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Cosmetic Dermatology



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Making waves

Ultrasound device could be useful addition to cosmetic armamentarium

By JOHN JESITUS

SENIOR STAFF CORRESPONDENT

Chicago — A recent study suggests that modest doses of transcutaneous ultrasound appear safe and surprisingly effective for tightening forehead, cheek and neck tissues, says its principal investigator.

“In the last decade, there’s been an increasing drift toward minimally invasive cosmetic therapies for facial rejuvenation,” says Murad Alam, M.D., chief, section of cutaneous and aesthetic surgery, and associate professor of dermatology, otolaryngology and surgery, Northwestern University, Chicago.

Traditional CO₂ resurfacing remains effective, but patients shy away from the two weeks of downtime it requires for healing, he says.

Conversely, early minimally invasive cosmetic devices were designed to improve color but did little for significant wrinkling and sagging, though devices produced in the last four to five years perform better in this regard, Dr. Alam tells **Dermatology Times**.

Sound wrinkle therapy?

“The problem that has arisen is that while we’re getting minimal downtime, we’re also

getting minimal efficacy” with the latest minimally invasive devices, he says.

Devices typically produce a few millimeters of tightening at best, he says.

“Additionally, there’s wide variation in outcomes, and we don’t have a way of predicting which patients are likely to get more benefit than others,” he adds.

Theoretically, ultrasound could outperform modalities including radiofrequency, visible light and intense pulsed light, because ultrasound energy delivers peak heat at a point where multiple energy beams focus, Dr. Alam says.

This enables the technology to apply heat extremely deeply within the skin without damaging superficial skin, he says. He likens the effect to that achieved by the submuscular aponeurotic system (SMAS) lift, which targets not facial skin but the fascial layer beneath it for longer-lasting results.

“Ideally,” Dr. Alam says, “one wants to deliver heat energy far below the skin into the SMAS, potentially, so that one can get the same tightening response” nonablatively that CO₂ lasers and a facelift can achieve.

Because ultrasound is an entirely different energy from those currently available for skin rejuvenation, he says, “It

can be expected to provide benefits that are quantitatively and markedly qualitatively different than other devices.”

Ultrasound could also provide an effective option for patients in whom other technologies have failed. Patients seem to find the thought of ultrasound treatment comforting, because they’re familiar with its use in other therapeutic indications, Dr. Alam adds.

Testing theories

To test the safety of transcutaneous ultrasound for tightening and lifting of the face, Dr. Alam and his colleagues enrolled 36 patients, mostly female, and treated them with the Ulthera device (Ulthera Inc.).

Researchers treated the full face and neck with a single pass using a 7.5 MHz probe with a 4.5 mm focal depth in the temple, preauricular and submental/neck areas or a 4.4 MHz probe with a 4.5 mm focal depth for the cheeks.

Treating physicians began by imaging the treatment area with the device’s handpiece, then delivering energy (after applying a topical anesthetic) in linear arrays up to 25 mm long, spaced about 5 mm apart, Dr. Alam says. Patients received total energy levels between 0.4 and 1.2 J.

Quick READ

Transcutaneous ultrasound

appears safe for facial rejuvenation and can deliver results comparable to the best available from current technologies, even at modest energy levels, an expert says.

Because this was a safety study, he says, “We treated patients at low to moderate doses to begin with. And we had good results, in that there were no significant adverse events.”

Twenty-five patients experienced minor erythema and swelling, both of which were transient, Dr. Alam says. Additionally, two patients developed small linear white stripes in treated areas. However, he says applying topical steroids resolved the problem in both cases overnight.

Patients’ reports of pain varied, Dr. Alam says. While patients typically assigned pain scores of 3 on a 10-point scale, a small proportion rated their pain around 7.

“We couldn’t find any reason for that in the amount of energy they got” or which probe was used, he says.

Rather, he says such reports consistently came from patients who had no previous

experience with laser or energy-based aesthetic treatments.

“We expected to see at least some problems like crusting, infection, textural abnormalities or pain” that patients couldn’t tolerate, but none of these occurred, Dr. Alam says.

Measuring results

To gauge the treatment’s efficacy, researchers used double-blinded rating of pre- and post-treatment photographs and photos taken at follow-up visits occurring two, seven, 28, 60 and 90 days post-treatment.

Results in the cheeks, jowls and neck were tougher to rate, though evaluators consistently noted at least significant improvement.

Furthermore, investigators quantitatively assessed browline elevation — not because they expect this to be the device’s primary application, but because it’s one of the few objective methods of assessing skin tightening, Dr. Alam says.

Generally, he says, “We found close to 2 mm (mean: 1.7) brow elevation, consistently. That’s a very good outcome” compared to devices such as the ThermoCool™ (Thermage®).

“Our average result was close to the best Thermage® result,” and researchers weren’t even attempting to optimize treatment parameters in the test, he says.

“We were trying to be very conservative,” Dr. Alam says, “and yet we got efficacy comparable to the best efficacy attainable by other skin-tightening devices at present.”

Results in the cheeks, jowls and neck were tougher to rate, though evaluators consistently noted at least significant improvement, Dr. Alam says.

“That led us to believe that it wasn’t a focal result — tightening was occurring at multiple sites,” he says.

For such reasons, researchers hypothesize that in subsequent studies using multiple passes and treatments, “We might dramatically further optimize the outcome,” Dr. Alam says.

Now in preparation, these tests should be completed within the next year, he adds. **DT**

Disclosure: Dr. Alam reports no financial interests relevant to this article.

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