

# Facial Wrinkles in Asia Treated by Tri Focused Ultrasound: Painless Non-invasive Procedure

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## Abstract

HIFU is a non-invasive cosmetic procedure that uses high-intensity ultrasound waves to target and heat deep tissue layers, stimulating collagen production and tightening the skin. Several studies have evaluated its efficacy and safety in skin tightening for various areas of the face and body, including the crow's feet wrinkles around the eyes.

One such study published in the journal of cosmetic and laser therapy in 2018 evaluated the efficacy and safety of HIFU for non-invasive skin tightening of crow's feet wrinkles in 20 female participants. The study found that a single session of HIFU resulted in a significant improvement in skin tightness and reduction in wrinkles at 12 weeks post-treatment. Moreover, this improvement was maintained at 24 weeks post-treatment, suggesting that HIFU can provide long-lasting skin tightening effects.

However, it is important to note that the effectiveness of HIFU may vary depending on the individual's skin condition, age, and other factors, and multiple sessions may be required to achieve optimal results. Additionally, as with any cosmetic procedure, there may be some risks and potential side effects associated with HIFU, including temporary redness, swelling, and tingling sensations.

**Keywords:** HIV • cART adherence • Disclosure • Joint model • Dietary adherence • HIV transmission

## Introduction

Non-invasive skin tightening is preferred over invasive or surgical methods due to its advantages such as rapid return to work, short recovery time, and low risk of adverse events. To meet this demand, various devices have been developed including laser, radiofrequency, and High-Intensity Focused Ultrasound (HIFU) [1].

HIFU is a non-invasive method that heats tissue to greater than 60°C, producing a small thermal coagulation zone in the dermis and subdermis. This leads to immediate contracture of denatured collagen, initiation of neocollagenesis, and collagen remodeling, resulting in non-invasive skin tightening and lifting. Cold laser 635 nm is a surface laser penetrating at 1.5 mm, producing a vasodilation, oxygenation of the tissue, and biostimulation at dermis level. The study aims to evaluate the efficacy and safety of HIFU combo laser wrinkles and determine how long the skin tightening can be maintained [2].

## Materials and Methods

The study you described involved 20 patients (2 male and 18 female

Asian skin type) with wrinkles who received HIFU combo laser treatment using Sygmalift by Medixsysteme. The treatment used 0.8 MHz, 1+1.5+2 mm depth transducers (Trifoca) and was performed by the same surgeon. The treatment involved 25 sequences and was performed three times with a one week interval between each session. Informed consent was obtained from all patients, and the study was conducted in accordance with the Helsinki declaration [3].

The study had specific exclusion criteria that aimed to exclude patients with conditions that might interfere with the outcome of the treatment or increase the risk of complications. These criteria included cervicofacial, skin disease or vascular facial disease; pregnancy or breastfeeding; local skin diseases that might alter wound healing; soft tissue augmented by fillers, previous facial surgery; receipt of an anti-aging procedure in the preceding 3 months; and any local infections [4].

The exclusion criteria help to ensure that the study is focused on a specific population of patients, and that the results obtained are more likely to be valid and relevant. The use of standardized exclusion criteria is a common practice in clinical research and helps to ensure that the study population is homogeneous and the results are not confounded by other factors [5].

## Procedure

Skin was cleaned from any make up or dirt prior to treatment. The gel is applied to the area to be treated, in order to offer a good coupling with the ultrasonic hand pieces.

The trifocal ultrasound of sygmalift is set in red mode in order to treat wrinkles of 1, 1.5 and 2 mm depth in a single sequence. 25 sequences were performed on each area treated. The graphic interface of Sygmalift guides the operator to cover the whole selected area in uniform mode. Each sequence pulsed for 2.5 seconds in circular beam direction [6].

The total time of treatment per area correspond to 10 to 15 minutes.

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Then the procedure requires to wash off the ultrasound gel was washed off. Then the 635 nm Laser is programmed to be operated on the same area for 5 minutes. The 635 nm laser will reach a deepness of 1.5 mm in the dermis [7].

## Measurement

Physician and patients compared preoperative and postoperative results based on the Global Aesthetic Improvement Scale (GAIS) at 1 week after the first procedure, 1 week after the second procedure, 1 week after the third procedure, and 9 weeks after the third procedure. Results were assets by experienced 2 physicians and also 3 nurses in the clinic.

## Statistical analysis based on friedman test

To compare patients score, it is common to use the Friedman test before treatment and after treatment weekly and 9 week after treatment.

