How I do?

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Standardization of the body vectoring technique with calcium hydroxyapatite

Padronização da aplicação corporal de hidroxiapatita de cálcio com a técnica de Figures vetorizadas

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ABSTRACT

Introduction: Calcium hydroxyapatite in a carboxymethylcellulose carrier gel presents unequivocal results for facial skin improvement, stimulating the collagen and elastin production. Regulatory agencies recently approved its use after scientific proof of its benefit in greater dilution.

Objective: This study aimed to demonstrate a technical standardization to rationalize body application. Methods: This study idealized vectorized figures to apply calcium hydroxyapatite with intermediate dilution (1:4).

Results and discussion: The proposed technique makes it possible to accurately calculate the required for each patient, depending on the anatomical unit's size to be treated and the region's topographic characteristics. This technique's rationale also allows homogeneous distribution, minimization of complications due to product accumulation, good tolerability by the patient and optimization of results.

Conclusions: The vectorized figures' technical simplicity facilitates calcium hydroxyapatite application, and customizations must be made with the injector's greatest experience.

Keywords: Collagen; Hydroxyapatites; Cosmetic techniques

RESUMO

Introdução: *a hidroxiapatita de cálcio em gel carreador de carboximetilcelulose apresenta resultados inequívocos para a melhora cutânea facial, estimulando a produção de colágeno e elastina. Seu uso para tratamento corporal tornou-se on- label apenas recentemente, após comprovações científicas de seu benefício em maior diluição. O objetivo deste trabalho foi demonstrar uma padronização técnica para racionalização da aplicação corporal. Neste estudo foram idealizadas Figures vetorizadas para aplicação da hidroxiapatita de cálcio com diluição intermediária. Com a técnica proposta, é possível calcular, com exatidão, o volume de produto necessário para cada paciente em função do tamanho da unidade anatômica a ser tratada e das características topográficas da região. A racionalidade desta técnica permite ainda distribuição homogênea, minimização das complicações por acúmulo de produto, boa tolerabilidade pela paciente e otimização dos resultados.*

Conclusões: *a simplicidade técnica das Figures vetorizadas facilita a aplicação da hidroxiapatita de cálcio, e as customizações devem ser feitas com a maior experiência do injetor.*

Palavras-chave: *Colágeno; Hidroxiapatitas; Técnicas Cosméticas*

INTRODUCTION

Skin aging is a complex and multifactorial process that develops with progressive thinning of the epidermis and dermis, in addition to subcutaneous tissue atrophy. Histologically, there is a reduction and disruption of elastic and collagen fibers leading to tone and elasticity loss and skin wrinkles.[1,2,3] Some specific factors accelerate these phenomena, such as smoking and massive weight loss.[4] Hyaluronic acid fillers significantly contribute to restoring these structures. However, they have a small biostimulating property for collagen and elastic fibers. In this flaccidity and fibroelastic disorganization context, there is a need for a product that is biocompatible, non-allergenic, safe, and that acts explicitly by stimulating these structures.

Radiesse® (Merz Pharmaceuticals, Germany) is a product that fulfills these requirements. It consists of a mixture of 30% calcium hydroxyapatite (CaHA) associated with 70% carboxymethyl cellulose (CMC) carrier gel, combining the biostimulatory capacity of the first component with the filling capacity of the latter. Once applied, this product has an initial volume of carboxymethyl cellulose, which can last for a few months, and is then replaced by the formation of collagen and elastin. Despite its widespread use on the face,[6] it is recently indicated as a body biostimulator, limited mainly by the lack of data on the dose and dilution to be used to maintain the biostimulatory effects.[5,6]

In 2015, Cogorno documented the flaccidity and thickness improvement of the skin of the abdomen, thighs, and arms with the application of Radiesse distributed with the vectorization technique.[7] Several other scientific studies have proven its efficiency even with the product dilution. Histology confirmed the production of collagen and elastin, and ultrasonography established an increase in skin thickness. These data can be observed in arms,[8,9] abdomen,[9] hands,[10] neck, and chest.[11]

Based on these studies and the experts' experience, the global consensus on hyperdiluted Radiesse use was published in 2018, and the Brazilian consensus in the following year.[12,13] By definition, hyperdiluted Radiesse is any dilution greater than 1:1. The recommended body dilution varies from 1:2 to 1:6, depending on the anatomical topography, flaccidity degree, local skin thickness, and injector experience.

