

# Innovation in the concept of controlled chemical dermabrasion: ME LINE, with depigmenting, rejuvenating and recovering effects on phototypes I-IV.

## AUTHORS

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## SUMMARY

We have a great many therapeutic weapons on the field of Cosmetic Dermatology. The controlled chemical dermabrasion technique represents a major step forward, particularly for severe hyperpigmentation conditions, either melanic or melano-hematic seen in the dermatology clinic. Here, we describe a new technique to treat hyperpigmentation, skin aging and acne.

## MATERIALS AND METHODS

The controlled chemical dermabrasion treatment is a combination of the products ME LINE 00 PREP and ME LINE 01 PRO and utilizes a series of active ingredients at high concentrations, applied in the form of an occlusive emulsion for a period ranging from 45 minutes to 2 hours. Different active ingredients are added to its basic composition according to the predominant lesion to be treated. ME LINE 02 HOME is then used for maintenance. 168 cases were treated, 45 with hyperpigmentation of various types, 55 with signs of skin aging, 42 with seborrheic skin and 26 with melano-hematic pigmentation. Results were evaluated via visual inspection by the researches and using photographs taken before and after the procedure. In 3 cases, skin biopsies were taken before and after the treatment. The study was carried out on patients of phototype I-IV.

## RESULTS

In the hyperpigmentation group, excellent results were seen in 95% of cases, in 90% of cases for the aged skin group, in 85% of patients with acne-prone skin and in 65% of cases with melano-hematic pigmentation. Immediate effects included erythema and fine desquamation. There were no complications to the treatment.

## CONCLUSIONS

The ME LINE treatment represents a major innovation in the field of dermo-cosmetics by virtue of its results and polyvalence, able to treat a range of indications.

## KEYWORDS

Acne

Dermatitis

Pigmentation

Rejuvenation

Controlled Chemical Dermabrasion

Skin aging represents the range of changes and alterations that occur in skin due to the passage of time. It becomes dry and fragile, with epidermal atrophy, alongside a progressive increase in wrinkles.

Photo-aging of the skin is due to excessive sun exposure throughout life, from childhood. One of its signs is hyperpigmentation, associated with increased melanin levels due to melanocyte hyperactivity.

Melasma and/or chloasma are conditions involving facial hyperpigmentation, which are very challenging to treat, particularly due to their tendency to recur. It should be noted that other pigmented lesions and tattoos are best treated with laser as first line therapy.

Melano-hematic pigmentation is partly due to pigment leakage and hemosiderin deposits. When iron is maintained in its ferrous state, its reabsorption is facilitated via the action of vitamins C and E.

## MATERIALS AND METHODS

We carried out a study on 168 patients divided into four groups in line with the predominant lesion to be treated: the first group was made up of 45 patients (40 women and 5 men) with pigmentation disorders, the second of 55 patients with skin aging (45 women and 10 men), the third of 42 patients (38 women and 4 men) with acne-prone skin (42) and the fourth of 26 patients (22 women and 4 men) with a range of conditions involving melano-hematic pigmentation.

The first group was further subdivided according to the predominant lesion, be it melasma (35 cases) or chloasma (10).

The second group included patients with signs of chronological aging, photo-aging (groups I-IV on the Glogau classification) and hormonal aging. The third group included ochre dermatitis (7), hyperpigmented scars (6), post-sclerotherapy hyperpigmentation (5) and necrobiosis lipoidica (8). The patients included in the study belonged to phototypes I-IV. Overall, there were 140 women and 28 men. In all cases, informed consent was obtained regarding the study to be carried out. Prior to application of the chemical dermabrasion, the patients applied factor 50 sun protection using the Colipa method.

ME LINE 01 PRO is applied in the form of a uniform and compact semi-occlusive emulsion mask. Its basic composition consists in different concentrations of tranexamic acid, mandelic acid and kojic acid, in addition to vitamin A derivatives, arbutin, cysteamine, mimetic peptides and chelating agents.

