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### Abbreviations

PIH: Post inflammatory  
hyperpigmentation; EGF: Epidermal  
growth factor; TGF Beta 3: Transforming  
Growth Factor type beta 3

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Case Report

# Combined Protocol of Micro Needling with Chemical Peelings for Intimate Skin Whitening

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### Abstract

Post-inflammatory hyperpigmentation in the intimate region is a cause of complaint among women with skin phototypes II and IV. Several techniques such as Laser, chemical peelings, skin lighteners are used in isolation without success in the treatment of these dyschromia. The present study shows a practical and systematic way of combining micro needling techniques, chemical peelings and home care depigmenting agents, with just one treatment session, promoting significant lightening of hyperchromia in women.

### Introduction

The skin is considered the largest organ of our body and one of its main functions is to protect. This protection is carried out mainly by the outermost layers: epidermis and dermis [1]. In the epidermis stand out keratinocytes, cells responsible for the formation of the epidermis itself and stratum corneum, and melanocytes, cells that produce melanin [2]. Melanin is a heterogeneous protein synthesized from the amino acid L-tyrosine, which has the function of protecting against ultraviolet rays, helping to control body temperature, gives color to the skin, eyes and hair, in addition to having an antioxidant and anti-inflammatory action [3]. Melanin is considered a defense protein, therefore, every time the skin is attacked, melanocytes will be activated to increase production and deposition at the site of aggression [4].

Post inflammatory hyperpigmentation (PIH) is common in skin phototypes above III and causes a considerable change in quality of life. The armpit and groin regions, especially the genital region, suffer a lot of trauma due to friction from skin and clothing, leading to darkening increased melanin deposition [5]. The classic treatment is done with whitening creams that can take about 4 to 6 months to promote a significant improvement [6]. Depigmenting agents act on different targets in the process of melanin formation and aim to reduce the speed of synthesis of a new pigment. Among the agents, we can highlight hydroquinone, alpha arbutin, niacinamide, kojic acid, phytic acid, vitamin C among others [5].

Micro needling is a technique that uses microneedles to open microchannels to increase the permeation of actives into the skin [7]. Opening of the micro channels by micro needling, presents a gateway for actives and acids to increase the renewal of the epidermis and consequently improving the desquamation process [8].

The objective of this work is to present a new protocol associating micro needling and chemical peelings to promote faster and more effective whitening of post inflammatory hyperpigmentation in the genital area of patients.

### Combined Protocol of Micro Needling with Chemical Peelings

10 female patients aged between 30 and 45 years, all classified by Fitzpatrick between III and IV, presenting PIH in the vaginal region, groin and legs, underwent only on session of the combined protocol of micro needling and peelings as described in detail:

- The site was previously cleaned with 10% urea foam, with light circular movements, removing excess products with dry gauze.
- An enzymatic cream containing 30% enzymatic complex extracted from pomegranate (Renew Zymeã) was applied, leaving it to act for 20 minutes. After this period, the product was removed with a gauze soaked in water.
- It was applied with the aid of gauze moistened in a hydroalcoholic peeling solution containing 25% mandelic acid and 15% lactic acid stabilized at pH 1.8 throughout the site, leaving it to act for 5 minutes. The peeling was removed with a 10% sodium bicarbonate solution soaked in gauze. It is very important to be careful not apply it on the mucous membranes.
- Micro needling was performed using a Dermapenã device coupled to a 36-needle cartridge at a depth of 0.5mm together with a serum containing the following actives and their concentrations: liposomal tranexamic acid 3% TGF beta 3 1.5% vitamin C 2% fluocinolone acetone 0.4%. the serum was applied before, during and after the procedure.
- After micro needling, without removing the serum, a thin layer of a peeling cream containing retinoic acid 3% ferulic acid 12% ascorbic acid 10% vitamin E 5% was applied and left in place for 4 hours. The patient removes the product at home with soap and water.

All Patients uses, for 7 days after the procedure, twice a day, a soothing regenerating ointment containing vitamin A 2% vitamin E 2% EGF 1% hydrocortisone 2% zinc oxide 10% raspberry oil 2%. After this period, the patients applied a skin care routine to the site, with a cream containing liposomal tranexamic acid 3% TGF beta 3 1.5% mandelic acid 6% alpha arbutin 5% kojic acid dipalmitate 3% fluocinolone acetone 0,1% stabilized at pH 4.0 for 30 days.