Briefly, the thinner the skin of the place to be treated, the more diluted the product must be. Also, the more diluted the product is, its volumizing effect and the chance of nodule formation will be less decreased. The consensus also allows the use of cannulas or needles. The body regions to be treated include arms, thighs, abdomen, buttocks, neck, chest, knees, and elbows.

Although studies and consensus facilitate the use of body Radiesse, there are many variables to be analyzed, such as topography, final product dose, and product distribution pattern, limiting its use mainly to the less experienced.

OBJECTIVE

This study aims to standardize a form of intermediate dilution of Radiesse for body use and use figures with vectors to calculate the final amount of diluted product needed for each area.

METHODS

Dilution

A Radiesse® syringe containing 1.5 ml of product is inserted in 6 ml of diluent, making a final volume of 7.5 ml. The diluent solution consists of 4.5 ml of saline and 1.5 ml of lidocaine (with or without vasoconstrictor) (Figure 1).

Lidocaine (1.5 ml) and saline (4.5 ml) are placed in a 10 ml syringe with luer lock. The solution receives Radiesse® (1.5 ml) using the three-way. Another 10 ml syringe is used for homogenization (reserve the original Radiesse® syringe for the application moment). The number of passes between the two 10 ml syringes is variable, enough to observe all the homogeneous material, which, on average, takes 10 to 20 back and forth movements.

At the application time, the original syringe with the product is used. With the dilution, we have five syringes of the diluted product.

Vectorized figures

This technique employs pre-patterned figures in vector format (asterisk and seven points) (Figure 2).

Application with a 5 cm long microcannula and 22 gauge needle is recommended. Each vector must be drawn with a 5 cm length, which is the length of the microcannula to be used. The application technique is linear retroinjection, in the justadermal plane. In each retroinjection, 0.2 ml of the diluted product will be deposited. The red circle is the entry hole of the

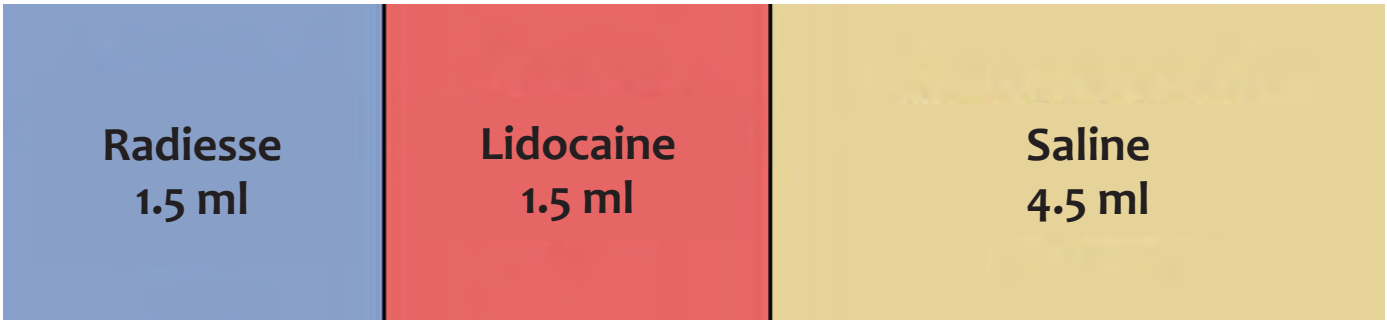

FIGURE 1: Figure 1: Dilution of Radiesse for body use (1:4)

microcannula and is not red by chance, as attention should be paid at the end of each retroinjection to avoid overpositioning the product in this area.

