

NON-ABLATIVE SKIN TIGHTENING

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Non-ablative skin tightening is a newer approach to tissue remodeling and skin rejuvenation employing noninvasive procedures. These procedures produce less dramatic effects in comparison to traditional ablative laser resurfacing, but also significantly less healing time and patient discomfort. A variety of non-ablative procedures have been developed to achieve skin tightening through dermal thermal injury while preserving the epidermis. They include infrared (IR) lasers (Nd:YAG 1064 nm and 1320 nm, diode 1450 nm and Er: glass 1540 nm laser), visible light lasers (pulsed dye laser 585 nm and 595 nm, long pulsed 532 nm laser), intense pulsed light (IPL), photodynamic therapy (PDT), light-emitting diodes (LEDs) and radiofrequency (RF). Visible and IR lasers stimulate the production of type I and type III collagen and elastic fibers, improving skin texture without influencing skin pigmentation and redness. IPL

targets both melanin and hemoglobin, resulting not only in improvement of skin texture but also in global improvement of dyspigmentation and vascularity. Photodynamic therapy uses a photosensitizer, light and molecular oxygen to produce improvement of photodamaged skin. Low energy LEDs may improve redness and texture modestly. Radiofrequency is a method using devices that produce electrical energy that heats the dermis at relatively low temperatures, resulting in collagen shrinkage and skin tightening. New technologies combine radiofrequency and IR laser or IPL, with better therapeutic results. Although the results of non-ablative treatments are by far less dramatic than with ablative resurfacing, they have become more popular than traditional methods because the recovery period is shorter, the risks of treatments are minimal, and the improvement is still acceptable.

MANAGEMENT OF THE LASER HAIR REMOVAL SIDE EFFECTS

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Laser hair removal is achieved through follicular unit destruction based on selective photothermolysis. The principle of selective photothermolysis predicts that thermal injury is restricted to a given target if there is sufficient selective absorption of light and the pulse duration is shorter than the thermal relaxation time of the target. It is a safe procedure provided that laser parameters are selected correctly according to patient characteristics such

as skin type, anatomical location, or sun exposed tanned skin. Surely, any laser system potentially can produce unwanted tissue damage and can result in scarring from excessive thermal diffusion when used incorrectly. Therefore, appropriate education and skill of the operator are essential. Side effects and complications that occur consequentially to laser treatment can be significantly reduced if diagnosed and treated in an efficient way.

BURN SCARS: WHAT IS THE BEST METHOD?

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Currently there are many different successful methods for ordinary scars, whereas reconstructive methods are frequently used for burn scars. Cosmetic outcomes achieved by the reconstructive method of cervico-pectoral 'super-thin flaps' have been rated as very good (1). Zhang *et al.* report on 17 patients undergoing extreme scar resection that subsequently received grafts of allogeneic dermal matrix dressed with thin-split, with satisfactory outcome (2). Hafezi *et al.* report on successful inflation of tissue expander in 48 patients with head and neck burn scars. A total of 86 tissue expanders were inserted with subsequent overexpansion to 2- to 4-fold maximum volume stated by the manufacturer. Overinflation of smaller tissue expanders minimizes complication rates (3). Cosmetic full-perioral reconstruction of burn scars by use of bilateral-pedicled expanded forehead flap is safe, ample and color-matched for full-perioral reconstruction (4). Massive facial scars were treated by resurfacing procedures with prefabricated cervicothoracic flaps as a reliable alternative tool for resurfacing of massive facial soft tissue defects (5).

A variety of techniques are available to the burn reconstructive surgeon (6). The choice of treatment option is based on advanced understanding of the pathophysiology of hypertrophic scars and keloids (7). Laser Doppler imaging with low-resolution fast-scan is accurate and effective in pediatric population (8). Skin transplantation and transfer of skin flap with overall planning and individual isatin are the key points of repair of claw hand after burn (2). For axillary region burn injury, a free flap is recommended in early reconstruction (9).

Cepan cream has been applied for 20 years for topical treatment of burn scars and keloids as well as for postoperative scars and contractures. Cepan is useful in eyelid inflammation caused by the parasite *Demodex folliculorum* (10).

The circumferential incision technique (spindle-shaped incision line around the contracted scar) is used to release wide scar contracture and the surrounding skin returns to normal position (11).

Fat injection is used for severe burn outcomes with hypertrophic scars and keloids. Adipose tissue is harvested from abdominal subcutaneous fat and processed according to Coleman's technique. This lipofilling improves scar quality and appears to enhance the process of tissue regeneration (12).

