Phenol-Croton Oil Peel: An Update

Varying the strength of the croton oil in a phenol peel solution can customize the peel to suit the needs of each patient and address delicate areas, such as the eyelids and the neck. Here the author presents important refinements in phenol-croton oil peel application. (Aesthetic Surg J 2005;25:197-200.)

The phenol peel of Baker and Gordon, described decades ago, provided a useful tool for facial skin resurfacing but, over time, fell out of favor. This is because traditional phenol peels, in addition to requiring a prolonged recovery, often produce a waxy appearance and hypopigmentation. In 2000, with the publication of a series of articles, Dr. Gregory Hetter helped to revive interest in phenol as an ingredient in skin peeling solutions with his ground-breaking research on the phenol-croton oil peel. His articles1-4 provided not only an in-depth recap of the history of the classic “phenol peel” but also examined the activity of its 4 ingredients: (1) water, (2) phenol, (3) croton oil, and (4) Septisol (Steris Calgon Vestal, St. Louis, MO). Hetter’s writings, based on observing a patient volunteer who permitting variations of the phenol solution to be tested on her facial skin, resulted in his receiving the American Association of Plastic Surgeons’ coveted James Barrett Brown Award for the “Best Paper in Plastic Surgery” in 2001.

Hetter found that, contrary to longstanding beliefs, croton oil, rather than phenol alone, was a highly active ingredient in the phenol peel solution. Using this information, he proposed varying croton oil strength to make different concentrations of the peel, which could be used on various areas of the face and neck to provide a more controlled and uniform depth of injury. Now the peel solution could be customized to suit the needs of each patient. By modifying the strength of the peel, previously avoided areas, such as the eyelids and the neck, could also be treated.

Working with Dr. Hetter, one of my residents, Firas Karmo, MD, and I developed an animal model to confirm, as scientifically as possible, the clinical and histologic changes that occur with varying concentrations and substitutions to the original Baker-Gordon phenol peel that was described more than 40 years ago.

Our animal model confirmed many of the observations that Hetter published in 2000. But with an animal model, we had more latitude in our solutions and their application. The details of our work were presented at the annual meeting of the American Society for Aesthetic Plastic Surgery in Las Vegas in 2002 and will be published in their entirety in the near future.

Here are some of the more important conclusions and their clinical implications, including practical pointers on phenol-croton oil peel application that will enhance its usefulness and results:

• Tiny amounts of croton oil added to any concentration of phenol peel solution will cause peeling or skin burn. The most important finding of the research was that the peel depth increases with increasing concentrations of croton oil. Croton oil is not just an irritant, but rather a key contributor to the effects of the peel. By altering the amount of croton oil by even 1 drop, significant changes could be seen both clinically and histologically.

• Phenol peels more deeply with increasing concentrations. This finding contradicts the previous belief that low concentrations of phenol penetrated more deeply than high concentrations and were therefore more toxic.

• The addition of Septisol causes deeper tissue injury. This finding validated the importance of Septisol as a key ingredient.

• Multiple applications of the phenol-croton oil solution, using a folded 2 × 2 sponge applied with stroking motions, increases the depth of the peel. This is in contrast to the traditionally taught Q-tip application using a rolling motion. This sponge stroking motion is an important innovation that Hetter stresses. The more strokes, the deeper the...
peel; the fewer strokes, the more superficial the peel. Using this principle, in conjunction with the appropriate croton oil concentration, the peel can be varied depending on the thickness of skin and depth of rhytids.

When using the phenol-croton oil peel, here are some “clinical pearls” to keep in mind:

1. Vary the concentrations of croton oil for different areas of the face and neck. A 0.1%-croton-oil-in-35%-phenol solution, as Hetter describes, can safely be used on the eyelids and the neck, whereas a 0.4%-croton-oil-in-35%-phenol solution is very effective in the central forehead and anterior cheeks, but would create a deep burn in the neck skin.

2. Concentration of the peel can be varied with the number of “sponge” strokes used when applying. In

Figure 1. A, Preoperative view of a 45-year-old woman with perioral rhytids. B, Postoperative view 1 month after application of 0.4% croton-oil-in-35% phenol solution. Early post-treatment erythema can be easily covered with makeup. C, Four months after phenol-croton oil peel.
most cases, the number of strokes for the best results in a given area is between 5 and 8.
3. The depth of the peel is accurately reflected by the healing time and degree of redness retained in the treated skin. All patients should be told that they will have some redness for about 2 months; this will fade
to pink, and finally to normal. This redness is directly proportional to the long-term effectiveness of the peel. Rarely is there need to repeat the peel. The hypopigmentation seen with the CO₂ laser and the classic phenol peel does not occur with the phenol-croton oil peel.

4. To obtain the desired concentrations of croton oil, it is easiest to use the Hetter Stock Solution (Delasco Dermatologic Lab and Supply, Inc., 1-800-831-6273) when mixing solutions for various anatomic areas of the face and neck. Never use the Hetter Stock Solution undiluted.

Results of phenol-croton oil peels can be seen in the patients in Figures 1 and 2.

References

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