Rellenos Inductores de Colágeno

Carlos Vivas MD MSc

Cirugía Plástica / Medicina Estética/ Fotónica

Santo Domingo, República Dominicana

Conflictos de Interés:

- Líder de opinion de Wontech Laser
- Speaker de Global Skin Latinoamérica
- Speaker de Skin Services SRL
- Speaker de FAGIL SRL

LEYES DE PROTECCIÓN DE DATOS

@cavivax

Por leyes de varios países, abstenerse de usar/copiar fotos de pacientes exhibidas en esta presentación

Durante esta pandemia COVID-19

Durante esta pandemia COVID-19 hemos pasado por varias etapas:

Al inicio: “normal”

Durante esta pandemia COVID-19 hemos pasado por varias etapas:

… luego, los “selfies” de cuarentena…

Durante esta pandemia COVID-19 hemos pasado por varias etapas:

… desesperación del encierro …

Durante esta pandemia COVID-19 hemos pasado por varias etapas:

… y la gordura, por inactividad.

Durante esta pandemia COVID-19 hemos pasado por varias etapas:

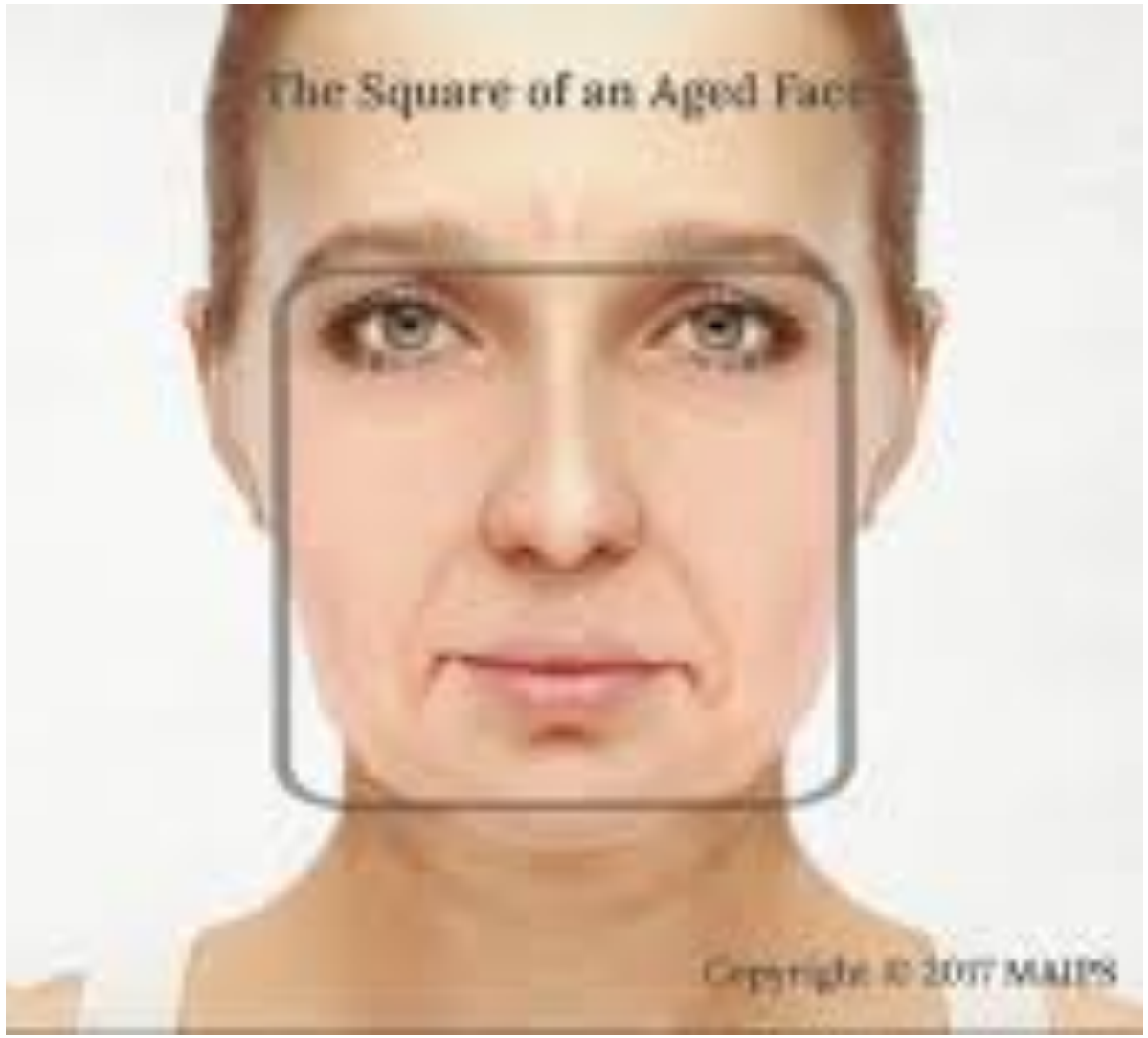
Con estiramiento de piel y aceleración del envejecimiento.

Así que tenemos patrones para las edades…

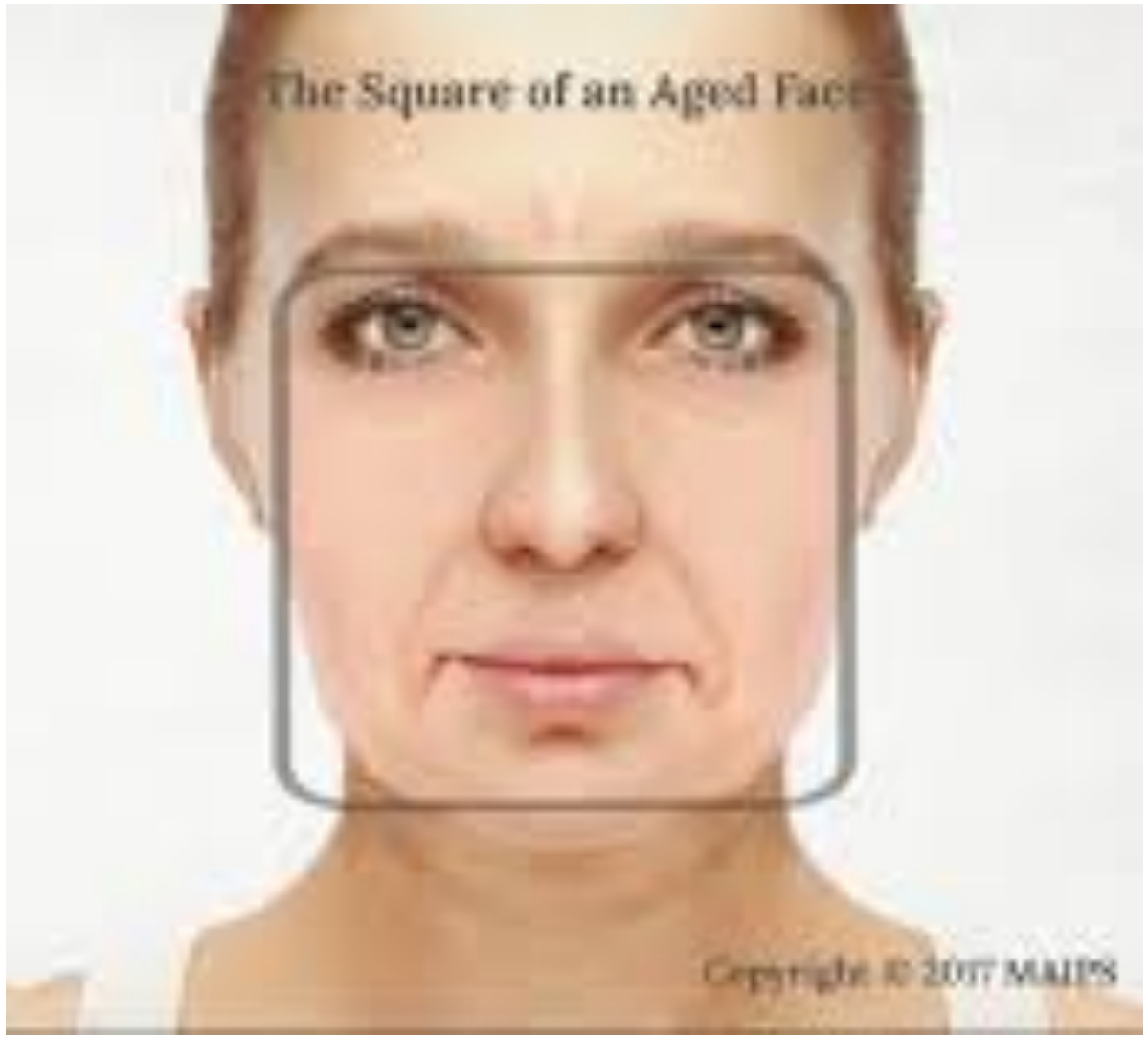
El triángulo de la juventud

Y el cuadrado de la vejez

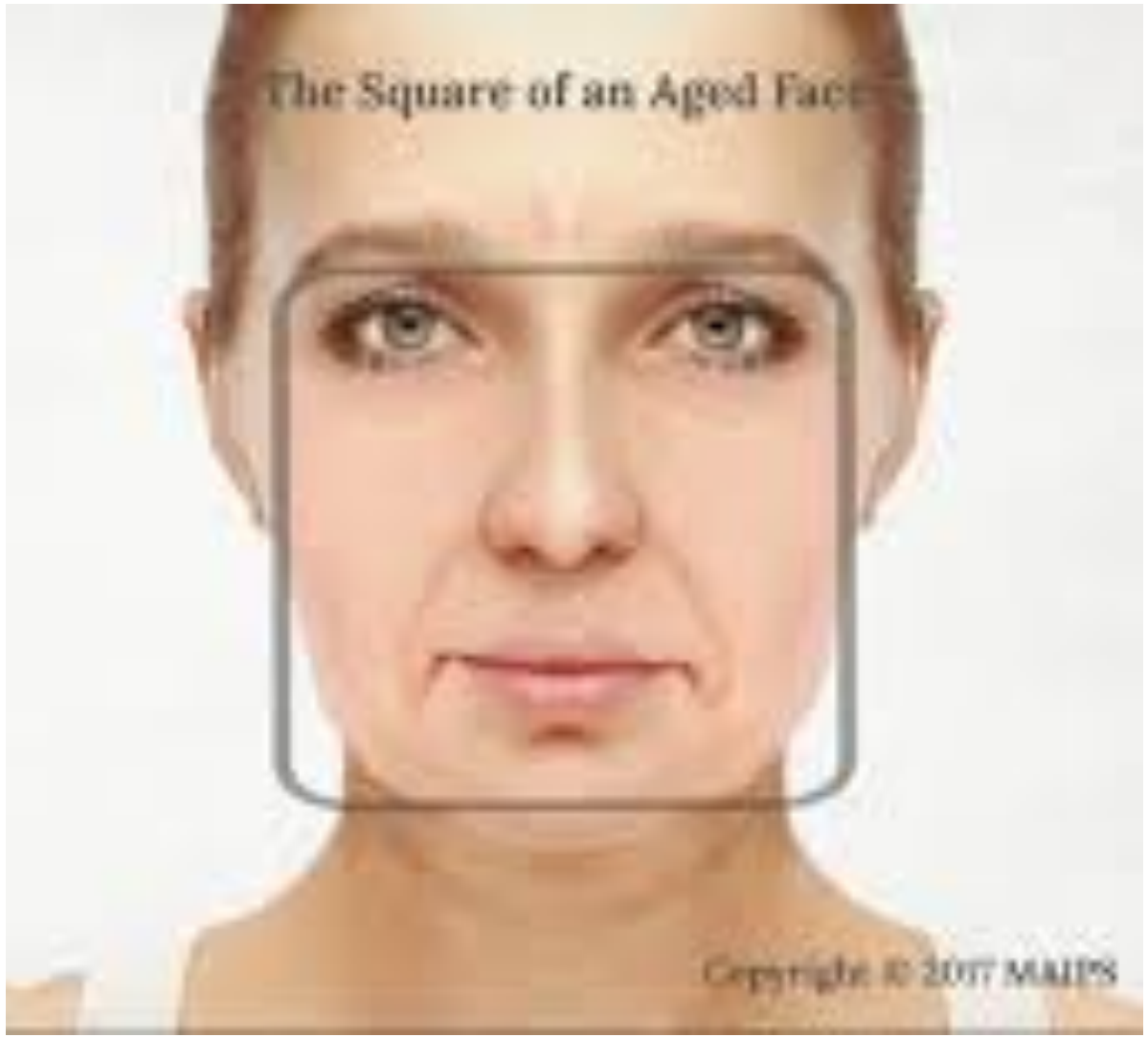
Donde hay reabsorción de grasa, hueso, músculos y daño cutáneo



Normalmente, el colágeno se degrada y no se repone



A menos que engañemos al cuerpo, estimulándolo



A eso se llama: “bioestimulación”

Bioestimulación

En este proceso hay 2 mecanismos que se estimulan

Bioestimulación

- Neocolagénesis
- Neoelastinogénesis

Bioestimulación

- Neocolagenesis
- Neoelastinogenesis

implica

Remodelación dérmica

Bioestimulación

- Neocolagenesis
- Neoelastinogenesis

implica

Remodelación dérmica

Y utilizando el esquema propuesto de Hausauer en “microneedling”:

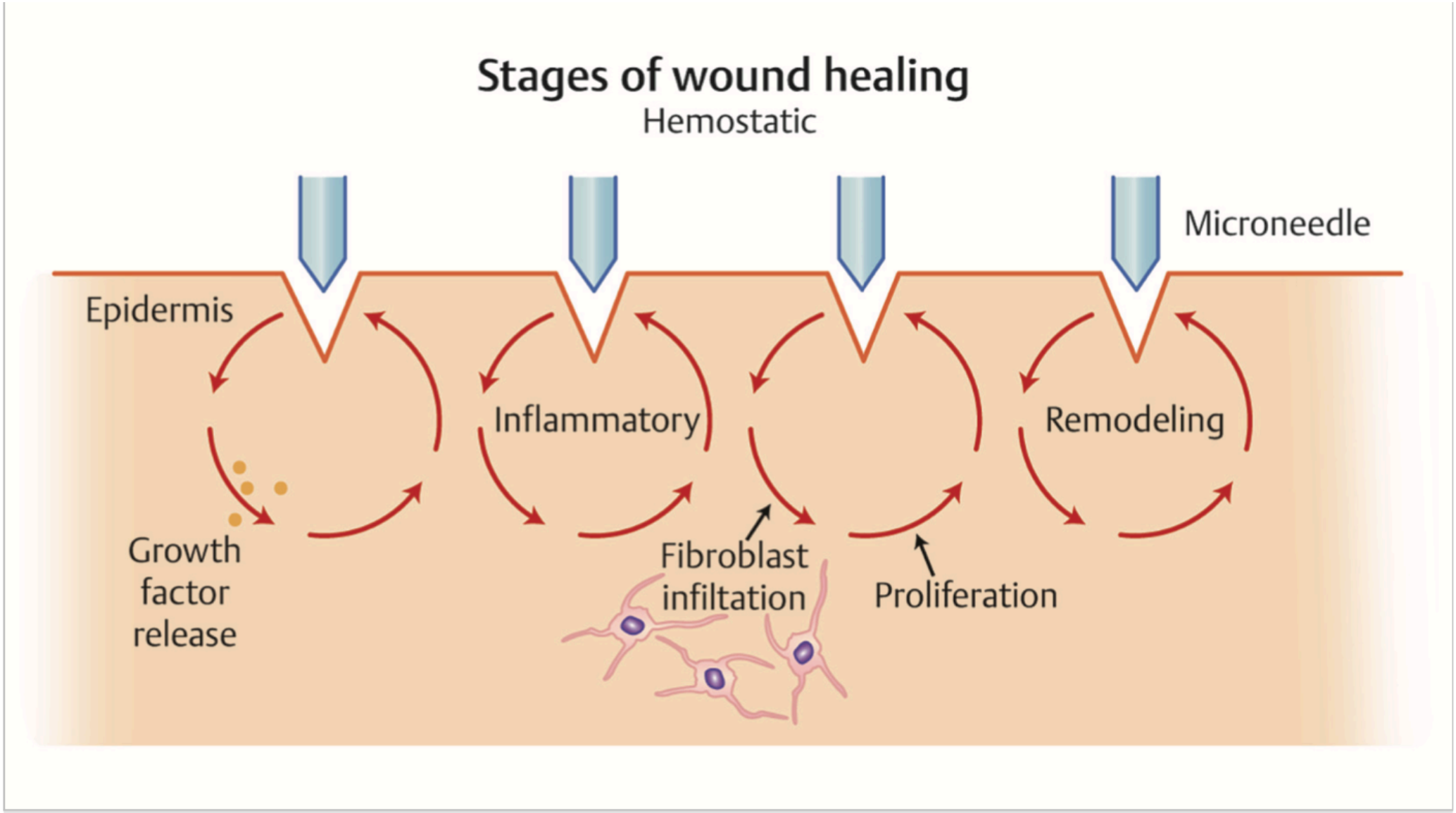
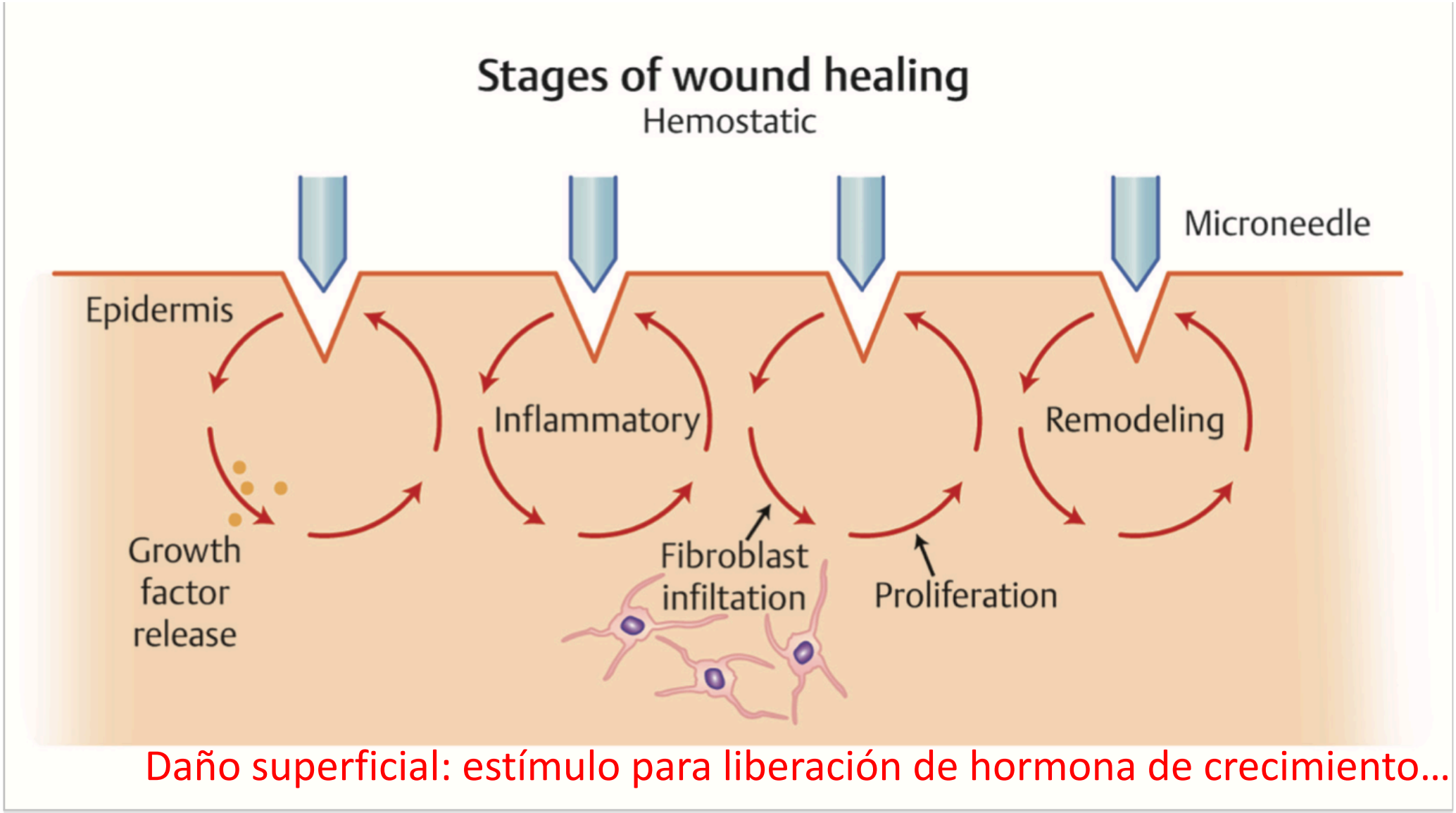


Fig. 5.1 Fractional mechanical microinjury hypothesis for the mechanism of action in microneedling. Tiny, superficial wounds form a strong stimulus for growth factor release and fibroblast infiltration following the classical phases of healing.

Hausauer A. Johns D. PRP and Microneedling in Aestethic Medicine. Thieme 2019.



Daño superficial: estímulo para liberación de hormona de crecimiento…

Fig. 5.1 Fractional mechanical microinjury hypothesis for the mechanism of action in microneedling. Tiny, superficial wounds form a strong stimulus for growth factor release and fibroblast infiltration following the classical phases of healing.

