

Redermalization & Ultrasound

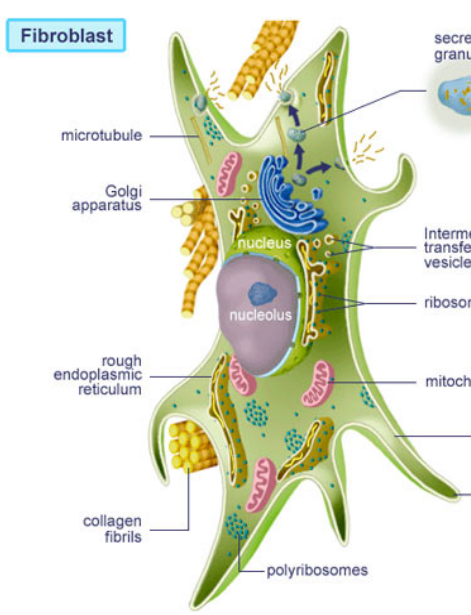
Quantifying the beneficial effects of combining Redermalization with Therapeutic Ultrasound

Background

Redermalization

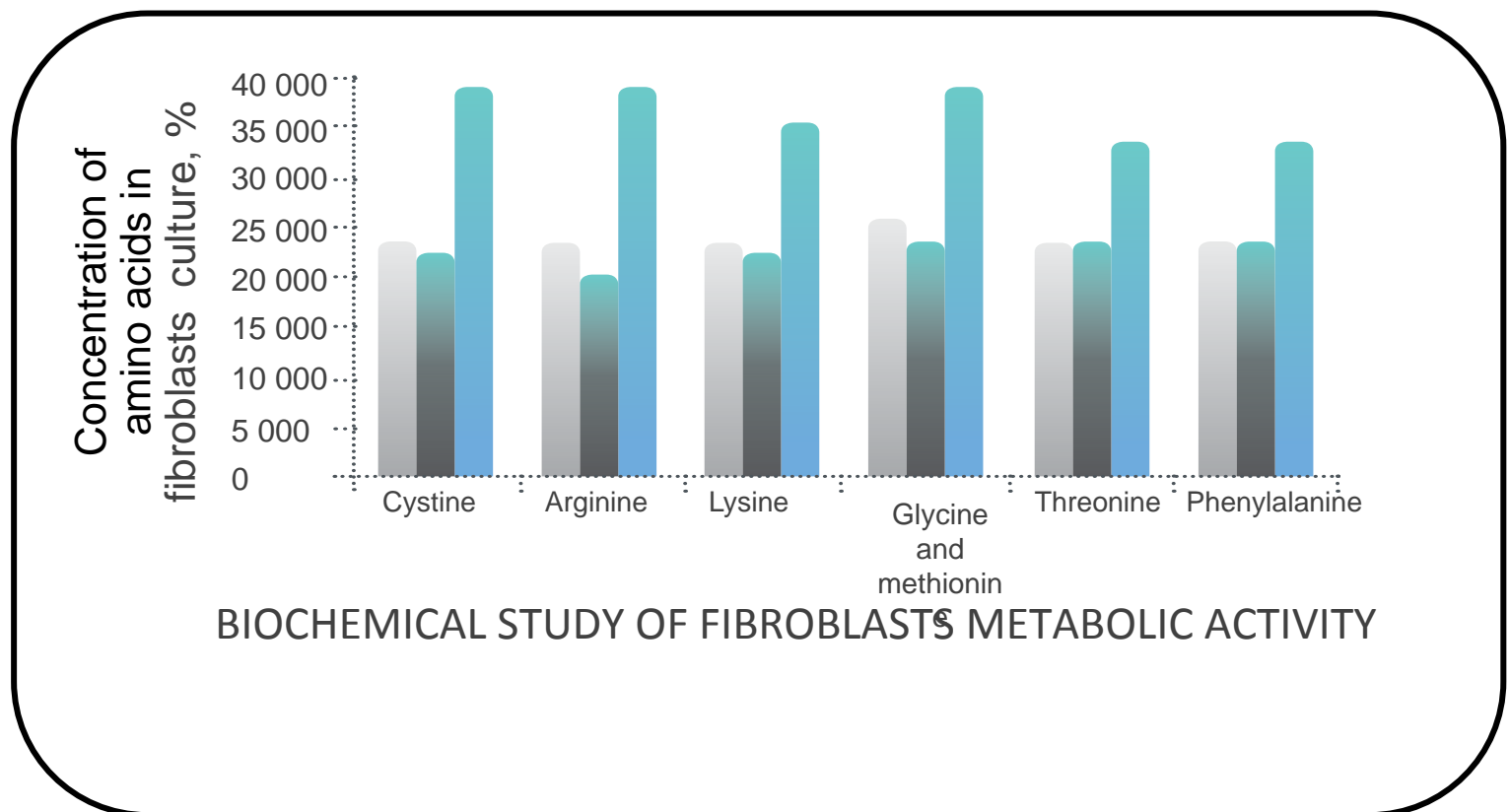
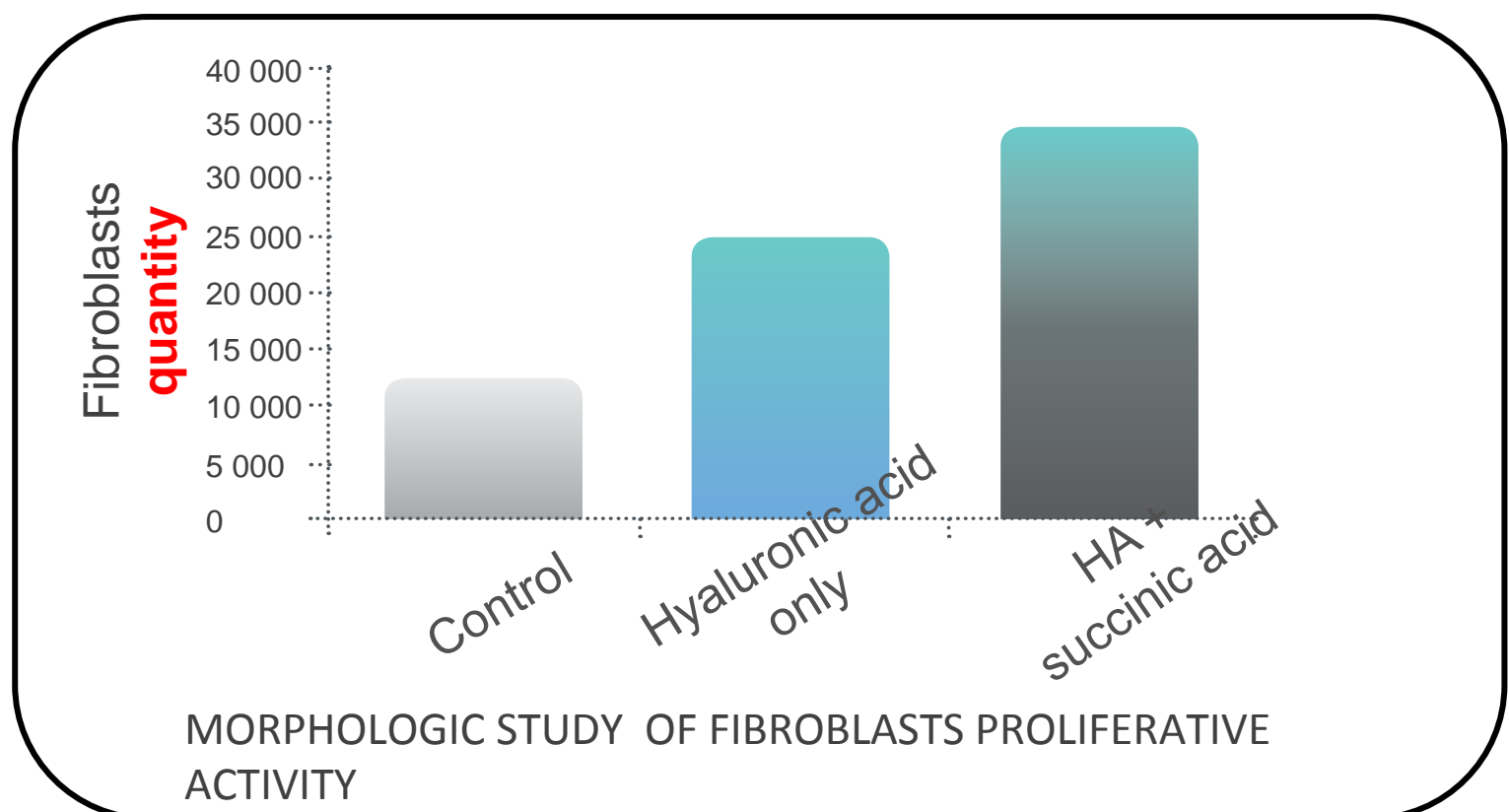
- Hyaluronic Acid and Succinic Acid
- Produces collagen and elastin
- Used to:
 - Dilute and break down pigmentation marks
 - Tighten and lift skin
 - Reduce the appearance of fine lines and wrinkles
 - Improve skin tone and surface texture
 - Hydrate skin
 - Treat stretch marks and acne scars

