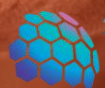




25th World Congress
of Dermatology
SINGAPORE 2023

Laser-assisted delivery

of vitamin C, vitamin E, and ferulic acid formula serum
for skin rejuvenation: a prospective split-face double-blind
randomized placebo-controlled trial



25th World Congress
of Dermatology
SINGAPORE 2023



HARVARD
MEDICAL SCHOOL



VALÉRIA CAMPOS

Chairs



Dr Purita (Peachy) Paz-Lao
Dermatologist
Philippines



Dr Klaus Fritz
Dermatologist
Germany



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Conflict of interest disclosure

- 1 Aché
- 2 Biotec
- 3 Fqm/
Neostrata
- 4 Loréal
- 5 Pharmapelle
- 6 Vyndence

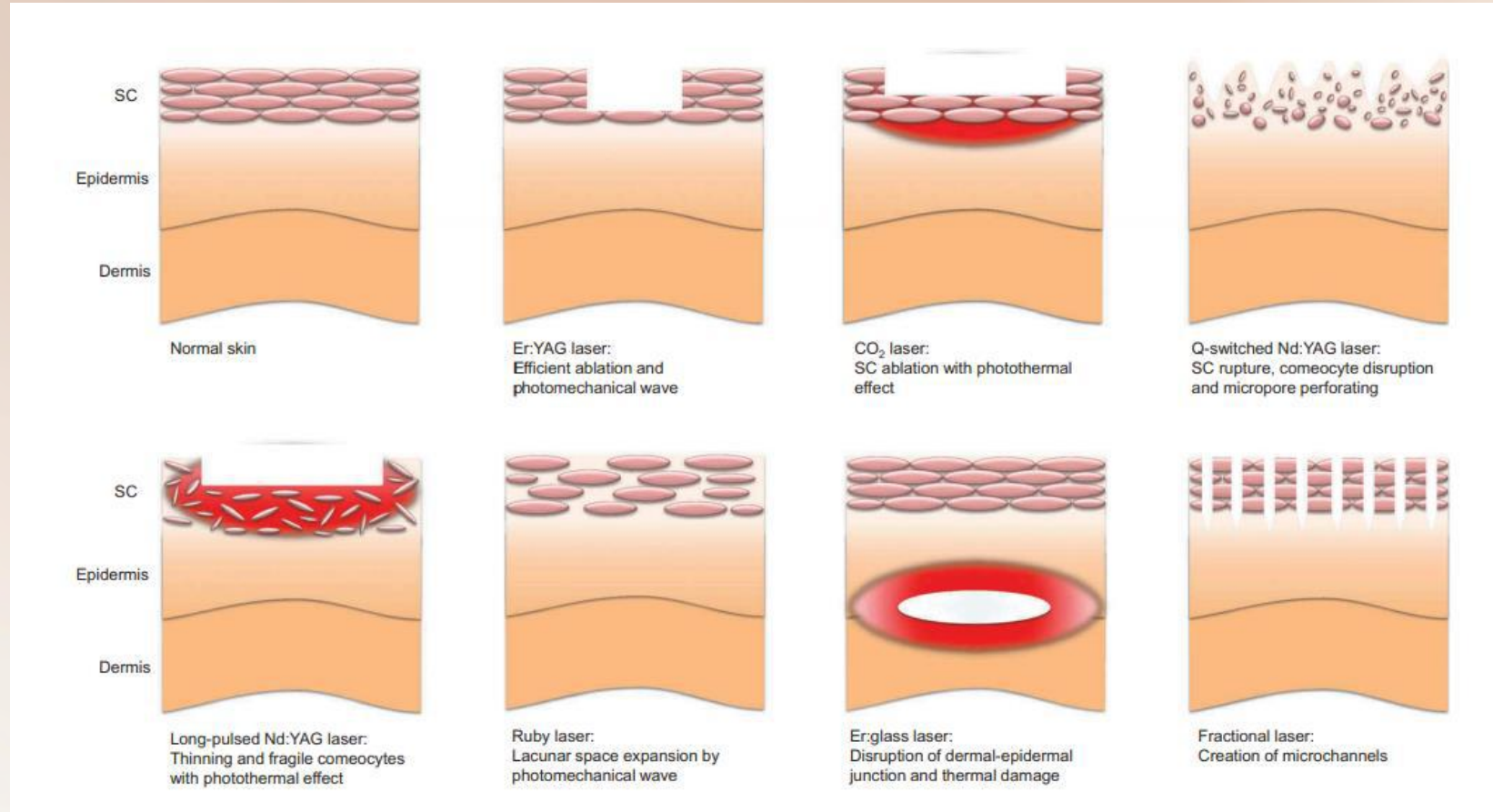
Drug Delivery in Dermatology

Fundamental and Practical
Applications

Célia Luiza Petersen Vitello Kalil
Valéria Campos
Editors

 Springer

Laser



Laser ablation and topical drug delivery: a review of recent advances
Chien-Yu Hsiao, Shih-Chun Yang, Ahmed Alalawi & Jia-You Fang
Expert Opinion on Drug Delivery 2019



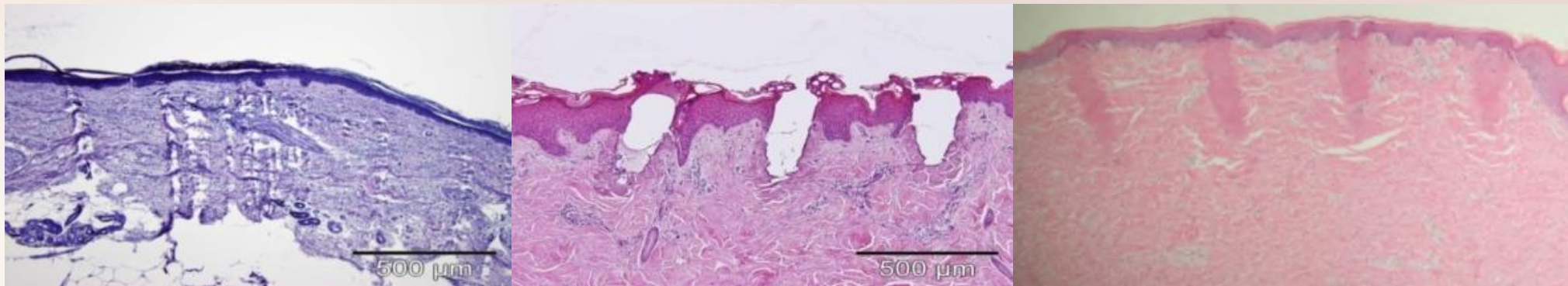
The
best...

Pretreatment of skin

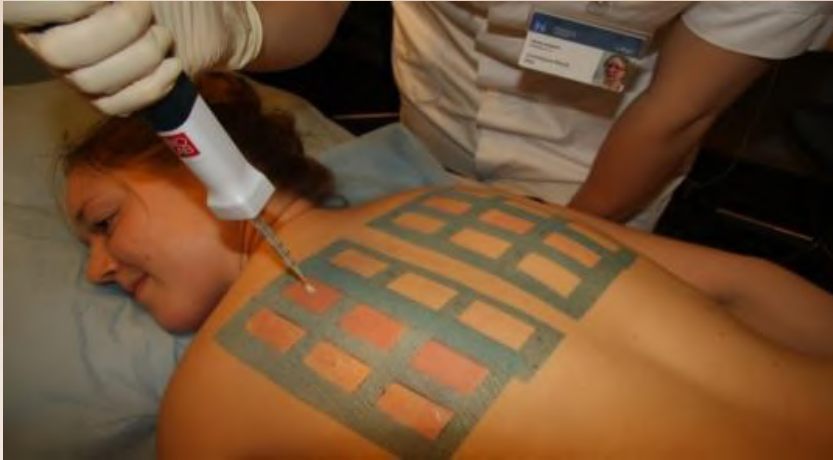
Physical Techniques

How efficacious are they?

