

Histological Comparison between Phenol Deep Chemical Peelings (Formula Rossi Fattaccioli) and Resurfacing Ultra-pulsed CO₂ Laser

Daniel De Rossi Fattaccioli *

* Dermatologist Cosmético- Surgical and Dermatopathologist,
Regional Directorate of Health Tacna- PERU

* Professor of Dermatology. Faculty of Human Medicine 1.- National University of Tacna
"Jorge Basadre Grossmann" and 2.- Private University of Tacna.

Abstract

Treatments with Carbon Dioxide (CO₂) Laser and Phenol Deep Chemical peelings (Backer-Gordon, Litton, Fintzi and Hetter formulas) have been used extensively for facial skin rejuvenation. I introduce new Formula which uses the HEAT like a penetration factor and on the same time in its preparation.

These studies have been done to compare the effects of the treatments using histological views in different periods of time. Biopsies of facial skin treated on pre and retro-auricular zone were made: immediately after application of CO₂ laser ablations and 24 hours after the application of a new adaptation of Baker's formula: De Rossi Fattaccioli's formulate for deep chemical peeling.

Areas almost the first biopsies were biopsied after 12 hours, 24 hours, 1 week, 2 weeks, 2 and 3 months after; and 24 hours, 48 hours, 72 hours, 1 week, 1 year and 10 years after application of Phenol. Initial biopsies showed that being CO₂ laser ablations were deeper than deep chemical peeling Phenol -Croton oil -Heat De Rossi Fattaccioli's Formule. Both treatments have produced a zone of new new collagen formation optical microscopy evident, but at 3 months comparatively deep chemical peeling with DeRossiFattaccioli's formula show a thicker and wide new collagen zone than CO₂ laser ultra-pulse ablation. Proving that this new Formula is more effective than the others and I introduce Heat like a new penetration factor and more safety. I expose this original article for its discussion.

Keywords:

Introduction

Skin resurfacing with CO₂ laser (which denotes an action of "resurfacing - removing a surface" a new epidermis) is a safe and effective insurance, with predictable results, non-toxic, for the reduction of facial wrinkles and atrophic scars as well as multiple Dermo-epidermal lesions (1-10a). The introduction of scanning, ultra-pulsed and high-energy systems has allowed laser surgeons to ablate the epidermal tissue and dermis with the minimum risk of unwanted scars (8-10).

The old CO₂ laser technology using continuous waves and superpulsed systems were efficient in tissue ablation, but they carbonized too much tissue with significantly high thermal and residual damage that resulted in remarkable changes in skin texture and scarring, prolonged erythema time and post-laser hyperpigmentation (2,3,5).

According to the principles of selective photoderm lysis (9,10a), the new laser generation limits residual thermal damage to the skin producing high-energy laser light with very short tissue evaporation time (estimated thermal relaxation time of the epidermis) in approximately one millisecond for CO₂ laser in a tissue with 70% water content) for which scanned and ultra-pulsed laser systems were developed, which uses radio frequency waves stimulated to produce unique high-energy pulses of very short duration.

The ultra-pulsed CO₂ laser system can develop frequencies above 7 J / cm² with "WIDTHS" pulses, shorter than one millisecond.

The "Scanned" laser systems operate generating a continuous beam of CO₂ laser energy that moves quickly through different computer programmed directions. This limits the tissue evaporation time to 0.3 millisecond (less than the epidermal thermal relay time), thus preventing the excessive heating of the continuous wave of high laser energy (3,11,12).

Chemical peels with phenol are the first described in the history of chemical "peels". The first formulas date back to 1800; one could say that they are the mother of all "peelings". The initial histological studies were done by Samuel Stegman in animals in 1980 and in human skin in 1982, which proved scientifically its action and pre-mining on the medium peels and dermabrasion (13). The varied formulas, empirical and even "secret", which was what gave the appearance of "non-scientists" were systematized and regulated in 1961 by plastic surgeons Backer and Gordon (Phenol 3ml-bidestila-da 2ml-8 drops) septisol-3 drops Croton oil) (14-16) and in 1962 Litton made another formula (table 1) that increased the penetration and destruction of tissue (17).

Table 1. History of chemical peeling phenol

Date of Investigation	Comment	Ingredients
Mackee, 1903	Phenol for scars	
Eller & Wolf, 1941	Peeling and Scarification	Sulfur, Resorcinol, Salicylic acid, phenol lotion, CO ₂ passes "Slush"
Urkov, 1946	Defects of the surface of the skin: controlled exfoliation treatments	Resorcin, lactic acid, Salicylic acid, phenol, cantharidin
Winter, 1950	Method of removal permanent freckles	
Mackee & Karp, 1952	Treatment of sequelae of acne with phenol	
Combes y col.	Dermal defects: treatment by an chemical agent	
Brown y col.	Histological changes induced by phenol. Findings, techniques and uses	60% to 95% phenol, Sol. of Cresol 0.3%, olive or sesame 0.25%, water dest. q sad 100%
Ayres, 1960	Subsequent skin changes to the application of cauterizing chemicals in aged skin	Phenol 33 1/3%, TCA 33 1/3%, Alcohol 33 1/3% (Formula Dennie)
Backer, 1961	The wrinkle removal by chemistry: preliminary report	Phenol 5cc, Water dest. 4cc, Croton oil 3 drops, Septisol 5 drops
Litton, 1962	Chemical facial lifting	Phenol crystals 1 pound, 8cc distilled water, Glycerin 8cc, Heat and liquefied, Liquefied phenol 4oz, Croton oil 1 cc, Distilled water 4 oz.
Sperber, 1963	Chemoexfoliation in treatment of acne scars	Salicylate sodium 0.05ml, Acne Camphor 0.025ml Anhydrous glycerin 1.25 ml, 100% Ethanol 0.5ml
De Rossi, 1993	Chemodermo exfoliation Treatment of the PhotoEnve Jecimiento	Phenol 3 ml, Distilled Water 2ml, Croton Oil 3 drops, Glycerin 8 drops Heat

These standardized formulas, together with the precautions of intra-post-operative cardio-respiratory monitoring in addition to laboratory tests (blood count, glucose, liver and kidney profile) ECHO and EKG-Holter (to avoid arrhythmias that are the most frequent complication), have made of deep chemical "peels" safe, predictable and clinically very satisfactory treatments for both doctors and patients for the duration of their results (18).

The chemical "peels" with phenol have been shown to act by destruction (necrosis) of the skin, which is proportional to its dilution (unlike the other chemical "peels" that the penetration depends on the concentration of the acids), the time that is left on the treated skin, the times it is rubbed on the area and the occlusion.

As in lasers, chemical peeling agents cause deposits of a zone of new collagen that is comparable to the extent of tissue destruction (19). Unlike laser, in peelings with phenol the results depend a lot on the experience of the executioner as well as the "State of Art" that would come to be like the "mastery of the artist" (20).

