Cosmetic Dermatology

Overview

- Chemical Peels
- Sclerotherapy
- Botox
- Soft Tissue Augmentation
- Future Trends

Chemical Peels

- improve skin texture
- reduce hyperpigmentation and mild wrinkling
- do not improve deep wrinkles or sagging skin
- useful as adjunctive treatment for acne, rosacea, and melasma

Chemical Peels

- Categorized based on depth of the procedure:
  - superficial: induce necrosis of all or parts of the epidermis
  - medium: necrosis of the epidermis and part or all of the papillary dermis
  - deep: necrosis extends into reticular dermis

Superficial Peels

- alpha hydroxy acids (AHA)
- beta hydroxy acids (BHA)
- Jessner's solution
- modified Jessner's
- resorcinol
- trichloroacetic acid (TCA)

AHA's and BHA

- Naturally occurring organic acids
  - high concentrations cause detachment of keratinocytes and epidermolysis
  - lower concentrations reduce keratinocyte cohesion above granular layer
- 2 major effects:
  - quickens the cell cycle
  - smoothes stratum corneum

AHA's

- Glycolic acid
- Lactic acid
- Citric acid
- Phytic acid

- sugar cane
- sour milk
- citrus fruits
- rice

Glycolic Acid

- AHA most commonly used in peels
- “lunchtime peel”
- increases skin thickness and MPS’s in dermis
- improved quality of elastic fibers
- increased density of collagen

Lactic Acid

- Found in many OTC and Rx moisturizers
- Lac-Hydrin is AHA used as rx for dry skin
- Not frequently used for in-office peels

BHA

- Aka salicylic acid (SA)
- derived from willow bark, wintergreen leaves, and sweet birch
- in-office peels use 20-30% salicylic acid, OTC preps contain ~2% SA
- helps decrease hyperpigmentation, decrease surface roughness, and reduce fine lines

BHA

- increase exfoliation
- accelerate cell cycle
- exhibits anti-inflammatory capabilities, thus induce less irritation than AHA's.
- useful peel in rosacea and acne patients
- lipophilic and comedolytic
- does not increase collagen synthesis

Disadvantages of Hydroxy Acids

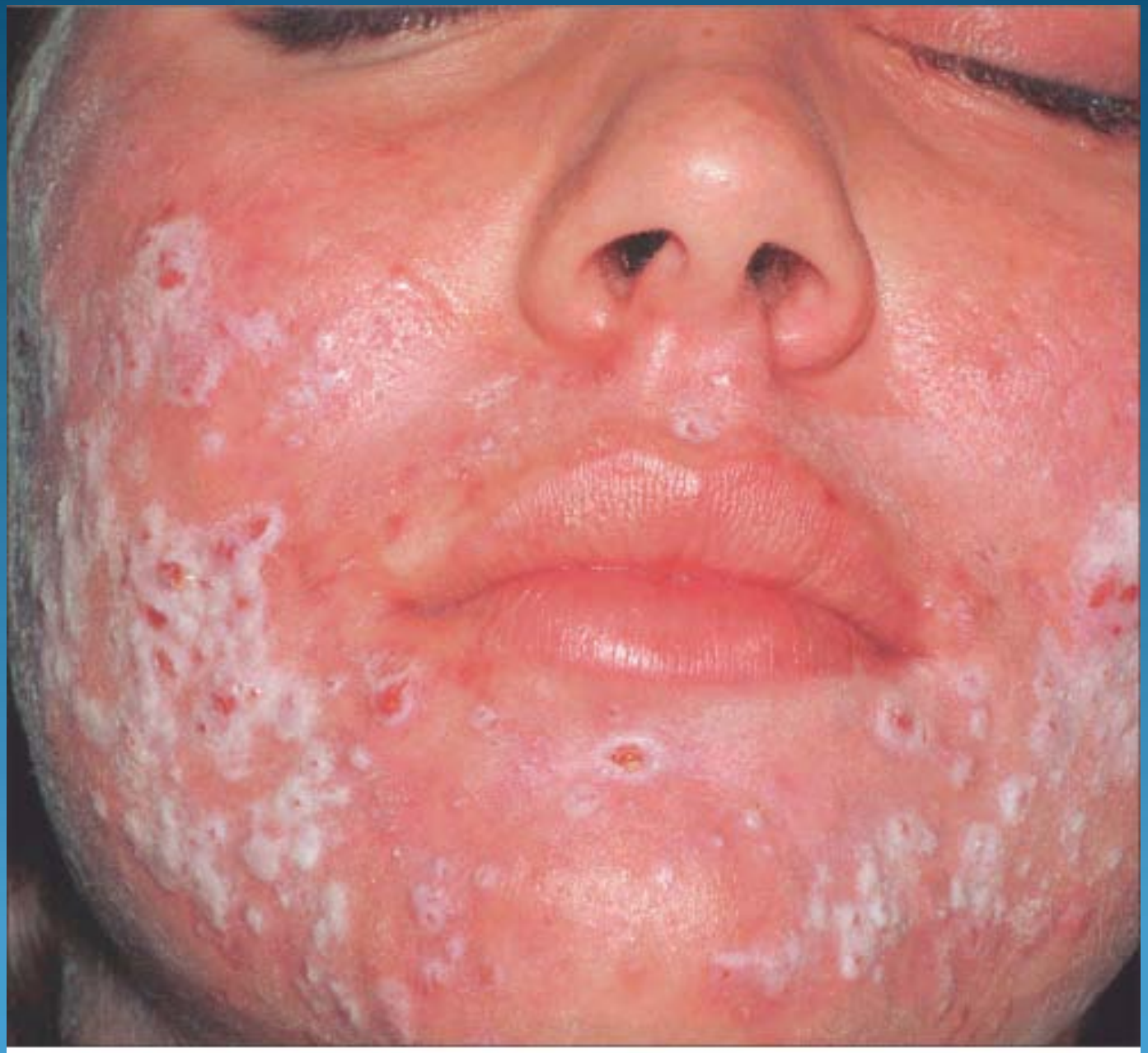
- unrealistic patient expectations
- decreased efficacy with continued use
- ? decrease natural skin barrier to UV light and harmful environmental toxins

Important Considerations When Comparing Preparations

- pH and pKa
- buffered solutions
  - sodium bicarb
  - sodium hydroxide
  - vehicle

Performing a Superficial Peel with AHA or BHA

- Cleanse the skin
  - 4 x4 gauze with 0.25% triclosan
  - rinse with water, then dry
  - apply acetone gauze
- Apply 40-70% glycolic acid with 2x2 gauze, and rinse with water or neutralize with 5%$NaHCO_3$ after 2-4 min.
- Apply SA with 2x2 gauze. It will precipitate (frost) in approx. 2 min. and does not need to be neutralized



Jessner's Solution

- Combination of:
  - resorcinol 14g
  - salicylic acid 14g
  - lactic acid 14g
  - ethanol 95% to make 100cc of solution
- formulated to reduce concentration and toxicity of individual ingredients while increasing efficacy

Jessner's Solution

- strength of the peel determined by how many layers are applied
- does not need neutralization
- can be combined with other peels to increase efficacy (ie. TCA)
- use cautiously in dark skin b/c of risks of post inflammatory hyperpigmentation or contact dermatitis with resorcinol

Performing a Jessner's Peel

- Cleanse skin
- Apply thin layer of petrolatum to naso-alar grooves and lips
- Apply thin coat of Jessner's to desired treatment area
- First coat complete when frosting occurs (approx. 3-5 minutes)
- can apply more coats to deepen penetration
- patient will experience flaking for ~7days

Modified Jessner's

- Combinations including hydroquinone and kojic acid
- combination without resorcinol

Resorcinol

- Used as peeling agent since 1882
- is *m-dihydroxybenzene,* a phenol derivative
- antipruritic, keratolytic, antimycotic, and antiseptic properties
- used as treatment for pigmentary disorders, acne, and in combo with other peel agents

Resorcinol

- must limit surface area treated due to risk of phenol-like systemic toxicity
- prolonged use can be assoc. with myxedema and methemoglobinemia
- can cause allergic contact dermatitis and post-inflammatory hyperpigmentation

Medium Depth Peels

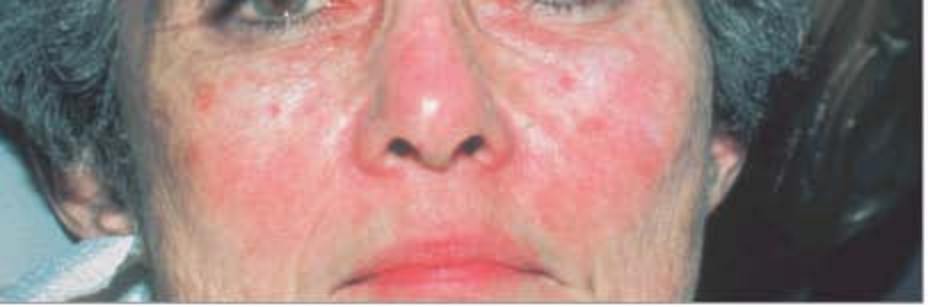
- Trichloroacetic Acid
  - 10-20% used for superficial peels
  - 35-40% used for medium peels
    - produces epidermal and papillary dermal necrosis
    - can cause hyperpigmentation and scarring
  - usually used in combination with Jessner's or 70% glycolic acid as priming agents

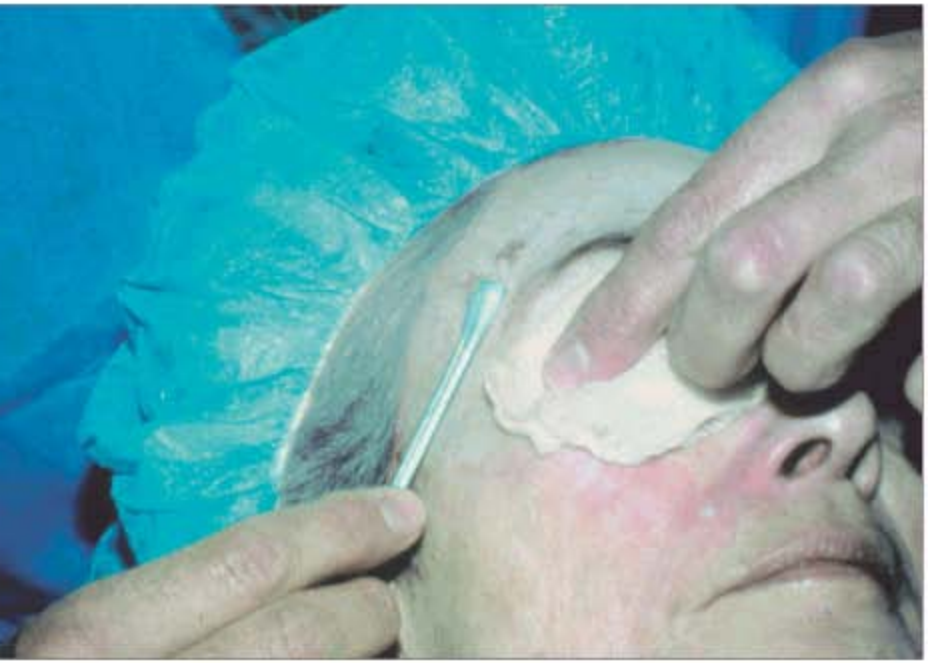
Medium Depth Peels

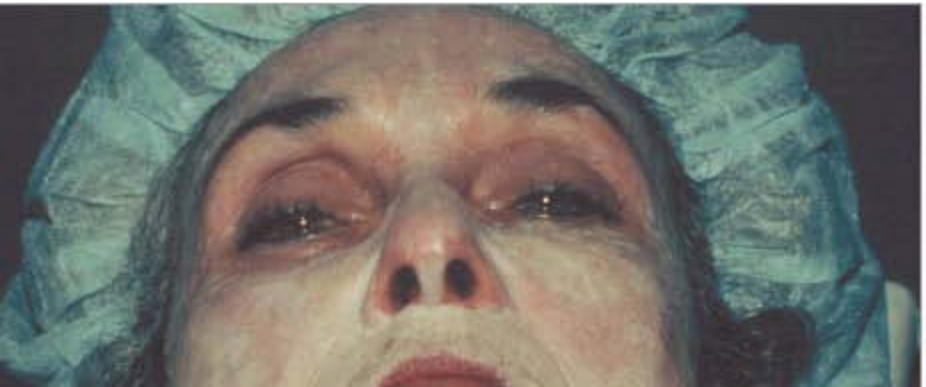
- Indications:
  - photoaging
  - actinic keratoses
  - pigmentary dyschromias
  - mild acne scarring
- improves fine lines and stimulates collagen remodeling for 3-4 months after the procedure

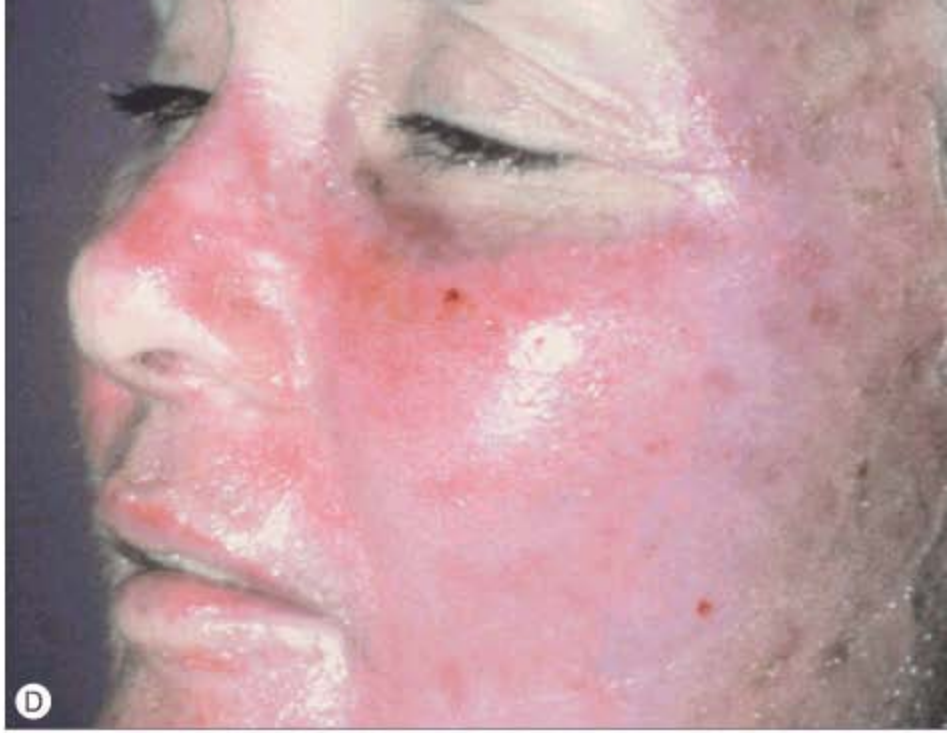
Performing a Jessner's/TCA Peel

- Cleanse face, de-grease with acetone or Etoh
- Apply Jessner's and wait 1-2 minutes for frosting to occur
- Apply 35% TCA with 1-4 cotton tipped applicators. Allow 30sec-2 min. for white-coated frosting with background erythema.
- May re-apply to areas without adequate frosting
- May apply saline compresses for comfort after frosting





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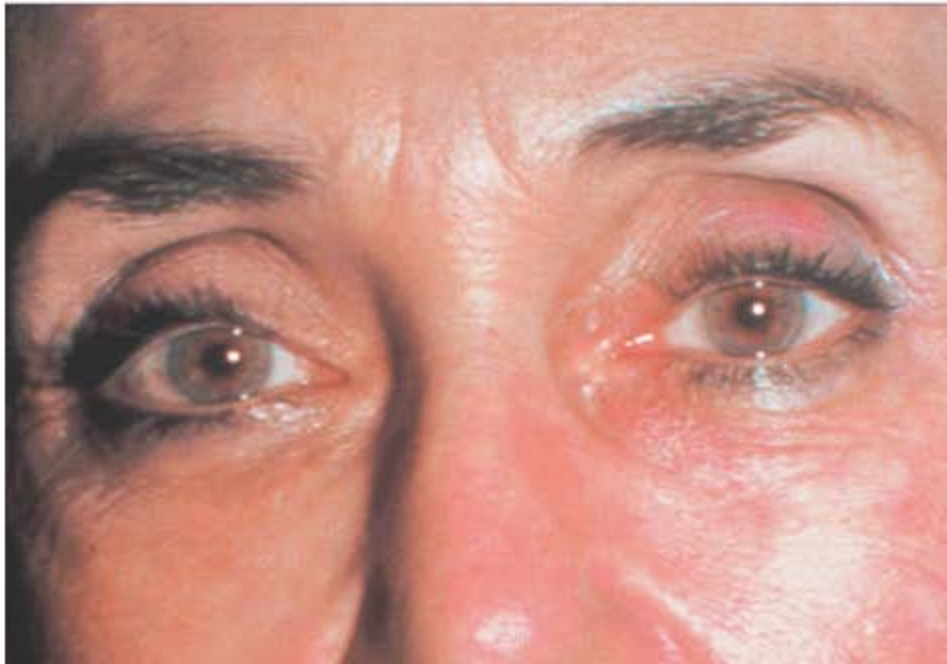