Therefore, on average, each of these figures would use 1.5 ml of the hyperdiluted Radiesse®; that is, with this standardized dilution, we can work with five vectorized figures in the body region to be treated. The choice between one and the other design must be based on the comfort of the hand for application to avoid bone shields or undesirable contacts with the stretcher, for example. For example, seven-point designs are usually more comfortable in the submental and neck, while the abdomen and buttocks are comfortable with both, as we will see below.

The region to be treated is marked with a pen, keeping in mind the drawings size and the dose used in each, and estimating the final quantity of product for the proposed treatment with total safety. It is imperative to have a homogeneous distribution of the product throughout the region to be treated, leaving no uncovered application areas. This protocol drastically reduces the chances of error in calculating the number of syringes needed for treatment.

This study used a female model with a medium body size by the Brazilian standards, measuring 1.68 m and weighing 65 kg of body weight (BMI = 23 kg/m2).

Post-procedure recommendations

At the end of the application, massage is performed, and it is recommended to continue it at home for seven days, twice a day. Massage helps to spread the product and prevents complications such as nodules. Nodules are rare in this dilution unless there is an overlap of product at some point due to technical error, being more common in the entrance orifice.

On average, three sessions are recommended at intervals of 30 to 60 days.

RESULTS

When conducting the application in this model, we observed:

1 – Abdomen

The overall treatment of the abdomen requires around nine to ten vectorized figures, that is, two Radiesse syringes in this dilution (Figure 3). As noted in the figure, it is worth mentioning that, in specific clinical situations, only the superior or inferior abdomen can be treated. In this situation, only a product syringe is required (five vectorized figures).

2- Buttocks

For global biostimulation of the gluteal region, five vectorized figures are required in each gluteus, demanding two syringes for bilateral treatment (Figure 4).

Thighs

Crural cutaneous flaccidity is quite variable between patients, but generally, it compromises the thigh root primarily and then the inner central region, as we can see in Figure 5. With this marking, we used five vectorized figures (one product syringe) across the thigh. These figures can be transposed to all sides of the patient's thigh according to the clinical need.

Arms

Brachial flaccidity, like crural flaccidity, is highly variable. A large proportion of patients complain predominantly of their inner faces. When it happens, two to three vectorized figures are required per side; that is, in this situation, a syringe could treat both internal faces of the arms (Figure 6). Due to the heterogeneity of the flaccidity clinical presentation and the area size, there is often a demand for a syringe (five figures) per side.