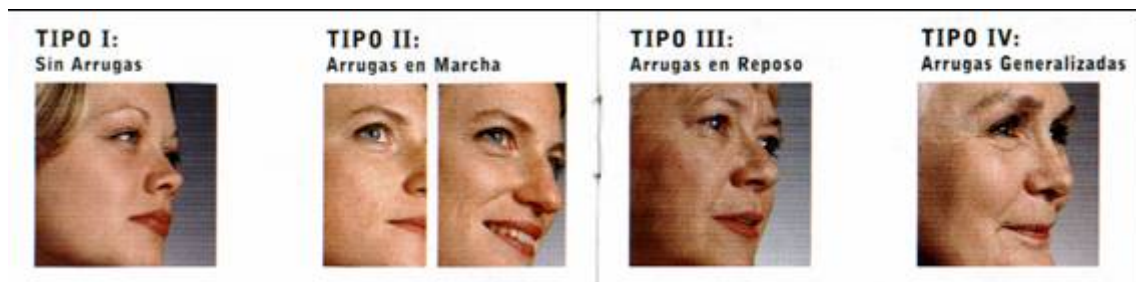
The purpose of this study is to identify the histological effects of the "Deep Phenol-Croton Formula DeRossi Fattaccioli" + Controlled Heat and the Coherent Ultra-Coated CO2 Laser. The depth of the damage and the zone of new collagen are compared micrometrically.

Material and Methods

Ten patients who underwent "resurfacing" laser and twenty "deep chemical" peeling with the formula DeRossi Fattaccioli of Phenol-Croton-Calor were studied. All gave their consent to be treated and biopsied. We excluded patients who had undergone either of the two treatments in the last twelve months, used photosensitizing drugs, corticosteroids, chemotherapy, isotretinoin and who had problems with scarring, photosensitivity, diabetes mellitus, psychiatric disorders, hepatorenal dysfunction and heart disease.

The ages fluctuated between 40 and 60 years old and were white or mestizo (10% -90%)

They presented photodamage III to IV on the Glogau scale (26).



Groups			
		Photoenvironment	
Group	changes	Manifestation	Age (years)
I	Minima	Slight wrinkles no keratosis no scars no makeup minimum pigmentary changes	28-35

II	Moderate	wrinkles in activity palpable keratosis not visible scars + pigmentation + light makeup + minimum nasolabial groove	35-50
III	Advancing	wrinkles at rest + keratosis ++ scars + Notable pigmentations, makeup dyschromias + bases color cancer in situ, actinic keratosis	50-65
IV	Severe	profuse wrinkles, furrows, sagging, skin ridged by fine wrinkles in its entirety yellowish gray coloration cancer skin makeup not curbe wrinkles	60+

Patients were prepared using alcohol-ether as a facial fat cleansing diluent. At 1 cm² of the pre-retroauricular area it was infiltrated with 2% lidocaine + 1'000,000 epinephrin.

The ultra-pulsed CO₂ laser was used at 300 mj and 3.0 mm spot-firing size with the computerized figure generator, 60W Power and density 6J / cm². Creams hydrocortisone and mupiro-cin was applied the first 3 days and then a personal reepithelizing Formula. Every morning a sunscreen was applied that does not produce any burning or allergic reactions. After a week of complete capitalization, a personalized depigmenting formula based on retinoic acid 0.025% -0.05%, glycolic acid 5%, kojic acid 4%, hydroquinone 4% -10%, hydrocortisone 1% in skins III began to be applied. IV of Fitz patrick.

They were also administered aciclovir or valaciclovir in adequate doses to avoid reactivation of herpes simplex (21). The DeRossiFattaccioli solution was prepared by melting phenol crystals in a water bath, when it was liquified, 3 cc of phenol was taken and immediately adding 2cc bidistilled water plus 8 drops of glycerin, this mixture was stirred and 3 drops of croton oil were added. , stirring the mixture again; In a vacuum resistant glass beaker. Before we used the Litton Formula of stable solution for 3 years, for use without variations, but this was not accepted by patients who preferred a custom formula just prepared (22)

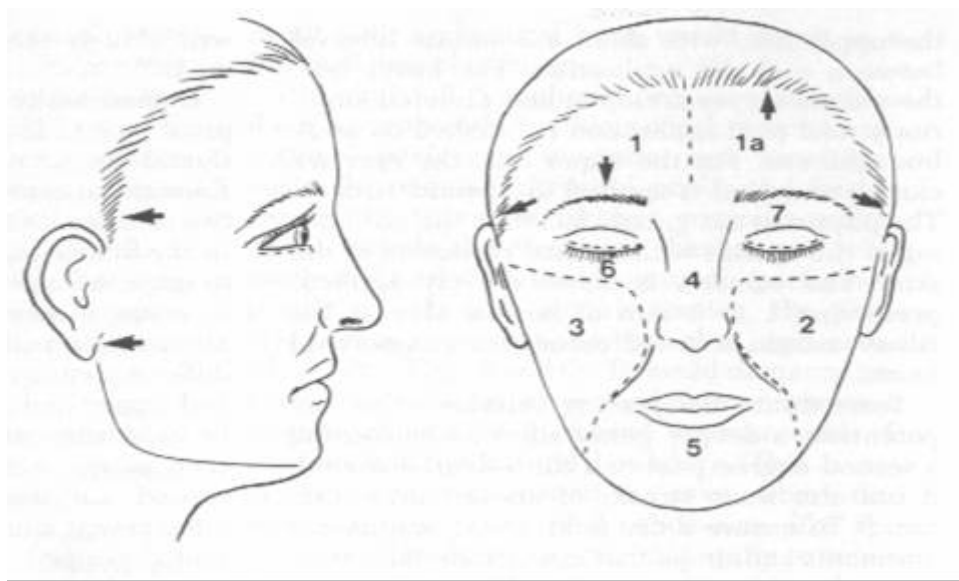
They were also administered aciclovir or valaciclovir in adequate doses to avoid reactivation of herpes simplex (21). The DeRossiFattaccioli solution was prepared by melting phenol crystals in a water bath, when it was liquified, 3 cc of phenol was taken and immediately adding 2cc bidistilled water plus 8 drops of glycerin, this mixture was stirred and 3 drops of croton oil were added. , stirring the mixture again; In a vacuum resistant glass beaker. Before we used the Litton Formula of stable solution for 3 years, for use without variations, but this was not accepted by patients who preferred a custom formula just prepared (22).

This mixture deposited in a thick glass vessel was placed in a metal container with water at a temperature of approximately 50 ° C to 70 ° C, avoiding the boiling that would cause the evaporation of the bidistilled

water of the formula, denaturing it and decreasing its penetration. The solution of the Formula De Rossi Fattaccioli needs to be hot for its best application with greater security since the heat makes it more fluid and in turn the heat increases the penetration; The glycerin in the formula makes it safer when applied near the cornea when we treat the eyelids because it adheres better to the skin and should be almost at room temperature. By controlling the temperature of the formula we can treat all the areas of greater photodamage with more than 40 degrees centigrade (forehead, eyebrows, crow's feet, peribucals, furrows, lentigos), from 10 to 20 degrees Celsius we apply the new formula on the rest of the face with less photodamage and in problem areas (eyelids, line mandibular, folds and skin of nostrils, lips) almost at room temperature.

Sample swabs are used that are immersed in the hot solution that is in the glass and then squeezed with the internal face of the same, rubbing circularly. Then it is applied without pressing on the previously prepared skin 2 to 3 times maximum in an area of 5 to 10 cm long by 2 to 3 cm wide with horizontal direction mostly, sequentially and by cosmetic segments of the face (Scheme 1 and 2).