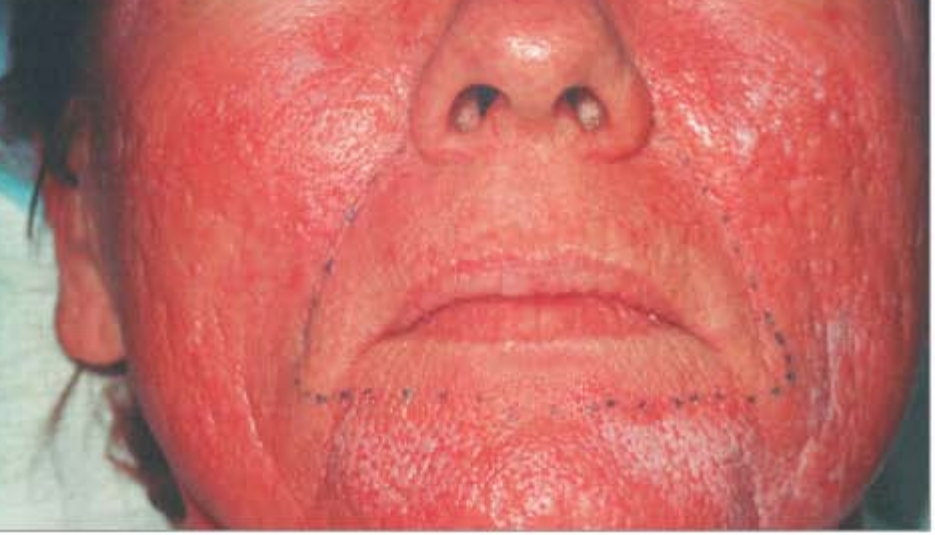

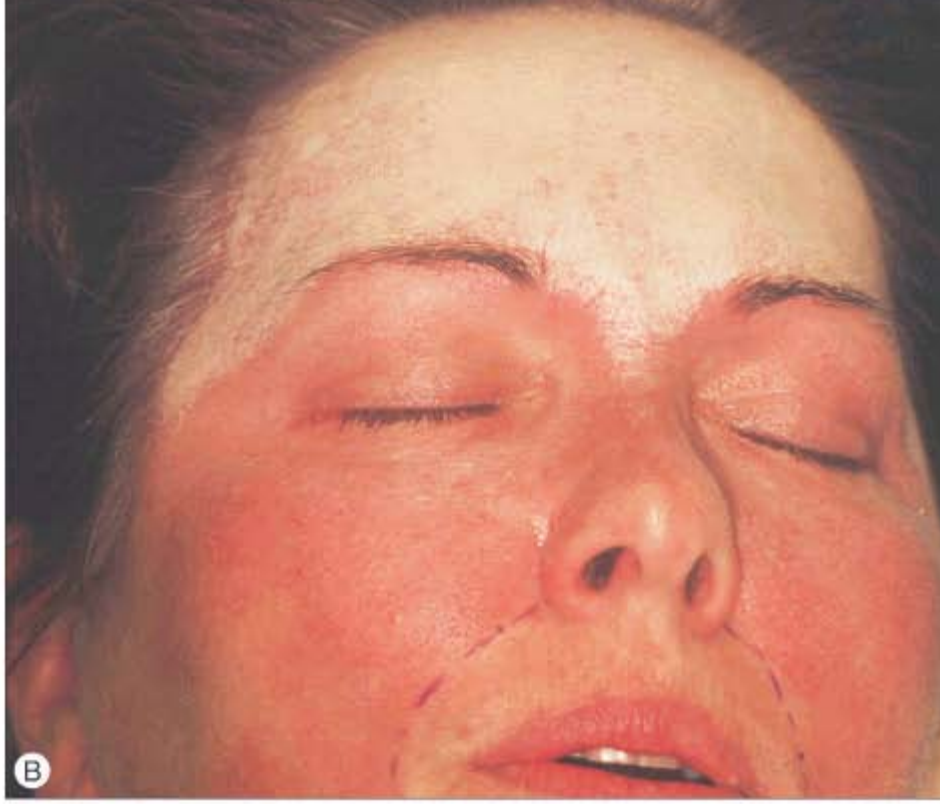
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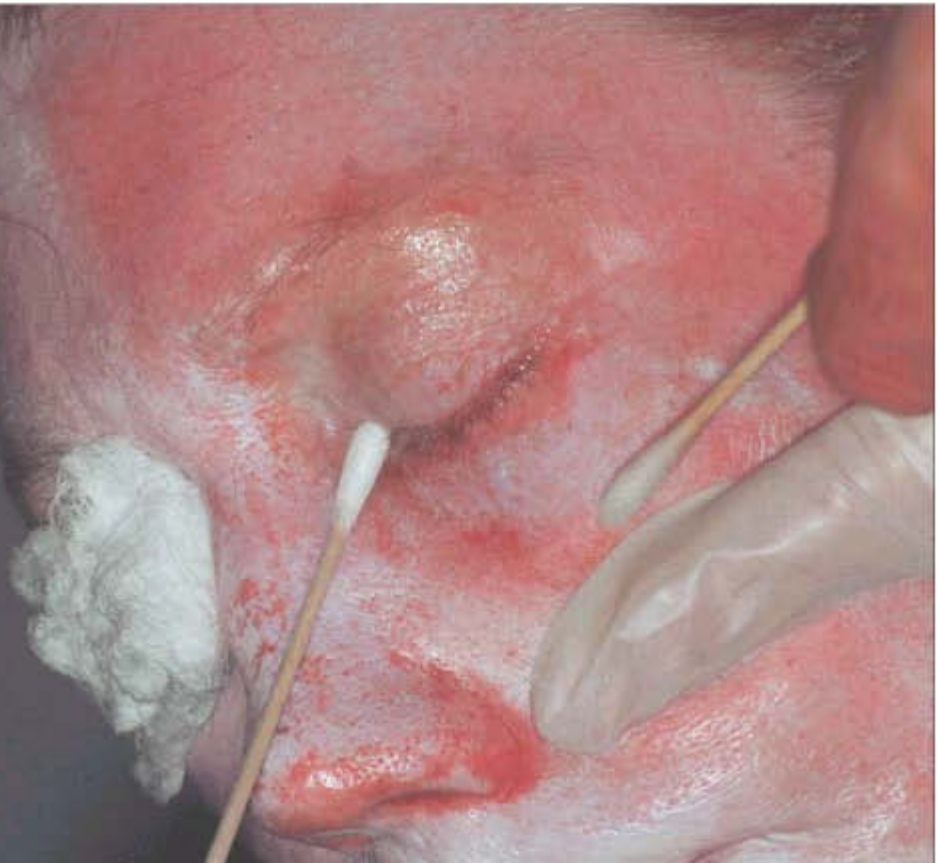
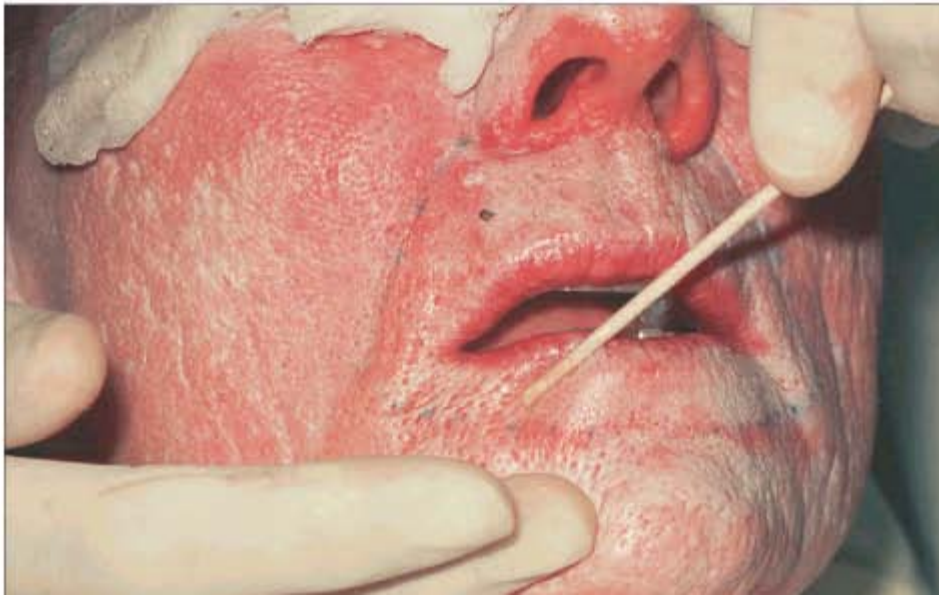




Medium Depth Peels

- Healing time:
  - 5-7 days with TCA alone
  - 7-14 days with Jessner's/TCA peel
- Contraindications:
  - dark skin types
  - recent treatment with Accutane
- Cost: $28-32/ 2 oz. Bottle ($1/ patient)

Deep-Depth Peels

- Create injury through papillary and into reticular dermis
- TCA >50% or 88% phenol preparations
- largely supplanted by dermabrasions and laser resurfacing due to high incidence of side effects

Post-Op Care

- Superficial Peels
  - minimal down time
  - mild erythema and desquamation for 1-4 days post op
  - wash face with mild cleanser
  - use routine moisturizers and sunscreens

Post-Op Care

- Medium Depth Peel
  - apply soaks QID with warm compresses
  - apply petrolatum or Aquaphor following each soak
  - NSAIDs for pain control
- What to Expect
  - immediate edema with worsening for 48 hours
  - erythema resolves within 2-4 weeks post op

Post Op Care

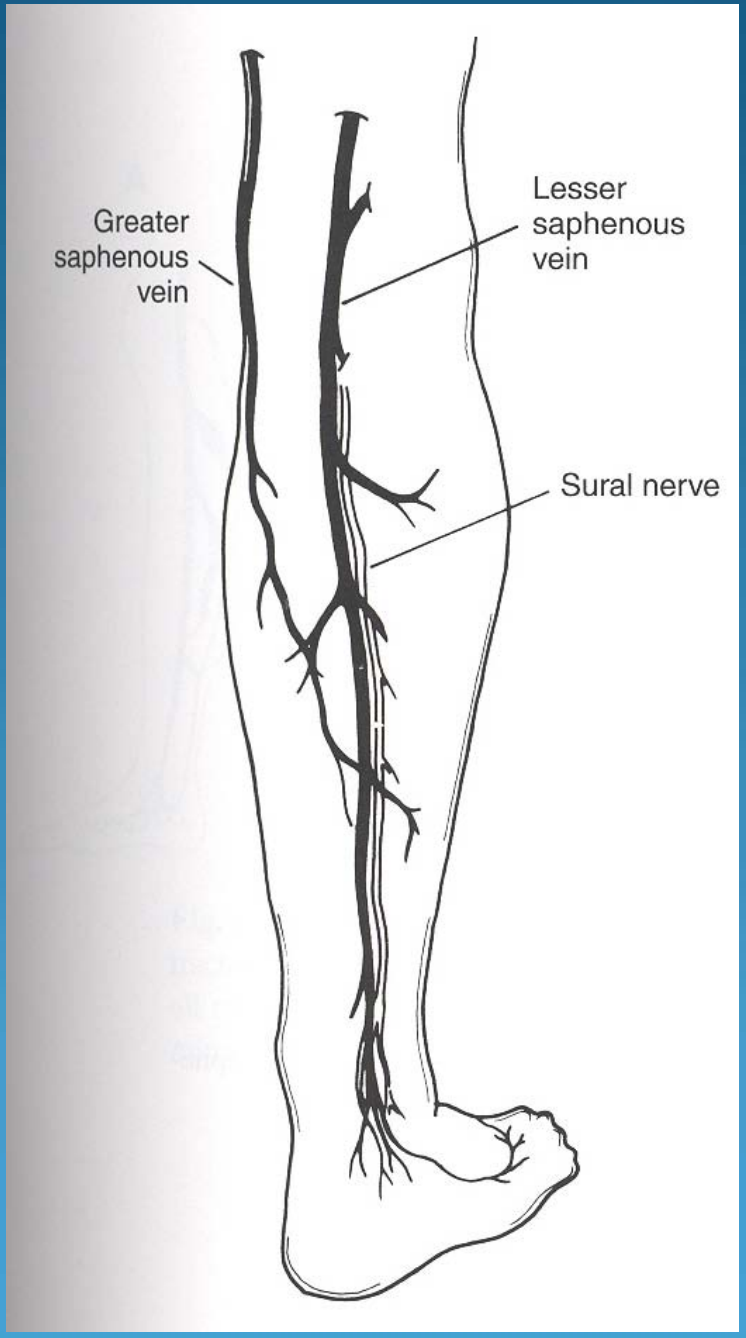
- Deep Depth Peels
  - biosynthetic dressing applied QD for the first 2-3 days post op
  - debridement with saline soaks and cotton tips
  - D3-14 acetic acid soaks 4-6x/d, followed by ointment
- What to expect
  - edema for weeks, erythema for 2-4 months

Complications of Peels

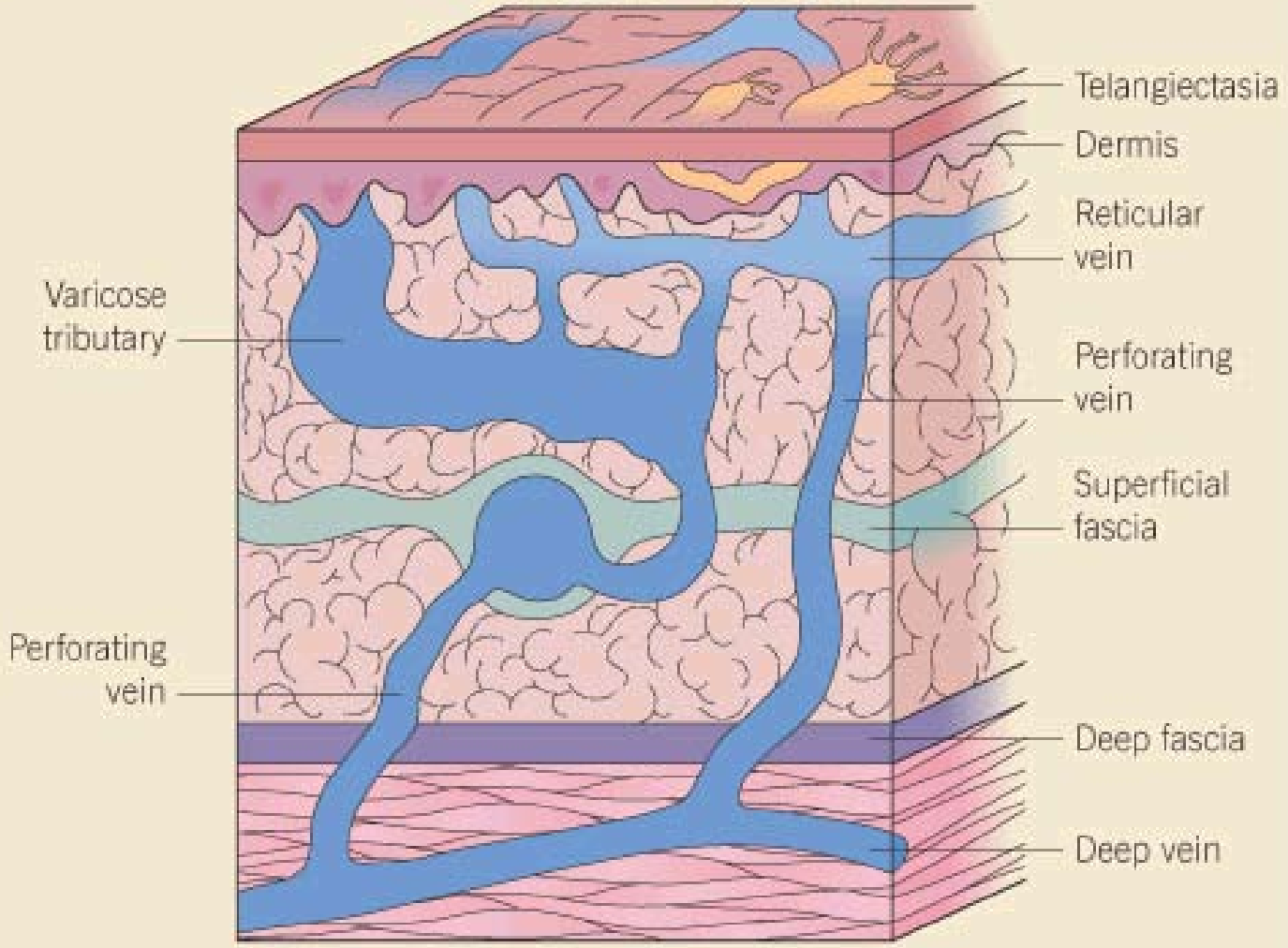
- Excessive depth of tissue injury
- Infection
- Delayed wound healing and erythema
- Scarring
- Post-inflammatory hyperpigmentation

Sclerotherapy

- The art of using sclerosants to destroy endothelial cells and cause vessel fibrosis
- Venous pathology occurs when venous return is impaired for any reason
  - primary muscle pump failure due to venous obstruction
  - valvular incompetence


