

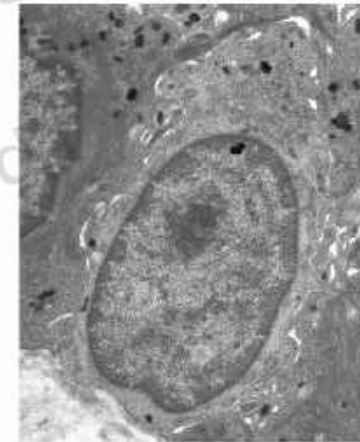
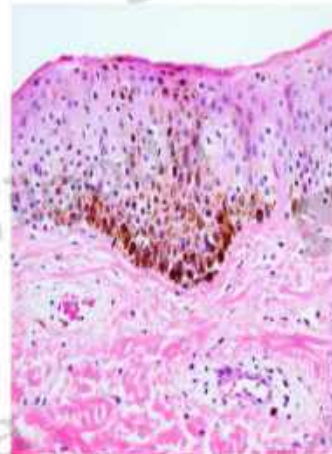


A face-split study to evaluate the effects of

# microneedle **radiofrequency**

with/without Q-Nd:YAG laser for the treatment of **melasma**

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## Back ground I

### Combined Use of **Monopolar Radiofrequency** and Transdermal Drug Delivery in the Treatment of **Melasma**

Norma Cameli, MD, PhD, Elva Abril, MD, Maria Mariano, MD, and Enzo Berardesca, MD, PhD\*

2014 by the American Society for Dermatologic Surgery, Inc

The **RF energy** emitting device enables to exert 3 levels of biostimulation (low, medium, and high) with different biological response

- (1) **cellular biostimulation**, with an increase in the proliferative processes and membrane permeability with low-energy transfer mode;
- (2) intracellular **oxygensation**, with an increase in the cellular metabolism and in the speed **of blood flow** with medium energy transfer mode;
- (3) marked endothermic increase, with **vasodilatation and hyperemia** with high-energy transfer mode.





## Back ground II

Low energy **Q-switched Nd Yag** laser for melasma treatment

**Subcellular Selective Photothermolysis** of Melanosomes in Adult Zebrafish Skin Following 1064-nm Q-Switched Nd:YAG Laser Irradiation.

*J Invest Derm*, 130: 2333–2335. Epub 13 May (2010)

**A low fluence Q-switched Nd:YAG laser** modifies the 3D structure of melanocyte and ultrastructure of melanosome by **subcellular-selective photothermolysis**.

*J Electron Microsc*, 60: 11-18. Epub 11 Oct (2010)