In 2008, Martin *et al.* reported on the use of Microskin spray upon damaged skin, which improved psychosocial function in pediatric burns patients. Microskin was applied for 5 weeks producing a computer color-matched skin camouflage that lasted up to 5 days of application (13). Amnion in the treatment of pediatric partial-thickness facial burns as a novel and standardized procurement and processing method with biological dressing as wound coverage is a safe new therapeutic option for children with facial burns (14). Fractional resurfacing may be an effective treatment for burn scars (15). Treatment of burn scars by pinhole method using carbon dioxide laser proved very successful (16).

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APPROACH IN CHOOSING THE RIGHT FILLER

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This presentation focuses on various challenges encountered with the use of fillers for facial rejuvenation. Newer developments in fillers and the differences between them help to better understand the various challenges in their use to get better and safer results for our patients.

One has to know the physical properties of various fillers in order to make the best choice of their use in different areas of the face that respond best to each filler, and to avoid adverse events. In choosing the best filler for the intended correction in a specific area the following must be considered:

- Patient's wishes
- Patient's history

Allergies, former treatments with fillers

- Physicians own experience with handling the specific filler agent
- Training of the physician
- Area of treatment:

Skin quality

Elastosis

Atrophy

Skin type thick/thin,

Type of wrinkle superficial/ deep

Volume deficiency

Area of expression

- Knowledge of the filling agent to be injected

- Resorbable/permanent
- Injection technique
- Injection level

Dermis: Superficial/deep

Subcutaneous

Epiperiosteal

- Flow capacities of the filling agent
- Volume to be injected
- Size of needle
- Type of anaesthesia
- Longevity of the filling agent
- Necessity of adjunctive treatment

Regional facial diversities may be a challenge for treatment with monotherapy of fillers and

may require combination therapy with Botulinum Toxin.

For facial volumizing a different filler will be used from those used for augmentation in the perioral area or for lip enhancement. Successful rejuvenation of the perioral area requires sophistication in the application of fillers with different flow and elasticity properties.

Synthetic injectable fillers with a permanent effect differ with respect to composition and to chemical and biological characteristics. Foreign body granulomas may develop at the sites of injections, sometimes many years later and represent a therapeutic challenge.

LIP AUGMENTATION

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The lips are the central cosmetic feature of the lower third of the face and the whole perioral region is an extremely important area for esthetic enhancement.

Successful rejuvenation of the perioral area requires sophistication in the application of multiple minimally invasive procedures, such as injectable fillers, as well as solid implants. Ablative, fractional, nonablative resurfacing and BTX-A injections are also important components of the therapeutic armamentarium for perioral rejuvenation.

The lips, when they are full and well defined impart a sense of youth, health and attractiveness. As the lips age, they are losing volume, they become thin and flat. As dental height is lost, the face ages such that the ends of the lips hang down, contributing to the marionette lines (labio-mandibular grooves).

Goals for lip enhancement are directed to improve the architecture of the lip, to enlarge the cupid's bow, to increase the relative length of the lower lip, and to augment the projection bulk of both the upper and lower lips.

MESOTHERAPY AND AGING SKIN

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“Few – rarely – in the right place”, it is how Dr. Michel Pistor, mesotherapy inventor, used to define it.

Mesotherapy is a technique of medicine in general and as such has all the rules. Its originality is to bring up the site of suffering in the site of treatment. As for knee osteoarthritis, the site of injection is at the knee level, and for cellulite, it will be next to the cellulite. The injection is given into the skin: epidermis, dermis, hypodermis, and medications used are those of the traditional pharmacopeia, provided they are compatible with the method.

Mesotherapy is a recent technique since Dr. Pistor developed it in the 1950s. The information is divided into two major groups: medical and cosmetic.

In the beginning, most remarkable results were achieved in the fields of musculoskeletal rheumatology, sports medicine, functional rehabilitation and physical medicine, e.g., osteoarthritis, tendonitis, traumatic muscle diseases, and pain proprioception in general.

In cosmetic medicine, there are three strong indications:

- cellulite and localized adiposity,
- androgenetic alopecia, and
- prevention and treatment of aging skin.

The prevention and treatment of aging skin is an excellent indication for mesotherapy. Mesotherapy is even able to do what some other techniques cannot do because, unlike filler or botulinum toxin, it is not associated with transitory action but has a renewable and sustainable action over time. This, however, requires the protocol I have developed over years of experience to be strictly followed.