Fibroblast



- Target Cell: Fibroblast Cell
- FB is synthesizing and recreating the intercellular substance, collagen, elastin and other important amino acids.
- As skin ages the proliferative and biosynthetic activity of Fibroblasts decreases resulting in loses of collagen, dermal thickness and moisture content.
- The skin loses its turgor flexibility and elasticity which leads to increase of folds and lines

Redermalization



History of Combination

- Ultrasound Introduced in an attempt to Minimize Redermalization downtime
- Basis: Mechanical Vibration aids integration
- Patients then reported **much improved** results
- Therefore it was decided to investigate further and quantify this enhanced effect.

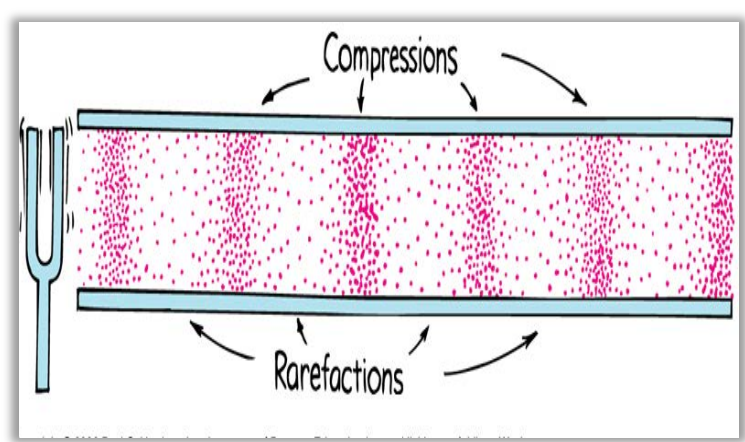


Therapeutic Ultrasound



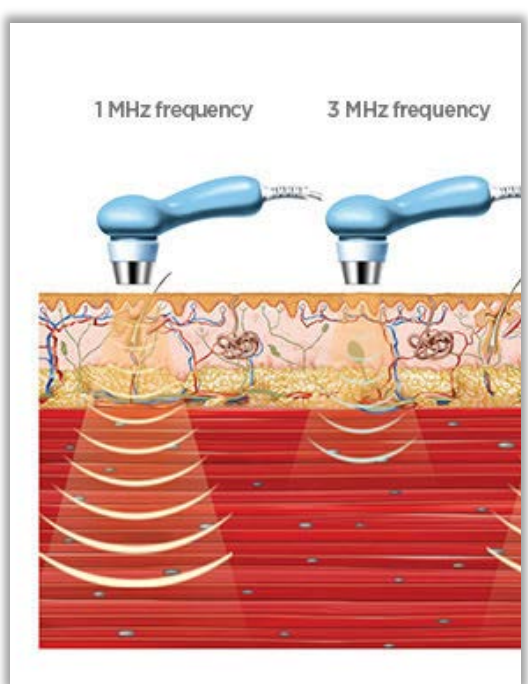
- Therapeutic ultrasound (US) is a form of MECHANICAL energy.
- Electrical energy is converted to acoustic energy through mechanical deformation of a piezoelectric crystal.
- Sound Waves are Longitudinal waves

- Energy within the sound wave will cause oscillation of the particles of the material.
- Resultant effects on healing cascade.

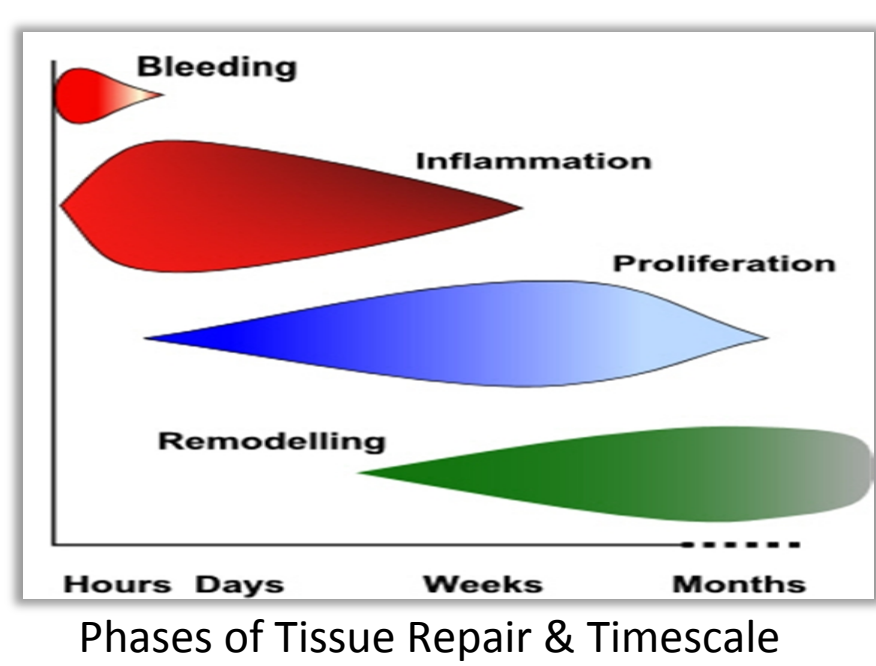


Thermal & Non Thermal Effects

- Thermal
 - Heating of collagenous tissues will require a relatively high intensity (continuous mode)
- Non-Thermal
 - Cell membrane becoming 'excited' (up regulation), increasing the activity level of the whole cell.
 - The US energy acts as a *trigger* for this process
- MICROMASSAGE

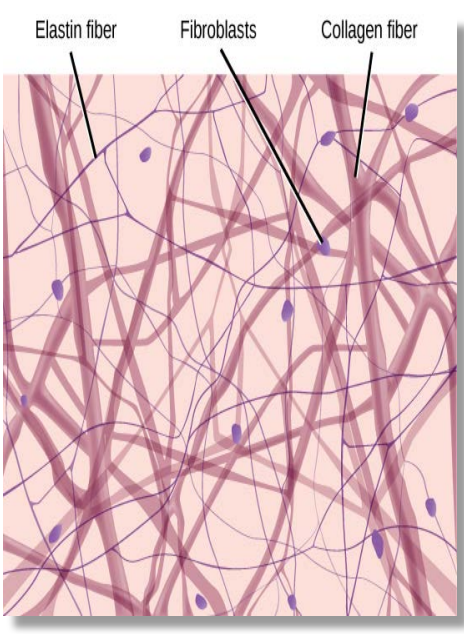
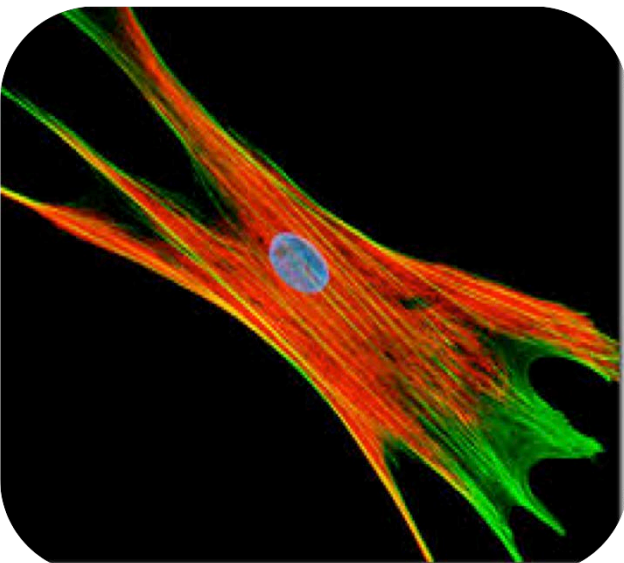