Greater saphenous vein
Lesser saphenous vein
Sural nerve

THE VENOUS SYSTEM

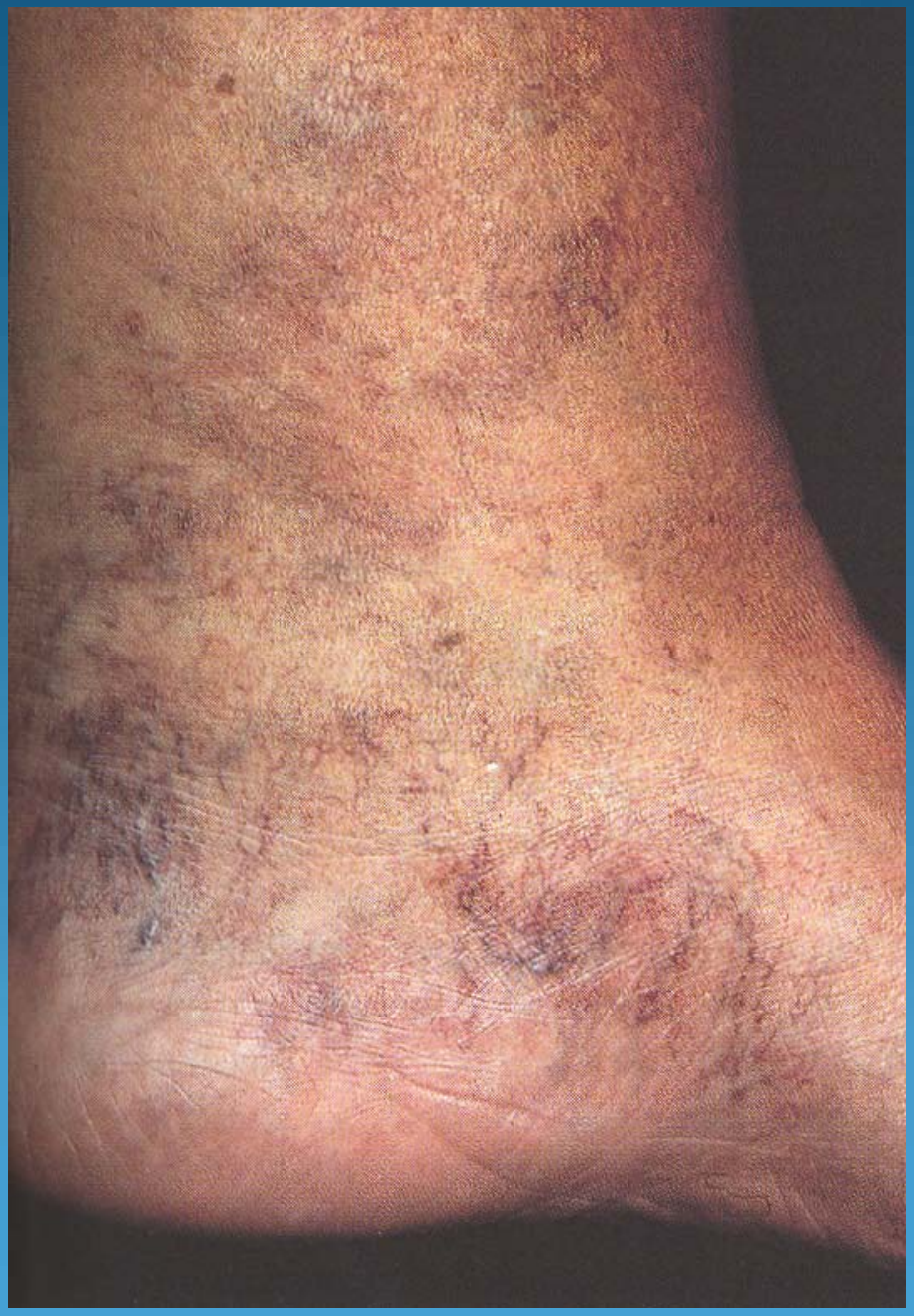


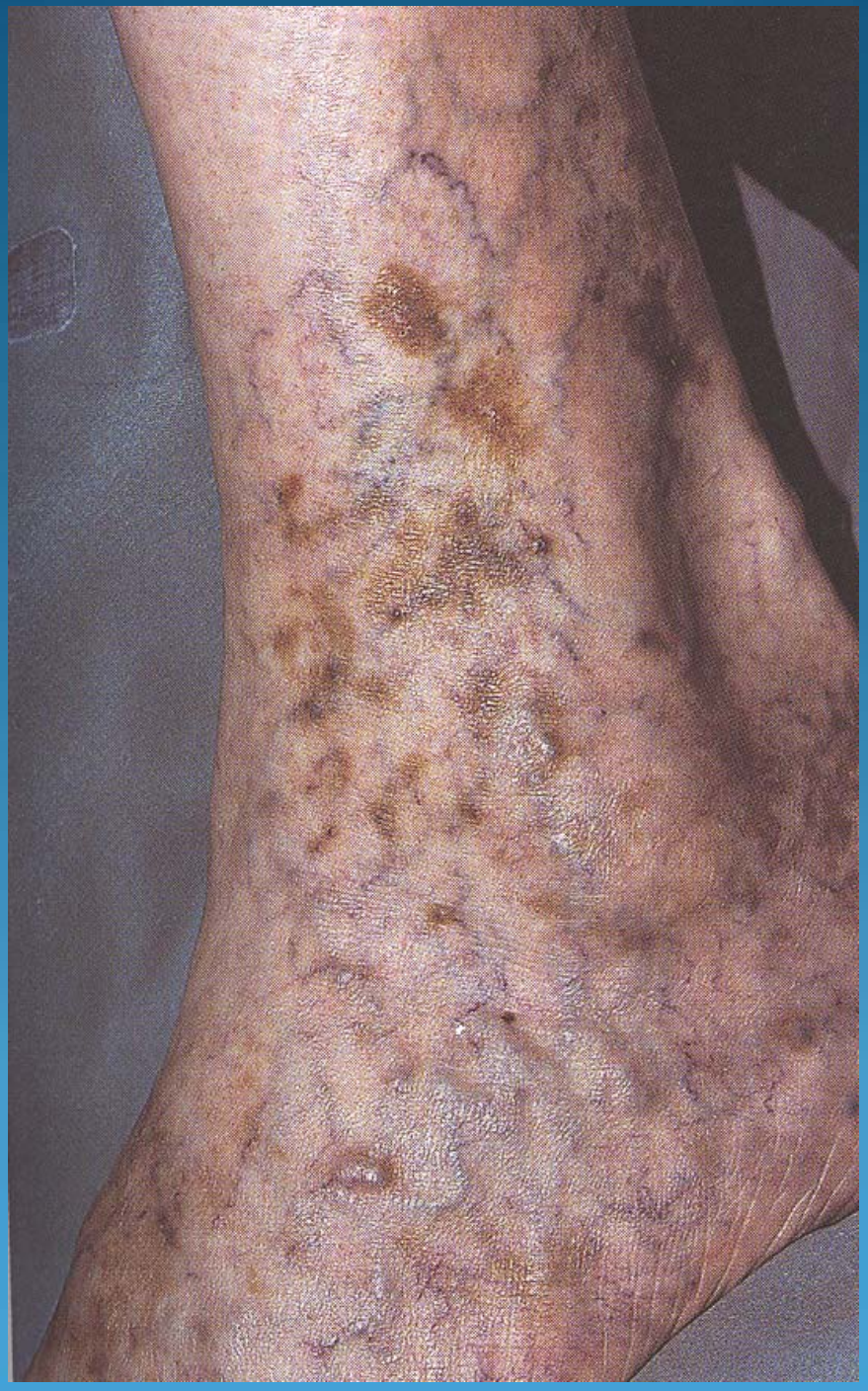
Sclerotherapy

- Telangectasias, reticular veins, and varicose veins are influenced by
  - heredity
  - hormones
  - static gravitational pressures
  - incompotent valves

Physical Exam of Patient

- Goal is to determine where the primary or highest points of reflux are located
- Grade insufficiency with Widmer classification
  - Stage I - presence of corona phlebectasia (telangectasias)
  - Stage II - hypo- or hyperpigmentation
  - Stage III - presence of recent or healed ulcer

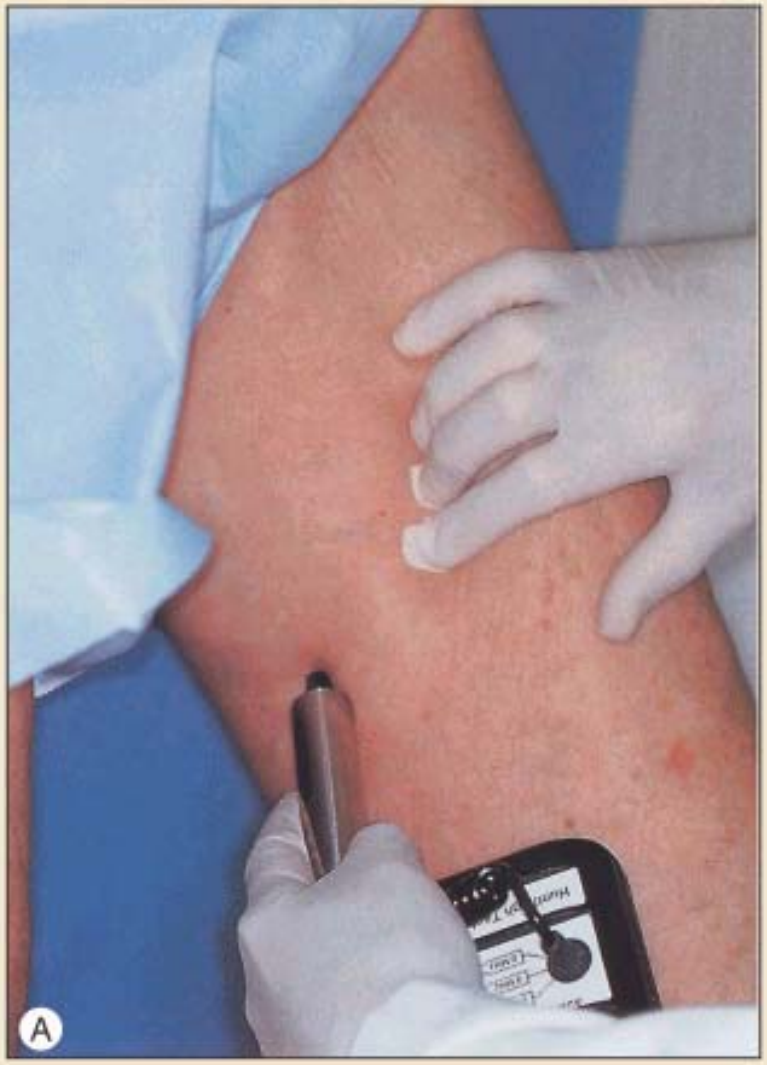


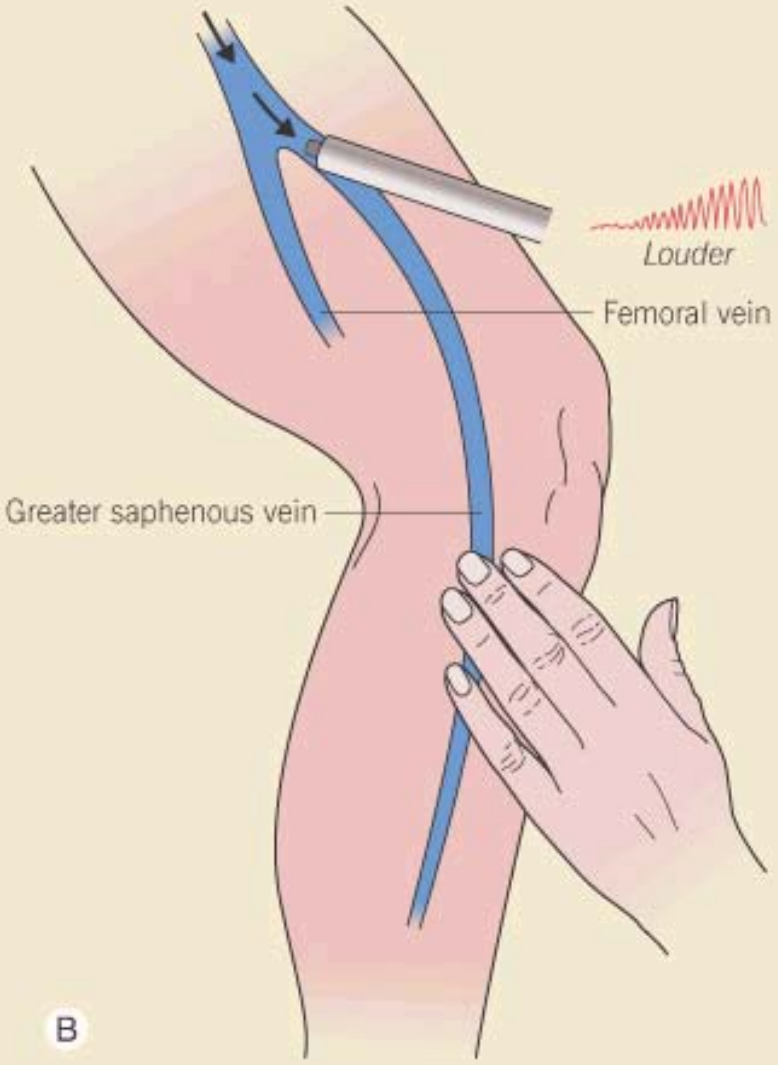


Vascular Testing

- Indicated for symptomatic patients when reflux source is unclear
- Use of Doppler probe to detect frequency shifts of blood coming towards or going away from probe

DOPPLER EXAMINATION OF THE LONG SAPHENOUS VEIN





Sclerosing Solutions

- Optimal agent produces pan-endothelial destruction without systemic toxicity
  - if too weak, thrombosis without fibrosis and eventual recanalization
  - if too strong, hyperpigmentation, telangectatic matting, and ulceration can occur

Table 156.4 Important characteristics of sclerosing solutions.

IMPORTANT CHARACTERISTICS OF SCLEROSING SOLUTIONS					
Sclerosing solution (Brand name)	**Class**	**Allergenicity**	**Risks**	**FDA Approval**	**Dose limitation**
Hypertonic saline (HS) [18–30%]	Hyperosmotic	None	Necrosis of skin Pain and cramping Hyperpigmentation	Yes, as abortifacient	6–10 ml
Hypertonic saline [10%] and dextrose [25%] (HSD) (Sclerodex®)	Hyperosmotic	Low (due only to added phenethyl alcohol)	Pain (much less than HS)	No (sold in Canada)	10 ml of undiluted solution
Sodium tetradecyl sulfate (STS) (Sotradecol®, STD injection, Thromboject®)	Detergent	Rare anaphylaxis	Hyperpigmentation Necrosis of skin (higher concentrations) Pain with perivascular injection	Yes	10 ml of 3%
Polidocanol (POL) (Aethoxysklerol®, Aetoxisclerol®, Sclerovein®)	Detergent	Rare anaphylaxis	Lowest risk of necrosis Lowest risk of pain Hyperpigmentation at higher concentrations Disulfiram-like reaction	No	10 ml of 3%
Sodium morrhuate (SM) (Scleromate®)	Detergent	Anaphylaxis, highest risk	Hyperpigmentation Necrosis of skin Pain	Yes	10 ml
Ethanolamine oleate	Detergent	Urticaria, Anaphylaxis	Hyperpigmentation Necrosis of skin Pain Viscous, difficult to inject Acute renal failure Hemolytic reactions	Yes (used primarily for esophageal varices)	10 ml
Polyiodide iodide (PII) (Varigloban®, Variglobin®, Sclerodine®)	Chemical irritant	Anaphylaxis, iodine hypersensitivity reactions	Pain on injection Necrosis of skin Dark brown color makes intravascular placement more difficult to confirm	No	5 ml of 3%
72% glycerin with 8% chromium potassium alum (Chromex®) (Sclereme®)	Chemical irritant	Extremely rare anaphylaxis	Ineffective sclerosis (weak agent) Very low risk of hyperpigmentation Viscous, difficult to inject Pain and cramping Ureteral colic/hematuria	No	5 ml

Sclerosing Agents

- Hyperosmotic agents
  - hypertonic saline and saline-dextrose (Sclerodex)
    - endothelial damage through dehydration
  - hypertonic saline is FDA approved
  - associated with burning and cramping on injection
  - increased incidence of ulcerative necrosis

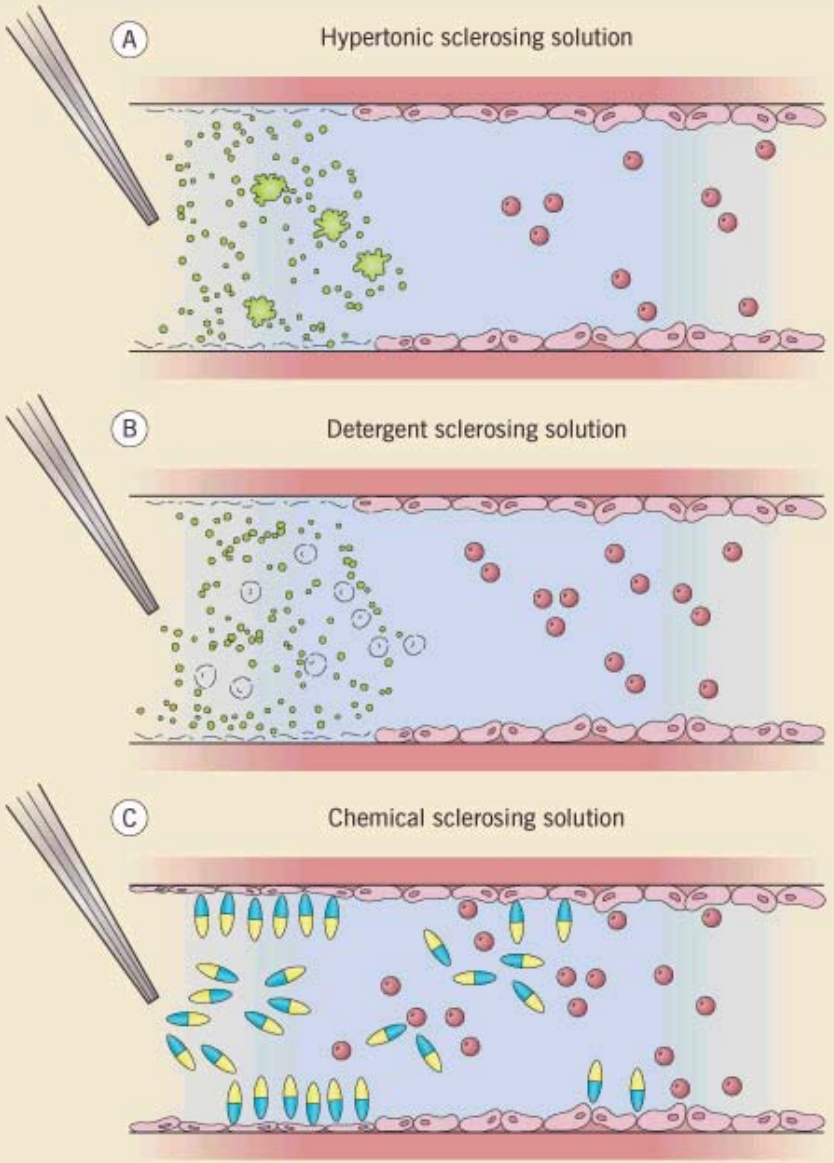
Sclerosing Agents

- Detergent sclerosants
  - sodium tetradecyl sulfate (Sotradecol), polidocanol, sodium morrhuate (Scleromate)
    - vascular injury by altering surface tension around endothelial cells
  - Sotradecol assoc. with allergic hypersensitivity and hyperpigmentation
  - Polidocanol foam

Sclerosing Agents

- Chemical irritants
  - chromated glycerin and polyiodide iodide
    - injure cells by acting as corrosives
    - cauterizing effect due to the associated heavy metal
  - neither are FDA approved
  - SE: anaphylaxis, pain, necrosis

MECHANISMS OF ACTION OF SCLEROSING SOLUTIONS



Technique for Telangectasias and Reticular Veins

- Telangectasias: flat red vessels 0.1-1mm
- Venulectasias: bluish vessels 1-2 mm
- Reticular veins: have a cyanotic hue, 2-4 mm
- treat proximal and larger vessels first with the minimal sclerosant concentration (MSC)

Techniques

- Aspiration technique
- Puncture-fill technique
- Air bolus technique
- Empty vein technique
- Foaming

Injection technique

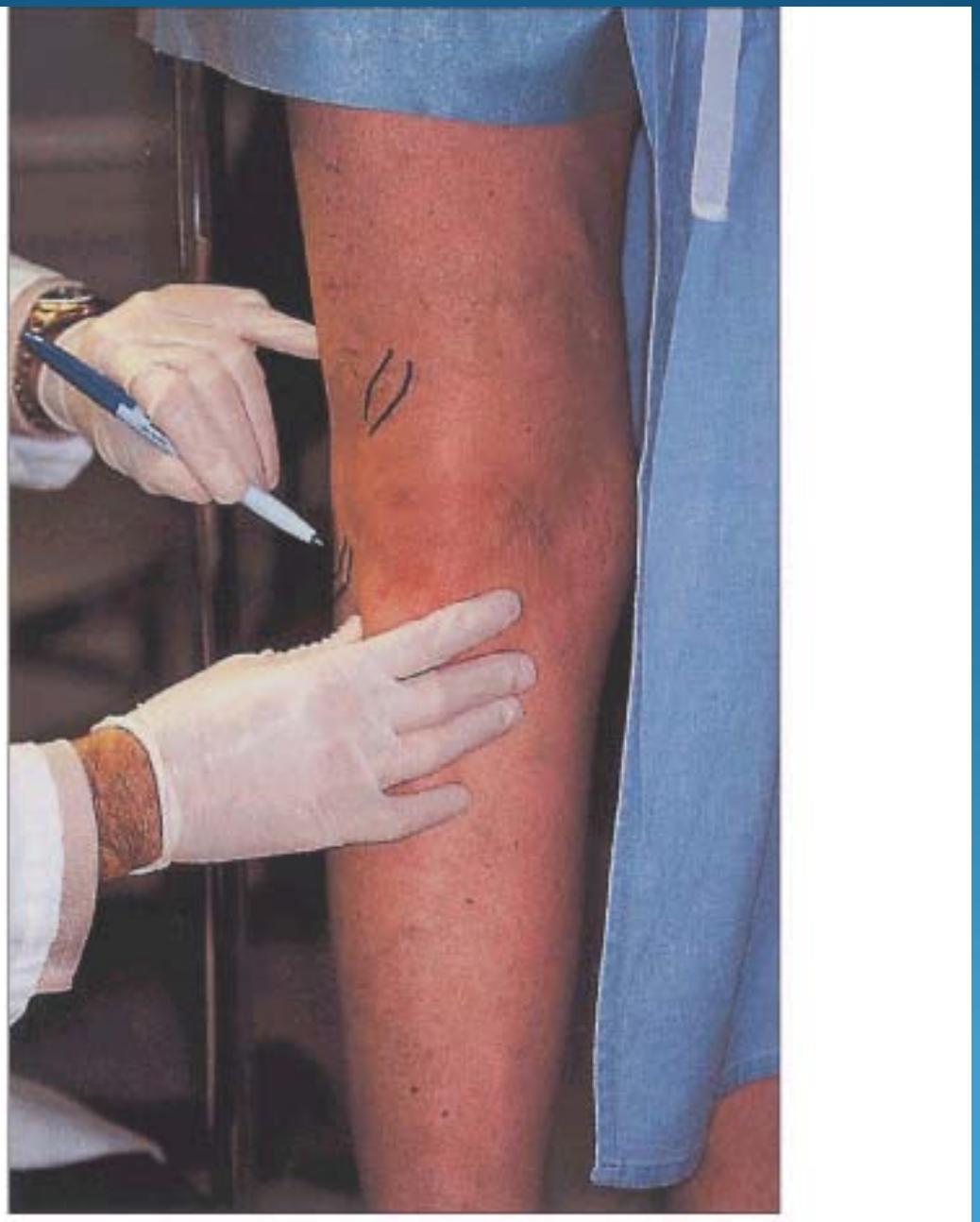
- Choose one of four previous techniques
- Insert 30g needle at 30 degree angle, maintaining hand traction
- Inject larger vessels first
- Inject 0.1-0.4 cc into each injection site at 3cm intervals
- Wear 20 mmHg compression hose for 3 weeks post op
- Wait 6-8 weeks between treatments