SCHEME 1



SCHEME 1

SCHEME 2: Suggested sequence in time - "peeling" Phenol

08.30 am	Pre-operative preparation: Skin is cleansed and degreased, analgesia: neurolept plus local anesthesia on face. Via intravenous fast-jet. Cardiorespiratory monitoring. Urinary catheter.
09.00 am	Solution is applied in front in 2 sub units
09.15 am	Left cheek from nasolabial groove to preauricular region, to temple and mandibular border.
09.30 am	The other cheek
09.45 am	Nose and glabella
10.00 am	Perioral area, chin
10.15 am	Lower eyelids near the ciliary border 1-3 mm, open eyes looking up
10.30 am	Upper eyelids, eyes closed, covering the eyebrows. 1 to 3mm from the ciliary border, prepare swabs for inner canthus tears
10.35 am	Place tape in the same order backing from eyelids to front. At the end place 2 to 3 layers of

	tape
11.35 am	End of compulsory cardiological monitoring and urinary catheter is left
12.00 am	Patient in observation room starts Petidina ("Demerol") EV condicional N.V.O.

It is immediately observed that this marble white classified in stage VI appears in the **"Table of Visual Stages"** to determine the end point for neutralization in the chemical peel. (Rubin) (23)

Visual Stadiates to Determine Depth in Peeling Chemicals			
Stadium	Frost Level(Rubin)	Description	Clinical Applications in:
I	0	Pink or erythematous skin	Brown skin with minimal actinic damage to face and / or body.
II	1	Pink skin with white spots	Light to white skin with moderate actinic damage on face and / or body.
III	2	Appearance "Frost" with pink skin accumulating transparenencia	White skin with moderate to severe actinic damage on face and / or body.
IV	3	Appearance "Whitened" with an opaque white color.	White skin, single face or on top of the neck.
V		Appearance "Whitened" with a yellowish white color.	Single face with severe actinic damage.
VI		Appearance "Whitened" with a grayish white color.	Single face with severe actinic damage.

We avoid the appearance of small vesicles or myelic-colored excoriations because this indicates that a pass of more or a lot of friction has been applied in a sufficiently treated area.

The areas thus treated were covered by waterproof plasters, producing the desired occlusion since it is widely proven that this increases the penetration-destruction-regeneration neo collagen and new elastic fibers.

In the areas described at the beginning, biopsies were made. A 3 mm punch was used in each case. A sample of untreated skin was taken at the edges of the treated area to then compare the depth of damage of both treatments. The post-biopsy wound was allowed to close by second intention applying a cream with Neomycin + Bacitracin or Fusidic Acid or Mupirocin.

With CO2 Laser the first biopsy was done immediately after the 2nd and 3rd passes, at 24 hours, 1 week, 3 months.

With Deep Chemical Peeling Fenol Formula De Rossi Fattaccioli the first biopsy was taken at 24 hours and then 48 hours, 1 week, 1 month, 6 months, 10 years.

Biopsy specimens, preserved in formaldehyde, were processed with Hematoxylin-Eosin stains. The neo-collagen zones were measured using a calibrated micrometer with a microscope of 100 x magnification.

Type of Procedure	Approximate depth	Indications	Advantage	Disadvantages
<u>Very superficial chemical peeling.</u> AHA 10% / Ac. Azelaic / Ac. Retinoic 0.5-0.1% / CO2 + alcohol + sulfur / 5 fluoracil	<0.05 mm stratum corneo, grainy	Early changes, photo aging Glogau I	Combined with medical treatment. Minimal morbidity, no rest, in the consulting room.	Minimum results Applicable oli to early changes. Its effects are dependent on the constant applications.
<u>Superficial chemical peeling</u> Ac. Glicólico 70%, Sol. Jessner, TCA 25%, Re-sorcina Formula Hdez. Perez	0.06 mm stratum granule, papillary dermis	Fine wrinkles, melasmas, dyschromias, initial actinic keratosis. Glogau I - II	Combined with tramto. medical correction of majorities of epidermal problems, minimal morbidity. No sedation, safe, fast, does not crust or very thin, drops 3 - 4 days	It does not correct defects Derma Repeated treatment for effective correction, short duration of effects post treatment only. Fitzpatrick III-IV hyperchromia.
<u>Deep chemical peeling.</u> Jessner + 35% TCA CO2 + 35% TCA Glycolic 70% + TCA 35% 88% Phenol	0.40 mm Papillary dermis superior reticular	Photo moderate aging, superficial epidermal-dermal changes of photo aging, dyschromias Glogau II	Simple procedure, epidermiza 7 days, little morbidity, can be repeated twice a year, easy preparation and low cost, no prolonged erythema, is performed in the office.	Requires analgesia, recovery period 24 hours. Epidermal dermal regeneration 7 to 10 days. It does not correct moderate to deep wrinkles. Duration of variable effects from 6 months to 2 years. Fitzpatrick III - IV post-inflammatory hyperpigmentation. Superinfection causes hyper-trophic

				scars.
<u>Chemical peeling pro-fundo Phenol.</u> <i>De Rossi</i> Fat-taccioli <i>Formula occuido / sin ocluir</i>	0.60 mm medium to deep reticular dermis	Advanced photo-aging Glogau III - IV Profound histological changes	Effective, satisfactory in results, predictable. It can be combined with other procedures. Effects persist histologically for at least 10 years. 40 years of experience.	Requires cardio-respiratory monitoring, minimum 2-day hospitalization. Cardio hepa-to nephrotoxic. Erythema > 2 months definitive hypopygmentation. It is very technical - sensitive.
<u>Laser resurfacing</u>	0.60 mm medium reticular dermis pro-funda	Advanced aging photo Glogau III IV Pro-found histological changes	Cash. Satisfactory in result. Great control in depth with fewer complications. It does not cause toxicity. No hypopigmentation. It can be done in the office.	It requires analgesia. Classified as a Major Surgery procedure. 15 days recovery. Erythema possible > 5 months. Skin Hyperpigmentation Fitzpatrick III IV. High cost of equipment and maintenance.

Results

The initial biopsies demonstrate the depth of ablation-destruction of the tissue, unlike the chemical peels of Phenol, the CO2 lasers cause a histologically-demonstrable thermal injury in the periphery of the area. With 2 pulsed CO2 laser passes, necrosis is noted and disappearance of the epidermis and upper papillary dermis by evaporation (95 +/- 8 um) and thermal involvement of the deep papillary dermis to the upper reticular dermis (30 +/- 2um), With the second pass-ablation the epidermis and papillary dermis disappeared, with the 3rd. Pass-ablation vaporized the dermis to the upper reticular zone at a penetration of 130 +/- 5um and thermal damage of 80 +/- 2 um. Fig A, Fig B.

What is found in the biopsies are shown and detailed the most important of Fig. A-H in respective Laser Resurfacing.

