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Large-Surface Fractional Non-Ablative Resurfacing: Exploratory Case of Systemic Metabolic Effect

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Key Clinical Message

Fractional non-ablative resurfacing, involving 30% of a body surface, may induce improvements in the skin laxity and potentially contributing to metabolic changes associated with weight loss.

Citation:

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1. Abstract

Preclinical investigations demonstrated that fractional ablative and non-ablative lasers enhanced systemic metabolism. The patient exhibited clinical improvements in dermal quality, with a notable reduction in localized adiposity and an unanticipated overall weight loss. This case highlights the potential systemic metabolic effects of large-surface fractional non-ablative resurfacing in humans.

2. Introduction

Preclinical investigations by Salma N et al. [1,2,3], demonstrated that fractional ablative and non-ablative lasers applied to approximately 8% of the murine body surface area, induced systemic metabolic activation. This finding suggests that fractional resurfacing, traditionally employed for localized cutaneous rejuvenation4, may exert broader physiological effects. However, its clinical translation to human subjects has not yet been documented.

We present a case of fractional non-ablative resurfacing applied to approximately 30% of the body surface area in a healthy female, which resulted in both localized improvements and unexpected systemic reduction in body weight.

3. Case History

A 36-year-old healthy female patient underwent fractional non-ablative resurfacing with a ResurFX® device (Lumenis). The protocol was designed as a translational adaptation of the preclinical work by Salma N et al. [1], who demonstrated that fractional ablative and non-ablative lasers increased systemic metabolism in murine models when applied to approximately 8% of the body surface area at higher fluences.

In this clinical case, the laser device did not permit fluence levels as high as those reported in murine models. Therefore, lower-fluence parameters were employed while expanding the treated surface.

4. Methods

Approximately 30% of the body surface area of the patient, including the abdomen, posterior thighs, buttocks, and upper extremities, was treated.

Laser parameters (ResurFX®):

• Energy: 10 J (low-energy setting)

• Density: 200 (high density)

• Passes: 1

• Spot size: square

5. Treatment Protocol

• Each cycle comprised three sessions performed on alternating days within the same week (interval of one day).

• The cycle was repeated three times at 30-day intervals.

• The patient underwent nine treatment sessions over a 7-month period.

• Baseline photographs were obtained in January 2025, and the final evaluation photographs were collected in August 2025.

Adjunctive treatments for contouring and skin-tightening technologies were applied to targeted areas:

• Tru Sculpt iD® (single session, separate day) for localized adiposity.

• Fotona Er: YAG laser with robotic honeycomb lens for cutaneous laxity.

• Ultrasound (micro focused ultrasound with visualization) performed on the same day as the final follow-up photograph.

6. Conclusion

Fractional non-ablative resurfacing over large body surface areas may confer systemic metabolic effects in addition to localized cutaneous rejuvenation. Further controlled studies are warranted to confirm reproducibility, define optimal parameters, and ensure long-term safety.

7. Discussion

This case represents an exploratory attempt to translate preclinical findings into a clinical setting. Salma N et al. [1]. Demonstrated in mice that fractional ablative and non-ablative laser stimulation of approximately 8% of the body surface area resulted in increased systemic metabolism. Contrarily, in the present study, lower fluences were applied over a substantially larger surface area (approximately 30% of the body) using a non-ablative fractional laser Figures 2,3. The patient experienced visible clinical benefits, including improvement in skin quality, cutaneous turgor, and reduction in localized adiposity, accompanied by generalized weight loss, as documented photographically Figures 1a,1b.

Although adjunctive devices encompassing TruSculpt iD®, Fotona Er:YAG with Honeycomb lens, and Ultherapy® were also employed during the treatment course, these technologies primarily target dermal laxity and localized fat deposits, and are not typically associated with systemic weight reduction, This observation suggests that the broader metabolic response may, at least in part, be attributable to the large-surface laser protocol.

However, it must be acknowledged that this intervention was conducted as an exploratory rationale rather than a controlled protocol. No strict isolation of variables was performed, and the synergistic effects between multiple devices could not be fully excluded. Nevertheless, the observation of generalized metabolic improvements beyond localized contouring is intriguing and warrants further investigation.

This case underscores the potential translational relevance of preclinical findings to human applications and raises important questions regarding optimal treatment parameters, surface area exposure, and combination strategies.

The patient reported clinical improvement in skin quality, cutaneous turgor, and texture, with a notable reduction in localized adiposity and loss of body weight, accompanied by improved flaccidity.

The treatment was well-tolerated, with only transient post-treatment erythema and edema observed following ResurFX administration (figure 4). No systemic adverse effects were noted.

Controlled clinical studies are necessary to determine whether fractional non-ablative laser resurfacing can reproducibly influence systemic metabolism and to establish the most effective and safe protocols

Figure 1a and 1b: Baseline (January 2025) and post-treatment (August 2025) photographs, frontal/back view. Note visible weight reduction and improved abdominal contour.

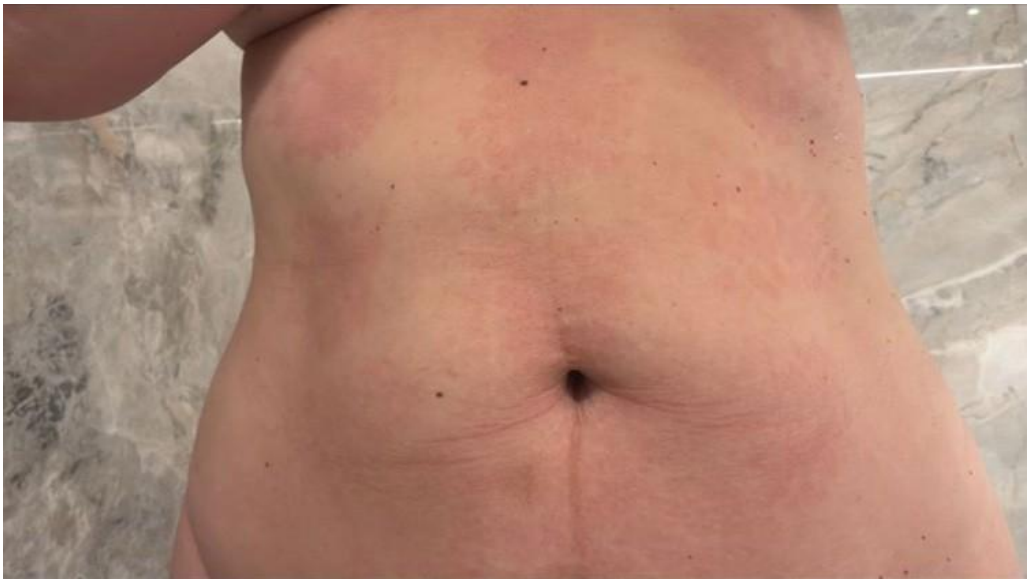

Figure 2: Immediate post-treatment erythema and edema over the abdomen.

Figure 3: Immediate post-treatment erythema and edema over the thighs.

Figure 4: Acute erythematous response on the buttocks following ResurFX® treatment, demonstrating transient but expected thermal effect.

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