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Hand Rejuvenation with Novel Calcium Hydroxyapatite Dermal Filler (Stiim): a Case Report

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Abstract: The report investigates hand rejuvenation using a novel dermal filler based on calcium hydroxyapatite. Hands undergo aging due to environmental factors and age-related changes. We present a case report of a patient who received applications of the product on the dorsum of the hand, exhibiting visible improvement in volume and reduced visibility of veins and tendons. Aesthetic evaluation indicates a 'very much improved' outcome, both for the physician and the patient. This report highlights the promising application of the novel dermal filler for hand rejuvenation.

Keywords: Rejuvenation; CaHA; Dermal Fillers; Hands; Case report.

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1. Introduction

The hands are one of the most exposed structures of the human body to the environment, thus highly susceptible to various environmental factors that can affect their appearance [1]. Hand aging is a common complaint in aesthetic offices [2]. Throughout the aging process, the skin on the dorsum of the hands undergoes changes, becoming thinner, more fragile, and dry [3]. Additionally, prominent veins and tendons on the dorsum of the hand, wrinkled and excessively loose skin, and loss of elasticity can be observed. Studies demonstrate that it is possible to estimate a person's age solely by observing the appearance of their hands [4]. Consequently, there is significant interest among physicians and patients in treatments to restore a youthful appearance to patients' hands.

Rejuvenation of the dorsum of the hands is an effective procedure promoting high patient satisfaction with a relatively low risk of complications [5]. Dermal fillers based on calcium hydroxyapatite (CaHA) microspheres carried in aqueous carboxymethylcellulose (CMC) gel are commonly used for their biostimulatory effect [6-7]. Following implantation, the CMC gel provides an immediate filling effect, albeit temporary due to its rapid degradation [6], while the calcium hydroxyapatite microespheres remain for 9 to 12 months, promoting collagen stimulation, the effects of which have proven to be long-lasting [8, 9]. In animal models, injection of CaHA has been shown to result in increased collagen from four weeks up to 18 months [10].

The new commercially available calcium hydroxyapatite filler, Stiim by Ilikia (CGbio, Korea), features a novel technology in which particles are presented in a "Lattice-pore structure", promoting gradual particle degradation, potentially resulting in increased longevity of the product in the applied area and consequentially its collagen stimulating action. This filler contains 30% CaHA, with particles measuring from 25 to 45μm. Animal studies have demonstrated that this product stimulates fibroblast proliferation and an active phagocyte response, leading to cellular transition to neo-collagenesis, resulting in remodeling of the extracellular dermal matrix similar to the original [11].

This case report aims to demonstrate the potential of the novel Stiim calcium hydroxyapatite filler for hand rejuvenation.

2. Case Report

A 57-year-old healthy female patient sought medical attention with complaints of volume loss and skin laxity in dorsum of her hands, which highlighted superficial veins and tendons. It was verified that the patient had no prior fillers in her hands, local infection, history of keloids, connective tissue disorders, or coagulation abnormalities. The use of a calcium hydroxyapatite-based bio-stimulatory filler was indicated for the dorsum of the hands. The patient provided consent for the publication of this case report, including the use of accompanying photographs.

The application area was properly sanitized and then markings on the patient's skin were done as illustrated in Figure 1. To ensure a safe and comfortable procedure, the skin was gently pinched between two fingers, elevating it above the level of the blood vessels and adjacent anatomical structures. Next, entry point anesthesia was applied with 0.2 mL of 2% lidocaine without a vasoconstrictor. For the procedure, one syringe of Stiim containing 1.5 mL of product was used. It was diluted in a 1:1 ratio by adding 0.5 mL of lidocaine and 1 mL of 0.9% saline to a 3 mL syringe. The solution was homogenized by transferring it between syringes connected with a Luer-Lok connector 30 times.

Using a 25G needle, a puncture was made at the entry point as illustrated in Figure 1. A 25G x 50mm cannula was used for the product application, with the injection performed in the subdermal plane using the retrograde injection technique. A total of 1.5 mL of the product was injected per hand, distributed in 5 retro-injections of 0.3 mL each, covering the entire dorsal surface of each hand according to the prior markings (Figure 1). The patient reported no pain or discomfort during the procedure. After the application, the patient's hand was massaged using a surfactant to evenly distribute the product. The patient was advised to perform hand massages three times a day for 5 days.

Figure 1. Marking scheme for the application of calcium hydroxyapatite. The black circle indicates the cannula entry point, and the lines shows the area for the retroinjections.

The patient was monitored, and photographic images of the hands were obtained to track the procedure's results. In Figure 2, images of the hands are presented for pre-procedure, Day 1, and Day 14. In Figure 2B, one day post-implant, a temporary volume effect

provided by the gel is observed. It is important to note the absence of edema or bruising. After 14 days, a rejuvenation effect on the hands can already be noted (Figure 2C).

Figure 2. Pre and post-procedure images of the 1st session. A. Pre-procedure image. B. One day after the procedure. C. Fourteen days after the procedure.

For logistical reasons, the second session of the procedure was performed after 45 days, using the same technique as previously described. Images corresponding to the pre-procedure condition, 1.5 months, and 3 months are presented in Figure 3. In the post-procedure images (Figure 3B, C, E, and F), it is possible to observe that the tendons and blood vessels became less apparent, and the appearance of loose skin was reduced. Both the physician and the patient rated the result as 'Very Much Improved' on the GAIS (Global Aesthetic Improvement Scale) (11). No adverse events were reported throughout the follow-up period.