Treatment of Varicose Veins

- Must understand precise anatomy of varicosity to be treated
- May need Duplex ultrasound to determine primary source of reflux
- Sotradecol and hypertonic saline commonly used

Treatment of Varicose Veins

- Supine Direct Cannulation technique
  - map out injection sites while patient is standing
  - inject 0.5-1.5 mL of sclerosant at sites separated by 3-4 cm along the vein
- Multiple Precannulation Sites technique
  - 23g butterfly needles inserted into one proximal and distal site on vein
  - 2-3 mL of sclerosant infused into cannulas

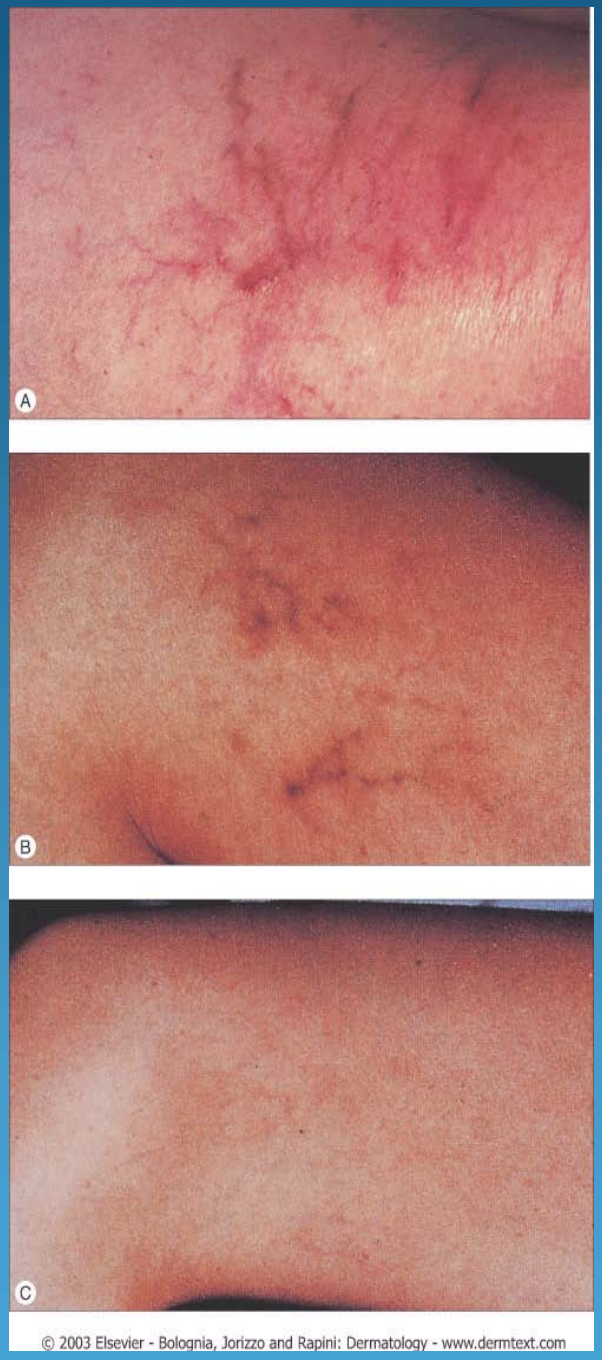


Treatment of Varicose Veins

- Pt. Wears 30-40 mmHg compression hose for 3 weeks post op, and continuously for first 72 hours

Sclerotherapy Complications

- Hyperpigmentation (10-30%)
  - usually lasts for 6-12 months
  - avoid NSAID's and minocycline
  - elevate leg during treatment
  - use sclerosant concentration appropriate for vessel size
  - apply compression immediately post-op

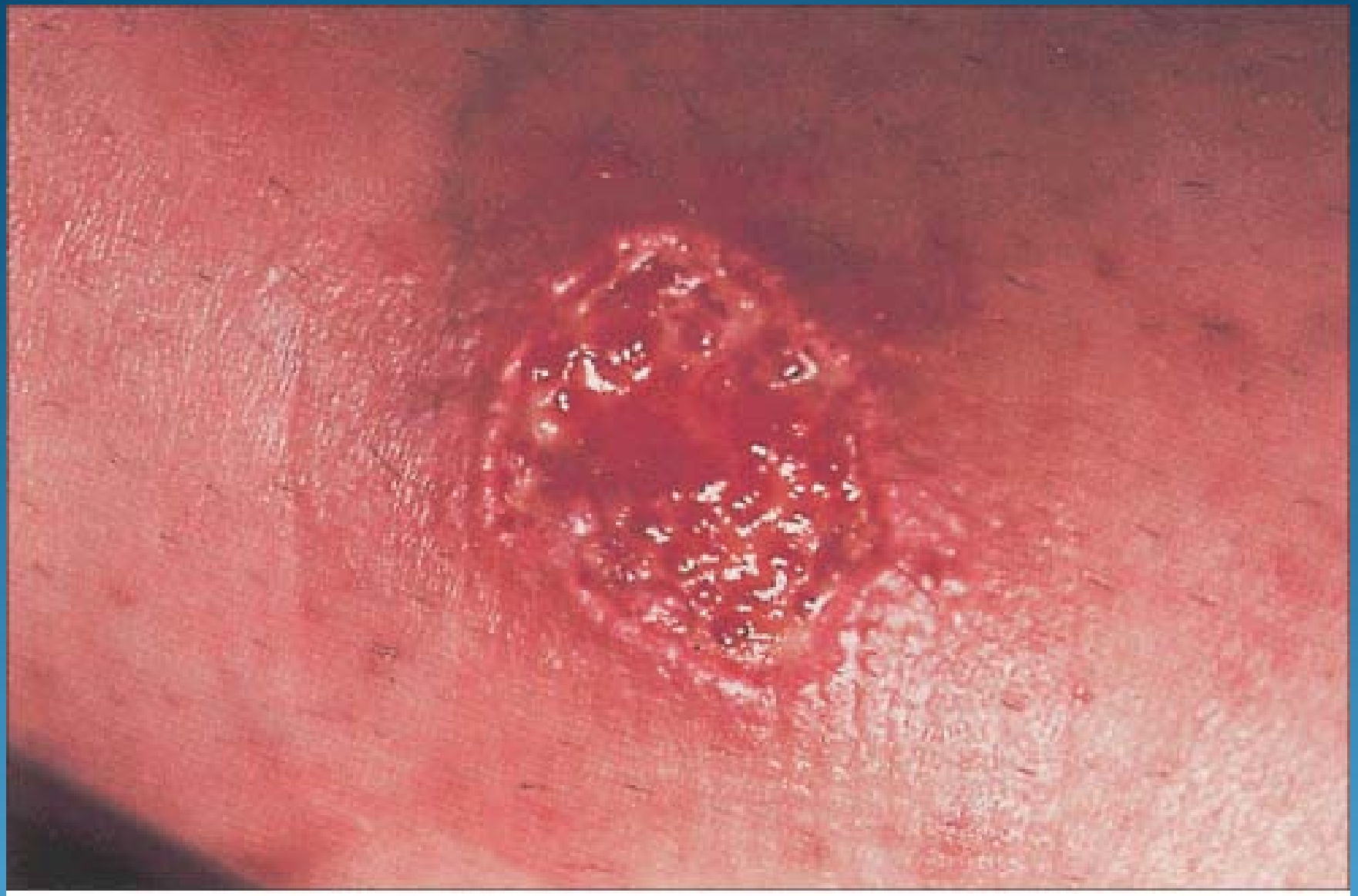


Sclerotherapy Complications

- Telangectatic Matting (5-14%)
  - usually resolves within 3-12 months
  - risk factors: obesity, use of estrogen containing medications, pregnancy, Fhx, excess post-op inflammation
  - use minimal sclerosant concentration
  - may discontinue OCP's for 1 month prior and 2 months following treatment

Sclerotherapy Complications

- Ulceration
  - due to extravasation of sclerosing agent, injection into dermal arteriole, or reactive vasospasm
  - hemorrhagic bulla may form within 12-24 hours
  - may apply 2% nitroglycerin ointment to try and prevent ulceration



Serious Complications

- Systemic allergic reaction
  - Sotradecol has low allergic potential (0.3%)
- Arterial Injection
  - produces sludge embolus
  - most commonly occurs in posterior or medial malleolar region
  - immed. pain, decreased pulses, cyanosis, pallor
  - tx with immediate periarterial 1% procaine, heparin for 7-10 days, and IV dextran for 3 days

Miscellaneous Complications

- Localized urticaria
- Compression ulcers, dermatitis, folliculitis
- Nerve damage
- Superficial thrombophlebitis

Botox

- 1895- Emile Pierre van Ermengem identified Clostridium botulinum as an agent of food poisoning
- 1920- Herman Sommer attempted to purify the neurotoxin
- 1946- botulinum toxin A purified by Edward Schantz
- 1979- Alan Scott used botox to tx strabismus

History of Botox

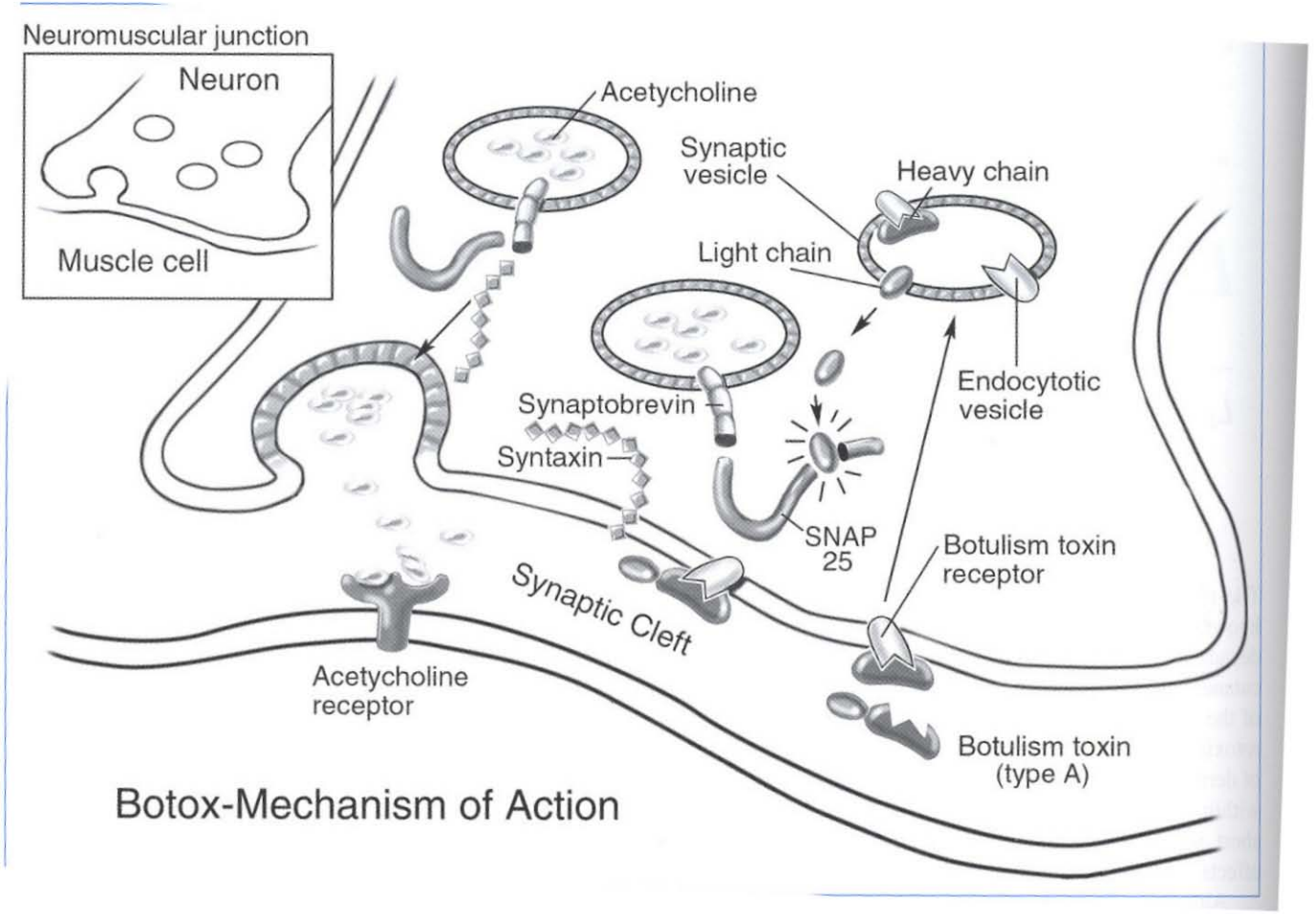
- 1987- Alastair and Carruthers incidentally discovered potential use in cosmetics when a patient treated for blepharospasm noticed a decrease in glabellar wrinkles
- 1989- botox accepted by FDA for treatment of strabismus, blepharospasm, and hemifacial spasm

Basic Science of Botox

- 8 distinct subtypes of botulinum neurotoxin
  - **A, B**, C, alpha, C beta, D, E, F, and G
- botox induces chemical denervation of straited muscle by cleaving proteins required for release of acetylcholine
- results in temporary flaccid paralysis of the injected muscles for 3-5 months

Basic Science of Botox

- Botox type A (BOTOX) is most common type used
- it cleaves the SNAP-25 protein (a component of the SNARE complex)
- an intact SNARE complex is necessary for release of Ach
- Botox B (Myobloc) cleaves synaptobrevin, another component of SNARE

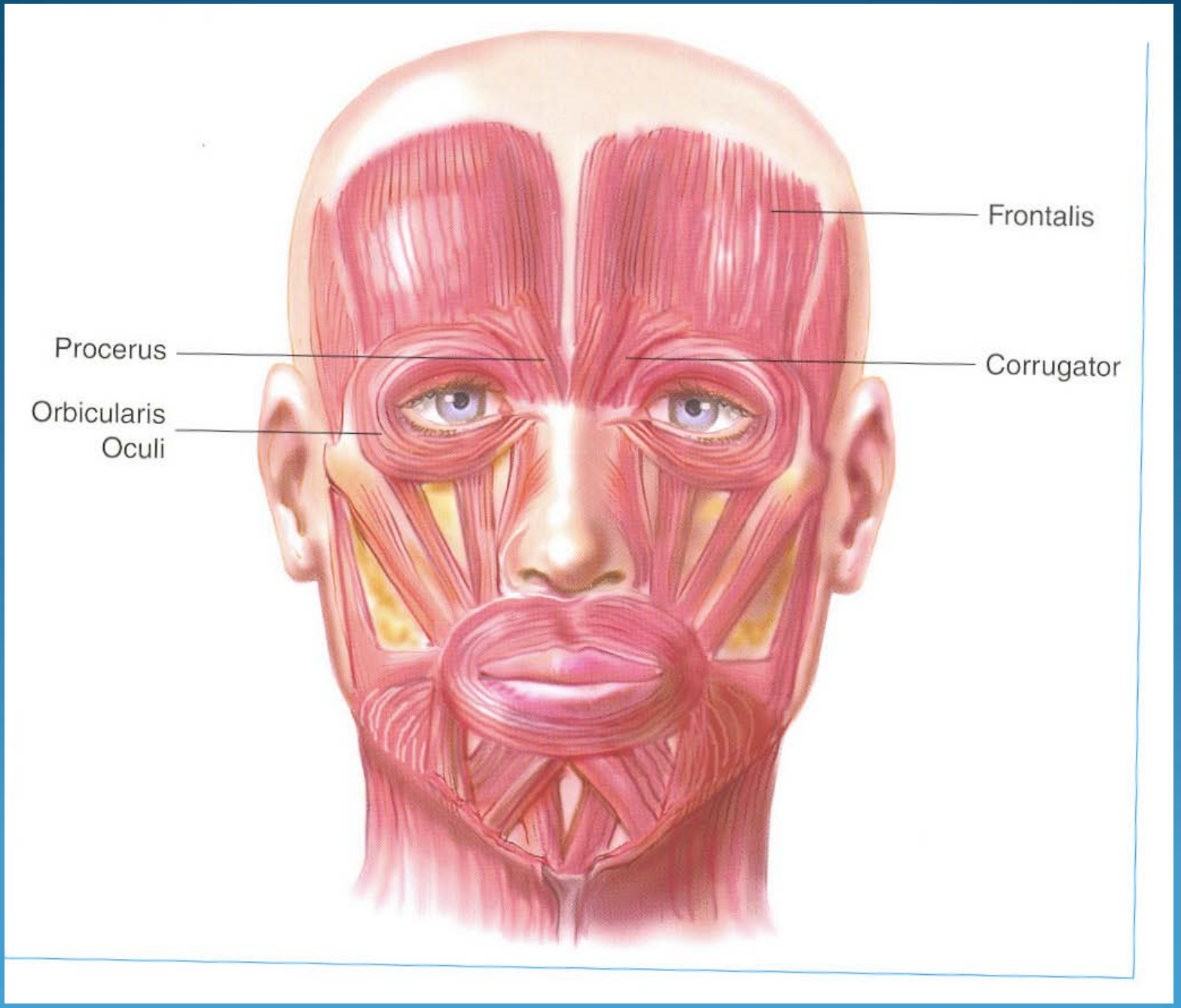

Neuromuscular junction
Neuron
Muscle cell
Acetycholine
Synaptic vesicle
Heavy chain
Light chain
Endocytotic vesicle
Synaptobrevin
Syntaxin
SNAP 25
Botulism toxin receptor
Synaptic Cleft
Acetycholine receptor
Botulism toxin (type A)
Botox-Mechanism of Action

