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Microdermabrasion

Preeti Savardekar
Consultant Dermatologist, Mumbai, India

Correspondence Address:
Preeti Savardekar
Shri Krishna Polyclinic, Krishna Building, J. P. Marg, Opp. Poddar Hospital, Worli, Mumbai - 400 018, Maharashtra
India

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Full Text

Microdermabrasion, popularly known as 'body polishing', is a simple and safe, office cosmetic procedure that has gained popularity in the last 5 years. In this procedure aluminum oxide crystals or other abrasive substances are blown onto the face and then vacuumed off, using a single handpiece. [1] This procedure has been widely utilized for a variety of cosmetic objectives, including the improvement of photoaging, hyperpigmentation, acne scars and stretch marks. Despite its widespread use, little is known about its actual mechanism of action. A few published studies suggest that patients and physicians alike report a mild benefit when microdermabrasion is utilized for photoaging. [2] Histologic evaluation reveals little actual abrasion of the skin with the procedure, yet changes are seen in the dermis.

Principle of Microdermabrasion

All of the action in microdermabrasion takes place at the level of the stratum corneum. Affecting deeper layers of skin would be painful and harmful and it would result in permanently embedding the tiny grains into the skin.

Whether done with a product at home or in a professional setting with a specialized tool, the principle of microdermabrasion is the same. The idea is that if you remove or break up the stratum corneum, the body interprets that as a mild injury and rushes to replace the lost skin with new and healthy cells. In the first hour after treatment, there is mild edema (swelling) and erythema (redness). Depending on the individual, these side effects can last anywhere from an hour to two days.

This process has a few beneficial effects. With the stratum corneum gone, the skin's surface is improved. The healing process brings with it newer skin cells that look and feel smoother. Some of the skin's visible fine lines, post inflammatory hyperpigmentation and to some extent, pigmentation due to tanning are removed. Also, without the

stratum corneum acting as a barrier, medicinal creams and lotions are more effective because more of their active ingredients and moisture can find their way down to the lower layers of skin. As microdermabrasion temporarily removes some moisture from the skin, it is important to apply moisturizing creams.

Indications and Contraindications

Microdermabrasion is used mainly for superficial acne scars, post inflammatory hyperpigmentation and photoaging (fine lines and open pores). [3] however it is also claimed to improve mild acne and scars due to other causes. Microdermabrasion is not recommended for those who have active rosacea, fragile capillaries, vascular lesions, widespread acne, herpetic lesions, warts, erosions or ulcers, eczema, psoriasis, lupus erythematosus and diabetes mellitus. Microdermabrasion should not be used on patients who have taken isotretinoin in the previous six months due to the associated dryness of skin and the possibility of inducing scarring. [4]

Procedure of Microdermabrasion

After putting the patient in a comfortable position, the area to be treated is cleansed. The technician steadily moves the tool over the target area, applying even and steady pressure to remove the stratum corneum without affecting the lower skin layers. A standard session usually consists of one to three passes with the tool. The procedure may take anything between 15-30 min. More pressure can be applied till pinpoint bleeding is seen in cases of deep acne scars and this is more effective provided the patient is informed of the aftercare and is willing to have a sensitive skin for two to three days till healing occurs. The depth of the treatment depends on the strength of flow of the crystals, the rate of movement of the handpiece against the skin and the number of passes over the treatment area. Slower movement of the handpiece (allowing longer contact of the abrasive crystals with the skin) and more passes achieves deeper abrasion. [4] Crystals are available in different sizes like 100 microns, 130 and 180 microns. It is believed by a few that the bigger the size of the crystal, deeper is the depth of abrasion. However, this view is not universally accepted. [4]

The patients are asked to apply specialized lotions and creams to the affected area between sessions. This rehydrates the area and assists in promoting healthier new skin.