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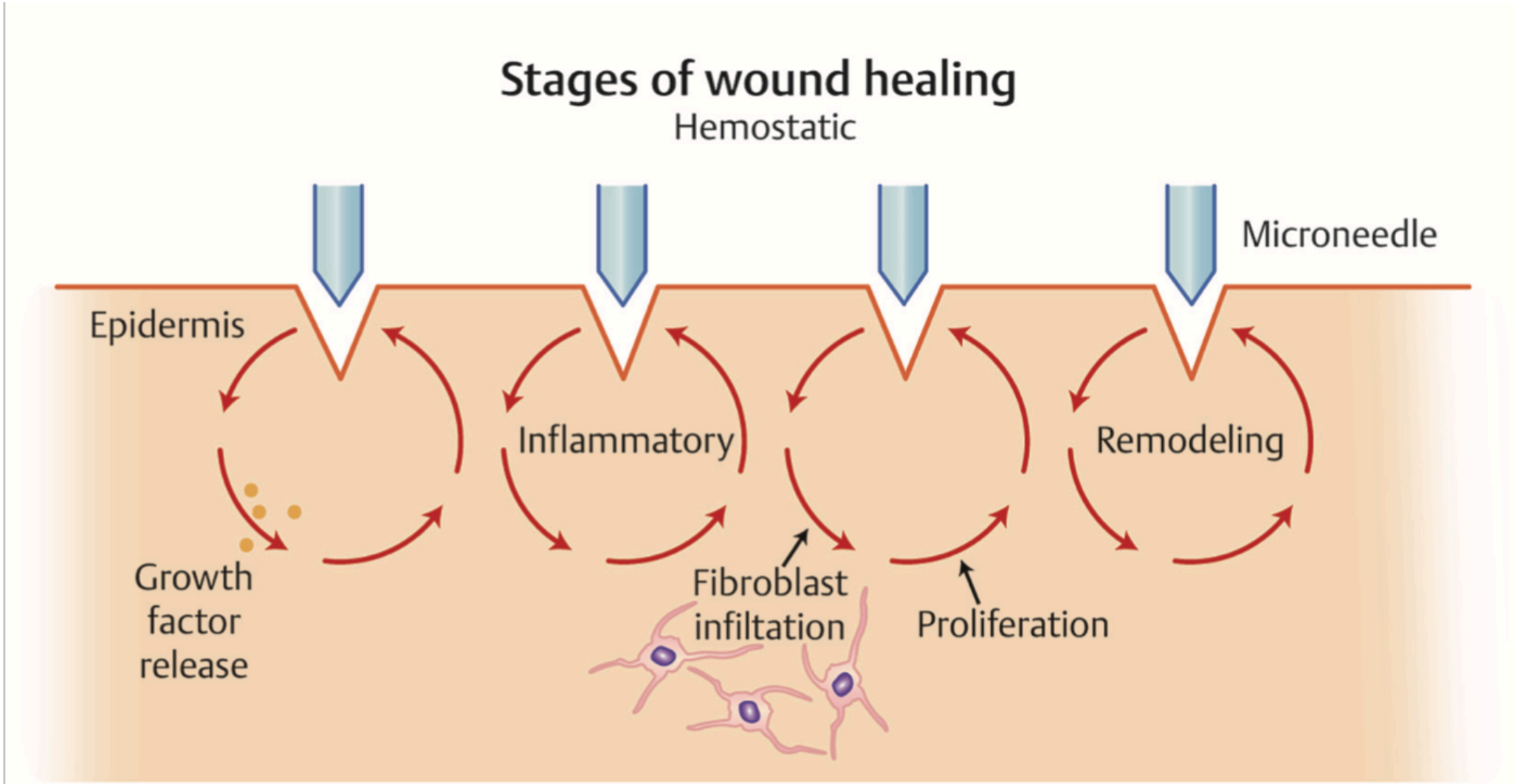


…e infliltración fibroblástica en las fases de reparación tisular = mas colágeno

Fig. 5.1 Fractional mechanical microinjury hypothesis for the mechanism of action in microneedling. Tiny, superficial wounds form a strong stimulus for growth factor release and fibroblast infiltration following the classical phases of healing.

Hausauer A. Johns D. PRP and Microneedling in Aestethic Medicine. Thieme 2019.

Table 5.1 Important growth factors, cytokines, and other signaling molecules necessary for wound healing and cutaneous remodeling

Molecule	Abbreviation	Functions
Fibroblast growth factor	FGF	• Fibroblast, epithelial cell proliferation • Matrix deposition • Angiogenesis • wound contract
Platelet-derived growth factor	PDGF	• Fibroblast, macrophage, neutrophil chemotaxis • Fibroblast, epithelial, smooth muscle cell, mesanchymal cell proliferation • Collagen metabolism • Angiogenesis
Transforming growth factor alpha	TGF-α	• Keratinocyte migration, proliferation (reepithelialization)
Transforming growth factor beta	TGF-β	• Fibroblast chemotaxis, proliferation • Collagen, matrix metabolism • Protease inhibition • Angiogenesis • Immunomodulation TGF-β1 and TGF-β2 are profibrotic while TGF-β3 is antifibrotic
Epidermal growth factor	EGF	• Keratinocyte migration, proliferation
		• Angiogenesis • Platelet adhesion • Fibrosis
Keratinocyte growth factor	KGF	• Keratinocyte proliferation
Connective tissue activating peptide III		• Matrix proliferation, production
Neutrophil activating peptide-2		• Neutrophil chemotaxis
Interleukin 1	IL-1	• Fibroblast proliferation • Collagenase regulation-3 (MMP-13) • Pro-inflammation, pyrogen
Interleukin 10	IL-10	• Collagen remodeling • MMP gene expression • Anti-inflammation

Abbreviation: MMP, matrix metalloproteinases.

Con todos los factores de crecimiento y citoquinas que intervienen en el proceso…

Hausauer A. Johns D. PRP and Microneedling in Aestethic Medicine. Thieme 2019.

Bioestimulación

- Neocolagenesis
- Neoelastinogenesis

Remodelación dérmica

Encontramos varios bioestimuladores

Bioestimulación

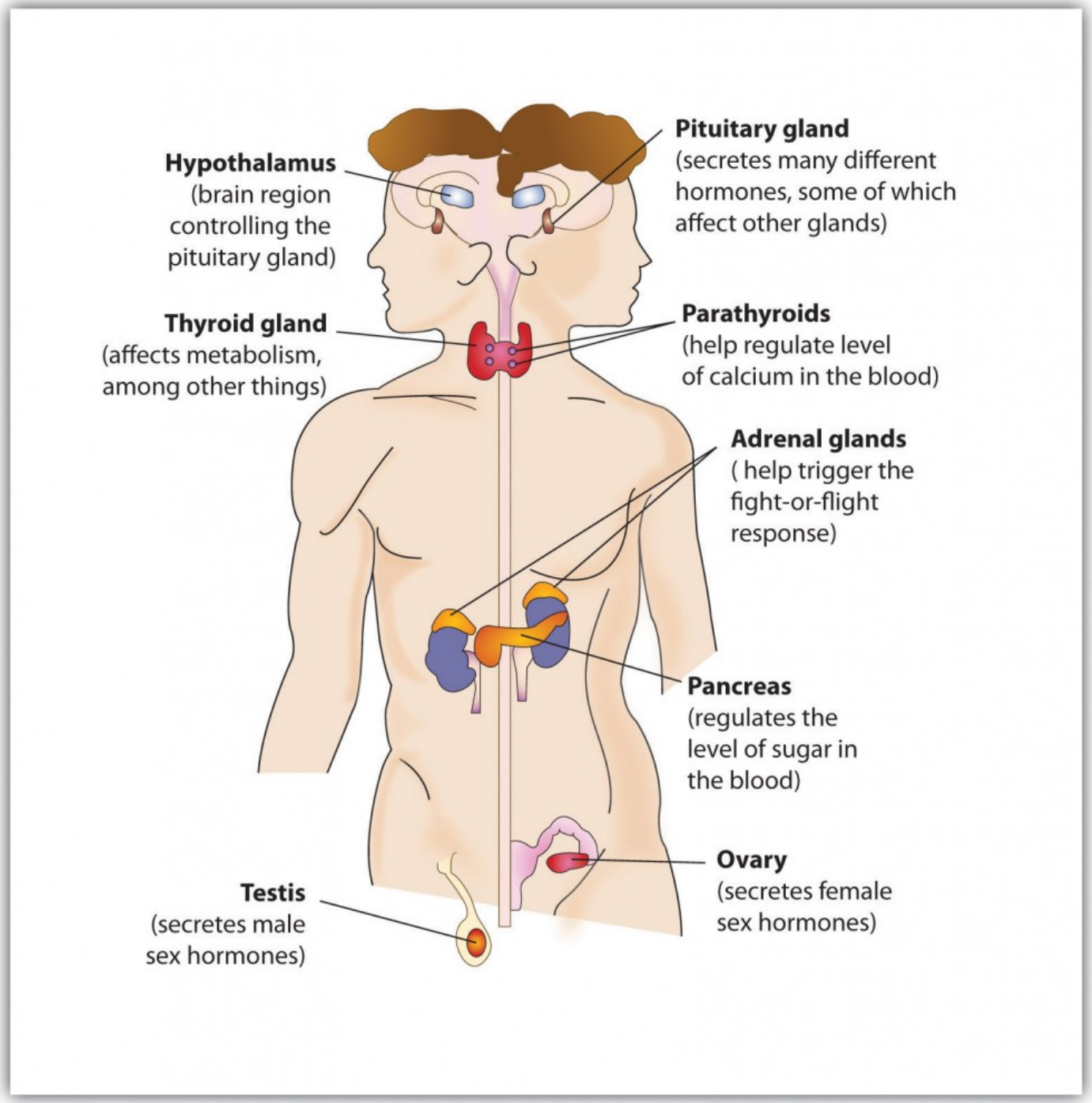
- Neocolagenesis
- Neoelastinogenesis

Remodelación dérmica

Hormonales
Físicos
Químicos

Hormonales:

- Melatonina
- Hormona de crecimiento
- Testosterona
- Estrógenos



Físicos:

- Láseres
- Ultrasonidos microfocalizados
- Radiofrecuencias
- Microneedling

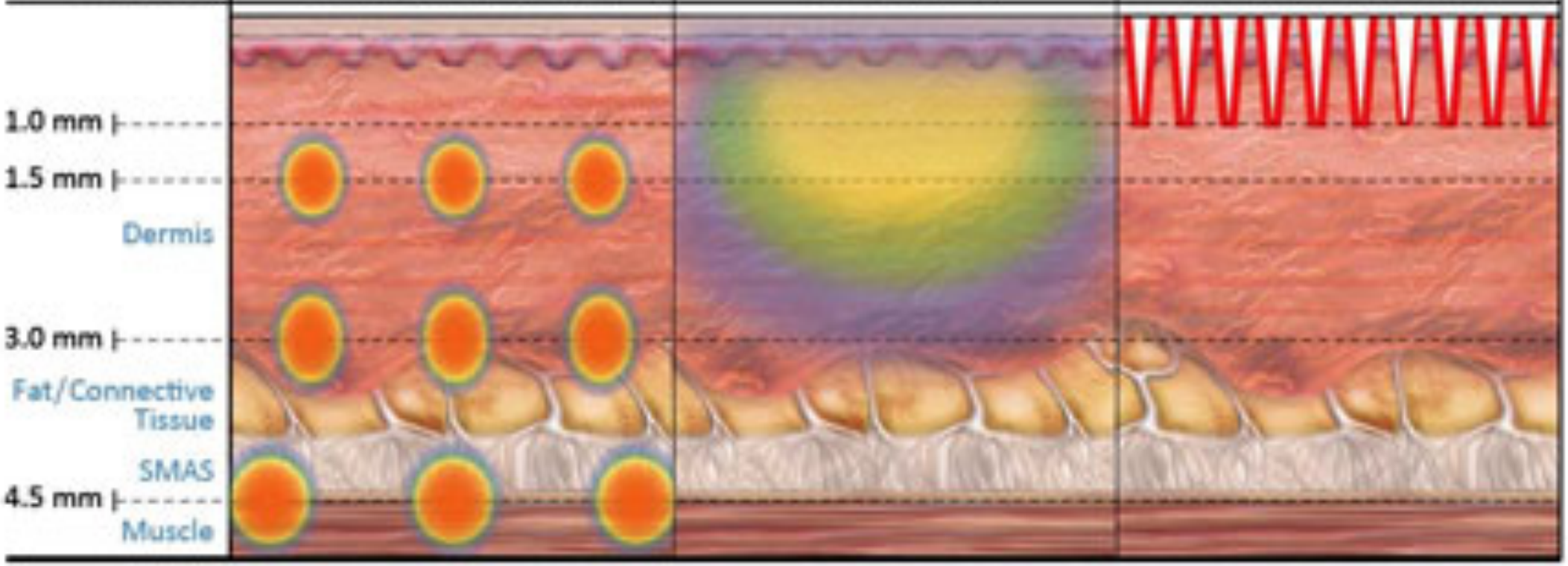
Físicos:

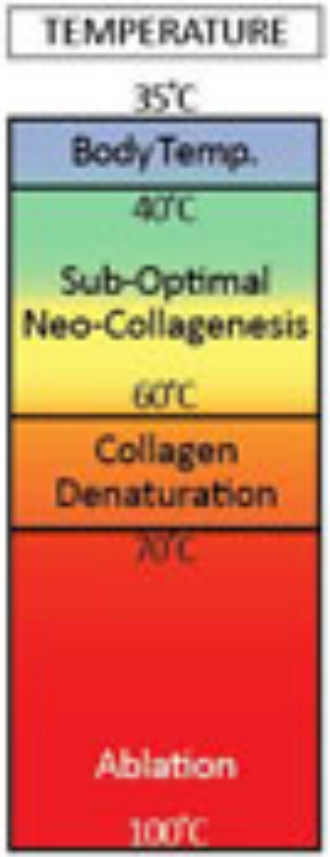
- Láseres
- Ultrasonidos microfocalizados
- Radiofrecuencias
- Microneedling

Usan energía en el tejido para estimular inflamación

Ultrasonidos microfocalizados

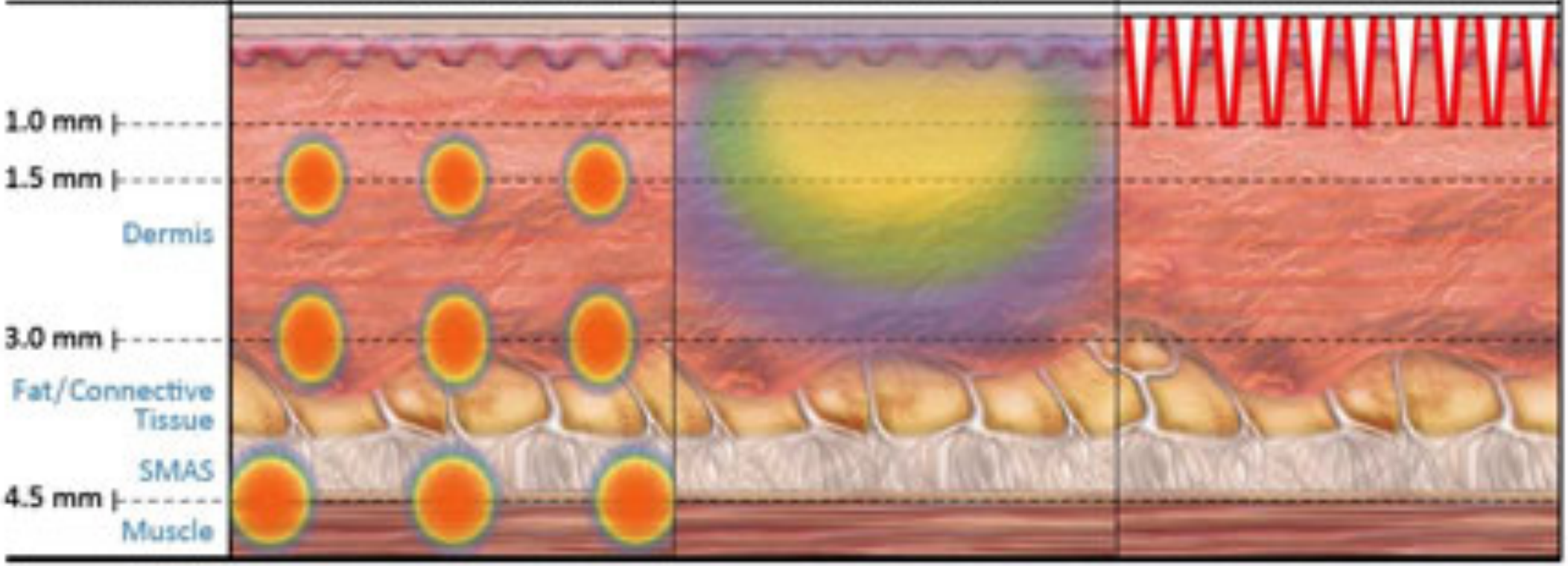
	ULTHERAPY	RF	LASERS
Temperature	60-70˚C; Denaturation	<55˚C; Sub-Optimal	100˚C; Vaporization
Depth	4.5mm, 3mm & 1.5mm	<3mm; Variable	<1.5mm; Superficial
Precision	Precise & Fractional	Bulk Heating	Precise & Fractional

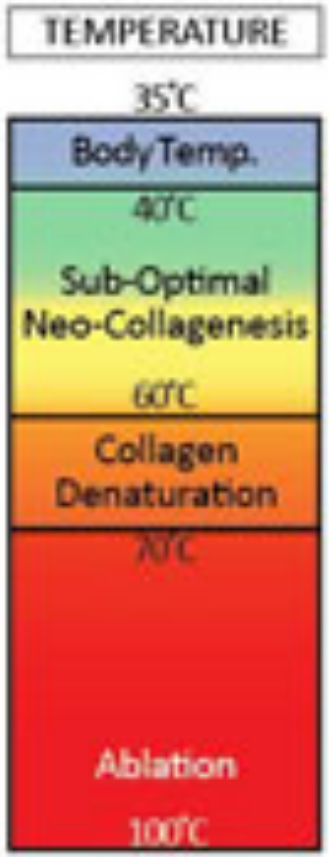




Ultrasonidos microfocalizados: actúan en varias profundidades del tejido

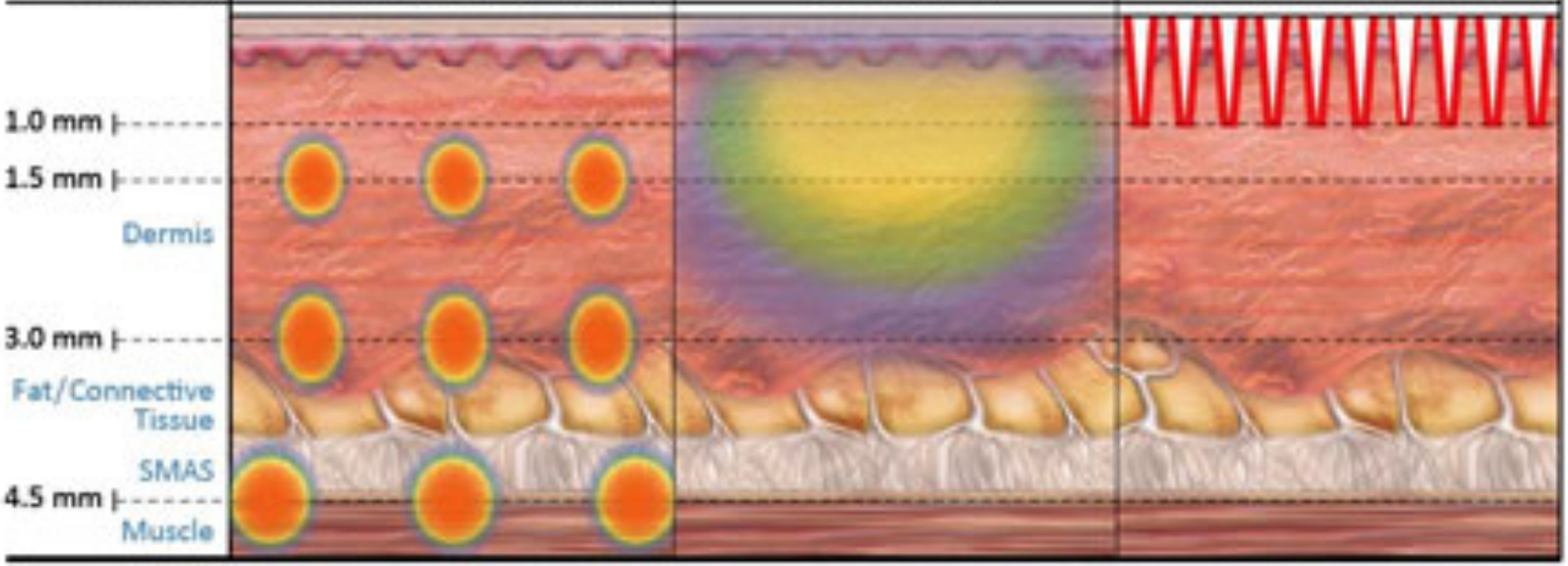
	ULTHERAPY	RF	LASERS
Temperature	60-70˚C; Denaturation	<55˚C; Sub-Optimal	100˚C; Vaporization
Depth	4.5mm, 3mm & 1.5mm	<3mm; Variable	<1.5mm; Superficial
Precision	Precise & Fractional	Bulk Heating	Precise & Fractional