Clinical Indications

- Prevention and amelioration of dynamic wrinkles ("wrinkles in motion") and cessation of hyperhidrosis
- Not useful for static wrinkles ("wrinkles at rest")

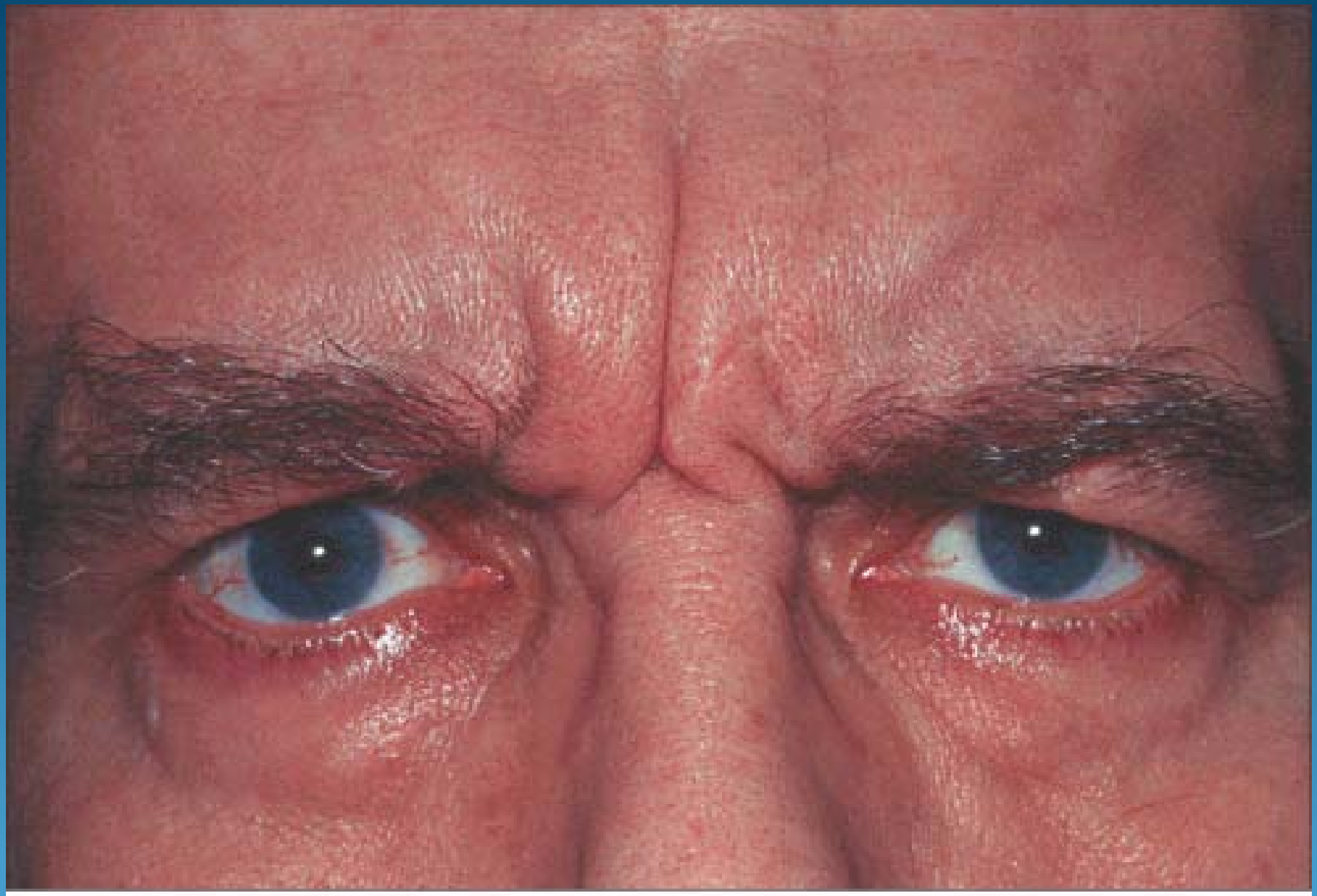
Storage and Handling

- One vial of BOTOX contains 100 units of vacuum dried type A toxin, human albumin, and sodium chloride
- reconstitution procedures vary, but recommended is:
  - 2.5 mL of 0.9% saline per vial
  - results in 4.0 units per 0.1 mL
- use by 48 hrs to up to 6 weeks, keep refrigerated


Frontalis
Procerus
Corrugator
Orbicularis
Oculi

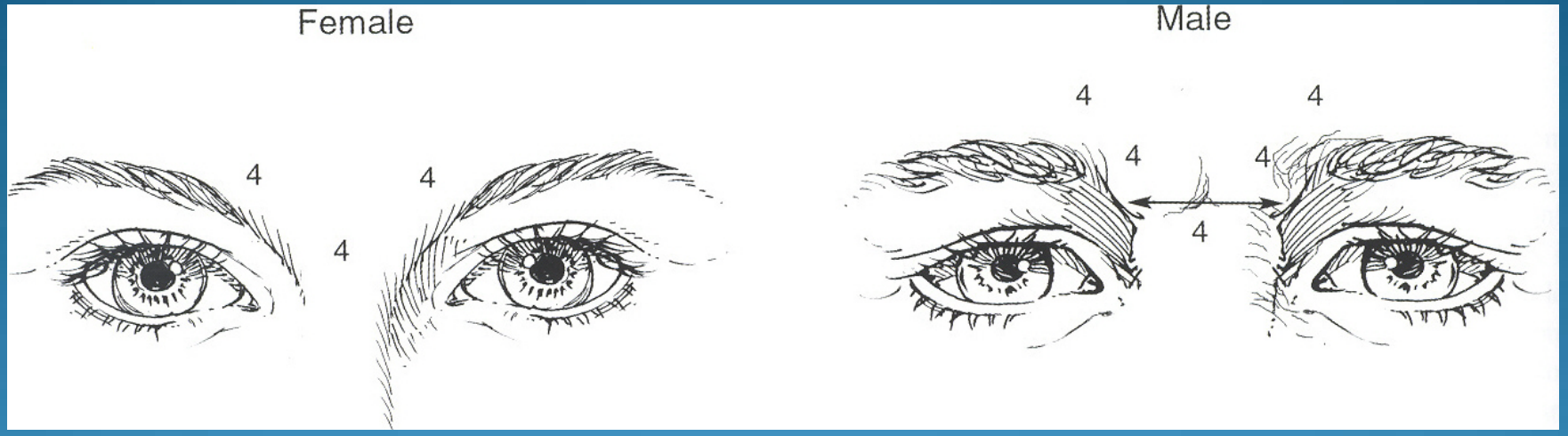
Glabellar Frown Lines

- Muscles involved include frontalis, procerus, corrugator supercilli, and medial fibers of orbicularis oculi
- contraction results in elevation of the brow and wrinkles of the forehead
- corrugator contraction results in adduction of the eyebrow inferiorly and medially



Glabellar region

- Inject 4 units (0.1cc) into each corrugator and the procerus muscle (**IM injections**)
- avoid hitting the periosteum
- after injection of the procerus, massage laterally to ensure diffusion into the depressor supercilii portion of the corrugator


Female
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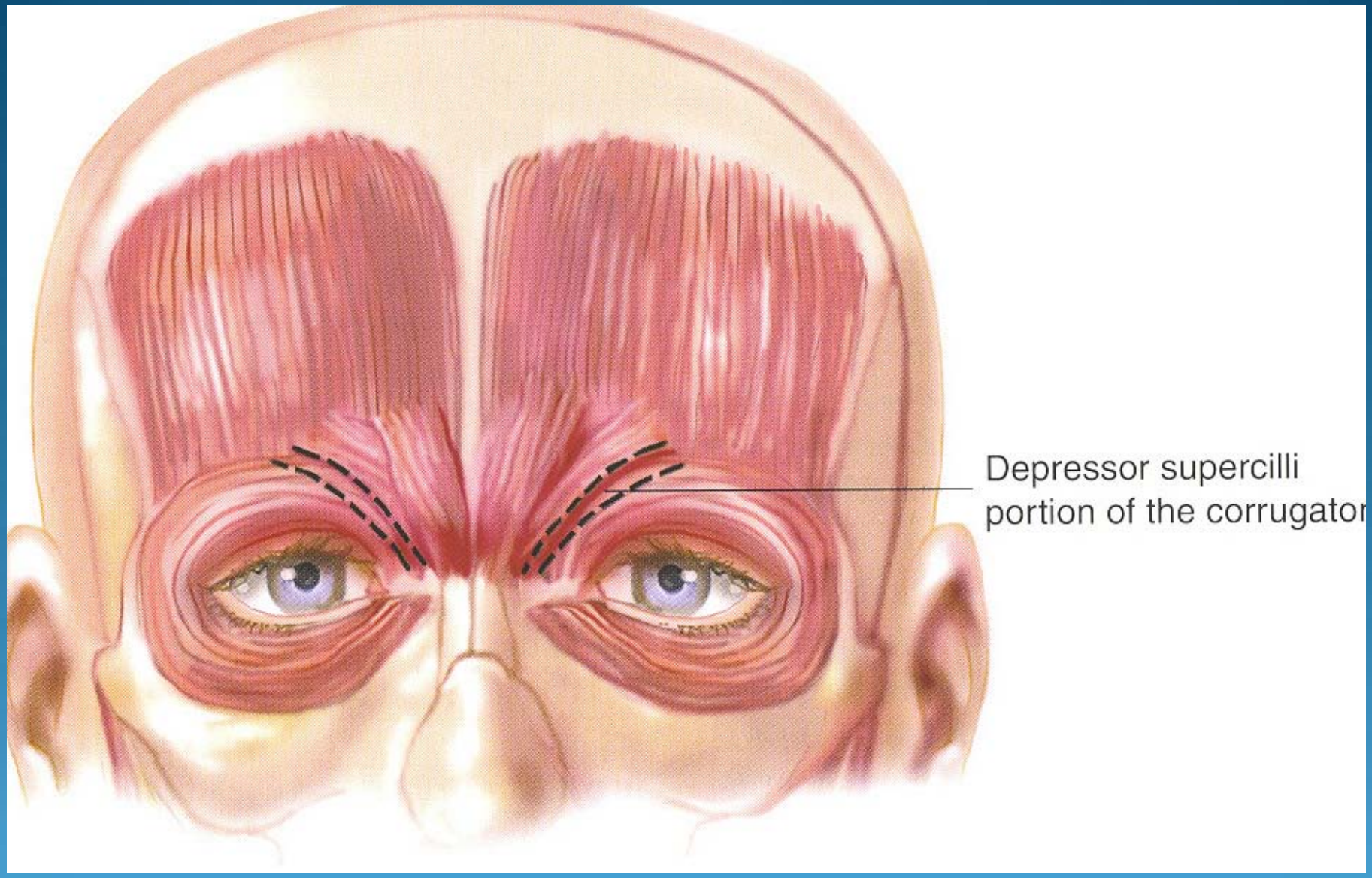
4
4
Male
4
4
4
4
4


Depressor supercilli
portion of the corrugator

Side Effects of Treating the Glabellar Region

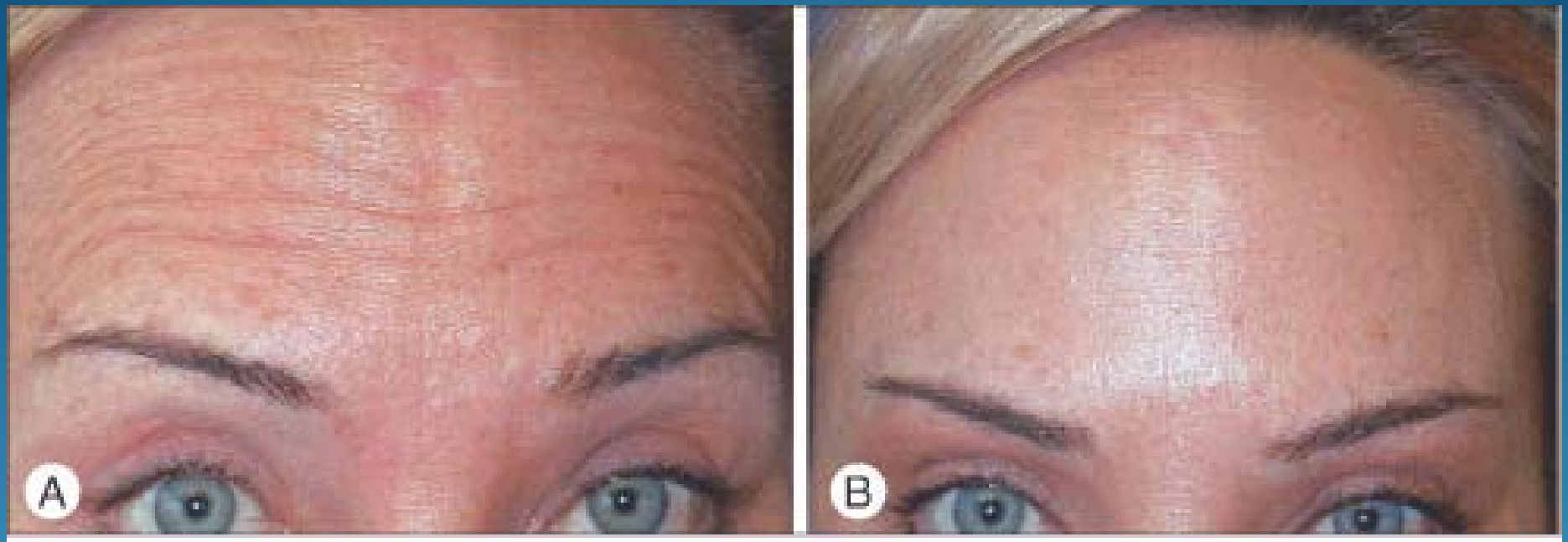
- Blepharoptosis- occurs when toxin diffuses into upper eyelid levator muscle

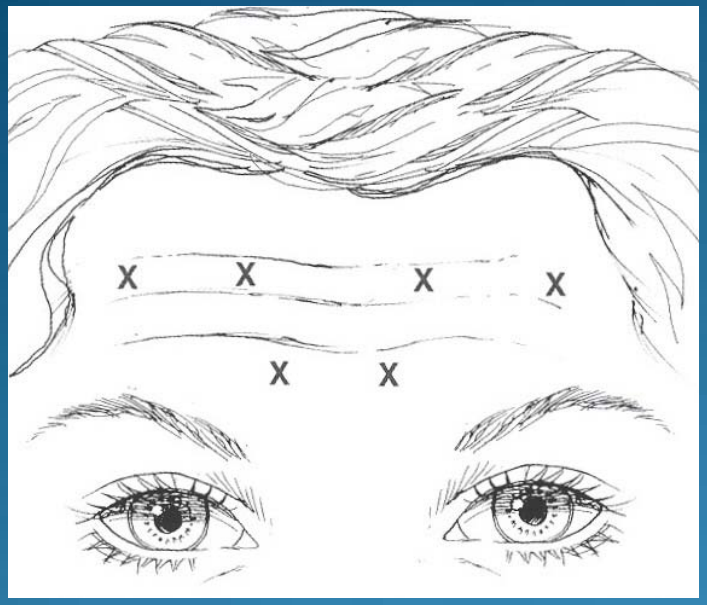
Avoiding Side Effects

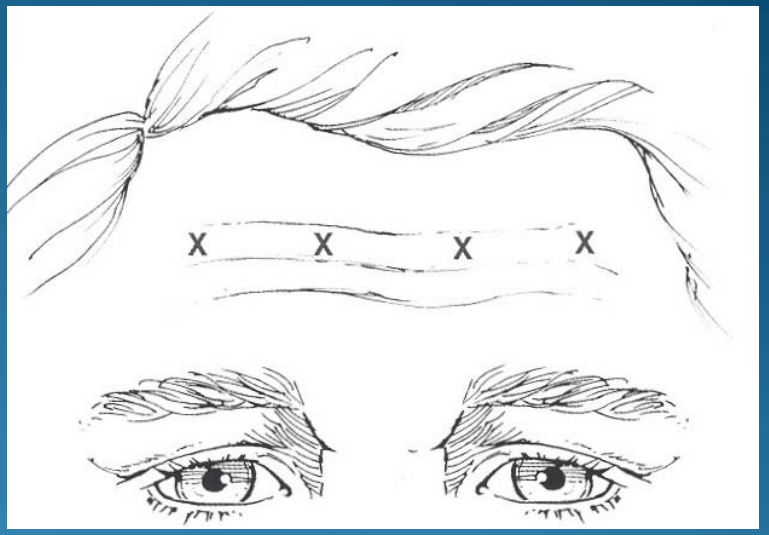
- Patient should remain vertical for 2-3 hours postop
- encourage patient to frown frequently, but not manipulate the area
- avoid injection of the levator palpebrae superioris muscle
- corrugator injection should be at least 1 cm above supraorbital ridge
- do not inject closer than 1 cm above the central brow

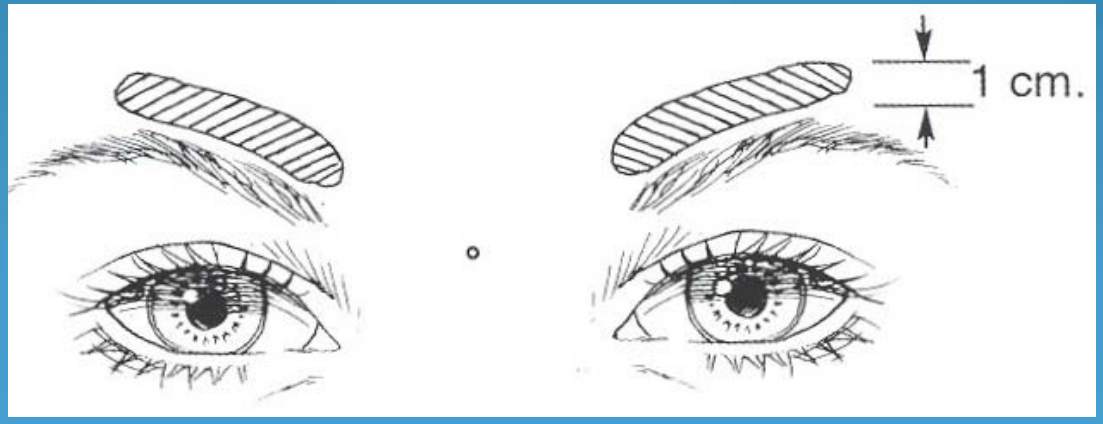
Treatment of the Forehead

- Horizontal lines produced by action of the frontalis muscle
- inject 4 units (0.1 cc) along the forehead at 2 cm intervals
- injection of the forehead may dramatically affect eyebrow shape



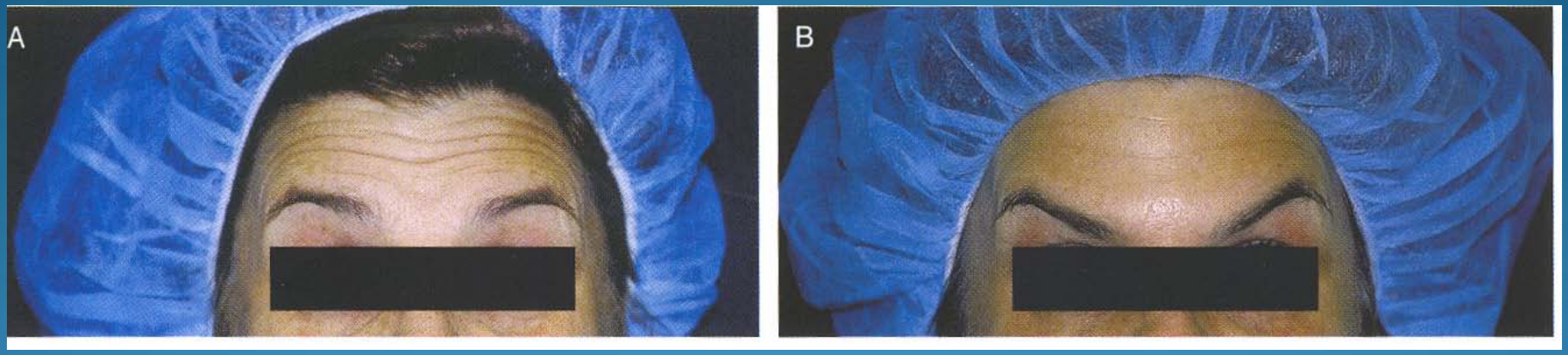





1 cm.