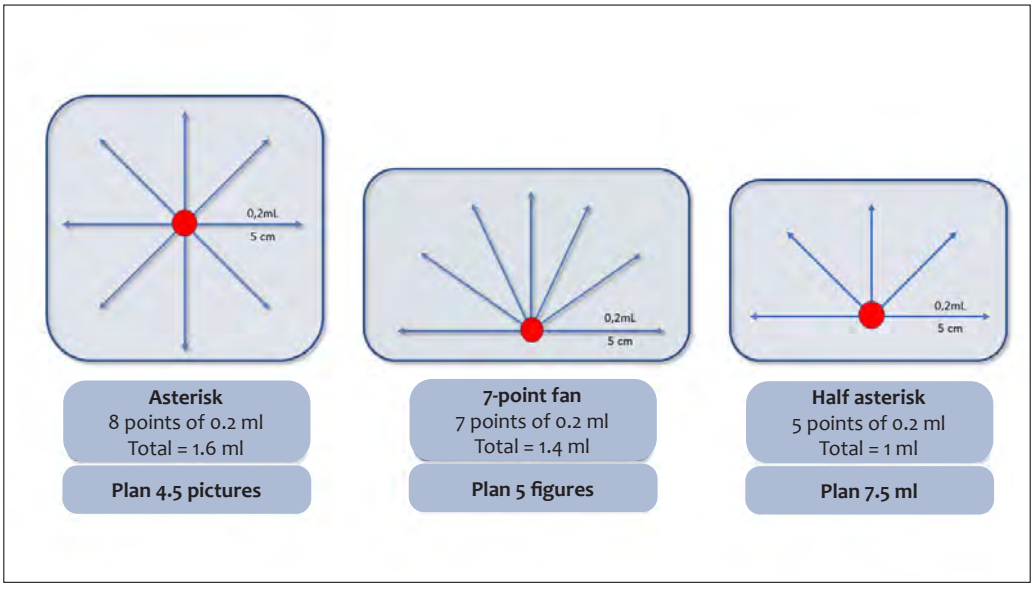

FIGURE 2: Vectorized figures in asterisk, fan of seven points and half asterisk. Attention to the length (5cm), number of vectors, and the volume injected in each vector (0.2ml). Observe the possible number of figures to be planned and the total volume of product used

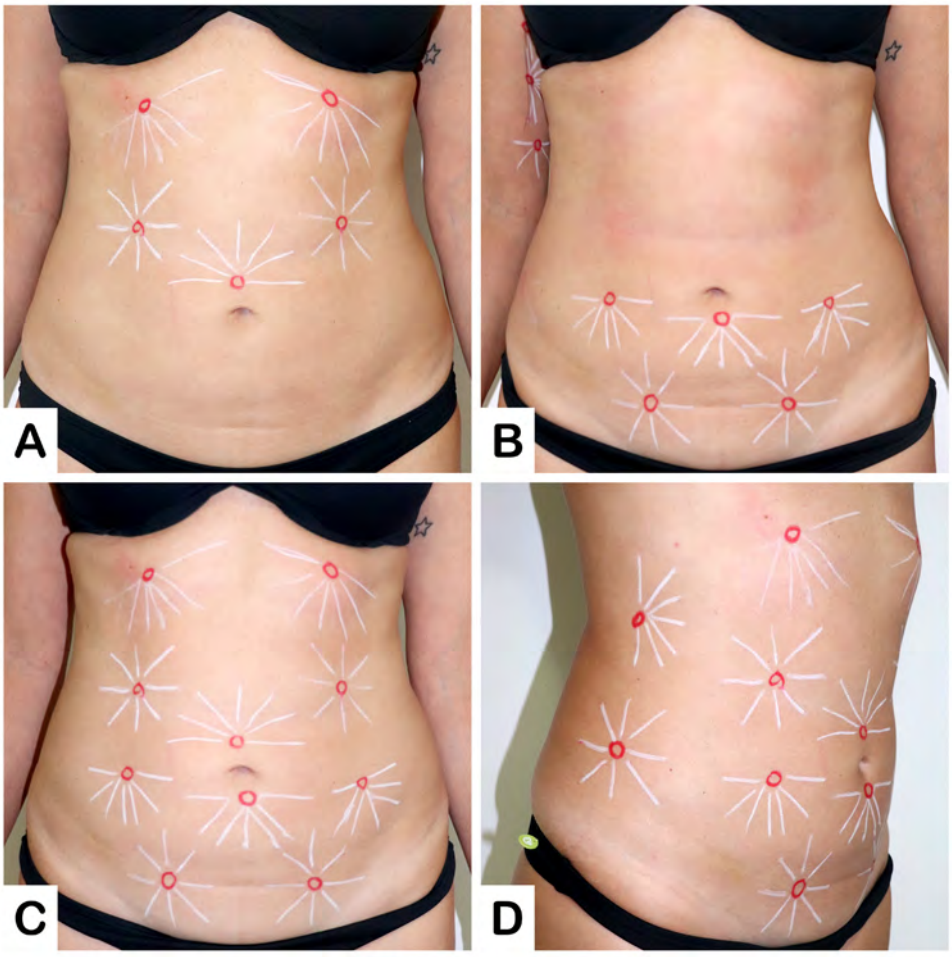

FIGURE 3: Abdominal treatment possibilities according to the patient's needs: upper abdomen **(A),** lower abdomen **(B)**, upper and lower abdomen, **(C)** and abdomen associated with flanks **(D)**

Cervical

The cervical region is usually very comfortably treated with seven-pointed figures, with an average of five vectorized figures, as shown in Figure 7. Each cervical session, therefore, requires, in this technique, one Radial syringe.