First, it should be remembered that that any act of mesotherapy involves two actions:

- action of the needle; there is no needle-free mesotherapy because the prick itself creates therapeutic integumentary stimulation, which is more important than the number of punctures, stimulating the immune system located in deep epidermis (Langerhans cells) and immediately below basal cells (lymphocytes); and

- action of the drug, i.e. pharmacological action by passive diffusion and active diffusion provided that all products are injected.

However, mesotherapy has its limits and does not replace other therapeutic measures available, like fillers, botulinum toxin, laser, and others. Instead, mesotherapy is complementary to one or more other techniques. For example, if the patient has large wrinkles on the forehead, botulinum toxin is undoubtedly the best way to remove them, even if transiently.

What are good indications for mesotherapy on the face? There are two major indications:

- prevention of skin aging on the face, neck, décolleté and hands; and
- treatment of small wrinkles and very small wrinkles around the eyes, nose, cheeks (wonderful indication), neck, décolleté and hands.

For good results to achieve, we must follow strict protocol that I have well defined, i.e. to treat three levels with three techniques. This implies good knowledge of mesotherapy.

Treat three levels:

- deep epidermal level, adjacent to the basal layer,
- transitional epidermis-dermis level at the basal layer, and
- dermal level at 2-3 millimeters deep.

These three techniques are used for:

- epidermal mesotherapy: a succession of punctures very shallow, in the deep epidermis. The technique involves introducing the bevel of the needle (13 mm in length) at 0.4 to 0.6 millimeters deep exerting continued pressure on the piston;
- “papules”: injection at the basal level, by injecting a small amount of product (0.1 mL). The effect can be compared with a small pearl (“papule”); and
- “nappage”, a classic technique of mesotherapy, with injection of a variable amount of drug (generally 0.2-0.3 mL per puncture) into the dermis and strictly within the dermis, each point being spaced a few millimeters. This is done using a 4-mm long needle.

The choice of drugs in mesotherapy always depends on the physiopathology. Thus, medicines are strictly chosen according to the precise state of the patient.

How to prevent and treat aging skin?

First syringe:

- technique: epidermal
- drugs: nutrient complex with vitamins, especially A, C, E, amino acids, nucleic acids, mineral salts; an organic silicon and vasodilator can be added.

Using this technique, the drug is injected all over the face by crossing injections, thus increasing cutaneous stimulation, also including the neck, décolleté and hands if necessary.

Second syringe, i.e. providing two different treatments with the same syringe:

- first technique: "papule"
- second technique: "nappage"

- drugs: it combines the complex nutritional precedent with non-cross linked hyaluronic acid, which is the physiological form of hyaluronic acid.

Why injecting at three levels?

The aim is to provoke tissue response, both through the injection (cutaneous stimulation) and the injection of drugs. Stimulation of the immune system and microcirculatory system combined with the injection of nutrient complex and non-cross linked hyaluronic acid contributes to cell proliferation, increased production of fibroblasts and compensation for the loss of silicon and hyaluronic acid, estimated to 10% *per year* each.

Therefore, it is necessary to inject at different levels to achieve the desired results.

Mesotherapy is actually a way to slow the process of skin aging; however, it should be emphasized again that the protocol must be strictly followed.

INTENSE PULSED LIGHT-ACTIVATED BOSWELLIA NANOPARTICLES: A NEW APPROACH IN CORNEOTHERAPEUTIC ANTI-AGING TREATMENT

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Corneotherapy is a therapeutic concept for the treatment of stratum corneum, coined by Prof. Kligman, a famous dermatologist from the USA. He describes it as outside-in therapy using appropriate dermaticals. Treatment with topical drugs such as cortisone he calls inside-out therapy. In his studies, Prof. Kligman found that both therapies were of similar value. Corneotherapy restores natural balance and repairs defects in the skin barrier. With a new approach in corneotherapeutic anti-aging treatment, we improve skin structure with intense pulsed light (IPL)-activated

Boswellia nanoparticles. IPL stimulates antimicrobial peptides and heat shock proteins in the skin and activates boswellic acids in the infrared wavelength range. The activated *Boswellia* nanoparticles were used for different skin diseases, e.g., atopic dermatitis, actinic keratosis, white skin cancer and acne. Boswellic acids inhibit 5-lipoxygenase, a key enzyme in the inflammation process of the skin, and matrix metalloproteinases that destroy collagen fibers. IPL-activated *Boswellia* nanoparticles are an effective dermatologic treatment for inflamed skin diseases.