3. Discussion

This case report described the use of the novel calcium hydroxyapatite filler, Stiim, for hand rejuvenation in a 57-year-old patient. This calcium hydroxyapatite filler used diluted 1:1, has proven to be an effective and safe option for hand rejuvenation. The treatment provided satisfactory aesthetic results, resulting in a younger and revitalized appearance of the patient's hands with less visible veins and tendons.

Safely and minimally invasively, subdermal injection with a cannula represents a straightforward method for distributing diluted CaHA, as it occurs in a superficial plane, meaning that it is less likely to injure vessels or tendons [12]. In the literature, when adverse events of hypersensitivity with CaHA were tracked, none were recorded [13]. No adverse event was observed in this reported case.

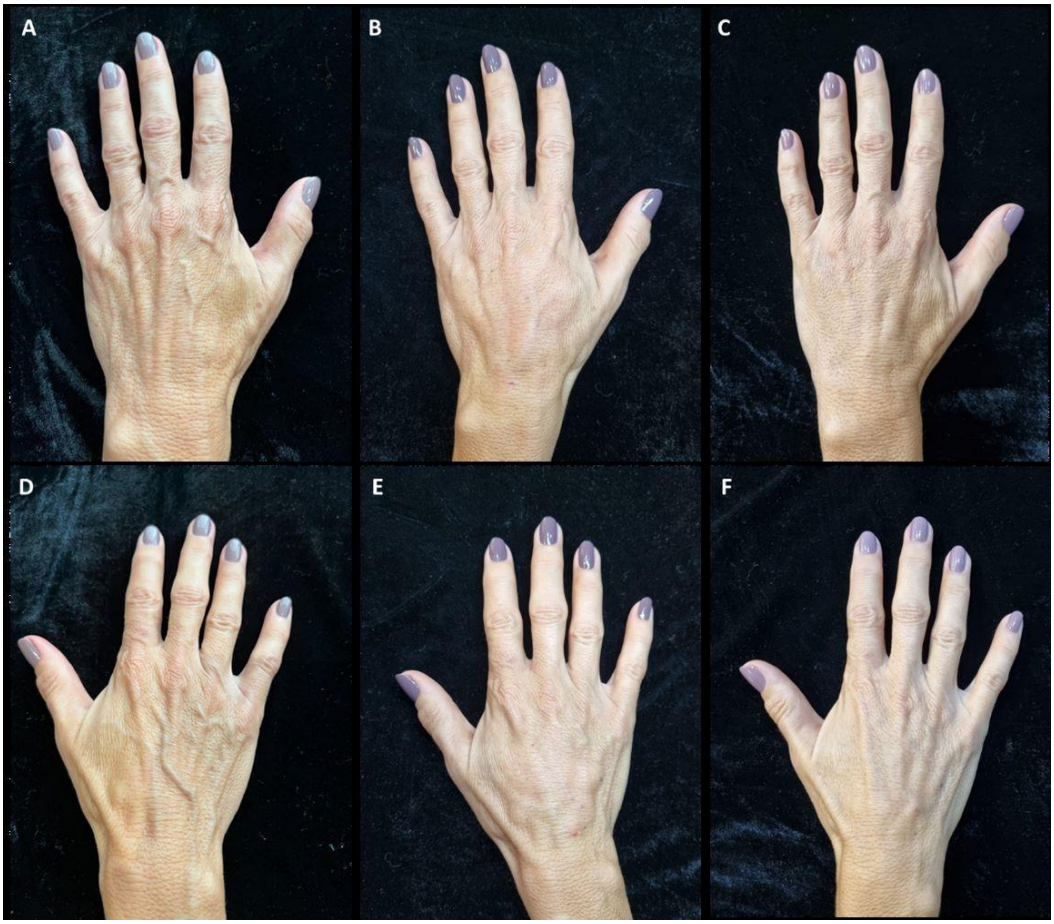
In relation to other filling alternatives, studies highlight the use of PLLA for filling and projection of areas that have suffered from volume loss and increased sagging, thereby creating a rejuvenating effect [14]. However, preclinical studies have shown that PLLA has a higher inflammatory potential compared to CaHA. Another form of treatment that helps with hand volumization and rejuvenation is treatment with Hyaluronic Acid (HA), whether combined with CaHA or not [15, 16]. Using both products strategically combines their benefits. Studies indicate that the intradermal application of cross-linked HA gel on the dorsal hand enhances various skin parameters, particularly hydration [2].

As this is a case report, there are inherent limitations in generating more detailed quantitative data and outcomes. Conducting future studies that include quantitative measures, such as dermal thickness assessment via ultrasound, would be advantageous. Moreover, additional research is needed to confirm the long-term efficacy of the filler and to compare it with other available market alternatives. However, there is also a need for larger randomized clinical trials to establish more comprehensive clinical guidelines.

This procedure may result in side effects such as infection, inflammation, localized discomfort, bruising, swelling, and adverse reactions to the substance [13]. Additionally, although rare, there is a potential risk of severe allergic reactions and even ischemia (reduced blood flow) in areas adjacent to the application site; however, there were no records of these adverse events in this reported case. Stiim demonstrated safety and efficacy in

enhancing the aesthetic appearance of the hands over the short to medium term, highlighting its potential as a valuable option for hand rejuvenation procedures.

Figure 3. Pre and post-procedure images. Right hand on the top and left hand on the bottom. A and D: Pre-procedure images. B and E: 1.5 months after the first session, image taken before second session. C and F: 3 months after the first session.



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Conflicts of Interest: The authors declare no conflicts of interest.

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