

SAFETY AND EFFICACY OF TRANSCUTANEOUS ULTRASOUND FOR FOREHEAD, CHEEK AND NECK TISSUE TIGHTENING

Murad Alam, Lucile E. White, Rania A. Majzoub, Nicolle Martin, Simon S. Yoo
Northwestern University, Chicago, IL

Background and Objective: Non-invasive tissue tightening can potentially correct age-related facial sagging without risk of surgical scar, neurovascular injury, or prolonged down-time. Therapeutic ultrasound is an energy modality that appears highly adaptable to tissue tightening applications since it: (1) can penetrate deep into the skin; (2) creates precise 1 mm zones of thermal ablation; and (3) is not limited by surface chromophores, such as pigmented skin. The purpose of this study was to assess the safety and efficacy of a novel ultrasound modality for tightening of facial and neck skin.

Study Design/Materials and Methods: 36 adult patients (33 women) were enrolled from an urban academic cosmetic dermatology practice. Baseline standardized front and 45-degree photographs of face and neck were obtained via custom Canfield Imaging set-up. Topical 7% lidocaine/7% tetracaine anesthetic was applied for 45 minutes prior to procedure, then removed. Two probes were used with a single pass at 5 mm intervals as follows: 7.5 MHz, 4.5 mm focal depth, power 15-30 W, exposure duration 10-80 ms (temple, preauricular, submental, neck); 4.4 MHz, 4.5 mm focal depth, power 30-40 W, exposure duration 10-80 ms (cheeks). Targeted skin was first imaged with ultrasound and then a row of microthermal areas of ablation were deposited. Follow-up and photography was obtained after treatment, and at 2, 7, 28, 60, and 90 days. Outcome measures were subjective pain scores, observer grading of physical features (hypo-, hyperpigmentation, vascularity, fine texture, coarse texture, pliability, ulceration/erosion, laxity), double-blinded rating of pre- and post-treatment photographs, quantitative assessment of facial landmarks (e.g., brow) before and after treatment, and patient and physician self-assessment.

Results: All treatments were completed. Over 2/3rds (25) of patients experienced mild to moderate erythema and edema. Elevated linear striations of the neck (1 patient) and cheek (1 patient) were rarely seen with the use of shallow probes, and resolved without sequelae within 1 week. Patient pain perception ranged from 2/10 to 8/10, with the rare high values reported by patients who had no prior cosmetic procedures. Quantitative brow elevation of 1-2 mm or subjective neck wrinkle reduction graded on the Fitzpatrick Wrinkle Classification System was seen in over ¾ (29) of patients.

Conclusions: Therapeutic ultrasound appears safe and efficacious for facial and neck tightening. Further parameter optimization may further enhance clinical results.