## Results

The study involved 20 patients with mouth, forehead and crow's feet wrinkles who received focal ultrasounds and cold laser treatment at three intervals over a period of three weeks. The study included three experienced plastic surgeons who evaluated the patients' satisfaction with the treatment, and the patients themselves also rated their satisfaction using the GAIS scale.

The results showed that both the plastic surgeons and patients reported a significant improvement in the appearance of the crow's feet wrinkles at all time points measured (1 weeks after the first, second, and third procedures, and 9 weeks after the third procedure). The GAIS scores reported by the plastic surgeons and patients were similar, ranging from 1.5 to 2.5, and no serious adverse effects were observed during the study. The study's findings suggest that HIFU combo laser treatment can be effective for improving the appearance of crow's feet wrinkles in female patients. The absence of serious adverse effects is also encouraging, although it is important to note that further research is needed to confirm the safety and long-term effectiveness of the treatment (Table 1). Overall, the study provides preliminary evidence to support the use of HIFU Combo laser as a non-invasive method for improving the appearance of wrinkles, in Asian type female and male gender [8].

Male group				
Plastic surgeons' gais scores	2.5	2.1	1.3	1.2
Patients' gais scores	2.4	2.2	1.5	1.1
Female group				
Plastic surgeons' GAIS scores	2.2	1.8	1.5	1.1
Patients' GAIS scores	2.1	1.7	1.4	1.2
Total area treated evaluation men and women) Week +1-+9				
Supraorbital	2.11 ± 0.65	1.40 ± 0.61	1.41 ± 0.69	<0.001
Infraorbital	2.11 ± 0.88	1.53 ± 0.61	1.45 ± 0.61	<0.001
Perioral	2.26 ± 0.65	1.14 ± 0.60	1.37 ± 0.50	<0.001
Cheek	1.80 ± 0.60	1.21 ± 0.54	1.16 ± 0.50	<0.001
Eyes Crowfeet	1.80 ± 0.65	1.26 ± 0.45	1.23 ± 0.45	<0.001
Nasolabial fold	1.70 ± 0.60	1.20 ± 0.54	1.10 ± 0.50	<0.001
Jawline	2.10 ± 0.61	1.52 ± 0.51	1.50 ± 0.51	<0.001
Global average	1.98 ± 0.68	1.32 ± 0.51	1.31 ± 0.51	<0.001

**Table 1.** Total area treated evaluation men and women group.

## Discussion

The micro-focused ultrasound technology used in Sygmalift delivers focused energy to the deeper layers of the skin, which triggers a healing response and stimulates the production of new collagen. The cold laser technology is then used to promote additional collagen production and to help reduce inflammation and redness in the treated area [9].

Ultrasound energy has characteristics that they penetrate in the skin in real time. Focused ultrasound is a platform technology that can interact with the body in a number of different ways. It can produce both mechanical and thermal energy, and may deliver this energy through either high or low pressure waves. With focused ultrasound, an acoustic lens is used to concentrate multiple intersecting beams of ultrasound on a target deep in the body with extreme precision and accuracy. Where each of the individual beams passes through the tissue, there is no effect. But, at the focal point, the convergence of the multiple beams of focused ultrasound energy results in many important biological effects (thermal effect and mechanical effects).

Those specificities are very suitable for lifting; you can precisely reach dermis, epidermis up to SMAS, or subcutaneous tissue and keep protected the cutaneous layers. Thermal effect induces a contraction of collagen, and mechanical effects induce cells polarity balance, realigned the fibroblast, vasodilation for oxygenation of the tissue. Sygmalift trifocal is curved surface and circular cupolas are mounted in cylinder shape, this avoids any risk of blistering, since the skin is 100% in contact even in tiny curved body area. Such has periorbital area, or mouth area [10].

## Sygmalift 635 nm laser is a low-level laser (light) therapy with the following mechanism of action

LLLT is a photobiomodulation based on using photons for a non-thermal irradiance to stimulate the dermis biological activity. The LLT has a low penetration in the tissue to 1.5 mm. Several studies and medical applications of LLLT are design to reduce pain and inflammation, boosting collagen regrowth and promoting regeneration of different tissues, and vasodilation in the tissue to induce oxygenation of the dermis and epidermis. The combination of the two technologies are perfect for treating wrinkles, fines lines and induce rejuvenation of the skin [11].

## Conclusion

The aging face wrinkles are improved by using HIFU combo, within 9 weeks, with 3 treatments noninvasive and also minimizing epidermal and dermal injury with a painless procedure. This study suggests that the aging face, with wrinkling and sagging, can be improved by HIFU, while minimizing injury to the epidermis and dermis. In addition, retreatment is recommended at 3 months later to maintain the efficacy of the results.

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