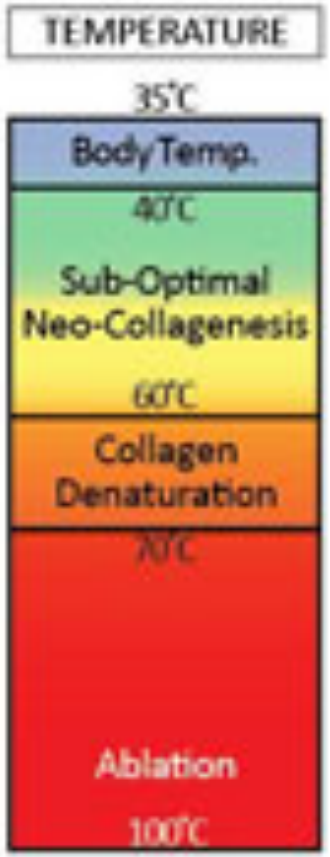




Ultrasonidos microfocalizados: no hay daño cutáneo

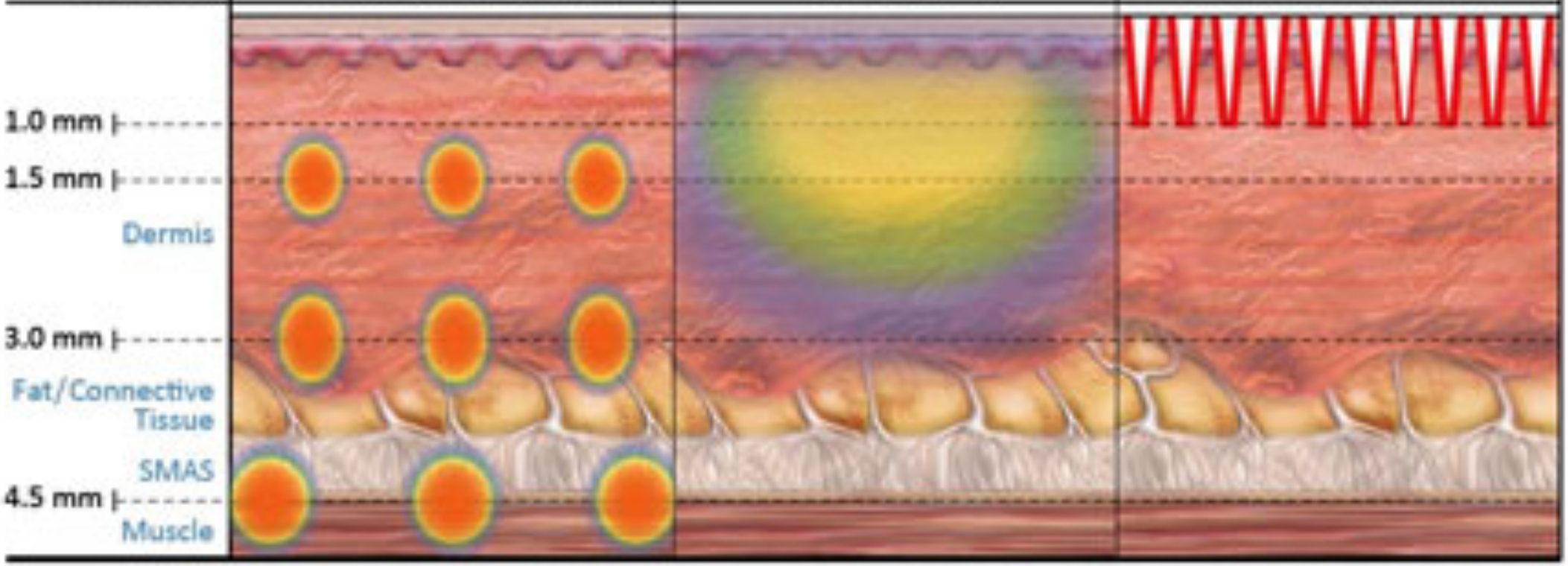
	ULTHERAPY	RF	LASERS
Temperature	60-70˚C; Denaturation	<55˚C; Sub-Optimal	100˚C; Vaporization
Depth	4.5mm, 3mm & 1.5mm	<3mm; Variable	<1.5mm; Superficial
Precision	Precise & Fractional	Bulk Heating	Precise & Fractional

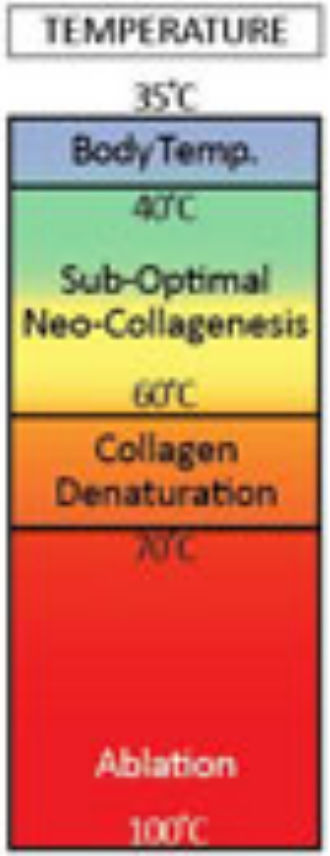




Radiofrecuencia: Calentamiento de tejido en bloque

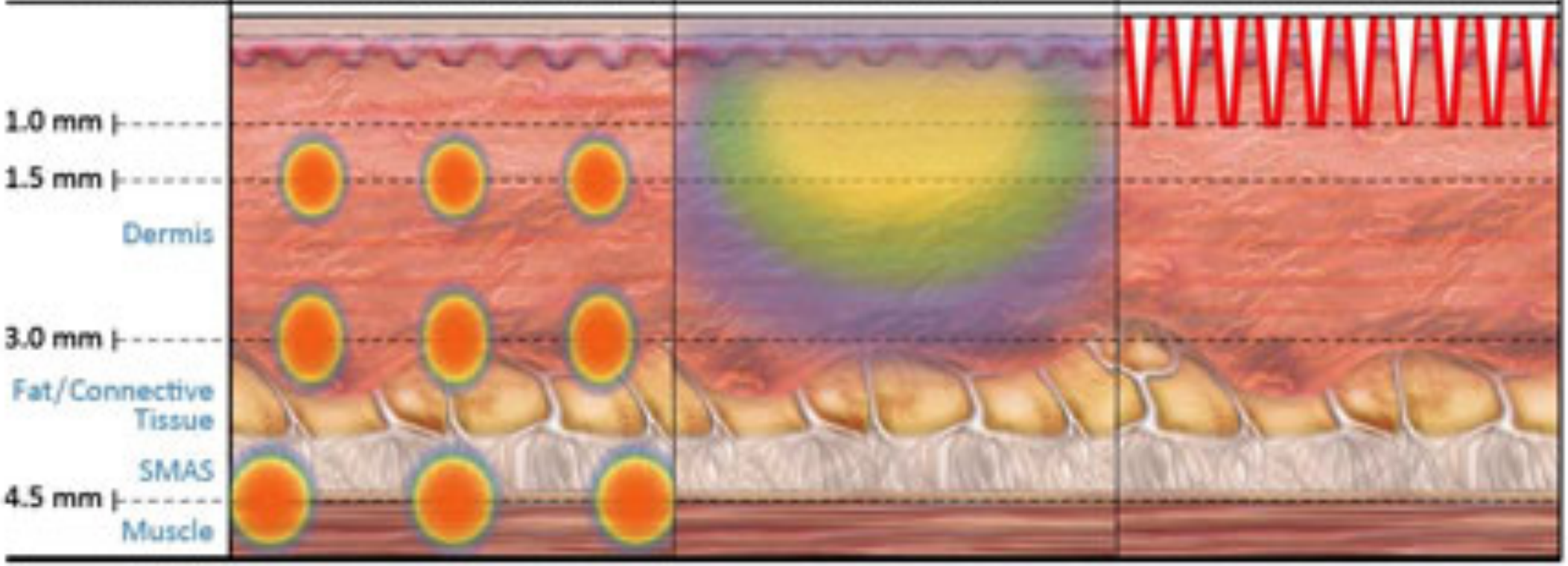
	ULTHERAPY	RF	LASERS
Temperature	60-70˚C; Denaturation	<55˚C; Sub-Optimal	100˚C; Vaporization
Depth	4.5mm, 3mm & 1.5mm	<3mm; Variable	<1.5mm; Superficial
Precision	Precise & Fractional	Bulk Heating	Precise & Fractional

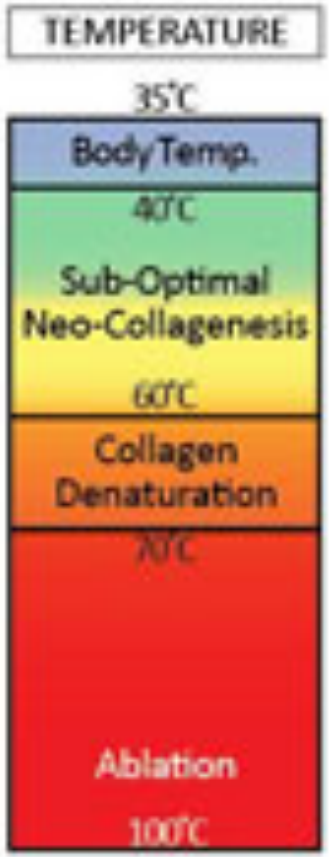




Radiofrecuencia: Necesitan muchas (>15 a 20) sesiones

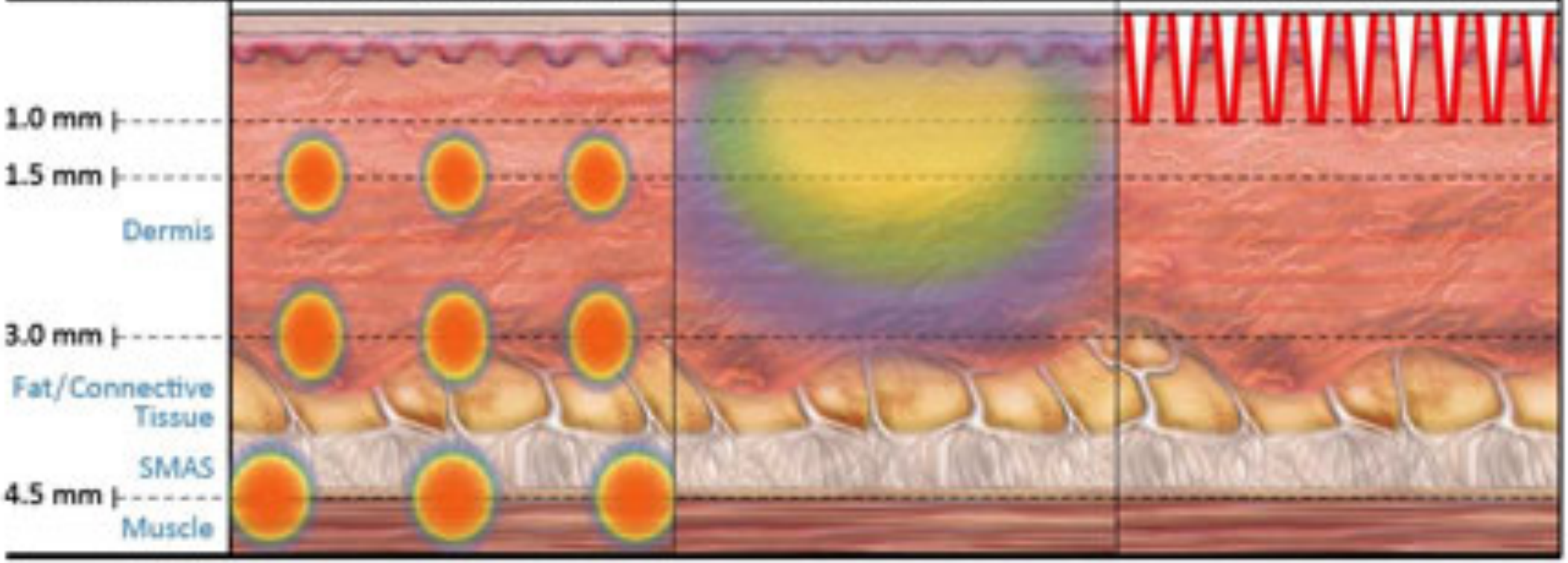
	ULTHERAPY	RF	LASERS
Temperature	60-70˚C; Denaturation	<55˚C; Sub-Optimal	100˚C; Vaporization
Depth	4.5mm, 3mm & 1.5mm	<3mm; Variable	<1.5mm; Superficial
Precision	Precise & Fractional	Bulk Heating	Precise & Fractional

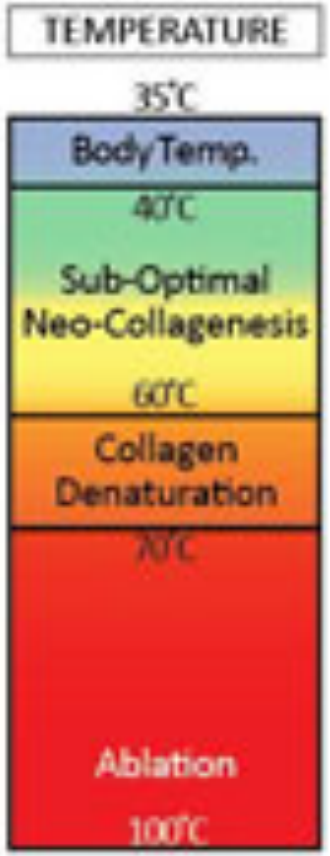




Láseres: columnas de daño. Con o sin ruptura de piel. Superficial

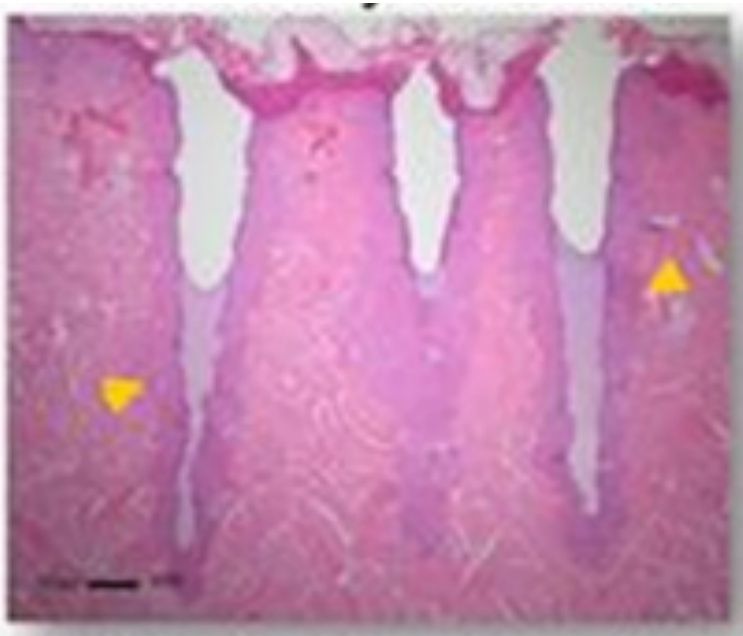
	ULTHERAPY	RF	LASERS
Temperature	60-70˚C; Denaturation	<55˚C; Sub-Optimal	100˚C; Vaporization
Depth	4.5mm, 3mm & 1.5mm	<3mm; Variable	<1.5mm; Superficial
Precision	Precise & Fractional	Bulk Heating	Precise & Fractional





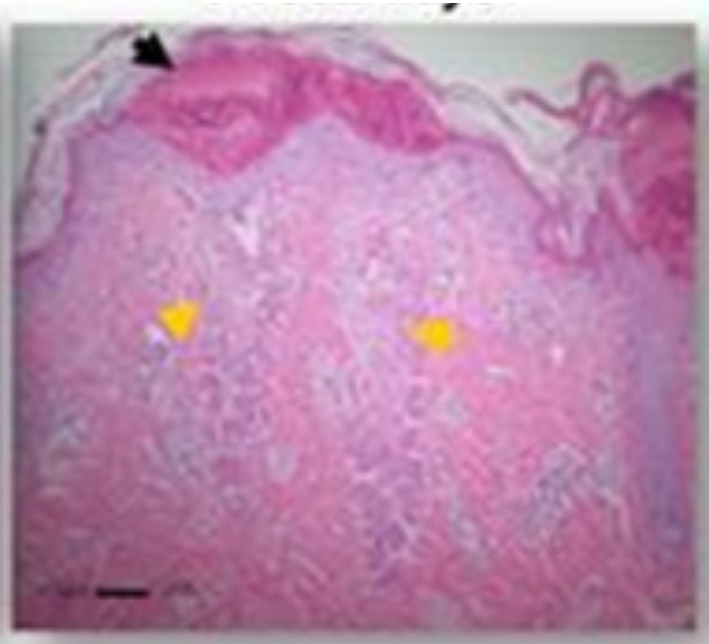
Proceso de regeneración cutánea después de láser fraccional CO2 (ablativo-rompe la piel)

Inmediatamente después del láser



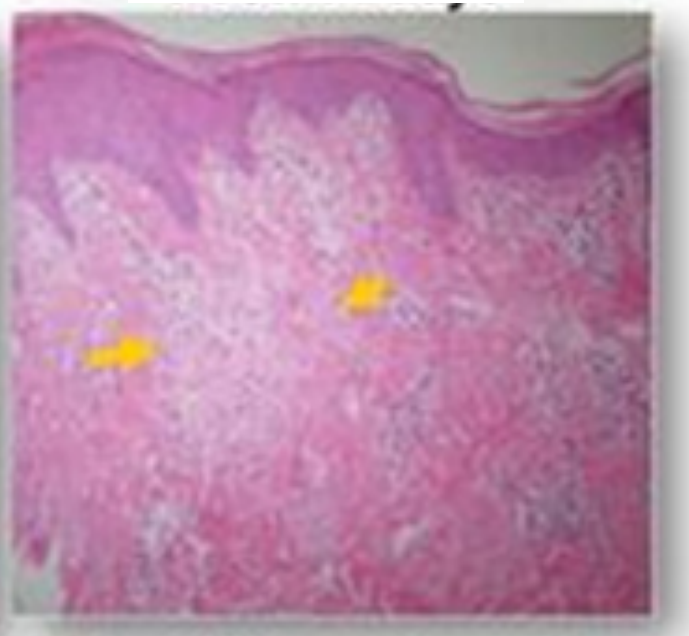
Ablación de dermis y epidermis

2 dias después

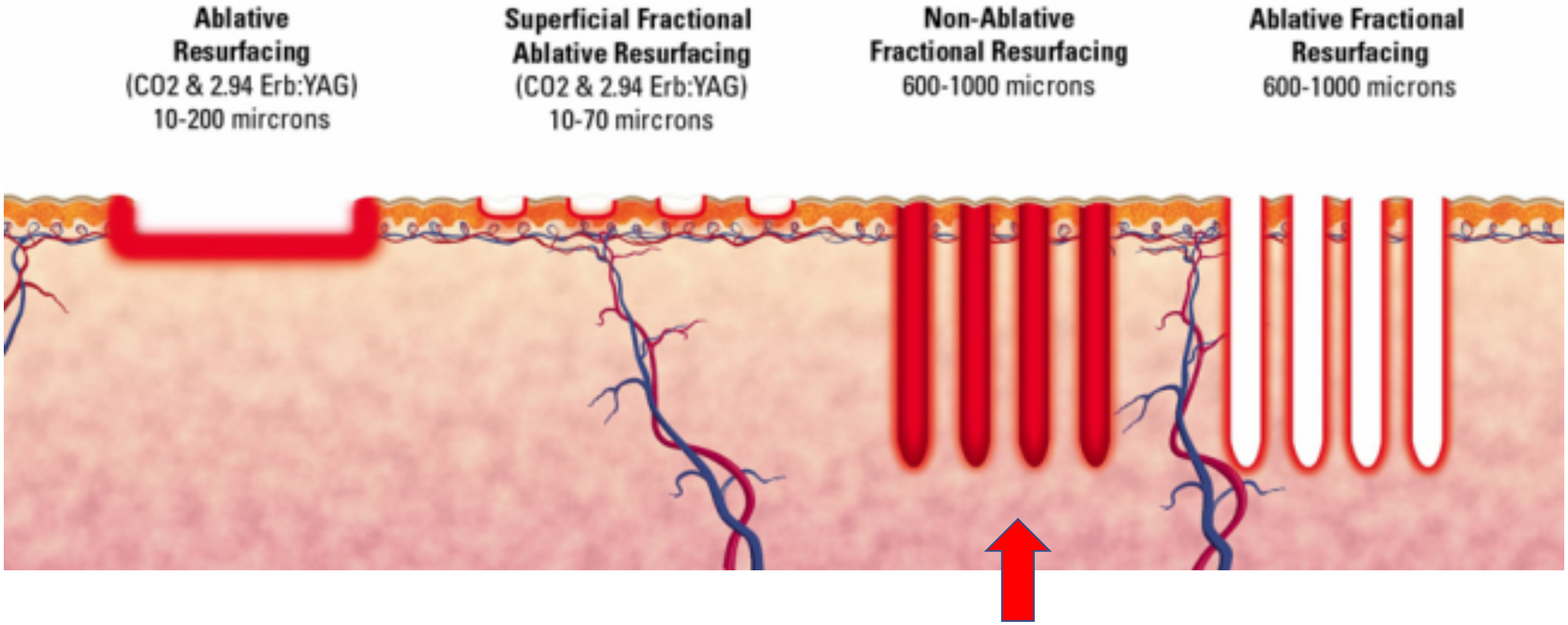


Reepitelización y síntesis de colágeno

14 dias después



Regeneración epidérmica completa y colagenogénesis contínua



En el método no ablativo, hay daño en columnas <u>sin</u> vaporización de tejido

Láser fraccionado para estrías

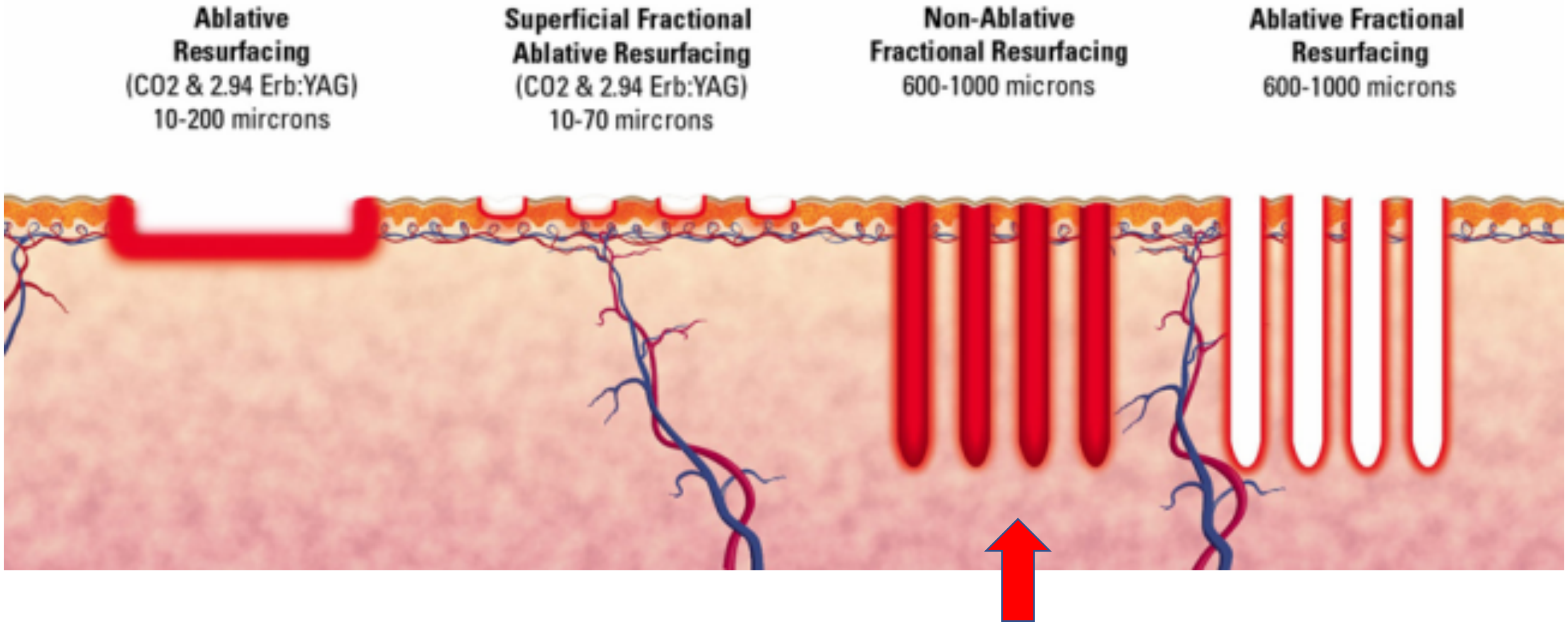
No ablativo

Antes

20 minutos

45 días después

En este caso tomado de @cavivax se ve el resultado con una sesión de Thulium 1927 nm



En este caso, el resultado es menos espectacular que el ablativo, pero con recuperación mas rápida.

