Skin Conditions Appropriate for Chemical Peels
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Choosing the Correct Peeling Agents
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The following potential conflict of interest relationships are germane to my presentation.

Histological Depth of Penetration of Chemical Peels

- Superficial, very light
  - Wounding to level of stratum spinosum
- Superficial, light
  - Wounding through entire epidermis
Histological Depth of Penetration of Chemical Peels

- Medium depth
  - Wounding to level of upper reticular dermis
- Deep
  - Wounding to midreticular dermis

Classification of Chemical Peeling Agents

- Superficial, very light
  - TCA 10-20%
  - Low potency alpha hydroxy acid
  - Beta hydroxy acid
  - Tretinoin
- Superficial, light
  - TCA 20-30%
  - Jessner’s solution
  - 70% glycolic acid

Classification of Chemical Peeling Agents

- Medium depth
  - 35-40% TCA
  - 88% phenol (unoccluded)
  - Solid CO₂ plus 35% TCA
  - Jessner’s solution plus 35% TCA
  - 70% glycolic acid plus 35% TCA
- Deep
  - Baker Gordon phenol peel
Choosing Chemical Peeling Agents: General Guidelines

- Sagging skin only responds to phenol peel and only if skin is relatively thin
- Neck does not respond well to chemical peels
- Expression wrinkles benefit from botulinum toxin type A treatment prior to any peel; allows skin to regenerate on non-moving base
- Photoaging and free radical aging from smoking and pollution can be treated with chemical peels; healing speed and quality of results depends on peel depth

Choosing Chemical Peeling Agents: General Guidelines

- Active acne should only be treated by medium peel after it has been treated medically and infection has cleared
- Facial acne scars are difficult to treat
- Results of treatment of hyperpigmentation disorders depend entirely on depth of problem and depth of treatment; only way to treat melasma permanently is to completely destroy melanocytes
- Solar lentigines respond to peels in Grenz zone and papillary dermis
- Peels are not intended for hypertrophic scars

Acne
Pathophysiology of Acne
- Sebaceous follicle ductal hypercornification
- Hyperseborrhea
- Increased number of P. acnes
- Inflammation

Types of Acne
- Acne vulgaris
- Acne conglobata
- Acne fulminans
- Acne excoriee
- Other types include mechanical, occupational, drug-induced, neonatal, and infantile

Acne Vulgaris
- Most common
- Three types of lesions
  - Non-inflamed lesions
  - Inflamed lesions
  - Scars
**Acne Vulgaris**

- Non-inflamed lesions
  - Microcomedones
  - Closed comedones (whiteheads)
  - Open comedones (blackheads)
- Inflamed lesions
  - Papules
  - Pustules
  - Nodules
  - Cysts

**Acne Vulgaris**

- Scars
  - Atrophic scars
    - Ice pick
    - Rolling
    - Boxcar
  - Hypertrophic
    - Keloids

**Acne Conglobata**

- Chronic, severe form of inflammatory acne
- Characterized by grouped comedones, cysts, abscesses, draining sinus tracts, and scars
**Acne Fulminans**
- Multiple, intensely inflamed nodules, cysts, and plaques

**Acne Excoriee**
- Predominantly found in young adult women
- Picking and scratching of lesions leads to inflammation and crusting

**Chemical Peels for Acne**
- Glycolic acid 70%
- Jessner’s solution
- Salicylic acid 25%
- Pyruvic acid 40-70%
- TCA 25-30%
- Unna paste (resorcinol 40%)
- Phenol 45-80%
### Indications

- **Comedonal acne**
  - Glycolic acid
  - Jessner
  - Salicylic
  - Pyruvic acid
  - Unna paste

- **Mild/moderate inflammatory acne**
  - Salicylic acid
  - Pyruvic acid
  - Glycolic acid
  - Jessner
  - Unna paste

- **Severe nodulo-cystic acne**
  - Pyruvic acid

- **Superficial post acneic scars**
  - Pyruvic acid
  - TCA
  - Salicylic plus TCA

- **Medium-deep post acneic scars**
  - Phenol
  - TCA >40%
**Frequency of Application**

- Glycolic acid: 3-6 peels every 1-2 weeks
- Jessner’s solution: 3 peels every 2 weeks
- Salicylic acid 25%: 3-8 peels every 2-4 weeks
- Pyruvic acid 40-70%: 3-8 peels every 2-4 weeks
- Salicylic acid plus 25-30% TCA: 5-6 peels every 4-5 weeks
- Phenol: 1 treatment

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**Advantages of Various Agents**

- Salicylic acid
  - Safety and efficacy in darker phototypes (V-VI)
  - Possible association with other substances such as TCA and pyruvic acid to improve absorption
  - Easier to manage than glycolic acid in terms of uniformity of application
- Salicylic acid and pyruvic acid better than glycolic and Jessner in terms of risk of side effects and patient discomfort
- Glycolic acid preferred over Jessner: equal treatment effect but lesser degree of exfoliation in glycolic acid.