Ultrasound Effects During Phases of Healing



- Ultrasound in Inflammation
 - Stimulating effect on the mast cells, platelets, white cells with phagocytic roles and the macrophages stimulating the release of arachidonic acid which is a precursor for the synthesis of prostaglandins and leukotriene which act as inflammatory mediators.
 - pro-inflammatory in the short term

- The benefit : to act as an inflammatory 'optimisor'.
- Promotion of the inflammatory phase also acts as a promoter of the proliferative phase.
- Post Redermalisation Treatment.
- Ultrasound in Proliferation
 - US has a stimulating effect (cellular up regulation).
 - Fibroblasts, endothelial cells and myofibroblasts.
 - Active during scar production
 - US is therefore **pro-proliferative**
 - Maximizes efficiency of scar tissue formation.



- US in Remodeling
 - The new collagen adopts **functional characteristics** of the tissue that it is *repairing*.
 - Enhancing the **orientation** of the newly formed collagen fibres.
 - Encouraging collagen profile change from mainly **Type III** to a more dominant **Type I**.

- In brief... Ultrasound is a sound wave that penetrates the skin and causes **up-regulation** of cellular activity and a **micro-vibration** of tissues at a cellular level.
- Ultrasound has the capacity to **enhance** and **stimulate** these normal events and therefore increase the **efficiency** of the repair phases.

Study Description

- Body areas: Face and neck.
- Method: Patients divided into 3 groups.
 - Group 1: injected with Xela Rederm only
 - Group 2: Injected with Xela Rederm and receive ONE session of Ultrasound
 - Group 3: Injected with Xela Rederm and receive TWO sessions of Ultrasound.

Assesment Criteria:

- Questionnaire:
 - Skin texture
 - skin density,
 - pigmentation marks
 - fine lines
 - degree of skin sagging
 - moisture levels
 - Mood
 - self confidence
 - attractiveness and skin tightness.



- Antera: texture, depressions, lines, pigment, pores.

- Jowel Length measurement

- Images, questionnaires and measurement are repeated by doctors and patients at 1&3 month.

Treatment Process

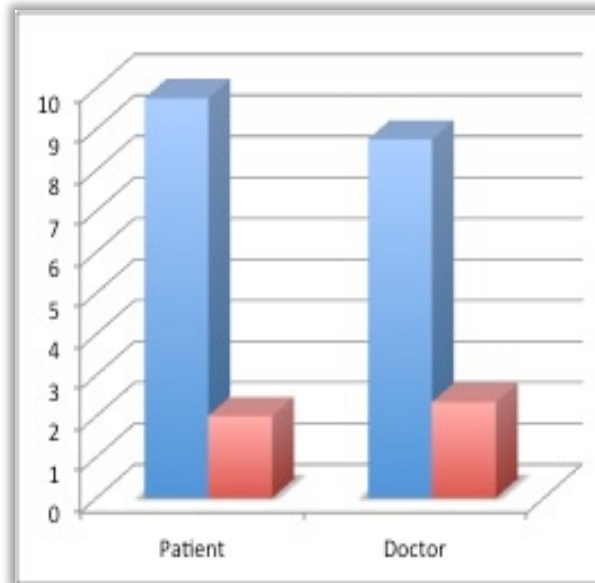
- Anaesthetize and Clean.
- Inject in superficial dermis.
- Target problem areas.
- Spray with Daily Deluxe Spray.
- Send to Physiotherapist.

Ultrasound Protocol

- Disinfect ultrasound head
- Settings & Dosage: 3.3Mhz; 2.0-2.5 W/cm²; Continuous Mode;
- Apply Sterile Coupling medium
- Critical Angle of 90 degrees between the applicator head and the skin
- Application time: 15 mins
- Areas to avoid: infra-orbital space and the thyroid gland

