Case Report
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The Challenge of Treating a Thin-Faced Patient with Microfocused Ultrasound (MFU): Clinical Protocol using the ATRIA® Device

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Abstract

Microfocused ultrasound (MFU) is a valuable non-invasive modality for treating facial aging. This case report evaluates the clinical outcomes of a novel, tissue-preserving protocol using the ATRIA® device, adapted specifically for patients with thin facial features. A 64-year-old female with advanced cutaneous aging-characterized by photoaging, thin skin, dyschromia, and pronounced superficial wrinkles-underwent a single session. The tailored treatment design utilized specific transducers (1.5 mm and 3.0 mm) and adjusted energy shots per region to protect subcutaneous adipose tissue integrity. According to the Global Aesthetic Improvement Scale (GAIS), the patient was classified as 'much improved' and reported progressive skin rejuvenation, resulting in enhanced self-esteem. Clinical outcomes included refined facial contours, increased tissue firmness, a noticeable midface lifting effect, and enhanced skin texture and tone. The protocol proved safe and effective for thin faces while successfully preserving volume. The device can be reapplied or combined with regenerative medicine protocols to reinforce findings and maximize aesthetic performance.

Keyword: Rejuvenation; Cosmetic Techniques; High-Intensity Focused Ultrasound Ablation; Face; Skin Aging.

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Introduction

A wide range of non-surgical procedures has emerged as an alternative to facial surgery in the last decade through the administration of controlled dermal heating. The use of microfocused ultrasound (MFU) in cosmetic medicine is on the rise, having been successfully utilized for tightening and lifting lax skin.[1]

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In addition, the treatment of marionette folds with MFU promotes tissue contraction that can be modulated according to the depth and intensity of energy delivery.[2]

In 2009, microfocused ultrasound (MFU) received FDA approval for brow lifts, followed by neck and submental lifts in 2012, and décolletage rejuvenation in 2014. MFU delivers short, low-energy pulses (0.18-1.2 J) at megahertz frequencies.[3] The technology heats specific target tissues at micro-thermal coagulation zones while sparing surrounding non-targeted structures. This focused energy targets collagen-rich networks to induce tissue tightening.[4] By triggering

Figure 1 (A, B, C): Anatomical site mapping and energy vector delivery for ATRIA® MFU application in scan and pen modes. Figure 1.A - Scan 3.0 mm (45 shots); Figure 1.B - Scan 1.5 mm (40 shots); Figure 1.C - Pen 3.0 mm (10 shots) and Pen 1.5 mm (10 shots).

neocollagenesis and neoelastogenesis, it promotes progressive dermal rejuvenation between 90 and 180 days post-treatment.[5,6] Based on these findings, this study aimed to reduce signs of facial aging by improving collagen expression and skin firmness through a modified MFU protocol using the ATRIA® device-extensively utilized by Brazilian dermatologists-in a female patient presenting with a thin facial phenotype

Case report

A 64-year-old woman presented with significant facial photoaging, marked skin atrophy, dyschromia (age spots), and pronounced superficial wrinkles. She explicitly declined invasive surgical or aggressive chemical interventions (such as deep phenol peeling). Her aesthetic history was notable only for botulinum toxin and lip dermal filler administration 6 months prior. She expressed strong concern regarding treatments that might drastically alter her natural facial contours or induce volume deficit.

Regarding pre-treatment management, no topical anesthetic or oral analgesics/ anti-inflammatory drugs were administered, as the protocol was well tolerated by the patient. Standard dermatological practice often considers topical numbing to optimize comfort during microfocused energy delivery.[2]

The ATRIA® device (LMG® - Laser Medical Group, Brazil)[7] was employed in accordance with strict anatomical safety principles. The standard manufacturer parameters were tailored specifically to accommodate the patient's thin facial phenotype. Microfocused energy was restricted to focal depths targeting the mid-dermis (1.5 mm) and deep dermis (3.0 mm) to address cutaneous laxity without compromising deeper subcutaneous adipose tissue.

Crucially, although standard manufacturer guidelines recommend utilizing a 4.5 mm transducer to target the Superficial Muscular Aponeurotic System (SMAS), this transducer was deliberately omitted in this patient. This modification prevented thermal energy delivery into deeper subcutaneous fat layers, thereby eliminating the risk of iatrogenic facial fat depletion in a patient with limited baseline facial volume. Energy delivery was concentrated on the lower face, with complete exclusion of the malar and buccal regions to preserve midface fullness **(Figure 1)**.