<u>Rejuvenecimiento no ablativo</u>:
Laser Thulium 1927 nm desfocalizado. 7 watts, stack 2. Modo contínuo fraccional; mas rellenos faciales bioestimuladores: Hidroxiapatita de calcio en malar y párpado inferior

Rellenos inductores de colágeno (“químicos”)

- Hidroxiapatita de calcio
- Poliaprolactona
- Ácido poliláctico

Rellenos inductores de colágeno

- Hidroxiapatita de calcio
- Poliaprolactona
- Ácido poliláctico

(ácido hialurónico-?)

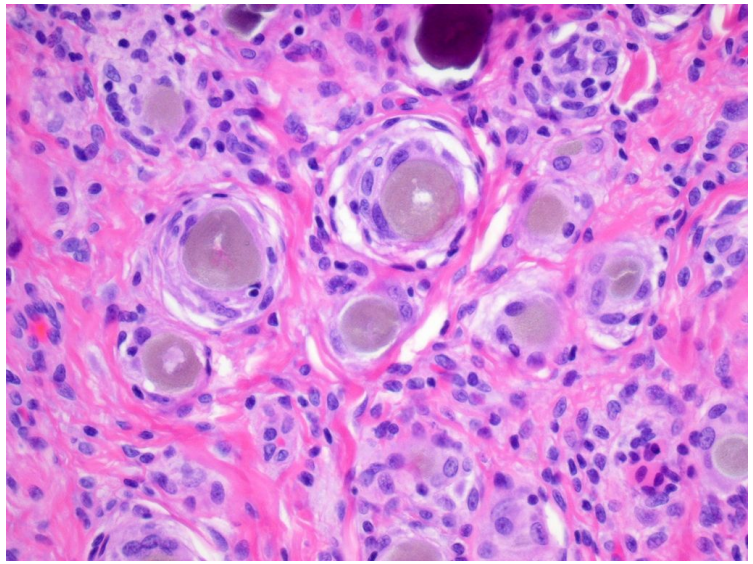
Rellenos inductores de colágeno

- Hidroxiapatita de calcio
- Poliaprolactona
- Ácido poliláctico

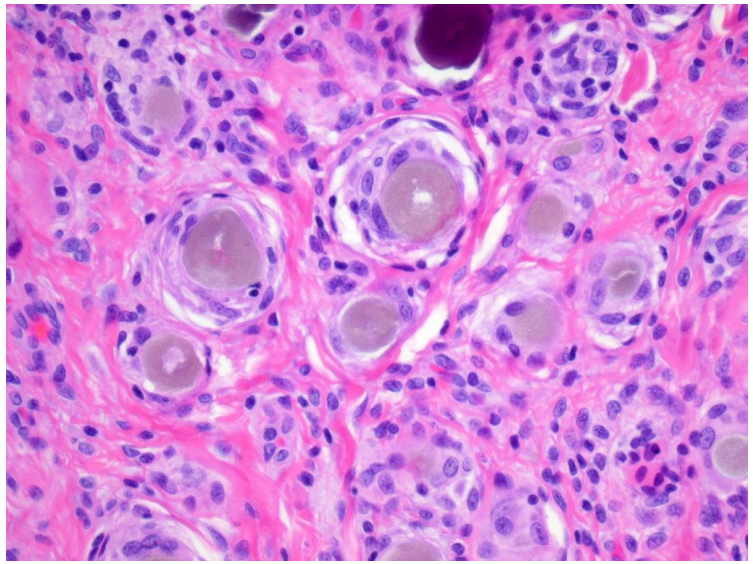
  (ácido hialurónico sólo genera

  1 a 2% de colágeno)

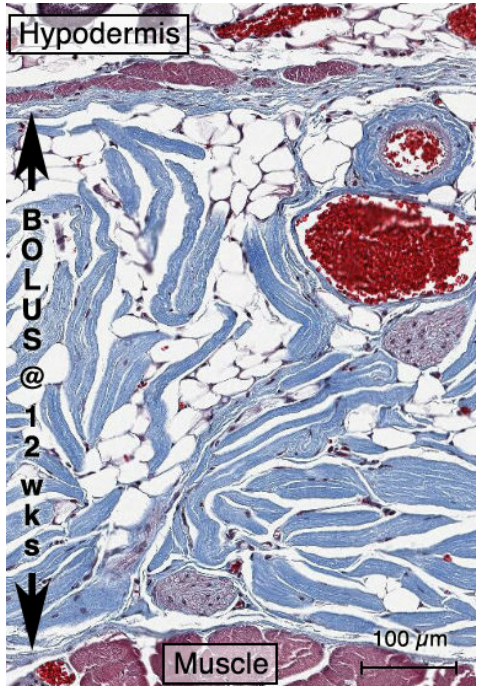

Hidroxiapatita de calcio
CaHA
Neoformacion tisular
Efecto > 18 meses
100 µm



Proliferacion dermica



Proliferacion dermica



Angiogenesis

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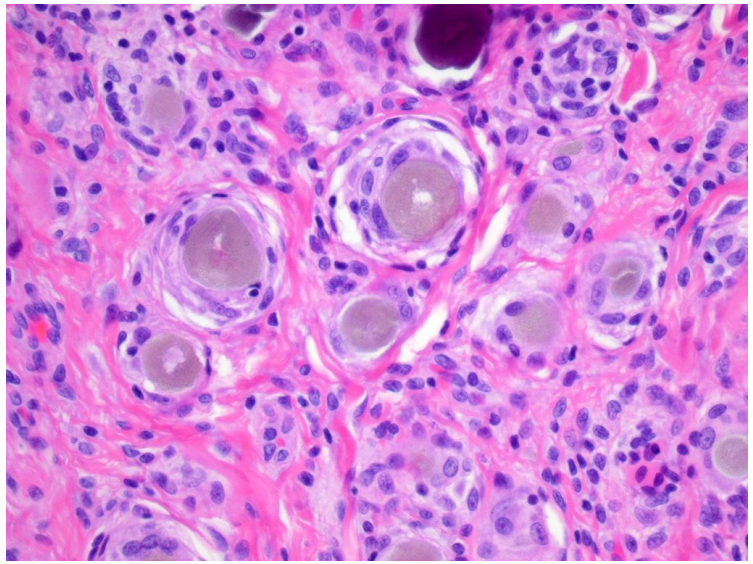
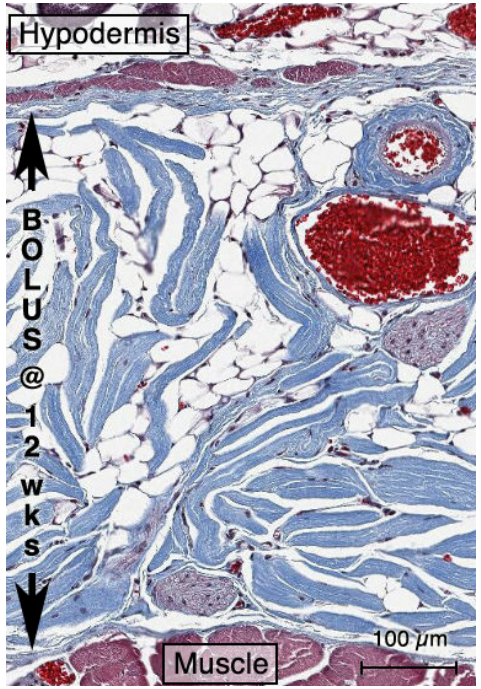
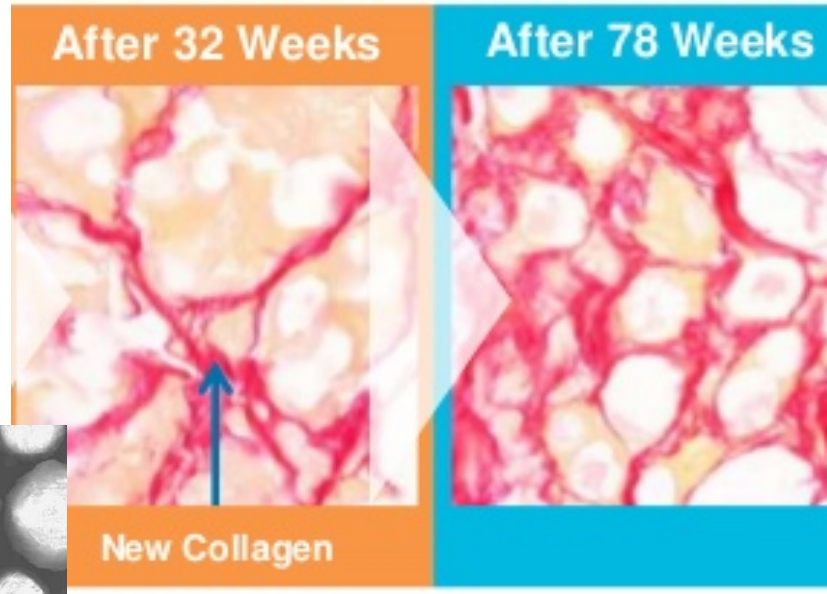


Proliferacion dermica



Angiogenesis



Neocolagenesis tipo I

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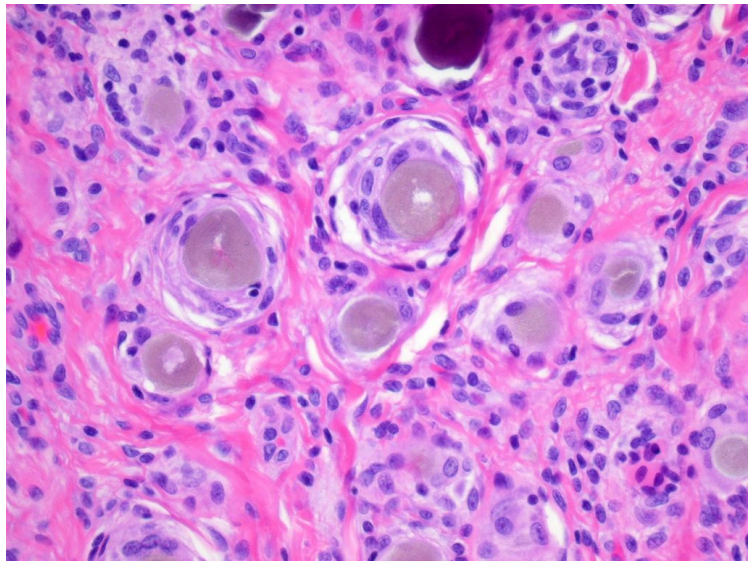
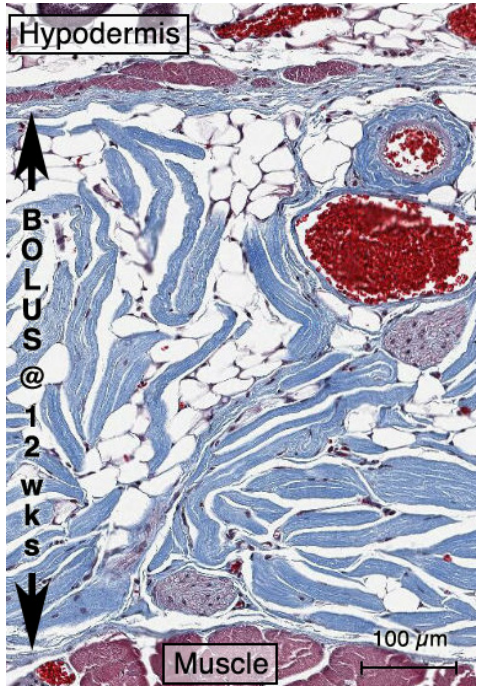
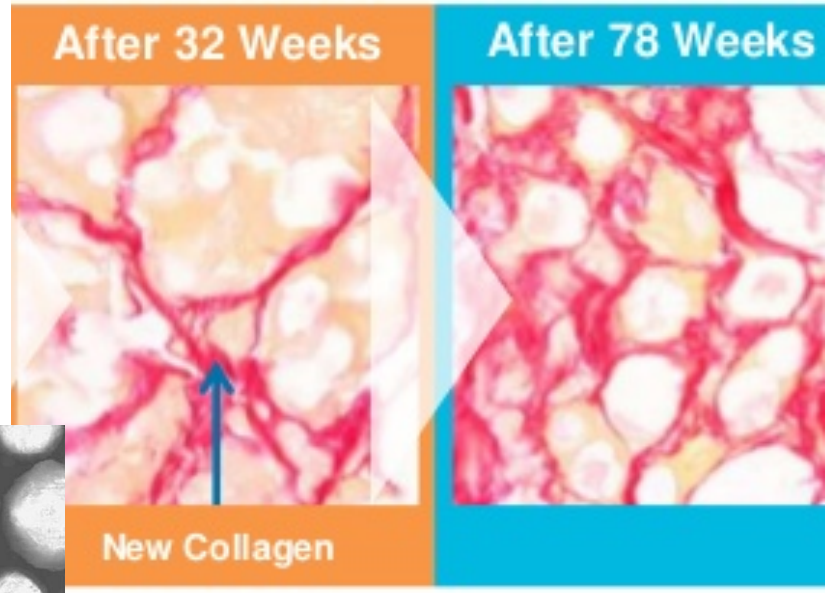


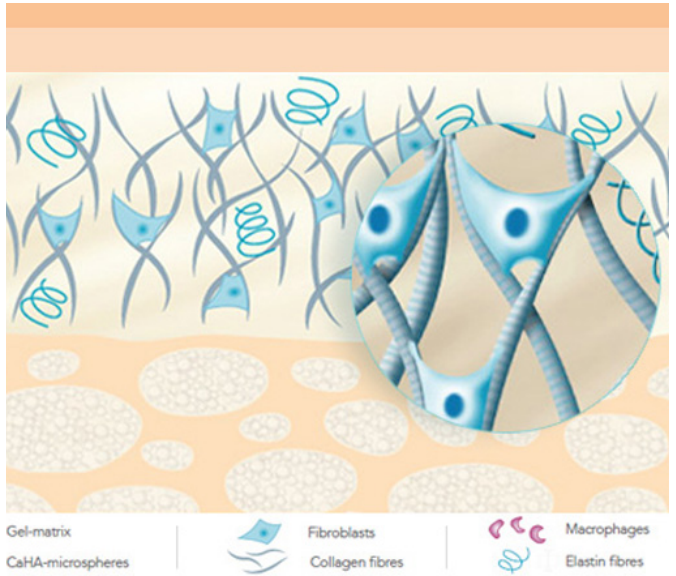
Proliferacion dermica



Angiogenesis



Neocolagenesis tipo I



Produccion de elastina

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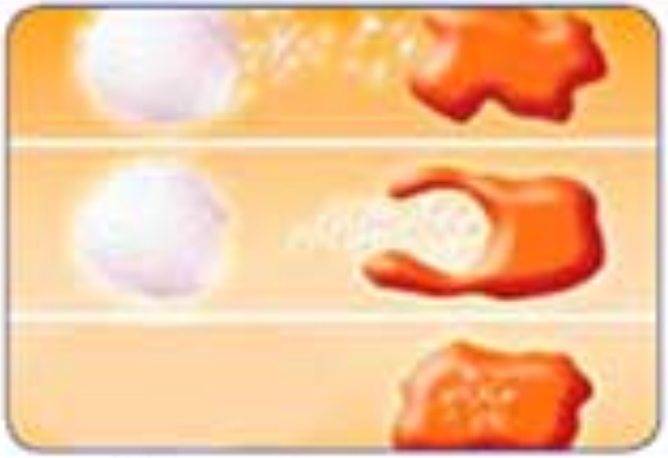
Hidroxiapatita de Cálcio

Estimulação de colágeno



Absorção em cerca de 18 meses

La reabsorción se estima en cerca de 18 meses. En ese tiempo, nuevo colágeno es generado alrededor de la hidroxiapatita degradada

Para el uso de hidroxiapatita como bioestimulante, se ha realizado un consenso internacional de expertos

(De Almeida et al. Plast Reconst Surg Glob Open 2019;7e:2160)

OPEN

PRS GLOBAL OPEN

ORIGINAL ARTICLE

Cosmetic

Consensus Recommendations for the Use of Hyperdiluted Calcium Hydroxyapatite (Radiesse) as a Face and Body Biostimulatory Agent

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Vinicius Figueredo, MD†
Ana Lúcia Gonzaga da Cunha, MD‡
Gabriela Casabona, MD§
Joana Ribeiro Costa de Faria, MD¶
Emerson Vicente Alves, MD‖
Mauricio Sato, MD**
Adeíza Branco, MD††
Christine Guarnieri, MD‖
Eliandre Palermo, MD‖‡‡

Background: Calcium hydroxyapatite (CaHA) is a well-established collagen stimulator. In recent years, it has been increasingly used in hyperdiluted form as a biostimulatory agent rather than a volumizing filler to improve skin quality and firmness in both facial and corporal areas. However, guidelines on the techniques required to achieve optimal results are still lacking. The objective of this study was to develop a consensus recommendation for the safe and effective use of hyperdiluted CaHA for face and body biostimulation.

Methods: A team of 10 experts with extensive experience in dermal fillers and biostimulatory treatments for facial and body rejuvenation convened for a live meeting. Consensus was defined as approval by 70%–89% of all participants, whereas agreement of ≥90% denoted strong consensus.

Results: For most items, the group achieved a majority consensus. Recommendations have been provided for the face, neck, décolletage, buttocks, thighs, arms, abdomen, knees, and elbows with detailed injection techniques, providing information on insertion points, dosages, and volumes for both needle and cannula injections as well as the number of treatment sessions and intervals.

Conclusions: The expert consensus supports and provides guidance for the use of CaHA as a biostimulatory agent for face and body rejuvenation. However, further clinical studies are necessary to provide physicians with the best evidence for the best treatment practices. *(Plast Reconstr Surg Glob Open 2019;7:e2160; doi: 10.1097/GOX.0000000000002160; Published online 14 March 2019.)*

STRONG CONSENSUS > 90%

Hiperdilución

1.5 ml CaHA ≥1.5 ml diluyente

STRONG CONSENSUS > 90%

Hiperdilución

1.5 ml CaHA ≥1.5 ml diluyente

(1:2/1:6 – 7 meses)

Yutkovskaya & Kogan

Cánula contra aguja

Table 2. Consensus Statements

Statements for Facial Treatment	Agreement (%)
Strong consensus	
Product application can be performed via retroinjection using a cannula in a fanning or asterisk technique, with 2–4 entry points per facial side.	100
For facial treatments, the preferred dilution is 1:1 (1.5 mL of diluent).	90
A short linear threading technique with a needle can be used.	90
Consensus	
Usually 1 syringe per session is indicated.	80