Interim Results

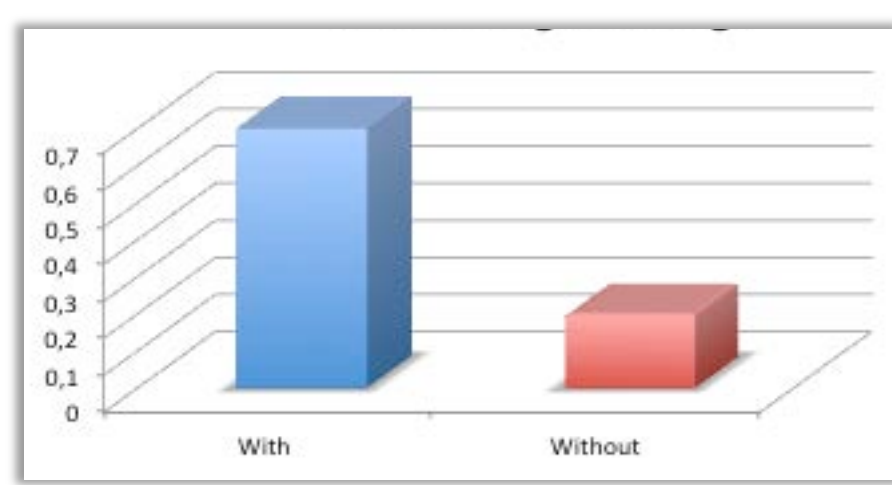
Subjective Questionnaire Responses



- Graph represents total point changes from pre treatment to one month, and the average taken over all patients in each category.
- Changes seen by doctors and patients are closely approximated.
- Patients undergoing ultrasound (blue) report better results.
- For all that could be said about subjective ratings, they are important in the world of aesthetics because this is how patients experience treatments.

Jowel Length Change

- An objective measurements.
- Average shortening of 0,75cm versus 0,15cm with (blue) and without ultrasound respectively.
- On a 10cm distance that translates to 7,5% versus 1,5% change respectively.

