

New techniques

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Poly-L-lactic acid in the rejuvenation of the medial and anterior arms

Ácido Poli-L-láctico na região medial dos braços

ABSTRACT

Poly-L-lactic acid is an aliphatic polyester, a lactic acid polymer. It is a biocompatible, fully absorbable and immunologically inert substance. Its action mechanism is based on the increase of dermal tissue by stimulating collagen production. The application of this substance in the face is well known, however there are few publications on its use in other areas of the body. This article describes for the use of poly-L-lactic acid in the deep dermis to rejuvenate the medial and anterior region of the arms.

Keywords: rejuvenation; skin; arm.

RESUMO

O ácido poli-L-láctico é poliéster alifático, polímero do ácido láctico. É substância biocompatível, completamente absorvível e imunologicamente inerte. Sua ação baseia-se no incremento do tecido dérmico através do estímulo à produção de colágeno.

A aplicação dessa substância na face já é bastante conhecida, porém há poucas publicações sobre seu uso extrafacial. Descreve-se técnica de rejuvenescimento da região medial e anterior dos braços através da aplicação do ácido poli-L-láctico na derme profunda.

Palavras-chave: rejuvenescimento; pele; braços.

INTRODUCTION

Over the last few years, many techniques and products used in filling and volumizing procedures have emerged that aim to minimize the signs of aging such as wrinkles and loss of volume due to a reduction of the subcutaneous tissue.^{1,2} Poly-L-lactic acid is one such product.

Poly-L-lactic acid is a biocompatible, inert, and completely resorbable polymer. In Brazil, it has been approved for use in HIV-related lipoatrophy and has been used as an off-label substance for cosmetic purposes. When injected into the junction between the dermis and the subcutaneous layer, it stimulates fibroblasts to make collagen, resulting in an increase in the volume of the skin. The thickening of the dermis is not generally visible until two months after the procedure, and the results last for up to two years. After that period, the product degrades and converts into lactic acid monomers and is eliminated through

the lungs in the form of carbon dioxide.^{3,4}

The product is diluted in distilled water and combined with anesthetics (prepared without vasoconstrictor) 12–36 hours prior to application. There is no consensus on the volume of product used; it varies in the literature from 4.5–8 ml (average = 6 ml). The product must be kept at room temperature and stirred immediately before the procedure. The most widely used method is the retrograde technique, which involves inserting the needle into the deep dermis or subcutaneous layer and applying 0.05–0.1 ml per injection. Another option is the use of microcannulas, which allow access to deeper planes, with greater comfort and a lower incidence of hematomas.⁵ From 1–9 sessions are necessary (three sessions on average) at intervals of 4–6 weeks in order to avoid overcorrection.^{3,6} It is crucial to massage the area at the end of each session.² The most common side effect is the occurrence of subcutaneous papules or nodules. However their incidence can be reduced by using lower concentrations, injecting into the subcutaneous tissue, massage after application and at home. Perhaps most important, this product should only be administered by skilled professionals in body areas that are appropriate for such treatment.

Most publications describe the use of Poly-L-lactic acid in facial and neck rejuvenation; only a few studies cite other body areas, such as the hands and chest.^{7,8}

Some treatments for improving the signs of aging on the skin of the arms have been described: radio frequency, infrared, cutaneous fillings, and surgical techniques.^{9–11} In 2009, Distanto and colleagues used hyaluronic acid to rejuvenate the arms of 16 women, with significant results in the increased hydration of the stratum corneum, a progressive increase in the thickness of the dermis, and improvement in cutaneous elasticity.¹² Also in 2009, Radaelli and Forte described promising results for using Poly-L-lactic acid to regenerate this region.²

After good results with treating the face and back of the hands, in October 2009 the authors started applying the product in other extra-facial areas, such as the medial and anterior regions of the arms, the anterior and medial areas of the thighs, and the abdomen. This article describes the technique used to treat sagging in the anterior medial region of the arms and the authors' experience over 24 months of treatments.

TECHNIQUE

Poly-L-lactic acid must be reconstituted on the day prior to its use with 8 ml of sterile distilled water and preserved at room temperature. Immediately before use, the vial must be shaken vigorously until the product is homogenized. At the same time, 12 ml of aqueous solution must be prepared using 8 ml of distilled water and 4 ml of 2% lidocaine without vasoconstrictor. Thus, by combining the volumes of the vial and the solution, the final Poly-L-lactic acid dilution per vial is 20 ml.