Acne-prone skin is characterized by increased sebum secretion, more dilated pores and a degree of accompanying redness or erythema, particularly in fairer phototypes. This is a hereditary and constitutional skin type which is aggravated by various factors, which may be psychological, dietary or hormonal. One of the therapeutic arms offering the best results is controlled chemical dermabrasion.

ME LINE's controlled chemical dermabrasion product represents a new option for all of the indications described above. It is an innovative treatment in terms of its application in the form of an occlusive emulsion, composed of various depigmenting active ingredients which act at different points in the pigmentation cascade, and in terms of its leave-on time. This study's objectives are to demonstrate that ME LINE'S controlled chemical dermabrasion is an effective treatment for a range of indications in the field of dermo-cosmetics offering a high degree of safety.

Mandelic acid produces a good peeling activities and is a melanin synthesis inhibitor, as it is a mildly-irritating substance. Kojic acid is a powerful, non-cytotoxic depigmentator, which inhibits tyrosinase through iron ion chelators in the active 5,6-dihydroxyindole-2-carboxylic enzyme tautomerization suppression sites, and inhibits the conversion of o-quinones, norepinephrine and dopamine in the corresponding form of melanin. Retinoids work through an exfoliating effect and disperse melanin granules within the keratinocytes, which results in their elimination due to the increased renewal of epidermal cells. Arbutin, for its part, inhibits tyrosinase through the polymerase of 5,6-dihydroxyindole-2-carboxylic acid (DHICA) and inhibits melanosome maturation.

ME LINE 02 HOME was used for maintenance. It was applied from the third day following treatment with ME LINE 01 PRO, once a day for the first two weeks and then twice a day if well tolerated. The maintenance product's active ingredients are: tranexamic acid, mandelic acid, glutathione, chelating agents, phytic acid, vitamin A derivatives, oligopeptides and rucinol.

The study measured the results achieved after application of the ME LINE controlled chemical dermabrasion product in two sessions, one month apart, following which the post-treatment product ME LINE 02 HOME was applied and results were observed after both the first and second session.

### Contraindications for the technique

1. Active skin infection (especially with herpes simplex)
2. Known allergy to any of the active ingredients in ME LINE
3. Presence of purpuric lesions
4. Recent sun exposure
5. Photosensitivity and autoimmune diseases
6. Immediate social engagements

### ME LINE controlled chemical dermabrasion application technique:

**First of all, ME LINE 00 PREP is applied as a vehicle solution and to exfoliate the skin prior to treatment with ME LINE 01 PRO in view of achieving greater bioavailability of the various active ingredients.**

**The following steps are then followed:**

#### Skin preparation

1. Thoroughly cleanse and de-grease the skin to remove any traces of make-up or sebum which could interfere with the results of the peel, then dry the skin. Pour the contents of the ampoule into a suitable container and apply one or two uniform layers over the entire face using a cotton swab, before leaving on to act for 3-5 minutes as per the professional's judgement. yuda de una torunda de algodón y dejar actuar durante 3-5 minutos, dependiendo del criterio del profesional.
2. Apply 2-3 layers one after the other, in line with the patient's tolerance and pigmentation level.
3. Remove product with plenty of water and rinse.

#### Controlled chemical dermabrasion mask application

1. Apply a medium thickness layer of ME LINE 01 PRO as evenly as possible.
2. Apply a thicker layer on areas with more intense lesions, e.g. more marked hyperpigmentation, greater concentration of fine expression lines or more seborrheic areas.
3. Leave on for 45 minutes to 2 hours in line with the phototype, the indication and the treatment area.
4. Once the appropriate leave-on time is over, clean and remove the mask cream with a gentle, lipid-rich soap.

## POST-TREATMENT

24 hours post-treatment the patient may experience pruritus, erythema, a pulling sensation and, in the case of patients having had a longer leave-on time, mild edema which may remain for 1-3 days. 48 hours after the treatment, fine desquamation will start, lasting 3-4 days.

After 3 days, the patient can start to apply ME LINE 02 HOME at home once a day, preferably at night. The post-treatment care is completed with a highly concentrated hyaluronic acid serum ME LINE 03 MOIST, in view of repairing and hydrating the skin to promote recovery. In addition, with a view to protecting the skin and attenuating the appearance of pores, redness and blemishes, the

treatment is also completed with ME LINE 04 B.B.