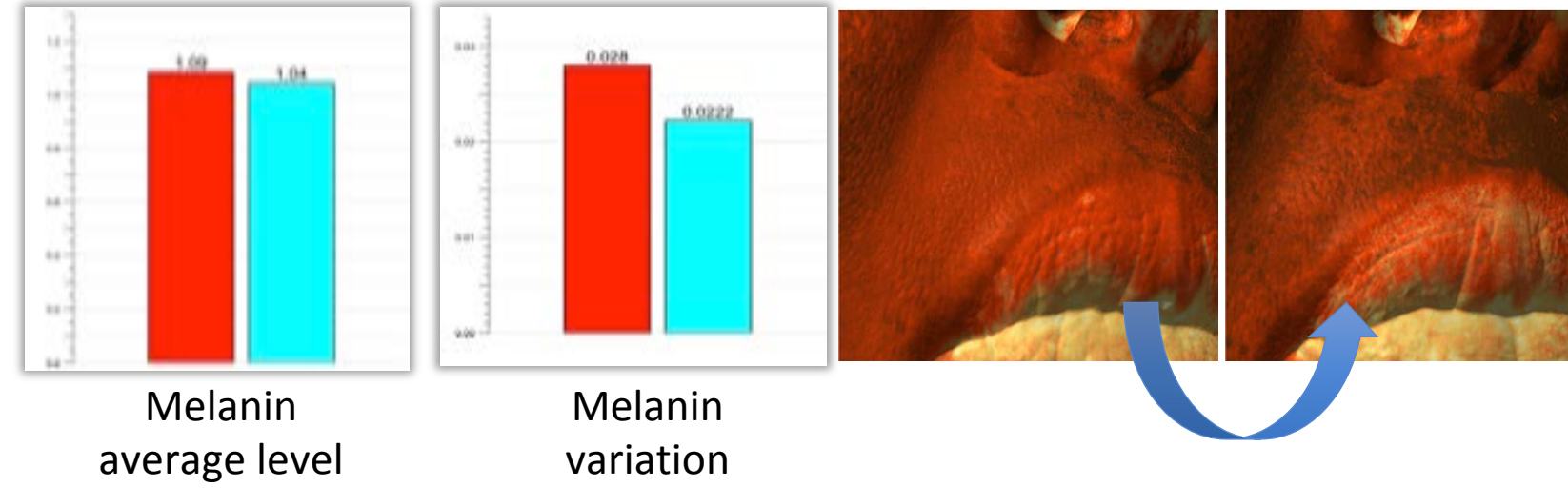


Interim Results: Antera

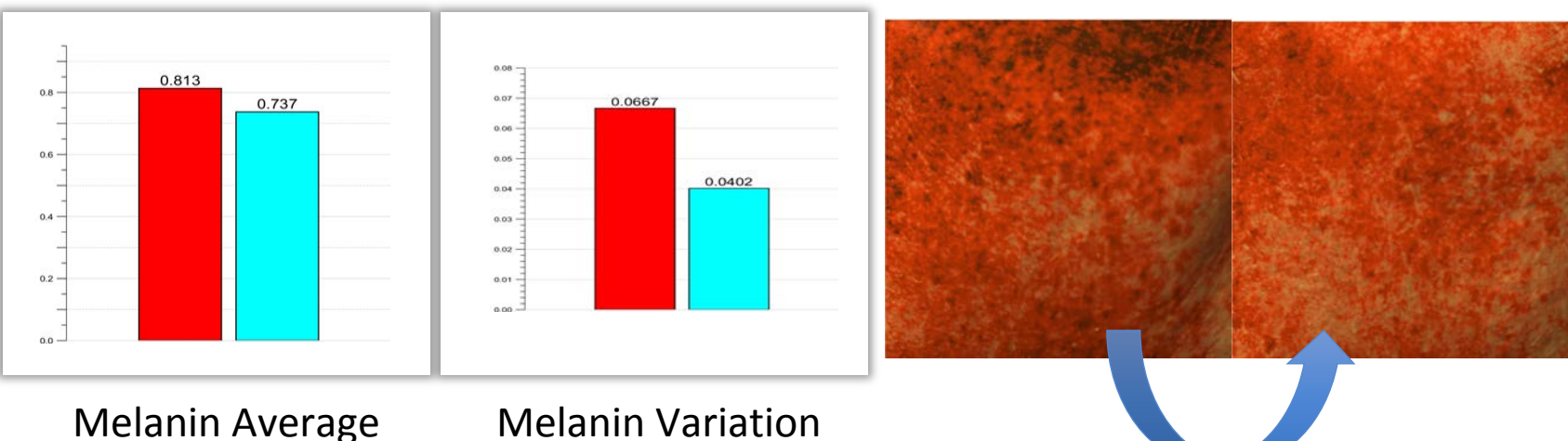
Pigmentation

Pigment change without Ultrasound

- The antera device may be set to measure various parameters.
- Change in pigmentation with Redermalization without ultrasound is clearly visible.
- The Melanin Average dropped by 5 % after just one month.
- The Melanin Variation dropped by 21%. This is the overall measure of equal skin tone and is what the majority of patients want, even skin tone. The closer this number is to 0, the more flawless the skin will appear.