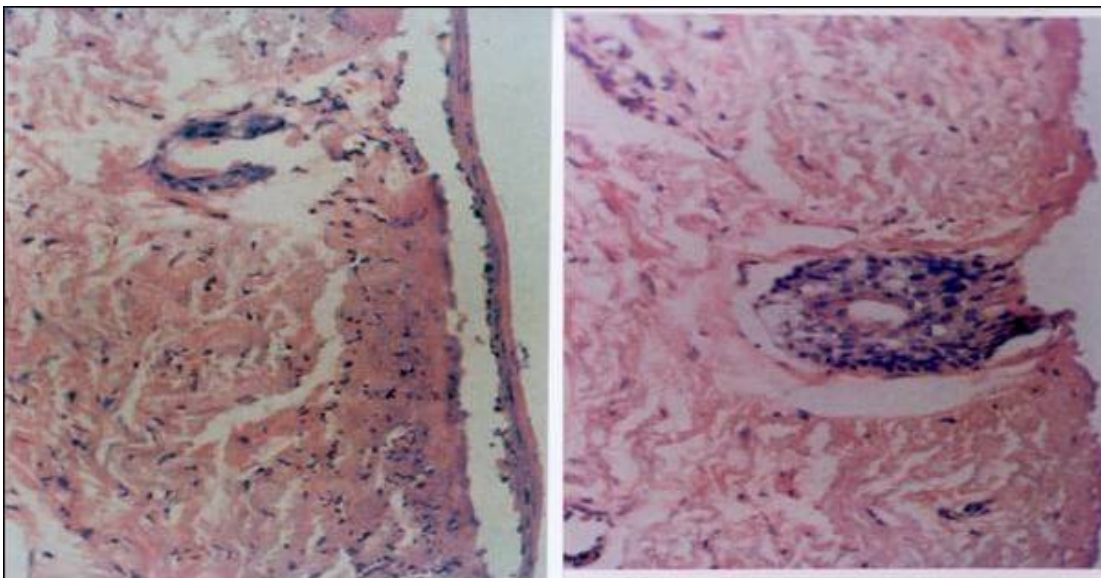


Figure. A

Figure. B

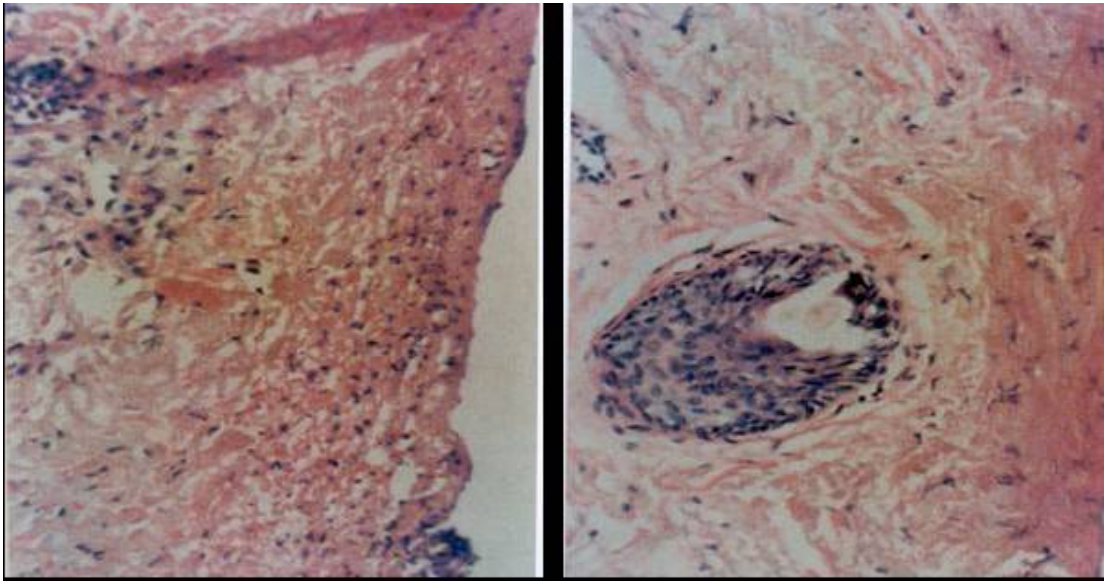


Figure. C

Figure.D

FIG A. LASER CO2 300mj 2 IMMEDIATE PASSES The epidermis and papillary dermis sup. vaporized Thermal damage to upper reticular dermis

FIG B LASER CO2 300mj 3 IMMEDIATE PASS The papillary dermis completely vaporized. Thermal damage to reticular dermis is observed as a homogeneous color band

FIG C LASER CO2 300mj 3 PASSES 12 HOURS inflammatory infiltrate with PMN and Eosinophils fragmented nuclei. Edema +++

FIG D LASER CO2 300mj 3 PASSES 24 HOURS. Greater infiltrate, Necrosis and thermal damage are observed. Hair follicle unscathed

FIG E LASER CO2 1 week complete reepithelization with moderate inflammatory infiltrate is present. The number and size of the vessels increased. In the papillary dermis a dense infiltrate of fibroblasts with hyperchromatic nucleolus and hyperchromatic cytoplasm are presented.

FIG F LASER CO2 2 weeks complete re-epithelialization with moderate mixed infiltrated infiltrating infiltrate without variation in vessel diameter. The number of immature fibroblasts has decreased

FIG G LASER CO2 2 months a new layer of superficial collagen is prominent, laminar in the papillary-reticular dermis, some elastosis is seen in deep reticular. Vascular increase in superficial dermis (erythema)

FIG H LASER CO2 3 months a new layer of superficial collagen is noticeable, laminar organizing better. Less edema and vasodilation, increase fibroblasts. Normal appearance.

