

Microdermabrasion

Microdermabrasion with
Aluminium Oxide crystals

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Microdermabrasion

- Microdermabrasion = “Sand blasting” of skin
- Involves using a vacuum powered machine with a hand piece to propel inert crystals such as aluminium oxide.
- The crystals then hit the skin surface, thereby causing an area of abrasion on that spot of the skin.
- Crystals are then sucked back into the machine

History of Microdermabrasion

- 1500 years B.C Egyptian aesthetician used fine desert sand attached onto leather
- It was said that Cleopatra used it
- 1905 Rotary burrs was used to rub the skin (Kromayer)
- 1955 Wire brush dermabrasion (Burks)
- 1957 Reports of physiological wound healing post dermabrasion
- Since then Plastic surgeons surgically dermabrade skin for facial scars
- 1980s Dermabrasion machine using pressurized crystals hence called “microdermabrasion”
- Early 1980s spa machines from Europe
- Early 1990s medical machines appear

Mechanical action

- Suction and crystals delivered simultaneously on to the skin via a hand piece, of varying designs, abrade the skin at different levels (S. corneum, lucidum, granulosum, spinosum and germinativum)
- Depth of 10-100 microns
- Hand piece is moved in scrubbing or brush stroke manner
- Abraded skin is then sucked away

Mechanism

- Exact mechanism unknown
- Is it the suction or is it the crystals?
- Is it the heat being produced?

Mechanism

Pathophysiology

- Injury causes inflammation
- Controlled inflammation causes healing
- Uncontrolled inflammation causes scarring

Medical Indications

- Active Acne/white heads/black heads
- Acne scars
- Facial scars (trauma, varicella, keloid)
- Solar damaged/aging skin (lentigines, freckles, actinic and seborrheic keratoses)
- Stretch marks
- Hyperpigmentation
- Melasma
- Facial rejuvenation
- Fine lines and wrinkles
- Oily skin and open pores

Non medical Indications

- Total body toning and rejuvenation
- Lymphatic drainage (suction only)
- Bust firming and lifting
- Cellulite treatment
- Deep facial cleanser
- Pre treatment exfoliation (then cleanse and treat with cosmetic products)
- Face “polish” with organic crystals
- Pre laser or pre IPL

Contra-indications

- Skin malignancies
- Moles (naevi)
- Active herpes simplex
- Recent sunburn
- Recent oral Roaccutane therapy (wait 3-6 months, some authors suggest up to 2 years)
- Warts (papilloma virus)
- ?Capillary telangiectasia (can improved)

Medical Study

- 2000
 - Histological study to show that Microdermabrasion increase collagen regrowth
- 2002
 - Histological study to show that Microdermabrasion regenerate the epidermis and Aluminium Oxide does not lodge itself on the skin
- 2004
 - Microdermabrasion as a treatment for aging skin
- 2005
 - Photograph follow up of patients greater than 1 year

MICRODERMABRASION TRIAL

*DOES MICRODERMABRASION
PROMOTE COLLAGEN
GROWTH ?*

Dr Kee Lee TAN

MBBS(WA) FRACGP

1st September 2000

Dr KL Tan: Microdermabrasion

Methodology

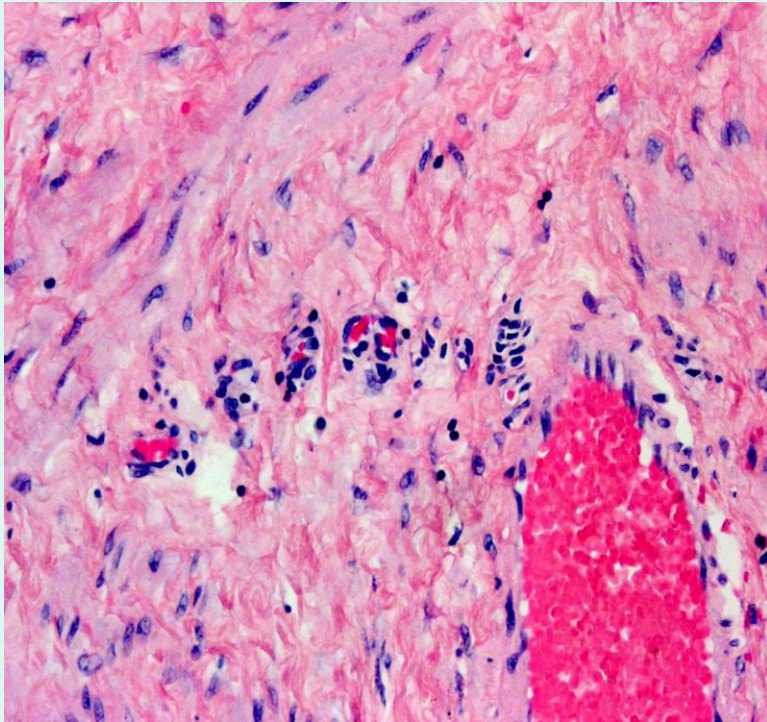
- 5 patients
- Given 10 treatments of microdermabrasion
- Skin biopsy done before and after 10 treatments
- Skin biopsy send for histological analysis

Patient 1

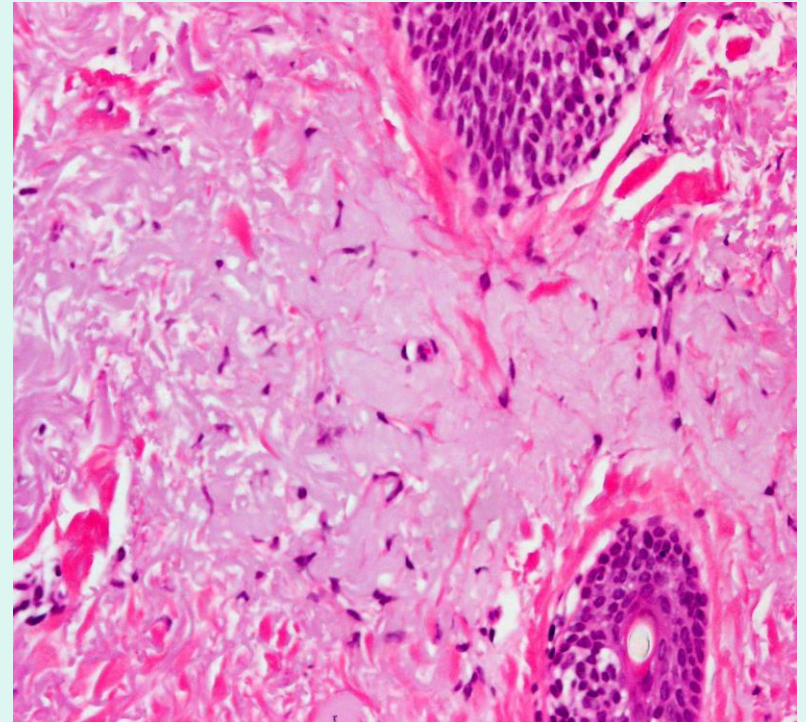
66 years old female

Showed marked increase in collagen tissue
Showed reduction in elastotic tissue

- BEFORE



- AFTER

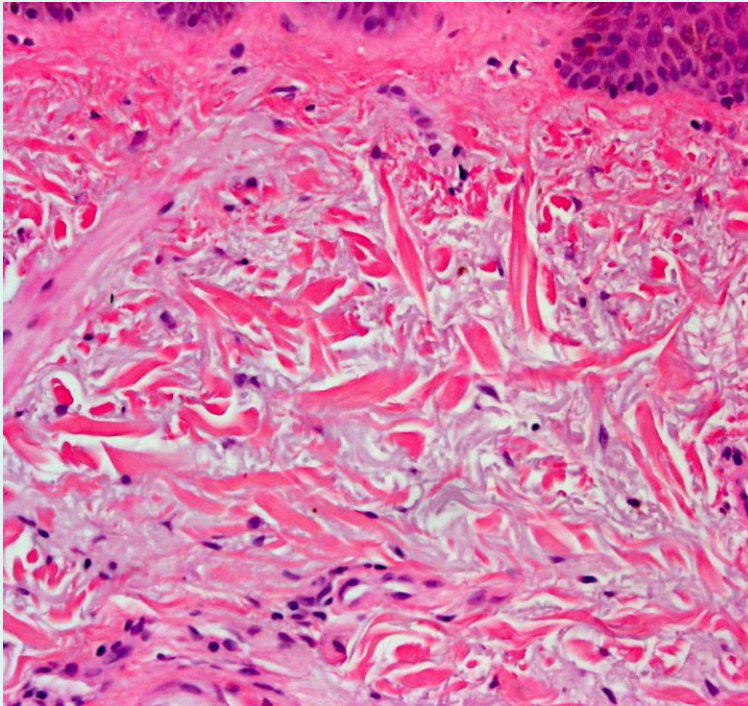


Patient 2

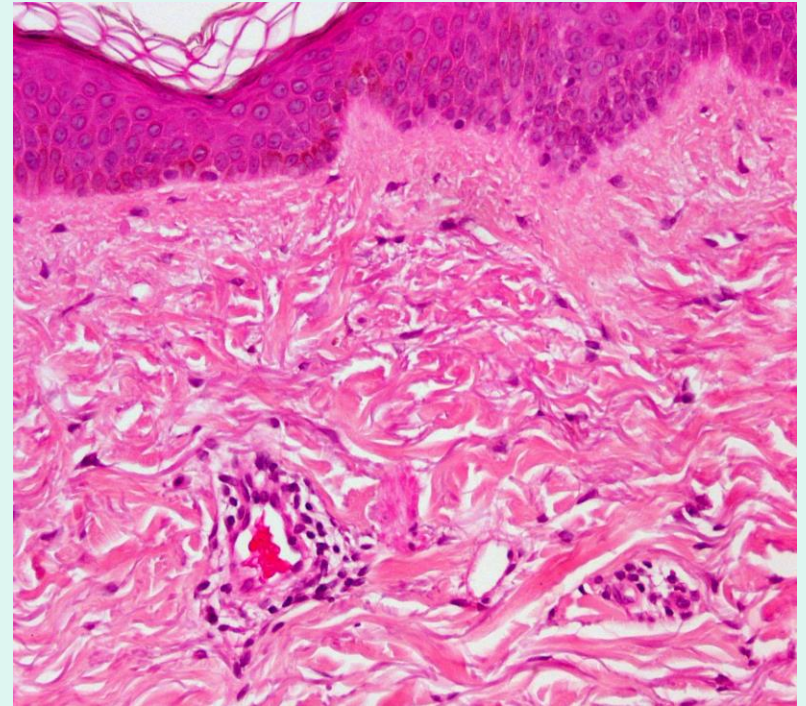
32 years old male

Showed collagen fibers minimally larger and more compact
Showed a mild decreased in elastotic tissue

- BEFORE



- AFTER

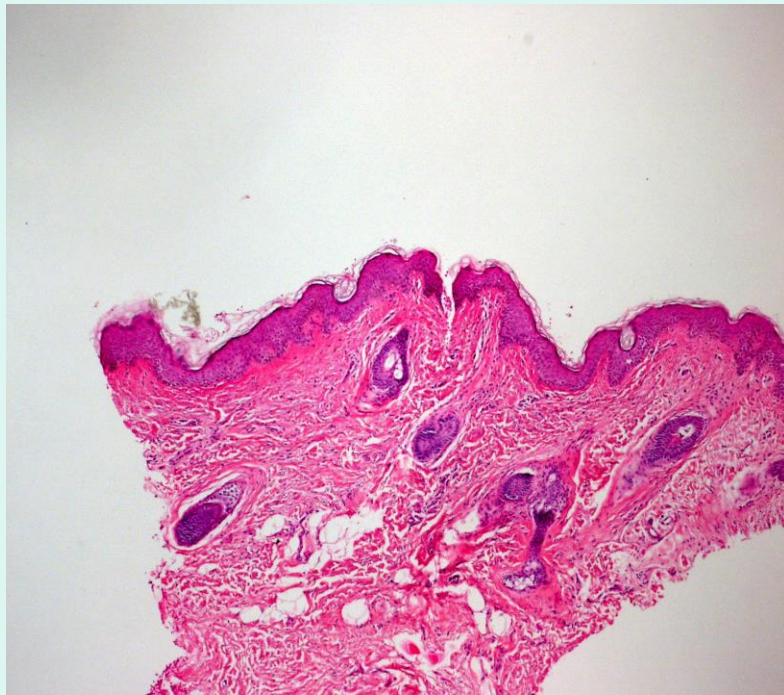


Patient 3

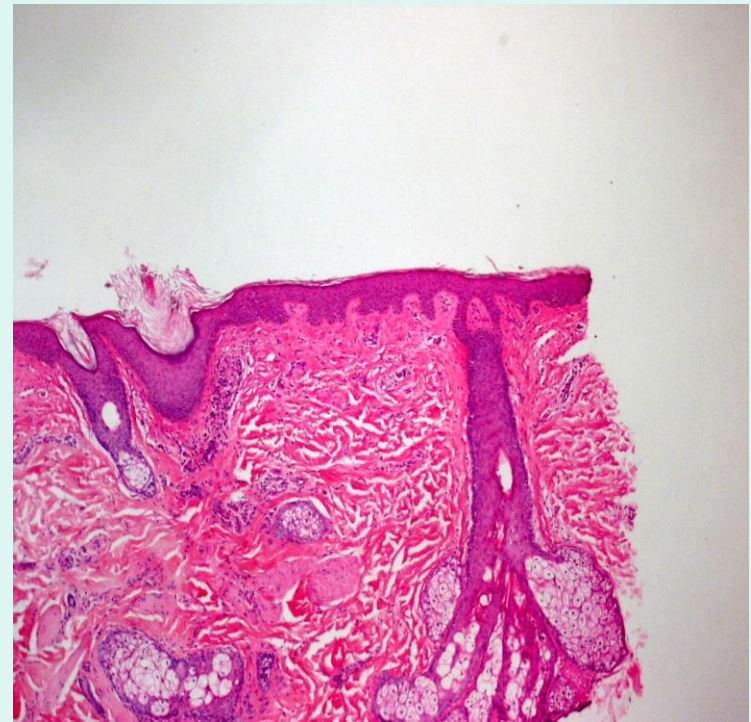
46 years old female

Showed a marked reduction in adipose tissue in dermis
which now consists of normal collagen tissue
Mild but significant decrease in elastotic tissue