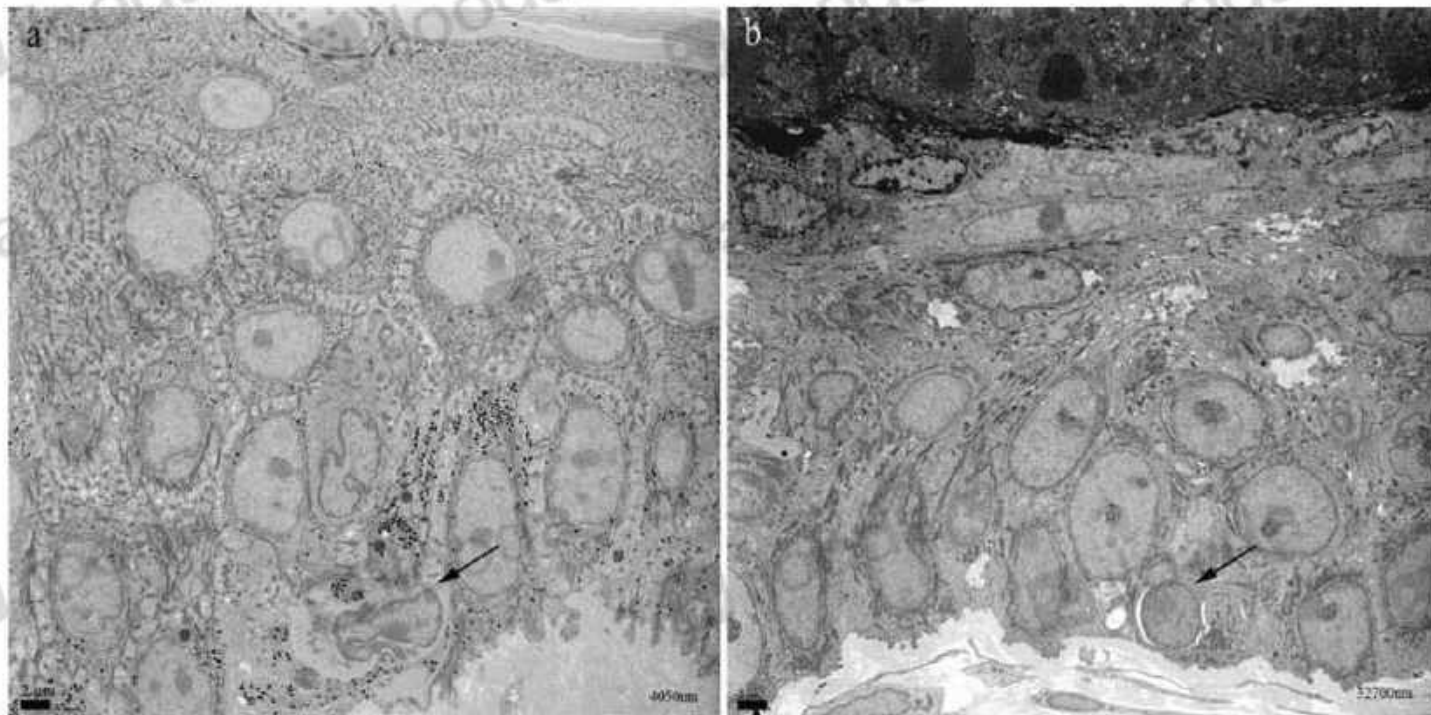




## Back ground III

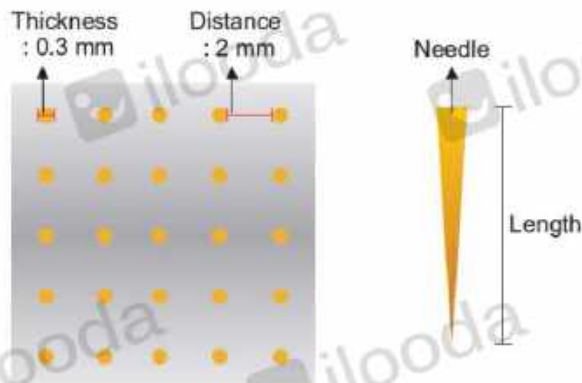
A low fluence QSND laser modifies the 3D structure of melanocyte and ultrastructure of melanosome by subcellular selective photothermolysis( laser toning)

JOURNAL OF ELECTRON MICROSCOPY, Vol. 60, No. 1, 2011





# RF(Radio Frequency) micro-needle system (Secret®)





## Material and methods II

### 1064nm Q-switched Nd:YAG laser (CuRAS®)

- Low-fluence mode : Fragment cytoplasmic melanin granules  
without causing cellular destruction
- Requires minimal downtime & causes lower incidence of complications







### 1. Period of study

- 2017.1.1~2017.5.31 (6 month)

### 2. Subjects

#### (1) Inclusion criteria

- 1) Clinical diagnosis of melasma
- 2) Without infective dermatitis

#### (2) Number of patients

: Total 15 patients (1 males, 14 females)/ Age : 35~57 (mean 43.1)

Pattern : Malar 11 (73%), Centrofacial 3 (20%), Mixed 1 (7%)/Fitzpatrick's skin type : IV (14), III (1)

#### (3) Treatment

microneedle radiofrequency (Secret®) : 50-60%, depth 0.7 mm to 1mm, single pass

low-fluence 1064nm QSND laser (CURAS®) : PTP mode, 1.0 J, median shot 2350.11±524.80

### 3. Measurement

#### (1) Mexameter®

- Measurement of absorption/reflection of the light from skin
- 16 light emitting diodes (LED) arranged circularly
  - 568nm (Green)
  - 660nm (Red)
  - 870nm (Infrared)
- **Measured on every visit**  
**on 3 marked points of both sides**







### 3. Measurement

#### (2) **PSI score** (Pigmentation and severity index)

- PSI score (0-48) = (darkness + density) x area
- Photographs were reviewed by 3 independent physicians

Darkness	Density	Area
0 = absent	0 = minimal	0 = no involvement
1 = slight	1 = slight	1 = less than 10%
2 = mild	2 = mild	2 = 10-29%
3 = marked	3 = marked	3 = 30-49%
4 = severe	4 = maximum	4 = 50-69%
		5 = 70-89%
		6 = 90-100%



### 3. Measurement

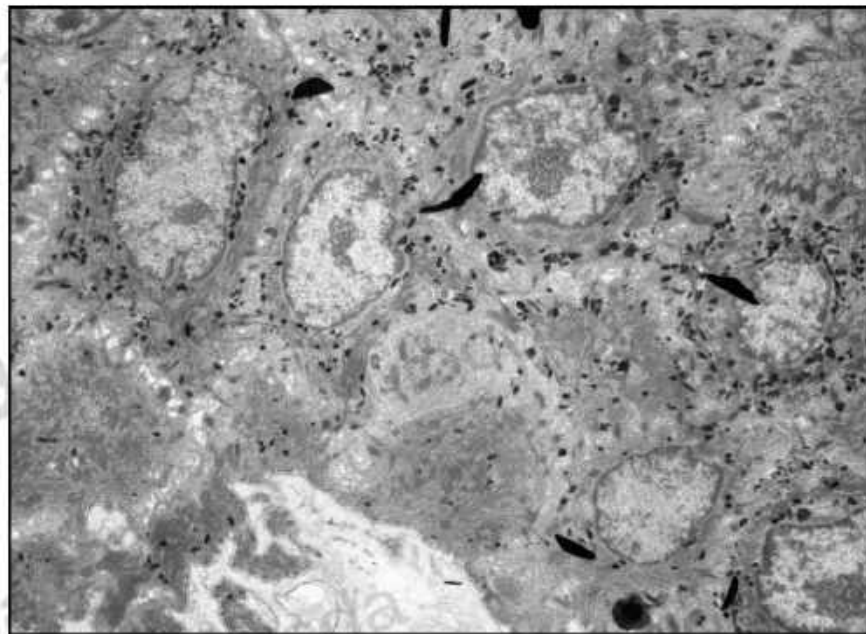
#### (3) Skin biopsy & Electron microscopy

- 9 patients who agreed with skin biopsy



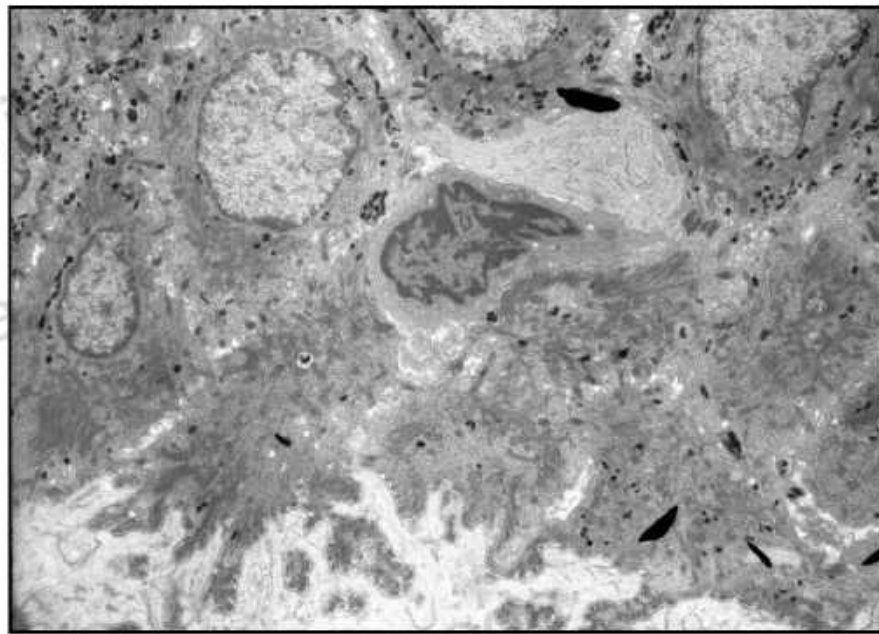
## Result : preliminary study

치료전



(x3000)