## Results

All patients were photographed on the day of the procedure, before using the combined technique. After 30 days all patients returned for new photos to be taken. In all cases, only one session of the combined technique of micro needling and chemical peelings was performed, with the use of a regeneration and a topical whitening emulsion in home care. In this paper we present some cases results in figures 1-4.

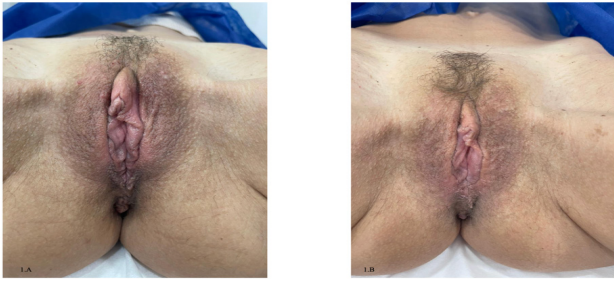


Figure 1: Presents 1.A before procedure and 1.B 30 days after procedure.

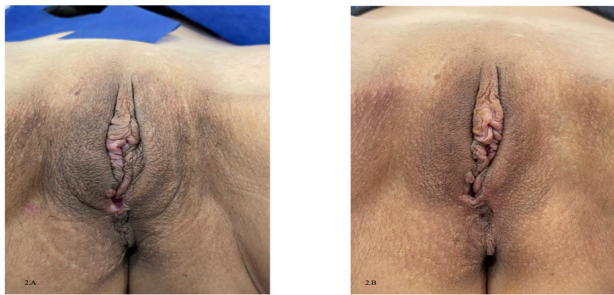


Figure 2: Presents 2.A before procedure and 2.B 30 days after procedure.

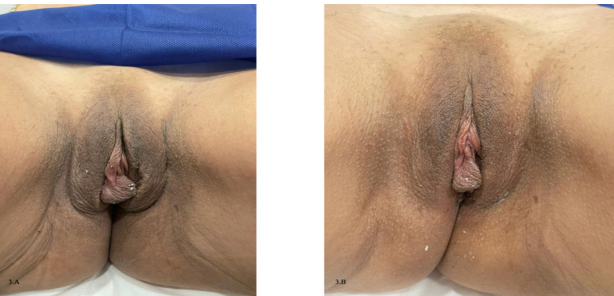


Figure 3: Presents 3.A before procedure and 3.B 30 days after procedure.



Figure 4: Presents 4.A before procedure and 4.B 30 days after procedure.

## Discussion

The principle of combining the techniques describe in this protocol aims to prevent activation, synthesis and deposition of melanin in the skin [9]. Micro needling has the function of drug delivery, increasing the permeation of whitening actives serum, reducing the synthesis of more melanin [10]. Chemical peels generate exfoliation and superficial peeling on the skin, without causing considerable aggression, in this way it is possible to efficient remove already formed melanin [6]. However, it is important to point out that, if you do not continue the treatment with whitening agents at home care, it is likely that the melanin will be formed again and deposited in the area [11].

Several studies demonstrate the ability to improve skin whitening results when the use of depigments is combined with micro needling [7,8,12]. As the melanocyte is locate at the dermal-epidermal junction, the active ingredients need to permeate to the basal layer of the epidermis [13]. The stratum corneum acts as a barrier to the entry of any substance into the skin [14]. The fact that the micro channels opened by micro needling help in the entry of the actives and consequently, promote a better absorption of the active's trough the drug delivery, presents a greater success in the whitening treatment [6,15].

Lactic acid and mandelic acid are two acids with characteristics in common, both are pH-dependent alpha hydroxy acids [16]. It has a mild exfoliative action and promotes an acting focused on the epidermis, generating an increase in cell turn over [17]. Retinoic acid is a cellular transcription factor acting on all skin cells [18]. In the epidermis, it can stimulate cell removal, promoting a slight desquamation in addition to dispersing the formed melanin. Combining ascorbic acid with ferulic acid, both excellent antioxidant agents, promote a calming and anti-inflammatory action on the skin [19,20].

PIH is chronic and multifactorial, therefore, treatment success depends on to combine the in-office procedure with home care treatment [21,22]. Therefore, the use of topical bleaching agents, such as alpha arbutin an important tyrosinase inhibitor and kojic acid, a copper chelating agent, are crucial for a good response in skin lightening [23,24]. Two actives present in serum and topical home care formulations deserve to be highlighted: TGF beta 3, which promotes an improvement in the quality of the dermal matrix, stimulating the synthesis of more extra cellular matrix and fluocinolone, a potent fluorinated corticoid that reduces inflammation local caused by friction of the skin [25-27].

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