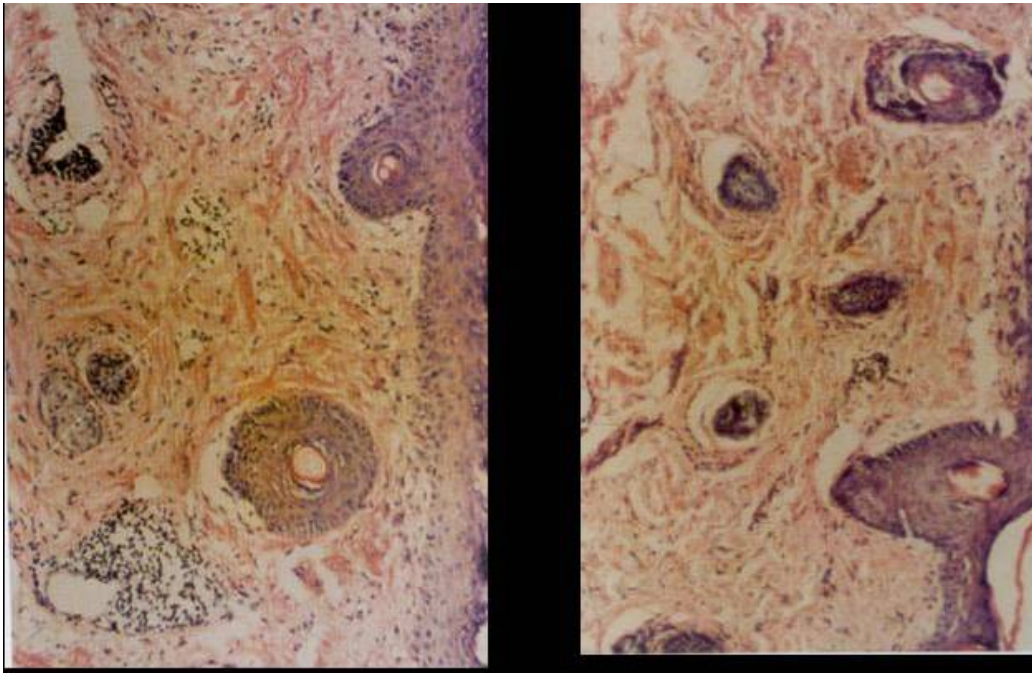


Figure. E

Figure. F

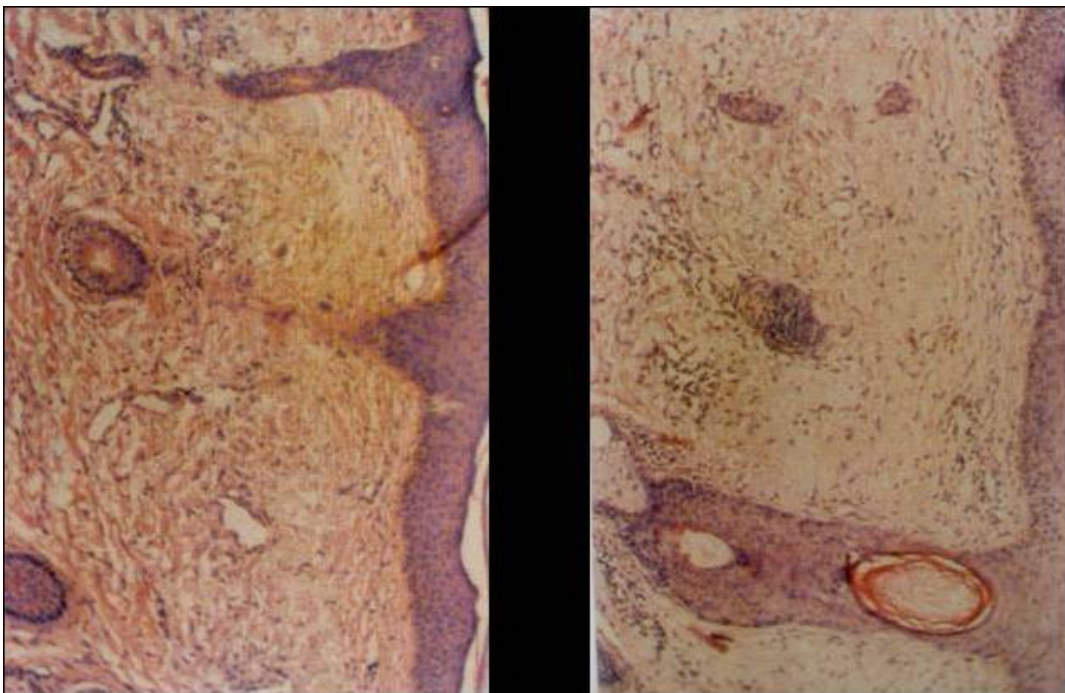


Figure. G

Figure. H

In the biopsies of the deep chemical peeling formula De Rossi Fattaccioli the most relevant details of these histological findings are described in the following figures (from 1 to 7).

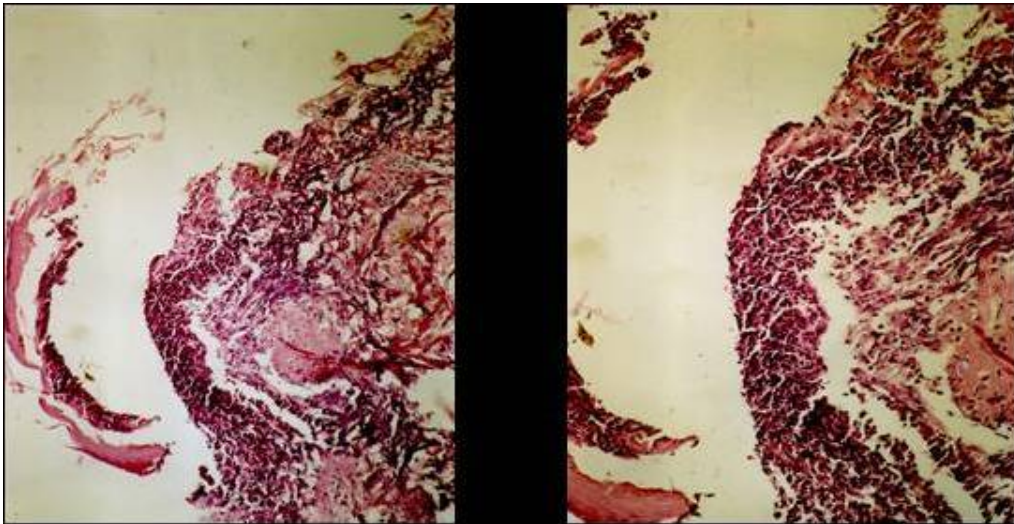


Figure 1. PhenoL-croton De Rossi Fattaccioli 24 HOURS H.E. Coagulated epidermis, total necrosis, no layers. Papillary dermis to deep median reticular: total necrosis. Inflammatory infiltrate lymphocytes-PMN-Eosinophils abundant.

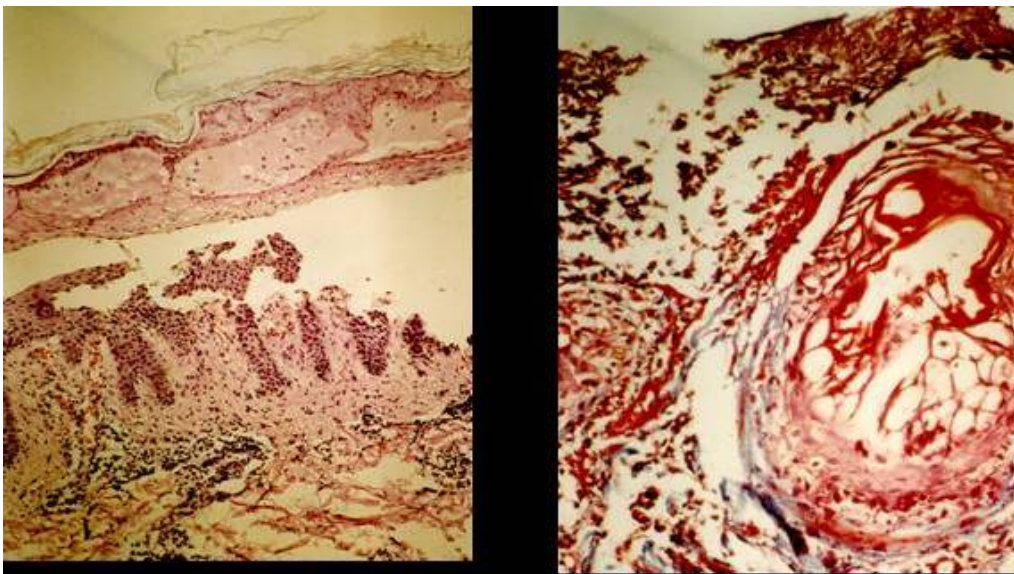


Figure.2

Figure.3

Figure.2. Phenol-Croton De Rossi Fattaccioli 48 HOURS H.E. CORNEA LAYER AND MALPIGHI LAYER replaced by necrosis and nuclear detritus. Inflammatory infiltrate in vacuoles. Under epidermal necrosis we already observed regeneration of basal-spiny layers not granulosa or cornea. Marked vasodilatation of the papillary plexus. Compact neocollagen becoming horizontal with abundant fibroblasts. Abundant lymphocyte predominant inflammatory infiltrate - PMN EDEMA +++++. You make necrotic collagen and repairing.

Figure 3. Phenol-Croton De Rossi Fattaccioli 48 HORAS TRICROMICA MASSON Foliculo pilosebaceo parcialmente necrosado , se observa regeneración por zonas, infiltrado inflamatorio y abundante necrosis periférica, se sitúa en dermis reticular profunda Adipocitos de glandula sebácea sin daño alguno, foliculos pilosos necrosis periférica.