RF + 레이저 토닝 치료후



(x3000)





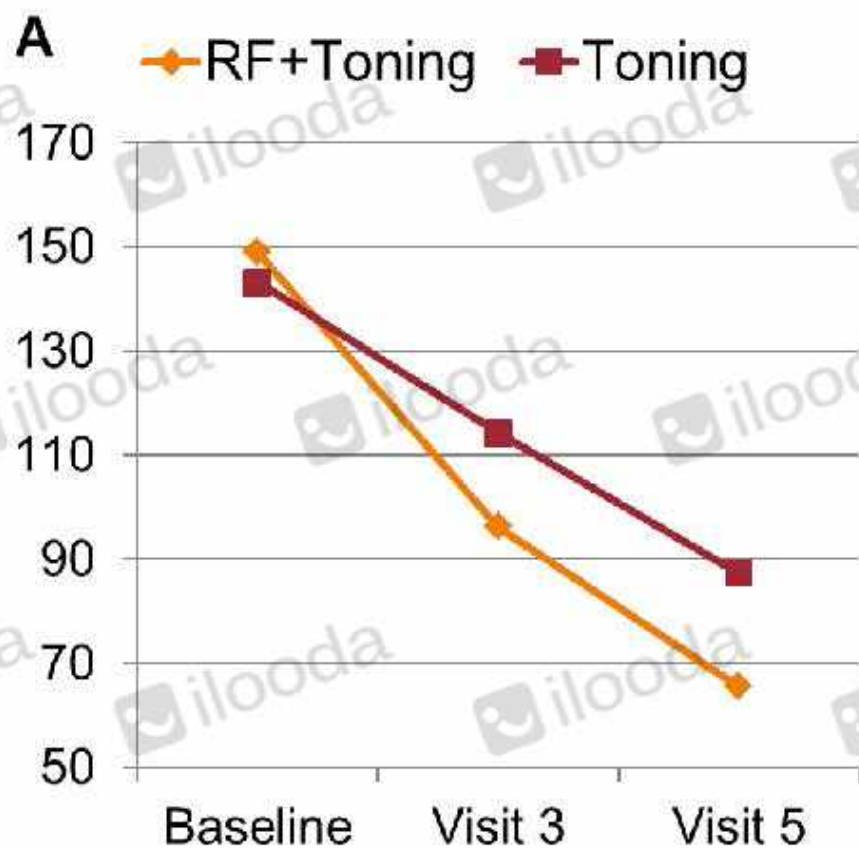
# Result

	Baseline	Visit 3	Visit 5	P value
<b>Mexameter</b>				
<b>RF+Toning</b>	148.98±57.45	96.30±26.85	65.55±26.24	0.000
<b>Toning</b>	143.24±54.85	114.23±43.49	87.31±42.13	0.006
<b>P value*</b>	0.460	0.041	0.005	
<b>PSI score</b>				
<b>RF+Toning</b>	10.20±3.06	7.90±2.70	5.50±2.05	0.000
<b>Toning</b>	11.13±4.88	9.00±4.19	7.63±3.16	0.037
<b>P value*</b>	0.241	0.066	0.002	

