Case Report

Calcium hydroxylapatite-based treatment for rejuvenation of the hands

Tratamento para rejuvenescimento das mãos com hidroxiapatita de cálcio

ABSTRACT

Calcium hydroxylapatite is a biocompatible, non-antigenic, biodegradable, opaque material that is a viable treatment option for rejuvenating the hands by increasing their volume and reducing the visibility of blood vessels and tendons. This article describes 16 cases treated with a half syringe of calcium hydroxylapatite in the back of each hand. The results suggested that the treatment was safe, well tolerated and effective, with a high degree of satisfaction in 75% of cases and clinical improvement for up to 12 months after the injection.

Keywords: hand; hydroxyapatites; rejuvenation; skin aging.

RESUMO

A hidroxiapatita de cálcio é material biocompatível, não antigênico, biodegradável, opaco, sendo opção viável no tratamento para rejuvenescimento das mãos, aumentando seu volume e reduzindo a visibilidade de veias e tendões. Relatam-se 16 casos tratados com meia seringa de hidroxiapatita de cálcio em cada dorso de mão. Os resultados demonstraram que o tratamento foi seguro, bem tolerado e eficaz, com alto grau de satisfação em 75% dos casos e melhora clínica por até 12 meses após a injeção.

Palavras-chave: *mãos; hidroxiapatitas; rejuvenescimento; envelhecimento da pele.*

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INTRODUCTION

The aging of the skin of the hands involves two main processes: alterations in the texture and loss of volume. The texture alteration includes skin pigmentation, atrophy, and the emergence of wrinkles. The volume loss occurs through a reduction of the subcutaneous tissue and muscles. These changes lead to a greater visibility of blood vessels and tendons, the appearance of fragility, and the loss of elasticity and tone.

Dermal fillers are a viable option to restore the loss of volume in the back of the hand. This paper describes a series of 16 cases treated with calcium hydroxylapatite (CaHA), a non-permanent filler, in the back of the hand.

METHODS

Sixteen female patients (aged 46-73), who presented a loss of volume on the back of their hands, were included in this study at a private practice. The three doctors involved in the study assessed that the patients would benefit from the treatment. The study started in June 2009, and the final follow-up took place in September 2010. The exclusion criteria were: previous filling procedure in the treatment site, acute or chronic local infection, history of keloidal scars, conjunctive tissue disease, abnormal clotting, Raynaud's phenomenon, or alterations in the circulatory system. All patients signed a term of informed consent.

The 1.3 ml contents of the calcium hydroxylapatite syringes (Radiesse,® Bioform Medical Inc, San Mateo, CA, USA) was mixed with 0.4 ml of 2% lidocaine without vasoconstrictor to create a homogeneous solution. The lidocaine was first aspirated into a 3 ml syringe, which was coupled with the CaHA syringe using a Luerlok connector (Baxa, Englewood, NJ, USA). The mixture was transferred from one syringe to the other 15 times in order to homogenize the solution, without compromising the rheological properties of the product. Half of the volume was kept in the original syringe for injections with a 27G x 1/2" (13 mm) needle in one hand. The other half was reserved for the other hand, thus using a single syringe per patient per session.

The antisepsis of the treated area was carried out using alcoholic chlorhexidine. The skin was pinched between two fingers and elevated to a level above blood vessels and adjacent to anatomic structures, and the CaHA (0.85 ml) was applied in *bolus* in the subdermal plane. The injections were distributed among three or four points on the back of each hand (Figure 1). The site was then massaged and molded, using the fingertips, to spread the material evenly. All patients were photographed before the procedure, after two and three weeks, and after six months (Figures 2 and 3).

Twelve patients underwent one session, and two underwent four. The second session was performed after intervals ranging from 3-7 months (Figure 4). Two patients attended follow-up visits at 12 months (Figure 5). The post-procedural adverse effects were evaluated in all follow-up visits. Each patient answered a questionnaire to assess her degree of satisfaction (very satisfied, somewhat satisfied, or dissatisfied with the treatment).

The patients' photographs were evaluated by four dermatologists who were not involved in the study. The variables evaluated were: increase in volume, decrease in the visibility of veins and tendons, and overall improvement in the back of the hands, according to the following quartile scale: Grade 1 (0% to 25%) = absence of or little improvement, Grade 2 (26% to 50%) moderate improvement, Grade 3 (51% to 75%) considerable improvement, and Grade 4 (76% to 100%) almost total improvement.