- **Curettage** CU
- **Microdermabrasion** MD
- **Microneedling** MN
- **Ablative fractional laser** AFXL
- **Non-ablative fractional laser** NAFXL



Methods



- 12 healthy human volunteers
- Good Clinical Practice
- Randomized intra-individual trial
- Upper back – 17 test areas
- Physical preTx before MAL (Methyl aminolevulinate)- PDT
- -

CU



7-mm ring-curette

MN



Dermaroller

MD



Sandpaper 0.05-mm grains

AFXL



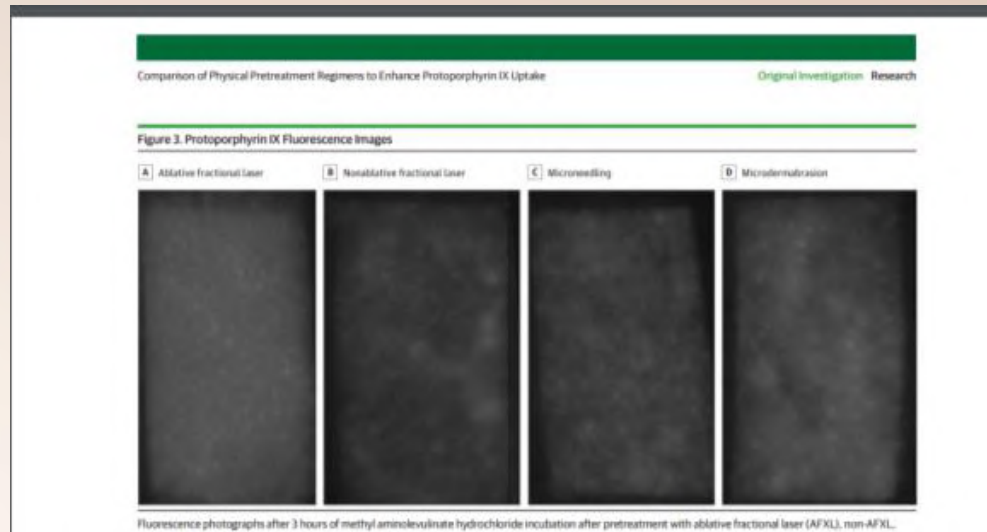
Fx CO₂ laser 10,600 nm

NAFXL



Er: Glass laser 1540 nm

COMPARISON OF PHYSICAL PRETREATMENT REGIMENS TO ENHANCE PROTOPORPHYRIN IX UPTAKE IN PHOTODYNAMIC THERAPY



PPIX accumulation was greater after pretreatment:

1. Ablative fractional laser

2. Microdermabrasion

3. Microneedling

4. Curettage

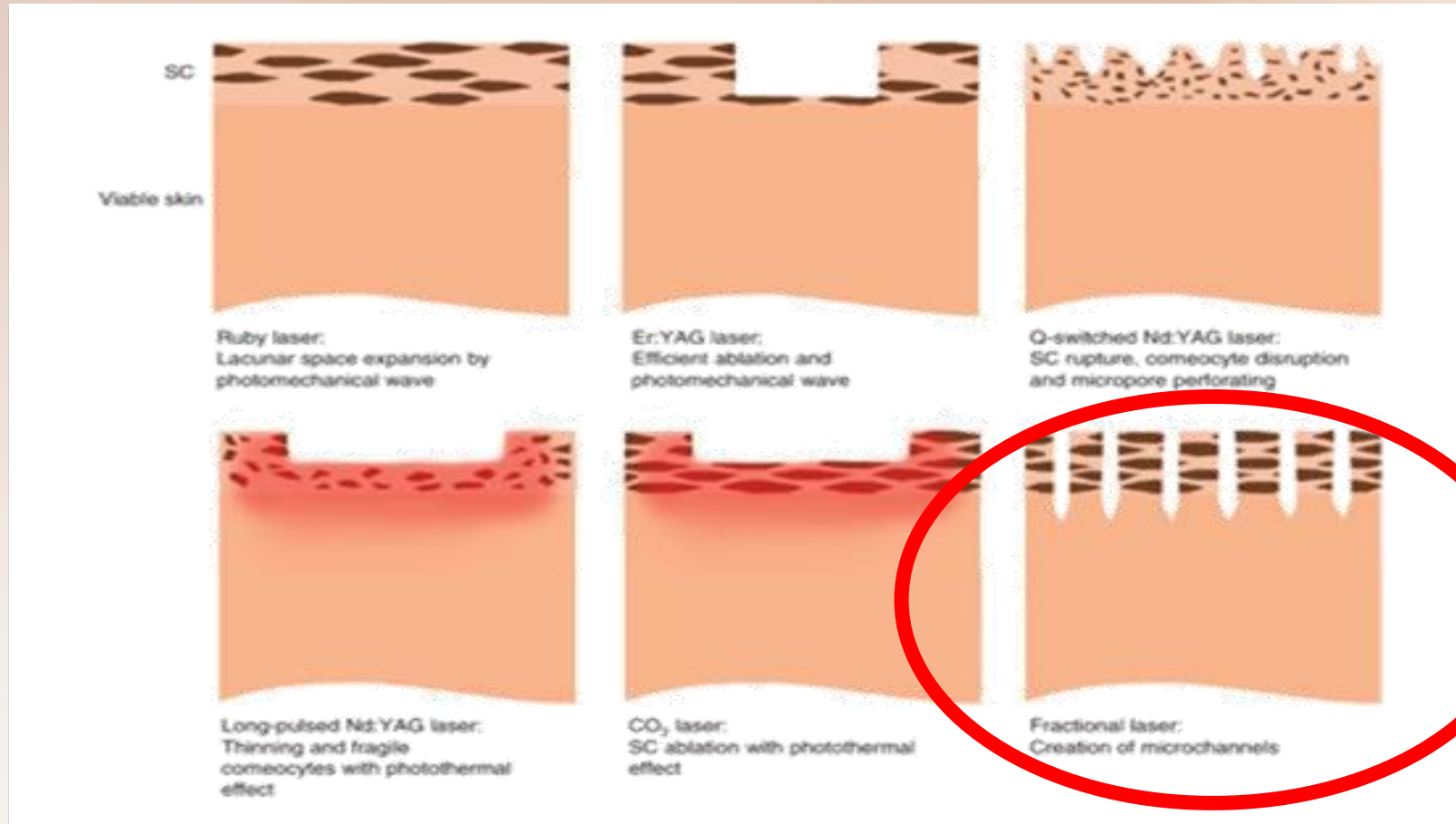
5. Non-ablative fractional laser

The increase in the number of pretreatment passes and laser densities did not increase PPIX accumulation

