Skin

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Functions

• Protection from trauma and irritants
• Temperature regulation
• Signals disease
• Enables and restricts joint motion
Fiber Component

Collagen Fibers  Elastin Fibers
Meshwork of Collagen Fibers in the Dermal Layer

Collagen Fibers

Unloaded  Loaded
Langer’s Lines
Lines of Cleavage

Lacerations/Abrasions

• Classified based on depth
• Superficial wounds to epidermis and partial thickness wounds usually result in re-epithelialization if just clean wound, antibiotic, and dressing for protection
• full thickness wound takes longer to heal and requires good opposition of wound edges- sutures, steri-strips, skin “glue” to minimize scar tissue formation and maximize re-epithelialization
Lacerations/Abrasions

- With wide abrasive wounds that are partial thickness- collagen laid down in a circular fashion
- causes wound contraction and closure
- scab protects but delays healing with drying out of the wound site
- moist dressings with antibiotic topical agent and protective dressing addresses this
- scar is weak relative to skin
- need to release subcutaneous adhesions

Closure of Incisions

- Skin glue has the same mechanical strength as sutures and similar cosmesis
- Skin glue closure can take less than 3 minutes while sutures take 6-7 minutes
- Steri-strips have inferior mechanical strength and cosmesis
Closure of Incisions

- Staples and skin glue (OCA, or 2-octylcyanoacrylate) faster than sutures, but are more costly. Sajid (2009)
- Patient satisfaction similar across the three methods for THA and TKA. Khan (2006)

Closure of Incisions

- Paper tape can be used after suture removal to decrease the incidence of hypertrophic scarring that may result from skin movement
- Acts to decrease multidirectional forces imposed across the healing incision
Closure of Incisions

- Occlusive dressings such as OpSite Post-Op that provide have high moisture vapor transmission rates tend to provide incision covers that have less exudate and reduced rates of blistering

Hematomas

- Bleed from blunt trauma to skin or from injury to subcutaneous tissues
- Ecchymoses is seen when the bleed penetrates into the skin or mucous membranes
- Bleed may collect into a confined space such as under a finger nail and may require pressure relief
- Ice and compression initially may limit bleed and heat later may aid resorption
Subungual Hemorrhages

Drain. Address shoe toe box and sock wear.

Dirt Tattoo

Entrapment of dirt or particles. Risk of infection. Removal with laser fragmentation of particle or microsurgery.
Piezogenic Papules

Herniation of fat pad particles. May or may not cause pain. Tx with external constraint of heel cup or tape job.

Piezogenic Papules

- Can be treated with steroid/anesthetic injection if they become painful
- Locations: heels, anterior leg, wrist
Acne Mechanica

Friction, pressure, and heat from equipment produce entrapment of oils in oil glands. Gland becomes infected. Treatment with underwear that wicks moisture, scrub with soap, topical agents.
• Medial or lateral edge of nail grows down into skin producing irritation, bleed, swelling
• need to remove nail growing in downward fashion
• elevate nail edge with cotton wool
• trim “V” into center of nail to encourage central rather than lateral growth
Blisters - Treatment

- Separation of epidermis from dermis secondary to friction- gap fills in with fluid and sometimes blood
- Drain repeatedly with sterile needle
- Keep epidermis layer in place until healing of dermis takes place and then remove old epidermal layer
- Protective dressing through all of this

Blisters - Prevention

- Spenco 2nd Skin prophylactically
- Vaseline on the skin to decrease coefficient of friction
- protective gloves
- two layers of socks
- blister free socks made of two layers
- socks that wick away moisture
Calluses and Hard Corns

- Hyperkeratosis 2° to excessive friction
- Gloves on the hands
- soak and then use pumice stone, graters, scalpel to remove the extra tissue
- salicylic acid preparations
- shoewear/inserts to address cause for feet

Pitted Keratolysis

- presence of moisture and heat produce conditions for fungal infection
- heel of the foot is a common location
- pitted lesions that may evolve into large irregular clefts and green or brown coloration
- treat with topical antibiotic
Heel Fungus

- Can be treated with botulinum toxin injection to kill off the fungal infection (Tamura et al, 2004)
- Topical antibiotic medication such as Dryso (chloride hexahydrate and erythromycin)
- Other interventions:
  - Antibacterial soap scrub
  - Cotton socks or other absorbent material

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Tinea Pedis - Athlete’s Foot

Fungal infection often contracted in communal areas. Tx: keep area dry with powders and use topical anti-fungal agents.

Plantar Warts

- Viral infection
- either auto-infection or communal infection
- a rough raised circular lesion with surrounding smooth hard border and may have central discoloration
- tender to pinching and less tender to pressure than callus
- topical acid, cryotherapy, laser, surgical excision
Hypertrophic Scar

- Keloid scars are more extensively overgrown and have a high rate of recurrence
- Individual differences
- Racial influence - 4.5% to 16% in black and Hispanic populations (Groot and Johnson, 1996)
- Greater incidence among Chinese population as well (Li-Tsang et al, 2005)
- Influence Langer’s Lines
- Massage with cocoa butter
- Cortisone injection
- Resurfacing with laser