Chest

The chest area usually treated is commonly not large, corresponding to the most exposed place in necklines. Therefore, no more than one syringe is needed in this technique. In Figure 8, three vectorized figures were sufficient to cover the area.

DISCUSSION

Radiesse® today must be categorized as a biostimulator. Its renowned and safe use on the face was a stimulating factor for its use in body treatment. The major concern would be the dose necessary to achieve the results of biostimulation without resorting to many syringes of product, making the indication financially unfeasible. Studies have shown that it keeps its ability to thicken the skin even when hyperdiluted, consequently improve the flaccidity. Thus, its use for this purpose started to be encouraged.[8,9,10,11]

FIGURE 4: Global biostimulation of the gluteus with two asterisks and three figures of seven points

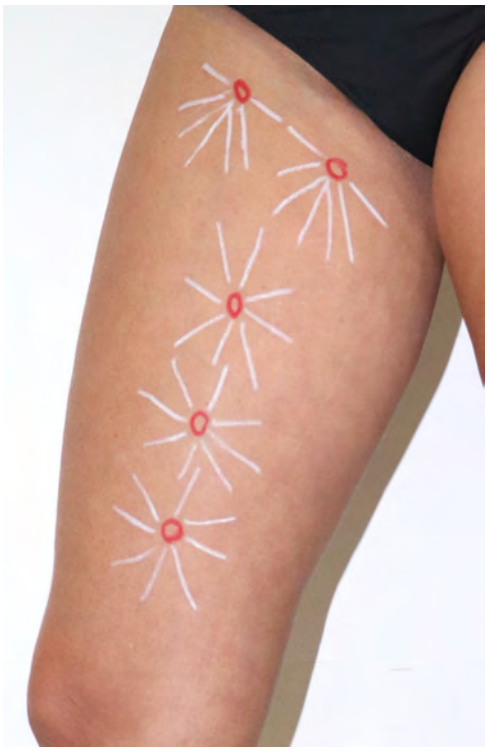

Figure 5: Demarcation of the inner side of the thigh with two figures with seven points and three subsequent asterisks

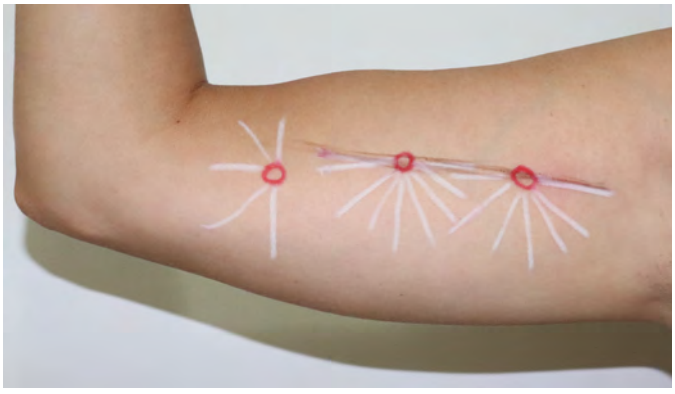

Figure 6: In this treatment, two figures with seven points were taken on the bicipital line, associated with the middle asterisk distally