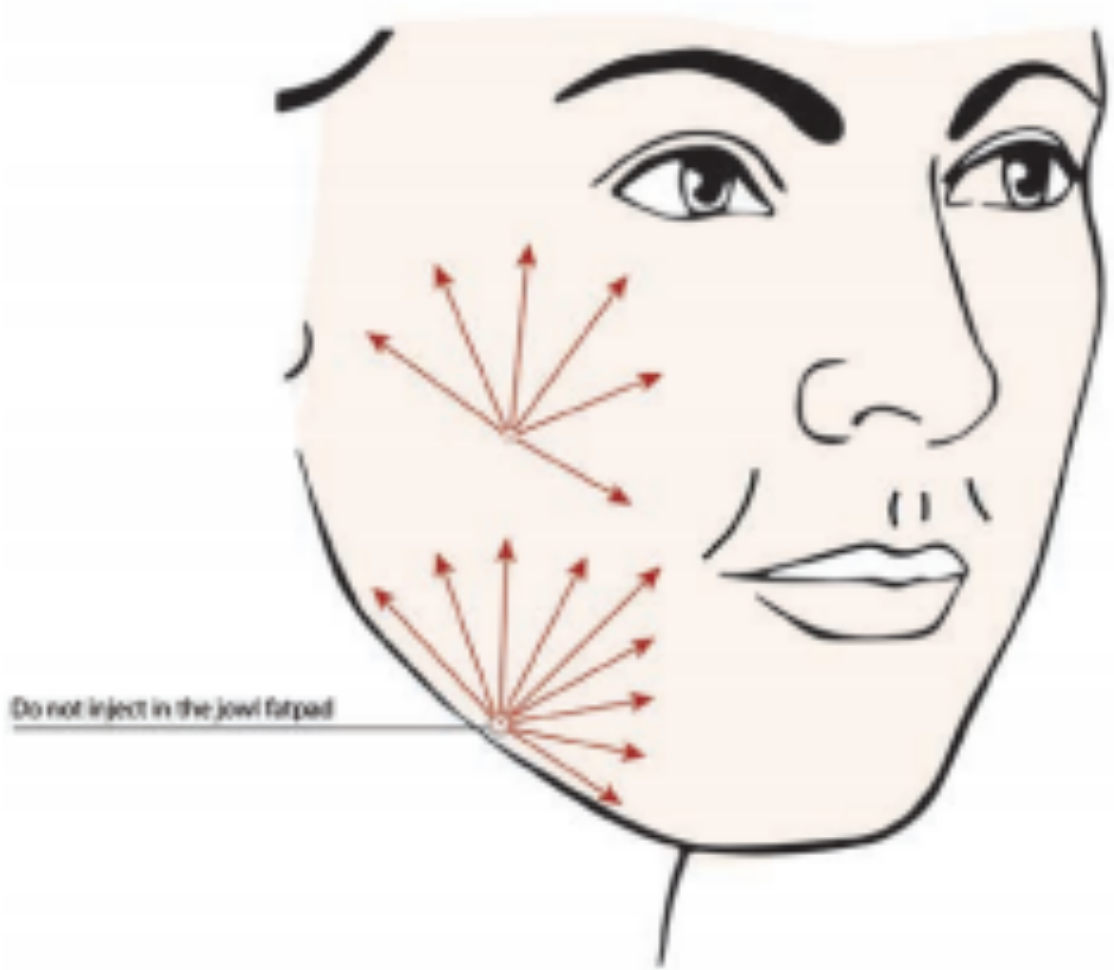
Table 2. Consensus Statements

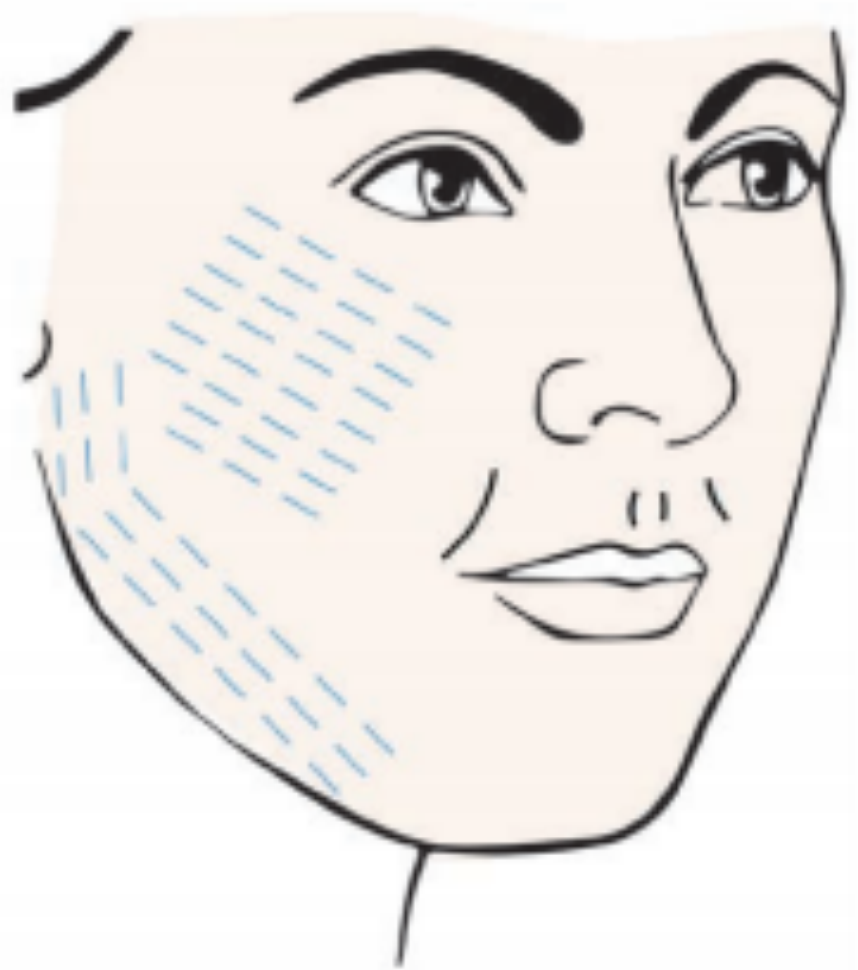
Statements for Facial Treatment	Agreement (%)
Strong consensus	
Product application can be performed via retroinjection using a cannula in a fanning or asterisk technique, with 2–4 entry points per facial side.	100
For facial treatments, the preferred dilution is 1:1 (1.5 mL of diluent).	90
A short linear threading technique with a needle can be used.	90
Consensus	
Usually 1 syringe per session is indicated.	80

Table 2. Consensus Statements

Statements for Facial Treatment	Agreement (%)
Strong consensus	
Product application can be performed via retroinjection using a cannula in a fanning or asterisk technique, with 2–4 entry points per facial side.	100
For facial treatments, the preferred dilution is 1:1 (1.5 mL of diluent).	90
A short linear threading technique with a needle can be used.	90
Consensus	
Usually 1 syringe per session is indicated.	80

Se recomienda uso de cánula para disminuir el riesgo de punción intravascular (25g o menos)



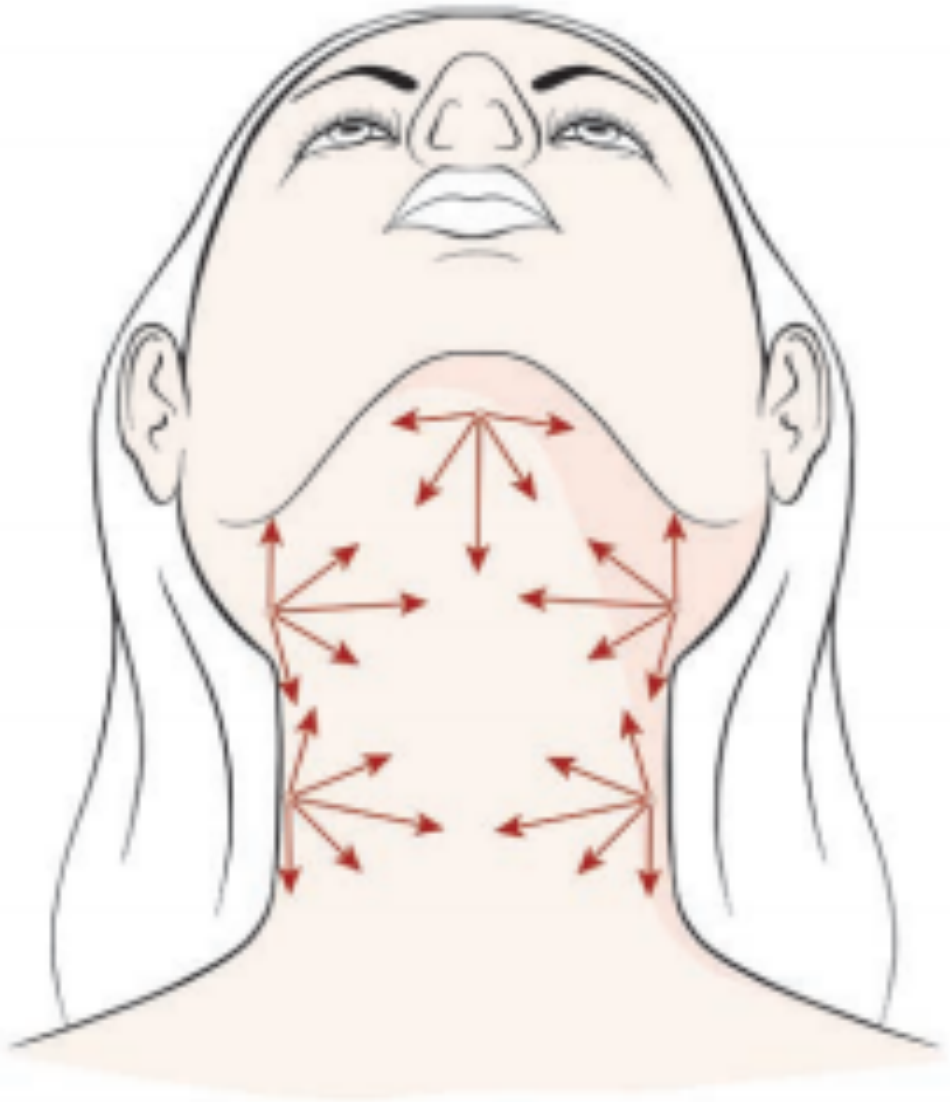


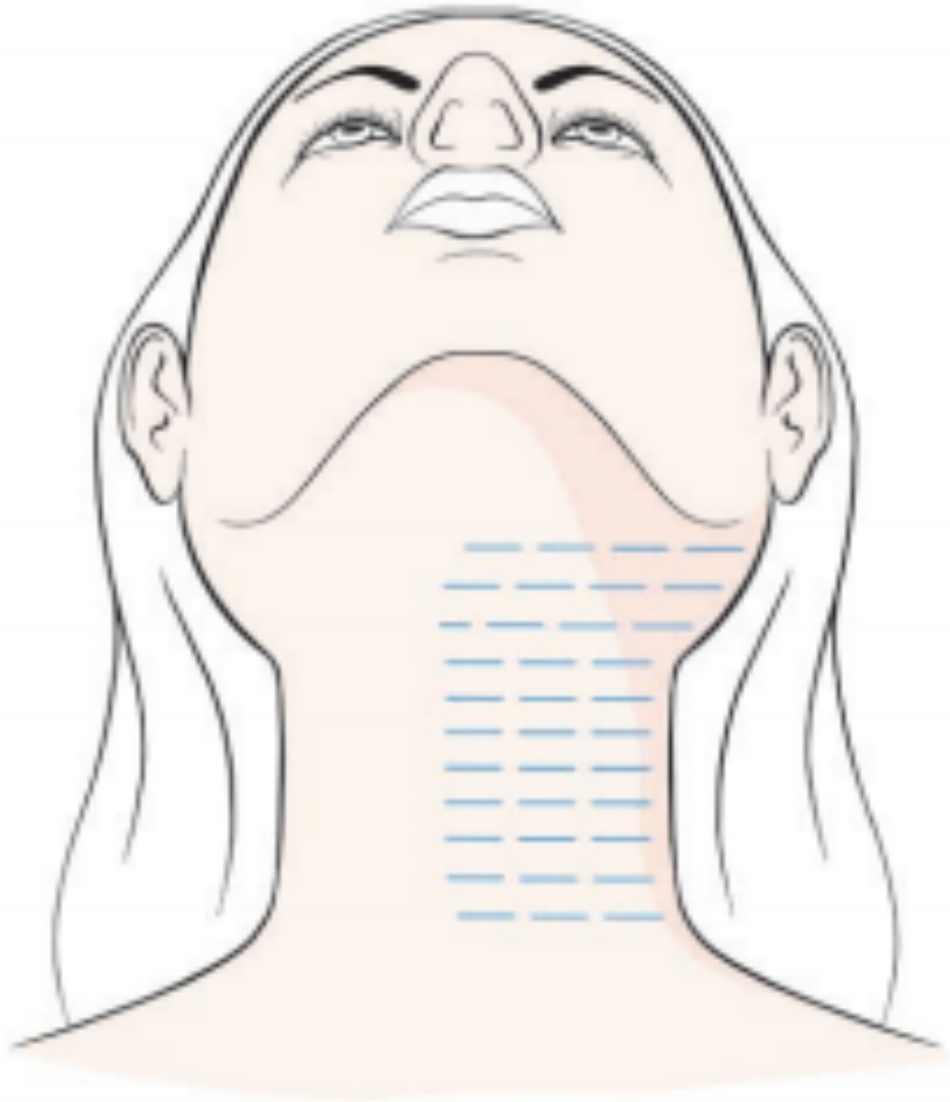
Patrón en abanico o lineal interrumpido

Fig. 1. The face before and 8 weeks after injections of 1.5 mL of CaHA (Radiesse) diluted 1:1 with 1.5 mL of lidocaine (total of 3 syringes split in 2 sessions with a 4-week interval). Notice the improvement of skin laxity and the discrete volume gain. Courtesy of Vinicius Figueredo, MD.

Statements for Neck Treatment

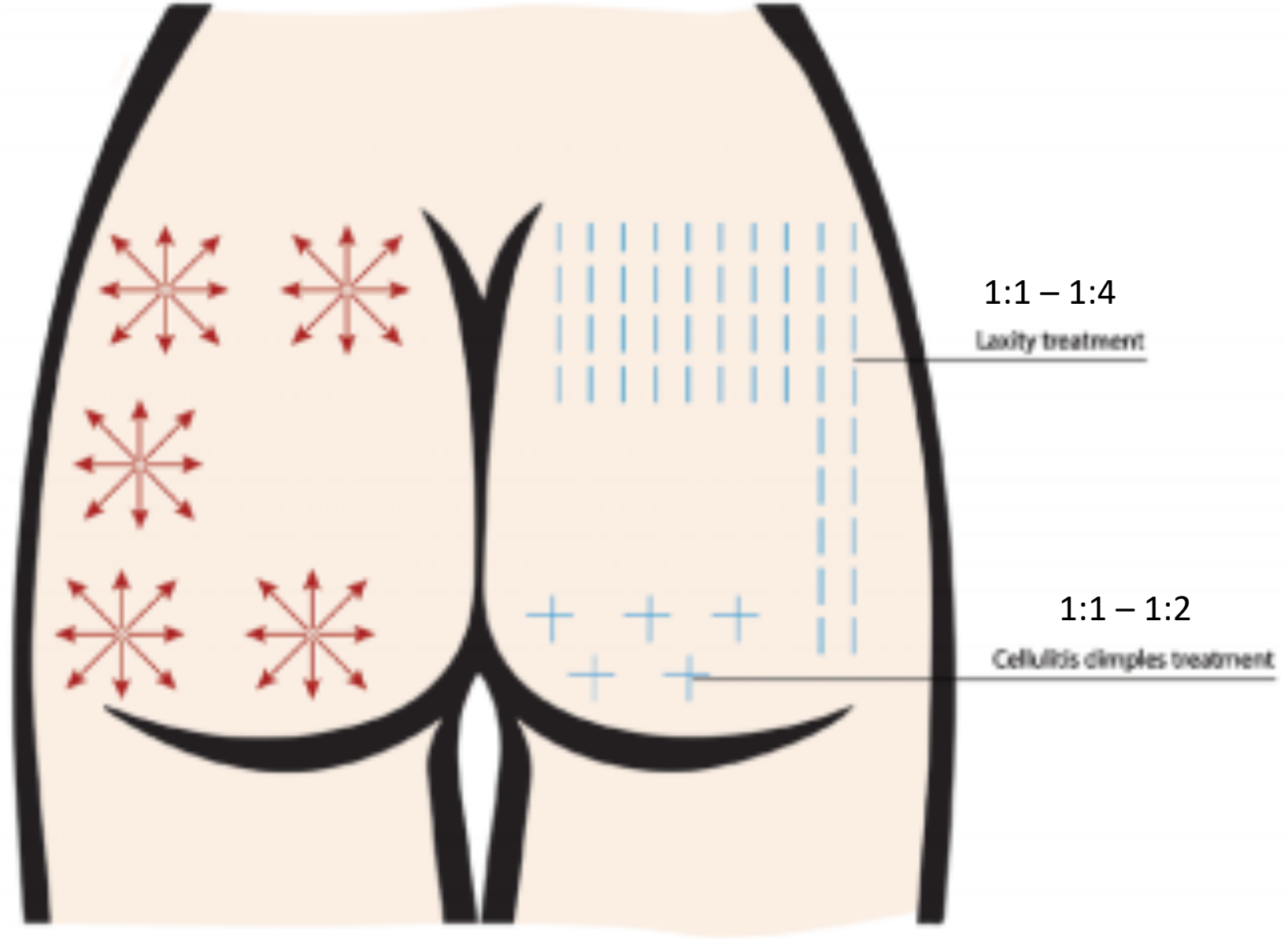
Strong consensus	
Usually 1 syringe per session is indicated.	100
Product application can be performed by cannula via retroinjection (fanning or asterisk technique) with 3–5 entrance points.	100
Consensus	
For neck treatment, a dilution of 1:2 to 1:4 (3–6 mL of diluent) is usually indicated according to the patient's skin thickness.	80
A short linear threading technique using a needle is an alternative option.	80