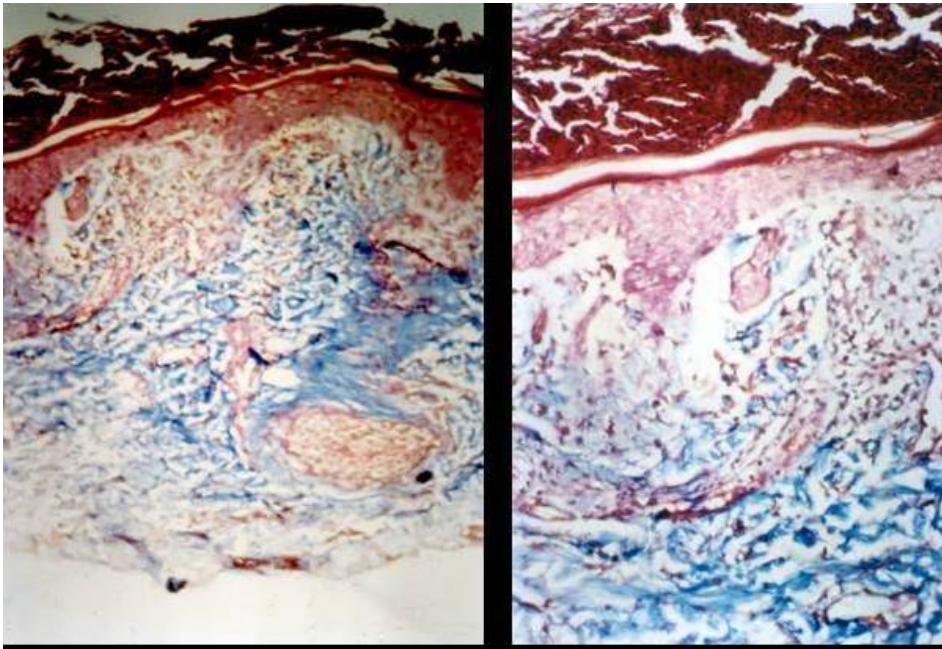


Figure 4. Phenol-Croton De RossiFattaccioli 72 HORAS TRICROMICA MASSON Epidermis parcial regeneración (bajo costra de Timol Yodado) Capa Cornea incipiente no granulosa. Necrosis más Infiltrado Inflamatorio mixto en dermis papilar abundante neocolágeno organi-zándose.

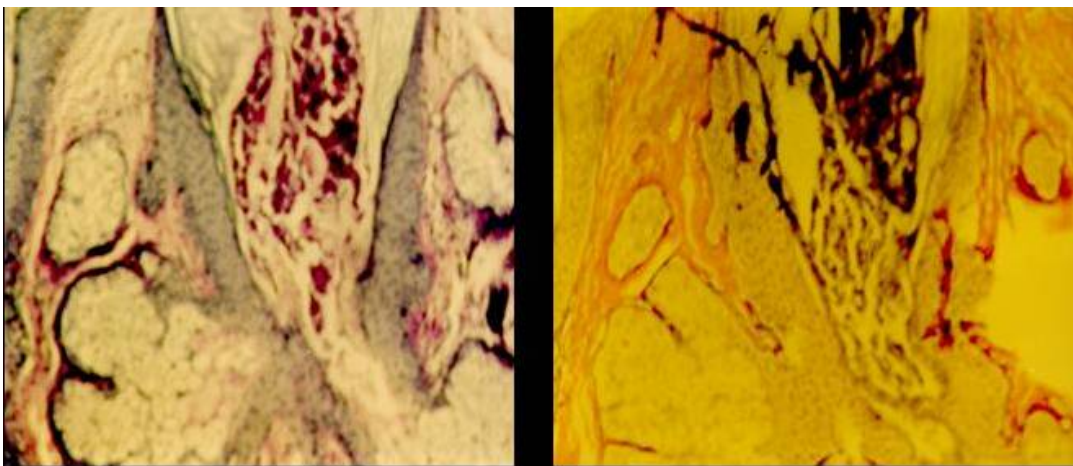


Figure 5. Phenol-Croton De RossiFattaccioli 5 DAYS TRICROMICO MASSON + SPECIAL STAINING Full epidermis is observed. We see a pilosebaceo conduit with necrotic material in its interior WHAT CAUSES DELAYED POROS

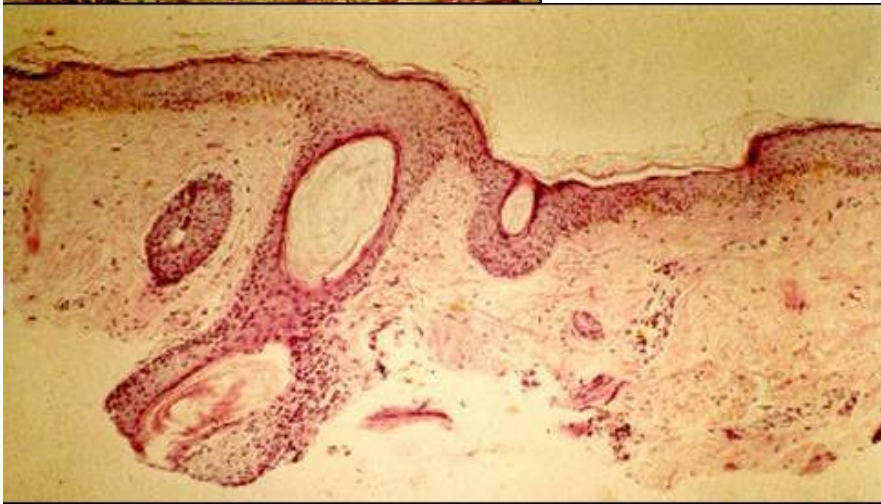
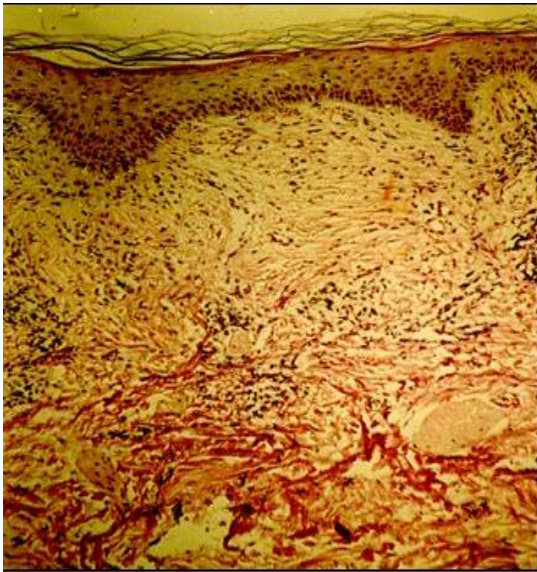


Figure 6. Phenol-Croton De RossiFattaccioli 5 DAYS fully regenerated epidermis, new epidermal papillae (replacing atrophy of photoaging) proliferated papillary plexus dilated, abundant young fibroblasts, abundant HORIZONTALIZED neocollagen and inflammatory infiltrate present by zones, complete annexes, necrotic tissue trapped in bundles of collagen in reticular dermis, abundant edema. DISAPPEARANCE OF ELASTOSIS SO-LAR (collagen degenerated hematox-ilinic)