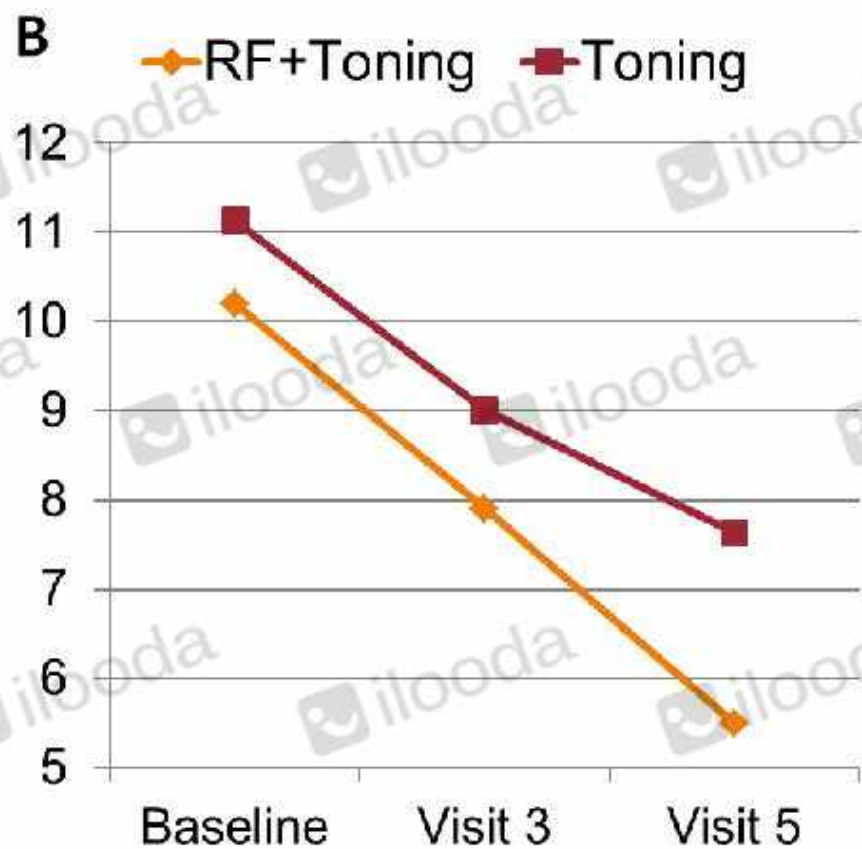


# Result

Mexameter



PSI score





## Result : Case 7 (F/53)

김 00

**Toning  
+ RF**



**Toning**



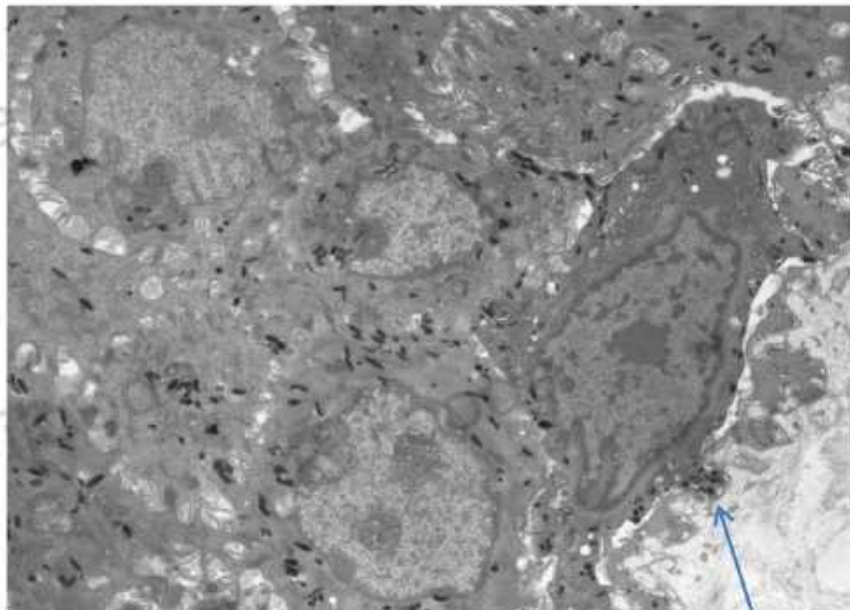




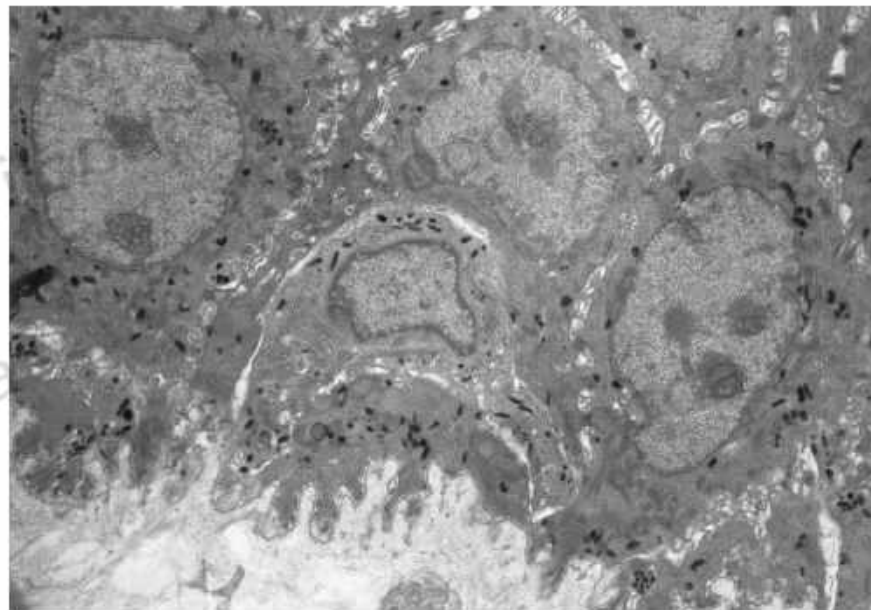
## Result : Case 7 (F/53)

김 00

**Toning + RF**



**Toning**



(x3000)