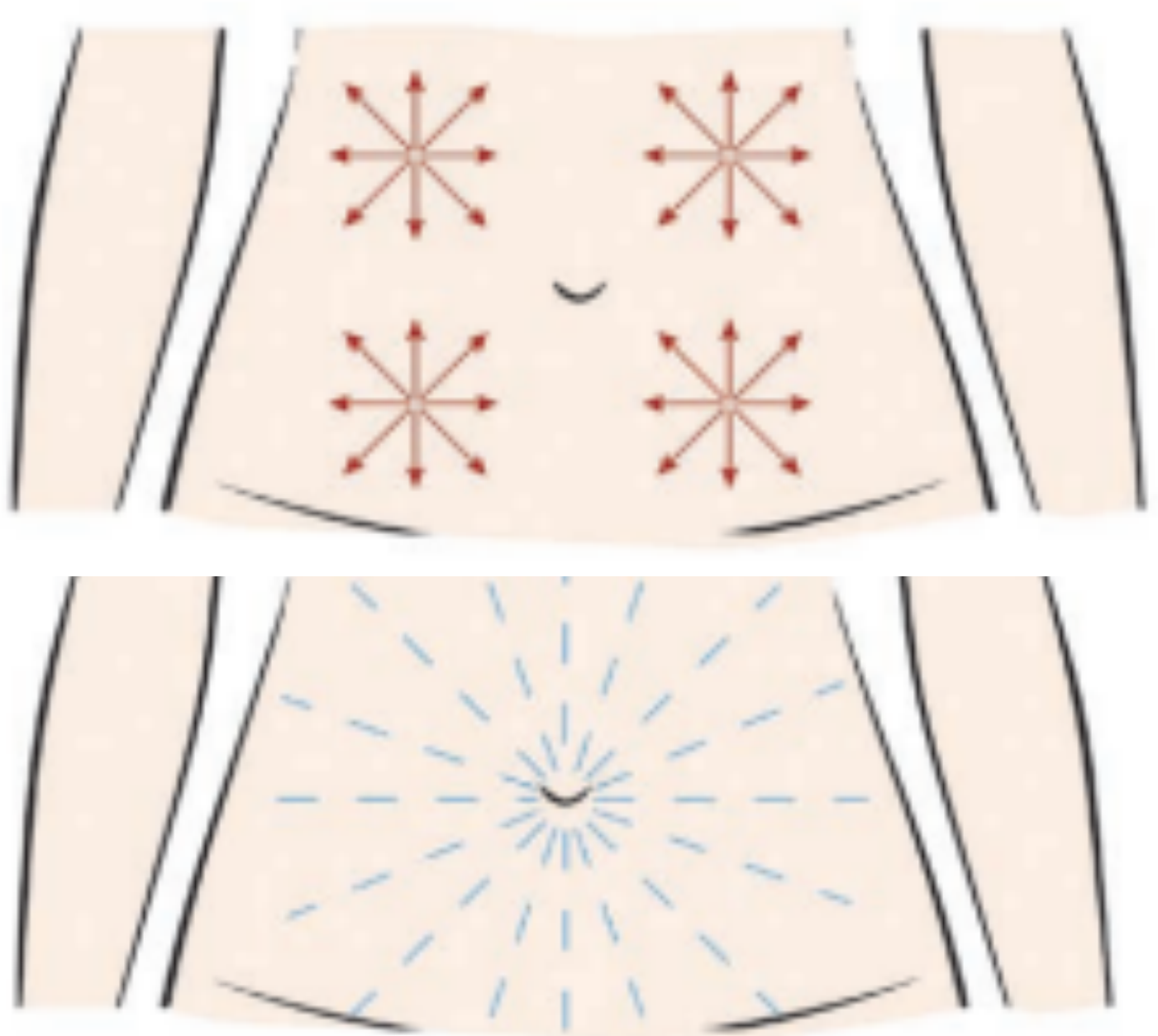




Por el mismo orificio se hace la punción en abanico

La resistencia es mínima en el plano correcto


1:1 – 1:4
Laxity treatment
1:1 – 1:2
Cellulitis dimples treatment



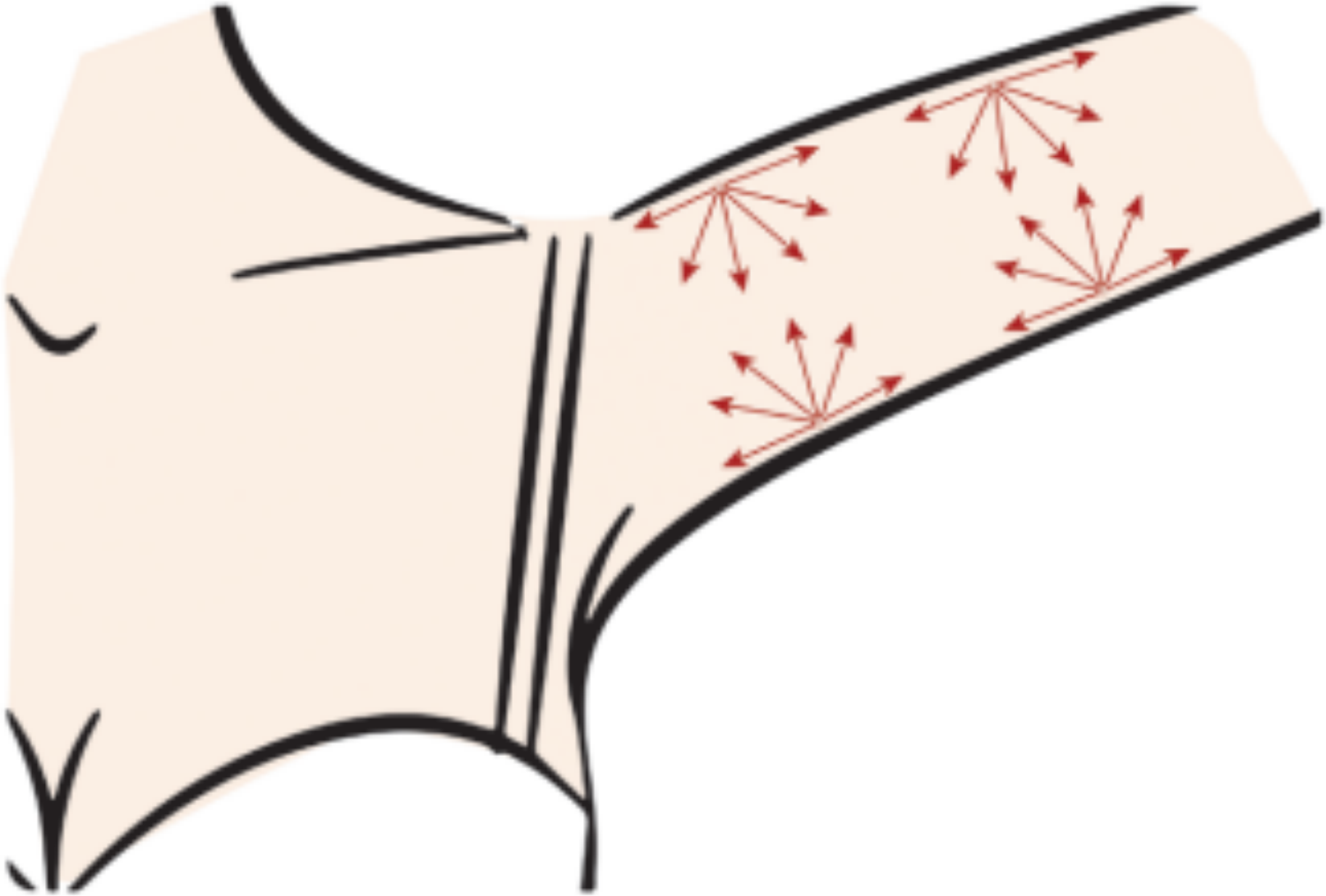
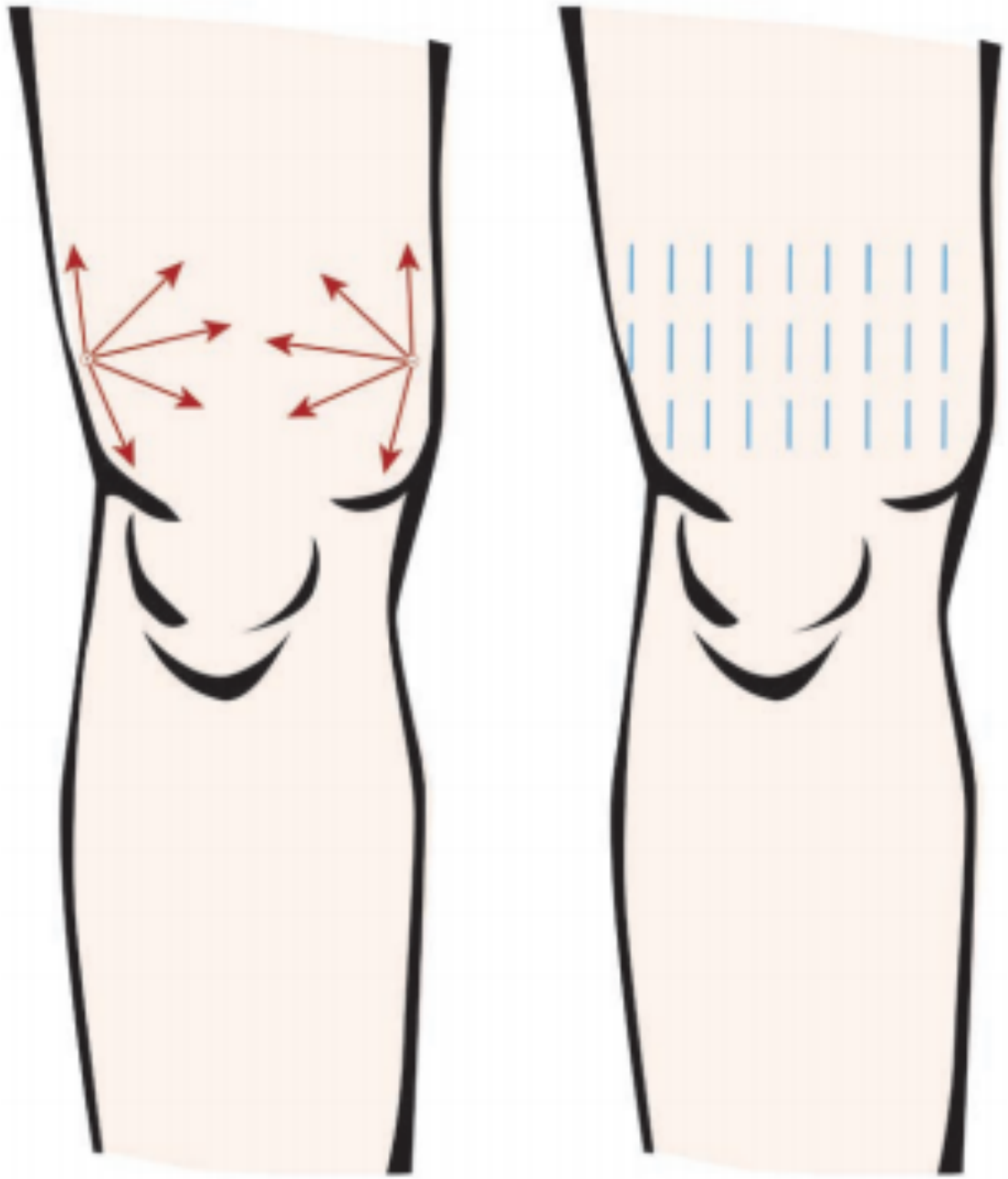


Fig. 6. The upper arm before and 48 weeks after injection of 1.5 mL of CaHA (Radiesse) diluted with 6 mL of lidocaine, per side. Notice the remarkable long-term improvement of skin laxity. Courtesy of Eliandre Palermo, MD.



Efectos adversos

- Nodulos: masaje, lidocaína o suero salino

Efectos adversos

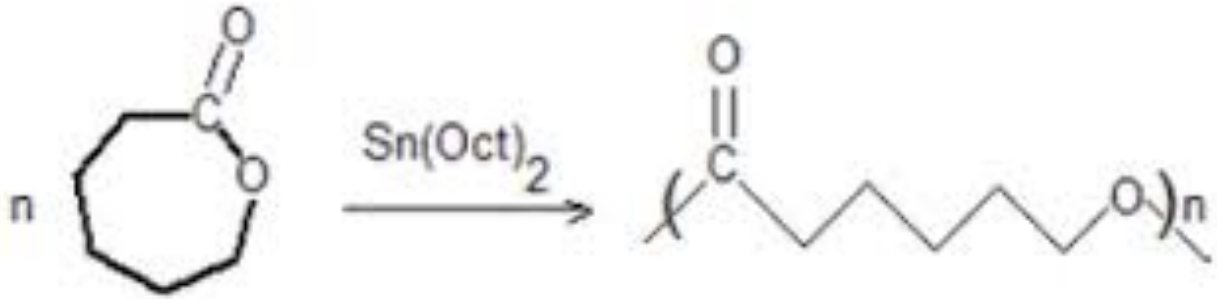
- Nodulos: masaje, lidocaina o suero salino
- 5-florouracilo, triamcinolona y lidocaína
- 5081 tratamientos – 45% de nodulos en areas dinámicas faciales

Efectos adversos

- Nodulos: masaje, lidocaina o suero salino
- 5-florouracilo, triamcinolone y lidocaine
- 5081 tratamientos – 45% de nodulos en areas dinamicas facials (boca).
- Evitar glabela y nariz. No eventos vasculares documentados

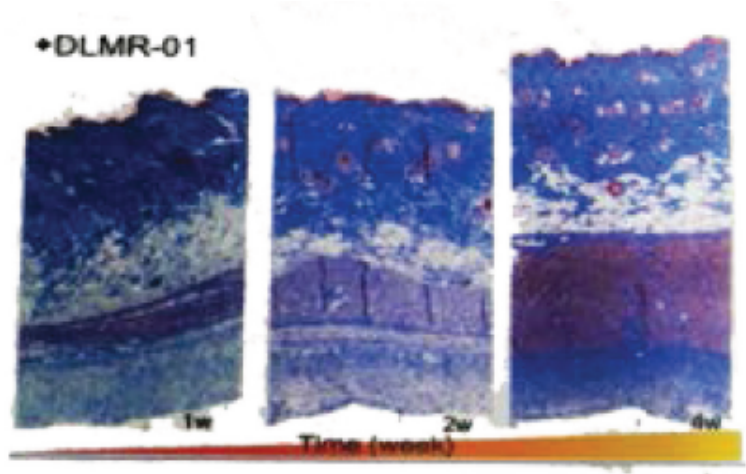
Efectos adversos

- Nódulos: masaje, lidocaina o suero salino
- 5-florouracilo, triamcinolona y lidocaina
- 5081 tratamientos – 45% de nódulos en áreas dinámicas faciales
- Evitar glabela y nariz. No eventos vasculares documentados
- Masaje postcolocación
- Masaje 2 veces/dia x 7 dias



Caprolactona

Policaprolactona



Relleno con NOVETAFIL

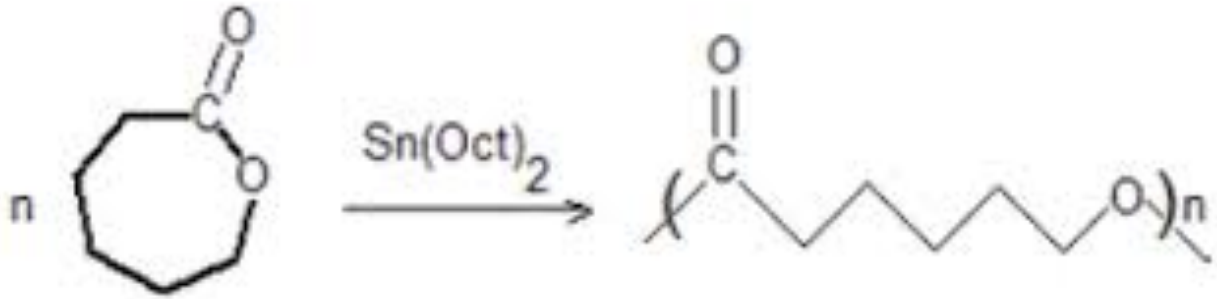
Relleno con NOVETAFIL es gradualemente degradado mientras induce la neocologénesis.

El colágeno es rejuvenecido y estimulado

El colágeno regenerado se mantiene por 12 meses.

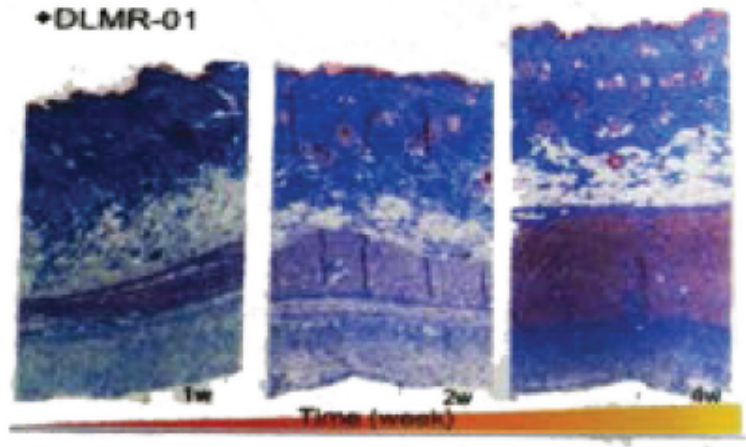
ELLANSÉ™

A touch of youth



Caprolactona

Policaprolactona



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ELLANSÉ™
A touch of youth

Material usado en suturas absorbibles en cirugía plástica

Clin Cosmet Investig Dermatol. 2017; 10: 431–440.
Published online 2017 Nov 8. doi: 10.2147/CCID.S145195

PMCID: PMC5685142
PMID: 29184426

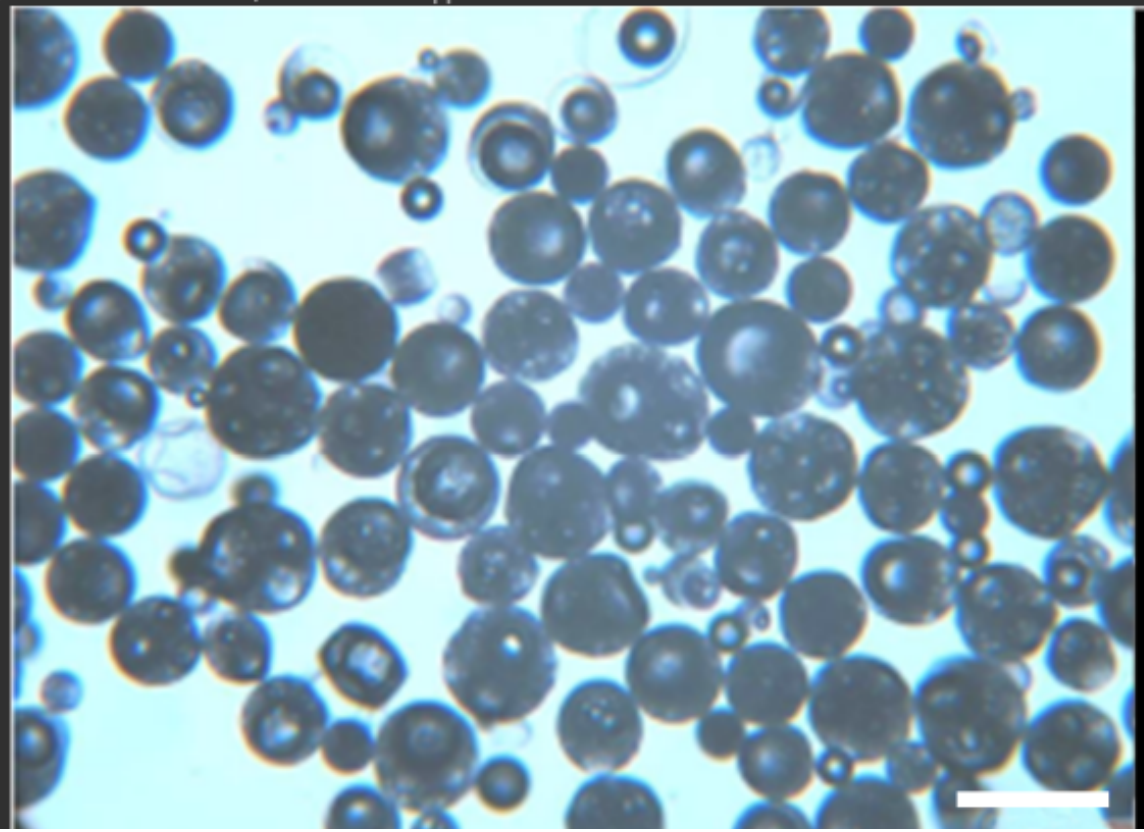
Recommendations for volume augmentation and rejuvenation of the face and hands with the new generation polycaprolactone-based collagen stimulator (Ellansé®)

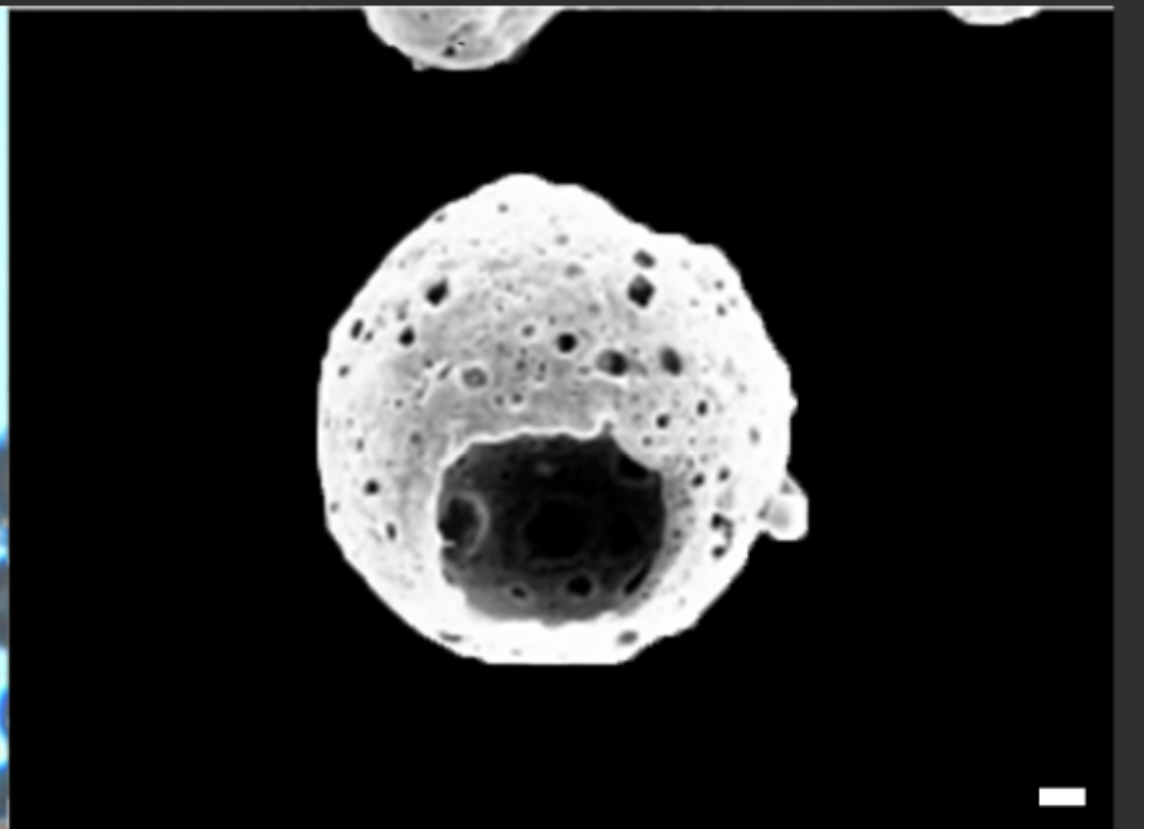
Francisco de Melo,[1] Pierre Nicolau,[2] Luca Piovano,[3] Shang-Li Lin,[4] Tiago Baptista-Fernandes,[5] Martyn I King,[6] Alessandra Camporese,[7] Kyungkook Hong,[8] Maria M Khattar,[9] and Marie-Odile Christen[10]

‣ Author information ‣ Copyright and License information Disclaimer

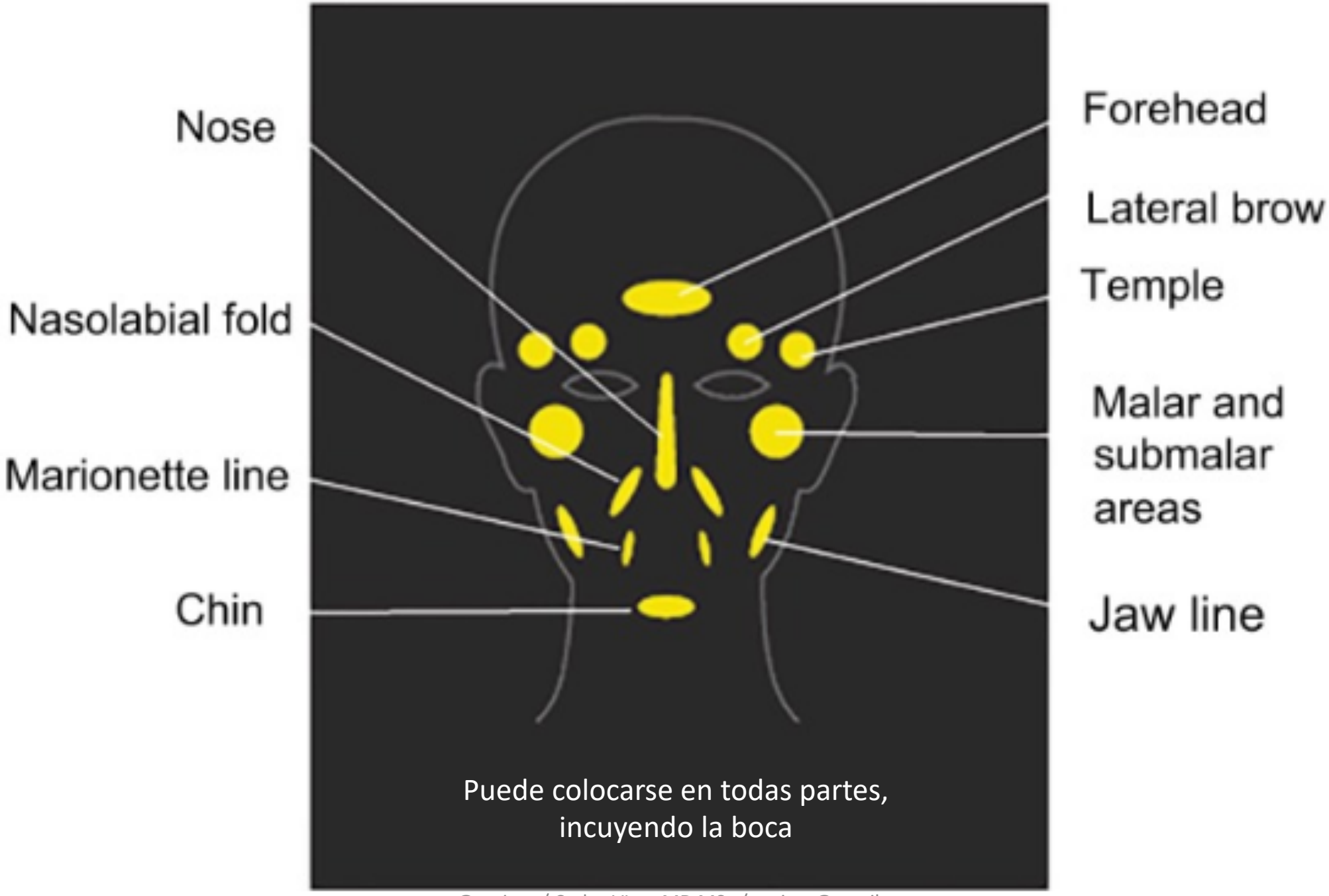
An in vitro and in vivo study on the properties of hollow polycaprolactone cell-delivery particles