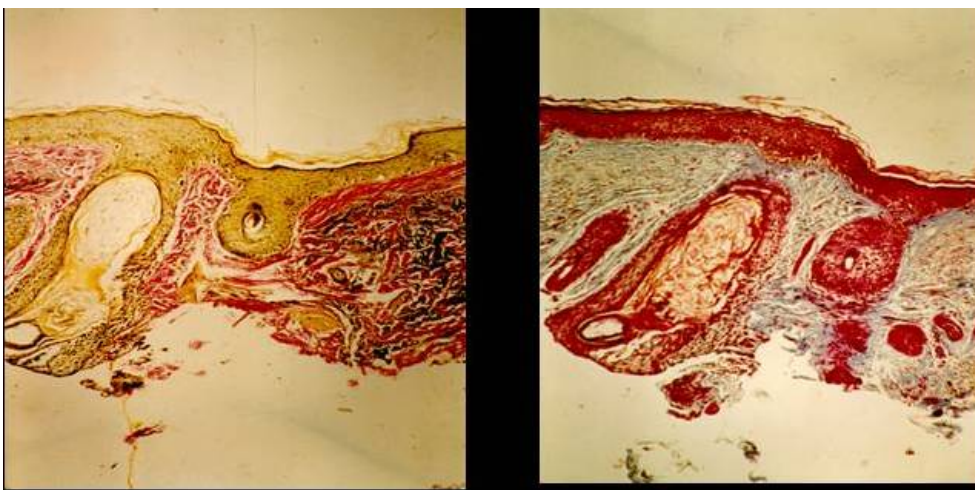


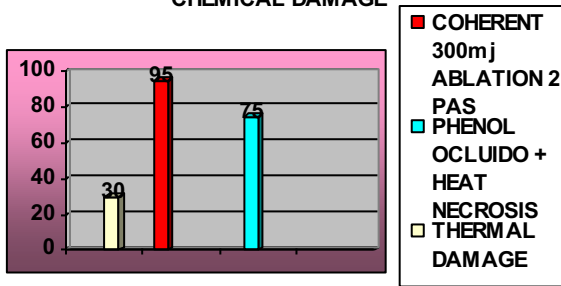
Figure7. 10 Years After Phenol Baker H.E - Patient Of 70 Years (biopsy done before applying Formula DeRossiFattaccioli to make new Peeling Phenol Croton)

Absence of Solar Elastosis. Hyperkeratosis moderate. Moderate epidermal atrophy without atypia of basal keratinocytes Persistence of collagen Compact laminar papillary dermis. Abundant collagen horizontalized around annexes in reticular dermis

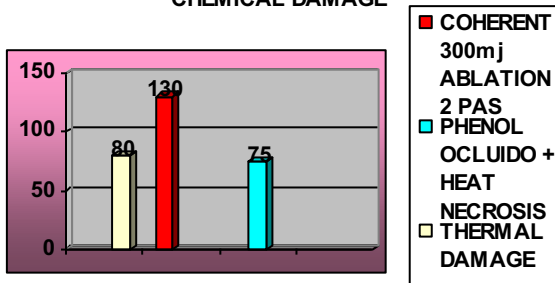
When measuring with magnification 100x microscope with calibrated micrometer, it was observed that with 2 pass ablation the penetration with CO2 Laser was 95 +/- 8 um, with thermal damage of 30 +/- 2 um. With 3 passes ablation the penetration was 130 +/- 5um and thermal damage 80 +/- 2um. With peeling phenol Croton De Rossi Fattaccioli DRF occluded more heat the penetration was 75 +/- 7 um.

The zone of neo-collagen formed was ultrapulse CO2 laser (Coherent 2 passes ablation) 140 +/- 10 um, with 3 passages ablation 180 +/- 9 um. and with Phenol DRF occluded peeling 400 um.

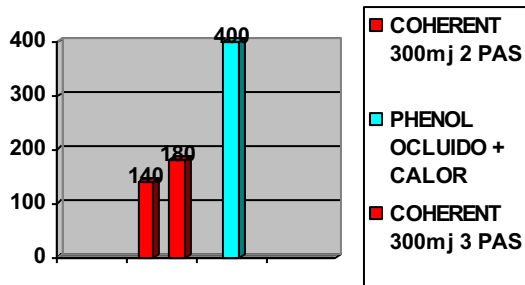
GRAPH 1
DEPTH: 2 PASS-ABLATION THERMAL-
CHEMICAL DAMAGE



GRAPH 2
DEPTH: 3 PASS-ABLATION THERMAL-
CHEMICAL DAMAGE



GRAPH 3: NEO COLLAGEN FORMED



Conclusions

It has been confirmed that phenol and other chemicals cause destruction of the dermo-epidermal tissue. In the unique case of Phenol, its penetration is directly proportional to its dilution and occlusion and its action is necrotizing by contact. With respect to trichloroacetic acid, resorcinol, AHA it is proven that its penetration depends on its concentration; the time between its application and neutralization as well as the times and pressure of the application.

The destruction occurs until the deep reticular dermis and in tissue regeneration a compact "neocollagen zone" is formed in all the destroyed areas.

The neocollagen zone replaces the elastosis layers of the photodamaged dermis that are necrotized by the phenol peel. Several studies have shown that the collagen zone generated by chemical peels is directly proportional to the extent of chemical destruction and the potency of the acid used (24).

The DRF De RossiFattaccioli solution we use penetrates deeper and more extensively than the Backer-Gordon solution because it uses heat, which is why the neocollagen zone is higher than in other studies.

The solution of Fenol DRF seems to act more actively in depth and in the presence of fundamental substance and water in the reticular dermis and, despite being less invasive than other Resurfacing treatments, it respects the annexes in the middle and lower portions of the body. which will occur the regeneration of the tegument.

Also, the occlude with adhesive tape ensures its penetration. In this study the results of the peels with Phenol undoubtedly demonstrate that there is a significant and greater destruction of the epidermis and median-deep reticular dermis and the neocollagen zone is directly proportional in extension and compaction to this destruction observed from the first day.

The histological findings confirmed by this study confirm those described above.

With regard to the results obtained by the Pulsed Laser system, the benefits of Laser Resurfacing are described. (1-10).

The depth of the ablations were those described for 2 and 3 passes, in the same areas of the face and are proportional to "fluence delivery". The results were measured in the 3rd month, the new collagen deposits replaced the dermal elastosis of the photodamaged skin that was vaporized or thermally affected.

In recent publications, they find that with respect to ablation-destruction with Laser CO2 Coherent Ultrapulse at 350 mj 2 passes penetration was 105 +/- um with a thermal injury of 37 +/- 6 um. At 500 mj the penetration was 134 +/- 13 um and the thermal injury 50 +/- 7 um.

The peel with Fenol Backer-Gordon caused a penetration-destruction of 41 +/- 8 um not occluded and 56 +/- 10 um occluded. At 3 months with the CO2 Laser 350 mj the neocollagen zone formed was 150 +/- 18 um and with 500 mj 190 +/- 20 um.