Side Effects to Treatment of the Forehead

- Unwanted eyebrow shape
- Brow ptosis
- Drooping of the eyelids

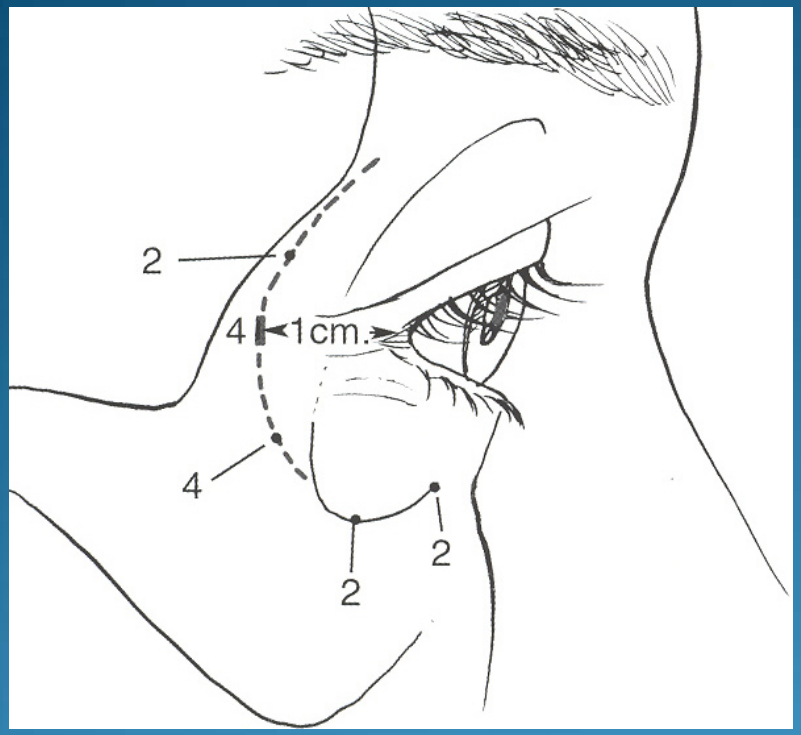

A
B

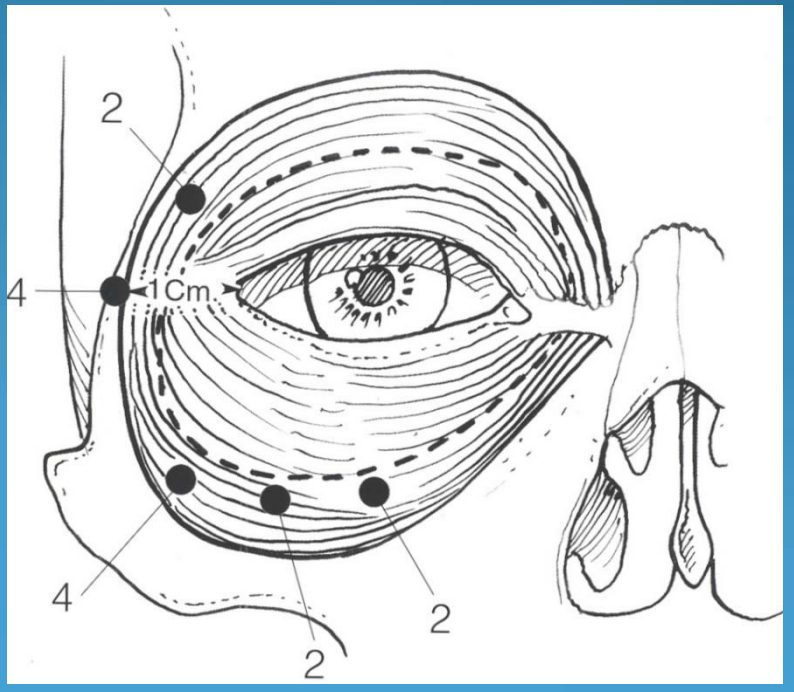
Avoiding Side Effects

- Do not over-inject the forehead
- avoid the area 1 cm above the eyebrows to reduce chances of ptosis
- avoid forehead injections in patients with low-set brows or excess eyelid skin
- ideal patient for forehead injections is 20-40 y.o.

Treating Crow's Feet

- Result from the action of the orbicularis oculi
- inject 0.1 cc 1cm lateral to the lateral canthus, 0.05cc 1 cm above the first injection, and 0.1 cc 1 cm below


2
4
1cm.
4
2
2


2
4
1Cm.
4
2
2

Side Effects of Treating Crow's Feet

- Bruising
- diplopia
- ectropion
- drooping lateral lower eyelid

Other Cosmetic Treatment Areas

- Brow-Lift
- Bunny Lines (Upper Nasalis)
- Lower Nasalis
- Orbicularis Oris (Vertical Lip Rhytides)
- Melolabial Folds
- Platysmal Bands
- Etc, Etc….

Post Procedure Care

- Patients should remain vertical for 2-4 hours
- avoidance of touching or rubbing of the treated sites for 24 hours
- results take 12-96 hours to appear
- optimal effect develops within 7 days
- effectiveness declines after 3-4 months

Contraindications to Botox

- Presence of neuromuscular disorders such as myasthenia gravis or ALS
- Pregnant or lactating women
- Patients taking aminoglycosides, penicillamine, quinine, or CCB's
- Evidence of active infection at injection site

General Complications

- Bruising (esp. in patients taking ASA or Vitamin E)
- acute Type I allergic reactions
- nausea, headache, fatigue, malaise, flulike symptoms, and rashes at sites distant from injection have all been reported

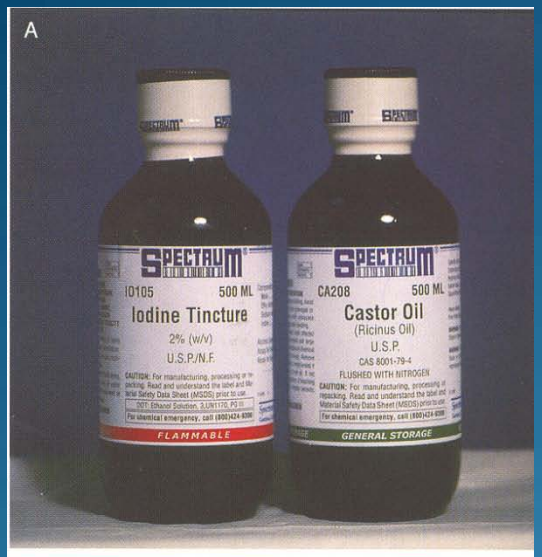
Hyperhidrosis

- Can treat axillary, palmar, and plantar areas
- reconstitute one 100 unit vial with 5 cc NS
  - 2 units per 0.1 cc
- injections are intradermally (vs. IM for facial lines)
- nerve blocks are needed for anesthesia
- inject 0.05 cc at 1.5 cm intervals

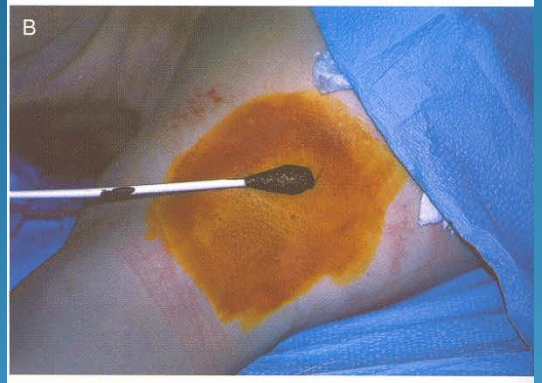
Hyperhidrosis

- Perform Minor's starch-iodine test
  - iodine solution (9 parts iodine with 1 part castor oil) applied to affected area
  - cover with starch powder
  - areas producing sweat will turn blue-black
  - provides map for injection sites

A

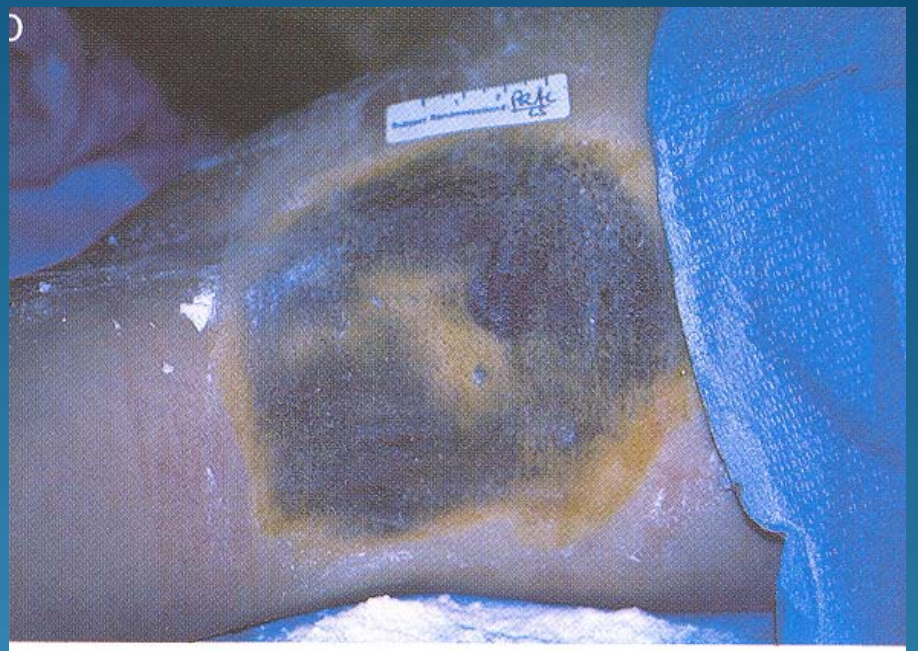

SPECTRUM
I0105
500 ML
Iodine Tincture
2% (w/v)
U.S.P./N.F.
FLAMMABLE
SPECTRUM
CA208
500 ML
Castor Oil
(Ricinus Oil)
U.S.P.
CAS 8001-79-4
FLUSHED WITH NITROGEN
GENERAL STORAGE

B

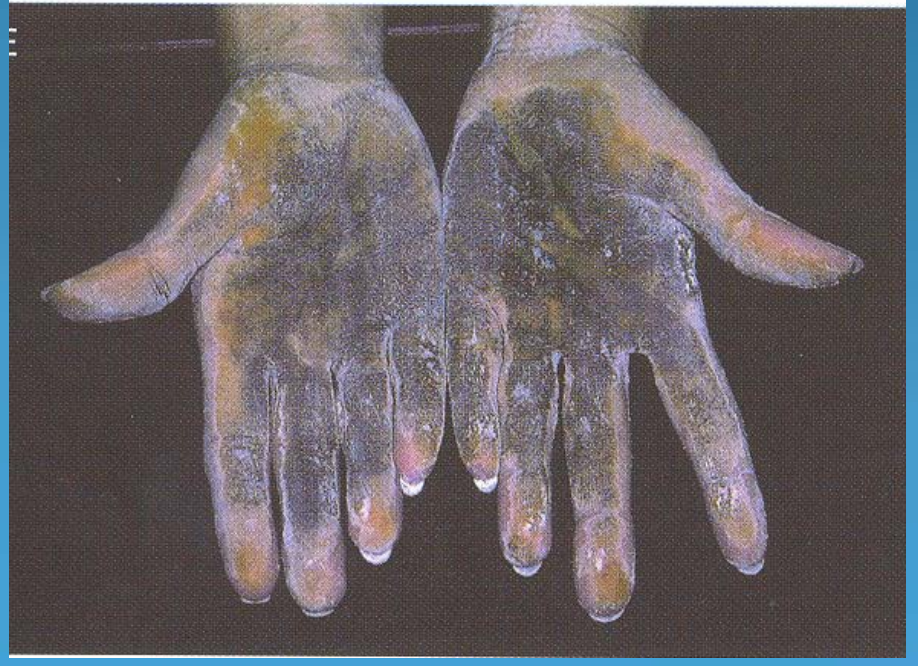


C

D

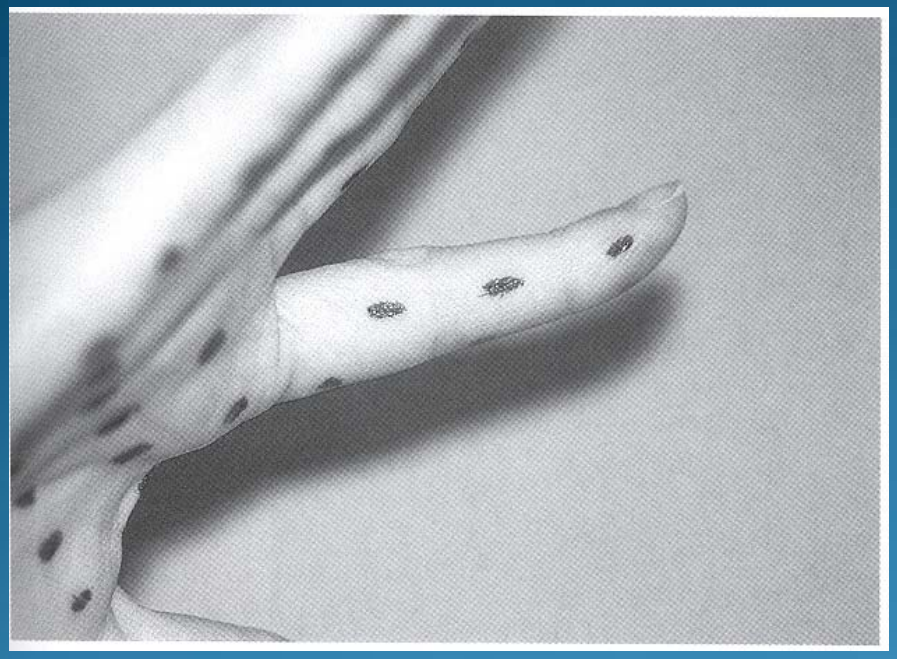


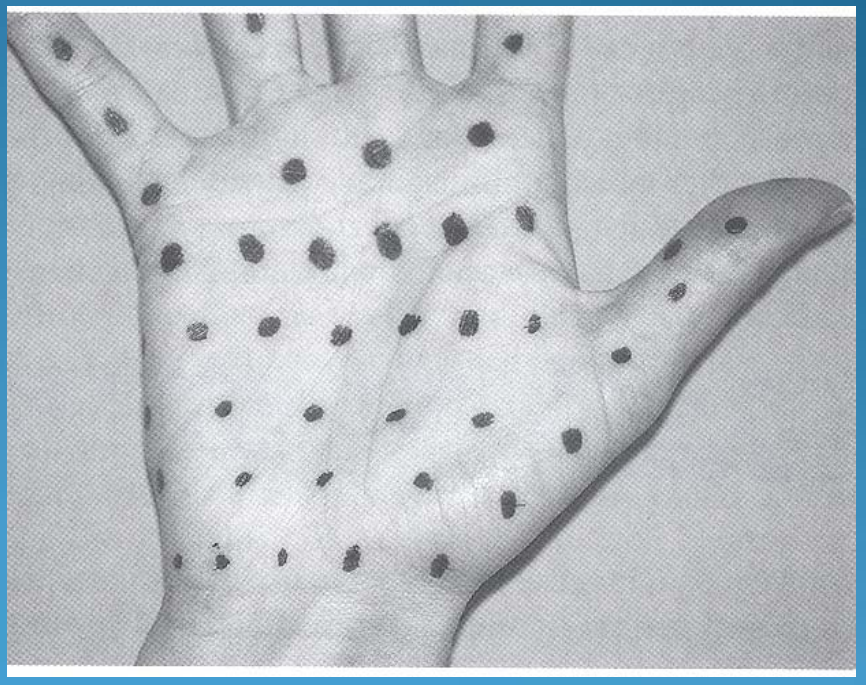
E



Hyperhidrosis

- 100 Botox units (5 cc) needed per palm or sole
- 50 Botox units needed per axilla
- effects last approx. 4 months
- side effects:
  - hematomas
  - transient weakness of hand muscles





Botulinum Toxin Type B (Myobloc)

- Approved by FDA only for cervical dystonia
- may be useful in patients who develop antibodies to Botox toxin type A
- onset of clinical effect more rapid than Type A
- diffuses more readily, therefore increased risk of side effects
- is 100 times less potent than Botox Type A

Soft Tissue Augmentation

- 1893- Neuber used fat from arms and transplanted it into facial defects
- 1899- Gersuny used paraffin as an augmentation material
- 1940's- silicone introduced
- 1970's- researchers at Stanford introduced bovine and human derived collagen

Table 159.11 Partial list of filler substances.