Barend Andre Stander, Fiona A. van Vollenstee, ... Michael S. Pepper

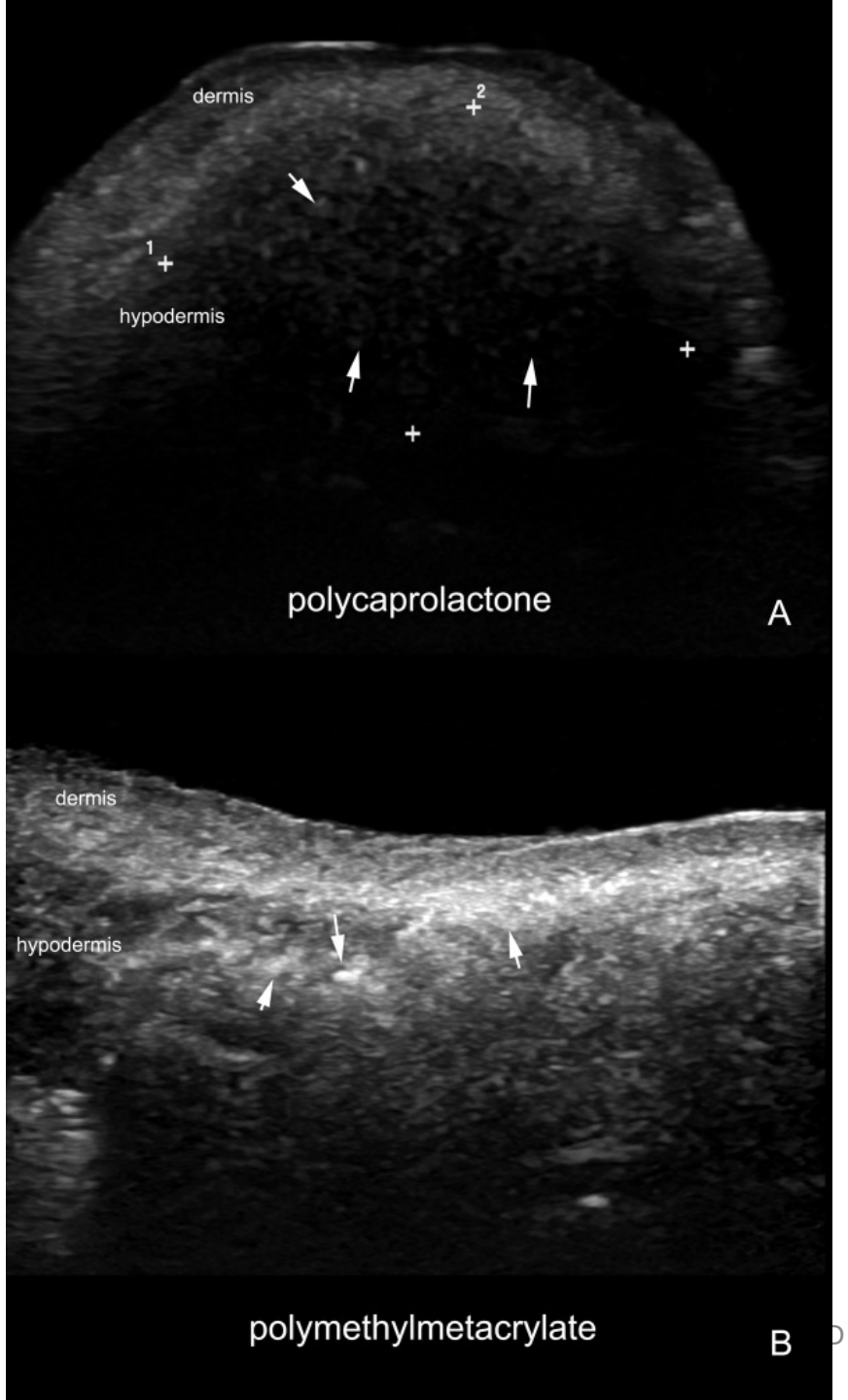




Las partículas de policaprolactona son degradadas en alrededor de 18 meses con estimulación de colágeno entre 40 a 50%



Puede colocarse en todas partes, incuyendo la boca



En evaluación sonográfica, se observan partículas ecogénicas con menos intensidad que el PMMA

Journal of the European Academy of Dermatology and Venereology

Letter to the Editor

Remarkable improvement of striae distensae with polycaprolactone filler injection

J.Y. Hong, H.S. Han, T.R. Kwon, J.H. Kim, J.T. Na, B.J. Kim

First published: 22 May 2019 | https://doi.org/10.1111/jdv.15702

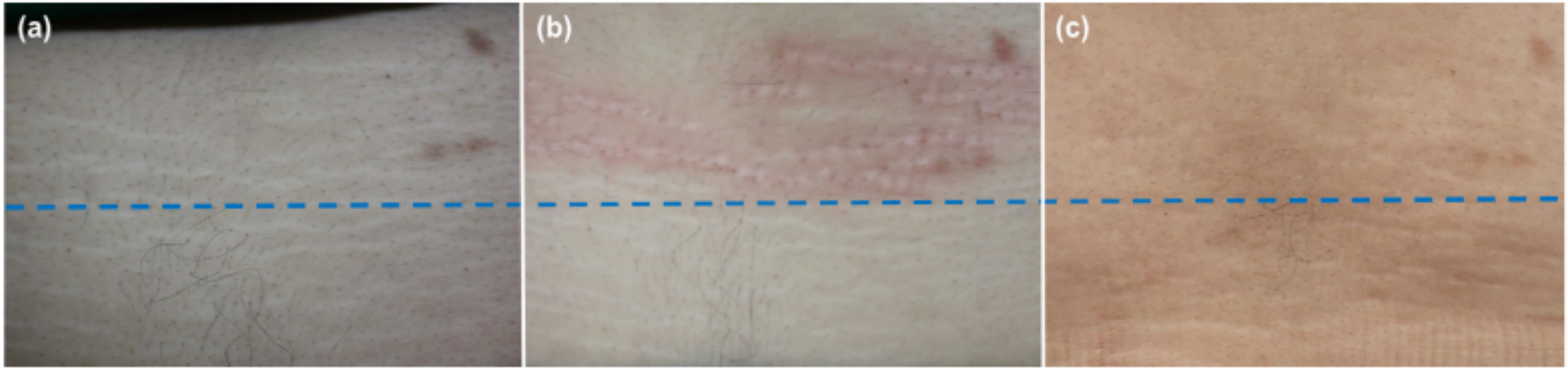


Figure 1 (a) Before treatment, hypopigmented and atrophic stretch marks are equally visible above and below the blue line. (b) Immediately after polycaprolactone filler injection to the stretch marks above the blue line, erythema and nodularity at the site of injection are noted. (c) Four months after the treatment, remarkable improvement in atrophic SD is noted in comparison with the control SD below the blue line

Preliminary Report

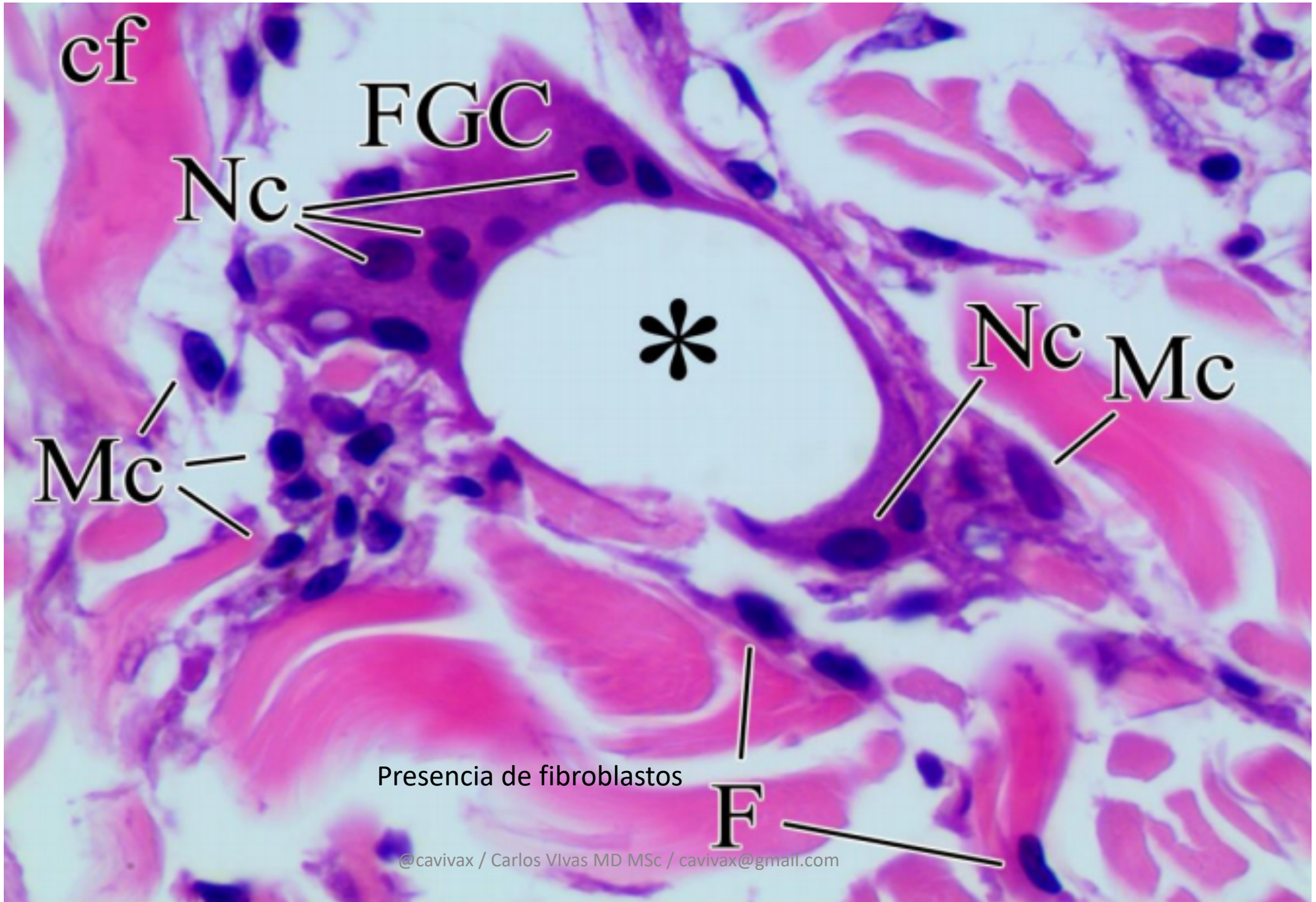
Changes in Dermal Thickness in Biopsy Study of Histologic Findings After a Single Injection of Polycaprolactone-Based Filler into the Dermis

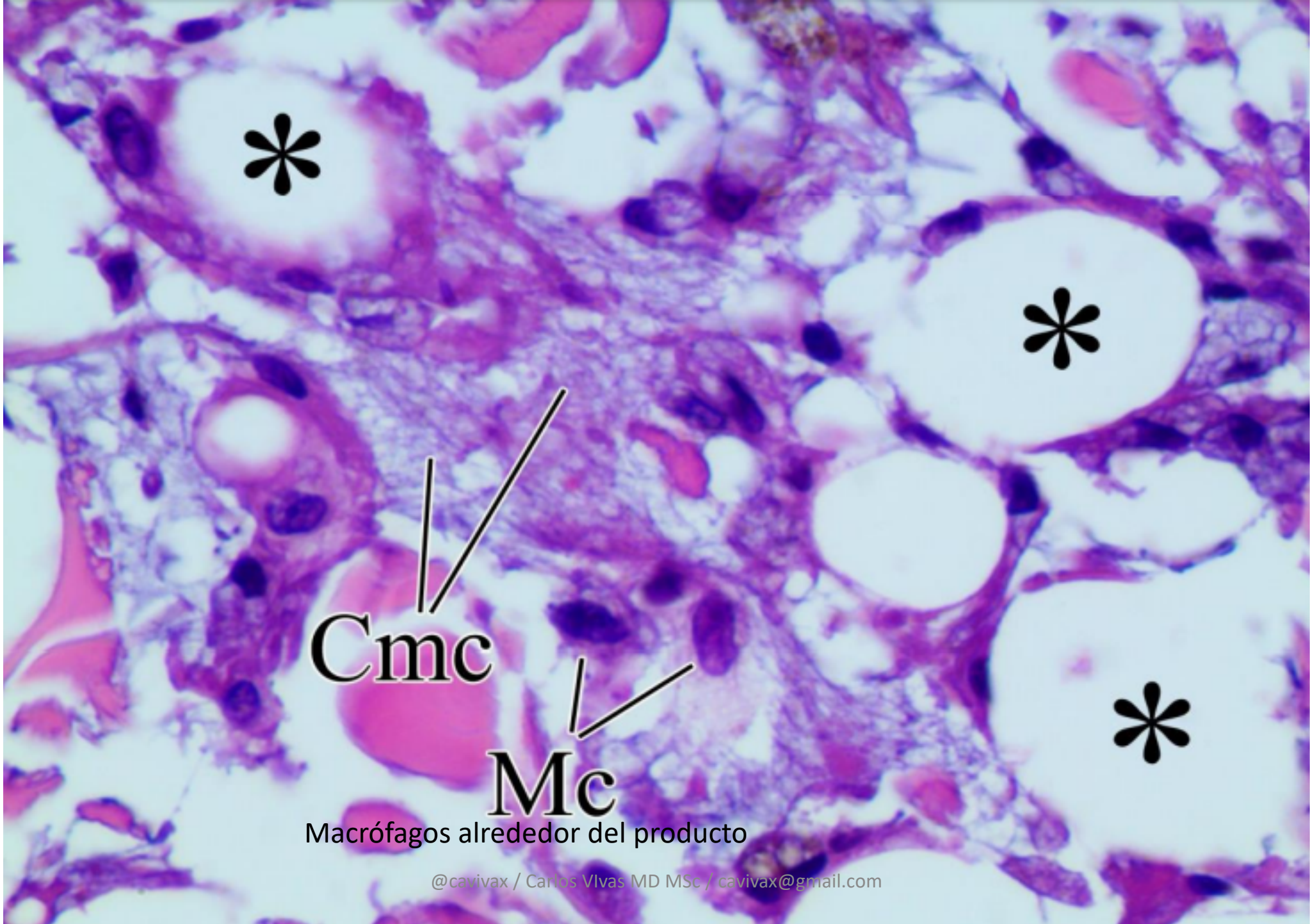
JongSeo Kim, MD

Aesthetic Surgery Journal
2019, 1–11

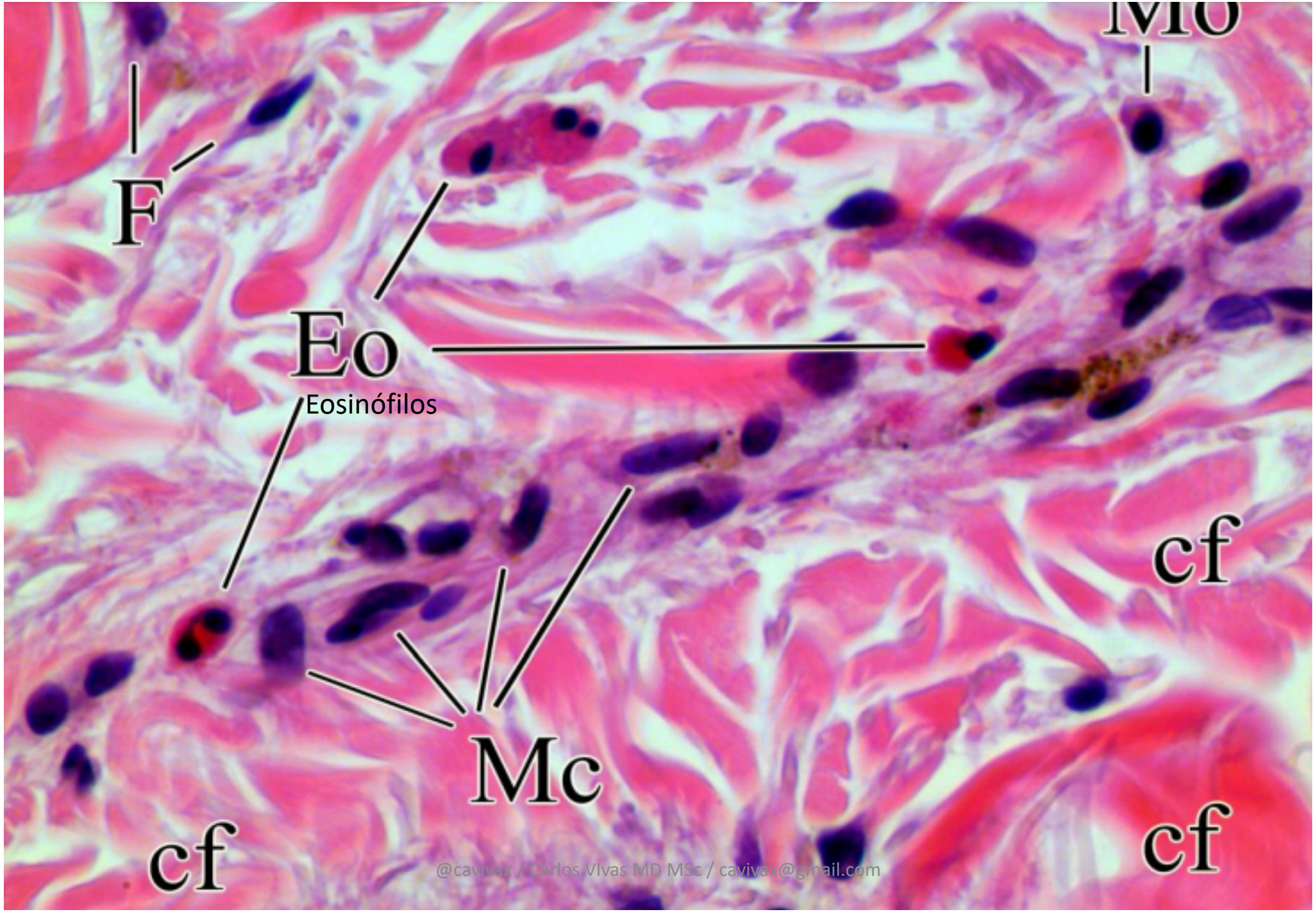
DOI: 10.1093/asj/sjz050
www.aestheticsurgeryjournal.com

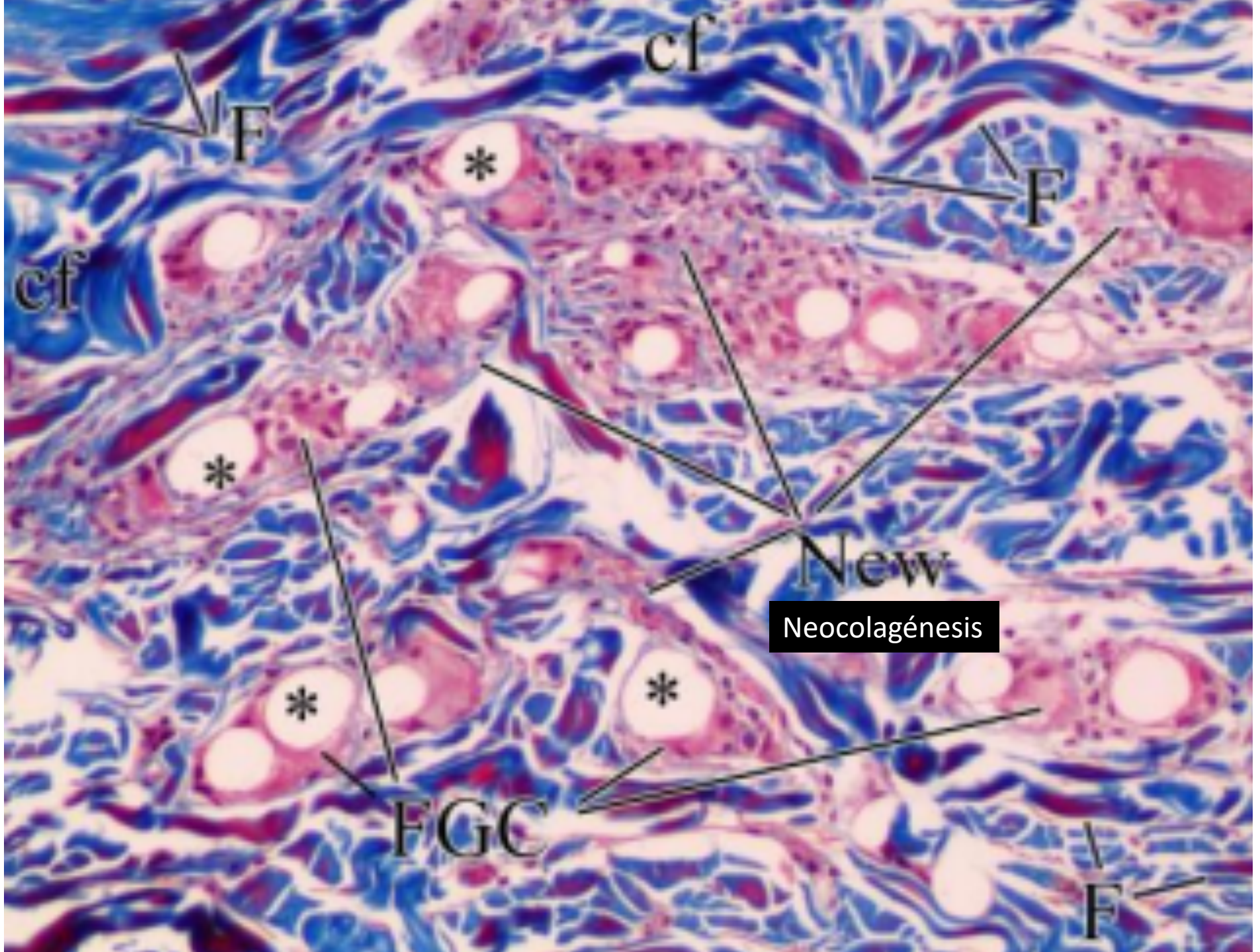
OXFORD
UNIVERSITY PRESS





Macrófagos alrededor del producto




cf
F
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*
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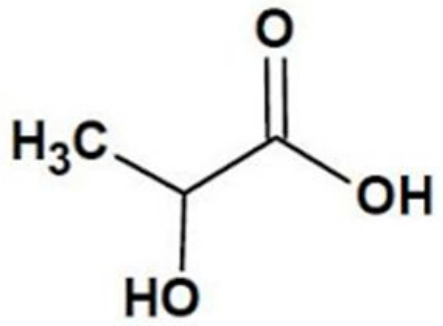
New
Neocolagénesis
FGC
F