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**Acne Results**
Acne Results

Actinic Keratoses

- Most common epithelial precancerous lesions occurring on sun-exposed skin of middle-aged and elderly people as multiple erythematous macules or papules with dry adherent scale
Causes of Actinic Keratoses

- Prolonged exposure to sunlight
- UV light from artificial sources
- X-radiations

Types of Actinic Keratoses

- Asymptomatic: developments such as tenderness, induration, erosions, and enlarging diameter may lead to squamous cell carcinoma
- Hypertrophic: may appear clinically as cutaneous horn due to significant hyperkeratosis

Types of Actinic Keratoses

- Spreading pigmented: displays variation in pigmentation with smooth, verrucous or scaly surface and centrifugal spreading, usually greater than 1 cm in diameter; referred to as a proliferative AK when spreading to more than 3 cm diameter with undefined borders
Types of Actinic Keratoses

- Lichenoid: solitary or multiple violaceous or brown flat-topped papules, resembling lesions of lichen planus
- Actinic cheilitis: typical of vermillion of lower lip; diffuse scaling, with blotchy and atrophic appearance; erosions may indicate squamous cell carcinoma

Pathophysiology of Actinic Keratoses

- Epidermal dysplasia with alterations in cell polarity and mild nuclear atypia
- Hyperkeratosis, parakeratosis, irregular acanthosis and thinning of granular layer
- Atypical keratinocytes extend into papillary dermis
- Dermis reveal solar elastosis

Differential Diagnosis

- Basal cell carcinoma: nodule with telangiectatic surface or ulcerated lesion with pearly translucent border
- Discoid lupus erythematosus: disc like patches with adherent thick scales and follicular plugging, atrophic scarring
- Seborrheic keratosis: uneven, verrucous surface, soft consistency; presents on non sun-exposed areas
Differential Diagnosis

- Solar lentigo: circumscribed pigmented macule, no surface scaling
- Verrucous naevi: present at birth or developed during childhood
- Warty diskertoma: elevated papule with keratotic umbilicated center, occasionally found on non-sun-exposed skin

Treatment of Actinic Keratoses with Chemical Peels

- Superficial chemical peel
  - 25-30% TCA
- Medium depth chemical peel
  - 35% TCA
  - 50-70% pyruvic acid

Actinic Keratoses Results
Melasma

• Acquired hyperpigmentation disorder characterized by tan, brownish macules and patches that occur on sun-exposed skin
• Most commonly observed in women skin types IV-VI

Causes of Melasma

• Idiopathic
• Sun exposure
• Genetic predisposition
• Pregnancy
• Oral contraception
• Elevated LH, FSH, estradiol levels
• Thyroid dysfunctions
• Antiseizure drugs
• Cosmetics
*All significantly increase tyrosinase activity in producing melanin
Clinical Patterns of Melasma

- Centrofacial
- Malar
- Mandibular

Types of Melasma

- Epidermal: increased melanin in basal, suprabasal, and stratum corneum layers; clinically, melasma is light brown
- Dermal: increased melanin in superficial and deep dermis; clinically, melasma is dark brown to gray

Types of Melasma

- Mixed: increased melanin in epidermis and dermis; clinically, melasma is dark brown
- Indeterminate melasma: melasma in patients with Fitzpatrick skin type VI
**Wood’s Lamp**

- Epidermal melasma appearance will be enhanced by Wood’s lamp
- Dermal melasma will not show under Wood’s lamp
- Mixed melasma will not show under Wood’s lamp

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**Melasma Area and Severity Index (MASI)**

- Subjective classification
- Face divided into four areas
  - F: forehead (30%)
  - MR: right malar (30%)
  - ML: left malar (30%)
  - C: chin (10%)

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**MASI**

- Melasma graded in each of these areas according to
  - A: percent total area involved
    - 0=no involvement
    - 6=90-100% involvement
  - D: darkness
    - 0=absent
    - 4=maximum
  - H: homogeneity or hyperpigmentation
    - 0=minimal
    - 4=maximum
**MASI**

- MASI formula = 30%(DF+HF) + 30% (DMR +HMR)AMR + 30%(DML+HML)AML + 10%(DC +HC)AC
- Maximum value of MASI = 48 meaning severe hyperpigmentation