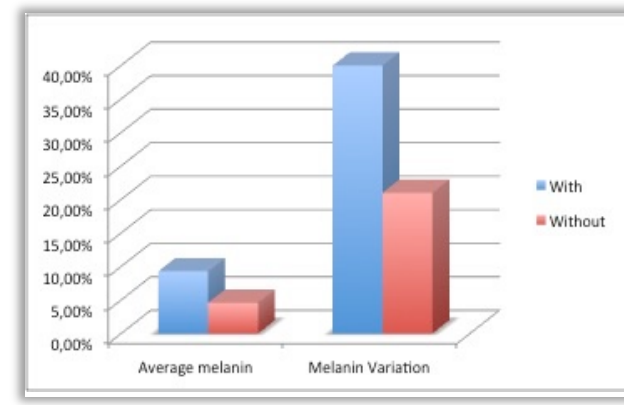


Pigment change with Ultrasound



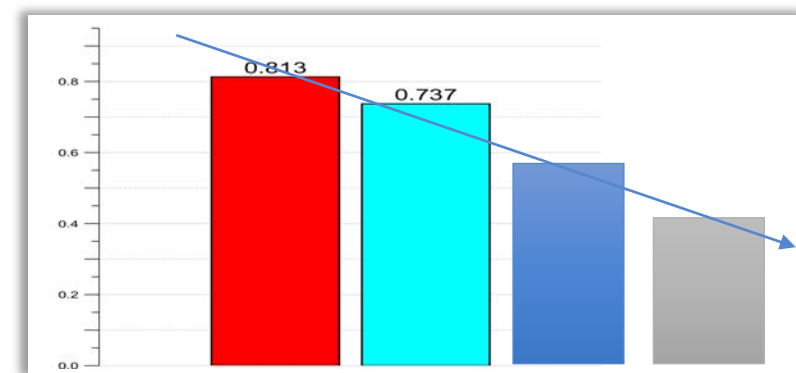
- When ultrasound is added, we see the Melanin Average drop by 9 %.
- And the Melanin Variation drop by 40%.

Pigment change difference with & without Ultrasound



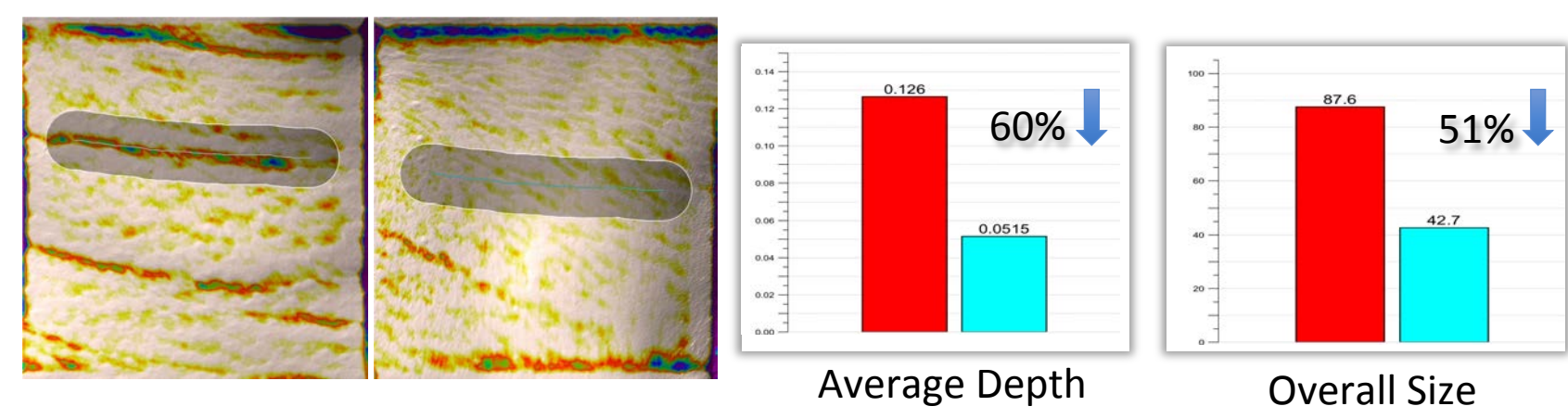
Extrapolation (Pigment) 3 months

The effect of Xela rederm on the fibroblast cells is maintained for three months therefore the results are seen to improve over that period.