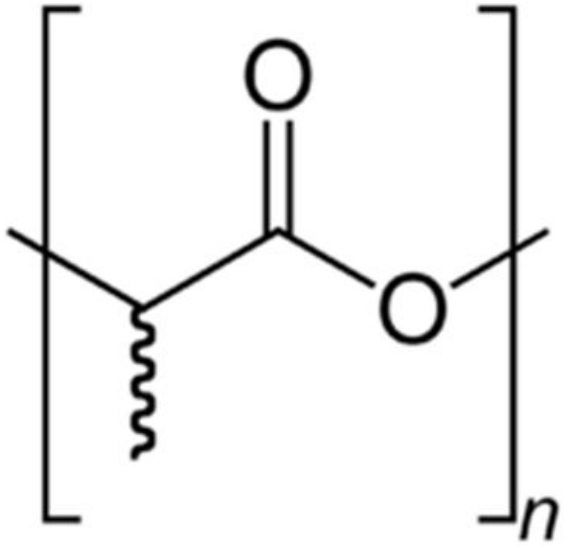
Puede usarse también como relleno, aunque la voluminización es menor que el CaHa

Plásticos BIOBASADOS

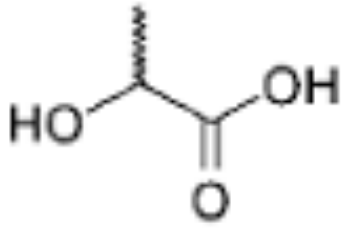
PLA Ácido Poliláctico

El ácido láctico (LA)
es el ácido 2-hidroxipropanóico

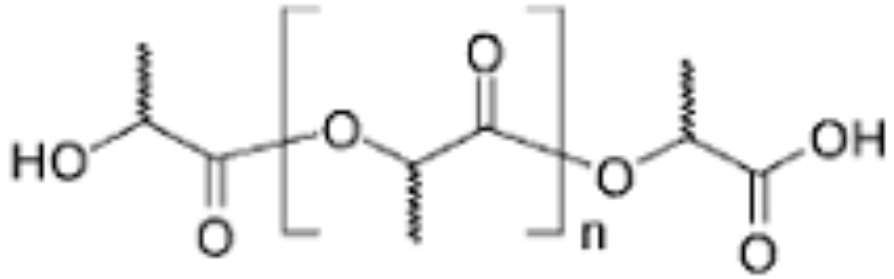




ÁCIDO POLILACTICO
PLA



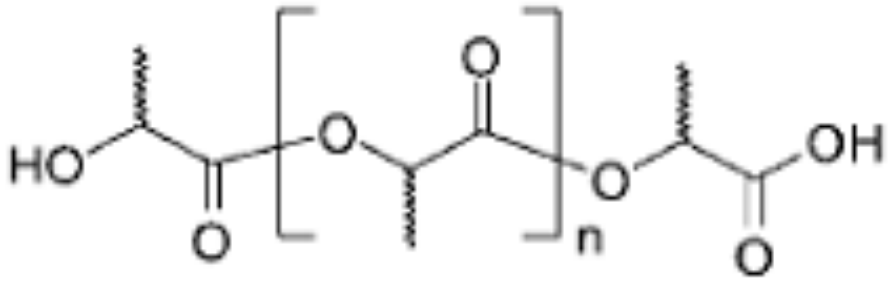
Acido láctico



PLA de alto peso molecular

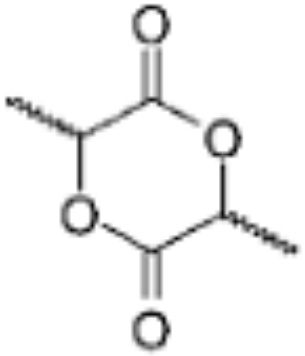
Condensación
- H2O

Polimerización
por apertura de
anillo



Oligómero de PLA
Bajo peso molecular

Despolimerización



Lactida

Accession Number : AD0636716

Title : POLYLACTIC ACID FOR SURGICAL IMPLANTS

Descriptive Note : Technical rept.

Corporate Author : WALTER REED ARMY MEDICAL CENTER WASHINGTON DC ARMY MEDICAL BIOMECHANICAL RESEARCH LAB

Personal Author(s) : Kulkarni, R K ; Pani, K C ; Neuman, C ; Leonard, F

Full Text : https://apps.dtic.mil/dtic/tr/fulltext/u2/636716.pdf

Report Date : Apr 1966

Desde 1966 es señalado para uso como biomaterial

Pagination or Media Count : 17

Abstract : High molecular weight polymer from lactic acid can be made from the cyclic lactide intermediate, suitable for casting films or spinning fibers. The films are quire permeable to water vapor and can soften in presence of water. Histological studies indicate that the polylactic acid is non-toxic, nontissue reactive, and biodegradable, as evidenced further by the study of degradation of C14 tagged polymer in vivo. The degradation studies also point out that the polymer or its degradation products are not retained in any of the vital organs of the animals. The polymer implant, however, degrades slowly in vivo, losing 12-14% in three months. This study indicates polylactic acid to be a very suitable material for sutures, vascular grafts, and other surgical implants.

Descriptors : *POLYMERS , *SURGICAL IMPLANTATION , *SURGICAL SUPPLIES , *LACTIC ACID , DEGRADATION , MATERIALS , TOXICITY , FILMS , HISTOLOGY , SYNTHETIC FIBERS

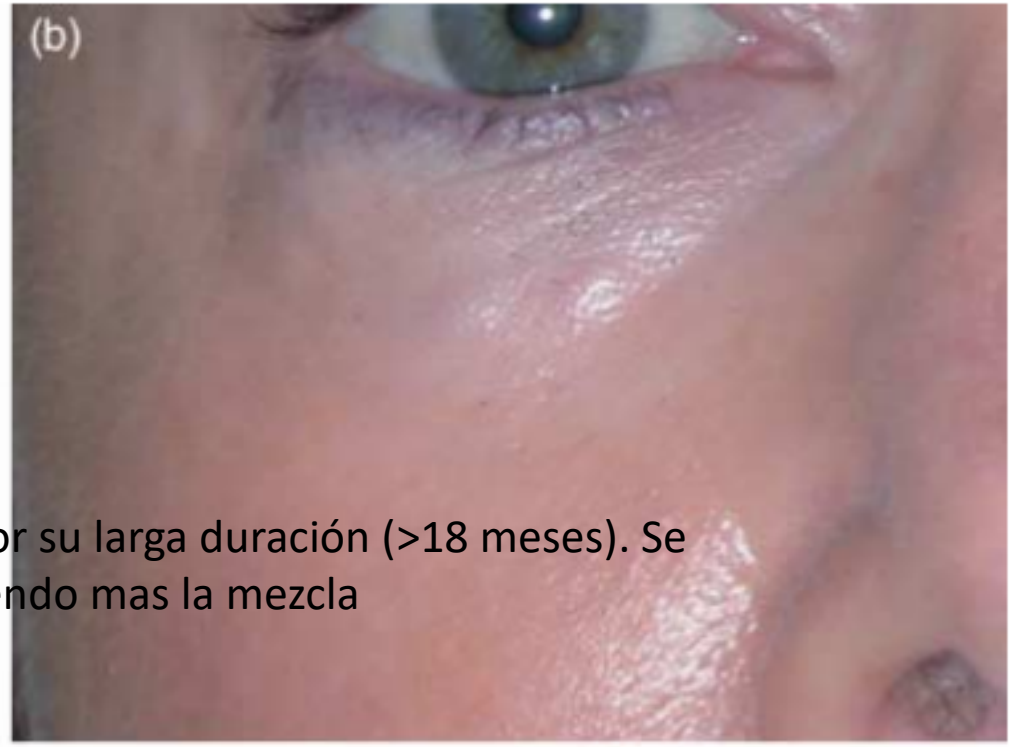
Polylactic acid implants (New-Fill)® to correct facial lipoatrophy in HIV-infected patients: results of the open-label study VEGA

Valantin, Marc-Antoine[a,b]; Aubron-Olivier, Camille[a]; Ghosn, Jade[a]; Laglenne, Elisabeth[c]; Pauchard, Michelle[a]; Schoen, Hélène[a]; Bousquet, Raymond[a]; Katz, Philippe[d]; Costagliola, Dominique[b]; Katlama, Christine[a,b]

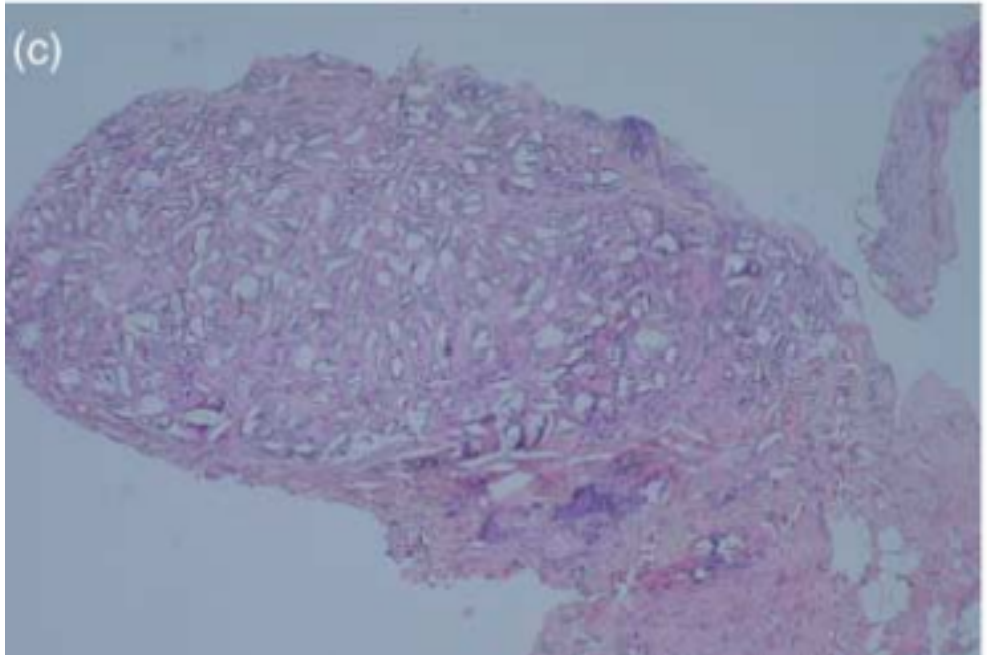
AIDS: November 21st, 2003 - Volume 17 - Issue 17 - p 2471-2477
CLINICAL SCIENCE

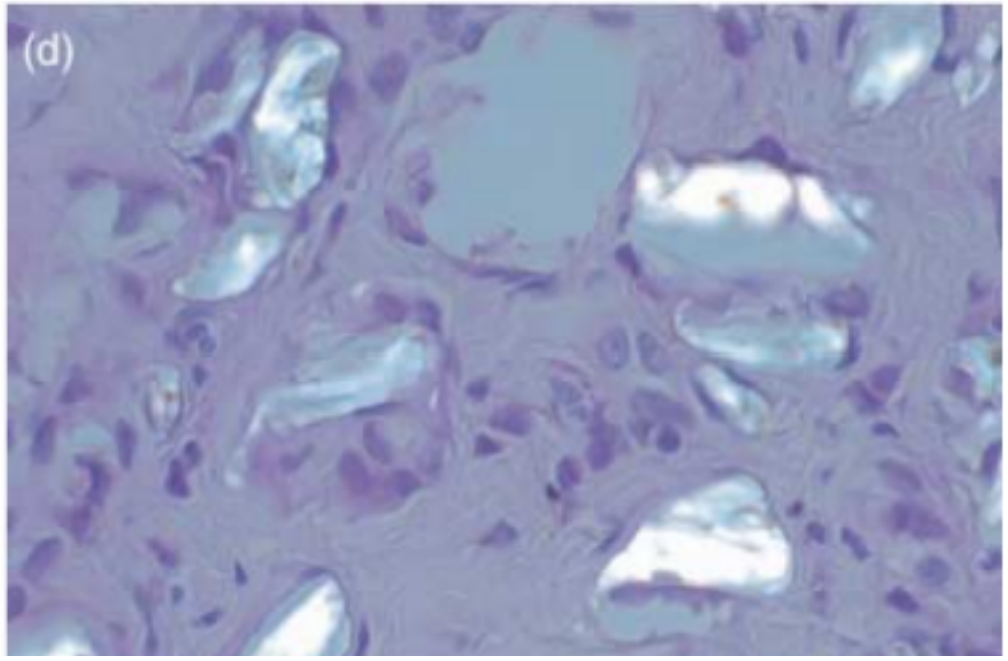
FREE SDC

Usado en pacientes HIV como voluminizador a largo plazo



Generó problemas de nódulos por su larga duración (>18 meses). Se solucionó diluyendo mas la mezcla





Original Contribution

Decrease of reported adverse events to injectable polylactic acid after recommending an increased dilution: 8-year results from the Injectable Filler Safety study

Florian Rossner,[1] Mathias Rossner,[1] Vanessa Hartmann, MD,[1] Ricardo Erdmann,[1] Luitgard G Wiest, MD[2] & Berthold Rzany, MD, ScM[1]

[1] *Division of Evidence Based Medicine, Klinik für Dermatologie, Charité Universitätsmedizin Berlin, Berlin, Germany*

[2] *Dermatologist in private practice, Munich, Germany*

La generación de colágeno nuevo es de hasta 60%

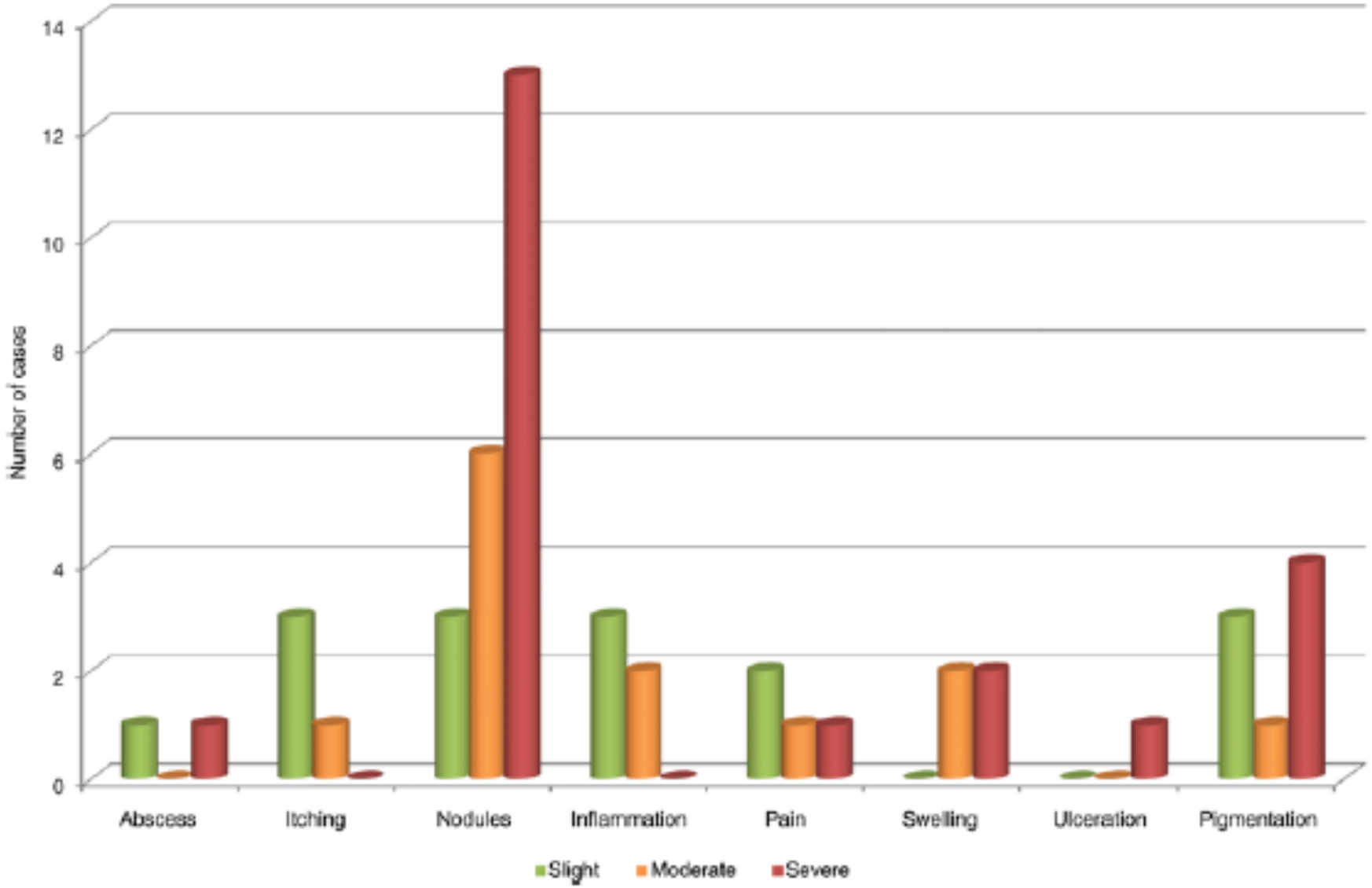
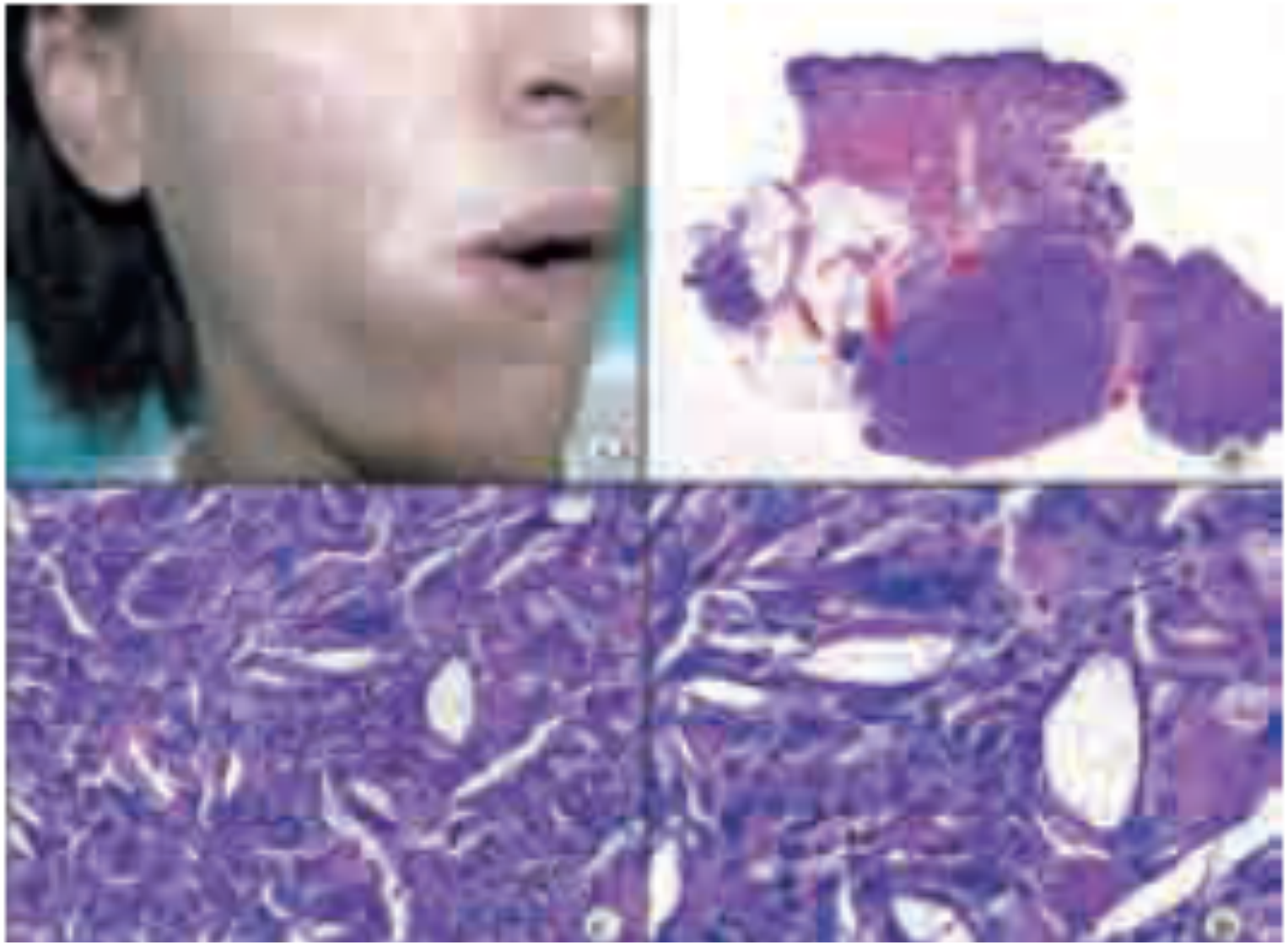


Figure 1 Type of adverse reactions to PLA per patient.



Hay varias marcas comerciales en el mercado


sculptra®
Ácido poli-L-láctico
GALDERMA
sculptra®
Ácido poli-L-láctico
Reconstituir con 5-8 ml de agua estéril para inyección para uso subcutáneo o en la dermis profunda

- Agua estéril
- Agitar constantemente
- Oclusión de agujas
- Dilución

Se usan métodos diferentes a otros estimuladores para su aplicación. Las agujas deben cambiarse si se tapan. La dilución está establecida por el fabricante

Actualmente nuevas fórmulas hacen mas fácil la colocación. Mezclada con hialurónico es mas fácil de manipular. Se usa para relleno glúteo (resultado mediano a pobre) y en todas partes del cuerpo.

Sabemos que la formación teórica es indispensable para el correcto ejercicio médico...

…pero en el caso de procedimientos, actividades prácticas generan destrezas motoras propias del cirujano…

… esperemos que pronto sea posible entrenar de manera práctica sin temer al Covid-19.
Gracias por su atención.

@cavivax / cavivax@gmail.com