- BEFORE



- AFTER

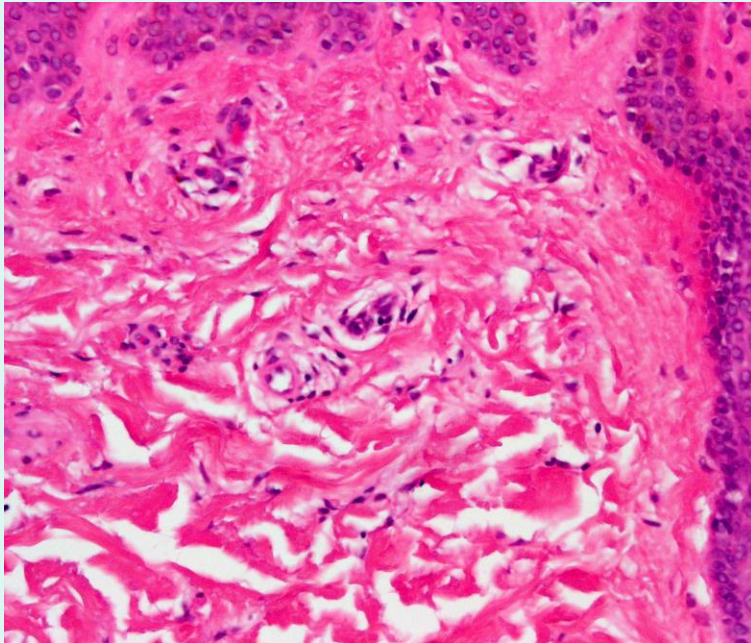


Patient 4

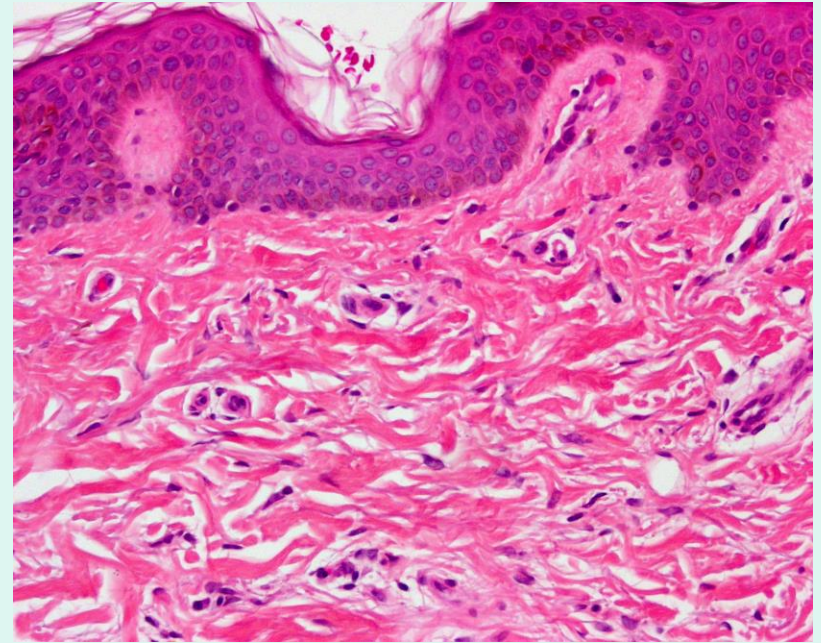
26 years old male

Showed dermal collagen to be marginally coarser and denser

- BEFORE



- AFTER

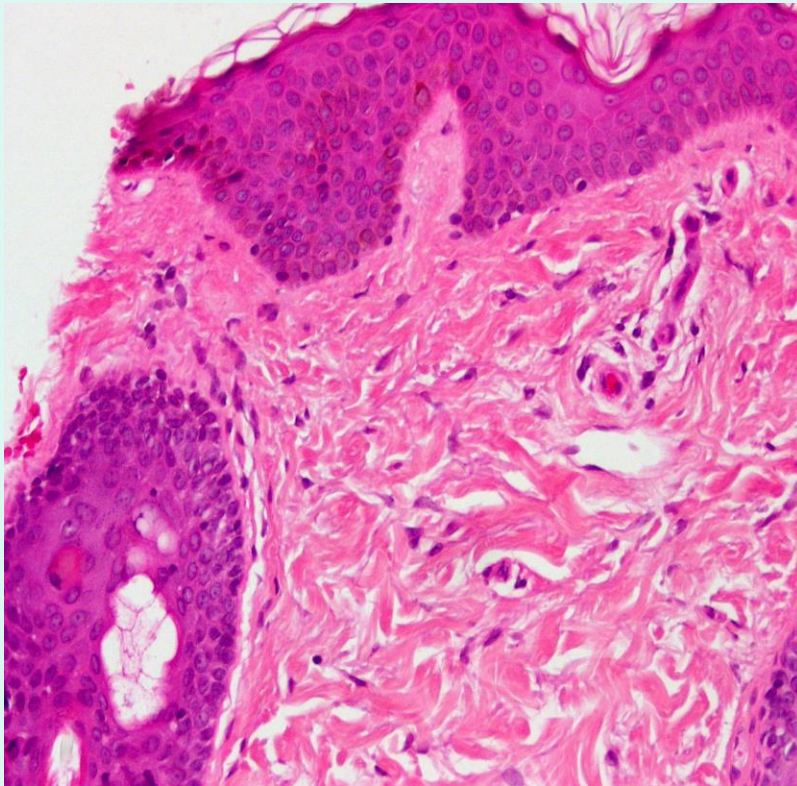


Patient 5

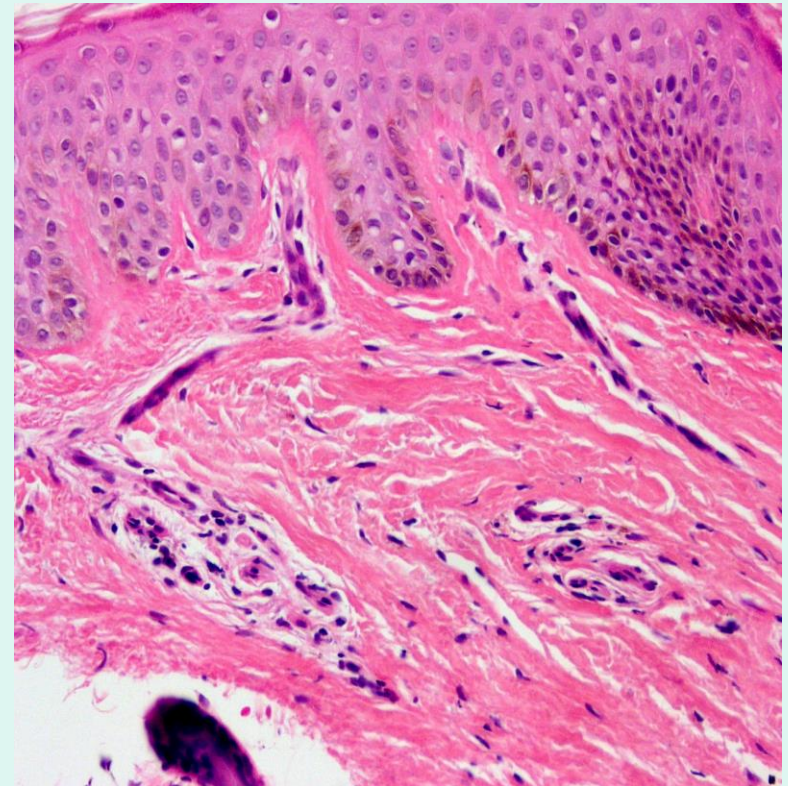
33 years old male

Showed no significant increase in collagen tissue but the collagen appears more compact

- Before



- After



Conclusion

- All patients showed improvement in their skin
- Histologically there was
 - Increase in collagen tissue
 - Decrease in elastotic tissue
 - Collagen becomes denser in younger patients

Histological Changes after Microdermabrasion

Dr. Kee Lee Tan

MBBS FRACGP MCPSA FFMACCS

Dr. Lawrence L Yu

MBBS FRCPA DipRCPath(Dermatopathology)

October 2002

Aim of study

- What changes can we see from microdermabrasion using low pressures (30-35kPa, max 35kPa) and normal crystals?
- Are there any lodgement of aluminium oxide crystals onto the surface of skin?
- Are there inflammatory response to aluminium oxide?

Methodology

- 10 patients
- 40 years of age and above
- Selection criteria
 - 40 years and above
 - Nil skin malignancy and other skin pathology (dermatitis)
 - Nil systemic disease (NIDDM, CT disease)
 - Nil previous cosmetic medical treatment (Lasers, IPL, Peels)
 - Nil cosmetic skin care treatment
- Informed consent
- Duomedic microdermabrasion machine

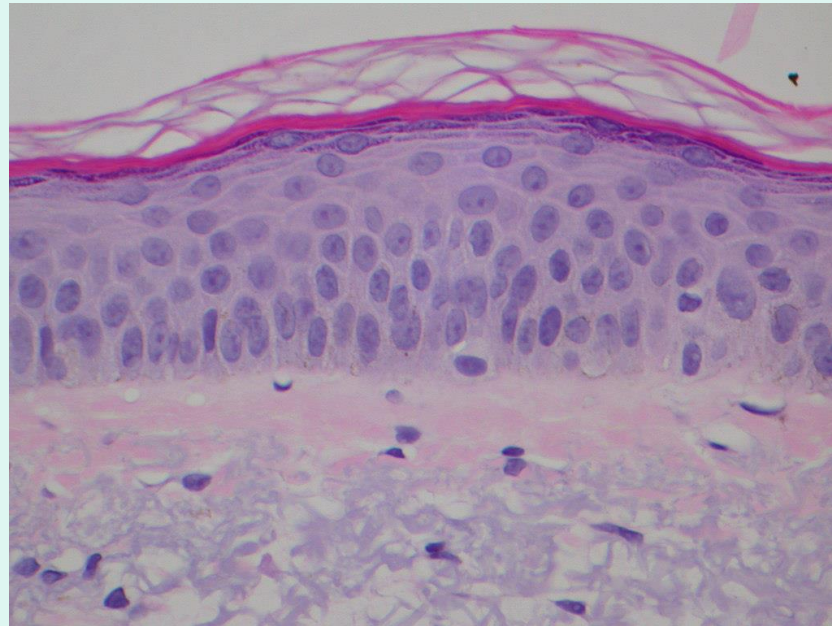
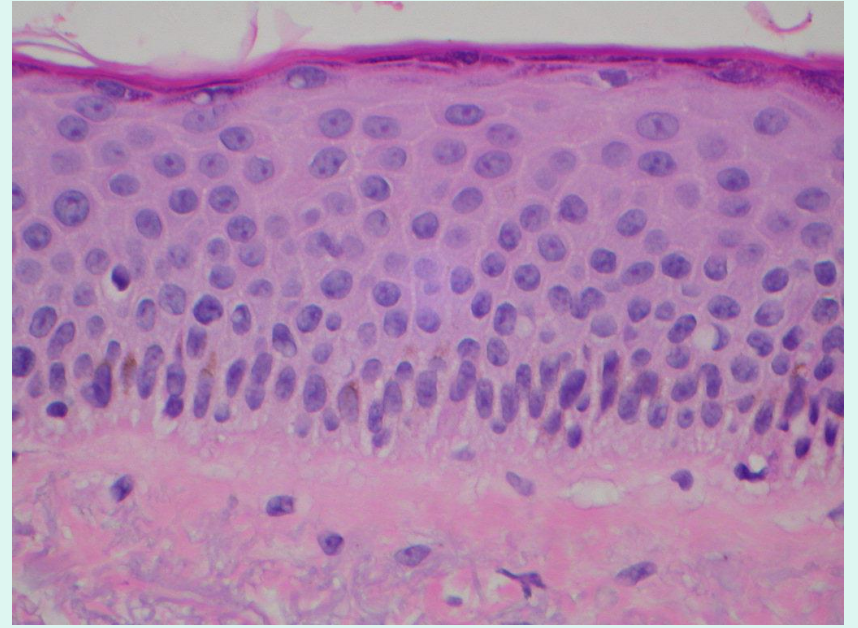
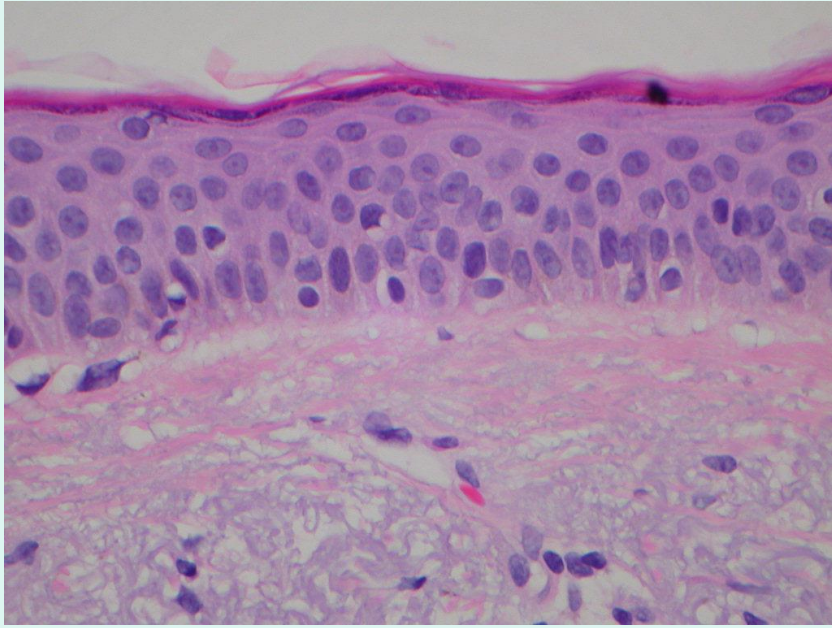
Methodology

- 10 treatments one week apart
- Each treatment by same operator
- 30-35kPa of pressure , maximum 35kPa
- Normal crystals
- 5 passes over entire face
- Endpoint: mild erythema which lasted maximum 2 hours