With the peel with phenol the result was neocollagen not occluded 260 +/- 22 um. Occluded 350 +/- 20 um with what demonstrated that the Fenol Backer having less penetration-destruction almost doubled the extension (length-width-volume) of the new collagen zone formed. (11)

With respect to the ultrapulsed CO2 laser, the epidermal atrophy and atrophy of the photo-damaged skin itself as well as elastosis were eliminated. The biopsies show normal regeneration of the epidermis, the melanocytes show hyperplasia and hypertrophy that go normalizing as time passes. The density and melanocytic functioning appear normal. All final biopsies show a substantial increase in neocollagen formation in both the papillary and superficial reticular dermis. This is associated with a similar degree of proliferation of elastic fibers as well as the decrease in glycosaminoglycans which are typically present in damaged photo dermis elastosis. The epidermal melanocytes after 2 months appear completely normal. (25)

With respect to Phenol, the increase in glycosaminoglycans was shown at the beginning and began to decline from day 30 to normalize from day 60 (26). Elastic fibers show a marked morphological change. These fibers related to this area of regenerated dermis were immature, apparently fragile and scattered after six months of treatment. Preliminary tensiometric analyzes of skin treated with phenol six months later indicated that the elastic fibers were thinner and weak in appearance (27).

This study shows that both treatments are the most effective, safe and with predictable results, with longer results and clinically give much satisfaction to both those who practice them and the patients treated.

Deposits of neocollagen, elastic fibers are evident and histologically proven.

All the histological signs of photo damage are replaced by new tissue with a reorganization of the dermal structural elements and an increase in the dermal volume.

Now, the chemical peel with Phenol being less penetrating is the one that produces the most collagen, and the DEROSSIFATTACCIOLI DRF formula is more producing neocollagen than that of Backer-Gordon, therefore, it produces the most remarkable and lasting effects than any other rejuvenation method.

All precautions must be taken into account when performing it, due to the high possibility of complications, being so sensitive-dependent to the doctor who performs it, for his technique and training.

While Resurfacing with CO2 laser ultrapulsed and FRACTIONATED have proven to be a safer weapon, with technology that supports the physician, not producing the hypopigmentation of phenol with a erythema that lasts a little longer that is reversible, being more attractive to patients more youngsters (Baby Boomer Generation). Thermal damage is an issue that is still controversial with regard to its action on the formation of collagen.

Bibliography

1. Goodman GJ. Laser CO2 Resurfacing, Preliminary observation in short follow-up period. Subjective study of 100 patients, attitudes and Dermatologic Surgery 1998; 24: 665-72
2. Nannica CA, Alster B. Complications of CO2 Laser Resurfacing. Evaluation in 500 patients. Dermatologic Surgery 1998; 24: 315-20
3. Trelles MA, Rigan J., Mellor TK, Garcia LA. Clinical and Histological Comparison of Laser Flash Scanning versus Technology Pulsed in CO2 Laser Resurfacing facial skin, Dermatologic Surgery 1998; 24: 43-9.
4. Yang CC., Chai CY. Animal skin study using ultrapulsed CO2 laser. Ann. Plastic Surgery 1995; 35: 154-8.
5. Ruboch BW, Schroenrock LD. Clinical Evaluation in Facial Resurfacing using a CO2 laser with a computerized generator module. Arch. Otolaryngol, Head Neck Surgery 1997, 123: 929-34
6. Shim E, Tse Y, Velasquez E, Kamino H, Levine V, Ashinall R: Short pulse CO2 laser resurfacing in treatment of wrinkles and scars. Clinical Histopathological Study, Dermatologic Surgery 1998, 24: 113-7
7. David L, Ruiz Esparza J ., Rapid healing after skin resurfacing. Dermatologic Sur-gery 1997. 23: 359-61.
8. Smith KJ, Depth of skin Morphological damage and viability after 1.2 3 passes of CO2 laser pulsed from AHA. Energy of short pulses (Trapulse) in pig skin. Journal American Aca-demy of Dermatology 1997; 37 (xxx): 204-10
9. Kawar ANB, Waldorf HA, Geronemus RG. Histological comparison of CO2 laser (fibercarbon). Dermatologic Surgery 1996, 22: 343-48

10. Fitzpatrick RE, Goldman MD, Satur NM, Top WD. Resurfacing with CO2 laser pulsed on photodamaged facial skin. Arch. Dermatology 1996; 132: 395-402.
- 10a. Alster TS. Wrinkle resurfacing. Manual and techniques cutaneous laser, Philadelphia: Lippincott-Roren; 1997, pp 10422.
11. Moy LS, Kotler R, Lesser T. Histological evaluation of CO2 laser resurfacing v.s. chemical peels with phenol in vivo. Dermatologic Surg. 1999. August 25: 8, 597-600.
12. Lowe NJ, Lask GP, Griffin ME et.al. Skin Resurfacing with iultrapulse CO2 laser, Derma. Arises. nineteen ninety five,; 21: 10-25-29
13. Stegman SJ. Comparative histological study of the effects of 3 peeling agents and dermoablasi3n in normal and photodamaged skin. Aesthetic Plastic Surgery 1982; 6: 123-35.
14. Brody H, Chemical Peeling St. Louis, Mosby Year Book, xxxx 12 1997, 2nd edition.
15. Matarasso S., Glogau R. Chemical peels. Dermat. Clinics Cosmetics and cosmetics surgery in dermatology. 1991 - Vol 9 No. 1: 131-49.
16. Alt TH. Deep chemical peeling. Backer-Gordon Occluded, Review and Update, J. Dermatol. Surg. Oncol. 15; 980-993-1989
17. Litton C, Trinidad G. Chemosurgery of the eyelids in. Astens et col .. III International Symposium on Reconstructive Plastic Surgery. Baltimore Williams R Wilkins 1982 pp 341-45.
18. Brody HJ. Chemical Peeling, Complications. Journal Dermatologic Surgery Oncol. 1989; 15: 1010-19
19. Fitzpatrick RE, Top WD, Goldman MP, Satur NM. Ultrapulsed CO2 laser, ATC, Fener Backer-Gordon and Dermarasion, Clinical and Clinical Comparative Study in Cutaneous Resuracing in porcine model. Arch. Dermatol. nineteen ninety six; 132: 469-71.
20. Glogau RG; Matarasso S. Dermatolo. Clinics Cosmetics dermatology. WB Sanders 1995 Vol 13; 2: 263-76.
21. Alster SA, Nanori Ch.A. Prophylaxis of reactivation of herpes simplex with Fanciclovir post Laser Resurfacing. Dermatologic. Surgery 1999; 25: 242-3.
22. Traucessec JM. French Cosmetic Surgery Magazine, 1996, 40: 23-28
23. Cook K.K .; Cook Jr. W. Chemical peeling of non-facial skin using glycolic acid gel with A.T.C. and neutralizing it according to visual studies. Dermatology Surg. 2000, Nov; 26: 11: 994-99
24. Cisneros JL, Marti M, Palou J. Clinical correlation of intermediate chemical peels vs Resurfacing with CO2 and ND laser: Yag Q-Switched poliderm. Med. Cutan. Iber. The t. Am. Vol. XXIV / 96: 179-185
25. Stuzin JM, Baker TJ; Baker TM; Kligman AM. Plastic Reconstuc Surg. 1997-Jun, 99: 7,2036-50; Discussion 2051-5.
26. Chemical peeling on photodamaged skin in an experimental study. Plast. Reconst. Surg. 2001, Jan 107 (1): 222-8
27. Giese SY, McKinnay P., Roth SI, Sukowski M .. The effect of surgical chemical peels and dermoabrasion in dermal elastic tissue. Plastic Reconst. Surgery 1997 Aug: 100 (2) 489-98, discussion 499-500.