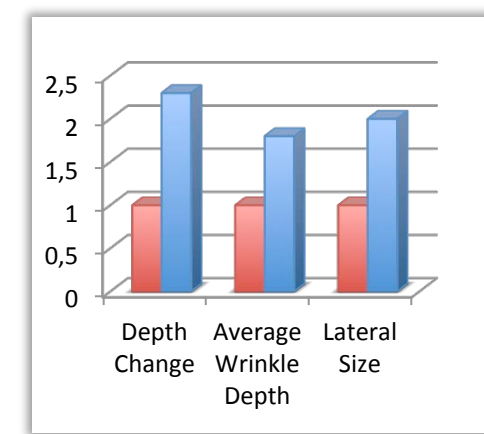
Lines & Wrinkles

Lines & Wrinkles With Ultrasound

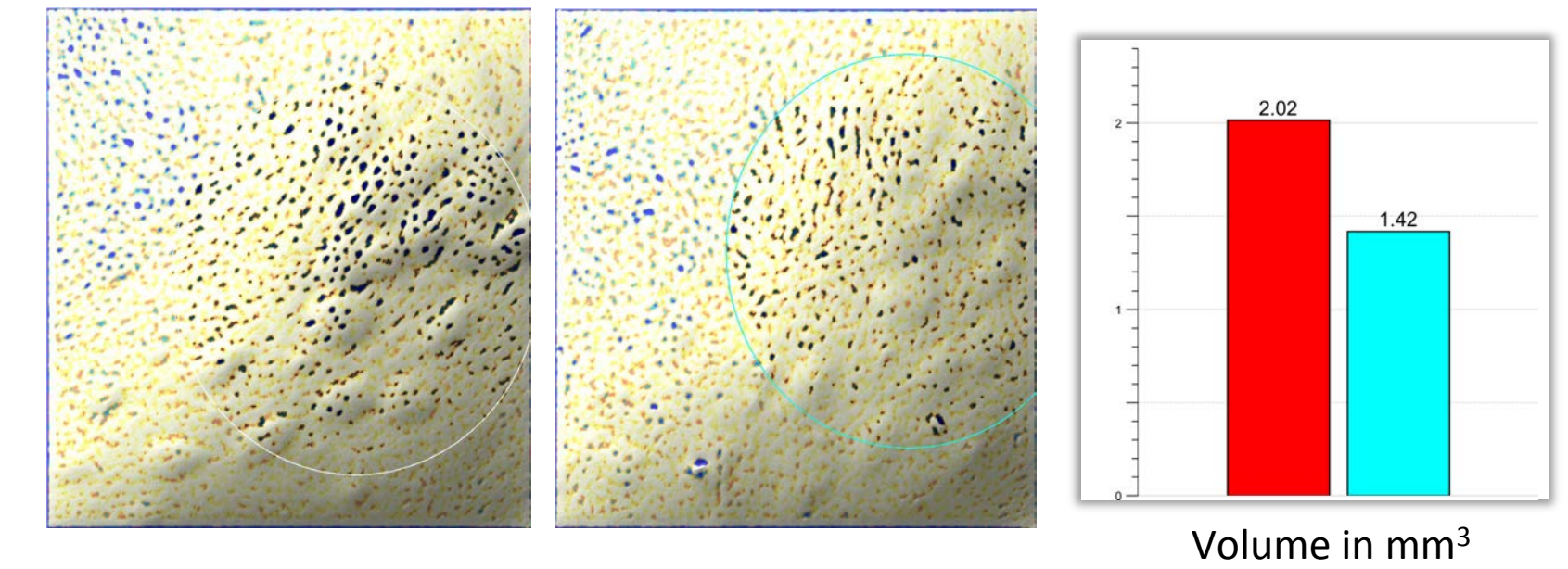


Lines & Wrinkles Change With & Without Ultrasound

- Maximum depth change with ultrasound was 2.3x better
- Average wrinkle depth improvement was 1.8x better
- Overall wrinkle size improvement on a lateral measurement was 2x better

