinity of the recipient site.

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