Next, the arm's region to be treated was marked and divided into four quadrants (Figure 1). A 1 ml Luer-lock syringe was used to aspirate 0.4 ml of the product and 0.6 ml of the solution. The product was applied using the linear retrograde technique, injecting approximately 0.05 ml into the deep dermis in

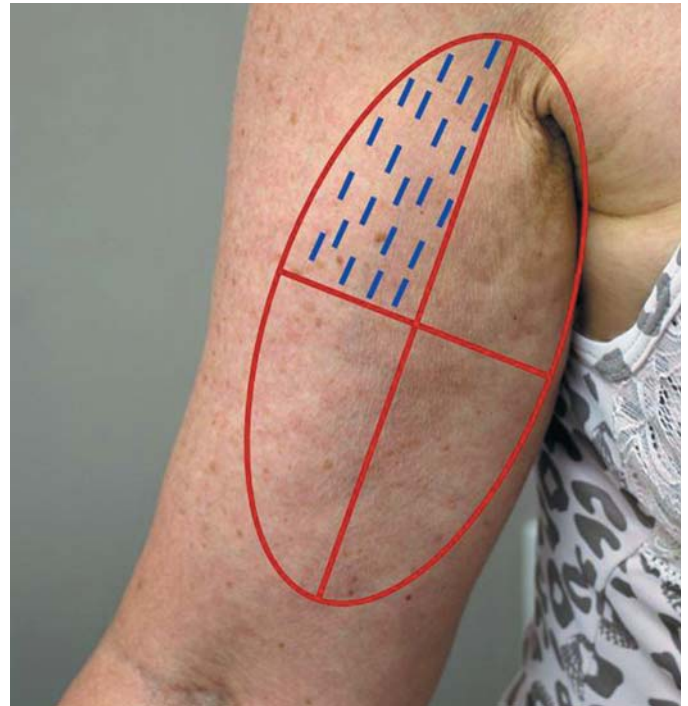


Figure 1: Division of the treatment area into four quadrants. Application of the product in "parallel sticks"

parallel cylinders (Figure 1). Approximately 1.25 ml of the product was used in each quadrant, amounting to 5 ml per arm. After the application, vigorous massage was performed in the treated area for 10 minutes, and patients were instructed to use the same massage technique at home, twice a day for 10 days. Only 10 ml of the product was used for both arms in each session. The number of sessions ranged from 2–4, at intervals of about four weeks.

RESULTS

Four weeks after the first application, there was noticeable improvement in the texture of the skin in the treated area; there was a reduction in sagging and in the "orange peel" appearance of cellulitis. However, the results were more evident after the second application.

To date, 22 patients have been treated using this technique, all of whom presented significant improvement. In some cases the improvement was more evident four months after the first application. The result obtained in the first patient treated remained unaltered after 22 months (Figures 2 and 3). The side effects including pain during the application, local erythema, and transient hematoma.

DISCUSSION

The treatment of aging skin through non-surgical rejuvenation has increased in recent years. An important strategy in reversing the signs of aging is to replace the volume in fibrous connective tissue. The technique of injecting Poly-L-lactic acid

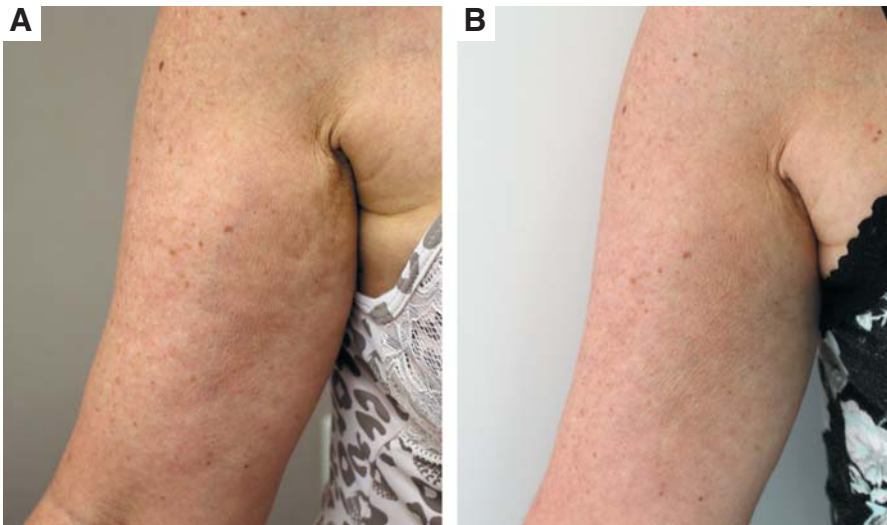


Figure 2: **A.** Before treatment; **B.** One year after two applications of 5 ml of Poly-L-lactic solution

stimulates the replacement of that volume through neocollagenesis and gives a natural appearance to the aging face. The main areas of indication are the lower third of the face, the malar region, and the nasolabial and labiomentalar folds.