ABLATIVE LASER

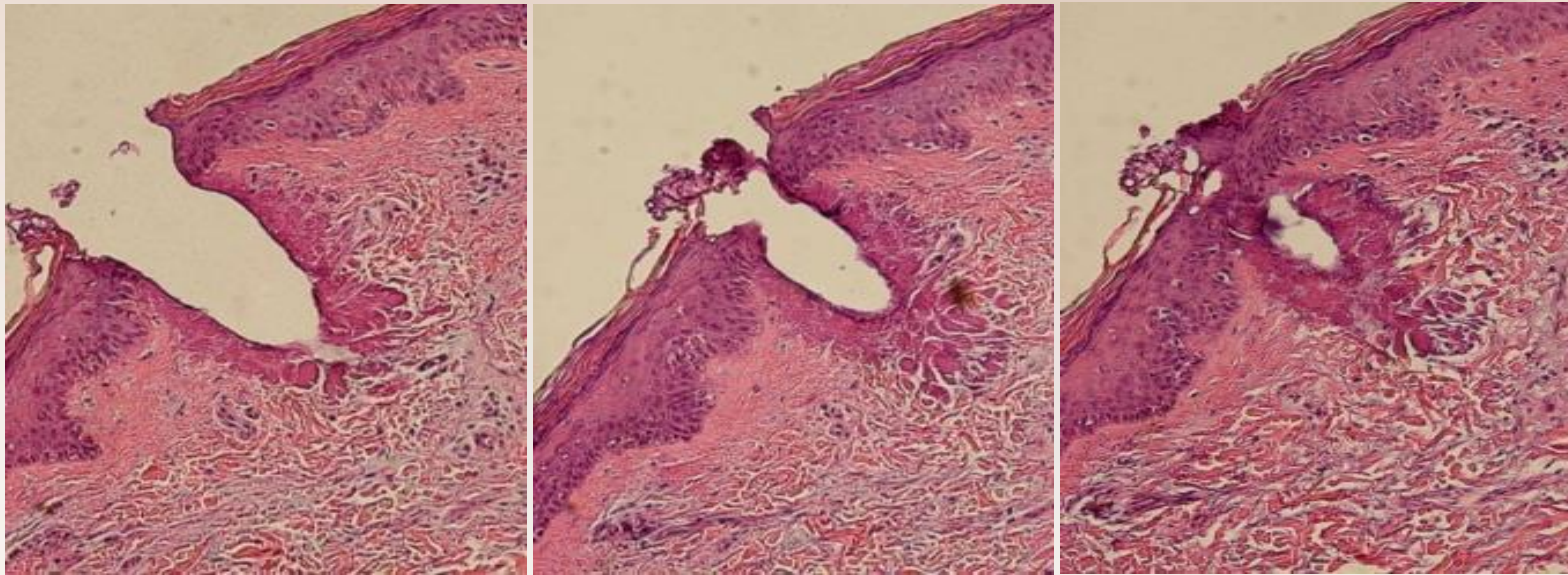


Lasers as na approach for promoting drug delivery via skin



Chih-Hung Lin, Ibrahim A Aljuffali & Jia-You Fang Lasers as an approach for promoting drug delivery via skin
Expert Opin. Drug Deliv. (2014) 11(4):599-614

Ablative Fractional Laser





**What is the best
drug for drug
delivery?**



VITAMIN C



The topical use of vitamin C is considered to be effective in stimulating fibroblast activity and hasten wound healing. The topical application of a Vitamin C, Vitamin E, and Ferulic acid serum immediately following fractional ablative CO₂ laser therapy did not result in associated complications.

Randomized Controlled Trial > [Lasers Surg Med.](#) 2016 Mar;48(3):238-44. doi: 10.1002/lsm.22448.

Epub 2015 Nov 27.

Laser-assisted delivery of vitamin C, vitamin E, and ferulic acid formula serum decreases fractional laser postoperative recovery by increased beta fibroblast growth factor expression

Jill S Waibel ¹, Qing-Sheng Mi ², David Ozog ³, Le Qu ⁴, Li Zhou ², Ashley Rudnick ¹, Firas Al-Niaimi ⁵, Julie Woodward ⁶, Valerie Campos ⁷, Serge Mordon ⁸

Conclusion: This is first study to show that Vitamin C, E, and Ferulic acid correlate with more rapid wound healing post-fractional ablative laser. Elevated bFGF could be involved in the Vitamin C, E, and Ferulic acid-induced rapid wound healing.

> [J Cosmet Laser Ther.](#) 2021 Nov 17;23(7-8):207-208. doi: 10.1080/14764172.2022.2049312.
Epub 2022 Mar 15.

Safety profile of laser-assisted drug delivery of vitamin C, E, and ferulic acid serum following ablative fractional resurfacing: A retrospective chart review

Conclusions: The topical application of a Vitamin C, Vitamin E, and Ferulic acid serum immediately following fractional ablative CO₂ laser therapy did not result in associated complications. However, these results may not be generalizable to longer application courses beyond the immediate post-procedure time period, nor to other cosmeceutical formulations. More studies examining the safety profile of topical cosmeceutical serums in laser-assisted drug delivery are needed.

Conclusions: The topical application of a Vitamin C, Vitamin E, and Ferulic acid serum immediately following fractional ablative CO₂ laser therapy did not result in associated complications. However, these results may not be generalizable to longer application courses beyond the immediate post-procedure time period, nor to other cosmeceutical formulations. More studies examining the safety profile of topical cosmeceutical serums in laser-assisted drug delivery are needed.

A prospective split-face clinical study to evaluate the long-term efficacy of vitamin C, vitamin E and Ferulic acid serum post fractional ablative laser for skin rejuvenation

Valéria Campos, Denise Steiner, Samir Arbache, Fernanda Ferrara, Kamilla Santos, Ludmilla Capucho - University of Mogi das Cruzes, São Paulo, Brazil.

Objective

The objective of the study is to evaluate the long-term clinical efficacy of an aqueous antioxidant serum containing 15% vitamin C, 1% vitamin E, and 0,5% ferulic acid after a single laser skin resurfacing session.

Methods

- A total of 34 female patients aged 35 to 55 years with Fitzpatrick skin types II to V undergo a single full-face fractional Etherea 2940nm 10-25 mJ, 8 mm, 3 Hz, 100mtz/cm² at 1 ms laser session in this prospective IRB approved study. All laser procedures were performed by a single operator.
- Right after the laser treatment all patients underwent a post-procedure treatment with an aqueous antioxidant serum containing 15% vitamin C, 1% vitamin E and 0,5% ferulic acid on one side of the face and placebo on the other half face for three months.
- Wrinkles, texture and evenness skin tone parameters were clinically evaluated for 90 days after the laser procedure. Analysis of the data was carried by descriptive statistics - frequency distributions.