PARTIAL LIST OF FILLER SUBSTANCES			
Dermal Filler	**FDA approved**	**Source**	**Complications, problems, benefits**
Zyderm®/Zyplast® McGhan Medical, Santa Barbara, CA	Yes	Bovine	Allergic reactions 1% Long history of use Commonly used
Autologen® Collagenesis, Inc., Beverly, MA	Yes	Large piece of patient's skin	Expensive shipping costs No allergy Not available
Isolagen® Isolagen Technologies, Paramus, NJ	Yes	3.0-mm punch of patient's skin	Effort to package Not accepting tissue at this time No allergy
Dermalogen® Collagenesis, Inc., Beverly, MA	Yes	Cadaver	Use at room temperature Painful Ceased production
Hylaform® gel Biomatrix, Inc., Ridgefield, NJ	No	Rooster comb	No allergy
Restylane® Q-Med Uppsala, Sweden	No	Fermentation, bacterial product	Intermittent swelling No allergy
Artecol® Medical Int'l B.V., Breda, The Netherlands	No	Bovine and inert beads	Permanent granulomatous reactions
Resoplast® Rofil Medical Int'l B.V., Breda, The Netherlands	No	Bovine	Allergic reactions
GoreTex® W.L. Gore & Associates, Flagstaff, AZ	Yes	Manufactured	Extrusion Infection Unnatural feel
SoftForm® McGhan Medical, Santa Barbara, CA	Yes	Manufactured	Extrusion Infection Unnatural feel
Subcutaneous fat	N/A	Autologous	Bruising Edema Harvesting No allergy
Fascian® Fascia Biosystems, Beverly Hills, CA	Yes	Cadaveric fascia lata	Large particles Large needle Edema
Cymetra® Lifecell Corp., Branchburg, NJ	Yes	Cadaver	Edema

Classes of Fillers

- Heterograft/Xenograft
  - Bovine Collagen
    - Zyderm and Zyplast
  - Hyaluronic Acid Derivatives
    - Restylane
    - Hylaform

Classes of Fillers

- Allografts (from human cadaveric tissue)
  - Human-Derived Collagen
    - Dermalogen
    - Cymetra
    - Cosmoderm/Cosmoplast
- Autografts
  - autologous fat transplantation

Classes of Fillers

- Synthetic Materials
  - silicone
  - Polytetrafluoroethylene (Gore-Tex)

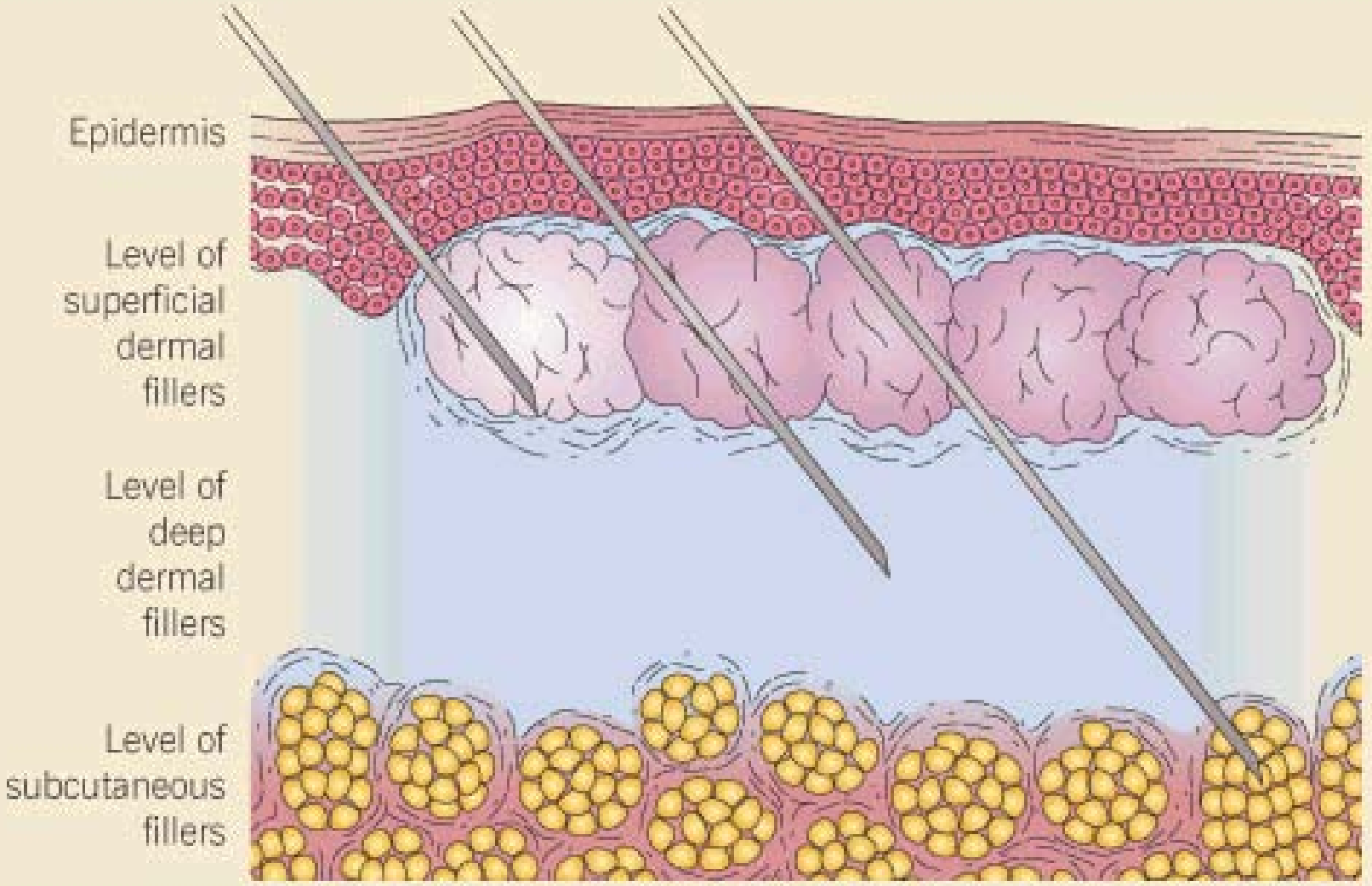
Indications

- “wrinkles at rest”
- scars
  - acne scars
  - traumatic scars
- lip augmentation
  - vermilion

General Technique

- Clean face to remove make-up
- surface anesthesia may be applied with ice or topical preparation
- injection techniques
  - serial multiple punctures
  - single-entry

SOFT TISSUE AUGMENTATION PLACEMENT



Bovine Collagen

- Zyderm (I and II) and Zyplast approved by FDA in 1981 and 1985, respectively
- both contain lidocaine
- Zyderm I (35mg/mL) indicated for superficial wrinkles
- Zyderm II (65mg/mL) used for mod.-deep lines and scars
- Zyplast (cross linked with glutaraldehyde) used for deep wrinkles and furrows

Bovine Collagen

- Must perform pre-tx skin testing x2
- Zyderm I and II should be injected into the superficial dermis at a 20-30 angle to produce blanching
- Zyplast is injected into the deep dermis at an angle of 45-90
- results last 3-6 months

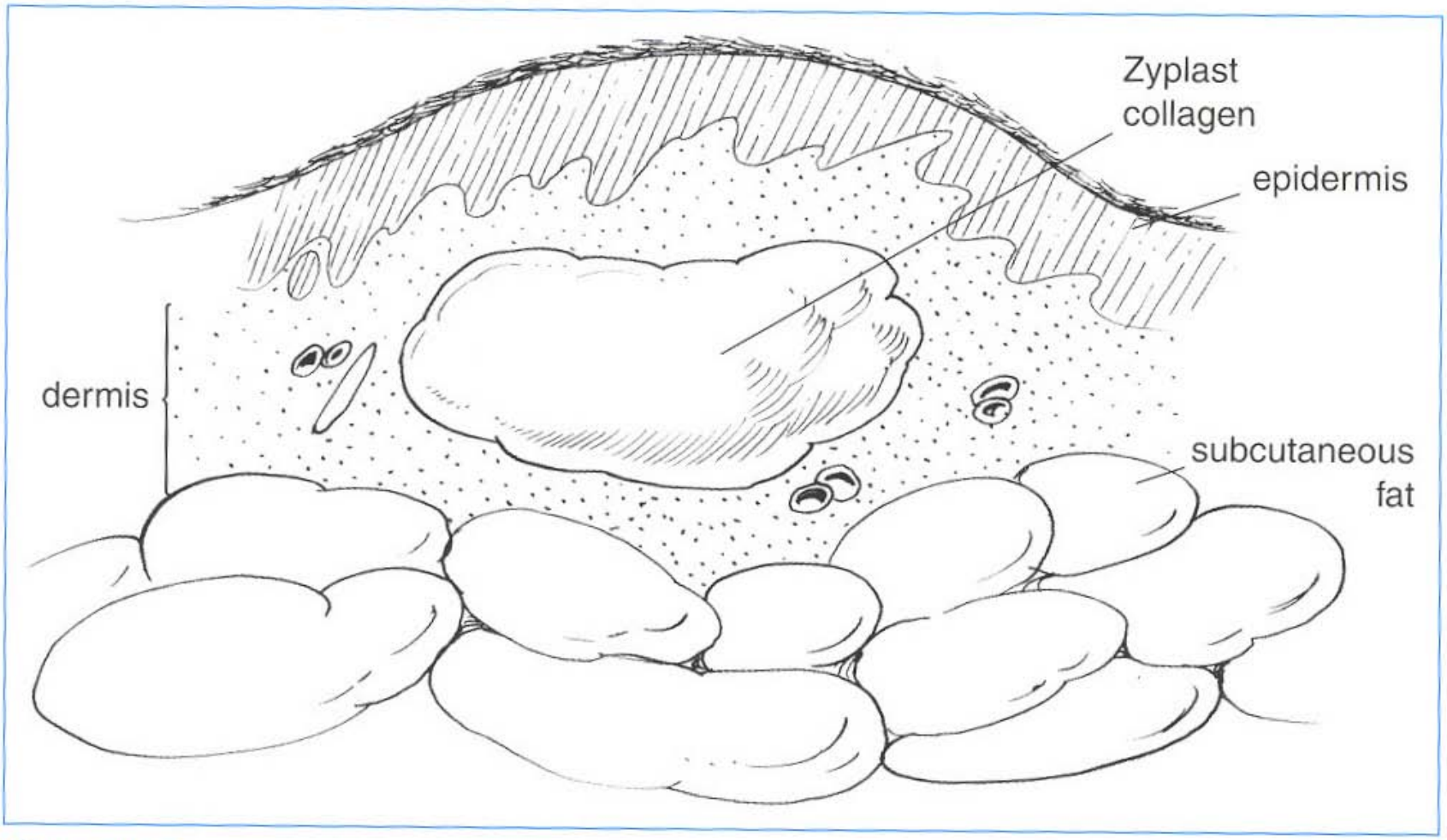


Figure 19-5.
Proper placement of Zyplast or Dermalogen in the upper to middle reticular dermis.

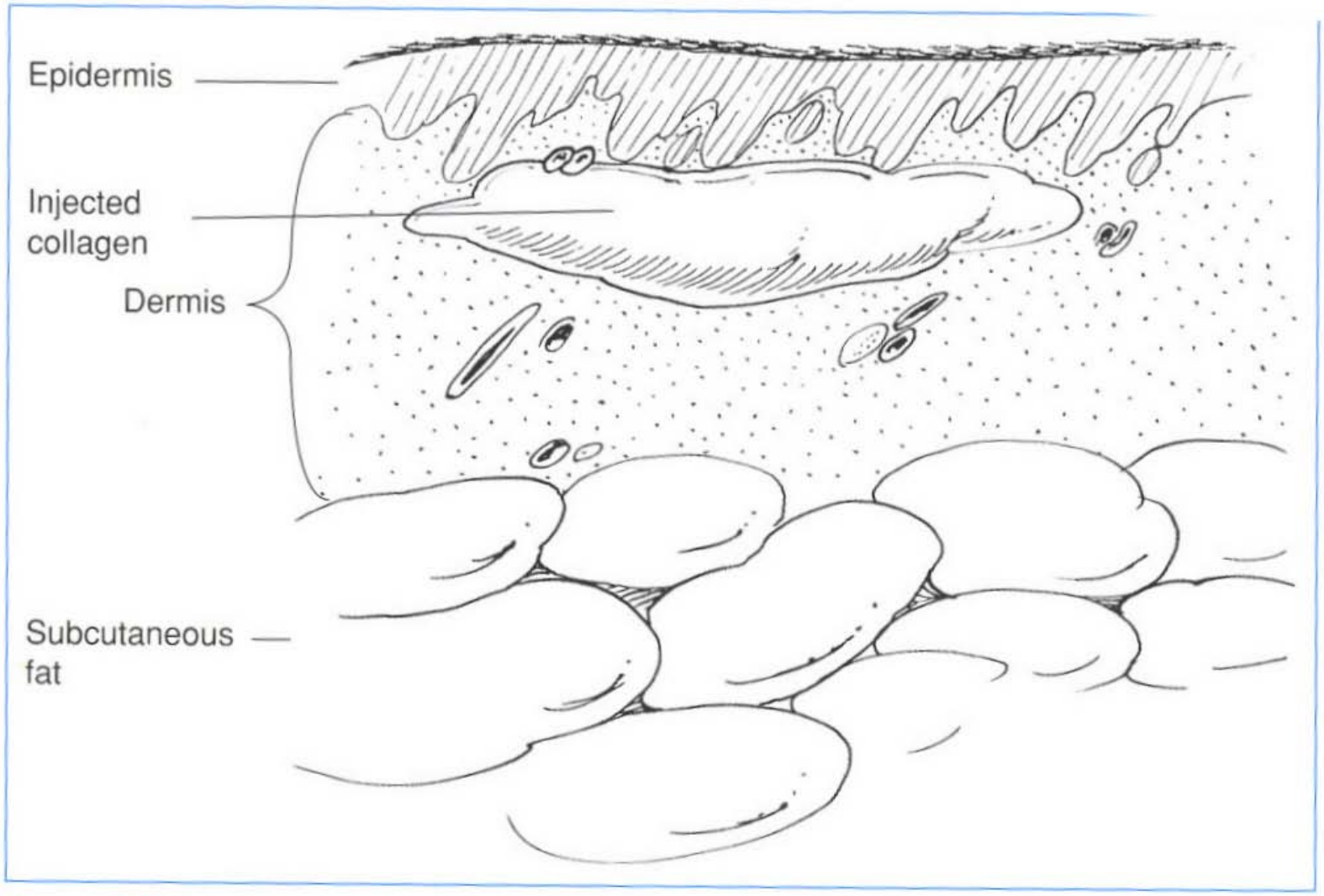
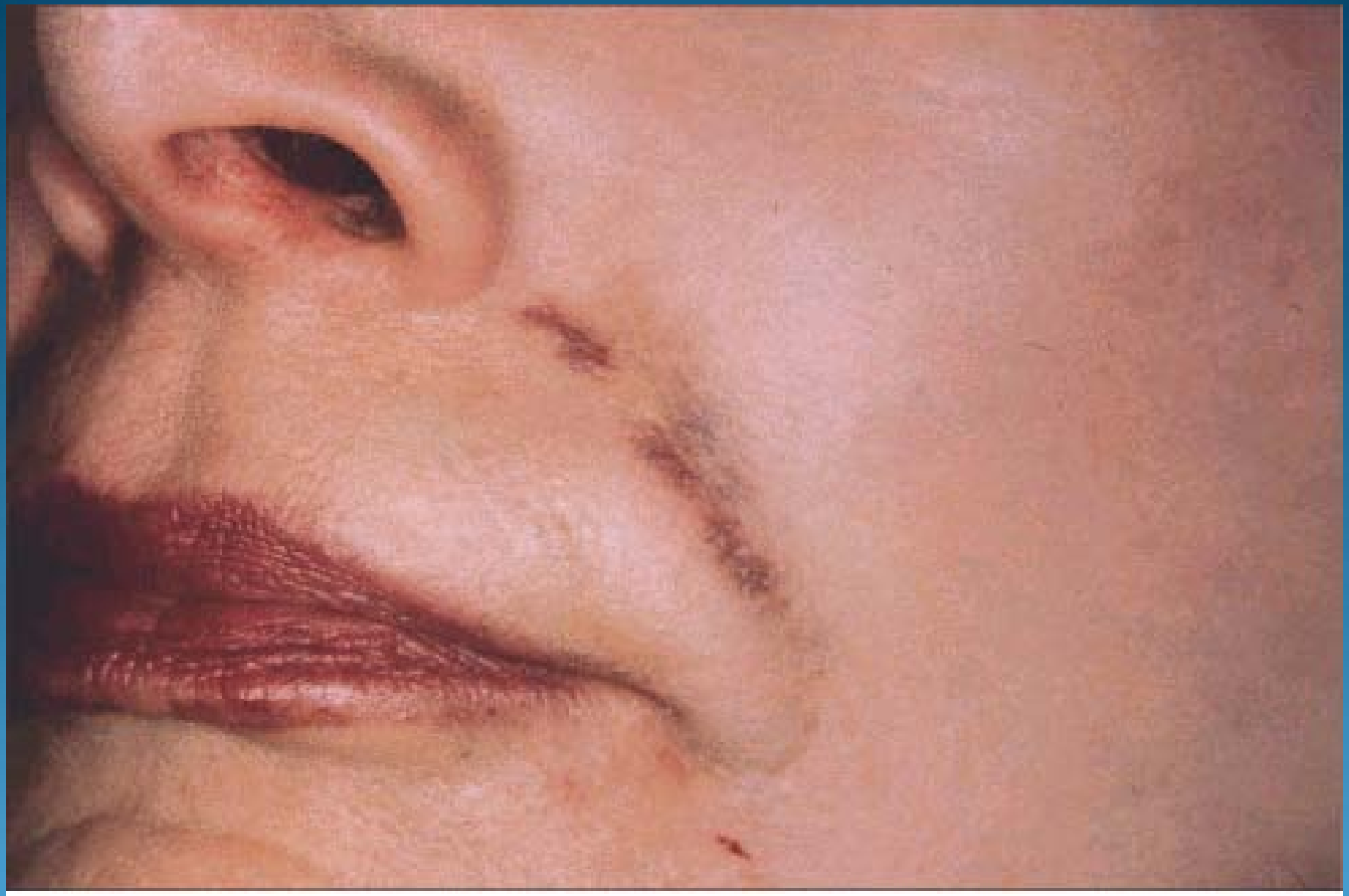
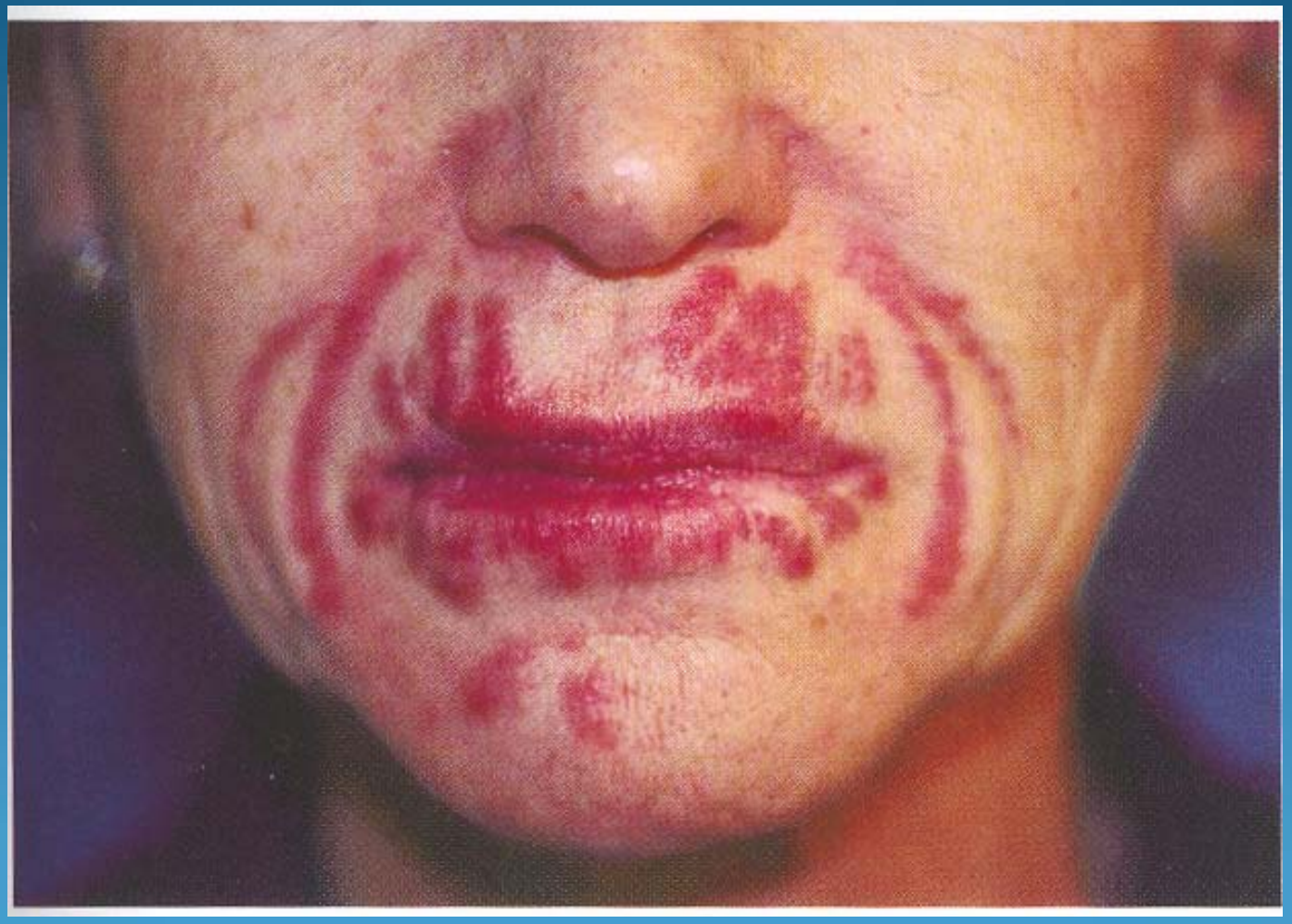