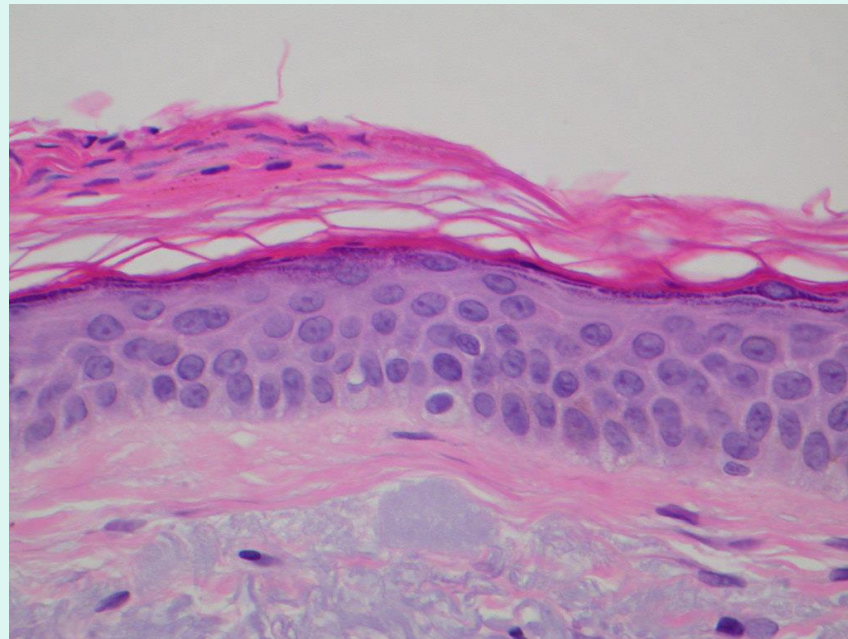
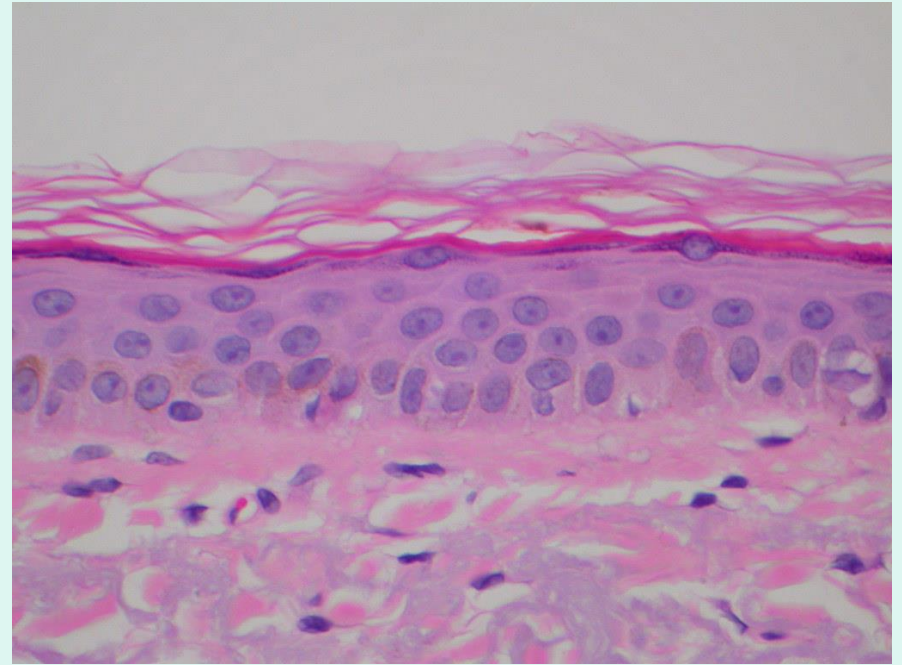
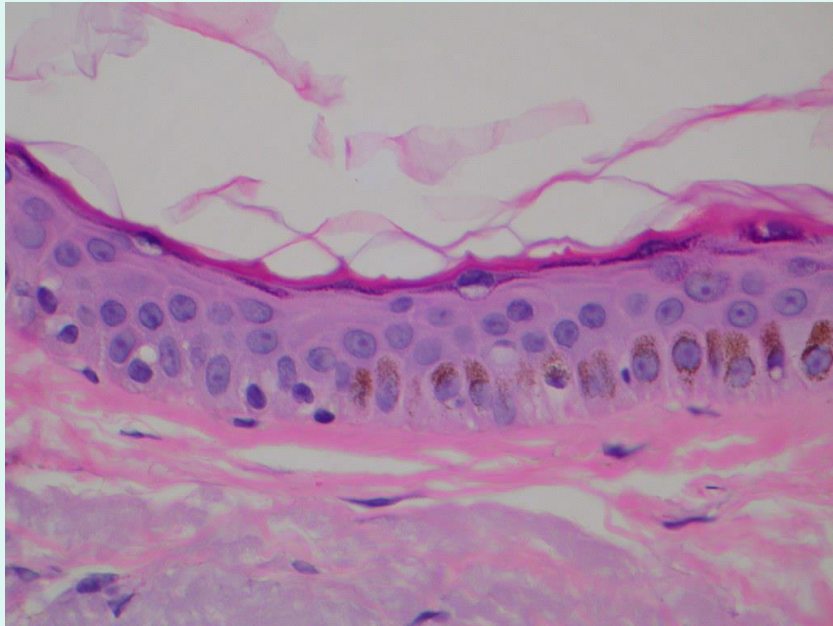
Methodology

- **Nil pretreatment skin preparation**
- **Face wash with cetaphil prior to treatment**
- **Post treatment care with cetaphil lotion only**
- **3 sets of preauricular biopsy done, before, immediately after first treatment and after last treatment**
- **All biopsies done with 1 cm diameter**
- **All biopsies processes simultaneously and reviewed by a dermatopathologist**

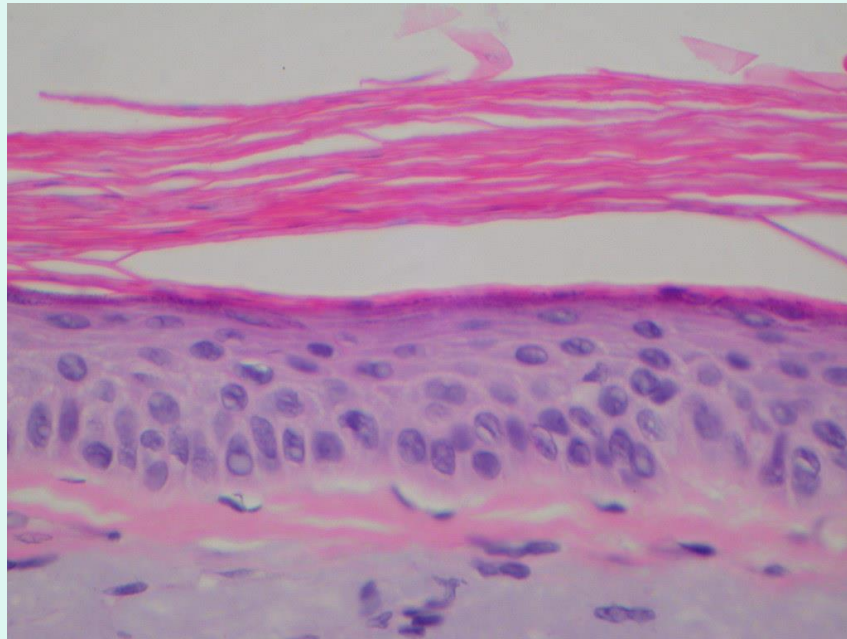
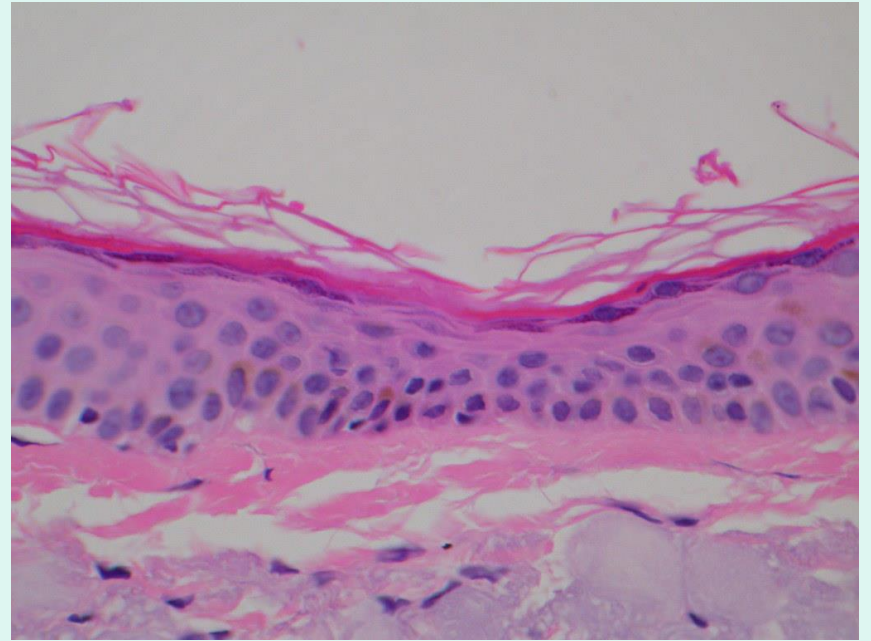
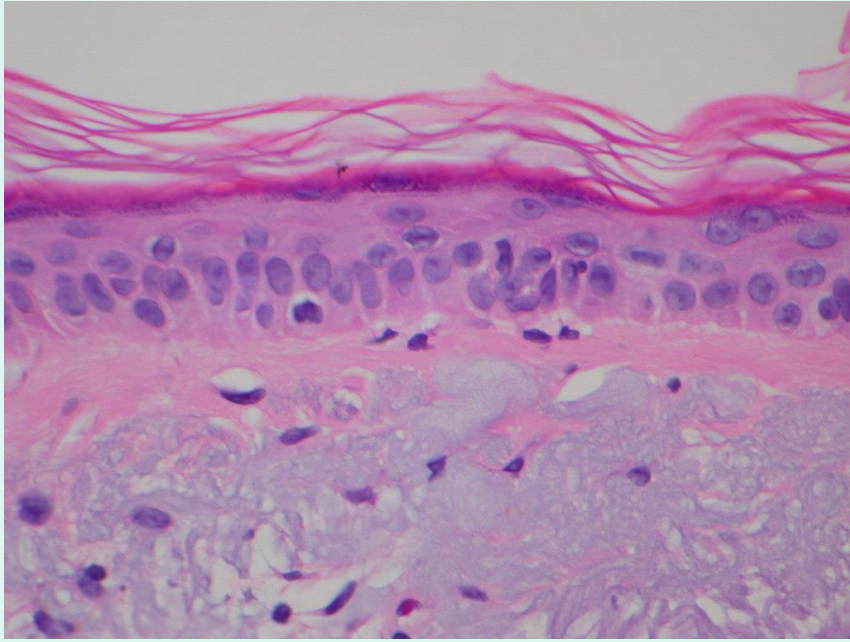
Patient 1