The patients attended follow-up 3 months after the 2nd application of the ME LINE 01 PRO mask.

The clinical evaluation was carried out by the researchers and using photographs before and after the application of the ME LINE products and at 3-month follow-up.

In 3 cases (2 melasma and 1 photoaging), histological analysis was performed before and after the treatment.

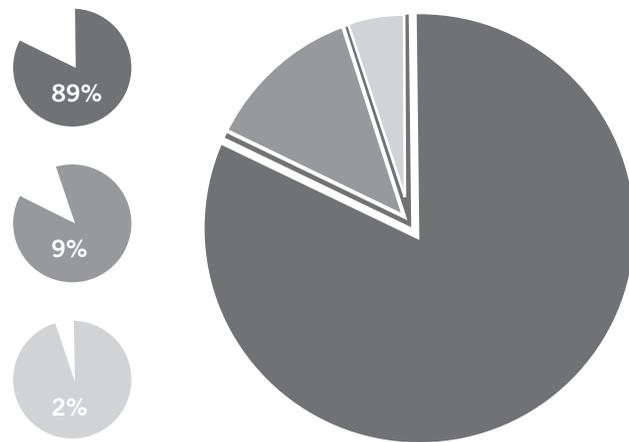
## RESULTS

### Primer grupo: Hiperpigmentación

With regard to the total number of patients studied, excellent results were obtained in 89% of cases; good results were obtained in 9% of cases and average results were obtained in 2% of cases (Graph 1).

#### Hiperpigmentations Patients Improvement treated with ME LINE

Of the 89% with excellent results, the majority saw a reduction of 95% hyperpigmentation after the second application, and a reduction of more than 60% after just one treatment. In the worst cases, cases with high phototypes, the application was successful for up to 4 hours.



Lesion	Nº patients	IMPROVEMENT		
		1st application	15 days	1 month
Melasma	32	50%	75%	95%
Chloasma	8	40%	60%	95%

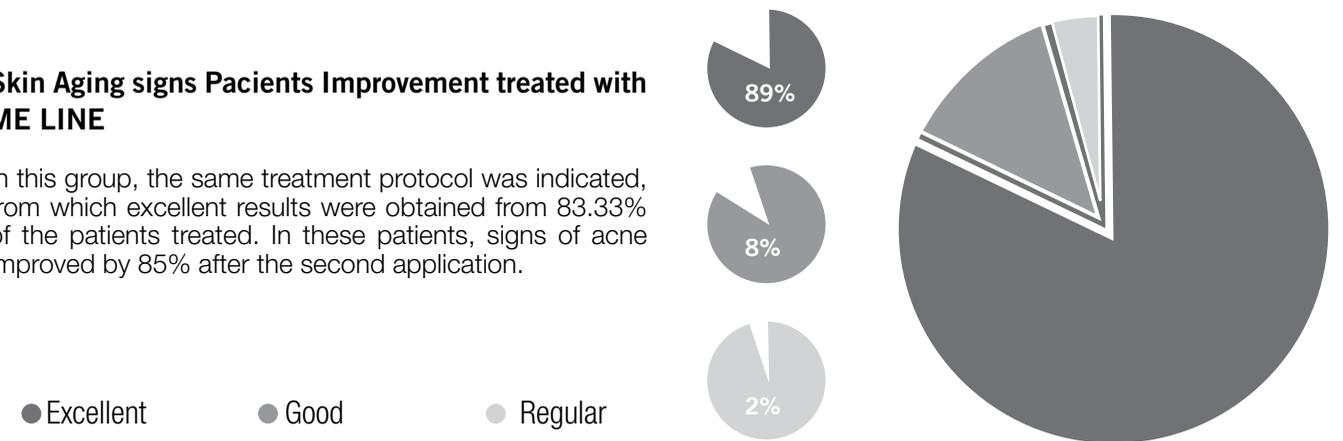
Table 1. Results of primer group (hyperpigmentation)

### Second group: Aged skin

In this second group, of the total patients treated after the second application, excellent results showing an improvement of 85.45% were obtained; a smaller percentage in comparison to the first group (Graph 2). In this 85.45% of patients, after treatment had concluded, signs of improvement were assessed at 90%.