D0



Treated side

Placebo

D5



D0



D5

The average time to re-epithelialization was 1 day less in the treated facial halves in comparison to the placebo facial halves





Antioxidant side showed less wrinkles than placebo side at all times

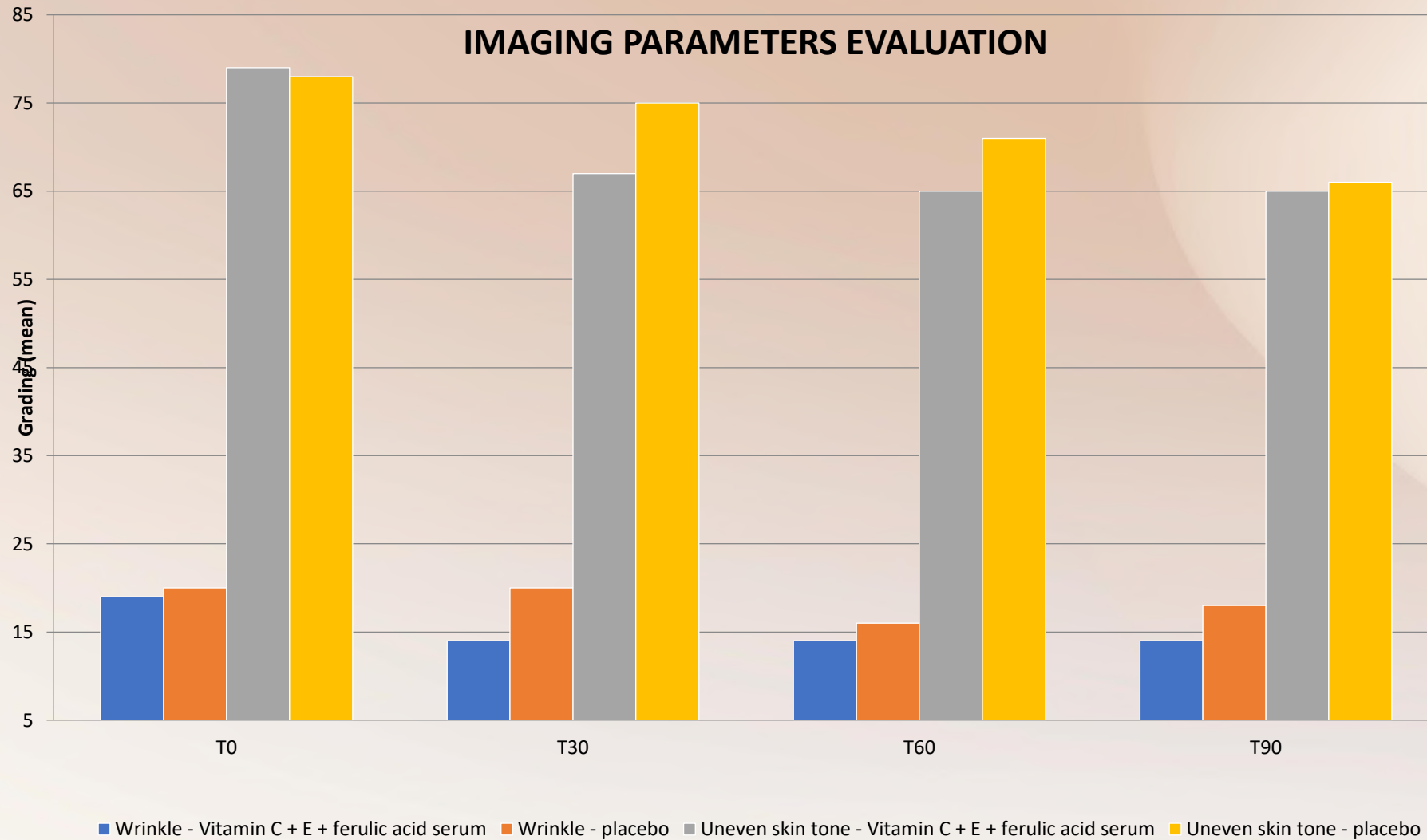


Antioxidant side showed less wrinkles than placebo side at all times



There was a statistically significant relevance for wrinkles parameter between the antioxidant half side and placebo by the end of 90 days

IMAGING PARAMETERS EVALUATION



Results

- Ferulic acid serum observed less pain duration in 60% of the patients 1 hour post initial application.
- The erythema was more intense in the treated facial halves in 50% of the patients in the day 1.
- Trend analysis showed an evener skin tone at T30 and T60 for antioxidant side, achieving a 18% overall improvement, when comparing to placebo (10% improvement).