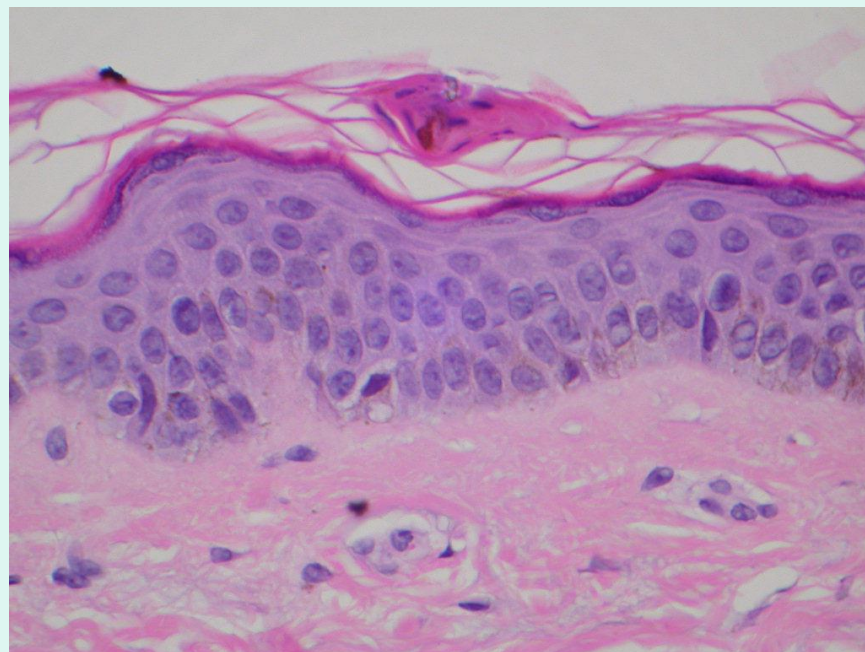
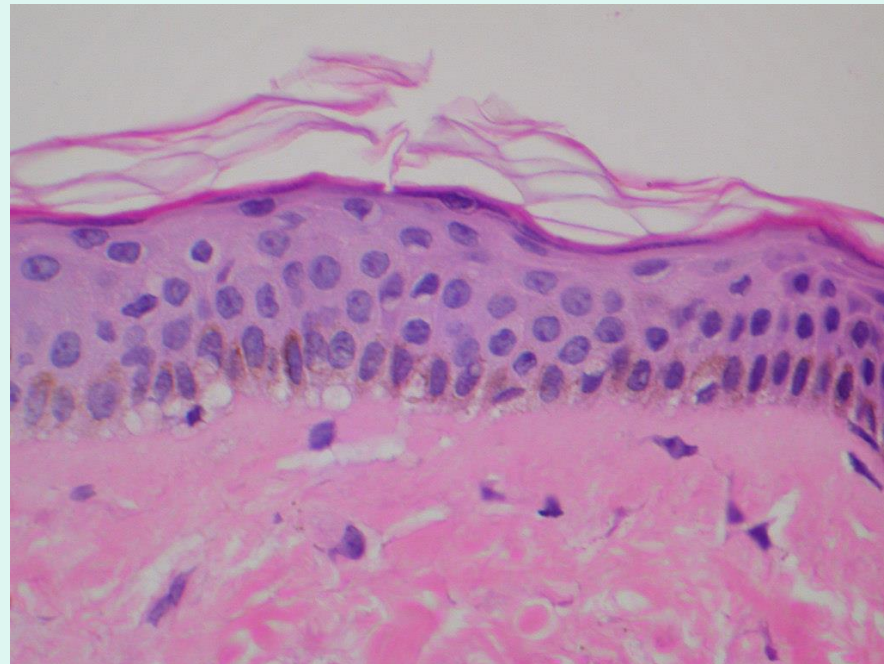
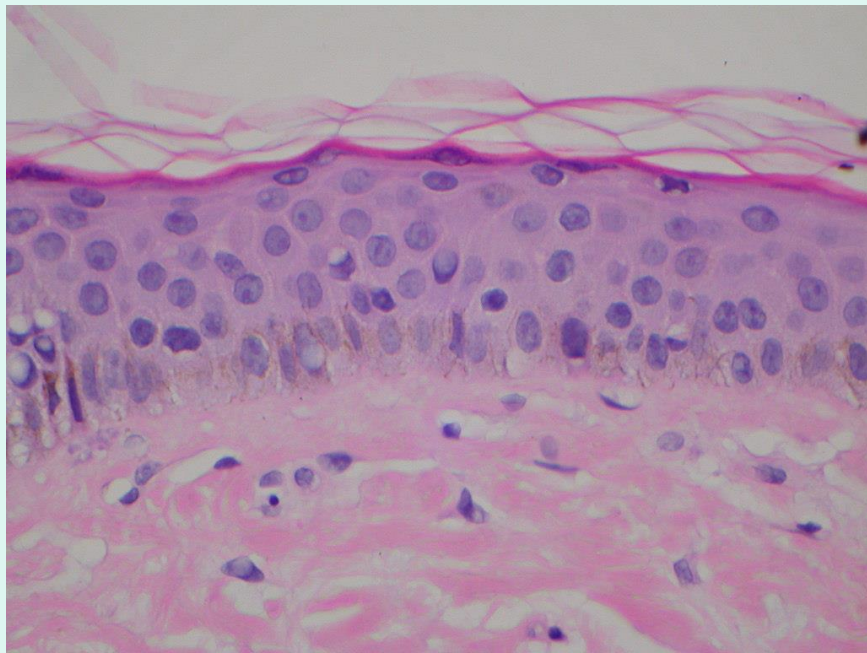
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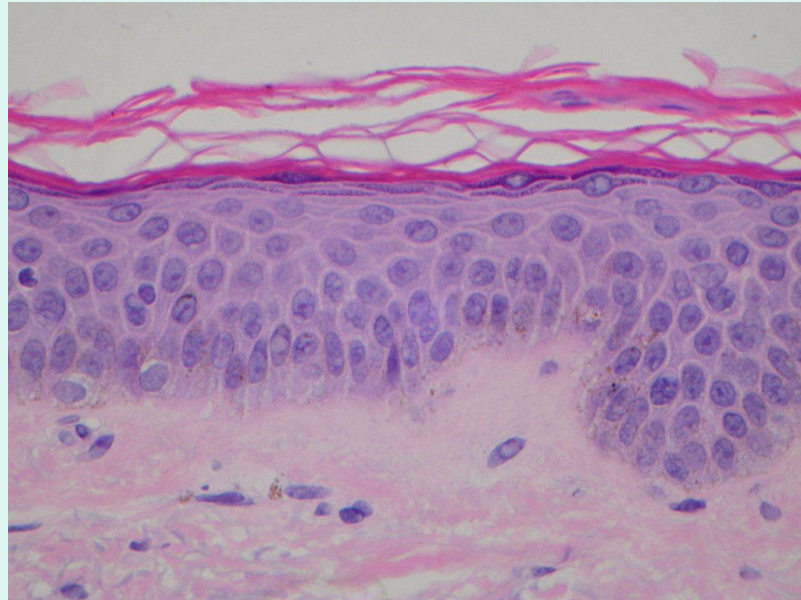
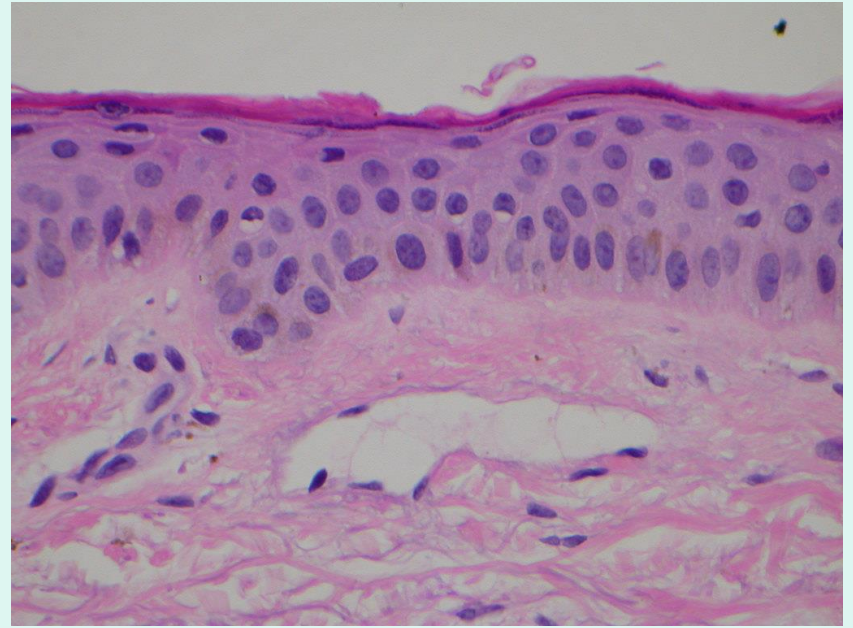
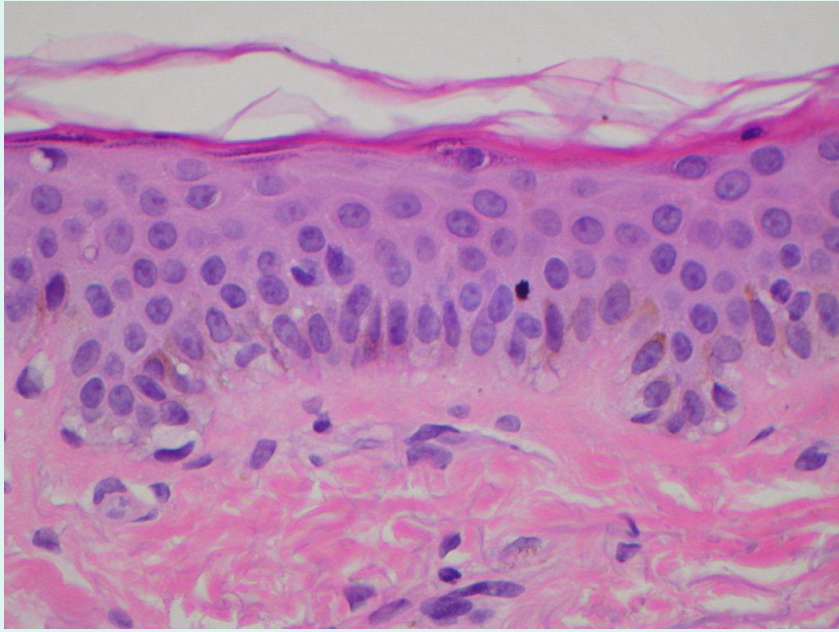
Patient 3



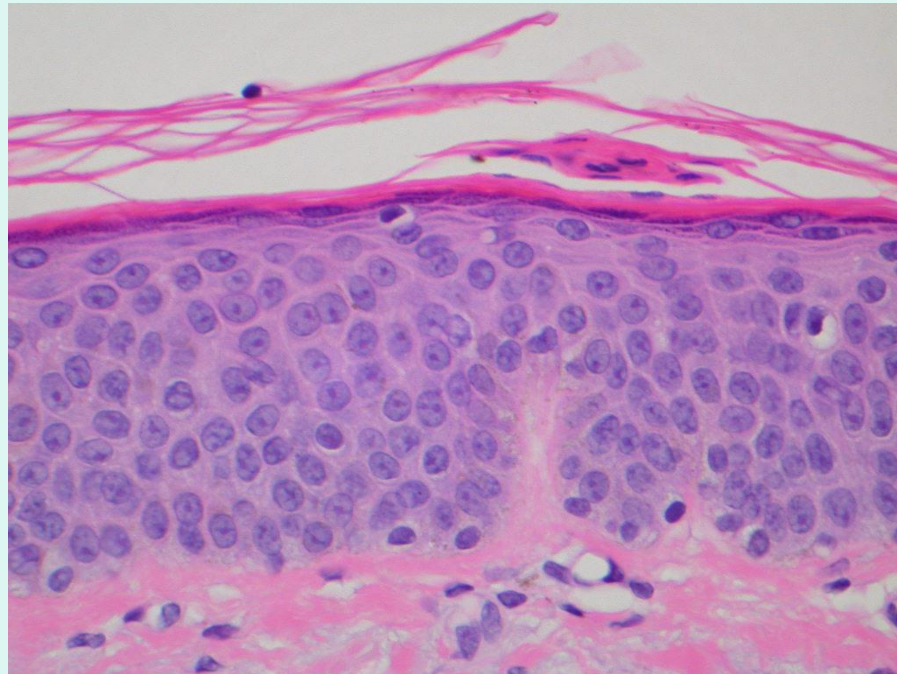
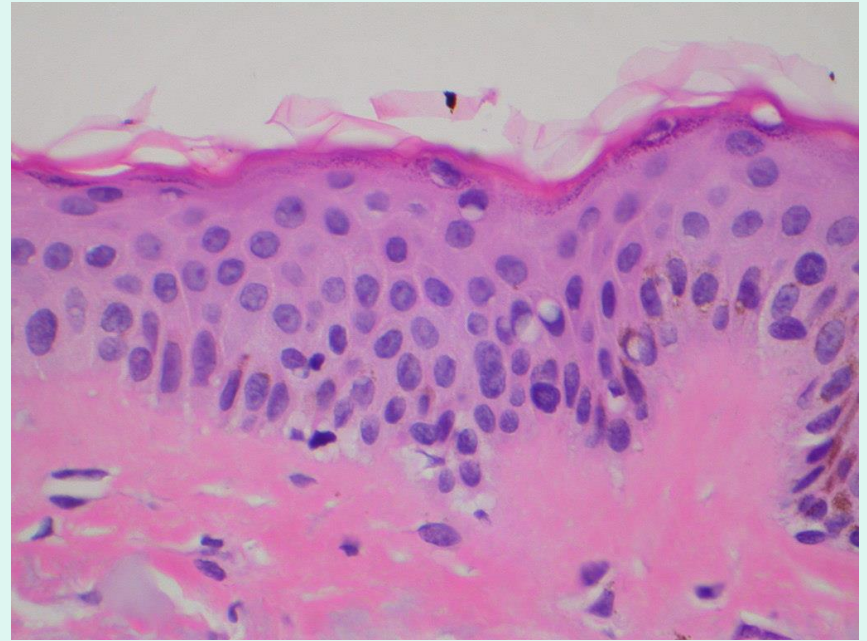
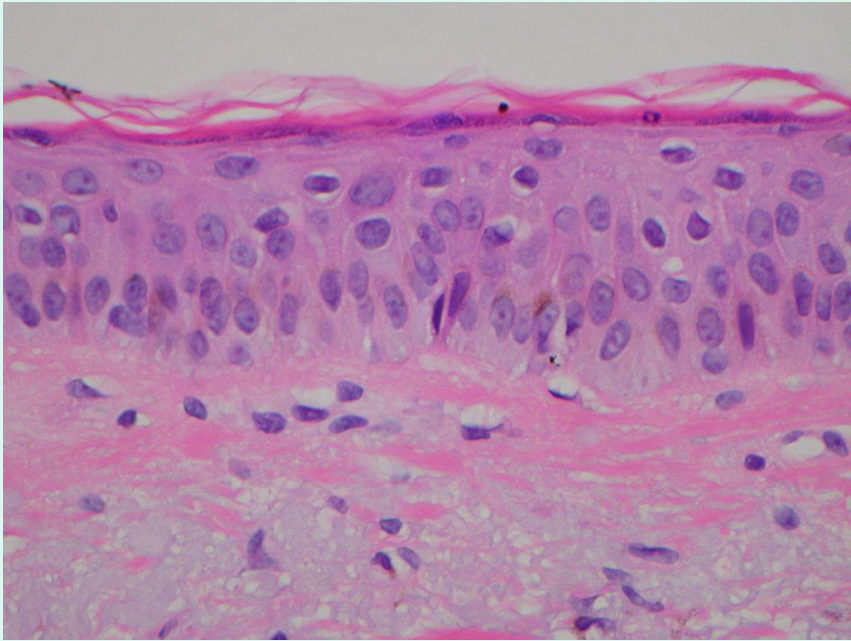
Patient 4



