

**Figure 1.** (A) Liquid nitrogen sprayer was assembled with a 22-gauge hypodermic needle, and intralesional cryotherapy was performed under the guidance of ultrasound. (B) The needle (white arrowhead) was inserted into the cystic lesion (white arrow) as seen in the ultrasonography. (C) The size of the cyst in baseline ultrasonography was  $7.4 \times 4.8 \times 4.5$  mm. (D) The size of cystic lesions was reduced to  $3.2 \times 1.7 \times 1.5$  mm in 3-month follow-up.

Several therapeutic methods have been described for the treatment of SM in the literature, including surgical excision, carbon dioxide laser, and cryotherapy.<sup>4</sup> Although surgical excision can completely remove the cystic lesions, it results in scars and is impractical for the removal of multiple lesions. Carbon dioxide laser and cryotherapy may be useful for the treatment of multiple lesions but they may cause scar formation and cosmetic disfigurement. In contrast to surface cryotherapy, intralesional cryotherapy can deliver liquid nitrogen directly into the dermal cystic lesions without epidermal damage and reduce the risk of scar formation or pigmentary changes. Using this method, the liquid nitrogen can be distributed throughout in the cystic space and destroy the epithelium in SM; therefore, physicians can not only reduce the size of cystic lesions but also reduce the risk of recurrence.

Ultrasonography can provide real-time imaging of anatomic structures and assist physicians in identifying the location of a subcutaneous lesion. Under ultrasound guidance, intralesional cryotherapy can be performed precisely while reducing the risk of damage to the surrounding tissue.

In conclusion, this article demonstrates that ultrasound-guided intralesional cryotherapy is a simple and innovative technique for the treatment of SM. However, further well-controlled studies are necessary to prove its efficacy and safety.

## References

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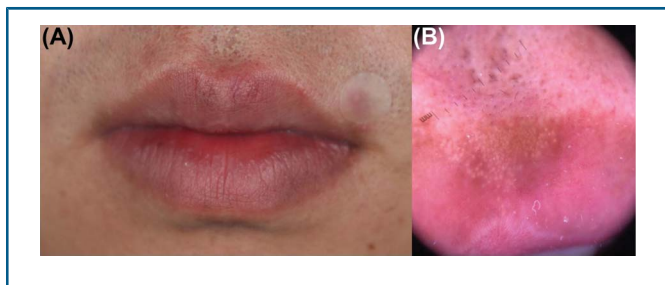
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## Fordyce Spots Treated by an Intralesional Insulated Microneedle Radiofrequency Device

**F**ordyce spots appear as whitish to yellowish papules on lips, buccal mucosa, and genital mucosa. They are sebaceous glands located ectopically. The pathophysiology of Fordyce spots is unclear. Lee and colleagues<sup>1</sup> suggest the anomalous disposition of sebaceous glands during the embryonic period as a possible cause. On histopathologic examination, they appear as a normal sebaceous gland with single lobule or gland in the dermis or submucosa. The lesion is benign, and treatment is not necessary except for cosmetic reasons. The lesions can be disfiguring for some patients with obscured lip lines. There is no standard treatment protocol for Fordyce spots.<sup>1</sup> Various

methods have been used for the treatment, such as CO<sub>2</sub> laser,<sup>2</sup> electrodesiccation,<sup>3</sup> and isotretinoin.<sup>4</sup> We present a case of Fordyce spots treated by an intralesional insulated microneedle radiofrequency device.

A 27-year-old male patient visited our department with asymptomatic whitish grouped papules on the center of the upper lip (Figure 1A,B). A punch biopsy was performed, and the lesions were confirmed as Fordyce spots. The patient wanted the lesions removed. Treatment was initiated with a 1 MHz monopolar radiofrequency (RF) device (AGNES, AGNES Medical Co., Korea). Local anesthesia was achieved with topical lidocaine cream. The



**Figure 1.** (A) Clinical appearance before treatment of Fordyce spots (B) Dermoscopic image of the lesion before treatment.

treatment was conducted with an SL-type microneedle. The insulated microneedle was insulated into the lesion and electrocoagulation was initiated by applying the RF energy. The energy was applied intralesionally, 1 to 2 times, at the energy level set at an intensity of power Level 4 (5 watts) and 100 milliseconds. After the first treatment, most of the lesions were invisible. However, there were residual lesions on the dermoscopic examination. The second treatment was conducted 4 weeks after the first treatment. The energy level applied was the same as the first treatment. A topical ofloxacin ointment was applied after each treatment. After second treatment there was no visible residual lesion (Figure 2A). However, on the dermoscopic analysis, the remaining lesions were visible, although less than after the first treatment (Figure 2B). The patient was satisfied that no visible lesions were observed and did not want further treatment. There was no significant adverse effect except for erythema and swelling after the procedure.

There have been a few studies about the treatment of Fordyce spots on lips. Ocampo-candiani et al.<sup>2</sup> used CO<sub>2</sub> laser for the treatment of Fordyce spots. Reepithelization took 17 days and the patient was administered oral antibiotics for 7 days. Chern and Arpey<sup>3</sup> used electrodesiccation and curettage for the treatment. This treatment method was conducted at a relatively low setting to minimize postprocedure crusting. Thus, this treatment method required 4 repeated sessions spaced over 4 to 6 weeks. Monk<sup>4</sup> reported a case of an acne patient with



**Figure 2.** (A) Four weeks after second treatment session. No residual lesions were observed. (B) Dermoscopic image of the lesion after the second treatment session. Many of the lesions were reduced compared with the previous image.

Fordyce spots whose symptoms improved after treatment with oral isotretinoin. Fordyce spots disappeared after 4 weeks of systemic isotretinoin treatment and reappeared 9 weeks after cessation of the drug. The treatment with an insulated microneedle radiofrequency device did not show postprocedure crusting or erosion of the epidermis. The down time is shorter than aforementioned treatment methods. The insulated part of the needle spares the epidermis from damage.

We chose this modality based on its previously studied therapeutic effect on facial seborrhea. Kobayashi and Tamada<sup>5</sup> reported that the biopsy specimen showed fibrous change of sebaceous glands after electrothermolysis using insulated needles. All subjects showed decreased sebumeter measurements.<sup>5</sup> The insulated microneedle can target sebaceous glands with minimal epidermal injury. It showed excellent results with no adverse effect except for immediate erythema and swelling. Because of its short healing time, patients can proceed with their daily life after the procedure. Because the treatment was minimally invasive, no scar formation was observed.

The limitation of this report is that there are no long-term follow-up results of the patient. Long-term follow-up would be desirable to track recurrence and maintenance of treatment effects.

Our findings suggest that using an insulated microneedle radiofrequency device for the treatment of Fordyce spots could be effective and safe. The method of selective intralesional insulated microneedle electrocoagulation can be considered as an optimal therapeutic method.

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