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%NaHCO₃ 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
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
Sclerotherapy

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

- Femoral vein
- Greater 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
## Important Characteristics of Sclerosing Solutions

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

A
Hypertonic sclerosing solution

B
Detergent sclerosing solution

C
Chemical sclerosing solution
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 striated 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 the 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
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
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
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
Side Effects to Treatment of the Forehead

- Unwanted eyebrow shape
- Brow ptosis
- Drooping of the eyelids
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 1 cm lateral to the lateral canthus, 0.05 cc 1 cm above the first injection, and 0.1 cc 1 cm below
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
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
# Partial List of Filler Substances

<table>
<thead>
<tr>
<th>Dermal Filler</th>
<th>FDA approved</th>
<th>Source</th>
<th>Complications, problems, benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zyderm®/Zyplast®&lt;br&gt;McGhan Medical, Santa Barbara, CA</td>
<td>Yes</td>
<td>Bovine</td>
<td>Allergic reactions 1%&lt;br&gt;Long history of use&lt;br&gt;Commonly used</td>
</tr>
<tr>
<td>Autologen®&lt;br&gt;Collagenesis, Inc., Beverly, MA</td>
<td>Yes</td>
<td>Large piece of patient’s skin</td>
<td>Expensive shipping costs&lt;br&gt;No allergy&lt;br&gt;Not available</td>
</tr>
<tr>
<td>Isolagen®&lt;br&gt;Isolagen Technologies, Paramus, NJ</td>
<td>Yes</td>
<td>3.0-mm punch of patient’s skin</td>
<td>Effort to package&lt;br&gt;Not accepting tissue at this time&lt;br&gt;No allergy</td>
</tr>
<tr>
<td>Dermaigen®&lt;br&gt;Collagenesis, Inc., Beverly, MA</td>
<td>Yes</td>
<td>Cadaver</td>
<td>Use at room temperature&lt;br&gt;Painful&lt;br&gt;Stopped production</td>
</tr>
<tr>
<td>Hylaform® gel&lt;br&gt;Biomaine, Inc., Ridgefield, NJ</td>
<td>No</td>
<td>Rooster comb</td>
<td>No allergy</td>
</tr>
<tr>
<td>Restylane®&lt;br&gt;Q-Med Uppsala, Sweden</td>
<td>No</td>
<td>Fermentation, bacterial product</td>
<td>Intermittent swelling&lt;br&gt;No allergy</td>
</tr>
<tr>
<td>Artico®&lt;br&gt;Medical Int’l B.V., Breda, The Netherlands</td>
<td>No</td>
<td>Bovine and inert beads</td>
<td>Permanent granulomatous reactions</td>
</tr>
<tr>
<td>Resoplast®&lt;br&gt;Robin Medical Int’l B.V., Breda, The Netherlands</td>
<td>No</td>
<td>Bovine</td>
<td>Allergic reactions</td>
</tr>
<tr>
<td>GoreTex®&lt;br&gt;W.L. Gore &amp; Associates, Flagstaff, AZ</td>
<td>Yes</td>
<td>Manufactured</td>
<td>Extrusion&lt;br&gt;Infection&lt;br&gt;Unnatural feel</td>
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<tr>
<td>SoftForm®&lt;br&gt;McGhan Medical, Santa Barbara, CA</td>
<td>Yes</td>
<td>Manufactured</td>
<td>Extrusion&lt;br&gt;Infection&lt;br&gt;Unnatural feel</td>
</tr>
<tr>
<td>Subcutaneous fat</td>
<td>N/A</td>
<td>Autologous</td>
<td>Bruising&lt;br&gt;Echima&lt;br&gt;Harvesting&lt;br&gt;No allergy</td>
</tr>
<tr>
<td>Fascian®&lt;br&gt;Fascia Biosystems, Beverly Hills, CA</td>
<td>Yes</td>
<td>Cadaveric fascia lata</td>
<td>Large particles&lt;br&gt;Large needle&lt;br&gt;Echima</td>
</tr>
<tr>
<td>Cymetra®&lt;br&gt;LifeCell Corp., Branchburg, NJ</td>
<td>Yes</td>
<td>Cadaver</td>
<td>Echima</td>
</tr>
</tbody>
</table>
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
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 dimethysiloxane 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