#### Skin Aging signs Patients Improvement treated with ME LINE

In this group, the same treatment protocol was indicated, from which excellent results were obtained from 83.33% of the patients treated. In these patients, signs of acne improved by 85% after the second application.



Lesion	Nº patients	IMPROVEMENT		
		1st application	15 days	1 month
Skin Aging	29	65%	70%	90%
Photoaging	18	75%	80%	90%

Table 2. Results of second group (aging)

**Third group: Acne-prone skin**

In this group, the same treatment protocol was indicated, from which excellent results were obtained from 83.33% of the patients treated. In these patients, signs of acne improved by 85% after the second application.

Lesión	Nº patients	IMPROVEMENT		
		1st application	1 month	2nd application
		15 days	1 month	1 month
Acne-prone skin	42	50%	60%	85%

Table 3. Results of third group (acne-prone skin)

**Fourth group: Melano-hematic pigmentation**

In the case of the results from this group, the data obtained was more varied and considered good in little more than 50% of the people treated, which was to be expected, taking into consideration the etiology of these pigmentations.

Lesión	Nº patients	IMPROVEMENT		
		1st application	1 month	2nd application
		15 days	1 month	1 month
Ochre Dermatitis	7	35%	50%	65%
Scars	6	40%	50%	50%
Hyperpigmentation	5	35%	60%	50%
Post-sclerosis Necrobiosis lipoidica	8	30%	40%	60%

Table 4: Results of fourth group (melano-hematic pigmentation).

The results achieved were maintained at 3-month follow-up.

With regard to tolerance of the treatment, there were no unpredictable immediate effects nor remarkable complications. The aforementioned erythema and desquamation were easily controlled using the pre-set protocol.

In the cases where histological analysis was carried out, a thickening of the epidermis was seen with moderate hyperplasia of the stratum granulosum, increased number of fibroblasts, neoformation of collagen and elastin fibers, slight angiogenesis and reduced melanin.

**COMMENTARY**

The many techniques available in the field of dermo-cosmetics (dermabrasion, laser, intense pulsed light, etc.) have evolved rapidly in recent years thanks to ever greater interest on the part of dermatologists and the pharmaceuticals industry, and demand from patients in search of an improvement in their appearance.

All of the techniques available offer excellent results if indications are respected and patients are selected appropriately.

Within the category of so-called chemical peels, there are a great many options available on the market. Classically, they tend to be divided into superficial, medium and deep. The most commonly used peels are superficial, based on alpha-hydroxyacids (50-70%) and salicylic acid (20-30%). Depending on the concentration, trichloroacetic acid can be applied as a superficial (10-20%), medium-depth (20-35%) or deep (35-50%) peel.

Controlled chemical dermabrasion acts to medium depth and is a very effective tool in expert hands at the dermatology clinic.

The new ME LINE chemical dermabrasion product studied here offers the innovation of combining several active ingredients at different and variable concentrations. It is applied as a dense, even, semi-occlusive emulsion. It treats the deep epidermis and papillary dermis. The product's combination of active ingredients work to lighten pigmentation, reduce the size of the pilosebaceous ducts, attenuate fine expression lines and partially reabsorb hemosiderin. The depigmenting agents block the enzyme tyrosinase, thus inhibiting the conversion of tyrosine to melanin. This mechanism is promoted by the superior penetration achieved thanks to the exfoliant action of the other active ingredients. The exfoliant agents reduce the skin's pH, while the proteases break the bonds between proteins, causing corneocytes to slough off and the epidermis to desquamate. The semi-occlusion allows for superior penetration of the active substances. The results achieved confirm the treatments polyvalence, effective for pigmented lesions (specifically melasma and chloasma) resistant to treatments known to date, for anti-aging effects, the treatment of acne and of extravasated hemosiderin. The depigmenting effect achieved with two sessions of ME LINE for both melasma and chloasma is difficult to

achieve with other products on the market to date, which almost always cause a very severe pigmentation rebound effect. Although the high degree of recurrence of pigmentation disorders is well known, result maintenance can be ensured with the use of ME LINE 02 HOME to inhibit all stages of melanin formation, with no rebound effect.