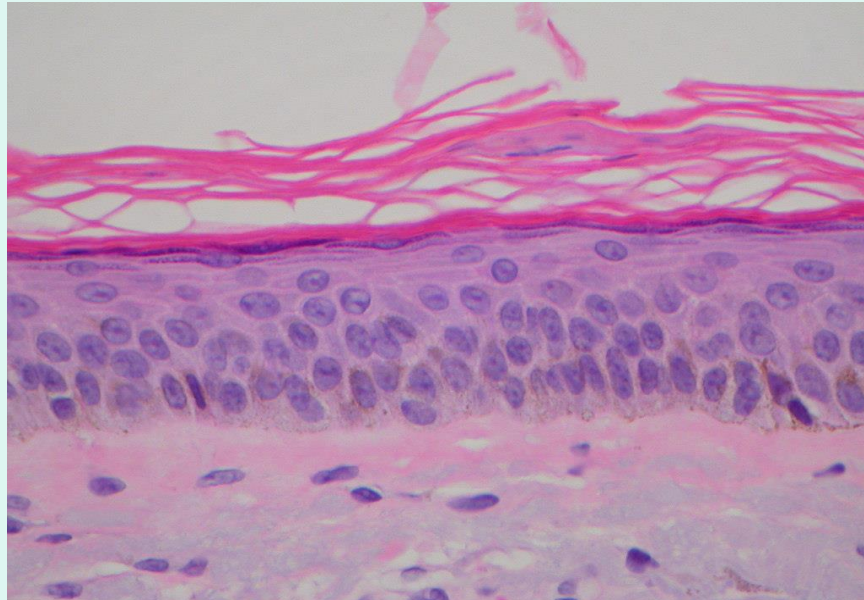
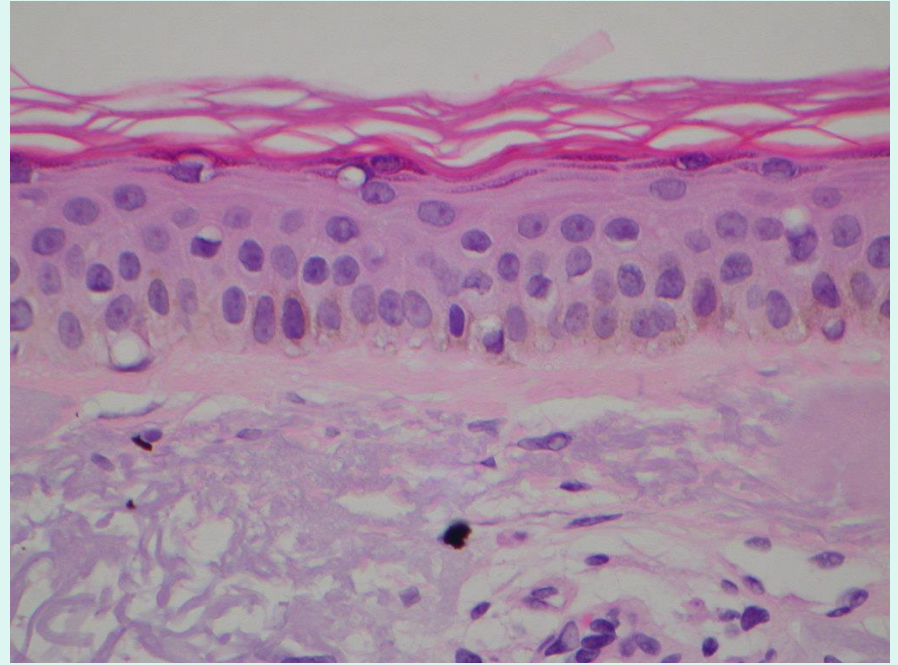
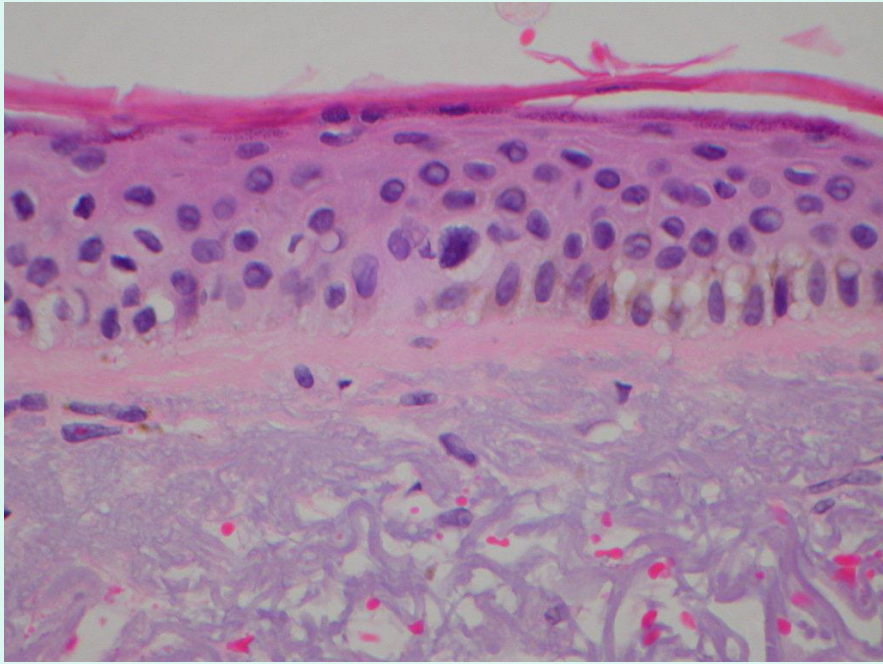
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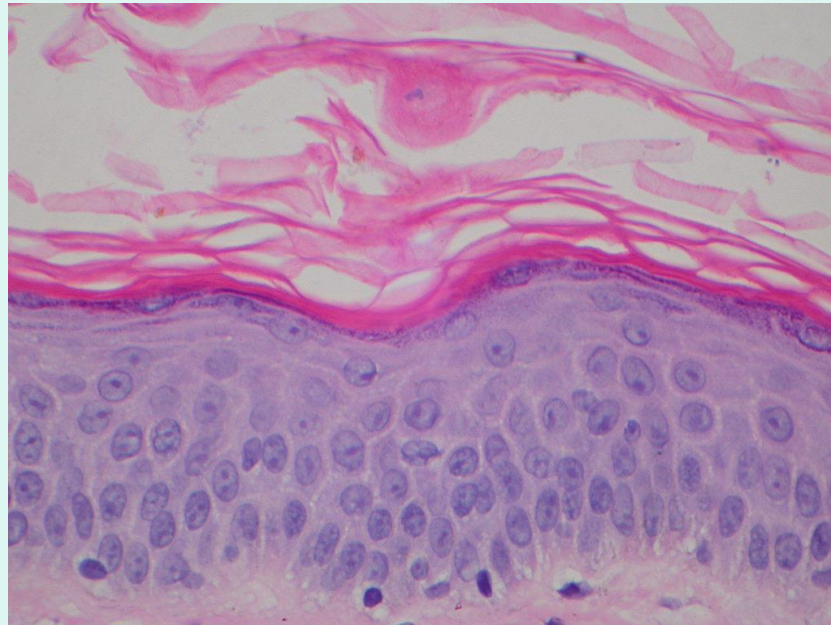
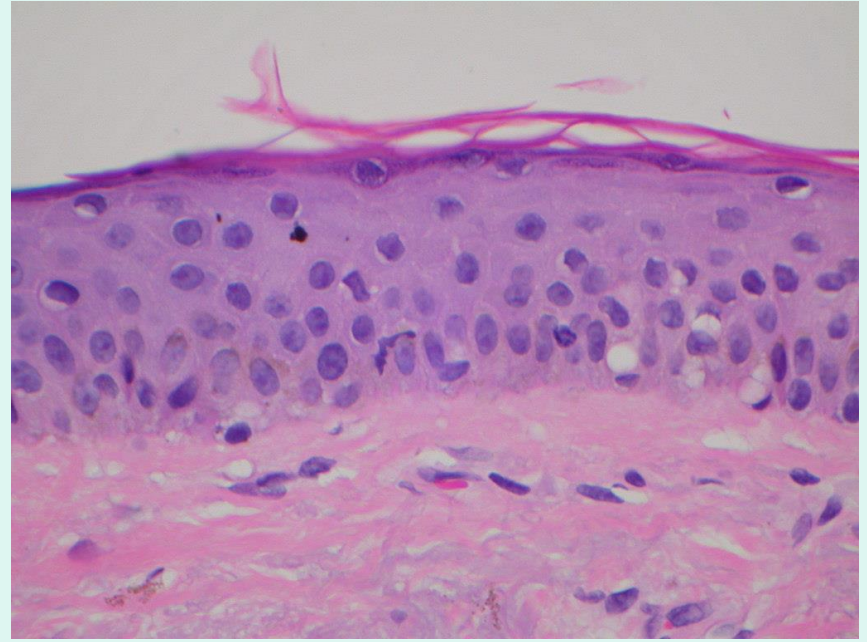
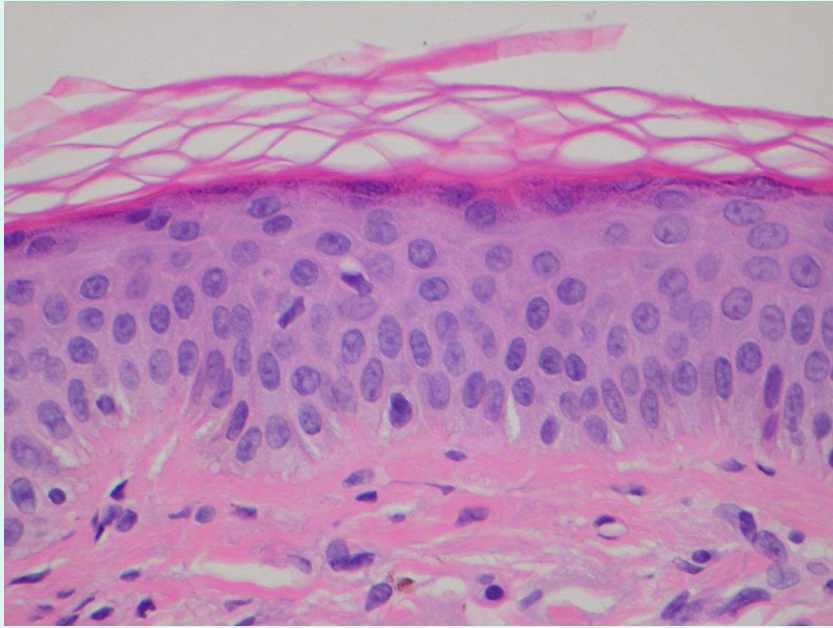
Patient 6



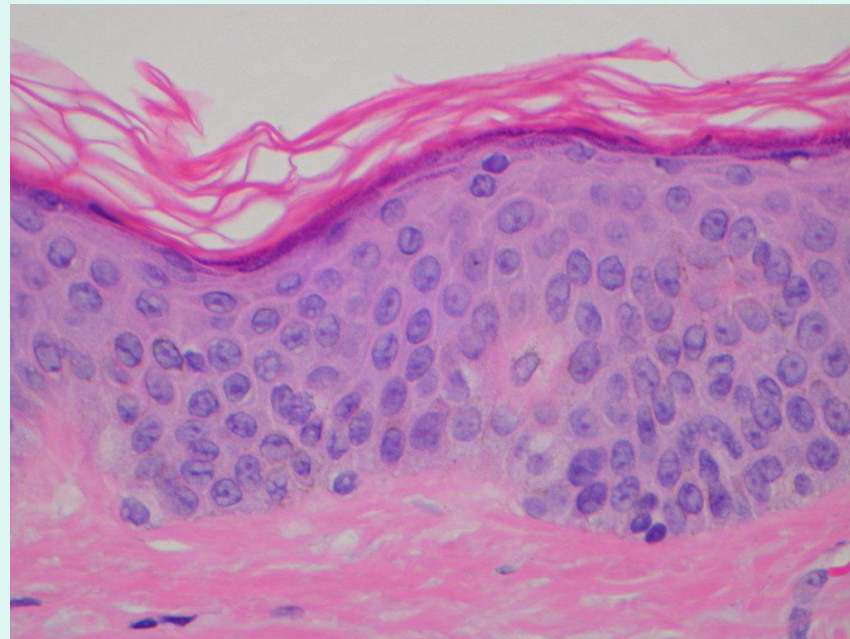
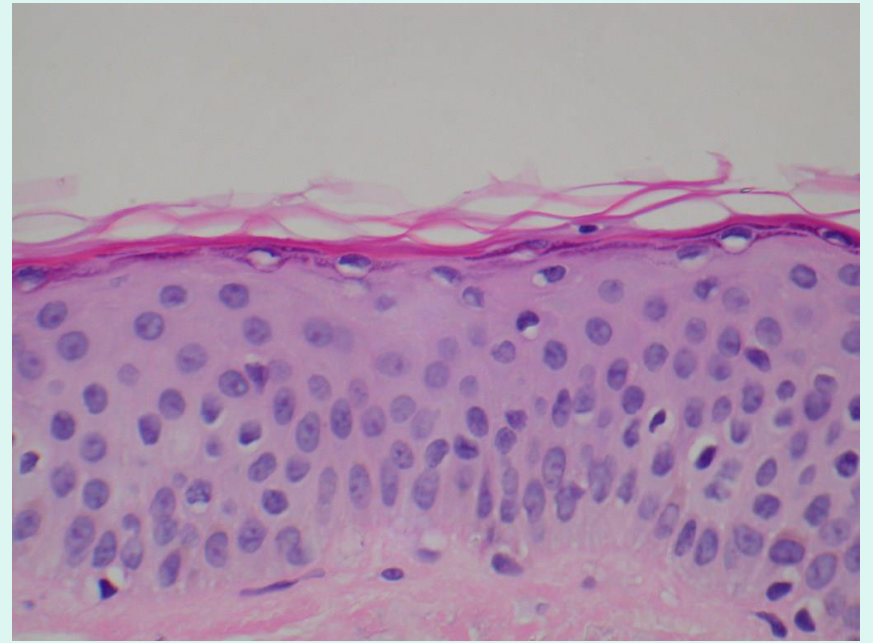
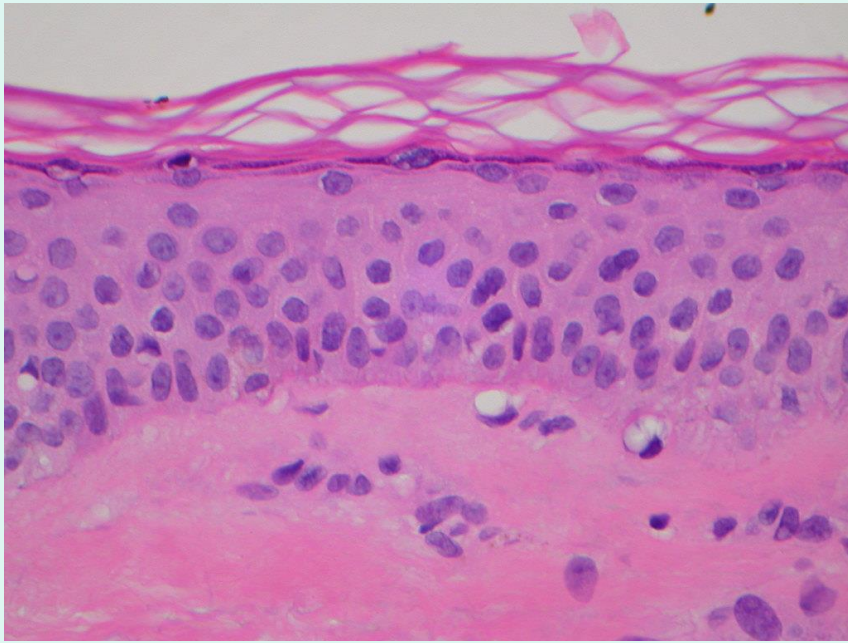
Patient 7