Professional microdermabrasion can bruise or discolor the skin if done incorrectly. Tiger stripes are commonly seen for 24-48h after the procedure on very fair or sensitive skins. The vacuum action tends to cause blemishes if the skin tension is let up or is uneven. The lip area is particularly susceptible to bruising and the eyelids should never be treated with microdermabrasion. Treatment that is too deep or intense can cause permanent discoloration to the skin.

Techniques of Microdermabrasion

Different methods of microdermabrasion include mechanical abrasion from jets of zinc oxide or aluminum oxide crystals, fine organic particles or a roughened surface. Many of the newer microdermabrasion machines offer the facility to use more than one method. When using a crystal machine, abrading crystals and the abraded material are both vacuumed off through the handpiece through which the abrasive particles come. The procedure is not very painful and requires no anesthesia. It is a useful alternative for patients whose skin is too sensitive to use anti-acne drugs like tretinoin.

Aluminium oxide crystal machines

The most commonly used abrasive in microdermabrasion is aluminum oxide. [5] It is a good abrasive because of its

coarse, uneven surfaces. It won't cause allergic skin reactions, such as eczema or itching; it is more or less chemically inert and is not absorbed by the skin. It has bactericidal properties, which is an advantage while treating acne, as acne is associated with bacterial proliferation.

Other crystal machines

Other crystals instead of aluminium oxide can be used for microdermabrasion and these include sodium chloride crystals, [6] sodium bicarbonate crystals and magnesium oxide crystals. These media are cheaper; although a bit less effective. Generally these alternative media are not as abrasive as aluminum oxide.

Crystal-Free

Instead of crystals, estheticians and dermatologists alike use diamond-tipped devices that abrade the skin. These wands have their tips made of diamond chips of varied size and coarseness for different types of skin and levels of resurfacing. Dead skin cells are sucked up at the abrasive tip of the wand into a waste filter. The major difference with the crystal-free treatment to the crystal is the hygiene. Loose abrasive crystals are hazardous irritants for eyes of the operator (who performs many treatments per day), but also the patient. A mask, along with protective eyewear should be used in order to keep the abrasive out of the eyes, nose or ears. Other differences are, shortened procedure time, lower maintenance costs and of course, less of a mess. Patients have commented that the crystal-free procedure is usually much less painful while not sacrificing results. [7]

The Vacuum

The vacuum action of the machine has the following functions:

It pulls and raises a small section of skin to work on. It shoots a stream of crystals across the targeted skin patch. It collects the used crystals and dead skin for disposal.

Some tools perform all of these functions with one circuit. The suction process in these devices is called 'Venturi suction'. More powerful versions use two circuits, one to shoot the crystals out and another to collect them.

If the powder is not cleared away from the face after the procedure, itching is experienced by the patient for a few hours.

Histopathologic Studies

Volunteers who underwent skin biopsies before and after a treatment series on the dorsal forearms showed that there was statistically significant improvement in roughness, mottled pigmentation and overall improvement of skin appearance, but not in rhytides. [8],[9] Acne scarring improved, but required deeper ablation. Immediately after the procedure, the stratum corneum was homogenized and focally compacted. There was slight orthokeratosis and flattening of rete ridges and a perivascular mononuclear cell infiltrate, edema and vascular ectasia in the upper reticular dermis one week after completion of the series. Chronically there was epidermal hyperplasia, decreased melanization and some increase in elastin.

Side Effects

Local side effects are uncommon and transient but include pain, burning, sensitive skin, photosensitivity, tiger stripes

or diffuse hyperpigmentation. Workers who routinely inhale silica dust (silicosis), asbestos fibers (asbestosis) or hard metal dust are at risk of pulmonary fibrosis. [8] Hence, the operator must protect himself/herself with a mask. The crystals may also get into the eyes of the operator or more commonly the patient. Hence, the patient must wear protective eyewear during the procedure.

Each session of microdermabrasion can be repeated every 10-15 days and combination with superficial peels alternating with microdermabrasion is claimed to give better results. If used correctly the microdermabrasion machine can be used for other body parts also and gives satisfactory results.

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