Chemical Peels

Hetter Peel: Modified Phenol-Croton Oil Peel

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Disclosures

• No financial disclosures
*Skin: Histologic Effects of Aging*

- Loss of normal differentiation of the epidermis
- Degeneration of elastin network
- Decrease amount of collagen
- Disorganization of collagen
- Loss of normal irregularity (flattening) of the dermal-epidermal junction
- Increased number of melanocytes with unevenly distributed and variable amounts of melanin
Skin Changes Treated With Resurfacing

- Dyschromias, Lentigines, Keratoses
- Rhytids
- Moderate periorbital and perioral rhytids
- Coarse and diffuse facial rhytides
- Acne scars
- Traumatic and surgical scars
Advantages of Chemical Peeling

• Equal or better results to laser
• More predictable outcomes
• Lower incidence of hypopigmentation
• Much lower cost vs. laser
• Much better results vs. IPL
• Variety of peel solutions that are inexpensive to stock and increase the diversity of peels
Chemical Peel

- Involves the application of a chemical exfoliant to wound the epidermis and/or dermis to remove superficial lesions
- The level of penetration, destruction, and inflammation determines the level of peeling
  - Superficial – epidermis, stratum corneum (glycolic acid, 10-20% TCA, jessner's solution)
  - Medium-depth – Destruction of epidermis, further inflammation of the superficial papillary dermis (50% TCA*, 35% TCA with jessner's)
  - Deep – Further inflammation into the reticular dermis
History of Peels

• 1920’s
  – Lay Peelers serviced the Hollywood starlets using phenol-croton oil solutions

• 1950’s – 1960’s
  – Legal action against lay peelers moved peels into the hands of physicians
  – Litton presents his findings to American Society of Plastic and Reconstructive Surgery (late 50’s)
  – Baker presented his formula November 1961 and further modified this to his classic formula in 1962
Classic Baker - Gordon Formula (~1960)

- Phenol 88% USP 3 cc
- Septisol 8 gtts
- Croton Oil 3 gtts
- Distilled Water 2 cc

- Known risks of hypopigmentation, “waxy” look, limited use to Type I & II skin
Modified Baker - Gordon Formula (1961)

- Phenol 88% USP 3 cc
- Septisol 8 gtts
- Croton Oil 1-2 gtts
- Distilled Water 2 cc

1980 – Stegman (SF dermatologist) published study demonstrating that croton oil increased the depth of peel
“Accepted” Dogma

- Adolph Brown, MD, published an article in British Journal of Plastic Surgery (1960) laying out his assertions of phenol chemical peeling
  - Lower Phenol concentration = deeper penetration (higher concentrations caused more keratization)
  - Septisol reduces surface tension increasing depth
  - Croton oil acts only as a “buffer”

- These assertions had no scientific evidence yet were followed as the accepted dogma for decades!!
Gregory P. Hetter, MD

• Gregory P. Hetter, MD (2000)
  – 4 articles about the history and use of croton oil
• He had been using diluted Baker solution since 1989
  – As effective
  – Less pigment loss
  – More rapid healing
Gregory P. Hetter, MD

- In his 4th article, the results of 5 cases (‘92-’95) were used to illustrate what we have come to know about croton oil in the ‘phenol’ peel.
- Started first with phenol varying concentrations
- Results were documented for each case

An Examination of the Phenol–Croton Oil Peel: Part IV. Face Peel Results with Different Concentrations of Phenol and Croton Oil


Gregory P. Hetter, M.D., M.S.
Hetter’s Findings

• Regarding Phenol
  – Phenol > 50% peels more deeply with maximum of 88%
  – <35% does not peel
  – 88% phenol gives only a light peel
  – Phenol does not possess “all or none” action

• Regarding Croton Oil
  – Contains cytotoxic resin
  – Minute amount causes skin burn
  – Peel depth increases with increasing concentration
The Hetter Peel: A Paradigm Shift

• The dogma that persisted for decades was rendered obsolete

• The truth:
  – Weaker phenol concentration ≠ deeper penetration
  – Septisol does not effect depth of peel
  – Croton oil is the critical peeling agent – not phenol
The Hetter Peel Formula

• Varying croton oil concentration
  – Improves surgeon control
    • Improves predictability of results
  – Expands application*
  – Improves specificity
  – Improves safety
The Hetter Peel Formula

• The Stock Solution
  – 24ml phenol + 1ml croton oil (4% Croton oil)
  *standardization- 25 cc= 0.04 ml (or 1 drop of croton oil) in each 1 cc of stock solution

• THE STOCK SOLUTION IS MEANT TO BE DILUTED AND SHOULD NEVER BE APPLIED TO SKIN IN FULL STRENGTH
# The Hetter Peel Formula

<table>
<thead>
<tr>
<th>Croton Oil %</th>
<th>0.2%</th>
<th>0.4%</th>
<th>0.8%</th>
<th>1.2%</th>
<th>1.6%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>5.5ml</td>
<td>5.5ml</td>
<td>5.5ml</td>
<td>5.5ml</td>
<td>5.5ml</td>
</tr>
<tr>
<td>Septisol</td>
<td>0.5ml</td>
<td>0.5ml</td>
<td>0.5ml</td>
<td>0.5ml</td>
<td>0.5ml</td>
</tr>
<tr>
<td>Phenol 88%</td>
<td>3.5ml</td>
<td>3.0ml</td>
<td>2.0ml</td>
<td>1.9ml</td>
<td>0.0ml</td>
</tr>
<tr>
<td>Stock soln</td>
<td>0.5ml</td>
<td>1.0ml</td>
<td>2.0ml</td>
<td>3.0ml</td>
<td>4.0ml</td>
</tr>
</tbody>
</table>