**Melasma Therapy Objectives**

- Slow proliferation and growth of melanocytes
- Inhibit formation of melanin and promote melanosome destruction

**Melasma Treatment Options**

- Broad spectrum sunscreens
- Topical depigmenting agents
  - Tyrosinase inhibitors
  - Antioxidants
  - Melanogenesis inhibitors
  - Exfoliants
- Chemical peels
- Laser
- Cryotherapy
Treating Melasma with Chemical Peels

- Superficial peeling
  - 25% salicylic acid
  - Glycolic acid 50-70%
  - TCA 15-20%
  - Resorcinol
- Combined peeling
  - 25% salicylic acid and 10% TCA
- Medium peeling
  - Pyruvic acid 50%

Treating Melasma with Chemical Peels

- Patients should undergo superficial peeling every 2 weeks or medium peeling every month
- 3 week pre-procedure and 10 day post-procedure
  - Morning regimen
    - Alpha-hydroxy cleanser
    - UVA/UVB sunscreen
    - No sun exposure
  - Evening regimen
    - Alpha-hydroxy cleanser
    - Hydroquinone/kojic acid every 2 days
    - Topical retinoid every 2 days

Effect of Combination Peels

- Salicylic has keratolytic effect, eliminating superficial pigmented, keratinocytes and stimulating cell turnover
- Allows TCA to act at low concentration to remove pigmented keratinocytes to papillary dermis
- Results in moderate to low inflammation
- Lower number of treatments required
Melasma Results

Photoaging

• Superimposed effects of photodamage on intrinsically aging skin
• Consequence of chronic, UV exposure
Features of Extrinsic Aging

- Fine and coarse wrinkles, sallowness, laxity, mottled pigmentation, textural roughness, telangiectasia
- Epidermal "basket-weave" or compact stratum corneum, acanthosis, and/or atrophy, keratinocyte atypia, flattened rete ridges
- Dermis: prominent Grenz zone, elastogenesis, elastosis, collagen degeneration, loss of anchoring fibrils

Glogau’s Classification of Photoaging

Glogau Type I (Mild)

- Ages 20’s-30’s
- Early photoaging
- Mild dyschromia
- No keratoses
- Minimal wrinkling
- Minimal or no scarring
Glogau Type II (Moderate)

- Last 30’s-40’s
- Early senile lentigines
- Dyschromia
- Early actinic keratoses
- Parallel smile lines
- Early wrinkling
- Some makeup worn
- Mild acne scarring

Glogau Type III (Advanced)

- Usually aged 50-65
- Dyschromia, telangiectasia
- Visible keratoses
- Wrinkling at rest
- Always wears make-up
- Moderate acne scarring

Glogau Type IV (Severe)

- Patient age 60-75
- Actinic keratoses
- Prior skin cancers
- Wrinkling throughout
- Make-up cakes and cracks
- Severe acne scarring
**Therapeutic Treatment Options for Photodamage**

- **Topical**
  - Broad spectrum sunscreens
  - Retinoids
  - Vitamin C
  - Alpha hydroxy acids
  - Polyhydroxy acids
  - Beta hydroxy acids
  - Bleaching agents

- **Resurfacing**
  - Microdermabrasion
  - Superficial chemical peeling
  - Medium-depth chemical peels
  - Deep chemical peeling
  - Ablative laser resurfacing
  - Nonablative laser treatment
  - Radiofrequency

**Treating Photodamage with Chemical Peels**

- **Mild to moderate photodamage**
  - Glycolic acid 50-70%
  - TCA 30%
  - Salicylic acid 20-30%
  - Salicylic acid plus TCA <25%

- **Extensive photodamage**
  - Glycolic acid 70% plus TCA 35%
  - Jessner’s solution plus TCA 35%
  - Pyruvic acid 60-70%
  - Phenol 45-80%
**Photodamage Results**

**Post-Inflammatory Hyperpigmentation**

- Acquired presence of darker macules and skin patches occurring at sites of previous cutaneous inflammatory conditions.
Post-Inflammatory Hyperpigmentation
• Usually a result of allergic reactions, inflammatory skin disorders, therapeutic interventions, mechanical injuries
• Usually occurs in Fitzpatrick skin types IV-VI
• Appears to be an increase in melanin production and/or abnormal distribution of pigment

Differential Diagnosis
• Fixed drug eruption
• Systemic drug-induced hyperpigmentation
• Macular amyloid
• Ashy dermatosis
• Melasma
• Medication: tetracyclines, antimalarial drugs, arsenic, bleomycin, doxorubicin