## Result : Case 7 (F/44)

조 00

Toning + RF

Toning

치료 전



치료 후

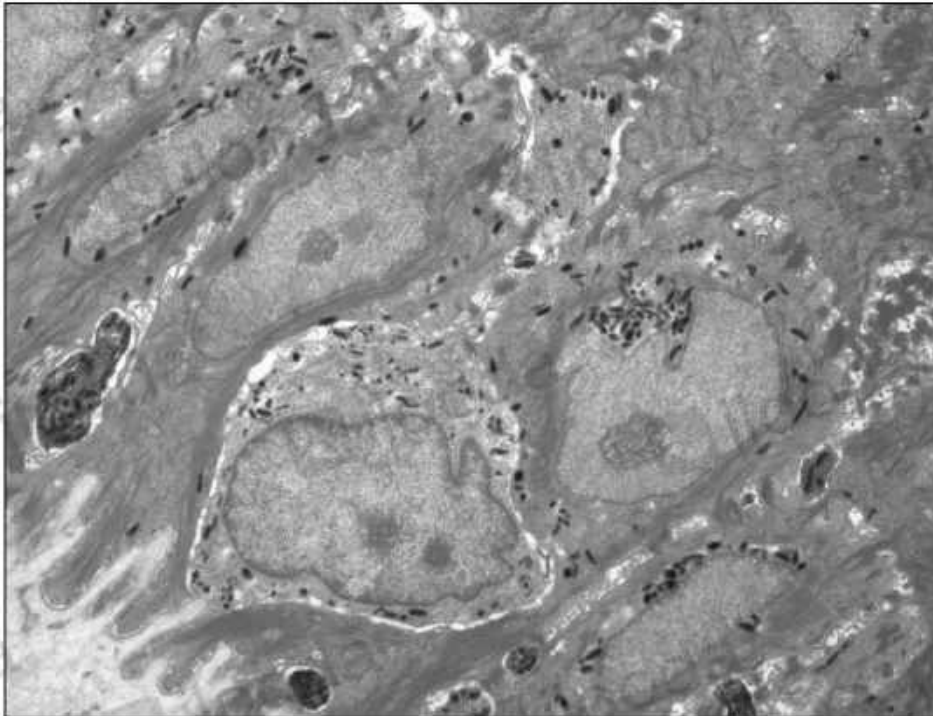




## Result Case 7 (F/44)

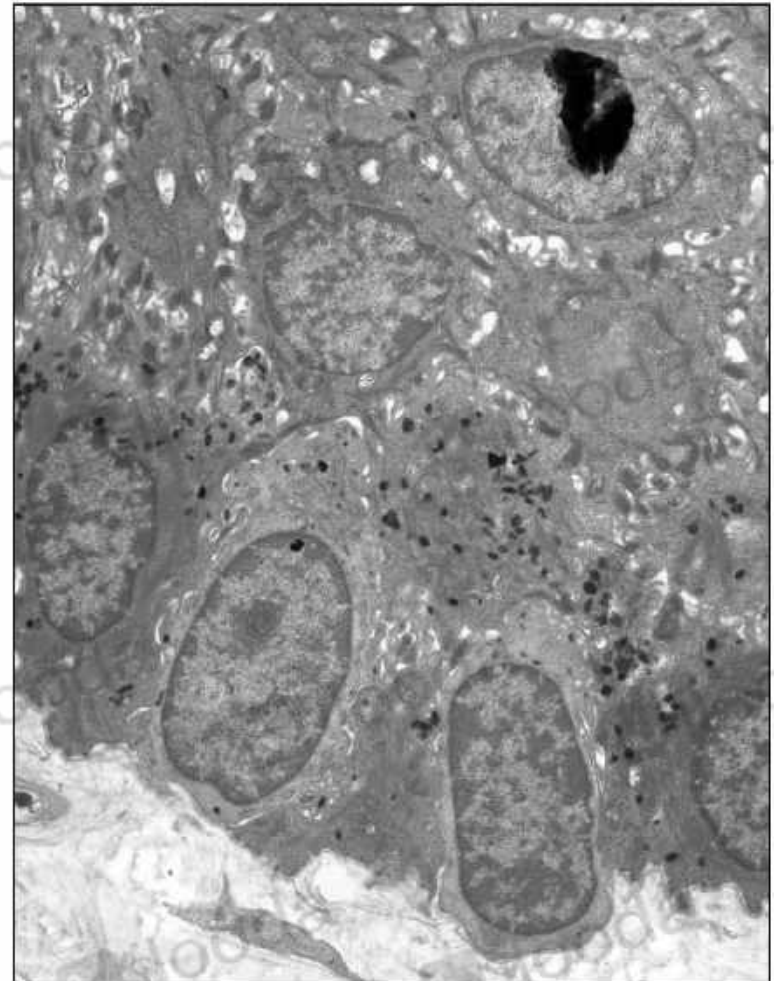
조 00

Toning + RF



(x3000)

Toning







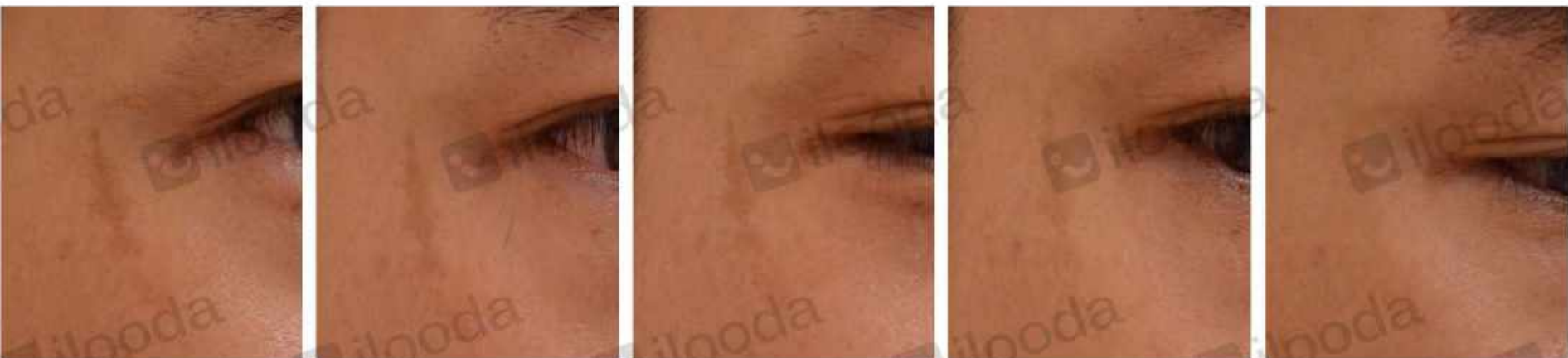
## Result : Case 14 (M/35)