10 ml total with each mixture
Patient Selection: The Ideal Patient

- Fitzpatrick type I skin
- Severe actinic damage
- Non-smoker
- Not opposed to make-up
- Motivated
- Good rapport
Application Fine Points

- Mark submandibular shadow in upright position
- Peel deeper rhytids individually
- Overlap peel solution into area of reactive hyperemia
Peeling Radial Lip Rhytides
Peeled Edge Reactive Hyperemia
Peeled Edge Reactive Hyperemia

Reactive Hyperemia
Technique: General Recommendations

• Peri-oral area
  – Can withstand strong concentrations – 0.8 to 1.6%
  – Stretch out the rhytids to allow penetration
  – OK to peel into the vermilion
• Cheeks and forehead
  – 0.4 - 0.8% peel – deeper in glabella and forehead
• Eyelids
  – 0.2 - 0.4%, extend close to ciliary margin
  – Apply with cotton-tipped applicator
• Neck
  – 0.2% judiciously
Technique: The Art of Application

- Application: cotton-tip applicators or gauze
- Observe frost: chemoexfoliant coagulates and precipitates protein
  - Rub multiple times
  - Variable pressure
  - Gauze/cotton tipped applicator can be wetter
  - Variable passes can be made
The Hetter Peel

- Topographical Map
The Healing Process

- Reversal of the photoaged skin characteristics
- Reepithelialization occurs from adnexal structures (pilosebaceous units)
- Collagen regeneration and remodeling in dermis rejuvenates skin integrity and elasticity
- Restores normal cell polarity, corrects atypia, corrects melanocytic hypertrophy and hyperplasia in epidermis
- Neocollagen arranged horizontally in dermis with fine elastic fibers also present
Hetter Peel: Case

• POD#1
  – dense gray

• POD#2
  – Improved edema
  – Epidermolysis
  – Gray in heavier peeled areas

• POD#7
  – Almost epithelialized
Peel Progression

POD # 5

POD # 7
Peel Progression

Preop                           POD 7                           3 months

[Three images of a woman's face showing different stages of treatment: preoperative, POD 7, and 3 months after.]
Peel Progression
Pre-op

- Cheeks: 0.8%
- Periorbital: 0.4%
- Forehead: 89% phenol
- Peri-oral: 1.6%
Peel Progression
POD #1
Peel Progression
POD #6
Postoperative Care

- **Week One**
  - Thick layer of Eucerin/Aquaphor Cream
  - Wash off in shower 3-4 times a day
  - Reapply immediately to prevent crusting

- **Week Two**
  - Re-epithelialization usually complete by 7 days
  - Any areas not yet epithelialized receive Bacitracin or Polysporin
  - No sun exposure or chemical sunblocks 3 months
  - Start Hydrocortisone 2.5% bid
  - Camouflage make-up
Postoperative Complications

- Acne & Milia Formation
  - Abx

- Scarring
  - Early topical steroid treatment
  - Kenalog injection
  - Pulsed-dye laser

- Hypopigmentation
  - Makeup

- Hyperpigmentation
  - Bleacheeze
  - Treat at 4-5 weeks
  - Sun protection

- Herpes simplex
  - Valtrex 1 gram tid; 10 days

- Ectropion
  - Massage, Taping, Surgical suspension
Scarring
Herpes Simplex Virus Infection

- Grouped vesicles on an erythematous base
- If an HSV outbreak occurs before reepithelialization has been completed, erosions may be evident.
- Rx: Oral Antivirals, Topical Antivirals, aggressive wound care.
Bacterial Infection

• Increased pain, discharge, and crusting are indicative of bacterial infection.
• Cultures should be obtained
• Strep, Staph, or occasionally Pseudomonas or Fungal
• Rx: Oral antibiotics or antifungals, Wound care

Hyperpigmentation

- Hyperpigmented square **laser** scan patterns 1 month postoperatively
- Fitzpatrick Type III
- Rx:
  - mild peels (Glycolics, light TCA – 15%)
  - Hydroquinone & Tretinoin
  - Avoidance of sun exposure.

Hypopigmentation

- 6-12 months after resurfacing
- Skin appears pale relative to the adjacent untreated skin, rather than truly hypopigmented
- Rx: Camouflage makeup reduces areas of surrounding hyperpigmentation
Ectropion

• Usually occurs in patients who have had previous transcutaneous blepharoplasty
• Rx: Topical corticosteroid and massage. Surgical correction is often necessary.

Pre and Post Combination Peel
Pre and Post Combination Peel
0.4% Periorbital and Forehead
0.8% Perioral
Full Face Hetter Peel
Conclusions

• Stronger concentration of Phenol penetrates deeper than weaker one
• Croton oil is the critical peeling agent
• Multiple concentrations of peel available
  – Increased control and specificity