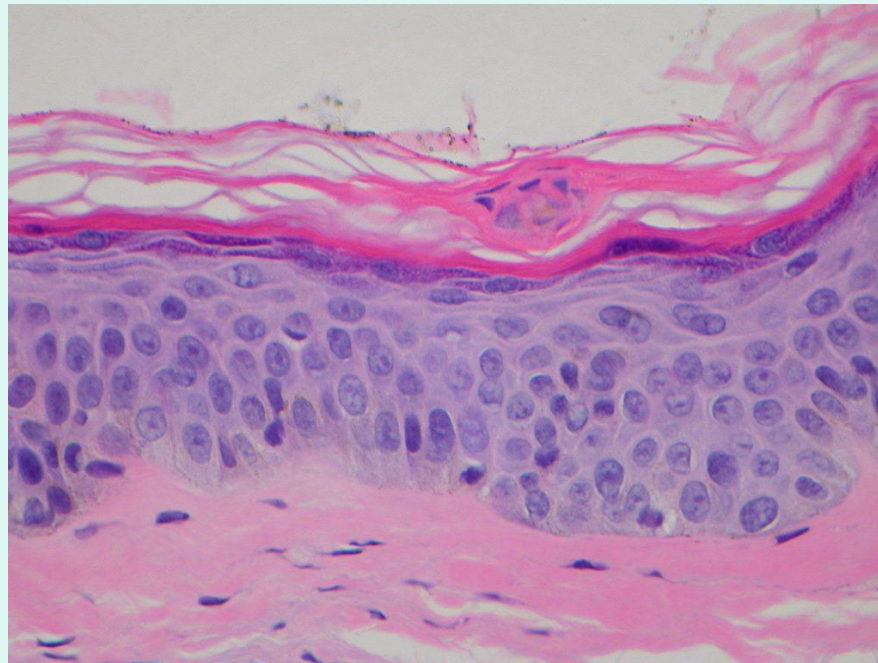
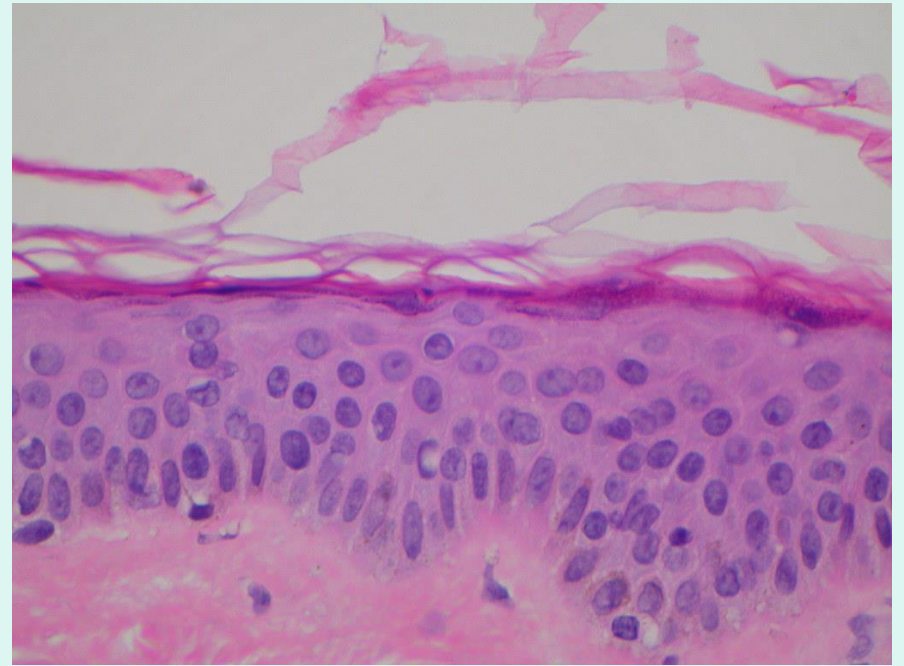
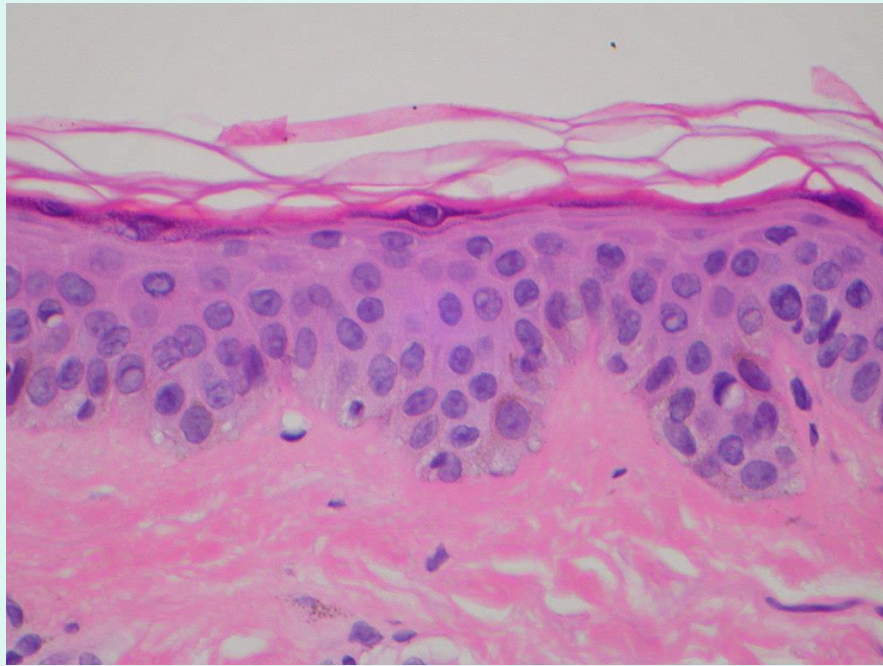
Patient 8



Patient 9



Patient 10



Results (acute)

- **The acute effect of microdermabrasion on the skin appears limited to the stratum corneum, where there is fragmentation and some homogenisation of the normal orthokeratotic stratum corneum.**
- **No breach of the epidermis is seen in any of the patients.**
- **There is no increased dermal inflammation or vascular dilatation post dermabrasion**
- **There is no residual crystals are identified in the biopsy samples.**

Results (delayed)

- **The delayed effects of microdermabrasion are seen entirely within the epidermis**
 - **compact hyperkeratosis**
 - **focal parakeratosis**
 - **mild epidermal hyperplasia.**
- **No change in the solar elastosis pattern or content is seen.**
- **No increased dermal elastic fibre content or distribution is detected with a Verhoeff-van Gieson stain.**
- **No change in the dermal collagen content, dermal thickness or dermal collagen fibre organisation or fibre thickness is noted.**

Conclusion

- **Changes in epidermal layers result in the skin becoming smoother and more even, the changes are real and can be back by histological evidence**
- **These changes are produced by using baseline parameters (low pressure and fine crystals)**
- **Aluminum oxide crystals are safe and does not cause any acute or chronic inflammatory response**

Can Microdermabrasion be used as a treatment for aging skin?

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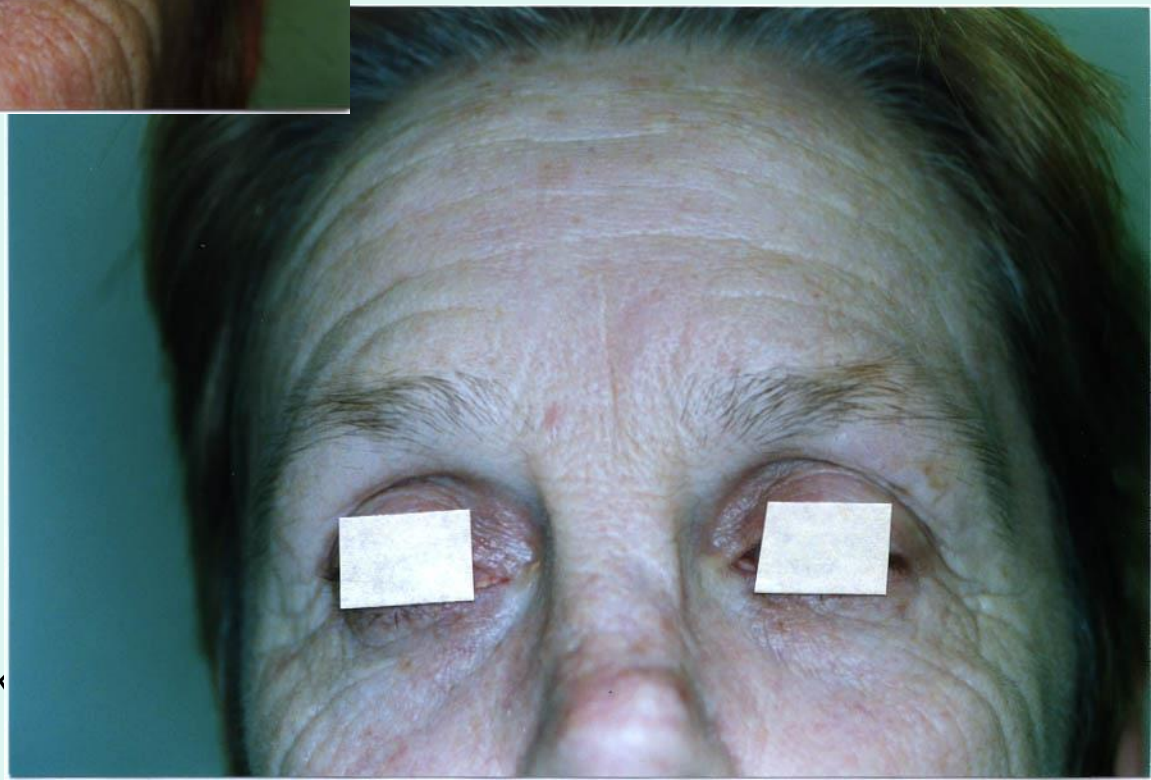
Methodology

- 9 patients were chosen for this trial.
- All were above 35 years of age.
- Photographs were taken before and after treatment.
- Patients were given microdermabrasion with the Diamond Duo Medic machine.
- Each patient was treated once a week, for 10 weeks
- The settings were for Normal crystals at 35kPa.
- Each treatment consisted of 5 passes over the entire face and neck
- After each treatment, patients used sorbolene as a moisturizer.
- Patients were advised to avoid sunlight during treatment.

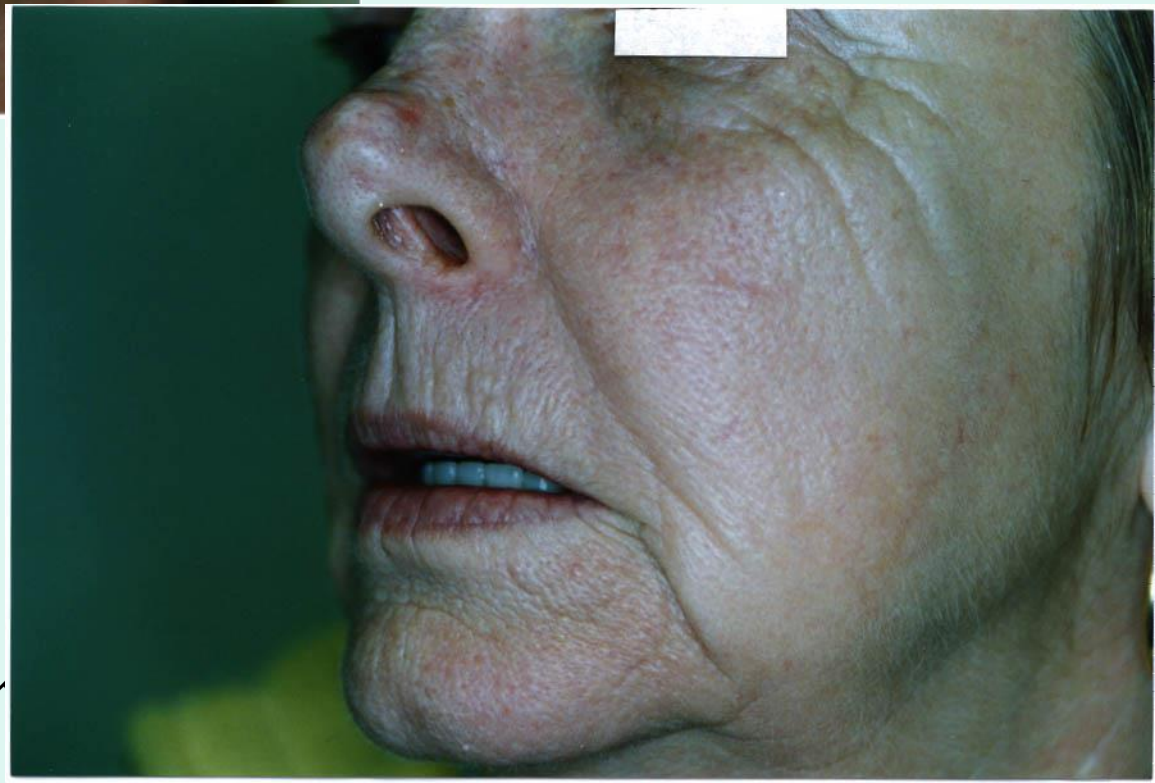
Results

- All 9 patients showed improved skin texture, with reduced wrinkles and pigmentation.
- All 9 patients also felt that their facial skin was tighter.
- All 9 patients were surprised and happy with the outcome.
- All 9 patients felt that they looked younger after treatment.