전00

**Toning + RF**

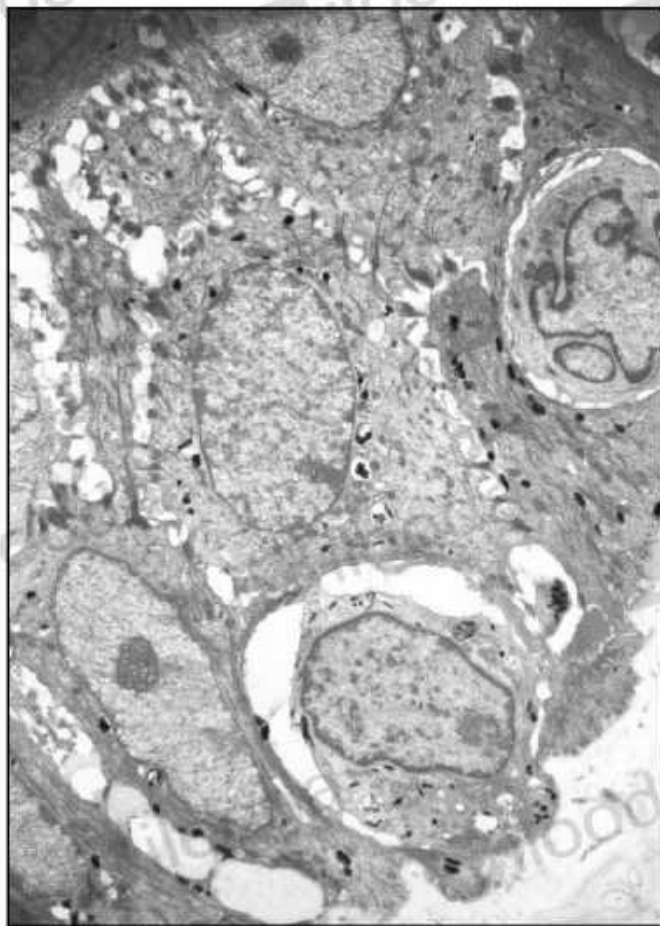


**Toning**

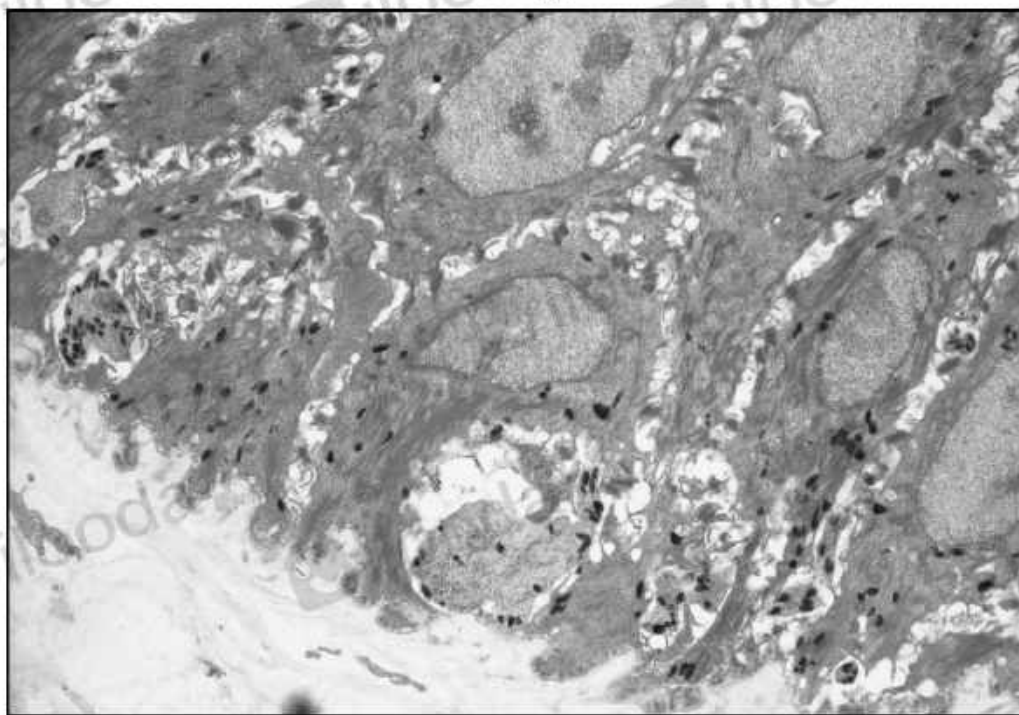


문00

Toning + RF



Toning

