LETTER TO THE EDITOR

The NEEDLELESS MICROJET: a novel device for hypertrophic scar remodelling on the forehead

Editor

Facial scars lead many patients to seek treatment such as intralesional steroid injection, silicone gel, Z-plasty, W-plasty, resurfacing, dermabrasion, CO_2 laser, Erbium laser, and medications such as tranilast, pentoxifylline, in an attempt to remove their scars.[1] However, in the case of plasty, the amount of time taken to recover is lengthy, and current laser treatments are accompanied by a long downtime with notable pain and discomfort. Thus, a new method for reducing scars is needed to overcome these shortcomings. The case that we present highlights the effective treatment of a linear scar using a novel pneumatic needleless microjet device.

A 27-year-old male patient presented with a 0.5 × 3-cm-sized erythematous linear scar (Fig. 1a). He had tripped and fallen on a stairway 2 months prior to presentation and had 11 stitches on his forehead due to an abrasion from the fall. He eventually ended up with a linear scar with a Vancouver scar scale (VSS) score of 6.[2] We decided to treat the patient using a less invasive pneumatic needleless microjet device (INNOJECTOR™; Amore Pacific, Seoul, Korea) prior to attempting surgical scar revision (Fig. 2). We took care to apply topical anaesthetic (EMLA cream) before treatment. Approximately 1 h was taken to complete each treatment with preparations taking 30–40 min and applications taking 10–20 min. The patient reported only a low degree of pain throughout the treatment. Swelling that occurred right after the treatment due to the injection of normal saline disappeared several hours afterwards (Fig. 1b). Entry points also disappeared within a matter of days. Without performing any other treatments, including laser treatment, topical agent, or silicone gel, we were able to decrease the VSS score of the patient's facial scar from 6 to 1 after only two microjet treatments. Treatment consisted of 0.10-mL injections at 2-mm intervals with 1 month between treatments (Fig. 1c).

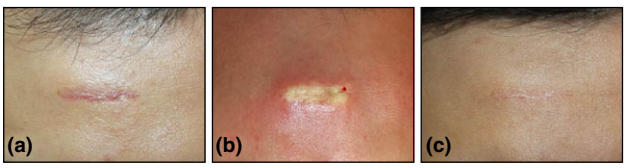

Figure 1 (a) The patient presented with a 0.5 × 3-cm-sized erythematous linear scar with a VSS score of 6. (b) Swelling that occurred right after the treatment due to the injection of normal saline. (c) A linear scar with a VSS score of 1 after a total of two needleless microjet device treatments with 1 month in between.

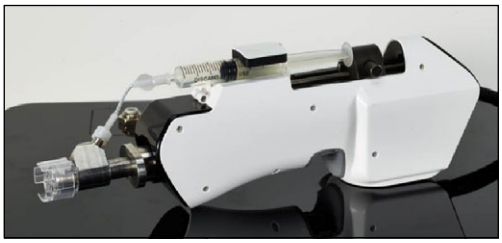

Figure 2 Novel pneumatic needleless microjet device.

Needleless injection systems are cutting-edge devices used to introduce a variety of medications, such as insulin and vaccines, into patients without piercing the skin. The advantage of needleless injectors is their ability to prevent the hazards of skin puncture and destruction of skin that are caused by traditional methods that only lead to a minimal skin response.[3] The needleless microjet device enables the injection of a solution into the epidermis at a high speed of upto 180 m/s, using pressurized air, enabling it to enter the dermis. As the jet meets the skin surface, it causes a hole in the skin. The deeper the hole in the skin, the more the jet slows down, causing the liquid to accumulate in the hole. It only takes a short period oftime (within tens of microseconds) from the point of impact for the dimensions of the hole to be established. The liquid is dispersed into the skin in a near-spherical shape due to stagnation of the jet at the end of the hole.[4] The hole decreases in size as time passes, and it is thought that the opening formed through this process provides the necessary space for scar remodelling. Much of the scar remodelling effect is due to the stimulation of fibroblasts by micro-trauma, which activates neocollagenesis.[5]

In conclusion, we were able to find that the needleless microjet device is an effective treatment for scars. In comparison with other methods, the microjet device has the added advantage of being less invasive and less time-consuming than other treatments. Additionally, its speedy recovery time allows patients to return to everyday life in a short period of time.

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