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Fractional microneedle RF-lifting – a trend in modern cosmetology

Skin rejuvenation by microneedle RF-treatment method is achieved due to warming of deep skin layers by electric current. The function of electrodes is fulfilled by the needles.

RF-lifting technology is based on controlled warming of tissues by radiofrequency energy (Radiofrequency, RF). Current passing through those structures which contain small quantity of water with dissolved electrolytes (i.e. high resistance) results in warming of such structures. These structures include connective-tissue derma matrix, interstitial (intercellular) substance of derma, adipose tissue. Rise of temperature in dermal layer stimulates activity of fibroblasts and causes contraction and synthesis of new collagen fibers, thus resulting in skin tightening and lifting [1, 2].

In recent times the technology of fractional microneedle RF-lifting has gained more popularity. As opposed to non-invasive fractional RF-devices, whose electrodes are applied on the skin surface, needle electrodes of the fractional RF-handpiece are applied directly into the skin. This provides more intensive warming of deep tissues, without fear of corneal layer overwarming and causing burns. As the result, the temperature of dermal structures, which are treated with tips of needle electrodes, may reach 60-80°C, thus resulting in contraction of collagen fibers and producing immediate lifting effect [3].



ABSTRACT

The article describes contemporary views of microneedle RF-technology. As opposed to non-invasive fractional RF-devices, whose electrodes are applied on the skin surface, needle electrodes of the fractional RF-handpiece are applied directly into the skin. This provides more intensive warming of deep tissues, without fear of corneal layer overwarming and causing burns. The author describes 2 clinical cases of correction of age-related changes with the help of fractional microneedle RF-lifting.



Key words: microneedle RF-lifting, fractional RF-technologies, RF in cosmetology

Promoted content

*Invasive method principle:
microneedles smoothly
needle the skin causing less
pain feelings.*

MICRONEEDLE FRACTIONAL RF-LIFTING BASED ON SECRET RF SYSTEM

Secret RF (ILLODA, South Korea) is a system for fractional microneedle RF-lifting the main function of which is skin rejuvenation and lifting. The system is equipped with different types of tips with isolated and semi-isolated microneedles, with controlled penetration depth for treatment of different skin layers (**Fig. 1**). Therefore, as opposed to non-invasive RF-treatment, the specialist always knows the exact depth of tissues warming. Microneedles penetration depth, RF-energy power and contact time of microneedle electrodes with the skin are adjusted based on individual indications and specifics of the treatment areas.

Variability of treatment parameters and target warming of deep skin layers (when epidermis is protected) allows using Secret RF system for intensive treatment of any skin types and phototypes with minimum risk of undesirable side-effects. For this reason, microneedle RF-lifting is the decision procedure when treating aged skin with predominance of chrono ageing-type changes and so called menopausal ageing



Fig. 2. Clinical case 1: the patient before treatment

caused by sudden change in estrogens level. In both cases there can be observed epidermal atrophy, thus, all aggressive treatments with damage of epidermal layer are associated with high risks of occurrence of side-effects.

Let's consider the options of Secret microneedle RF system in two clinical examples.

CLINICAL EXAMPLE 1

Female patient N., 48-years old, complained for reduction of skin tonicity and wrinkles on the face and neck (**Fig. 2**).

Objective findings:

- edematic-deformation type of ageing;
- papulopustular form of acne rosacea in relative remission;
- single telangiectasiae;
- sensitive skin;
- tightness and elasticity are reduced;
- rhytids in periorbital area;
- moderately expressed folds on the neck skin.