PIH Therapy
• Prevention of further pigment deposition
• Diminish altered discoloration
• Treatment/removal of etiologic insult
• Broad spectrum sunscreens
• Topicals agents
  – Retinoids
  – Bleaching agents
Chemical Peels for PIH

- Salicylic acid 20-30%
- Glycolic acid 70%
- Jessner’s solution
- Pyruvic acid 40%

PIH Results
**Rosacea**

• Chronic inflammatory disorder affecting central facial area
• Vascular irregularity complicated by inflammatory changes
• Endocrine, psychological, pharmacological, immunological, infectious, thermal, alimentary factors contribute to vascular instability and tissue damage
• Symptoms include skin dryness and sensitivity, stinging and burning

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**Erythematous-Telangiectatic Rosacea**

• Flushing and persistent central facial erythema usually associated with telangiectasia
**Papulo-pustular Rosacea**
- Persistent central facial erythema associated with inflammatory papules and pustules

**Phymatous Rosacea**
- Irregular skin thickening due to sebaceous hyperplasia

**Ocular Rosacea**
- Eye involvement common and may precede skin lesions
- Ocular symptoms include foreign body sensation, burning, or stinging, dryness, itching, photosensitivity, telangiectasia
Granulomatous Rosacea

- Papular and nodular lesions affecting cheeks and perioral areas

Differential Diagnosis

- Acne vulgaris
- Seborrheic dermatitis
- Systemic lupus erythematosus
- Lupus miliaris disseminatus faciei
- Sarcoidosis

Melasma Therapy

- Avoidance of factors that trigger or cause flushing via vasodilation
Flushing Triggers

- Climatic
  - Sun exposure
  - Extreme heat or cold
  - Humidity
  - Windy weather
- Emotional
  - Anger
  - Anxiety
  - Embarrassment
  - Stress
- Temperature
  - Sauna, hot bath
  - Working in high temperatures
- Physical exercise
- Food/beverage
  - Alcohol
  - Spicy foods
  - Chocolate

Flushing Triggers

- Food/beverages
  - Vinegar
  - Certain fruits/vegetables
- Drugs
  - Antidepressants
  - ACE inhibitors
  - Statins
  - Vasodilators
  - Topical corticosteroids
- Cosmetics
  - Containing alcohol, perfume, and other ingredients that irritate sensitive skin
  - Soaps

Chemical Peels for Rosacea

- Salicylic acid peels performed at 3 to 4 week intervals
- Salicylic acid produces antimicrobial activity, reduces erythema and prevents relapses
Erythrosis Treatment

• 15% to 25% to 30% salicylic acid peels performed at 3 week intervals
• Combine with topical treatment of metronidazole cream and sunblock

Papulo-Pustular Treatment

• 25% -30% salicylic acid performed at 3 week intervals
• Combine with systemic treatment with metronidazole or antibiotics

Rosacea Results
**Solar Lentigo**

- Macular area of brown pigmentation appearing after acute or chronic sun exposure
- Caused by photoaging

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**Solar Lentigo Pathology**

- Linear increase of melanocytes at dermal-epidermal junction
- No cytological atypia
- Elongation of papillae and interpapillary ridges
**Solar Lentigo Therapy**

- Sunscreen
- Topical depigmenting agents
  - Tyrosinase inhibitors
  - Antioxidants
  - Peeling agents
  - Melanogenesis inhibitors
- Cryotherapy
- Laser

**Chemical Peels for Solar Lentigo**

- TCA >25%
- Salicylic acid 25% plus TCA 25-30%
- Pyruvic acid 50-70%
- Phenol 45-80%

**Solar Lentigo Results**
Chemical Peels and Ethnic Skin

Ethnic Skin

- Fitzpatrick skin types IV-VI
- Melanocytes of darker skin produce more epidermal melanin
- Melanosomes distributed throughout epidermis in darker skin
- Increased stratum corneum layers, increased desquamation, increased lipid content, decreased ceramide content

Peel Indications for Ethnic Skin

- Melasma
- Post-inflammatory hyperpigmentation
- Acne
- Pseudofolliculitis barbae
- Textural changes
- Oily skin
- Wrinkles
- Photodamage

**benefits of chemical peeling in dark skin can be achieved utilizing superficial peels**
Peeling Preparation

- Pretreatment 2-4 weeks with bleaching agent
- Discontinue 1-2 days before peel
- Peels performed at 2-4 week intervals in a series of 3-6 treatments
- Post treatment includes topical products and bleaching agents

Peels for Ethnic Skin

- Salicylic acid 20-30%
- Jessner’s solution
- Glycolic acid 20, 35, 50, 70%
- TCA 10-30%

Ethnic Skin Results

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