Standardized serial photographs were captured baseline (Day 0) and at 120 days post-treatment using a fixed camera setup under uniform lighting **(Figure 2)**. At 15 days post-procedure, follow-up examination revealed a small, mobile, non-tender nodule in the right labiomental sulcus. High-frequency cutaneous ultrasound was performed to exclude filler migration or foreign body granuloma; ultrasound demonstrated a localized non-inflammatory tissue reaction without fluid collection or residual hyaluronic acid. The condition resolved completely following 15 days of gentle local massage and daily topical mometasone furoate ointment application.

At the 120-day follow-up, evaluation via the Global Aesthetic Improvement Scale (GAIS) yielded a rating

Figure 2 Sequential photographs taken at baseline (Day 0, prior to treatment), and Day 120

of 'much improved'. The patient reported high satisfaction, highlighting enhanced skin elasticity, global firmness, and subtle aesthetic restoration.

Discussion

Executing energy-based skin tightening on thin-faced individuals represents a therapeutic dilemma in aesthetic dermatology. Over-aggressive treatment or excessive focal depth (e.g., 4.5 mm depth in thin subcutaneous planes) carries a risk of adipose tissue atrophy, which can inadvertently accentuate an aged, gaunt appearance. By restricting transducer depths to 1.5 mm and 3.0 mm and avoiding energy delivery over the buccal fat pad, this modified protocol successfully promoted dermal collagen contraction without volume loss.

The omission of topical anesthesia in this case highlights the favorable comfort profile of the ATRIA® device, although patient comfort regimens vary across literature.[2,8,9] Adhering to the previously detailed technical parameters-and avoiding application over skin lesions or photosensitized areas-ensures the procedure is well tolerated without requiring pretreatment.[7] The treatment was performed with no verbal complaints, signs of distress during application, or adverse events. Given this favorable clinical tolerability, objective pain scale assessment was deemed unnecessary.

Patient satisfaction following MFU therapy remains high globally. Yusova *et al*. reported positive clinical responses in over 80% of treated subjects,[4] while Bellote and Miot observed consistent GAIS improvement ('improved' to 'very much improved') at 180 days without adverse effects.[2] Similarly, Yalici-Armagan and Elcin noted significant subjective satisfaction among patients treated for lower face laxity.[10]

The transient non-inflammatory nodule observed in the labial sulcus at Day 15 highlights the importance of post-procedure monitoring. MFU treatment was not administered to the area of the nodule in the right labiomental sulcus. Moreover, a six-month interval separated the procedures, which aligns with dermatological safety recommendations. In the absence of anatomical overlap, a direct causal link to nodule formation is unlikely. Ultrasound imaging was vital in ruling out filler dislocation or true granulomatous pathology, proving that prompt anti-inflammatory topical therapy (mometasone) and mechanical massage effectively resolve localized tissue reactivity.

Temperatures above 50°C can accelerate hyaluronic acid (HA) degradation; thus, thermal energy delivered to intradermally injected HA could theoretically alter its filler properties. Microfocused ultrasound (MFU) generates precise thermal coagulation zones (65-70°C) within the papillary and reticular dermis or superficial musculoaponeurotic system (SMAS), depending on transducer depth. Although the incidence of HA loss appears to decrease with longer intervals between filler injection and MFU treatment, clinical data regarding

MFU application over HA remains limited. Conversely, early application of MFU could provide an alternative approach for hyaluronic acid removal, particularly in cases of hyaluronidase contraindication (e.g., allergic reactions) or limited product availability.[11]

Combining MFU with injectable treatments, such as calcium hydroxylapatite (CaHA), poly-L-lactic acid (PLLA), and hyaluronic acid (HA) fillers, represents an emerging strategy in regenerative aesthetics. Better-elucidated protocols in the future may provide valuable insights into the interactions between these techniques and their potential to yield synergistic effects on neocollagenesis.[9]

Conclusion

The modified ATRIA® MFU protocol utilizing 1.5 mm and 3.0 mm transducers demonstrated high efficacy and safety in a patient with a thin facial phenotype, achieving noticeable skin tightening and contour refinement without inducing volume loss. This tissue-preserving approach provides dermatologists with a safe, adaptable strategy for non-invasive facial rejuvenation in slim or volume-deficient individuals.

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Declaration of patient consent The authors declare that written informed consent was obtained from the patient for the publication of this case report, including clinical details and accompanying images. The patient was informed that the report would be publicly accessible online and that all personal identifiers, such as name and initials, would remain confidential. Eye-masking was omitted with the patient's explicit permission. The signed consent form is archived and retained by the IBA (Bruna Andrade Institute).

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Conflict of interest The authors declare no conflict of interest.

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