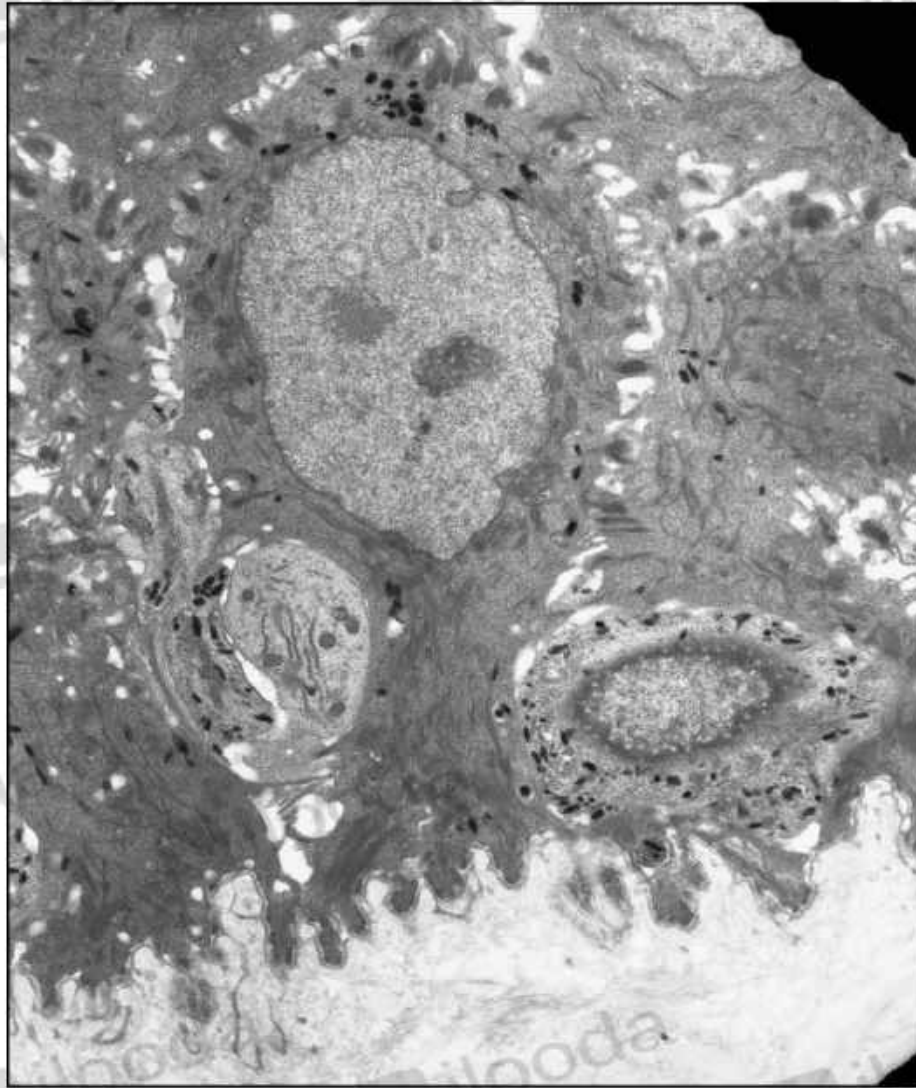


(x3000)

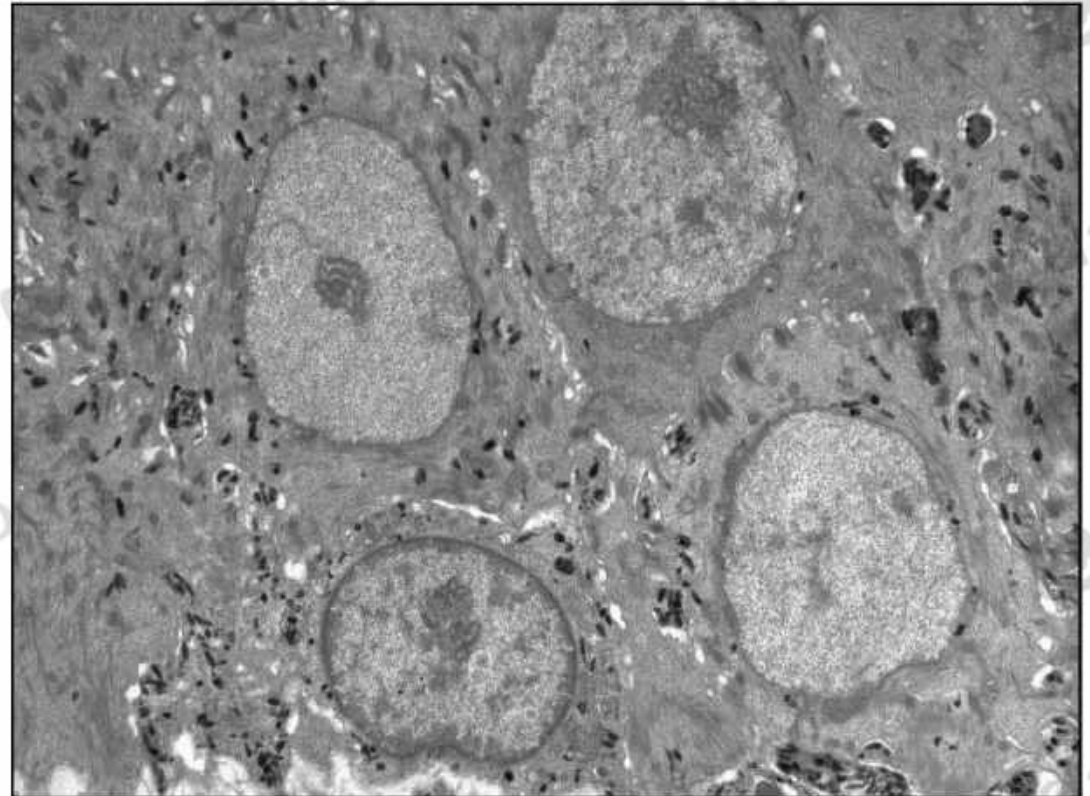


문00

Toning + RF



Toning



(x3000)





## Result

(x3000)