Patient A



Dr K



Dr H



Dr K



Dr KL Tan: Microdermabrasion

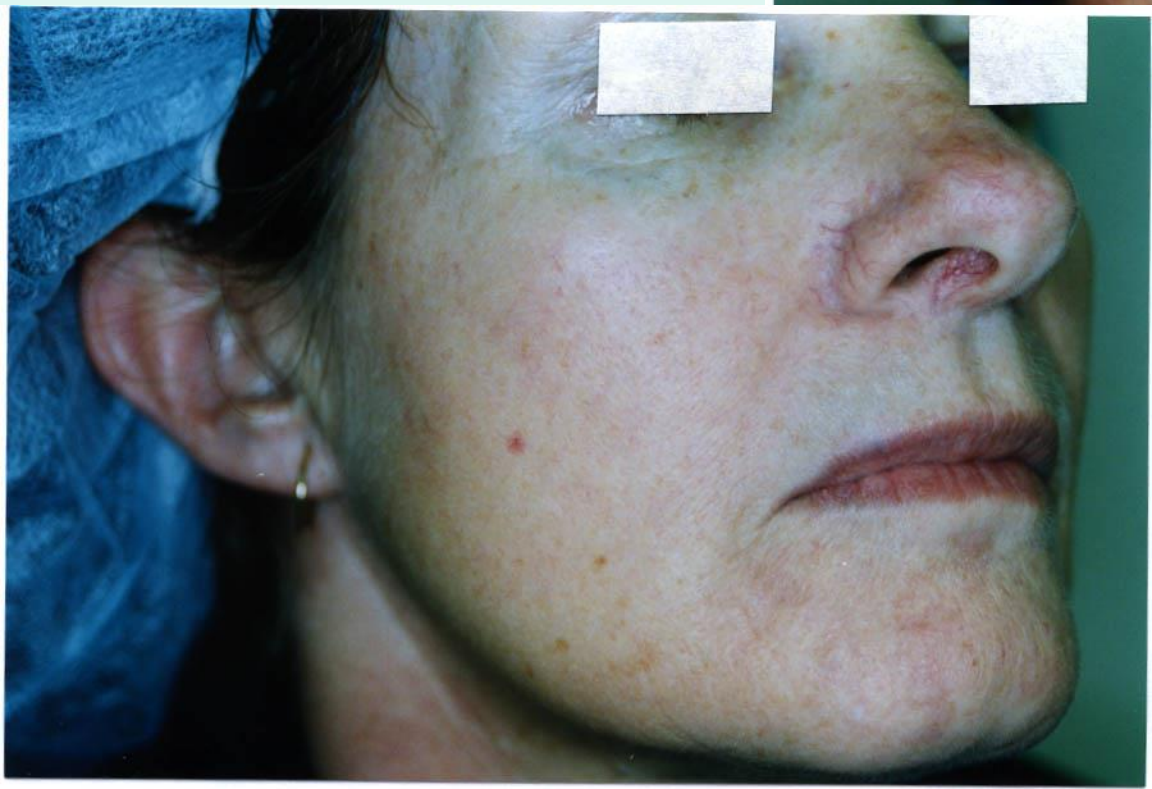
Patient B



Dr I



Dr KL Tan: Microdermabrasion



sion

Patient C



sion



Dr I



Dr KL Tan: Microdermabrasion

Patient D



Dr H





Dr h





Dr h

Patient E



Dr I

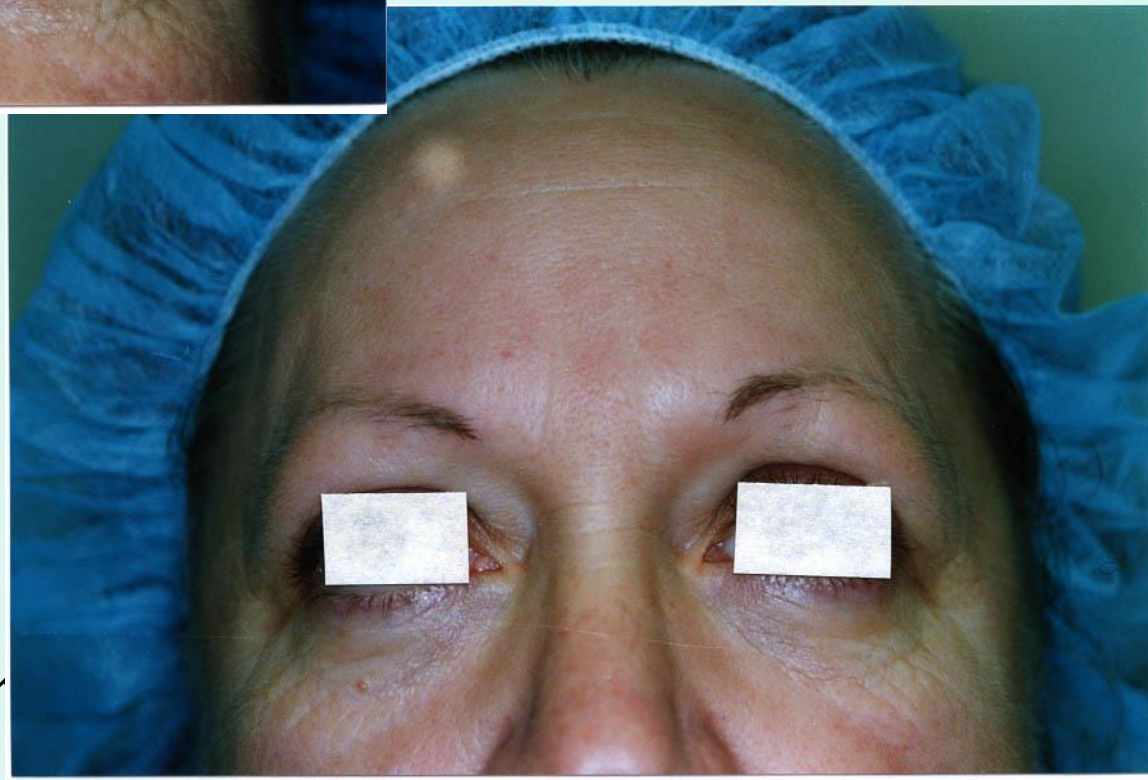
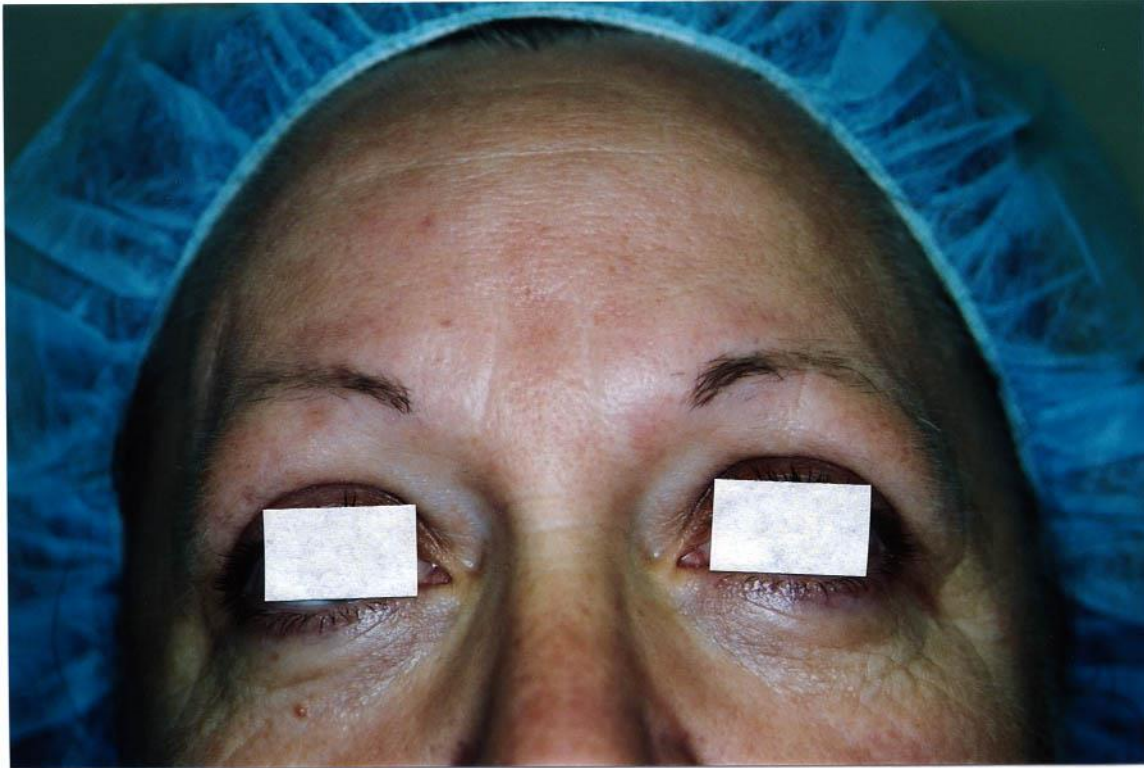


Dr K



Dr KL Tan: Microdermabrasion

Patient F



Dr h



sion



Dr |



Dr KL Tan: Microdermabrasion

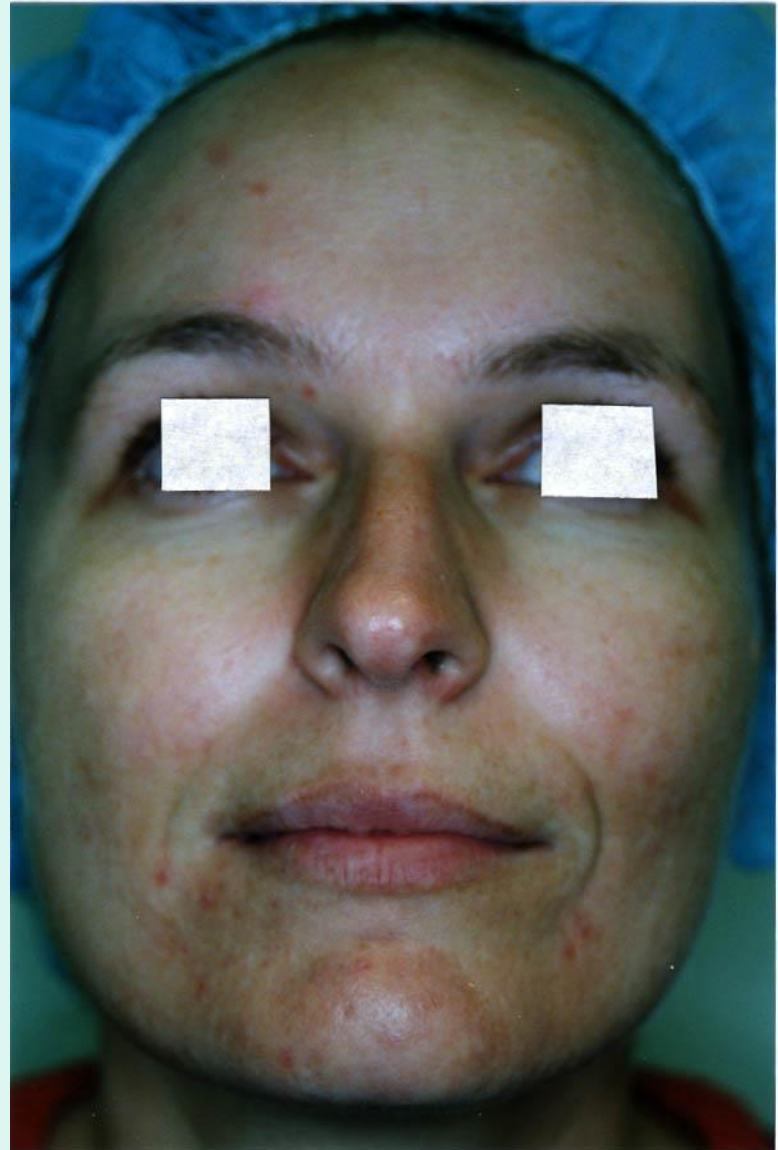
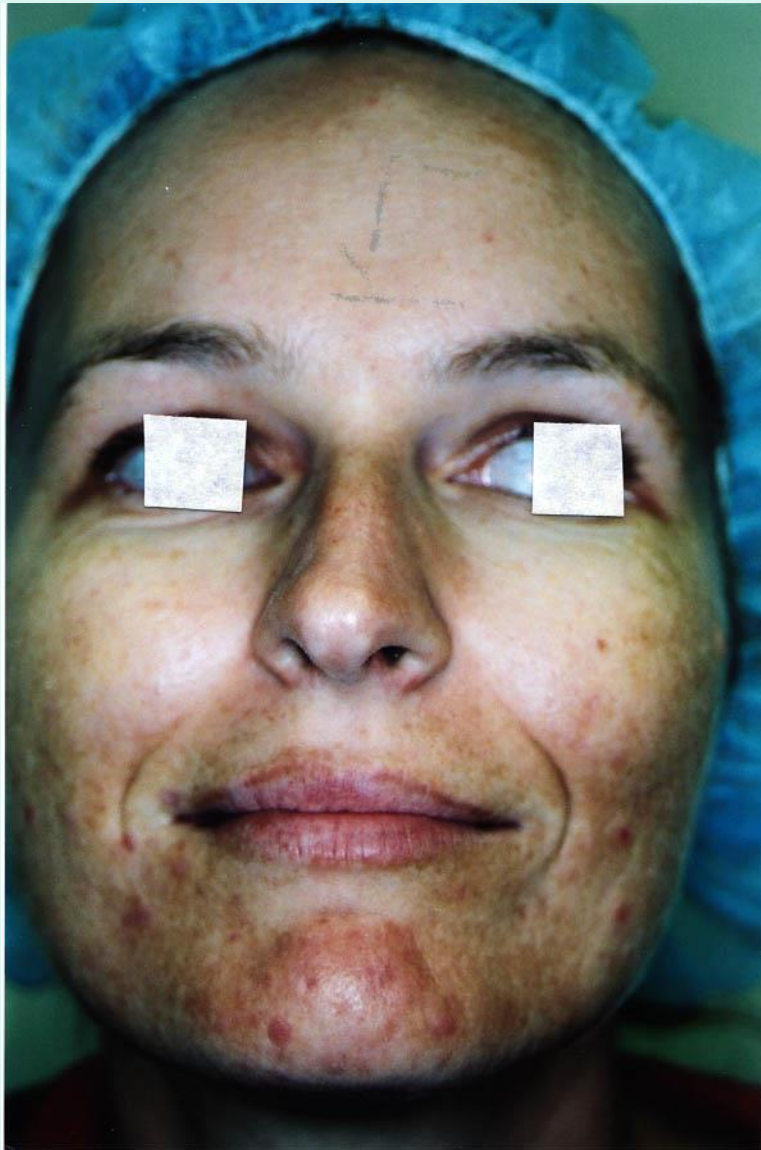
Patient G