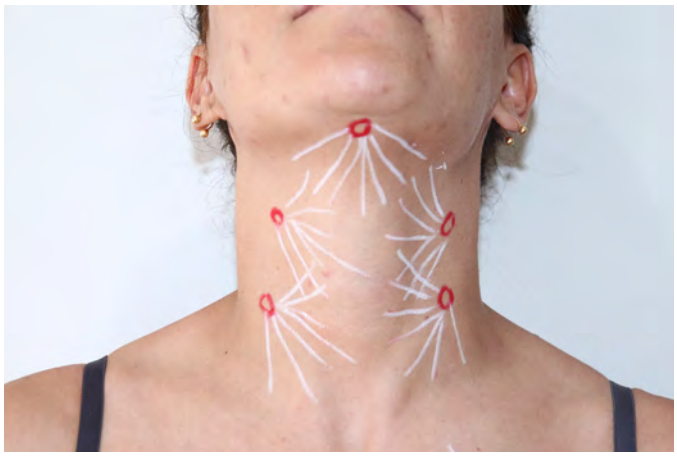

FIGURE 7: Demarcation of the cervical region with five figures with seven points

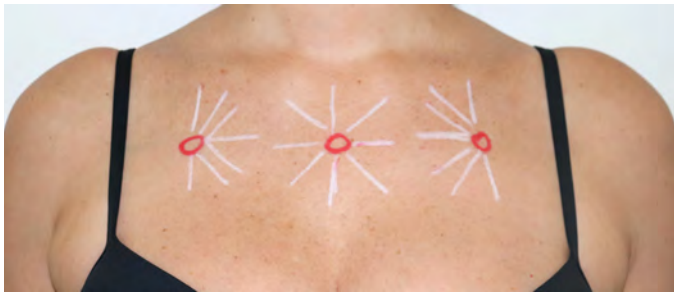

FIGURE 8: Demarcation of the neck region with a central asterisk and two adjacent figures with seven points

The numerous possible dilutions and the various application techniques make the use for beginners confusing, mainly when calculating the number of syringes for a given area and how to distribute the application points. It is not uncommon to hear stories of injectors referring to the application asymmetrically or that the product was not enough for the entire target area, demonstrating that proper planning is essential for the success of any application.

The literature has not yet met the medical need for standardization. Hence, we conducted a body dilution protocol to meet the varied anatomical topographies and qualities of local skin. In this average dilution (1:4), studies show the biostimulatory capacity and minimal or absent complications related to nodules formation.

Although studies indicate that a product syringe can treat a skin area between 100 to 300 cm^2, this information is confusing in practice. In contrast, this new standardization technique with vectorized figures facilitates pre-procedure marking and the final calculation of the exact amount of product needed specifically for each patient.

Interestingly, these data corroborate the Brazilian and worldwide consensus regarding the total dose per session for each anatomical unit. According to the consensus, on average, one product syringe per hemiabdomen would be needed. A syringe would also be enough to treat each face of the thigh, each gluteus, and the cervical region, which was consistent with our results. Although the consensus recommends one syringe for the neck and each arm, our results observed relative savings in the product in this technique. The great collaboration in this application form is the ability to presume with relative safety the final dose of product needed for that specific patient, based on the pre-procedure marking of the vectorized figures, remembering that each 1.5 ml syringe of Radiesse®, in this technique, allowed to make up to five figures.

In addition to these benefits of rationalizing the quantity of product, the vectorized figures technique allows a homogeneous distribution of the product, preventing the treated areas from receiving different doses of hydroxyapatite and, consequently, precluding them from being unevenly stimulated.

Although the international and Brazilian consensus allow the use of needles or microcannulas for body treatment,[12,13] this technique indicates the use of the second device. In addition to better safety,[14] the retroinjection with microcannula is very comfortable for the patient It is believed that, due to the rationality of the vectorized figures technique, the number of punctures is lower, not requiring an anesthetic block of the accesses. Consequently, pain tolerance to treatment becomes even higher.

All standardizations seek to bring simplicity and technical security, not necessarily being a rule. With the greatest professional experience, different forms of dilution and application can be chosen, based on anatomical topography and local skin thickness.

CONCLUSION

Applying body Radiesse® with vectorized figures is suitable for different body regions, providing safety and simplicity in executing and calculating the final dose of the product. ●

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Approval of the final version of the manuscript; study design and planning; preparation and writing of the manuscript; active participation in research orientation; intellectual participation in propaedeutic and/or therapeutic conduct of studied cases; critical literature review; critical revision of the manuscript.