Results

- Antioxidant side showed less wrinkles than placebo side at all times; an improvement of 26% in decreasing wrinkles grading in comparison to baseline, whereas placebo half side improvement was 10%.
- There was a statistically significant relevance (95% confidence interval) for wrinkles parameter between the antioxidant half side and placebo by the end of 90 days.

Conclusion

- The application of an aqueous antioxidant serum containing vitamin C, vitamin E, and ferulic acid, at appropriate concentration and pH, right after fractional ablative laser skin resurfacing is safe and tolerable.
- Long term application of the antioxidant formula will promote collagen synthesis and therefore improve wrinkles and fine lines while enhancing skin protection to prevent future damage.

Single Tx Erbium Laser and CE Ferulic



Single Tx Erbium Laser and CE Ferulic



Single Tx Erbium Laser and CE Ferulic



Dual benefit of VitC, E Ferulic + Laser Synergy

ANTIOXIDANTS PROVIDE BETTER BENEFITS TOGETHER THAN ALONE

Antioxidant serum containing Vitamin C , E and ferulic has dual benefits in post-operative care:

IMMEDIATE: Promotes wound healing by stimulating collagen synthesis and increases uptake of antioxidants

LONG TERM: Improves skin quality by reducing cutaneous oxidative stress and stimulates collagen formation and reduces wrinkles

A close-up photograph of a couple's hands forming a heart shape. The man is on the left, wearing a dark suit jacket. The woman is on the right, wearing a white lace wedding dress. The background is a bright, out-of-focus outdoor setting, possibly a field or garden, with a warm, golden light. The text "AOX + LASER" is overlaid in the lower center of the image.

AOX + LASER

References

- ✓ Kalil C, Campos V. Drug Delivery in Dermatology Fundamental and Practical Applications. First Edition . Springer International Publishing, January 2021
- ✓ Waibel JS, Mi QS, Ozog D, Qu L, Zhou L, Rudnick A, Al-Niaimi F, Woodward J, Campos V, Mordon S. Laser-assisted delivery of vitamin C, vitamin E, and ferulic acid formula serum decreases fractional laser postoperative recovery by increased beta fibroblast growth factor expression. Lasers Surg Med. 2016 Mar;48(3):238-44.
- ✓ Johnson H, Kazemi T, Farah RS. Safety profile of laser-assisted drug delivery of vitamin C, E, and ferulic acid serum following ablative fractional resurfacing: A retrospective chart review. J Cosmet Laser Ther. 2021 Nov 17;23(7-8):207-208.

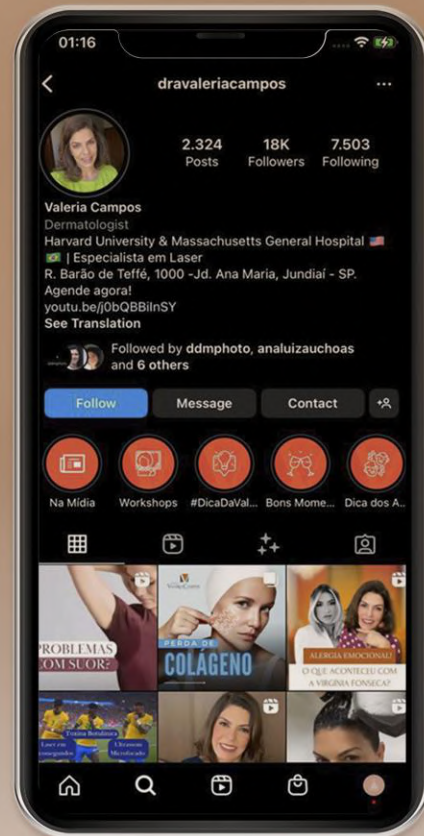


PROGRESSO

Thank You



VALÉRIA CAMPOS



SOCIAL MEDIA



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Dra Valéria Campos dermatologista