Case 1

Case 3

Case 8

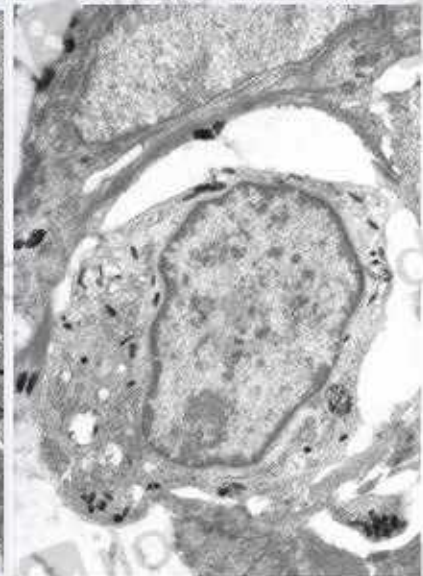
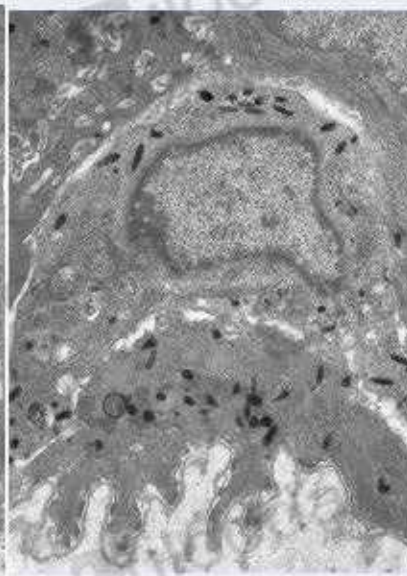
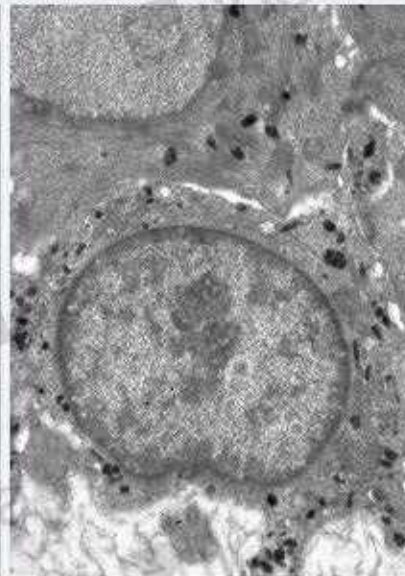
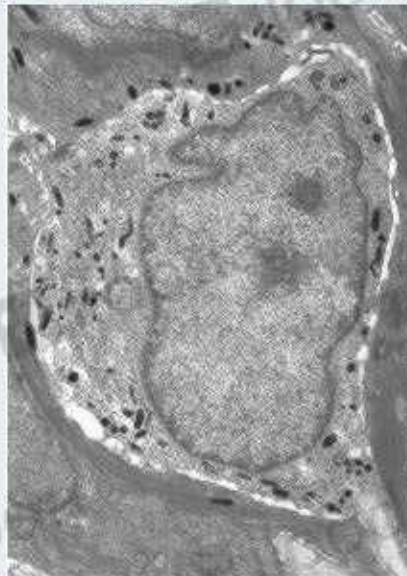
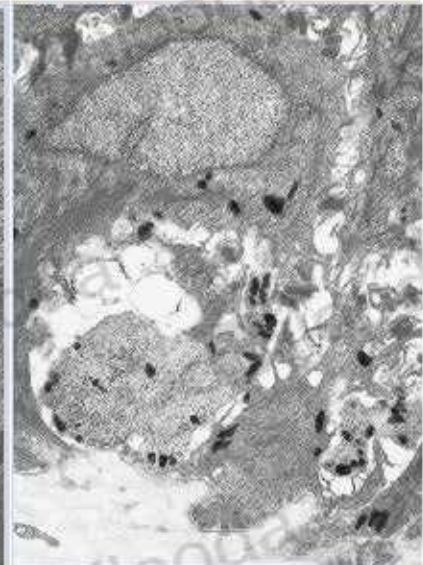
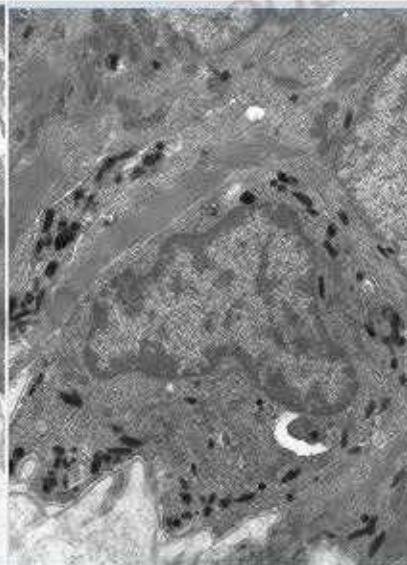
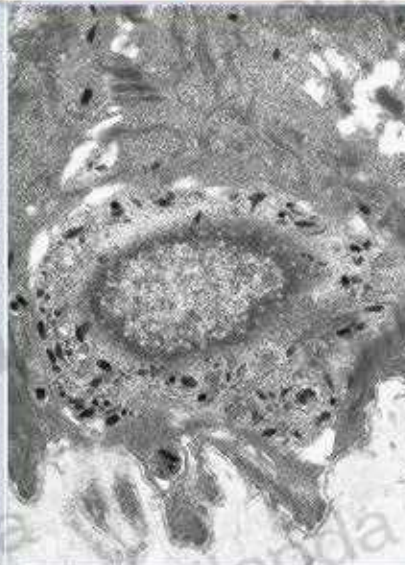
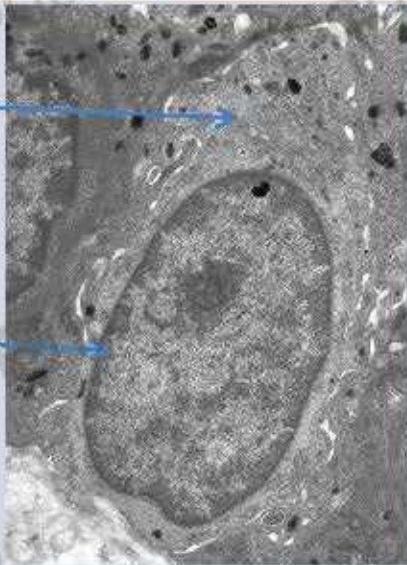
Case 9

T

cytoplasm of  
melanocyte

Nu of  
melano.

T+RF





## Discussion

### Entry pathway

- Melanin production
- Melanosome transfer

Deliver heat energy to the targeted lesion with minimal epidermal damage

- Induces cellular activation induces neocollagenosis & neoelastogenesis and immune rx
- High safety profile, and minimal posttreatment recover time

### Microneedle RF

### Melasma

### Exit pathway

Make pores through the stratum corneum and basement membrane

- Increasing transepidermal/ dermal elimination of melanin
- Alteration of micro-environment (Basement membrane)





### Limitation of our study

- (1) Our study was performed with a small study sample.
- (2) We didn't evaluate the long-term results of treatment.
- (3) Adequate intensity and depth of RF for the treatment of melasma is not yet established.

⇒ Further studies will be needed to evaluate

the long term result of microneedle RF on melasma



Dermabrasion

Selective photothermolysis - ruby laser, QSWND

Ablation fractional laser

IPL

**Subcellular selective photothermolysis** -laser toning QS & Nano wave length Nd/Alex

**Vascular clearing** – long pulsed Nd –Yag, long pulsed alex, dye

**Chemical peel** (TCA, GA, SA)

## Radiofrequency