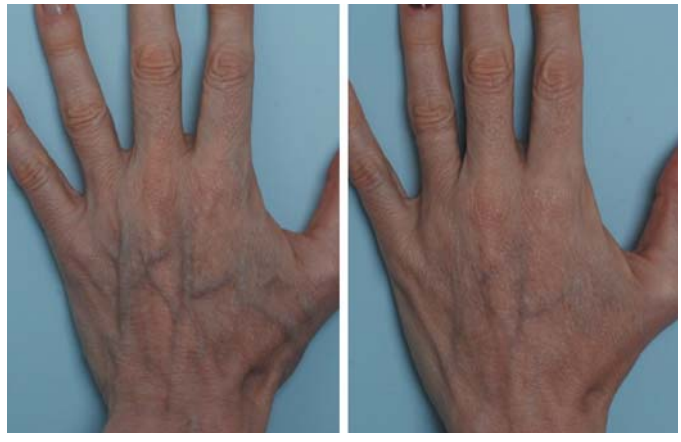


Figure 2: Appearance before the procedure and after 14 days (half syringe)

RESULTS

Twelve patients reported great satisfaction with the treatment, three were somewhat satisfied, and one was dissatisfied with the procedure. There were no reports of adverse effects. Two weeks after the procedure, the dermatologists' evaluations were 2.9, 2.9, and 3 for increase in volume, decrease of visibility of veins and tendons, and overall improvement, respectively. Three months after, the results were reduced to 2.3, 2.4, and 2.4, respectively; and in six months to 2.1, 2.1, and 2.3. Twelve months after, the increase in volume and overall improvement of the back of the hands remained constant, while the decrease in the visibility of veins and tendons was 1.8 (Graph 1). Nevertheless, it is important to note that only two patients returned within the year, making it difficult to assess those results.

Four patients who had a clinical indication for the replacement of higher volumes received injections of a second syringe, with the evaluations after three months rated at 2.4, 2.6, and 2.6, respectively.

There were no serious complications during the study. All patients experienced erythema soon after the procedure, which lasted an average of two days. Four patients had edema that lasted for more than two days, but it completely resolved within

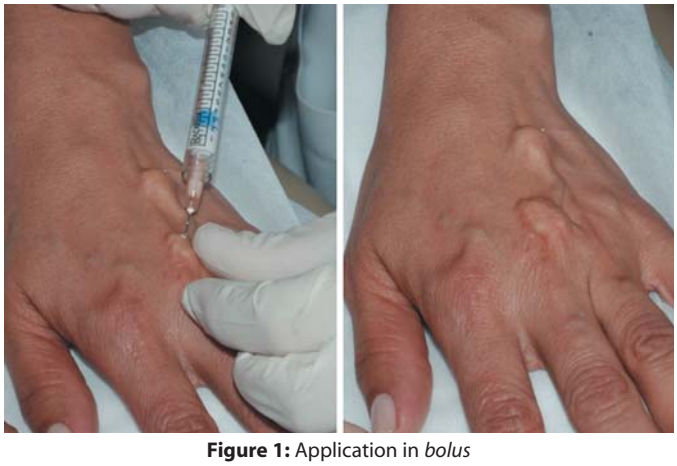


Figure 1: Application in *bolus*

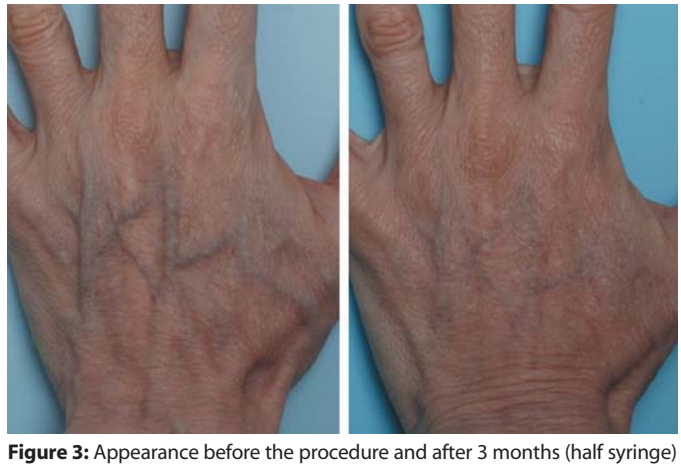


Figure 3: Appearance before the procedure and after 3 months (half syringe)