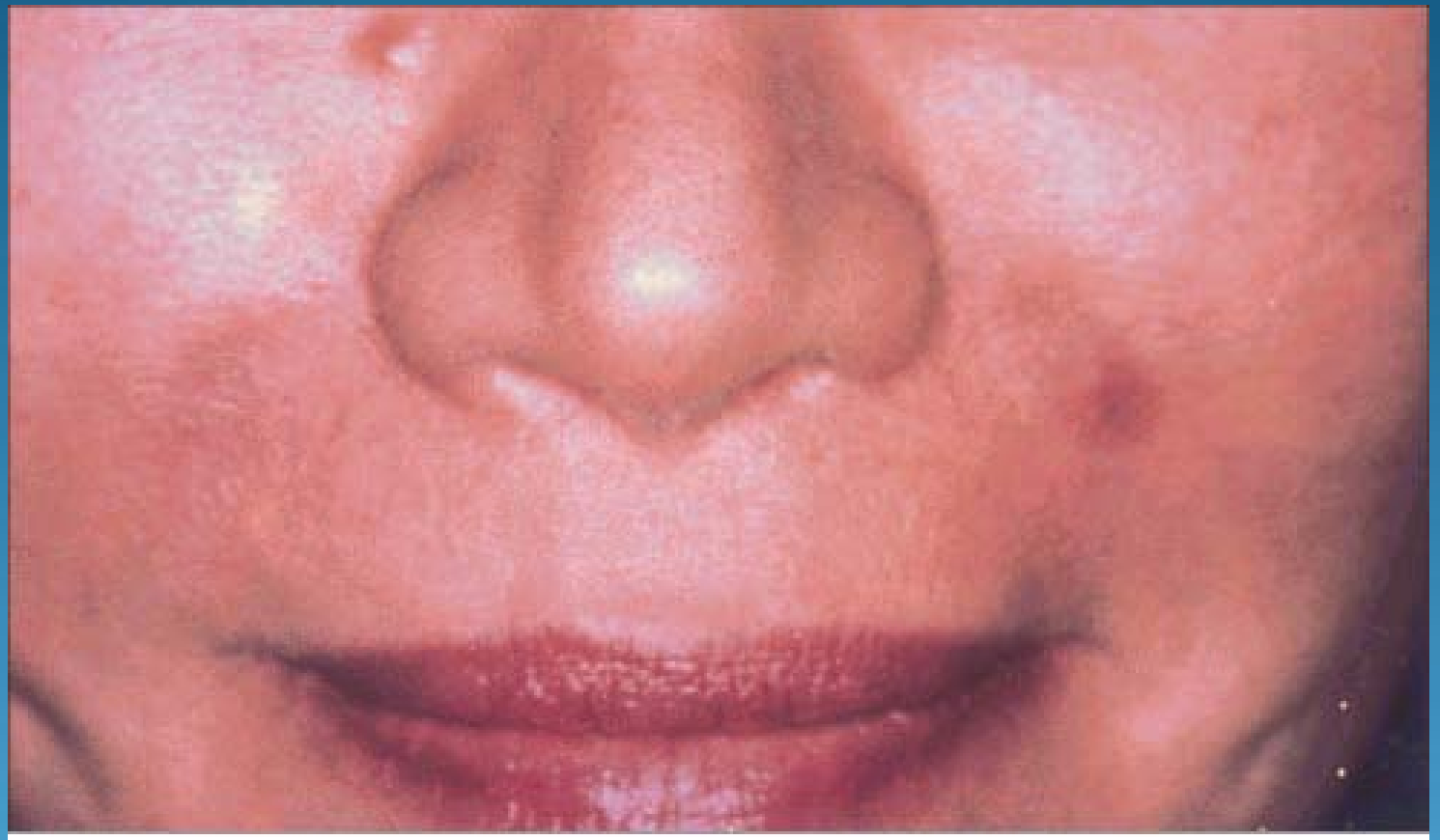
Figure 19-6.
Proper placement of Zyderm in the upper dermis.

Complications of Bovine Collagen

- Ecchymosis
- Type IV hypersensitivity reactions granuloma formation
- sterile abscesses (especially with Zyplast)
- Tissue necrosis with intravascular injection
- Re-activation of HSV







Hyaluronic Acid Derivatives

- Restylane
- Hylaform

Hyaluronic Acid Derivatives

- Hyaluronic acid is composed of repeating dimers of glucuronic acid and N-acetyl glucosamine
- These fillers are chemically altered forms of hyaluronic acid, a GAG normally present in the dermis and identical in all species
- Has capacity to bind water up to 1000x its volume
- Is insoluble, colorless, resists degradation, and does not cause allergic reactions

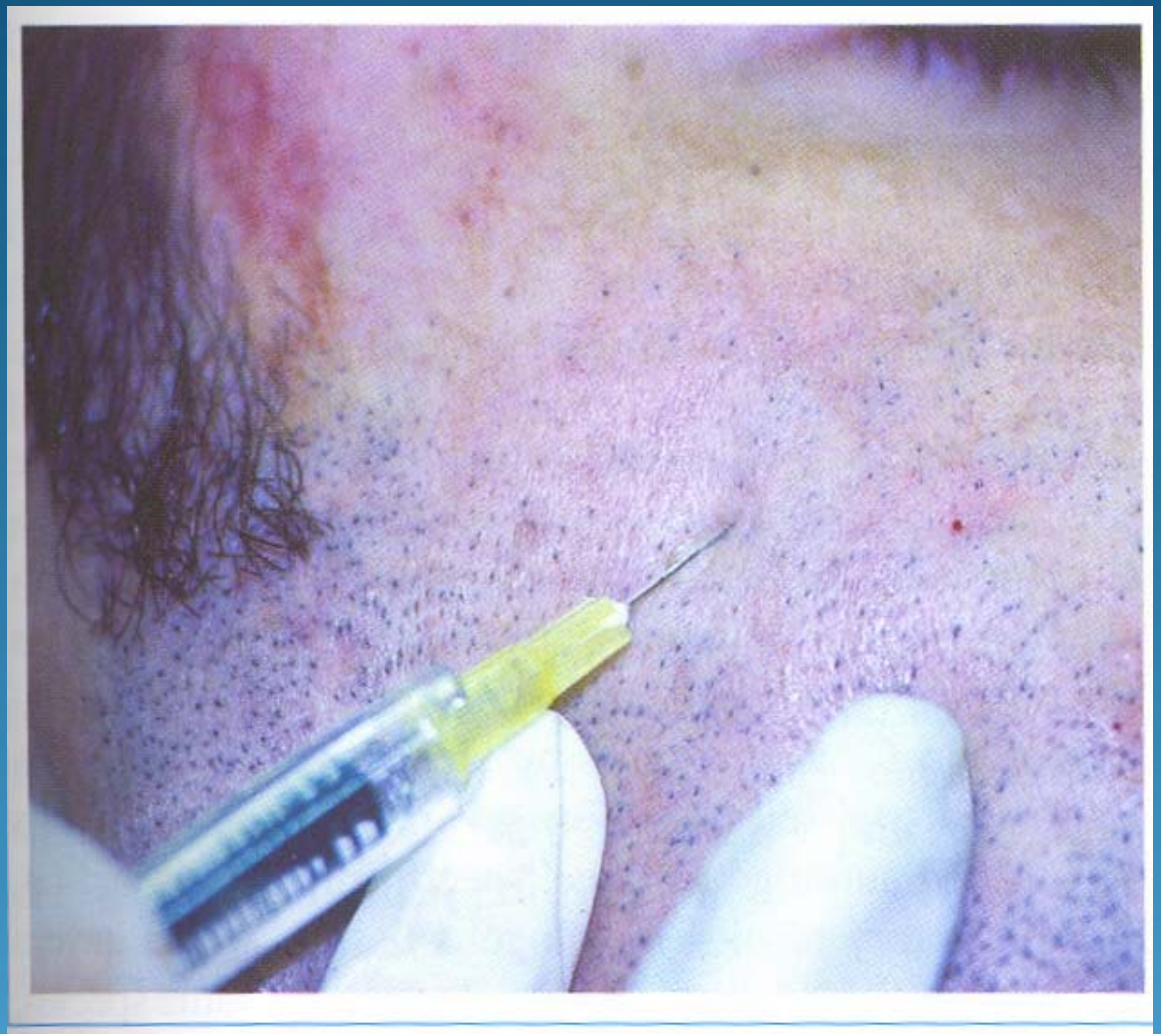


Figure 19-14.
Hyaluronic acid products are colorless. Thus, they can be injected superficially without sowing through the skin. This is beneficial when treating superficial acne scars as seen in this photo.

Restylane

- FDA approved in 12/03
- Produced by fermentation of streptococcal bacteria
- Less expensive than bovine collagen and able to be stored at room temperature
- Less volume needed as compared to bovine collagen
- Results last up to 6 months

Restylane

- Three types that all contain 20mg/mL of hyaluronic acid in a clear gel and vary based on the size of the particles
  - Restylane Fine Lines: 0.4 mL syringe, inject into upper dermis
  - Restylane: 0.4 and 0.7 mL syringes, inject into mid dermis
  - Perlane: 0.7 mL syringe, inject into deep dermis

Restylane Treatment

- Cleanse face prior to injection
- Apply topical, local or block anesthesia
- Inject into the superficial dermis at an angle of 30 degrees
- Cost $210/vial

Restylane Side Effects

- Increased pain with injection
- Injection site reactions
- Edema following lip augmentation

Hylaform

- Not yet FDA approved, used in Europe for past 7 years
- hyaluronic acid derived from rooster combs
- concentration 6 mg/mL
- no allergic reactions reported
- injected into the deep dermis
- does not contain lidocaine and therefore anesthetic is necessary

Hylaform

- Side effects
  - bruising, erythema, swelling
- ? Risk of use in patients with avian allergies
- Adequate studies lacking for use in African Americans

Human Derived Collagen

- Dermalogen- human cadavers
- Alloderm/Cymetra- human cadavers
- Cosmoderm/Cosmoplast- neonatal foreskin

Human Derived Collagen

- Use began in the 1980's
- eliminates need for pre-treatment skin testing
- no hypersensitivity reactions

Dermalogen

- Composed of intact collagen, elastin fibers, and GAG's harvested from the dermis of human cadaveric skin
- pre-screened for infectious diseases
- supplied in a 0.5 or 1.0cc syringe at a concentration of 3.5%
- pre-tx anesthesia necessary
- inject into mid-deep dermis

Cymetra/Alloderm

- Made from human cadaver dermis
- similar to Dermalogen, except is in powder form and therefore requires reconstitution with lidocaine
- inject into mid-deep dermis
- effects last 4-6 months

Cosmoderm/Cosmoplast

- Derived from fibroblasts taken from neonatal foreskin
- no required skin testing
- injected into mid-deep dermis
- effects last 2-6 months

Autologous Fat Transplantation

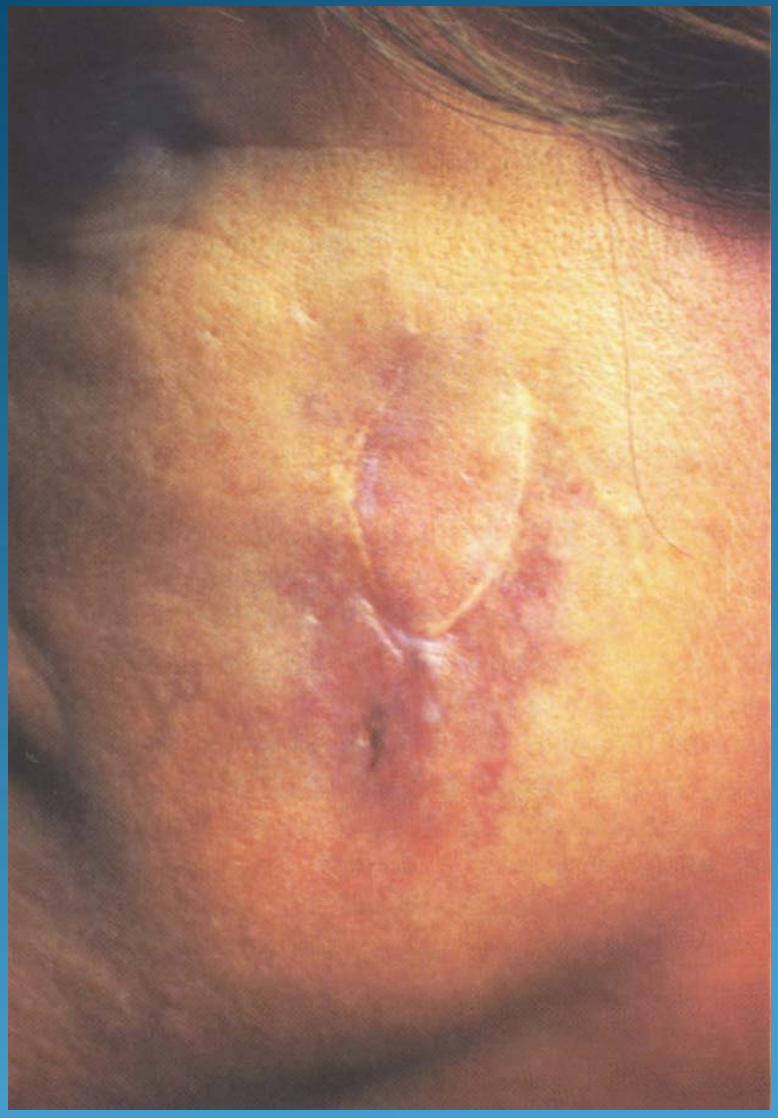
- Performed since the 1980's
- indicated for melolabial folds, lips, acne scarring, and lipoatrophy
- involves removing 15-20 cc of fat with a 13-gauge needle from various parts of the body, and re-injecting the fat into the SC using a 16-18-gauge needle

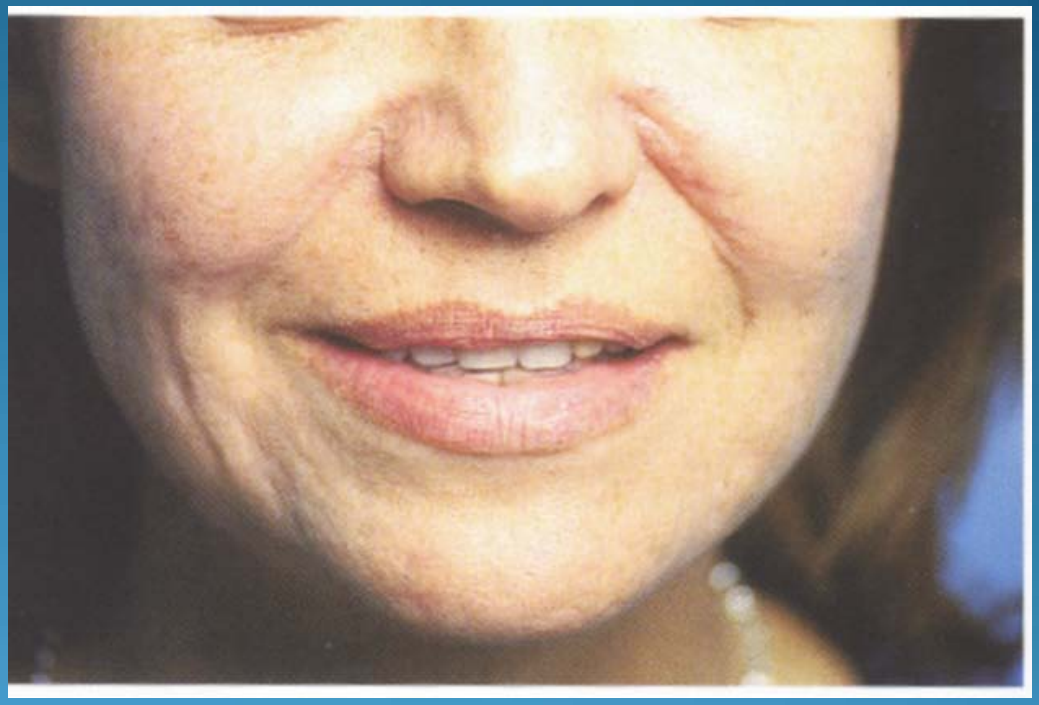
Autologous Fat Transplantation

- More time consuming because harvesting and injection required
- local anesthesia is necessary
- up to 50% of fat remains after 2 years of procedure

Synthetic Fillers

- Silicone
  - composed of dimethylsiloxane polymers
  - is permanent
  - not approved as a filler by the FDA
  - physicians use silicone “off label” that is only approved for ophthalmic use
  - SE: hypersensitivity, granuloma formation, migration of the material





New Fillers

- New-Fill (Sculptra)- polylactic acid, a component of vicryl suture material
- Radiance- calcium hydroxyapatite (approved for vocal cord paralysis and as a radiological soft tissue marker)
- Artecoll- polymethylmethacrylate microspheres suspended in bovine collagen

Future Trends

- Non-Ablative Radiofrequency
  - Thermage
- Plasma Skin Rejuvenation
- Mesotherapy