Dr h



sion



Dr KL Tan: Microdermabrasion

Patient H

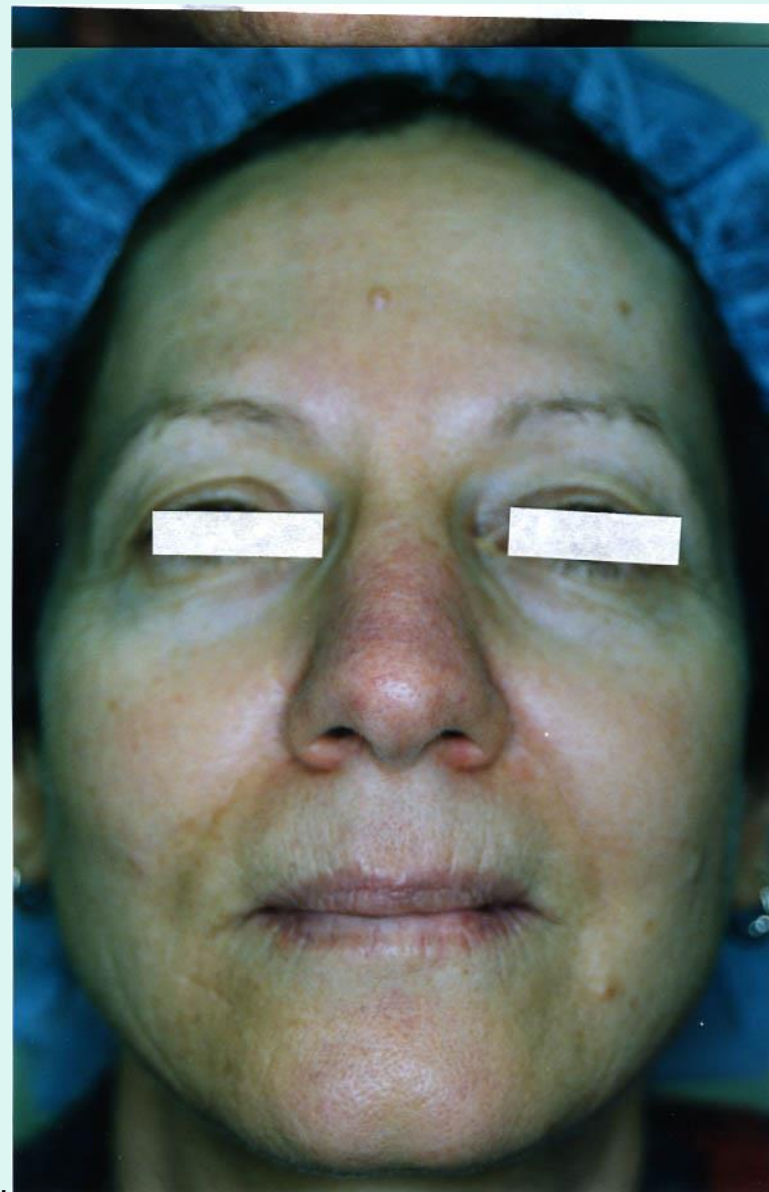
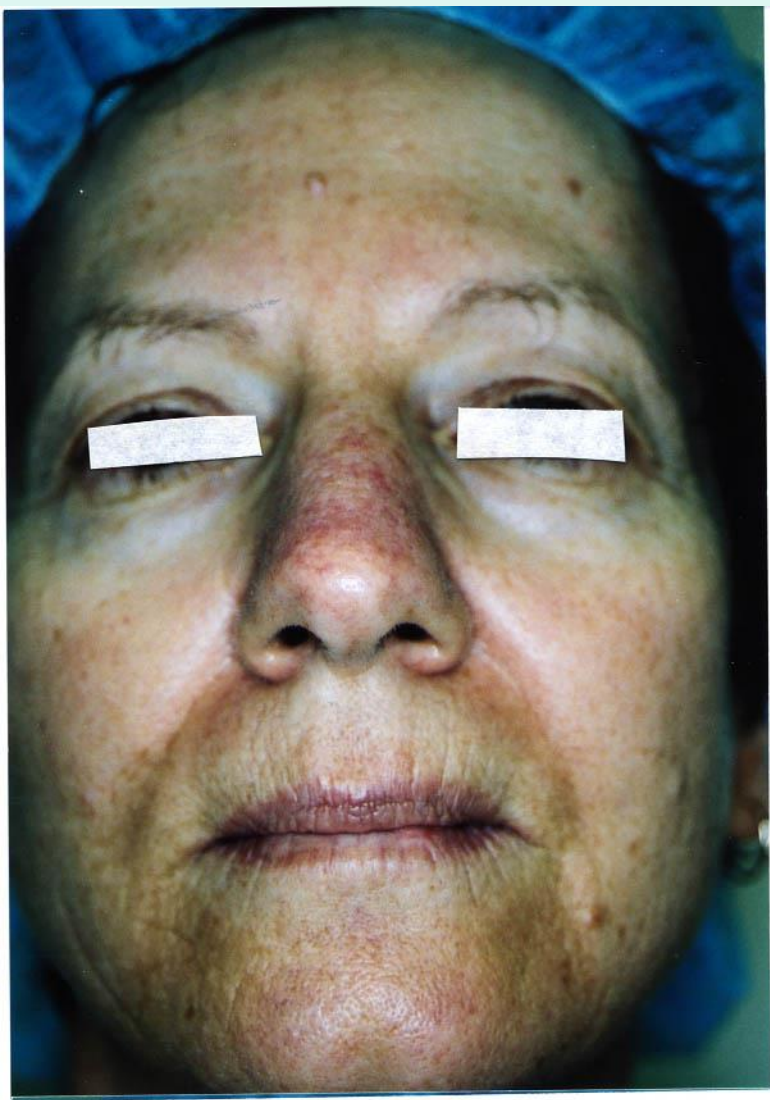


Dr h





Dr h



Dr KL Tan: Microdermabrasion

Patient I



Dr KL Tan: Microdermabrasion



Dr K



Dr K

Discussion

- This trial showed that microdermabrasion can reduce wrinkles and pigmentation.
- The results were comparable to those of Laser resurfacing, IPL or chemical peel
- Microdermabrasion is a cheaper alternative for both doctors and patients compared to IPL

- Microdermabrasion has the following advantages over Laser resurfacing or IPL:
 - Affordable.
 - Painless and quick.
 - Minimal side effects (scarring, HSV I, pigmentation).
 - Patients can have treatment done after work.
 - Patients can resume daily activities.
 - Nil local anaesthetics required.
 - Nil post treatment analgesia required.

References

- History of Dermabrasion. Lawrence et al. Dermatol Surg 2000;26:95-101
- Histologic effect of Aluminium oxide Microabrasion on facial skin. Rubin and Greenbaum. Journal of Aesthetic Dermatology and Cosmetic surgery Vol 1, Number 4, 2000
- The Use of Microdermabrasion for acne: A pilot study. Lloyd. Dermatol Surg 2001; 27:329-331
- Microdermabrasion: A Clinical and Histopathologic Study. Shim, Barnette et al. Dermatol Surg 2001;27:524-530

Longterm follow up of microdermabrasion patients

Completed Dec 2004

Follow up of patients who....

- Patients who had previously been treated with microdermabrasion
- No other cosmetic facial treatment since treatment
- Only use daily (own brand) moisturiser and sun block since treatment

Purpose of follow up

- To assess if the effects of microdermabrasion is long lasting
- To assess if patients have long term satisfaction

Patient selection

- Greater than 1 year since last treatment.
- Patients have not undertaken further cosmetic medical treatment such as IPL, chemical peel, Laser etc.

Microdermabrasion



After 2 years

Microdermabrasion



After 2 years

Microdermabrasion



After 2 years

Microdermabrasion



After 3 years

Microdermabrasion



After 3 years

Dr KL Tan: Microdermabrasion

Microdermabrasion



After 3 years

Microdermabrasion



After 3 years

Microdermabrasion



After 3 years

Microdermabrasion



After 3 years

Microdermabrasion



5 years later

Microdermabrasion



5 years later

Microdermabrasion



After 4 years

Microdermabrasion



After 4 years

Microdermabrasion



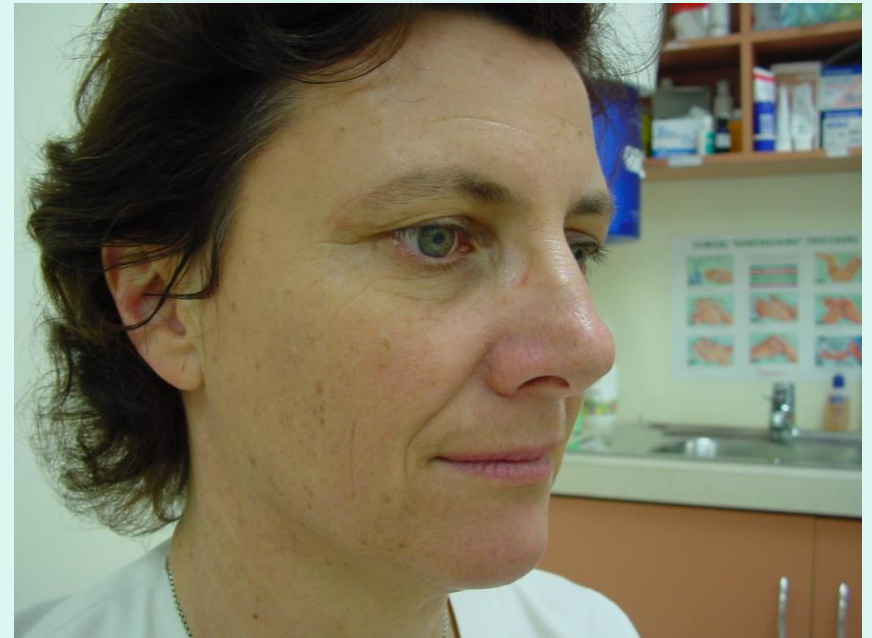
After 4 years

Microdermabrasion



After 2 years

Microdermabrasion



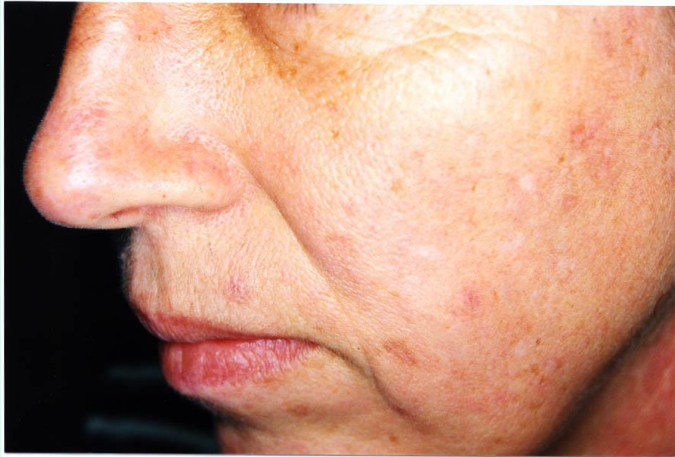
After 2 years

Microdermabrasion



After 2 years

Microdermabrasion



After 5 years

Microdermabrasion



After 5 years

Microdermabrasion



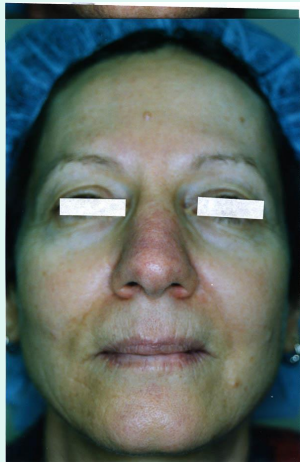
After 5 years

Microdermabrasion



After 5 years

Microdermabrasion



After 3 years

Microdermabrasion



After 3 years

Microdermabrasion



After 3 years

Microdermabrasion



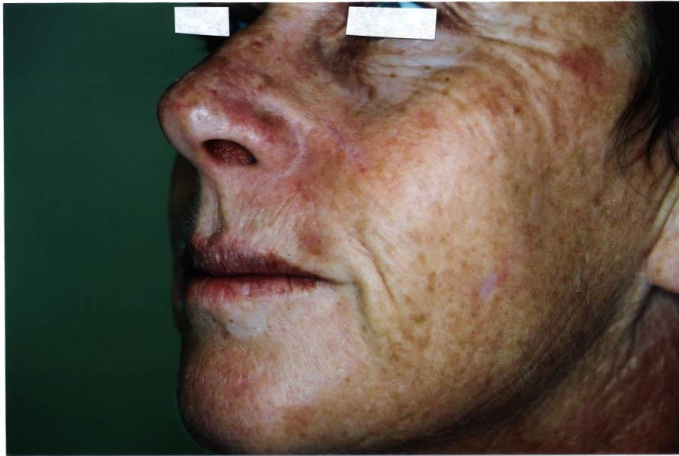
After 3 years

Microdermabrasion



After 3 years

Microdermabrasion



After 3 years

Active acne only 8 treatments and 1 year later



Dr KL Tan: Microdermabrasion

Active Acne only 8 treatments and 1 year later



Dr KL Tan: Microdermabrasion

Active acne only 8 treatments and 1 year later



Dr KL Tan: Microdermabrasion

After 6 treatments



1 year later



Dr KL Tan: Microdermabrasion

After 6 treatments



1 year later



Dr KL Tan: Microdermabrasion

After 6 treatments



1 year later



Dr KL Tan: Microdermabrasion

Stretch Marks after 18 Rx



Stretch Marks after 18 Rx



2 years later



Dr KL Tan: Microdermabrasion

2 years later



Dr KL Tan: Microdermabrasion

Conclusion

- All patients that were followed up showed sustained improvement of their skin
- All patients followed up were very happy with their outcome
- Effects of microdermabrasion are long term
- Healing effects of microdermabrasion continues after stopping microdermabrasion

Role of Microdermabrasion in Cosmetic Medicine

- Antiaging / lines and wrinkles
 - Laser Resurfacing / Laser micro laserpeel / IPL
 - Deep Chemical Peels
 - Botulism toxin
 - Dermal fillers
 - Chemical Peels
 - **Microdermabrasion** (shown to increase collagen)
- Acne treatment
 - Chemical peel / IPL / Photodynamic therapy
 - Antibiotics
 - Hormonal
 - **Microdermabrasion**
- Hyperpigmentation
 - Chemical Peels (AHA, TCA)
 - Bleaching agent
 - **Microdermabrasion**
- Stretch marks
 - **Microdermabrasion**

Summary

- Microdermabrasion is an ideal system to have in a cosmetic practice
- Can give results comparable to IPL, Erbium laser and Chemical Peel
- Cheaper than lasers and IPL
- Can complement other treatment modalities