Very promising rejuvenation results were achieved, particularly given the technique's ease of application and minimal risk. This excellent safety profile sets it apart from other medium-depth peels or laser resurfacing. To maintain the rejuvenation results, annual maintenance treatments are recommended.

Results ranging from good to excellent were achieved on acne prone skin and dilated pores, thus offering us a further therapeutic weapon able to be combined with other techniques and oral treatments.

This study confirms ME LINE's favorable tolerance and excellent safety profile for phototypes I-IV, with no complications observed in the 168 patients. To achieve these results, it is essential to determine the product's application time. Clinical follow-up allows a clear improvement to be observed after the first week. From the third day, the patient can start to apply ME LINE 02 HOME at night, adapting application frequency to tolerance. After a month, full results can be appreciated and the patient can re-introduce their usual cosmetic products and undergo a second application.

Another advantage offered by ME LINE is its ability to treat non-facial areas such as the neck, the pre-sternal region, hands and limbs. In cases of melano-hematic pigmentation, it was applied to a variety of areas, with no complications. More cases and new studies will be needed to confirm its efficacy in these areas. Based on the results achieved with the various agents on various pathologies, this therapy appears to treat all of their indications, employing active ingredients considered essential at the best-suited concentrations to achieve optimal therapeutic results.

VISIBLE RESULTS



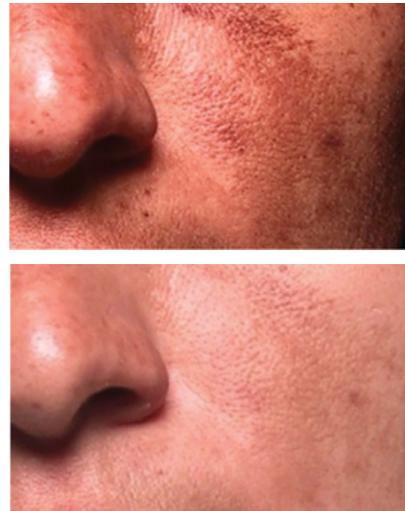
**Figure 1.**  
Patient with melasma-type hyperpigmentation

**Figure 2.**  
Visible results achieved after 60 days' treatment.



**Figure 7.**  
Patient with marked skin aging, pigmented lesions and expression lines.

**Figure 8.**  
Same patient treated with MELINE 01 PRO and MELINE 02 HOME after 60 days.



**Figure 3.**  
Patient with melasma on the face.

**Figure 4.**  
Visible results achieved after 60 days' treatment.



**Figure 9.**  
Patient with severe acne.

**Figure 10.**  
Results achieved after 60 days' treatment with MELINE products.



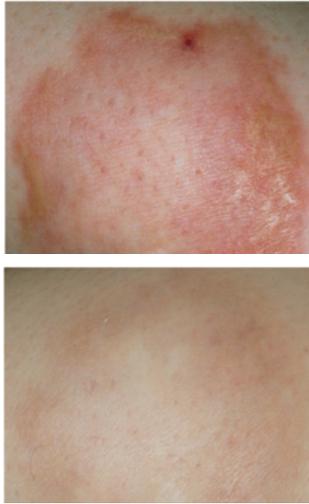
**Figure 5.**  
Patient with very marked chronological photo-aging.

**Figure 6.**  
Results achieved after 60 days' treatment.



**Figure 11.**  
Patient with ochre dermatitis-type hyperpigmentation affecting the thigh.

**Figure 12.**  
Results achieved after 60 days of treatment with MELINE products.



**Figure 13.**  
Patient with very marked necrobiosis lipoidica.

**Figure 14.**  
Same patient with necrobiosis lipoidica after 60 days' treatment with MELINE products.

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