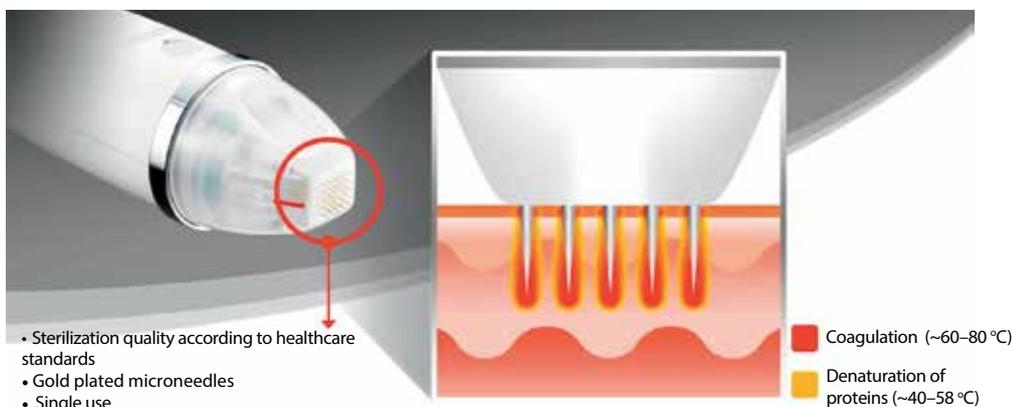


Fig.1. Microneedle RF-tip of Secret RF system (ILLODA, South Korea)



Fig. 3. Clinical case 1: the patient 5 weeks after the treatment

Cosmetological anamnesis: underwent numerous cosmetic procedures, in particular, injection procedures – calcium hydroxyapatite-based medication was injected and polylactic acid filaments with notches were used.

Correction purpose: to improve the skin texture due to derma tightening and perform partial coagulation of abnormally enlarged vessels.

The patient underwent single treatment of the face and neck skin with fractional microneedle RF-handpiece of Secret RF device. Needles penetration depth was as follows:

- 0.6 mm – for eyelids skin;
- 1 mm – for face and neck skin.

In addition, during the same procedure abnormally enlarged vessels were thermocoagulated with the help of SmartCure RF-handpiece.

Outcome: skin tightening, improvement of texture, lightening due to reduction of abnormally enlarged vessels (**Fig. 3**).

CLINICAL EXAMPLE 2

Female patient of elderly age category complained for skin laxity, lowering of facial contours, wrinkles, skin hypersensitivity (**Fig. 4**).

Objective findings:

- deformation type of ageing;
- atrophic changes of epidermis and inner derma;



Fig. 4. Clinical case 2: the patient before treatment



- tightness and elasticity of the face and neck skin are reduced;
- moderate rhytids in periorbital area;
- expressed nasolabial furrows, "marionette" folds;
- expressed laxity of the neck skin, folds on the neck skin.

Anamnesis: the patient is the long-term climacterical period, overweight and suffers chronic diseases (including arterial hypertension). The patient notes polyvalent allergy to medicinal and cosmetic products.

Cosmetological anamnesis: homecare and masks.

Correction purpose: to tighten the skin and start the processes of natural regeneration of tissues.

The patient underwent single treatment of the face and neck skin with fractional microneedle RF-handpiece of Secret RF device. Needles penetration depth was as follows:

- 0.6 mm – for eyelids skin;
- 1 mm – for face and neck skin.



Fig. 5. Clinical case 2: the patient 5 weeks after the treatment

Outcome: general improvement of appearance, skin tightening and increase of its thickness, decrease of skin sensitivity to external irritants (Fig. 5).

CONCLUSION

Use of fractional microneedle RF-systems is a promising direction in hardware cosmetology. Such variant of RF-treatment provides controlled treatment of derma and subcutaneous tissue for stimulation of neocollagenesis. The procedures with use of Secret RF system provide tightening and improvement of the skin texture, which is the evidence of derma restructuring processes. This method may be used as an independent treatment procedure or in combination with lasers, thus ensuring step-by-step improvement of the skin texture and color. Moreover, this method is perfect for preparation of skin for further injection of fillers and filaments.

REFERENCES

1. Hantash B.M., Ubeid A.A, Chang H., et al. Bipolar fractional radiofrequency treatment induces ne elastogenesis and neocollagenesis. *Lasers Surg Med* 2009; 41(1): 10–9.
2. Zelickson B.D., Kist D., Bernstein E., Brown D.B., Ksenzenko S., Burns J., Kilmer S., Mehregan D., Pope K. Histological and ultrastructural evaluation of the effects of a radiofrequency-based nonablative dermal remodeling device: a pilot study. *Arch Dermatol* 2004; 140(2): 204–209.
3. Hyun M.Y., Li K., Kim B.J., et al. Novel treatment of neck wrinkles with an intradermal radiofrequency device. *Ann Dermatol* 2015; 27(1): 79–81