More recent indications include its use in the treatment of the neck, chest, and back of the hands. Radaelli and Forte described 568 patients treated with Poly-L-lactic acid for cosmetic purposes, including treating new areas with promising results in a small group of patients: one case of local increase of the inferior region of the breast, one thoracic-axillary fold case, and 17 cases of revitalization of the arm and medial region of the thigh. One milliliter of the standard solution (6 ml) was used, adding 3 ml of distilled water, employing the retrograde insertion technique. Although only a few cases were treated, no side effects were reported.²

The dilution used in those applications was kept at 20 ml, however the amount used varied depending on the body area treated. The authors have chosen to describe the technique for application in the arms due to the more evident cutaneous

improvement seen in this region, and the greater number of cases.

Due to the descriptions in the literature of some cases of nodules in the areas where the product was applied^{4,13-16} and one case in which the authors observed the occurrence of small nodules 12 months afterwards on the backs of the hands, the authors have chosen to administer the 20 ml dilution in the deep dermis in small volumes in order to avoid those side effects. In addition, the authors carried out vigorous massage in the treated area immediately after the application, and instructed the patients to do the same in subsequent days in order to decrease the possibility of product accumulation, which could be related to the formation of nodules. To date, this adverse effect has not been observed in the cases treated.

The depth of the application affects the treatment results. The most effective application is in the deep dermis or subcutaneous tissue.¹³ This method decreases the formation of nodules while keeping the product in contact with the fibroblasts – which probably leads to an increase in collagen production and

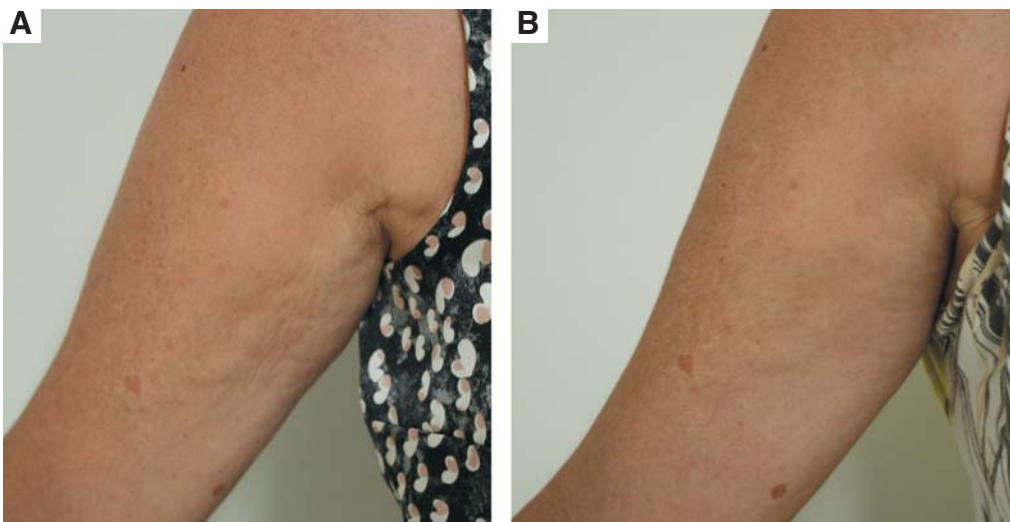


Figure 3: **A.** Before treatment; **B.** Two months after four applications of 5 ml of Poly-L-lactic solution

better results.

There is no consensus in the literature about the amount of product per application. The injected volume of 5 ml per arm per application was estimated based on the authors' experience, and was maintained due to the good results obtained. Notwithstanding, further studies are necessary to evaluate and quantify the ideal volume of product to use, depending on the area being treated.

The results obtained with this treatment have proven very promising, lasting longer than hyaluronic acid applications.² However, a greater number of cases is needed to evaluate the effects of the application, the optimal dose, the depth of application, its safety, and the duration of results.

CONCLUSION

The application of Poly-L-lactic acid to rejuvenate the face is already well known, however there are few reports of its use in other areas of the body. This article described a technique to treat sagging in the medial and anterior regions of the arms by applying the product in the deep dermis, with very promising results. The authors believe that the present description can serve as a starting point for studies aimed at quantifying treatment results, which may establish parameters for the standardization of applications in the arms and other areas of the body. ●

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