

LETTER TO THE EDITOR

Successful treatment of thyroidectomy scar with a pneumatic needleless injector and silicone gel

Dear Editors,

Thyroidectomy is the most frequently used method when performing surgery for thyroid cancer. A transverse incision on the neck is typically used to approach the thyroid; scar formation in highly visible areas of the neck is a consequence of using this method. The mean score of the Dermatology Life Quality Index for persons who have a thyroidectomy scar is similar to the mean score of patients with psoriasis and severe atopic dermatitis (1). In this study, we report the effects of a pneumatic needleless injector and silicone gel on scar remodelling in the case of a male patient with a thyroidectomy scar.

A 41-year-old male patient visited our hospital to lessen the conspicuousness of a thyroidectomy scar (Figure 1). He underwent a total thyroidectomy and bilateral central node dissection 2 weeks prior to his visit. He had an erythematous protruding scar, with a length of 6 cm and a thickness of 3 mm. The Vancouver Scar Scale (VSS), including pigmentation, vascularity, pliability and height, was used for clinical assessment. The first time the patient presented, his VSS score was 7 points. We had him apply a silicone gel sheet (Scar-Clinic™; Hans Biomed / Ildong Pharmaceutical Co, Ltd, Seoul, Korea) to only the left side of

his scar. We had the patient use the silicone gel sheet for 12 hours every day for a total period of 4 months. The silicone sheet used to treat the patient in this study had identical features to other silicone gel products (1.5–2.5 mm thick; permeability rate, 0.23–0.27), with a thickness of 2.5 mm and a permeability rate of 0.23. Furthermore, we utilised a pneumatic needleless injector with the intention of improving the cosmetic outcome. We treated the patient with a pneumatic needleless microjet injection device (INNOJECTOR™; Amore Pacific Co, Ltd, Seoul, Korea) on the entire thyroidectomy scar once a month for a total of four times. We injected normal saline into the dermis through a small entry point, with 0.10 ml injections at 2 mm intervals. Four months later, the left side, which was treated using both the silicone gel and pneumatic needleless microjet injection device, had a VSS score of 0; the right side, which was treated only with a pneumatic needleless microjet injection device, had a VSS score of 2 (Figure 2).

Silicone gel is well known for reducing hypertrophic scars. Its semi-occlusive nature has been found to improve scars by providing adequate, but not excessive, hydration. Thus, silicone gel serves as an occlusion that causes a decrease in TEWL and



Figure 1 The VSS of the patient's thyroidectomy scar at the time of his first visit to our hospital was 7.



Figure 2 After 4 months, the left side of the scar, which was treated using both the silicone gel and pneumatic needleless microjet injection device, had a VSS score of 0, and the right side, which was treated only with the pneumatic needleless microjet injection device, had a VSS score of 2.

restores the normal hydration state of keratinocytes. This causes dermal fibroblasts to downregulate extracellular matrix production (2). In another study, it was reported that in the case of silicone gel sheet-treated scars, the expression of transforming growth factor- β 1 and platelet-derived growth factor was significantly lower compared with the case of untreated scars (3). Hirshowitz *et al.* reported that polarisation of the scar tissue caused by the negative static electric change could be a possible mechanism of reducing scar tissue (4).

Treatment using a pneumatic needleless microjet injection device on a hypertrophic scar of the forehead caused a protruding scar to become flat (5). An accelerated jet pierces the epidermis through a small entry point through this device. It can inject the solution into the epidermis at a high speed of up to 180 m/s using pressurised air, distributing the solution intradermally by means of liquid-propelled compressed gases. Particles of the medical materials only enter the dermis to a controlled depth, received by strong pressure from the device. The liquid is dispersed into the skin in a near-spherical shape because of the stagnation of the jet at the end of the hole (6). This hole is thought to provide the necessary space for remodelling by inducing dermal microtrauma (7).

There were no cases of splitting application to only one side of a scar to compare their effects. There appears to be a synergistic effect between these two methods for scar remodelling when dealing with treatment of a thyroidectomy scar. An *in vivo* study that investigates this hypothesis is needed as is a protocol developed through a large-scale study.

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