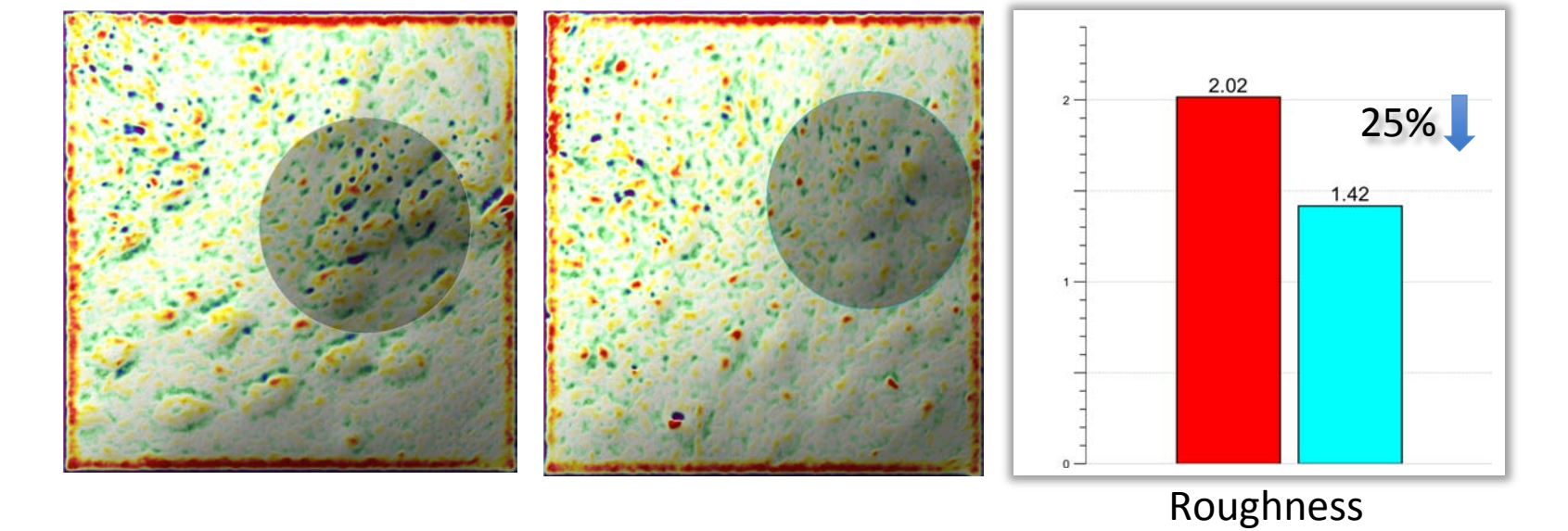


Other Outcome Measurements : Pores

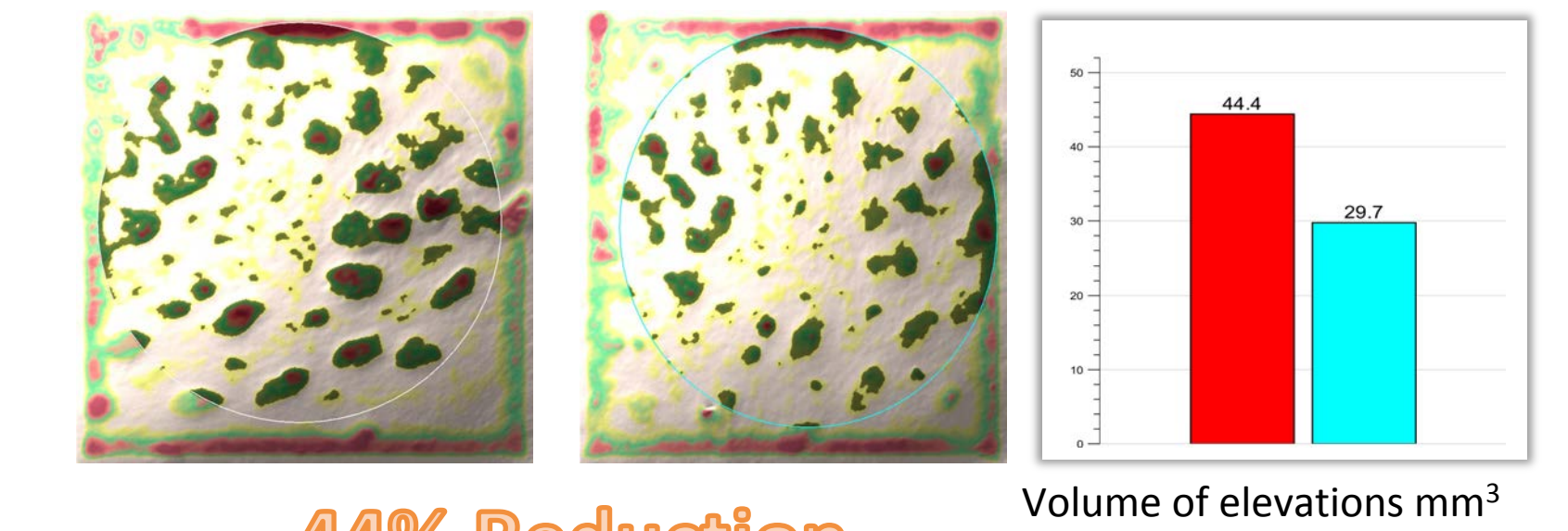


- These are not blackheads, which are better treated with peels, but actual pores and scars
- Improvement of roughly 30%

Other Outcome Measurements : Texture



Reduced Downtime



44% Reduction

- The reduced downtime has now become a desirable side effect.
- Reduced erythema and bleb size.
- Downtime reduced to one day instead of two to three days, making weekday treatments more attractive.



These are images taken by a patient who underwent this process. These are **same day** images taken a few hours apart. Granted in the second image she has applied some make up, but she was so happy with the result, that she excitedly posted these images to social media.

The combination of **Redermalization** and **Therapeutic Ultrasound** has been clinically shown to produce a valuable synergy by:

- enhancing the outcomes of the treatment and
- allowing us to perform more redermalization treatments due to the shorter down time.

Future Potential Research

- Further investigations focusing on other areas of the body using the 2.2% Xela Rederm product and Ultrasound.
- Use of a higher frequency Ultrasound Unit (MFU) to focus sound waves even more superficially? More efficient for target tissues? Potentially too destructive?
- Combining PRP, Xela Rederm and Ultrasound

Research performed and presented by:

- Dr Reza Mia (MBBCh) (MBA) (MSc Fin)
- Roxanne Elizabeth Ashkar (BSc Physio) (OMT1)
- Dr Elfrieda Fourie (MBBCh)



Contact details:

info@antiagingart.co.za
reza@drrezamia.com
+27114830881



@drrezamia
@antiagingart
@roxanneashkarphysio
@drelfriedaforie