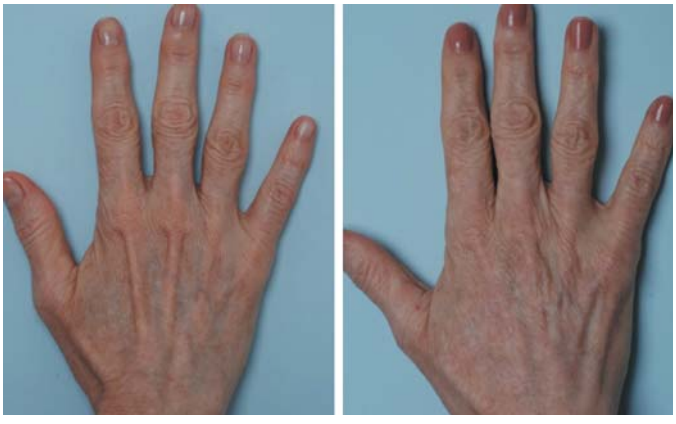


Figure 4: Appearance before the procedure and 2 months after the second application (half syringe)

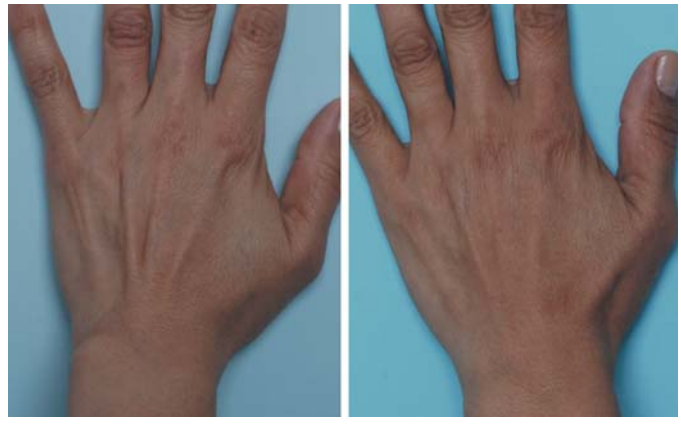
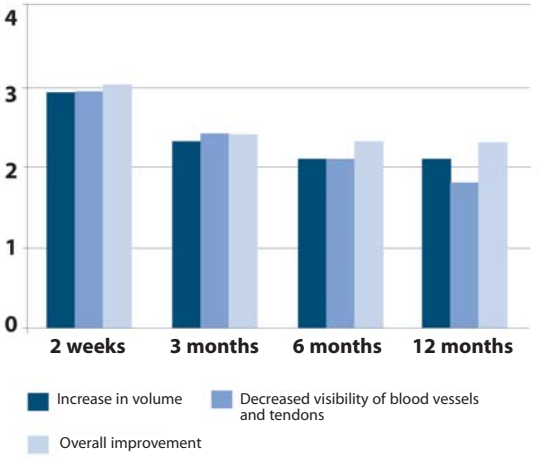


Figure 5: Appearance before the procedure and after 12 months (half syringe)



Graph 1: Results of the clinical evaluation

15 days. One patient had persistent pain for a month, which improved with a simple analgesic.

DISCUSSION

The original technique described by Busso and Applebaum 1 in 2007 consisted of injecting a full CaHA and lidocaine syringe per hand, in a single *bolus* of large volume. Later on, Marmur and colleagues 2 demonstrated good results using one syringe per hand, distributed among 3-5 variable insertion points. Five patients were treated, all of whom were very satisfied with the treatment after 24 weeks of follow-up. Among the adverse effects, swelling lasting 1-4 weeks occurred in all patients. One patient developed a papule on the back of the hand immediately after the injection, which improved after an intralesional injection of corticosteroid.

Unlike in the study carried out by Marmur, we used one syringe per patient (rather than two), which might explain the lower satisfaction rate found in this study. Yet 75% of patients were very satisfied with the treatment. Furthermore, the present study's sample (16 patients) was larger than that of Marmur and others, 2 which had five patients. In contrast, 25% of the patients in the present study had edema that lasted up to two weeks, which can likely be explained by the smaller volume of CaHA and lidocaine injected per hand.

Previous methods of filling the hand with other products, such as hyaluronic acid, fat and collagen, have shown limited efficacy, particularly regarding their short duration, which in most cases did not exceed three months. Moreover, none of these fillers was able to make structures such as veins and tendons less visible. The study product for this study has CaHA microspheres of 25-45 μm in diameter, dispersed in a carboxymethylcellulose carrier gel. The CaHA is identical to that found in human bone, and is thus highly biocompatible. The carrier gel disperses within a few weeks, leaving the calcium microspheres in the tissue. Laboratory studies have shown that the product does not induce tissue osteogenesis, and that the neocollagenesis may extend for up to 72 weeks. [3,4] Another unique and important characteristic of CaHA is its opacity, which reduces the visibility of blood vessels and tendons.

CONCLUSION

The results obtained in the present study showed that using CaHA to rejuvenate the hands was safe, well tolerated, and effective. Clinical improvement was verified for six months after the procedure, and up to 12 months afterwards in two patients. ●

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